

CONTRACTUAL ARRANGEMENTS FOR RICE CULTIVATION IN BANGLADESH



By

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CONTRACTUAL ARRANGEMENTS FOR RICE CULTIVATION IN BANGLADESH



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DECLARATION

I do hereby declare that the dissertation entitled, "Contractual Arrangements for Rice Cultivation in Bangladesh" submitted to the Institute of Bangladesh Studies, Rajshahi University, Rajshahi, Bangladesh for the degree of Doctor of Philosophy in Economics, is an exclusively original work of mine. No part of it, in any form, has been submitted to any other university or institute for any degree, diploma or other similar purposes.



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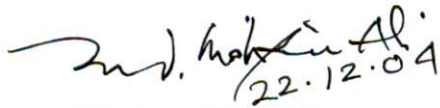
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CERTIFICATE

I have the pleasure to certify that the dissertation entitled, "**Contractual Arrangements for Rice Cultivation in Bangladesh**" is the original work of Md. Nur Alam. It is the candidate's own achievement and is not a conjoint work. The dissertation is prepared under my direct supervision and guidance.

I also certify that I have gone through the draft and final version of the dissertation and found it satisfactory for submission to the Institute of Bangladesh Studies, University of Rajshahi, Bangladesh for partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics.



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ABBREVIATIONS

AR	=	Average Revenue.
AC	=	Average Cost.
BARC	=	Bangladesh Agriculture Research Council
BBS	=	Bangladesh Bureau of Statistics.
BS	=	Block Supervisor
CV	=	Coefficient of Variance.
GK	=	Ganges –Kapatakhya.
GDP	=	Gross Domestic Product.
GOEP	=	Government of East Pakistan.
HH	=	Household.
HYV	=	High Yielding Varieties.
Kg	=	Kilogram
Km.	=	Kilometer.
MV	=	Modern Varieties
NA	=	Not Available
LFS	=	Labour Force Survey.
PRF	=	Population Regression Function.
SD	=	Standard Deviation.
SPSS	=	Statistical Package for Social Science.
Sq.	=	Square.
SRF	=	Sample Regression Function.
TK.	=	Taka (Bangladeshi Currency).
UAO	=	Upazila Agriculture Officer.

ABSTRACT

Bangladesh has been an agricultural-dependent economy with a growing population and one of the world's lowest per capita land areas. Agriculture sector is the single largest contributor to income and employment generation and a vital element in the country's challenge to achieving self-sufficiency in food, reducing rural poverty and fostering sustainable economic development. About 77% of the total population and 78% of rural labor forces are located in rural areas. Agriculture sector provides 63.2% of employment opportunities and 72% of rural employment. Moreover, 23.31% of country's GDP comes from agriculture. The production and employment opportunities either in agriculture or outside of it are circled around land due to the lack of off-farm source of earnings in rural areas.

Land is the crucial factor of agricultural production. Tenant and owner-cum-tenant farms cultivate about 42% of operated land. That is why sustainable agricultural development is impossible without improving the fate of the actual tillers of land. This study is mainly based on primary data collected from 150 tenant farms by surveying five areas, Pabna, Kushtia, Thakurgaon, Gazipur and Feni during the period of January to November 2003. A few models, such as Cobb-Douglas production function, regression and step-wise regression models, have been used for this study.

In Bangladesh, throughout its history, land tenure system appeared to have been changed in accordance with the aim of ruling authority for improving the fate of landowners, not for the tenants. The pattern of land distribution, structure of contractual arrangements along with resource base for agriculture had changed during the past 33 years of independence. On an average, nearly 2 lac acres of arable lands went out of agriculture every year during the past 3 decades. Per farm cultivated land has been reduced from 2.00 acres in 1983/84 to 1.50 acres in 1996. Moreover, a tremendous decrease in average farm size has taken place for all farm sizes. The structure of contractual arrangement has also been changing. The area under share tenancy was 91% in 1960, 74% in 1983/84 and 62% in 1996. Survey findings reveal

that 43.27%, 27% and 22% of tenanted lands were transacted under sharecropping, short-term leasing and kat (mortgage) system respectively. That is, till now sharecropping is dominant but its share is declining. Cash rent and kat system are taking place in lieu of sharecropping.

About 47% of landowners in rental market are absentee landlords who supplied 59.29% of total rented land indicating that urban people who are not attached with agriculture owns the major portion of land. About 63% of tenant farms are small farms that are rented-in 43% of the total leased-in land. Almost one-third tenants are absolutely landless and they rent-in 52% leased land. The owner and owner-cum-tenant farms' area has been decreased by 9% and 14% respectively during the period of 1983/84-1996. Moreover, the number of tenant farms had increased by 250% and area by 251%. So, land tenure situation and structure of contractual arrangements have also undergone substantial changes.

Social values and norms, structural and socio-economic factors influence on decision to rent-out of land by the landlord. About 58% tenants reported that they had taken land for using their labor endowments. Another 27% respondents reported that they had leased-in land for getting excess crop to make a safety net against food shortages. A regression result shows that Aman production is positively related with labor, capital and fertilizer but negatively with rent. However, output elasticities of inputs is less than 1, indicating the decreasing returns to scale in Aman production. Output is positively related to input but there is a decreasing returns to scale in Boro production.

There are great differences in cost of Aman and Boro production among the regions due to the variations in labor cost and hired cost of land and it indicates that employment opportunities in all regions and rental market are not even. The main cause of disparities in cost is the result of variations of rent. However, both per acre cost and revenue of Boro is higher than that of Aman. Rent, labor, capital and fertilizer constituted about 42%, 36%, 13% and 10% of per acre cost respectively. About 34%, 26%, 24%, 9% and 9% of per acre cost are constituted by rent, labor, irrigation, capital and fertilizer respectively. Average return from Boro production is higher than that of Aman in all regions. There are enormous variations in cost, production, revenue and profitability of tenanted land among the regions both for Aman and Boro.

Survey findings reveal that productivity under Kat arrangement is higher than other arrangements both in Aman and Boro. Meanwhile, productivity under sharecropping is

the least. Form of contractual arrangement and land quality (per acre revenue) play vital role in landlord's share on Aman production and in Boro production; form of tenancy, cost-sharing in production and land quality have much impact on landlord's income. Tenant's net return from tenanted land is influenced by rent, per acre revenue, labor cost, cost of capital and cost of fertilizer in Aman production and in Boro cultivation it is influenced by per acre revenue, labor cost, rent, cost of irrigation, cost of capital and cost of fertilizer.

Efficiency measurement of different contractual arrangements shows that landlord gets the highest share from sharecropping and the lowest from kat system. In Boro cultivation landlord gets highest rent from sharecropping and the lowest from fixed crop rent system. On the contrary, tenant gets highest net returns from kat system and the lowest from sharecropping both on Aman and Boro cultivation. Tenancy cultivation is profitable to the tenant either it is on cash rent basis or on crop rent. But it is more profitable on cash rent basis. Moreover, sharecropping and fixed crop rent arrangements are an inefficient mode of production in terms of productivity and resource allocation for both Aman and Boro production.

Alarming decline of cultivable land, the increase in functionally landless farm from 46% to 56%, the increase in tenanted land from 17% to 23% and increased number of marginal and small farms (70% of farm holdings) show the growing marginalization and pauperization. With negligible scope for area expansion and tremendous decline of cultivable land due to population pressure and the pavement of rural infrastructure, future growth will have to depend on raising productivity of per unit of land. The limited scope for increase in cropping intensity due to the pressure of soil fertility and the excessive use of chemical fertilizer needs mixing agriculture with livestock farming that can sustain the natural fertility of land.

Since per acre production of Boro is higher than that of Aman and it is also for flood-free area to flood-prone area, policy should be taken to ensure efficient use of water resources. That is, agricultural growth should come from the efficiency in the use of inputs, not from the expansion of input use. Because of the low land-man ratio and the pattern of ownership, there is little hope for gaining redistribution of land. However, at the dawn of the new millennium, in order to meet the challenges of globalization, the government, NGOs and the private sector should establish a research partnership in this field for having a sustainable agricultural growth as well as smooth and balanced development of the economy of Bangladesh.

GLOSSARY

Agricultural Holding: "an agricultural holding is a techno-economic unit of agricultural production unit under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form, or size."(BBS, 1999).

Agriculture: It is the practice of producing any crop by the farmer. In general, the concept of agriculture is the act of performing agro-based working mainly of crop production, poultry farming, cattle rearing and fish culture. But here agriculture is considered as the practice of producing any crops.

Area of Land Given to Others: This is the area of the holder's owned land (including that of others members of the household), which is given out to some other persons/body on rent or on lease usually for a limited period of time on payment in cash or kind.

Barga : It is one kind of sharecropping and synonyms of sharecropping.

Bonded labor system: Under this system, in lieu of using land the labor had to provide free labor to his landlord.

Char-abad: It means alluvial lands.

Double Cropped Area: Double cropped area means the area where two crops were grown during the year of data collection and only the net area of the land is taken into account.

Gini Coefficient: It is an aggregate numerical measure of income inequality ranging from zero (perfect equality) to one (perfect inequality). It is graphically measured by dividing the area between the perfect equality line and the Lorenz curve by the total area lying to the right of the equality line in a Lorenz diagram.

Jama : Is the state revenue during Mughal Period.

Khas: It means Government property.

khudka sta raiyats: They are the Long standing resident peasants of the village.

lakhira j: It is one kind of rent free grant.

Land tenancy: It is the system under which land is operated and its usufruct shared between the operator and owner. (Hossain, 1977).

Land tenure: It is the legal and customary system under which land is operated and held (Hossain, 1977)

Landowner: Landowner is the owner of cultivable land.

Madhayasvatvas: It means intermediate rights in land.

Maund: Unit of measurement equivalent to 37.37 Kg. Here 1 *maund* is considered equivalent to 40 kgs.

Mauza: Revenue village.

Owned Land: Owned land means the area of land owned by the holder including the members of the household having a title to the land with the right to determine the nature and extent of its use and to transfer the same.

Owner Holding: Owner holdings are those who may or may not leased out any land, but cultivate only their own land and the land of his family members.

Paikasta raiyats: Those who were never permanent settled in a village.

Part time leasing arrangements: A system of land leasing for crop production for a specific time period, e.g. 3 months.

Patitabad: It is reclaiming cultivable land.

Salami: A sum of money paid for allotment of land for using it from government or proprietor.

Single Cropped Area: Single cropped area refers to the lands where one crop was raised in during the period of data collection and only the actual area of the land is taken into account.

Tenant Holding: It is the farm holding which is exclusively constituted with the land taken from others for operation by the holder or any member or members or the holder's household.

Tenant: The tenant is a farmer who leases land from the landowner in return of rent.

Total Operated Area of Holding: Total operated area of a holding is the area owned by the holdings plus the area rented from others minus the owned area given to others for operation.

Triple Cropped Area: Triple cropped or more cropped area indicates the area where three or more crops were grown in the census year and only the net area is counted as triple or more cropped area.

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Chapter 1

Introduction

Agriculture is the oldest economic activity of mankind and the basic source of employment and income of rural Bangladesh. It plays a dominant role in the socio-economic development of the country. Despite three decades of planned development effort and attempts to industrialize the economy, Bangladesh has still mainly a rural economy. Agricultural growth through forward and backward linkages propelled demand for marketing, transport and other services. By and large, a transformation seemingly took place in the economy from the mid 1980s to 1990s and the ripples of that transformation touched agrarian institutions.

In a country where agriculture is the mainstay of the majority of the people, it is not surprising that land tenancy is a subject of much concern and discussion. Due to rapid growth of population and changes in socio-economic pattern, substantial changes have taken place in the agriculture sector of Bangladesh. The ripples of the transformation of the economy reached rural areas to affect agricultural institutions. Modernization of agriculture due to the adoption of new technology has made both lands and labour scarce. The traditional institutions surrendered to the emerging situation and new type of contractual arrangements evolved.

Bangladesh is mainly an agrarian country in which 76.61 percent of total population (BBS, Dec.2002) and 77.64 percent of total labour force are located in rural areas. Moreover, agriculture sector provides 63.2 percent of total employment opportunities. Again, among the rural employed persons, 72 percent of them are engaged in agriculture (LFS: 1999:2000). Rest of the rural employed persons are engaged in various kinds of occupation, which are indirectly depending on agriculture. Till now, 23.31 percent of country's GDP (Gross Domestic Product) comes from agriculture (BBS: Dec. 2002. 2001(p)). Thus, agriculture sector is considered the lifeblood of the economy. The production and employment opportunities are circled around land due to the limited non-farm or alternative

source of earnings in rural areas. That is why, rights of land use may affect seriously in the promotion of economic growth.

The land of Bangladesh is fertile but its ownership is heterogeneous. Large farmers (2.06%) occupy 22.19% of cultivable lands (BBS, November 2002). The pattern of land ownership is skewed. It has often been argued that agricultural development, which promotes the economic growth, becomes very difficult if the farmers do not have their own land and therefore do not have sufficient incentive to adopt modern practices. It can be argued that if the farmers are not assured of the fruits of their additional care and investment they shared, they will not be willing to undergo extra trouble to modernization. Economists, like Marshall, Johnson etc., agree that owner-farmers have best incentive to modernize because they have more freedom in their production plans than tenant; and because they do not have to share their output with others. This study is highly concerned with the efficacy of different sorts of leasing system with respect to production as well as their profitability to the tenant.

1.1 Rationale of the Study

The overwhelming majority of the population of Bangladesh are rural and depend on agriculture for their survival. More than 76% of its total population and 72.5% of labour force are located in rural areas.

Table 1.1 Distribution of Population by Residence

	Population	Percentage
Rural	94342769	76.61
Urban	28808477	23.39
Total	123151246	100.00

Source : BBS, Dec. 2002:3.

From the Table 1.2, it is evident that more than four-fifths of the total population live in rural areas. Obviously, it is impossible to gear up the economic condition of the country without improving the fate of rural people that depends on agricultural development. It is also evident from the Table 1.2 that 62.8% of employed persons are located in rural areas. Among the employed rural persons, 72.5% are engaged

in agriculture. Rest of rural employed persons are engaged in various kinds of occupations. In addition, other rural economic activities or employment in other occupations depend on agriculture. Moreover, this sector alone is employing more than three-fifths (62.8%) of the total labour force of the country.

Table 1.2 Percent of Employed Persons (10 Years and Above) by Broad Occupation¹

Major Occupation	Rural	Urban	Bangladesh
Professional and Technical	2.1	5.9	2.8
Administrative and Managerial	0.1	1.5	0.3
Clerical	1.2	6.3	2.2
Sales	8.8	21.8	11.2
Services	3.8	10.3	4.9
Agriculture, Forestry and Fishing	72.5	19.2	62.8
Production and Transport	11.5	35.0	15.8
Total	100.00	100.00	100.00

Source : LFS, 1999-2000(BBS). LFS=labour force survey.

That is why agriculture is not only the mainstay of rural populace, but also the main occupation of the nation as a whole. Looking at the following aspects related to agriculture can further substantiate the importance of the study.

Contribution to GDP

During the birth of the country, 62% of its GDP accrued from agriculture. Since then, the importance of the sector has been declining gradually. This gradual erosion from the dominant position of agriculture in the national economy is in conformity with the general pattern of economic development in most countries. As

¹ Note: employed person: persons of age 10 years and above, who either;

a) Working one or more hours for pay or profit or working without pay in a family farm or enterprise during the reference period,

b) Found not working but who has a job or business from which they are absent temporarily during reference period (BBS, LFS 1999-2000).

the demand for agricultural products tends to be income inelastic, rising income of the people, reduces the share of agriculture in national output. By 2000-2001, it contributed only 23.31% of GDP (BBS, Dec.2002). Given the socio-economic trend of the past 3 decades, it seems that the share of agriculture to GDP has been declining relative to other sectors. Yet it is likely that agriculture may remain the single most important sector of the economy in the foreseeable future. The sectoral shares of GDP at current market prices have been given in Table 1.3. The chronological changes are shown in Appendix-I-B.

Table 1.3 shows the relative share of agriculture is continuously declining over the years. One may expect that as the economy achieves the higher levels of economic growth along with industrial development, the relative share of agriculture will further decline. Being an agro-based economy, the economy of Bangladesh will likely to be highly dependent on agriculture in terms of its exports and its both value added and employment of labor force.

Table 1.3 Sectoral Share of GDP of Bangladesh at Constant Prices

Year	Sector			Total
	Agriculture (%)	Industry (%)	Others/ Services (%)	
1989-90	36.8	8.8	54.4	100.00
1990-91	36.00	8.7	55.3	100.00
1991-92	34.50	9.1	56.4	100.00
1992-93	30.50	9.7	49.8	100.00
1993-94	30.40	9.9	59.7	100.00
1994-95	30.90	9.6	59.5	100.00
1995-96	25.68	24.87	49.45	100.00
1996-97	25.78	25.14	49.07	100.00
1997-98	25.45	25.82	48.73	100.00
1998-99	26.18	25.16	48.67	100.00
1999-00	25.51	25.29	49.20	100.00
2000-01	24.10	25.94	49.96	100.00
2001-02(p)	23.31	26.25	50.44	100.00

Source : Statistical Pocketbook 1998, 1997 and 2001.

Cropping Pattern

The cropping pattern of a particular area depends to a large extent upon its climatic, soil and topographic conditions of land and in addition to many factors, such as rainfall, drainage and irrigation facilities, availability and cost of inputs, demand and utility of the crops, marketing facilities, local customs and traditions, use of new and improved varieties seed and farm mechanization, etc. Crop production of Bangladesh is dominated by rice, which is grown in 72.8% of the gross cropped area².

Table 1.4 shows that near about three-fourths of the total operated area are used in rice cultivation. So, most of the cultivable lands are used in rice cultivation transacted in tenancy market. That is why the researcher has chosen this study area.

Table 1.4 Area under Different Rice Cultivation.

Census		1983/84	1996
Area under: (Area in acre)	Aus	7684	4149
	Aman	11964	10548
	Boro	3138	6137
Percentage of Gross Cropped Area Under:	Aus	23.6	14.5
	Aman	36.8	36.9
	Boro	9.6	21.4
Percentage of Total Gross Cropped Area under Aus, Aman And Boro		70	72.8

Source : BBS, July 1999. Census of Agriculture 1996, National Series, vol. 1, p. xiii,

Cereals

Among temporary crops, cereals are dominant. The areas under cereals were 24.68 million acres in 1983-84 and 22.41 million acres in 1996. It was increased to 22.88 million acres in 1977 over 21.35 million acres in 1960. Comparative data on cereals are given below.

² Area under temporary crops is the part of sown area where crops that's growing cycle or length of life is less than 1 year. These crops are paddy, jute, sugarcane, pulses, potatoes and other vegetables etc. It is evident from the above table that almost three-fourths (78.32%) of the gross temporary cropped area was under cereals. Cash crops and pulses accounted for 6.30% and 4.63% of the gross cropped area respectively.

Table 1.5 Area under Cereals in Different Censuses and Surveys (Area in acres).

Censuses	Cereal	Rice	Wheat	Minor Cereals
1960	21123525	21123525	1521989	NA
1977	22880000 (100%)	21842000 (95.46%)	1321734 (2.73)	413000 (1.81)
1983-84	24668379 (100%)	22774600 (92.32)	625000 (5.36)	572045 (2.32)
1996	22412703 (100%)	20833078 (92.95)	230486 (6.79)	57636 (0.26)

Source : BBS, November 2002. Analytical Report, Agriculture Census 1996, Vol. 3 p. 47.

(Figures in the parentheses indicate percentages).

The cereal area constituted about 78% of the total cropped area. Among the cereals, rice is the dominant crop. It covers about 20.83 million acres constituting about 93% of the cereal area. Wheat occupies the 2nd place cultivating in area of 1.52 million acres constituting about 7% of the cereal area. Other cereals were cultivated in area of 57636 acres constituting only 0.26% of the cereals area (BBS, November 2002). Despite this concentration in cereal production, Bangladesh is still to achieve self-sufficiency in food production. A sizeable fraction of foreign aid and foreign exchange receipts has to set aside every year to meet the cost of food imports.

Changes in Tenurial Conditions

There is also a dramatic change in the structure of tenurial arrangements. This can be seen from the Table 1.6.

Table 1.6 Changes in Tenurial Arrangements.

Arrangements	1983/84		1996		Average Annual Growth Rate Of Holding Taking Land On Arrangements
	Number (In "000")	%	Number (In "000")	%	
Holding Taking on Sharecropping	2620.71	63.94	2724	54.83	0.33
Holding Taking land on Fixed Rent and Other Tenancy Arrangements	1477.99	36.06	2244	45.17	4.32
Sub Total	4098.7	100.00	4968	100.00	1.77
% Of Farm Holding Taking Land On Arrangements	40.80%		42.11%		

Source : BBS, July 1999, 1986 and (Shaha: 2001:80)

Moreover, area under different tenancy arrangements has been changes over the period 1983/84-1996. From the Table 1.7 it can be seen that area under tenancy has been declined from 71.83% in 1983/84 to 61.90% whereas area under fixed rent and other tenancy arrangements has been increased about 28% to 38% over that period.

Table 1.7 Operated Areas under Various Tenancy Arrangements.

Rented in Operated Area	1983/84		1996		Average Growth Rate (%) of Holding Taking land on Arrangements
	Operated Area (In '000'Acres)	%	Operated Area (In '000'Acres)	%	
Area Rented in Sharecropping	2412.14	71.83	2699	61.90	-0.34
Area Rented in under Fixed Rent and other Tenancy Arrangements	1102.86	28.17	1661	38.10	4.22
Total Area under Tenancy	3915	100	4968	100	2.24
%of Operated Area Under Tenancy	17.26		21.85		

Source : Estimated from BBS, July 1999, 1986.

Table 1.7 depicts that area under tenancy arrangements has been changed. In 1983/84, about 17% of the operated area were transacted under different tenancy arrangements. Whereas in 1996, about 22% of the total operated area were transacted under different tenancy arrangements. Structure of tenancy arrangements has been changing during that period. About 72% of the operated areas were transacted under sharecropping in 1983/84 but in 1996, 62% of the operated areas were transacted under sharecropping. So, it is obvious that pattern of tenancy arrangements have been changing over that period.

The credibility of the government and the favourable political mood largely depend on adequate availability of cereals; maintaining cereal prices relatively stable at an affordable level has been one of the prime concerns of all successive governments of the country. Therefore, government policies are aimed at ensuring food availability in relatively low prices. In spite of all governments' policy initiatives, there had been a lot of concerns for supplying adequate funds to people. The

governments had to import substantial amount of cereals in almost every year. In 1974-75, when Bangladesh faced a famine like situation, food import soared to 80% of the year's total export earnings. Even as late as 1987-88, food import bill stood in excess of 60% of the export earnings. In 1990's cereal import was also substantial. In 1999/00, cereal (wheat+rice) imports were Tk. 15897 million contributing 6.45% of total export earnings (BBS, Dec.2002). Achieving self-sufficiency in food production has, therefore, been a corner stone of agricultural policy of the country since its inception. From the above discussion it is clear that agriculture is the dominating sector of Bangladesh economy. In addition to this, rice is the single most crop in agriculture sector. Moreover, large amount of lands are transacted under different tenancy arrangements for cultivating rice. Another important issue is the increase in production of staple food rice, which in turn induces the researcher to examine the net earnings from tenanted land.

1.2 Statement of the Problem

Bangladesh is an agrarian society. The vast majority of the people are dependent on agriculture for survival. Alternative opportunities for employment and income outside of agriculture are extremely limited. Outsiders could be recognized that the only means of eradicating poverty is to provide humanitarian aid through food supply. Moreover, one could be addressed that progress in rural areas can be achieved by subsidizing the introduction of agricultural technology (High Yielding Varieties (HYV), fertilizer, pesticides and irrigation facilities). Actually, the economic problems of rural Bangladesh are poorly addressed either by means of programs of humanitarian aid or of technology transfer alone (Jannuzi and Peach, 1980). Yield per unit of land can be increased sufficiently, even within the framework of indigenous means of production. In Bangladesh agriculture, the distribution of rights in land is of enormous importance to the economic system within which production, distribution, exchange and consumption are taking place. The distribution of rights in land helps to determine and to reflect the structure of power in the society. In order to achieve self-sufficiency in food and to observe the actual scenario of existing tenancy system of Bangladesh whether it is favourable or not to actual cultivator, the study will analyse the economics of tenancy arrangements. It is

argued that the primary impediment to rural economic progress in Bangladesh is the traditional system of relationships of people and land. It is a system in which actual tillers of the soil must give at least 50% of their crop to landlords (Jannuzi and Peach, 1980).

The extreme pressure of population on limited land resources causes the growing of small and marginal farmers in agriculture. Only 28,000 households owned landholdings in sizes of more than 10 hectare in 1983-84; this number reduced to 19,000 by 1996. At other end, nearly 5.4 million households (46% of rural households) were functionally landless (owning less than 0.494 acre or 0.2 ha) in 1983-84; this number grew to 10 million (56%) by 1996 (Hossain: 2000). The landless households have increased by 3.6% per year compared to 2.1% for all rural households and 1.2% for farm households. The land tenure situation has also undergone substantial changes. The composition of the owner and tenant farms has remained almost the same at 61.4: 38.6 ratios (BBS, July 1999). Most of the tenants are owner-cum tenants who have some land of their own, and rent-in some land for better capacity utilization of the farm establishment. The average size of tenant holdings was higher than for owner holdings, which was noted by all previous agricultural censuses.

Agriculture Census 1996 reported that total owned area is 19601 thousand acres and total rented-in area is 4361 thousand acres. In percentages, owned self-operated area was 78.4% and 21.6% of operated area under rented-in area. Operated area under different tenures and their percentages can be seen from the Table 1.8.

Table 1.8 Operated Area under Different Tenures.

Tenures	Operated Area (In "000"acres)	% Operated Area
Owner Holding	11681	57.80
Owner-cum-tenant Holding	8416	41.60
Tenant Holding	111	0.60
Total	20208	100.00

Source : BBS, July 1999. (Agriculture Census 1996, vol. 2:23)

From the above discussions it can be said that tenant cultivation as well as owner-cum-tenant cultivation is the dominant agriculture practice in Bangladesh. That is why; agricultural development will be impossible without improving the fate of actual operator of land. But it is evident that the following issues have not yet clearly been identified and explained.

1. What types of tenurial arrangements exist in Bangladesh agriculture?
2. What are the main causes for the adoption of leasing land by small and marginal farmers?
3. What the benefits are of and what are the costs accruing from different types of rice cultivation?
4. What type of contractual arrangement is more profitable?

In order to have the answer of the questions mentioned earlier and to have the actual scenario of existing tenancy system of Bangladesh whether it is favourable or disfavourable to actual cultivator, the study will analyse the economics of contractual arrangements. The present study aims at seeking answers of the above questions. Thus, the study aims at identifying the existing contractual arrangements, determinants of rent-in and rent-out of land, measuring the cost and revenue of tenanted land and estimating the efficiency of different sorts of contractual arrangements.

1.3 Objectives of the Study

Since the economy of Bangladesh is an agro-based economy, its economic condition substantially depends on the growing pattern of agriculture. Land is considered the crucial factor of agricultural production. So, it is required to analyse the main roots of impediment to agricultural development. There are numerous constraints, which hinder agricultural development. It is argued that pattern of landownership is not beneficial to agricultural development. The main characteristics of changes in land ownership in Bangladesh are that of growing pauperisation rather than concentration of landholdings. The proportion of area under tenancy has increased

from 17 per cent of the operated area in 1983-84 to 22 per cent in 1996. There are also significant changes in the structure of tenurial arrangements (GOB, 1999).

The sharecropping tenancy is being replaced by different fixed-rent tenancy and medium-term leasing arrangements. From the above statistics and foregone discussion it can be said that tenurial arrangement is changing. In this context, the economics of tenancy arrangements is of great importance to this study. The general objectives of this study are to examine the tenancy system of Bangladesh agriculture, determinants of leasing out/in land and to estimate the profitability of tenanted land. The specific objectives are:

- a) To document the existing tenurial arrangements.
- b) To analyse the causes of existence of contractual arrangements.
- c) To analyse the changing pattern of tenancy and their causes.
- d) To examine the impact of various inputs on output.
- e) To examine the regional variations of profitability of tenanted land.
- f) To explain the efficiency of various types of contractual arrangements with respect to rice production.
- g) To examine the profitability of different types of contractual arrangements.

1.4 Review of Related Literature

For a research, review of literature is a must. It guides the researcher to reach the goal. Review of literature is an essential work for any researcher to find out the knowledge gap. In this field there had been many works since the late 1960s. Researcher reviews various publications such as books, manuscripts, dissertations, and articles, published and unpublished materials, government's promulgations and Acts and documents. But here only a few selected works are reviewed to show the knowledge gap, which the researcher seeks to fill up, by this study.

It has been suggested by Cheung (1969) that the theory of inefficiency in resource allocation under share tenancy is wrong. However, he has reached this conclusion only from the standpoint of the landlord who is maximizing agent. Cheung, in his

paper tried to investigate the analysis of sharecropping from its usual partial-equilibrium to a simple general equilibrium footing. Cheung maximizes only from the landlords point of view³. It is argued that maximization should be examined from both the supply side and the demand side, i.e., from the tenant. Cheung, in his analysis, has showed that the landlord himself determines the level of rent. So, Cheung's model can operate only when the landlord has the monopoly power to choose the rate of change. Further, Cheung assumes that the landlord can subdivide his land, leasing out each plot to a different tenant. If it is true, then there is no reason why he should ignore a similar decision variable on the part of the tenant, i.e. the tenant can also choose the number of landlords from each of whom he leases in a parcel of land (Barthan and Srinivasan, 1971).

Batrddhan and Srinivasan (1971) in their article titled 'Crop Sharing Tenancy in Agriculture: A Theoretical and Empirical Analysis' have tried to identify some of the economic factors that may lead to explain regional variations in the incidence of crop sharing tenancy on the basis of Indian State-Level and village level data. Bardhan and Srinivasan (BS) have used a different model where they have determined the demand side from the point of view of a maximizing tenant. They also assumed that there are a large number of landlords from which the tenants can lease-in a parcel of land. Then, in the BS model it has been shown that the tenant continuously gains from subdivision. But in this study, other forms of tenurial arrangements such as fixed crop rent tenancy and fixed cash rent leasing system, which are predominating tenancy systems in recent years in Bangladesh will be explained.

Braverman and Stiglitz (1982), in their article titled 'Sharecropping and the Interlinking of Agrarian Markets' have presented a general set of arguments applicable to both competitive and non-competitive environments, to situations where all the terms of the contract are determined in an optimal way. Although they argued that the presence of interlinkages need not be taken as evidence that agrarian markets in less-developed countries are non-competitive. It seems clear

³ The only way the tenant's decision enters in any way in Cheung's model is that the tenant's income from cultivation should be equal to the amount he would have earned had he been a wage labour.

that such linkages have both distributive as well as allocative effects. Attempts to reduce the landlord's 'power' by restricting his marketing or credit activities may, in certain circumstances, lower agrarian output and make tenants worse off. In other circumstances total agrarian output might increase, tenants could be better off, and only the landlords suffer.⁴ So, further empirical work is clearly needed to distinguish which of the various possibilities is relevant in any particular situation.

Bishop and Toussaint (1958) explained some provisions of land leases that were accelerating in agricultural production in their book titled 'Introduction to Agricultural Economic Analysis'. They found that some provisions of leases could be changed so that both landlords and tenants can have increased their incomes from their farming operations. Other adjustments in leasing arrangements may result in the lowering of one party's income and the raising of income to the other party. Since one party gains and other party loses, it cannot be determined through economic analysis whether such an adjustment is beneficial. So, no conclusion is drawn from the analysis.

Banik (1998), in his book titled 'New Technology and Land Elevations: Small Farms in Bangladesh' shows that tenurial arrangements in a village are influenced by different land elevations, and supervision of resident landlords in the village during the monsoon season. Resident landlords share cost with tenants in case of irrigated cultivation. In contrast, in an area under assured irrigation, fixed-rent tenancy is feasible for risk-averse resident and absentee landlords. In that book Banik tries to investigate the real determining factor of leasing agreements. He does not seek to evaluate the comparative efficacy of different tenurial agreements in the two villages, which he surveyed.

Zaman (1973) showed in his study 'Sharecropping and Economic Efficiency in Bangladesh' that under some circumstances sharecropping is socially desirable institution for the achievement of maximum aggregate economic gain. He also

⁴ When there is a single landlord and the expected utility constraint is not binding.

pointed out that sharecropping arrangements did not prevent the acceptance of modern inputs in Bangladesh. Only one drawback of sharecropping is that sharecroppers do not have access to institutionalised credit facilities. But now a day, local and international NGOs provide credit facilities to the small farmer. This was not considered in Zaman's study. Zaman tried to argue with empirical support that within the given context of Bangladesh the traditional marginality principles of western market to measure efficiency were not applicable and sharecropping as an institution was not only efficient but also socially desirable for the achievement of maximum aggregate economic gains. But Jabbar (1975) argued that the marginality conditions of Western economy are not applicable in the prevailing situations of Bangladesh. He also showed that the rules, which would govern the efficiency and social desirability of a system, should be biased towards a small number of landowners against mass of tenants and agriculture worker.

Taslim and Ahmed (1993) in their book "Land Leasing in Agriculture" have tried to discuss different types of tenurial arrangements by exploring village level survey. The essays contained in that book are an attempt to empirically test and establish some of the important issues and facts regarding cropshare tenancy, which were the dominant form of leasing arrangements of Bangladesh agriculture of that time. They made an important attempt to analyse some of the issues relating to land tenancy in Bangladesh agriculture. In their study, they tried to test the relevance of the competing models of cropsharing directly with the data from the sample survey.

From the data analysis, they concluded that a Cheung-type model is not very relevant for an analysis of cropsharing in Bangladesh agriculture. The landlords seldom stipulate the type and the amount of various inputs to be supplied by the tenants. They are also unable to restrict the mobility of their tenants leasing land from more than one landlord. The structure of the general Marshallian model seems to be a better description of cropsharing in this country. The tenants usually have considerable autonomy with regard to the cultivation of the cropshare land. However, the landlords exert indirect influence on the farming practices of the tenants by confronting them with an ever-looming threat of termination of their contracts if yield

of the crop share land is not satisfactory. The share contracts are almost always for a short duration, which makes frequent reviews of the performance of the tenants and eviction, if necessary, possible. Thus a model in the Marshallian tradition, which emphasises these aspects of cropsharing, holds much promise.

The findings presented in their essays hardly support the view that cropsharing is highly exploitative production arrangement that is 'semi-feudal' in character. The landlord's share of the output of cropshare land is almost constant at one-half. The one-half cropshare that the tenant receives seems to adequately compensate them for the inputs they provide. Cost sharing is not very widespread implying that the tenants usually have to bear the full costs of all variable inputs. What makes it appear that exploitation under certain circumstances is the low productivity of the tenants and not the system as such. Cropsharing has proved to be one of the most widespread and durable institutions in human history. This is largely due to its flexibility and adaptability to changing socio-political and economic conditions. They concluded that leasing decisions of rural households are closely related to their land, family worker and bullock endowments. Adjustment difficulties in the availability of bullock and family labour necessitate adjustments in the farm area, which could be done by the way of leasing. The leasing model assumes (and implies) that the amount of land leased in is determined by the same coefficients that determine the amount of land leased out.

Mahbub Hossain (1977), in his Ph. D. dissertation "Agrarian Structure and Land Productivity in Bangladesh: Analysis of Farm Level Data" pointed out that low levels of productivity is the result of existing agrarian structure. The study attempted to focus on agrarian structure to understand the causes of the low levels of productivity. His main objective was to find out the impact of agrarian structure on agricultural productivity. He also discussed the detailed picture of land distribution and tenancy conditions with farm level information that was collected during 1969-70 and 1974 surveys. Moreover, in his study he was concerned with productivity of land under different tenorial systems.

The main content of this study presented a brief summary of existing agrarian structure in Bangladesh and analysed production performances of different size and tenurial groups of cultivators. In the final chapter of that study he suggested some policies for agricultural development. He commented two sets of possible measures that would be beneficial to agricultural development. The possible measures are;

- a) Measures aimed at altering the pattern of distribution of land ownerships, and the terms upon which land is held and cultivated, which would be referred to as land and tenancy reforms, and
- b) Measures aimed at providing a package of cheap credit, modern inputs (water, fertilizers, pesticides and new seeds) and extension services, (without changing the existing structure), which will be referred to as 'special aid' to cultivators. Moreover, measures should be taken to increase rural savings and to alter rural power structure. That is, above measures should be taken
 - i. to reduce income inequality and to
 - ii. generate a high agricultural growth without changing the distribution of income in favour of the rich.

His study was too much rigorous and implicative in the context of then agriculture. Hossain's findings were very much suggestive. But that study was conducted about 28 years ago. With the passage of time, the characteristics of agriculture and agrarian relations have changed enormously. At present, different forms of cash rent tenancy arrangements are playing dominant role in the tenancy market. He did not discuss profitability of tenanted land or what would be the net gain of the sharecropper or tenant. Hossain's study did not indicate what type of tenancy is preferable to the tenant. That is why although his study was rigorous and had directives for the policy makers yet it excluded the existing tenancy arrangements and its main problem.

Das and Rahman (1976), tried to investigate socio-economic impact of sharecropping in their research report titled, "SHARE-CROPPING: A SOCIO-ECONOMIC ANALYSIS" taking the Aman paddy in point. The findings of their study were as follows:

1. The sharecroppers had close bindings, socially and economically, to their landowners.
2. They were very poor and men of small means. They had small amount of land compared to their other resources, especially labour supply; and they operate on others' land on sharecropping basis for their bare survival.
3. A very few sharecroppers operated under a written contract system.
4. Another finding of their study was that the term "share-cropping" was almost a misnomer, because the landowner hardly share any cost of production. The sharing arrangement involved mainly in the share of products.
5. They showed that existing tenorial arrangement would suffer from contractual injustice and did not induce the sharecroppers to supply inputs in a socially desired way. This would mean under utilization of resources.

The sharecroppers were very poor and had a low resource base and had many other constraints to the successful operation of their business. Lack of adequate draft animal, cash and credit facilities, many of them would not have access to modern means of production. In share-cropping arrangement, it was found that share-croppers earned a positive share-return, but the share of the landowners as compared to their investment definitely much higher than that of the share-croppers.' It was obvious that the existing contractual arrangements were not conducive to attract the sharecroppers to invest more of their existing resources that might impede agricultural advancement and demanded immediate and appropriate reform measures. Undoubtedly, findings had so much intractability in agricultural development for that time. But this study could not explain properly the present contractual arrangements in Bangladesh agriculture. The form of tenancy has been changed enormously. The short-term leasing arrangements along with different cash rent system have been taken place instead of sharecropping.

The socio-economic scenarios of sharecroppers and rural economy have been changed tremendously due to the creation of off-farm employment opportunities,

educational facilities and changes of social values. Moreover, the study was based on explanation of only Aman crop. But at present, HYV Boro rice is produced sufficiently. Moreover, this study was conducted on the basis of sample taken in 1974. Thirty years latter, it is no more representative analysis. So, an in-depth analysis is required to understand the actual scenario of contractual arrangements.

Diwivedi and Rudra (1973) are renowned agricultural economists who presented a research oriented study titled, "ECONOMIC EFFECTS OF TENNACY: SOME FURTHER NEGAATIVE RESULTS." In their paper they showed that the economic performance of owner and tenant farmers is not as different as it has been supposed. In their study they were trying to find out the differences in using and manipulating the agricultural inputs between owned lands and leased land. To find out the differences in input use, they asked following 3 questions;

- a) "Does the farmer apply material inputs to his owned land at a higher rate than to his leased-in land?"
- b) "Does he allocate crops to those kinds of land differently?"
- c) "Does he get more of output per acre on his owned land than on his leased-in land?"

Answers to all 3 questions above were 'NO'. The result of tests for differences in inputs and outputs as between owned land and leased land cultivated by the same farmer was non-significant and they drew following results;

- 1. Tenants were worse than owners in the matter of resources, but their performance in terms of inputs and outputs was none the worse for that.
- 2. Farmers cultivating both owned land and leased-in land did not reveal any tendency to manage their owned land differently from their leased-in land.

This study was highly empirical and representative for covering wide ranges of Indian agriculture and for in-depth analysis. But this study was conducted only on one issue of resource use in owned land and leased-in land. This study did not consider the actual costs and benefits of the tenants and their adoption of leased in

land. Moreover, the data used for this study were collected during the period 1970-71, which became obsolete at present. As the cropping patterns as well as tenurial system in Bangladesh are not same as Indian agriculture, the empirical study based on Indian agriculture may not reflect the actual scenario of Bangladesh agriculture. It does not include the tenurial system of Bangladesh. That is why, the present study demands greater importance in this arena.

Shaha (2001), in his article titled, "Changing Pattern of Agrarian Structure in Bangladesh: 1984-1996" tried to analyse the changing pattern of agrarian structure during the period 1984-1996 on the basis of data provided by Agriculture Census 1983/84 and 1996. In his article he showed that structure of farm and non-farm holdings had been changes significantly. Occupation of farm and non-farm households, landlessness of households, land distribution among the farm sizes, changes in farm sizes and tenurial structure and the extent of tenancy were the main concerns of his study. He clearly and efficiently analysed the issues relating to agrarian relations. Finding of his study was that there had been a rapid shift of rural households from farm to non-farm occupations.

He pointed out that landlessness and marginalization had been taken place increasingly over the period 1984-1996. Moreover, he observed that there was highly unequal distribution of land; dramatic proliferation of small and marginal farms, relative consolidation of middle farms and relative decline of large farms. He showed that land tenure situation had undergone some changes. In addition to these changes he showed that area under share tenancy declines significantly whereas under fixed rent and other cash rent tenancy arrangements were increasing. In his concluding remarks, he pointed out that under the pressure of market, social and demographic forces, agrarian institutions had the tendency to change. These institutional and structural changes have induced tenants to invest more on agricultural inputs. Shaha's findings have a great importance in the existing tenurial as well as in agrarian structure in Bangladesh.

However, Shaha did not analyse the underline causes of tenurial changes. He reached his conclusion on the basis of Censuses results. The Censuses were carried

on 1996, but the result of census was published on July 1999. So, some changes may have taken place during this time. Moreover, profitability of tenanted land, decisions of landowner and tenant about land rent out/in and efficiency of different types of tenurial arrangements are not discussed in his study.

Toufique (1988) in his note, "Sharecropping: Efficiency and Risk: A Note" argued that sharecropping might be as efficient as wage cultivation when input markets were either incomplete or non-existent. For arguing in favour of efficiencies of sharecropping he mentioned that some tenant possessed non-tradeable inputs like knowledge or husbandry skills. Some of the tenants even owned some land and some draught power. All these factors suggested that the landlord and the tenant did not possess the same cost curves; the landlords were likely to face higher cost. In such case inefficiency may not exist at all. For sufficiently lower costs, sharecropping may even be more efficient. Moreover, in his note he showed that why a peasant either worked as a wage-labourer or sharecropper or did both in an uncertain world of agricultural production.

When expected earnings from wage labourer exceed expected income from sharecropping, he prefers wage farming not only for a higher income but also for less risk. When expected income from wage labourer equals expected income from sharecropping, he does not change his decision because in this case he is likely not to trade equal expected income with unequal risk. But when expected income from sharecropping is greater than the expected income from wage labourer, the decision to work either as a sharecropper or wage labourer is obviously tantamount to a portfolio decision. In case of sharecropping his income, being a function of the produced, is uncertain but may be more rewarding depending on the outcome. Given this information, the problem of the peasant is simply to determine the value of α (=the proportion of time the tenant allocates for sharecropping) that will maximize his expected utility function. Toufique's explanation is highly model oriented, particularly in portfolio decision of a peasant. He tried to find out the efficiency of sharecropping and its existence. But he did not explain other forms of contractual arrangements why these forms of tenancy arrangements existed and in recent time, taking place increasingly throughout Bangladesh. Moreover, comparisons of profitability of

different contractual arrangements are not explained in his note. In order to have a clear picture of contractual arrangements and their efficiency in resource allocation along with productivity, it is required to enquire deeply other forms of tenancy arrangements too. These issues have not given much emphasis on this study.

Shaid and Herdi (1982) tried to compare the productivity of owned operated land and sharecropped land on the basis of sample survey of four villages of Dhaka district in Bangladesh. In their article titled, "Land Tenure and Rice Production in Four Villages of Dhaka District, Bangladesh" examined that whether the tenant and owner farmer adopts the modern technology differently. They compared Aus production on sharecropped land and owner operated land in 4 villages of Dhaka district in Bangladesh. They found that yields of MVs (Modern Varieties) on owners operated lands were about 15% higher than on sharecropped parcels, even when the same farmer operated both parcels. In case of input use, they found that there were no significant differences in the use of fertilizer, seed or labour on the sharecropped land and on the owned land. But there were significant differences in the use of chemical fertilizer, with roughly 3 times as much applied to owned land as to share rented land.

Adoption of modern rice varieties was somewhat higher on the owned parcels. Modern varieties were grown on 80% of the owned parcels and on 43% on the share rented parcels in Boro. In case of Aus, there was no significance difference in the proportion of all parcels planted to modern varieties (MVs), but the proportion was significantly higher among the paired parcels. The cropping pattern and cropping intensity were more or less same on both owned land and sharecropped land. They found that owner operated land produced slightly more rice than share tenant land. Moreover, their findings revealed that share tenancy was associated with slightly reduced yields in the study area. Their findings are highly implicative about efficiency of share tenancy with respect to production and income transfer. But it did not provide any directives about profitability of tenanted land. Not only this, they did not show any reasons for existing sharecropping as well as other form of tenancy arrangements. Moreover, comparison among different forms of tenancy arrangements with respect to production and revenues were not discussed in their study. In this respect their empirical study is narrow.

Nabi (1986) in his article titled "Contracts, Resource Use and Productivity in Sharecropping" tried to investigate the questions concerning resource on farms under different tenancy contracts. He tried to find out the efficiency in resource use in sharecropped land. Moreover, he tried to compare the productivity of tenanted land on different contractual arrangements. In his study he used empirical survey from 10 villages of Punjab in Pakistan. On the basis of findings he concluded the followings;

1. Cost sharing and supervision ensure efficient resource use in sharecropped land and absentee landlords attempt to achieve similar efficiency by using the threat of eviction.
2. Rental share does not change for a long time and landlords often give credit to their tenants for productive uses such as modern inputs.
3. Sharecroppers are free to hire land from more than one landlord that does not support the 'feudalistic' or 'semi feudalistic' relations with their tenants. On the contrary, it was found that many landlords intervene to ensure that sharecroppers use land as productively as owner cultivators and adopt modern techniques of production.
4. Nabi also found that returns from sharecropping were slightly higher than wage labourer because of the risk associated with cultivation.
5. The final assessment is that sharecropping tenancies do not appear to result in output loss even when the technology is changing. From his study he concluded that land reform aimed at redistribution of landownership does not increase production except income distribution in Pakistan.

From the above discussion it appears that sharecropping is as efficient as fixed rent tenancy and as cash rent tenancy. But he did not take into account of other forms of tenancy arrangements. Moreover, returns from other forms of tenancy arrangements and cost incurred in other tenancy forms were not dealt which are obviously shortcomings of the work.

Roy, Bhogal and Singh (1999), in their article, "Tenancy and Adoption of New Farm Technology: A Study in West Bengal, India" tried to examine the level of adoption of

new farm technology and the factors responsible for that under four major tenurial arrangements. The main query addressed in their paper was to examine how agrarian structure shaped technological development in the farm sector.

Their findings reveal that there have been significance differences in adoption of farm technology across the tenurial arrangements and support the view that tenancy has a direct impact on adoption of modern farm technology. The expenditures on modern inputs vary considerably among the four categories of tenurial arrangements and were highest in owner cultivation and the lowest in 50:50 output sharing. They used regression model to examine the factors influencing adoption of improved technology. Six factors, viz, size of operational holding, non-farm income, irrigation facilities, distance of the village from block head quarter, operational independence of the farmer and regularity in rent payment were found to have significant influence on adoption of new farm technology. The results of regression analysis show that all of these factors except distance of the village from block headquarters have positive impact on the level of new technology adoption. The study also reveals that because of poor resource base the tenants are unable to invest in modern farm inputs. Having provided above empirical results they propose following suggestions;

- a) Emphasis should be given on creation of employment opportunities in non-farm sector and providing institutional credit.
- b) Emphasis should be given on the development of rural infrastructure mainly irrigation and input supply system.

From their findings they have reached a conclusion that attempts should be made to encourage ownership cultivation so that the farmers can take independent decision regarding their choice of crops and input basket. This can be done by granting ownership right of land to the tenants.

From the above discussion it is obvious that suggestions concerning tenancy arrangements by them have great importance for the adoption of new technology that is the prime mover of agricultural development. But their study did not include other aspects regarding agricultural development. Moreover, they did not take into

account reasons behind the existing different types of tenurial arrangements and also the profitability of tenanted land. Beside these, they did not consider the socio-economic conditions of the tenant and landlord, which are the crucial factors in agro-based economy. Despite of these limitations, yet their study is the pioneering in taking decision to invest in new farm technology.

The literature review reveals that there exists some knowledge gap to understand economics of contractual arrangements for rice cultivation in Bangladesh agriculture. Most of the research had tried to compare the efficiency of resource allocation and productivity of sharecropped land and owned land. Some studies tried to represent the scenario of existing tenurial arrangements in Bangladesh agriculture. Moreover, most of the research showed that land elevations, supervision of landlords, amount of owned land of the tenant, tenant's family labor force, structural factors, social values and norms and agricultural practices were the main factors of land leasing by the tenant. The findings of the studies were highly implicative on efficiency of share tenancy with respect to production and income transfer. But they did not explain clearly other forms of tenancy arrangements. Why these forms of tenancy arrangements existed and in recent time are taking place increasingly throughout Bangladesh is not discussed in those studies. The studies could not explain properly the present scenario of contractual arrangements in Bangladesh agriculture. The form of tenancy arrangements has been changed enormously. The short-term leasing arrangements along with different cash rent system have been taken place instead of sharecropping. To have a clear picture of contractual arrangements and their efficiency in resource allocation along with productivity, it is required to enquire deeply other forms of tenancy arrangements too. Most of the studies did not consider the actual costs and benefits of tenanted land. Moreover, they did not provide any directives about profitability of tenanted land. In addition to this, they did not show any reasons for existing sharecropping as well as other forms of tenancy arrangements. However, comparison among different contractual arrangements with respect to production and net returns were not discussed in their study. That's why, this study demands greater importance in this arena.

1.5 Utility of the Study

Research is an indispensable work in every field to find out inherent problems and explore potentialities and prospects of the sector and enhance the knowledge for future research. Alarming growth of populations and lack of off-farm employment opportunities in rural areas are the main causes of increasing the number of marginal and small farms. Unavailability of modern facilities of developed life-style in rural areas leads to migrate well-off families to urban areas. As a result, absentee landowners are evolving. Owing to changes in socio-economic conditions in rural areas along with rural-urban migration induced both absentee and resident landowner to rent out their land in different tenurial arrangements. These may be major causes of changing tenurial arrangements. This study will explore the real causes of changing tenurial system. Comparative efficiencies of various types of tenurial arrangements along with product diversifications that cause the variation of terms and conditions in share contracts will also be analysed.

The land ownerships play a vital role in agricultural development. But heterogeneous land ownership is prevailing in Bangladesh. Heterogeneous land ownership and the existence of large number of poor small and marginal farms do affect the growth of agricultural production. Since agrarian changes in land ownership are not possible within the existing tenancy arrangement, helping the tenant should accelerate agricultural growth. So, present study bears great importance in prevailing contractual arrangements in Bangladesh agriculture.

The agriculture of Bangladesh largely depends on the busty of nature due to its geographical nature. A vast amount of arable land becomes inundated during the rainy season. Almost every year huge volume of crop is destroyed by flood. The tenurial arrangement varies from place to place and from crop to crop. The mainstream of tenurial researches has not explained these variations. This study will try to explain the causes of such variation in tenurial contracts. And thus, it is expected that the following issues may be resolved from the results of the present study.

- a) Why landowners lease their land in different form?
- b) Explanation regarding comparative contractual arrangement between flood-prone and flood-free areas.
- a) The types of land reform required.

So, this study will be helpful in knowing the actual scenario of tenurial arrangement and thus the policy makers are expected to be benefited in policy making in regard of land reform for the promotion of agricultural growth. This study may explore the new dimension of thinking and knowledge in actual tenurial arrangements. This study will be able to show a new dimension and it will be helpful for the government. And other policy makers to make proper tenurial policy by which agriculture sector will be able to play more effective role for the national economy of Bangladesh.

1.6 Scope and Limitations of the Study

It is obvious that a research cannot cover all aspects of a problem. As such the principle of parsimony must be exercised in the selecting areas of concentrated efforts. In this context only the economic efficiency of different contractual arrangement are included in the study. Because of time limits as well as financial constraints only five *Mauzas*/villages from five Upzilas, namely Faridpur Upazila under Pabna district, Thakurgaon Sadar, Kustia Sadar, Gazipur Sadar and Daganbhuiyan Upazila under Feni district have been selected for study area. Details of the study area have been discussed in the methodology chapter.

As a study like this have some inherent limitations. Moreover, some of these limitations are the by products of the difficulties that I faced in course of my field survey. These are;

- a) The method of investigation, as is generally followed in such studies, is actually a recall method and hence sufficient reliance has to put to the memory of the farmers. Farmers, though try to give sufficiently accurate farm accounts from memory, yet there is a possibility that they might forget to mention some of the expenditures incurred;
- b) Valuation of certain inputs, supplied at subsidized rate (as chemical fertilizer) or for which no market price exists (as ashes) in certain areas and estimation of the quantity of some by products (straw) raises the difficulty of subjective valuation of these costs and return;
- c) In some cases the researcher experienced reluctance, indifference and lack of co-operation of the local people as well as the tenant farmers:

- d) There is always possibility of overstatement and understatement of figures. Often the tenant farmers do this deliberately assuming that this information might be used against them for imposing a new kind of levy.
- e) Owing to time constraints as well as lack of other logistic support it has been the study is limited to collect data from 5 villages of former greater 4 divisions. So, it may not be representative for the country as a whole. In addition to this, 30 respondents were interviewed from every village, which might not be sufficient for drawing inference.
- f) Data have been collected only from tenant farms and the conclusion is drawn from the tenant's response. Landowners, especially absentee landowners who are playing dominating role in tenancy market have been excluded due to their sporadic nature. So, results may not be impartial.

1.7 Thesis Structure

The dissertation comprises eight chapters including the present one. First chapter deals with statement of the problem, rationale of the study, objectives of the study, feasibility of the study, scope and limitations of the study, review of related literature and utility of the study.

In chapter two methodology of the study is discussed. Different concepts, selection of study areas, sources of data, selection of sample size, sampling methods, methods of data collection, period of data collection, nature of data, techniques of data processing and analysis, model used for the study, limitations of data collection and reliability of collected data have been explained in this chapter.

Chapter three sheds light on agrarian relations in Bangladesh from historical point of view. Main elements of this chapter are: ancient land tenure system, land tenure in medieval period, land tenure in East India Company and British period, land tenure during Pakistani rule and land tenure after liberation.

Chapter four explores the scenarios of land distribution and tenurial conditions with a view to focusing on socio-economic condition of tenant farms. Moreover, in this chapter salient features of the study areas are discussed for exploring the actual

scenario of agricultural practices and socio-economic conditions. Structure of agricultural holdings, pattern of land distribution and size of holdings, structure of contractual arrangements, share of land ownership in tenancy market, tenurship, empirical findings of land distribution and tenant holdings and pattern of owned land distributions, land distribution in rice cultivation have been discussed elaborately in this chapter.

Determining factors of contractual arrangements have been examined both theoretically and empirically in chapter five. Decision models concerning land leasing by landowners and by tenants, empirical findings about land leasing in different regions and combined analysis of affecting factors of land leasing by the tenants have been discussed briefly in this chapter.

To get a comparative scenario on profitability of different form of tenancy arrangements existing different regions of Bangladesh, measurement of profitability in tenanted land has been analysed empirically in chapter six. Nature of production of Aman and Boro, production and revenue of Boro and Aman, comparison of Average Revenue and Total Revenue, Total Cost and Average Cost of both Aman and Boro under different contractual arrangements have been analysed empirically in this chapter.

Chapter seven is devoted to examine the efficiency and profitability of tenanted land on different contractual arrangements. In this chapter theoretical consideration of efficiency of contractual arrangements, productivity of tenanted land on different tenancy arrangements, nature of association between rewards from tenanted land and their determinants, landlord's and tenant's share (net profit) from tenanted land on different contractual arrangements have been analysed.

Summary and conclusion have been drawn in the eighth as well as the last chapter of this dissertation. Recommendations have been incorporated in this chapter for solving the various problems concerning tenancy arrangements and for ensuring the rights of tenants for improving the agricultural growth and economic development.

Chapter 2 Methodology

It is required to describe and analyze how to research work is done scientifically and systematically. In this chapter it has been discussed various steps which are generally adopted in studying the research problem along with logic behind them. This study is based on primary and secondary data. Collected data reveal that this study is quantitative and qualitative in nature and it is based on the case study method. So, case study design is followed to fulfill the objectives of the study. The main objectives of this chapter are to explain the concepts and models that have been applied and considered in this study with a view to built up models that are used in this study.

2.1 Concepts

Contractual Arrangements: According to Oxford Dictionary of Economics, contract refers to, "A legal agreement between two or more parties, specifying the actions to be taken and payments should be made by each party" (John Black, 2002-2003). Tenurial arrangement is a derived phenomenon of tenure and it is specially related to land tenure. The term 'land tenure' describes all those arrangements by which 'farmers' or others hold or control land and which determine its occupancy and use. In this context, 'land tenure' covers not only right in land, it encompasses agricultural economic institutions generally, including agricultural land ownership and tenancy, land rents, taxation of agricultural land or income from land, and even rural credit facilities (Fitzgerald, 1956).

In agricultural economics, contractual arrangements are nothing but different types of tenurial arrangements or land leasing systems. There are various types of tenurial arrangements in Bangladesh. The most common are share tenants, cash tenants, mortgaged owners, part-owners, fixed cash rent tenants, fixed crop rent and numerous combinations of these groupings. Under the tenurial arrangement the following arrangements are vital.

- a) Share cropping (Share tenancy)
- b) Fixed crop rent
- c) Fixed cash rent

Thus it can be said that tenurial arrangement is a contractual agreement between the landowner and the tenant. In agriculture economics, contractual arrangements are placed for tenurial arrangements. Tenure means, period, time or condition of holding or using land. Land tenure refers to the possession of rights to the use of land. That is, it encompasses the terms and conditions of tenure that are settled in landholding or using. It (tenure) also refers to the right of tenants renting or leasing land as they pay the agreed rent either in cash or kind and to abide by any conditions of tenancy. So, tenure means the rights to using or holding land. Thus contractual arrangements in agriculture are nothing but different types of tenurial agreement or land leasing system.

Sharecropper: The term 'sharecropper' has come from the concept 'share-rent.' A farmer under the leasing system has to pay a fixed amount of rent either in cash or in kind to the landowner. Payment in kind is called 'share-rent' and the renter is termed as sharecropper or tenant farmer. The farmers who operate sharecropping arrangement are locally called '*Bargadar*,' '*Bhag-chashi*' or '*Adhia*.'

Share Tenancy: Share tenancy may be defined, as a land lease under which the tenant pays the rent is a contracted portion of output produced in a given year. Usually the tenant supplies labor and the landowner supplies land. In share cropping system, rent is considered as a fraction of output by the sharecropper. According to *Banglapedia*, "sharecropping is a system of cultivation with an agrarian arrangement between the landholder and cultivator for sharing the produce between them according to the established system" (*Banglapedia*, 2003, Vol. 6).

Cheung (1969) says; "share tenancy is thus share contracting, defined ----- as two or more individual parties combining privately owned resources for the productions of certain mutually agreed outputs, the actual outputs to be shared according to certain mutually accepted percentages as returns to the contracting parties for their productive resources forsaken."

Fixed Cash Rent: Under this leasing system a farmer has to pay fixed amount of rent in cash to the landowner. Fixed cash rent is known as "standing rent" and the renter is termed as 'cash tenant.' The cash rent is fixed at the beginning of the year and the farmer invests all the inputs and does not have to share any part of the output.

Owner Farm: An owner farm is one who owns the land and operates and bears all the costs of production including management and supervision. That is, owner farm is one who cultivates his land by himself or by hired labor and bears all costs and takes all production.

Tenant Farm: A tenant farm is one who does not own any land and operates the land on a stipulated share-rent basis in cash or in kind. The cash amount is fixed at the beginning of the year and the far.

Farm Holding (Farm Household): A farm holding can be defined as the owner of land more than 0.05 acres who cultivate the land. The area of land situated at different villages/ *Mauzas* but under the same operational control constitutes one farm holding (BBS, June 2002).

Small Farm Holding: A farm holding having an operated area of 0.05 to 2.49 acres of land, with a minimum of 0.05 acres as cultivated area (BBS, June 2002).

Medium Farm Holding: A farm having an operated area of 2.50 to 7.49 acres of land is considered as medium farm holding (BBS, June 2002).

Large Farm Holding: A farm having an operated area of 7.50 acres and above land is called large farm holding (BBS, June 2002).

Land Tenure: It means period, time or condition of holding land. It also refers to the right of tenants renting or leasing land as they pay the agreed rent either in cash or kind and to abide by conditions of tenancy. So, land tenure means the rights to using or holding land. Tenureship of land is classified into the following groups:

- a) **Owner Holding:** "Owner holdings are those who may or may not leased out any land, but cultivate only their own area" (BBS, July 1999). That is, it is one

kind of farm holding who does not cultivate any land taken from others but operate own land and the land of his family members.

b) Tenant Holding: It is the farm holding which is exclusively constituted with the land taken from others for operation by the holder or any member or members or the holder's household. The holder of tenant holding operates only the land taken from others on any basis. "Tenant holdings are those who do not own any land but cultivate some land leased from others" (BBS, July 1999).

c) Owner-Cum-Tenant Holding: It is the farm holding which has taken land from others on any terms and also with owned land of the holder or any member of his/ her household. This is virtually a combination of an owner holding and tenant holding. "Owner-cum- tenant holdings are those who own some land, may or may not lease out some land, but lease some land from others for cultivation"(BBS, July 1999).

Mortgage/ Kat/Bhuyta Kat: It is also one kind of fixed cash rent leasing system. In this system, the landowner takes a handsome amount of money from the tenant and the tenant takes total amount of crop as an interest. The principal remains intact whether the tenant uses land year after year.

Patton: One kind of leasing arrangements in which the tenant pays rent for a fixed time period for the land utilization.

Rent: Here rent is defined as the amount of cash or crop paid by the tenant to the landlord for using land.

Khaikhalashi: One kind of fixed cash rent system of land leasing where the tenant for land use pays a handsome amount of money. In this case a fixed amount of money is deducted from the paid amount in every year.

Fixed Crop Rent: The tenant pays a fixed proportion of product to the landowner for the use of per unit of land for a specific period.

Total Production: It is the amount of per acre output produced in a specific crop season. Total production is estimated by summing up whole years per acre output

produced. Moreover, it is estimated in value terms on the basis of prevailing local market prices during the survey period conducted from January 2003 to November 2003.

Profit: "profit is the difference between market value of output and the market value of inputs that are employed to produce that output." (Todaro, 1985). A firm or farm's profit can be defined as the difference between total revenue and total cost. That is, a farm's profit is

$$\Pi = TR - TC$$

Where, Π = profit, TR = total revenue and TC = total cost.

Cost of production: Cost of production is measured on the basis of purchased input at the current market price. Here, per acre total cost is considered as the sum of i) labor cost and ii) Non-labor cost.

I. Labor Cost

Seedbed Preparation: Cost of seedbed preparation is estimated on the basis of man-hours spent on making seedbed. The price of seed is excluded from the cost of seedbed preparation. Naturally, the cost of seedlings for Aman is lower than the seedlings of Boro, because of Aman seedlings is rain fed and Boro seedlings is artificially irrigated.

Plantation: Cost of plantation is calculated on the basis of man-days labor required for plantation of seedlings in the well-prepared land. It is evident that most of the tenants plant their seedlings on the basis of contract wage; per acre or *bigha*¹.

Weeding: Cost of weeding is calculated on the basis of man-days requirement for removing the harmful plants from the planted land. The findings of survey reveal that cost of weeding in Gazipur is the lowest because of land quality. The second lowest weeding cost was observed in Pabna due to its soil condition. Cost of weeding differs from one tenant to another and from one region to another due to the variation of soil quality and the nature of wage payments for weeding cultivated land.

¹ *Bigha*, a local measurement of unit of land consisting of 0.33 acres.

Hired VS Family Labor Cost: Hired labor cost is calculated by summing up the amount of man-days employed for cultivating per acre land during the crop season². It is also estimated by adding up total labor employed times the prevailing local wage rate. On the contrary, family labor cost is estimated by adding up total labor spend during the crop season times 80% of local wage rate. But here, it should be noted that in calculating profitability of tenanted land all family labors have been transferred into hired labor in such a way that family labor would reflect the hired labor cost in the production process.

Harvesting: Cost of harvest is important for the tenant. It is estimated on the basis of man-days requirement for harvesting the crop including transport cost of harvested crop. Harvesting cost differs from area to area and from one crop to another. It is high for Boro and comparatively low for Aman. Since Boro is harvested within the very short period of time, the tenants as well as farmers compete for hired labor. It is observed from the survey that wage cost of harvest is paid in terms of a specific portion of total produce. In Pabna, harvesting cost ranges from 1/10th to 1/7th of total production and Kushtia it ranges from 1/10th to 1/8th of total production. But in Gazipur, Feni and Thakurgaon, a fixed amount of money is paid for harvesting. The amount of money paid for harvesting ranges from Tk.1500.00 to Tk.2100.00 per acre.

Preservation: Cost of preservation is calculated on the basis of tenant's estimate. Actually, preservation cost is negligible and usually tenants do not estimate preservation cost.

II) Non-labor Costs

Seed: Generally, tenant farmers use their produced crop as seed. Sometimes they buy seed from Government agencies and from other NGO's. Moreover, some tenants use high yielding varieties (HYV) as the direction of their respective Block Supervisors, a government employee for agriculture extension service. Whether buying seed from market or from different NGO's, cost of seed has been calculated

² One man-days= 8 hours.

at the current market price. Total cost of seed has been calculated as the total amount of seed multiplied by its price.

Ploughing: It is surprising that agricultural mechanization, in case of ploughing land, has been taken place whole over Bangladesh for both landlord and tenant farmers. Hundred percent respondent said that they had been used Power-tiller for ploughing land. The cost of ploughing is estimated as the money paid to the Power-tiller holder per unit of land ploughing. The cost of ploughing land ranges from Tk.750.00 to Tk.1000.00 per acre.

Fertilizer: Survey results reveal that cent percent tenant use fertilizer and all of them use chemical fertilizer. Some tenant farmers use non-chemical fertilizer, such as cow dung and ashes in their land. Owing to increase in price of cow-feed and the tremendous decrease in pasturelands, cattle rearing is prevalence only for commercial purposes. This made non-chemical fertilizer scarce. The cost of fertilizer is calculated as the amount used times local market price of fertilizer.

Irrigation: It is evident from the survey findings that irrigation cost is much higher for Boro than that of Aman. Irrigation cost differs from one area to another enormously due to the nature of payments of irrigation cost and land quality. Cost of irrigation is paid either in cash or in terms of produced crop. It is paid in terms of rice as a specific portion of total production. It ranges from $1/4^{\text{th}}$ to $1/6^{\text{th}}$ of total production in Kushtia but in Pabna, $1/4^{\text{th}}$ of total production is paid as irrigation cost. In Gazipur, Feni and Thkurgaon, irrigation cost is paid in terms of money. The total irrigation cost is estimated per acre in terms of taka. Irrigation cost, which is paid in terms of crops, is also measured in taka multiplying by prevailing local market price of rice for irrigation.

Pesticide: Pesticide is widely used in Thakugaon, Kushtia and Feni, whereas in Pabna and Gazipur, the use of insecticide was insignificant. Most of the tenant farms do not use pesticide in their cropped land. Cost of pesticide is estimated as the amount of pesticide use per acre in rice cultivation times it's price.

Rent: Though land is the prime input for rice production, from the sharecropper's point of view, the supply price of rented-in land is regarded as zero, whereas in other forms of tenancy arrangements the supply price of rented-in land is considered as positive to the tenant. For all forms of tenancy arrangements, the rent for leased-in land has been transferred into monetary unit. Moreover, interest or opportunity cost of working capital is not considered because of insufficient alternative uses of fund spent in rice production and sporadic nature of expenditure over the span of production. In *khaikhalashi* annual deduction from paid up money is considered as annual cost of leasing land. All forms of tenancy arrangements are on yearly basis not on the crop season basis. Rent is calculated annually while the tenanted land is used twice or more in a year. Generally, rent for double-cropped land is higher than single-cropped land. In Gazipur and Pabna most of the cultivated lands are single-cropped due to the inundation of cultivable land for a long time by flood. But in Kushtia, Thakurgaon and Feni most of the cultivable lands are double-cropped land. There is no variation in the duration of contract time in all study area. In mortgage/*Kat* system of arrangements, time of contract is unlimited³. In this case, tenant pays a handsome amount of money at a time and he cultivates the land for year after year as long as the landowner could not refund that amount. The tenant farm bears all cost of production and in turn takes all produced. Since that amount remains intact year after year, the rent for rented-in land is measured in terms of market rate of interest. However, 10% market rate of interest has been taken as rent for the tenanted land.

Per Acre Total Cost: All these costs of different items are added up and the total costs were calculated in terms of money. Total cost has been calculated on the basis of the cost of all inputs. Total costs are divided into 5 categories, such as irrigation cost, labor cost, hired cost of rented land (rent), cost of capital and cost of fertilizer.

³ Mortgage is locally introduced in different names, namely, *Bhyata Kat* in pabna, *Rehani* in Gazipur, *Kat* in Thakurgaon and *Bandhaki* in Feni.

2.2 Theories on Sharecropping

In this section attempts have been made to analyze the different theories provided by the prominent economists across the world with a view to compare the theoretical explanations with empirical findings related to agriculture of Bangladesh. Despite the prolific growth of literature, both theoretical and empirical, there has been little convergence in opinions on tenancy contracts. This discussion intends to be comprehensive but not necessarily exhaustive. Allocation and distributional implications of alternative theories which is tested from empirical studies that Marshallian inefficiency associated with sharecropping is not as significant as often assume and that the share contract is chosen for the sake of risk sharing under the condition of relatively efficient contract enforcement (Otsuka and Hayami, 1988). Our fundamental premise is that no theoretical findings and or considerations may be suitable with tenurial arrangements existing in Bangladesh agriculture.

2.2.1 The Marshallian Approach to Share Tenancy

To some extent, the prevailing and analyzed economic theory of tenancy is variant approach of Marshallian theory of share tenancy. Adam Smith, and David Ricardo explained the classical theory where they considered, rent provided by the tenant was not included in the cost of production. They did not use the marginal analysis of achieving the equilibrium.

Marshall used the marginal analysis to demonstrate the tax-equivalent argument under share tenancy. According to this approach, sharecropping is considered as an inefficient mode of production. In the sharecropping both landlord and tenant are said to get less than owner or wage cultivation, therefore, sharecropping implies an inefficient allocation of resources.¹

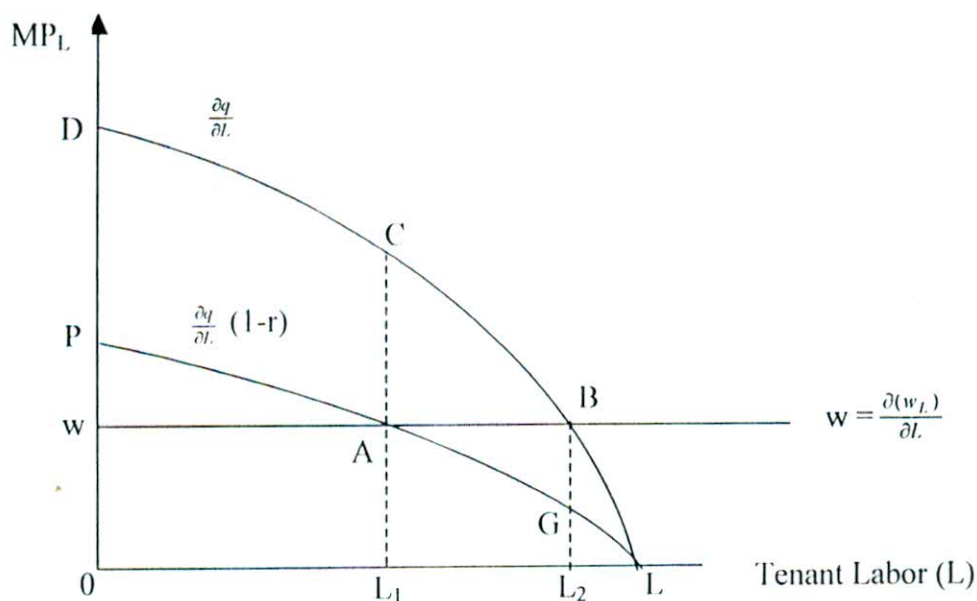
¹ A very close explanation to this statement described here can be found in many articles on sharecropping. Some are;

- a) Gale Johnson, "Resource Allocation under Share Contracts" PP. 935-42.
- b) S.N.S. Cheung, "Private Property Rights and Sharecropping" PP.1107-22
- c) Mahbub Hossain, "Agrarian Structure and Land Productivity in Bangladesh: An Analysis of Farm level Data" PP.59-65.

Marshall argued that sharecropping results under utilization of inputs compared to other tenancy arrangements because: "When the cultivator has to give to his landlord half the returns to each dose of capital and labor he applies on the land, it will not be to his interest to apply any doses the total return to which is less than twice enough to reward him. If then he is free to cultivate as he chooses, he will cultivate far less intensively than on the English plan (fixed cash rent); he will apply only so much capital and labor as will give returns more than twice enough to repay himself" (Marshall, 1952).

The explanation of inefficient resource allocation can be stated where the tenant bears entire input costs in the production process. Let the amount of labor, which is considered only the resource used in a given piece of land is measured along the horizontal axis and the marginal and average product per unit of labor on the vertical axis

Figure 2.1 The Marshallian Explanation of Sharecropping



In the figure 2.1, DL represents the $MP_L (= \frac{\partial q}{\partial L})$, which is decreasing with the labor employment. The marginal cost of hiring an extra unit of labor is given by $(\frac{\partial(w_L)}{\partial L})$, where w_L is the current wage level and it is same for different classes of cultivators assuming

competitive economy, this wage level remains constant and hence $w = \left(= \frac{\partial(wL)}{\partial L} \right)$ is a horizontal line. It is clear that in order to maximize profit under owner cultivation equilibrium is obtained at point B and the amount of labor employment is OL_2 .

On the other hand, Sharecropper would choose to produce using only L_1 of labor, since 50% ($= r$) of the output must be shared with landowner. In this case, tenant's income is marginal product minus rent (50% $= r$) will shift downward. So, tenant's gain is $\left(= \frac{\partial q}{\partial L} \right) (1-r)$. Equilibrium is now obtained at a point like A where the marginal cost of tenant is equal to the marginal benefit, i.e. at A $\frac{\partial q}{\partial L} = \frac{\partial q}{\partial L} (1-r)$. The employment of a tenant is now OL_1 . Thus, there will be an underutilization of labor equal to L_1L_2 and loss of production is equal to the area of ABC. It can be easily confirmed that the area ABC represents the size of inefficiency in resource allocation. Similar conclusions can be drawn for other non-land inputs and investment in land. In order to maximize profits, the share tenant will invest resources up to the level where the marginal product is higher than the marginal cost by the amount of the share. To be paid to the landlord: a fixed-tenant or an owner-cultivator will go on using these resources until the marginal product equals marginal cost. So, under sharecropping arrangement resources would be under-utilized and this would result in lower productivity in land.

2.2.2 The Chicago School Approach

If the traditional explanation is correct, why sharecropping exists in a third world country like Bangladesh? This contradiction between the theory and fact has been attempted to remove by some famous economists, called Chicago school approach.

The content of Marshallian theory was first challenged by Cheung (1968). In the tax-equivalent analysis (Marshallian model), the writers fail to realize that the rental rate (percentage shares) and the area under share tenancy are not mysteriously 'fixed' but are competitively determined in the market. The basis of Chicago school approach is of private property rights. Under private ownership of resources, the contracting parties are free to choose among a wage contract, a fixed rent contract, a share contract or a combination of each. Using the Neo-classical framework,

Cheung pointed out that, under private property rights, resource allocation would be in variant of the tenurial conditions of the farm. The first argument provided by Cheung is that if the landlord does not get a higher rent (share) from renting land, he can cultivate his land by using hired labor. Conversely, if the tenant does not get profit from renting land or the agreement is not profitable, he can choose alternative employment in some other occupation or as an agricultural laborer. The sharecropping agreement must imply efficient allocation of resources due to have alternative employment opportunities to both parties. Otherwise, either the landlord or the tenant does not enter into the agreement.

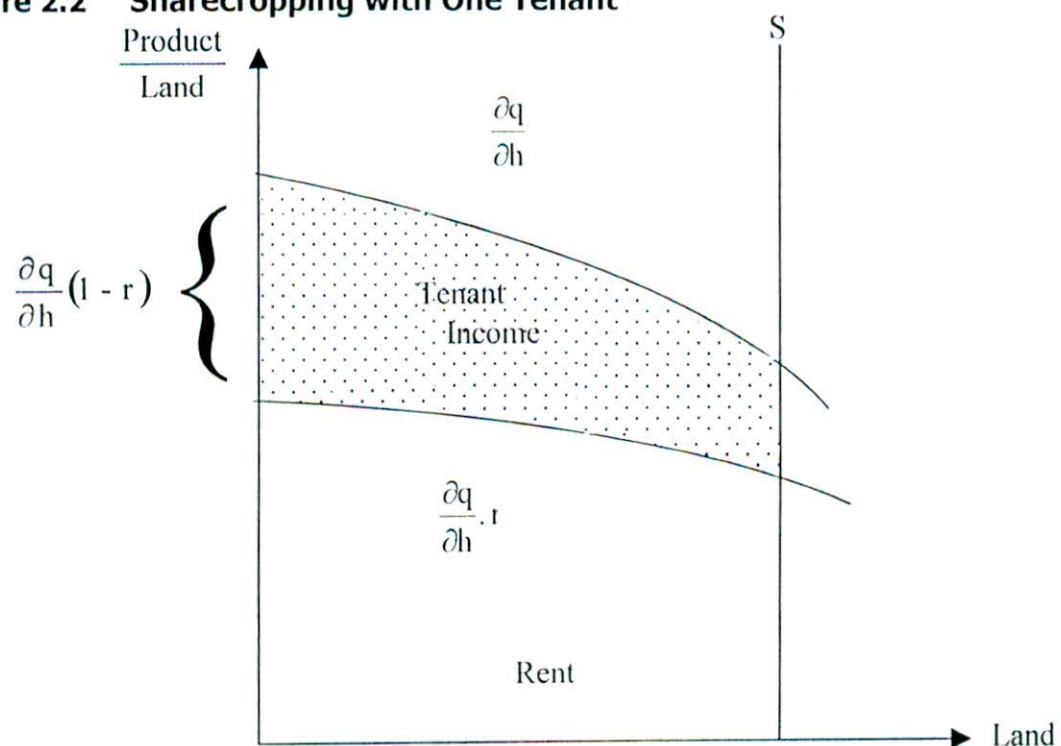
Cheung argued that the so-called equilibrium at a point A under share tenancy is not only asserted as shown in figure 2.1. The existence of residual earnings (=total tenant's receipt- alternative earning) for the tenant (area PAW) is inconsistent with equilibrium. Under private ownership of land, the landlord can extract all residual earnings from the tenant or he can stipulate labor employment up to the level L_2 , where marginal receipt net of rent equals marginal tenant's cost under competitive market. Moreover, the landowner can choose a wage contract, a fixed rent contract or sell his landownership outright instead of rent out of his land on sharecropped basis. In such case he can get more rental income than share rent. Even if we accept the tax equivalent approach and let tenant alone make the decision at the margin, there is no reason for him to choose to work up to the level L_1 for one landowner. In favor of his argument, he presented a solution model, which is presented below⁵. On the basis of wealth maximization by each party subject to the constraints of private rights in a free market, Cheung developed his model in the following fashion where he assumes a zero cost of contracting. Another argument of Chicago school is that sharecropping is an efficient response to risk; Cheung (1969) attacked the negative incentive implications of sharecropping by arguing that sharecropping should be viewed as an efficient response to risk. Under owner cultivation all risks are borne by the landowner. His income is after paying a fixed wage to the tenant. Under a fixed rent contract, the tenant bears all the risk. He

⁵ The discussed model is heavily drawn from Cheung's original model titled, " private property rights and sharecropping" in Journal of Political Economy, 1968(November-December), PP1107-1122.

pays a fixed rent to the landlord. So, in sharecropping arrangement, the risk is divided between the two parties in proportion to their output shares.

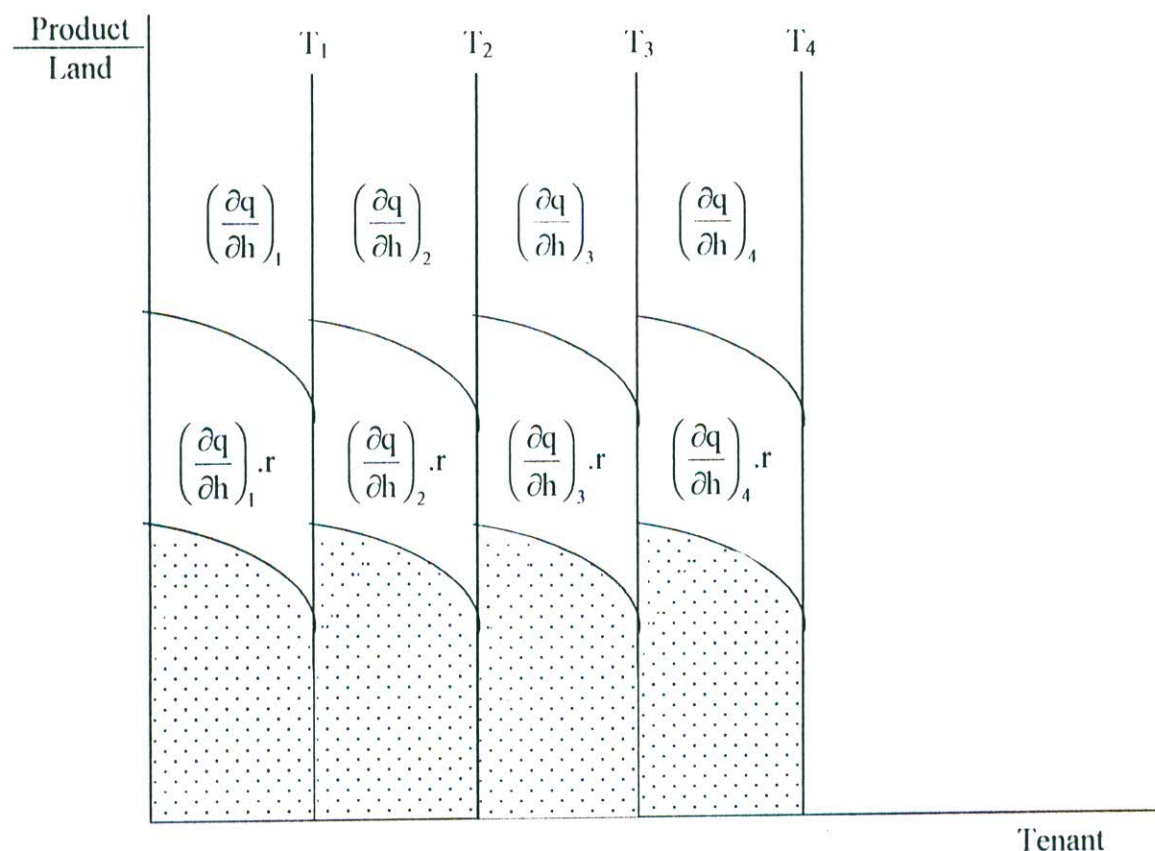
In the figure 2.2, vertical supply curve S , indicates the total area of land belonging to a landlord. Let, h denotes the land area held by the tenant and q is the product. The marginal product of land, $\delta Q/\delta h$, diminishes as h increases holding the farming inputs of one tenant constant. Suppose, the landowner charges 50% of the total annual yield as rent from the tenant, i.e. $r=0.5$. A marginal contract rent curve, $(\delta Q/\delta h).r$, is at 50% of $\delta Q/\delta h$. The vertical distance between $\delta Q/\delta h$ and $(\delta Q/\delta h).r$ is the marginal tenant income, $(\delta Q/\delta h)(1-r)$, defined as the change in tenant income with respect to change in area used by the tenant. The area below the $(\delta Q/\delta h).r$ represents the total rent collected by the landowner and the shaded area between $\delta Q/\delta h$ and $(\delta Q/\delta h).r$ represents the total farming income received by the tenant. Assuming all farming inputs constant other than land of a tenant, he will stay in farming if the tenant's income is higher than his alternative earnings as long as the marginal productivity of land is greater than zero. To maximize wealth, the landowner will raise the rental percentage until the tenant's income from farming equals the alternative earnings

Figure 2.2 Sharecropping with One Tenant



Moreover, the landowner can maximize his wealth by parceling land to several tenants that results higher total rent. This is shown in Figure 2.3. In Figure 2.3, the vertical lines $T_1, T_2, T_3, \dots$ are dividing lines of plots of land to the first, second and third respectively. Assume for the moment that the rental percentage is the same for all tenants. The curves, $(\partial q / \partial h_1), (\partial q / \partial h_2), \dots$ are the marginal product of land for each tenant, and $(\partial Q / \partial h_1).r, (\partial Q / \partial h_2).r, \dots$ are the respective marginal contract rent curves for each tenant. The income for each tenant is represented by the area between the respective $\partial Q / \partial h$ and $(\partial Q / \partial h).r$ curves for the tenant.

Figure 2.3 Sharecropping with Multiple Tenants



To maximize wealth, the landowner will maximize the difference between the integral of the marginal productivities of land and the integral of the 'tenants' incomes, which is represented by the shaded area. That is, the landowner will make the integral of marginal contract rents a maximum. This implies that the income of each tenant will not be higher than his alternative earning.

To prevent the tenant from giving up the lease, the landlord has to charge lower rental rate for the tenant to obtain his alternative earnings. This will lead to decrease in marginal rent contract, $(\delta Q/\delta h).r$. This decrease in $(\delta Q/\delta h).r$ will lead to lower rent received from each tenant, and if the land size per tenant continues to decrease, the rental percentage will eventually become so low that total rent from the land will decline. The solution is thus well defined. With private property rights over the land and the tenant input resources, maximization of the landowner's wealth, given his total landholdings and the cost of inputs, requires the simultaneous determination of the land size per tenant and the rental percentage

Cheung concluded that under private ownership of resources (land and labor) the share tenancy would satisfy the Pareto optimality in resource allocation under free market. Whatever the contractual arrangements, one of the main conclusions reached in his study is that these arrangements do not imply difference efficiencies in resource allocation as long as property rights are exclusive and transferable. The conclusion of this approach is that sharecropping agreements is not an inefficient in resource allocation.

2.2.3 Synthesize of Marshallian and Cheungian Model

Fundamental implications of the Marshallian and Cheungian models are discussed in this section. For simplicity, only the problem of determining the optimum level of labor is discussed, assuming the case of 'pure' share tenancy contract alone as an alternative to fixed-rent tenancy and fixed wage labor contract.

In figure 2.1, under the Marshallian unenforceable contract for a given amount of land (T) and a given share rent (r), the equilibrium of the share tenant's optimization is established at A , at which tenant's share of marginal product of labor is equated to the competitive wage rate. Labor input under share tenancy, L_1 is lower than the Pareto-optimum labor input (L_2), which corresponds to the equality between marginal product of labor and the market wage rate (w) to be established at point B under fixed-rent tenancy and owner farming.

However, as was first questioned by Johnson, the equilibrium cannot be established at A. Because the rent that the landlord receives under share contract (area ACDP) is smaller than under the fixed rent tenancy (area DBW); no landlord accepts the share contract. At the same time, the share tenant's income from farming (area PAL_1O) is higher than the income that he can earn by allocating the equivalent amount of labor to fixed-wage employment opportunities in the competitive market by area PAW. The excess 'profit' (positive net income) by area PAW will give rise to excess supply of tenant seeking the share contracts because all of them will prefer the share to the forms of contract. The excess supply arises in the solution of the Marshallian model because it neglects the landlord's optimization behaviors. If the landlord's optimization is considered, he will not accept the share rent lower than the fixed rent. He will try to eliminate tenant's excess profit by requesting that the tenant pay a fixed sum equivalent to area PAW, and further, he will try to raise r in order to induce the tenant to increase his labor input. In equilibrium the system will converge to the fixed rent tenancy contract. The Marshallian solution can exist in equilibrium only when the landlord is an altruist who supports the income of poor clients at the expense of his income.

Under the Cheungian assumption of enforceable share contract, the tenant's input labor, is contractually specified at an optimum level (L_2) for a given T (landlord total land). Output sharing rate (r) is the fixed rent, that is, area $PAW=ABG$. However, the equilibrium can also be achieved for a given r through the manipulation of β^* , as suggest by Marshall himself.⁶

The resource allocation and the income distribution under share tenancy are the same as under the other form of tenancy arrangements if the contract is enforceable. In contrast, if share tenancy exist under the Marshallian assumptions, the labor input, and hence the yield levels, as well as the land rent, will be lower for sharecropped land than for land under other forms of land tenure, although the tenant's income from farming under share tenancy (area $OPAL_1$) can be larger or smaller than under fixed rent tenancy (area $OWBL_1$). The implications of these two

⁶ $\beta^*=(\text{Fixed Payment})$, may be credit to the tenant, sharing of the inputs cost or tenant's support for the landlord in local politics.

different assumptions about labor enforcement under certainty are summarized in the following table.

Table 2.1 Relative Magnitudes Of Output, Input Land And Rent And Tenant Income From Farming Per Acre Among Three Land Tenure Classes, Implied From Different Assumptions About Share Contracts.

Assumption		Yield (& input per acre)	Rent (per acre)	Tenant income from farming per acre
Under certainty	Enforceable	$S=R=OF$	$S=R$	$S=R$
	Unenforceable	$S<R=OF$	$S<r$	$S\geq <R$

Source : Keijiro Otsuka and Yujiro Hayami (1988) "theories on share tenancy: Critical Survey" Economic development and cultural change, p.40.

Note: S= share tenancy, R= Fixed rent tenancy & OF= owner farming.

The basic implications of Chicago school approach to sharecropping are that sharecropping implies an efficient allocation of resources by assuming perfect competition in all markets. Another implication of this approach is that there would be no differences in the investment decisions of sharecroppers and owner-cultivators.

2.3 Decisions Models on Land Leasing

In this section it has been analyzed different types of decision models and their relationship to economic rationality and efficiency in resource allocation. The models are briefly discussed as follows:

Farmer Behavior under Certainty

Rationality is the fundamental behavioral postulate for investigation of individual choice. Given certain objectives and limitations, a rational decision maker will choose the activities or set of actions that is best for him among the available alternative actions. That is, given constraints and limitations, a rational decision maker will select that action or set of activities among the alternatives that is the best for him. Since rationality is a postulate and also since the objectives and constraints of different decision-makers are also different, there is no way to measure or to test whether the farmer is rational in taking decisions. The advocates of rationality postulate have implicitly defined economic rationality as profit maximization.

The simplest and most widely used model of farmer as well as tenant behavior is profit maximization. According to this model, farmers (tenant) select a combination of inputs (X_i) that will maximize the difference between price times yield and cost as a function of inputs, $C(X_i)$. Given the production $Y_i = f(X_i)$, their behavioral model specifies that they will choose inputs in such a way as to maximize

$$\Pi_i = p f(X_i) - C(X_i)$$

i.e. maximization of profit = revenue- cost.

This model explains the behavior of tenant farm as well as farmers by explaining profit maximization postulates given the production function. That is, a tenant will select such a combination of inputs that will minimize cost given a specific level of output. In this study, profit maximization (net returns from tenanted land) model is used for taking decisions both by the landlord and the tenants to lease in/out of land.

In a broad sense, economic rationality is that farmers or tenant act as if they were maximizing some utility function. In the utility model, farmers are assumed to act in accordance with a preference ordering over alternative bundles of family consumption. That is, a tenant farm will choose that consumption bundle for his family, which will maximize his total family satisfaction. A leading application of utility theory to farmer behavior is given by Mellor (Mellor, 1963). Mellor showed that unlike the profit maximization model that predicts labor would be allocated according to the rule that marginal product of labor equals wage. The utility maximizing hypothesis implies that the marginal product of labor will fall anywhere in the range from zero to labor's wage, depending on the farmer's distance from subsistence. Alternatively, the argument of utility model by Mellor is that allocation of available labor of tenant farm does not depend on MPL to wage rate but also on how far the farm from his subsistence level of income. The implication of this model is that marginal analysis of labor allocation is not applicable. The allocation of labor of a farm depends on the difference between his subsistence level of income and his actual income. The utility maximization allows for differences in preferences towards leisure, risk, and present versus future consumption. The primary difficulty with the utility model lies in specifying the exact nature of preferences or utility function.

Factor Market Imperfection and Tenancy

Rural households' decisions to land leasing are very closely related to socio-economic conditions and to their factor endowments of agricultural inputs especially to family labor relative to own land. Very often, tenancy is regarded as an exploitative production relation between landowner and tenant. In Bangladesh, 33.77% of total holding are tenant farm (owner-cum-tenant plus tenant farm). Tenant farms operate 40.97% of total operated area (BBS, 2002). In Pakistan, one-third of cultivated land is cultivated under tenancy arrangements (Nabi, 1986). Some argued that the existence of tenancy is the result of factor market imperfections and indivisibilities. Labor market imperfections make difficulty to adjust the availability of these inputs to requirement.

Bliss and Stern (1981) regarded the leasing decision of the farm is same as the capital adjustment decision of the firm in neoclassical theory. The model they developed implies that leasing decisions are closely related to the bullock, family worker and land endowments of the farmers. They successfully tested their model with Indian data. Subsequently, Nabi (1985) also proved empirical support for it with Pakistani data. The Bliss-Stern model is essentially a short-term model that emphasizes instantaneous adjustment difficulties in the lease market. However, some landlords and tenants are engaging in land leasing for a lengthy period of time. This may enable them to overcome whatever short-term difficulties there are and gradually attain the desired level of leasing. But Bliss and Stern did not allow for any gradual adjustment such that the landlords and tenants in their model never adjust fully.

To overcome these shortcomings, Taslim and Ahmed (1990) presented a model by explicitly incorporating a partial adjustment mechanism into the leasing model. They showed that leasing decisions of rural households are closely related to their land, family worker and bullock endowments. An adjustment difficulty in bullock and family worker necessitates adjustment in farm area, which is done by way of leasing. They gave a revised model to overcome the shortcomings of Bliss- stern model.

2.4 Cobb-Douglas Production Function

The Cobb-Douglas production function is the most widely used in the production function in empirical work. The function is explained by (Salvator, 1992)

$$Q = AK^{\alpha}L^{\beta} \text{-----} (1)$$

Where, Q =output,

L=labor input,

K= capital input and A, α and β are positive parameters.

A = state of technology,

α =Output elasticity of capital;

β = output elasticity of labor.

The greater the value of A, the more advanced is the technology. The parameter α measures the percentage increases in Q resulting from 1% increase in K while holding L constant. Similarly, β measures the percentage increase in Q resulting from a 1% increase in L while holding K constant.

The exponent of each input variable indicates the relative share of that input in the total output. In other words, the exponent of each input variable as the partial elasticity of output with respect to that input. The Cobb-Douglas type production we use is as;

$$Q = AK^{\alpha}L^{\beta}R^{\lambda}F^{\delta}e^{u} \text{-----} (2)$$

Where, Q= output; K= capital input; L= labor input; R= rent F= fertilizer u= disturbance term, e= base of natural logarithm ≈ 2.718

From equation (2), it is clear that the relationship between output and inputs is nonlinear, which can be expressed alternatively as

$$\begin{aligned} \ln Q &= \ln A + \alpha \ln K + \beta \ln L + \lambda \ln R + \delta \ln F + u \ln e \\ &= A + \alpha \ln K + \beta \ln L + \lambda \ln R + \delta \ln F + u_i \text{-----} (3) \end{aligned}$$

Where $A = \ln A$.

Thus, the model is linear in the parameters A, α , and β , and is therefore a linear regression model.

2.5 Regression Analysis

Our objective in regression analysis is to find out how the average value of the dependent variable (or regressand) varies with the given value of the explanatory variable (or regressor). In the regression model, population regression function (PRF) is estimated on the basis of the sample regression function (SRF) as correctly as possible. In other words, regression analysis asks, "What is the pattern of the existing relationship"? Prior to having an explanation of meaning R and R^2 in the production of Aman and Boro, it is required to understand the statistical and economic meaning of these two statistics in the regression model.

The coefficient of correlation in multiple regression models is the square root of multiple coefficient of determination, R^2 . The coefficient of correlation, R measures the degree or closeness between the dependent variable and independent variable when other variables are kept constant. A partial correlation coefficient, R measures the relationship between two variables, when all other variables connected with those two are kept constant (Kout'soyiannis, 1979). In the three variable regression model three coefficients of correlation can be estimated. For example, we can define partial coefficient of correlation in the 3 variable regression models as;

$R_{12,3}$ = Partial coefficient correlation between Y and X_2 holding X_3 constant.

$R_{13,2}$ = Partial coefficient correlation between Y and X_3 , holding X_2 constant.

$R_{23,1}$ = Partial coefficient correlation between X_2 and X_3 , holding Y constant.

In the multiple regression model, the coefficient of multiple determination (R^2) is a decimal fraction or percentage that shows the variation in the Y variable that is explained by its relation to $X_1, X_2, \dots, X_n$.

Damodar N. Gujarati, in his famous book "Basic Econometrics" explains the meaning of R^2 , as "in the three variable model we would like to know the proportion of the variation in Y explained by the variables X_2 and X_3 jointly. The quantity that gives this information is known as the multiple coefficient of determination and is denoted by R^2 ; conceptually it is akin to r^2 " (Gujarati, 2003). Value of R^2 lies between 0 and

1. The higher the R^2 the greater the percentage of the variation of Y is explained by the regression plane, i. e., the better the "goodness of fit" of the regression plane to the sample observation. The closer R^2 to zero, the worse the fit (Kout'soyiannis, 1979). Damodar N. Gujarati explains the value of R^2 as follows: "Note that R^2 , like r^2 , lies between 0 and 1. If it is one, the fitted regression line explains 100 percent of the variation in Y. On the other hand, if it is 0, the model does not explain any of the variation in Y. Typically, however, R^2 lies between these extreme values. The fit of the model is said to be "better" the closer is R^2 to 1." (Gujarati, 2003).

Moreover, in deciding on the best set of explanatory variables for a regression model usually stepwise or ridge regression technique is used. In this method one proceeds either by introducing explanatory variables one at a time (stepwise forward regression) or by including all the possible explanatory variables (X) in one multiple regression and rejecting them one at a time (stepwise backward regression).

The present study uses the improved form of the Bliss-Stern model with additional modifications. To obtain the specific results from the data the regression and Cobb-Douglas type model has been used.

2.6 Method of the Study

This study has five broad areas of enquiry: (a) documentation of different types of contractual arrangements and their pattern of changes (b) determinants of land lease in/out by the tenant and the landowners (c) measurement of profitability of tenanted land and their regional and seasonal variations and (d) comparison of profitability and efficiency of tenanted land among contractual arrangements for Aman and Boro production. This requires information from different groups of organization like, Ministry of Agriculture, Bangladesh Bureau of Statistics, and Agriculture Extension Directorate and so on. Moreover, information is required from landowner and tenant who are directly engaged in rental market. Therefore, it is obvious that the work would entail secondary and primary data generation by using different methodological techniques. Two methods have been used for the two main sources: sample survey method for primary data and documentary analysis method for secondary data.

2.6.1 Sampling Methods

The purpose of sampling is to provide sufficient information so that inference can be drawn about the characteristics of population. The goal in sampling is to select a portion of the population that displays all of the characteristics of the population. If we were to make a judgment about a population from sampling results, we want those results to be as representative of the population as possible. Unless a sample is similar to the population, there can be no reliability in estimates based on sample results. Unfortunately, it is extremely difficult, if not nearly possible, to have a sample that is completely representative of the population. Statisticians have learned to cope with error. If sampling error can be objectively assessed, the precision of estimates can also be objectively gauged. Statisticians are often willing to give up the benefits a complete enumeration for the advantages that can be gained from sampling.

Sanders (1990) wrote, "Data gathering by sampling rather than census taking is the rule rather than the exception". So, having the accuracy and representativeness of data it has been taken sample from different areas by spotted random sampling after the study areas have been selected purposively depending on the importance of rice cultivation and geographical location. Five areas were selected from 5 Upazilas of Bangladesh on the basis of regional variation of agricultural practices and on the flood situation of the areas. From every Upazila one village/ *mauza* was taken after consultation with Upazila Agriculture Officer, Upazila Extension Officer and above all with the Block Supervisors.

2.6.2 Selection of Study Area

Fulfillment of the objectives of the study and the representativeness of the data are the main causes behind the selection of study area. Considering the nature of investigation, objectives and the scope of study, resource constraints, representativeness of the data being collected from the study area and desired degree of accuracy, 5 *mauzas*/villages have been taken as study area from Dhaka, Rajshahi, Chittagong and Khulna divisions to represent the whole country. Two *mauzas*/villages were taken from Rajshahi division and 1 *mauza*/village from each of

other division. Due to the given emphasis on rice cultivation in the study area, two study fields (*mauza*/ village) are taken from Rajshahi division, one of them from Pabna district, which is severely flood-prone, and the other from Thakurgaon district that is flood-free area.

In order to show the variations in leasing arrangements between flood-prone and flood-free area two areas were taken from flood-prone areas (Pabna and Gazipur) and another two study fields were taken from food-free areas (Thakurgaon and Kushtia). One study field is taken from (Feni) casually flooded area by accumulated rainwater. Selection of flood-prone and flood-free areas have made the researcher to compare the differences in contractual arrangements as well as profitability of tenanted land in that areas and to compare between remote and well communicated areas. The selection of Bariatakimara *muza*/village of Kushtia sadar Upazila is very important. Existence of industrial area adjacent to this village has made the labor make tight. This village is well communicated with the district headquarters and the railway junction Poradah.

Pubail *mauza*/village of Gazipur sadar upazila has been selected as a study area for following reasons. This village is well communicated with capital city Dhaka as well as district headquarters. Modern facilities of living are available here. But the farmers who cultivate land of others have no access to modern facilities. Rice cultivating land is flood-prone and every year they had gone under water for six months. Only one crop is produced there. That is why this village has taken for as study area for its representativeness in rice cultivation.

Village Karamullahpur of Dagonbhuiyan upazila has taken as study area for following reasons. Feni district is almost in middle of the Chittagong division. Hill tracts districts along with Chittagong district are hill-oriented areas. Commilla district is developed in agriculture where vegetables and other cash crops are grown abundantly. Rice is grown also here; but its importance is not as great as Feni. For this reason, Feni is chosen as study field.

Every village (*mauza*) is chosen after the consultation with respective Upazila Agriculture officer, Upazila Extension Officer and above all, Block Supervisors who

are well-known government field officer. They are directly involved in agricultural practices and are endowed with motivating, encouraging, introducing the new technology and above all counseling the farmers about modern agricultural practices. That is why, selection of villages from Upazila may be considered as representative.

2.6.3 Sources of Data

Used data in this study, have been mainly drawn from various published and unpublished government and non-government sources. The main sources of data are different Agricultural Censuses, as Agriculture Census 1983/84, Agricultural Census 1996, National Series and zila series, statistical year book, and Statistical Pocketbook of different years and Banglapedia. Researcher's sample survey of interview with the tenant to complete a more comprehensive questionnaire designed for this study is also the main source of data. Since the Agricultural Census 1996 contains detailed information about agricultural practices, land ownership, tenurial status or tenancy, different types of holdings in rural areas of Bangladesh, cultivated area and cropping pattern, it becomes very useful and helpful for this study. Interviewing with Agricultural Officer, Upazila Agricultural Extension Officer and respective Block Supervisors of the study villages collects the data. Respondents of this study are also landowner and tenants, public representative like, Union Parishad chairman and members, landless people, retail traders and rural creditors. But the tenants are the main respondents of this study.

2.6.4 Selection of Sample Size

It is required to know how to determine and what numbers of sample sizes to be used. If it is too small, we may fail to fulfill the objectives of our study. But if it is large, it wastes resources when we gather sample. Whenever we select sample; we always miss some helpful information about the population. To get a high level of precision, we have to sample enough of the population to provide the required information. Selecting a sample that is adequate in size controls sampling error. In general, more precision we want the larger sample we need to take.

Bajpai (1974) wrote, "The size of sample should not be excessively large, or too small. It should be optimum. An optimum sample is one which fulfills the

requirements of efficiency, representativeness, reliability and flexibility". To have the greatest quality of sample's representativeness, that is, the degree of similarity that is required for valid generalizations, it has been taken 150 samples. Thirty sample units have been taken from each study area. When the village sample size is 30, it may be representative of that village. Considering the logistic supports as well as other available facilities and time, and also the applicability of various statistical tools, 150 samples may also be adequate for representativeness and drawing generalization. In statistical point of view, when sample size is 30 or above it is considered as large sample size. Statistical tools generate more precision about population when sample size is more than 30 (Levin and Rubin, 2000).

2.6.5 Methods of Data Collection

As mentioned earlier, selection of study area was discussed in detail. Here, some logic behind the method of data collection is to be analyzed. Thirty tenant farms were drawn randomly on spot selection. Thirty tenant households were interviewed randomly to fill up questionnaire from every village at tea stall and going tenant's home. The data were collected from every respondent by interviewing method and direct filling the questionnaire by the researcher himself. As most tenant farms do not keep farm records, and have not had sufficient education to fill up the questionnaire, researcher has collected information by interviewing the head of sample tenant households.⁷ Moreover, interviewing with Agriculture Officer, Agriculture Extension Officer and Block Supervisors data were collected. Direct interview with respondents to fill up the questionnaire by the researcher was used for data collection.

2.6.6 Period of Data Collection

Due to the existence of mainly two broad category of rice cultivation named Aman and Boro, data were collected during two sowing and harvesting seasons. The

⁷ To reduce the suspicions of the respondents of a village about the purpose of the survey, the researcher had been introduced by the local Block Supervisor who were engaged in the respective villages and then by the local inhabitants who introduced the researcher to the respondents.

researcher conducted a field study during the period from January to November 2003 in the selected areas. By taking a longer time period for data collection covering the sowing and harvesting seasons of main rice cultivation Aman and Boro, collected data enables the researcher to assess different components of cost and their variations with respect to rice cultivation. It also enables the researcher to examine the returns accruing from selling rice in different seasons. That's why, selection of time period for collecting data covering 11 months may be considered significant for research.

2.6.7 Nature of Data

The nature of data can be seen from questionnaire appended.⁸ But here, I would like to summarize the data as following. Area of land under tenant farms, number of landowners and tenants, number of various types of farm size, amount of land taken from others (rent in land), amount of land given to others (rent out land), different types of contractual arrangements, methods of production, use of different factors in production, rate of rent, prices of rice, total expenditures, total revenue and other necessary data for this study have been collected.

2.6.8 Techniques of Data Processing and Analysis

Collected primary data are processed after necessary checking and editing. Ordinary Least Squares (OLS) method has been used for multiple regression analysis. The completeness and accuracy of data have been checked carefully. Statistical methods of consisting percentage, measures of central tendency and dispersion, correlation, regression, test of significance and so on have been used where it was necessary. The analysis of qualitative data has been made through systematic and analytical description of the collected facts. In course of analysis, methods of comparison were followed and different tables; diagrams and charts were presented in the relevant chapters. Pattern of land distribution, structure of tenancy arrangements and their variations, determining factors of land leasing by the tenant and landowners' share of land in tenancy market have been analyzed by the obtained results.

⁸ Please see Appendix-IX

2.7 Limitations of the Collected Data

For its present purpose, the sampling survey has following limitations. Firstly, the data were collected mainly from tenants. Since both landlord and tenant are the participant in land leasing market, data should be collected from two parties in same number. But it was not possible to collect data from the landowner due to their absence from locality. Secondly, drawbacks of collected data can be stated as the absence of having interest of the people about tenanted land. So, collected data are not representatives of all people having interest on land. Thirdly, limitation of the collected data is the absence of information about labor market. Since the structure of labor market play vital role in land leasing; absence of labor market may be considered as weakness of collected data. Fourthly, limitation is occurred due to the existence of use of local measurement unit. Transformation of local measurement unit into a standard measurement unit requires rounding up some measurement that may insignificantly affect actual measurement.

2.8 Reliability of Collected Data

Empirical survey does not supply cent percent accurate information of this type of study. No claim is made here that the data obtained from the survey are 100% accurate and authentic. Since this survey is sample survey; the sampling error is a must. A few errors are common in this kind of survey. The first arises from cost of production. The respondents always try to estimate higher cost in their production process. As records on tenant farm are not kept, some answers to questions related to past events may be quite arbitrary. Information about landholding, land allotments to different crops, the amount of output produced, the amount of sources of credit, prices of crops, prices of inputs and irrigation costs which are given by the respondents from their memories have been taken as accurate and authentic for keeping originality of the study intact. In addition to this, cost in different plots for producing the same crop must be different. But the respondents supplied average cost, which may not be accurate.

Another type of error arises from willing hiding of facts by respondents. Landholding, rate of rent, production cost and revenue may be inaccurate. In peasant economy with low literacy rate and unfamiliarity with research, it is often difficult to convey the purpose of the study to the respondents. They suspect that giving their personal information may cause loss to them. So, they tend to miss-report according to their expectation. This type of errors in data may produce biased results. To minimize these errors the questionnaire was designed to contain a few similar questions in different parts that may pave the way to cross checking. Since the errors arise from hiding attitudes of all respondents, it would not affect the study result. Data drawing from different areas have minimized the loopholes of information provided by the respondents.

From the above discussion it can be said that followed methodology in this study provides guidelines for completion of research systematically and scientifically.

Chapter 3

An Overview of Agrarian Relations of Bangladesh

Agrarian relations are of critical importance in rural Bangladesh. The contemporary distribution of rights in land is the result of the historical evolution of a distinctive land tenure affecting agrarian relations in Bangladesh. Land tenure means the holding or cultivating land of the state or of a proprietor on predetermined terms and conditions that convey the legal rights to tenant to cultivate land. Land tenure is the result of historical and traditional evolution of socio-political, economic and legal systems. Thus, it is a combination of social values and norms, legal and socio-economic relations in the whole being of the society.

In the pre-industrial world, when all economic activities were circled around agriculture, Bengal allures commercial and military adventurers from abroad throughout its history. The conquerors of Bengal frequently established their polities and ruled the country according to their own fashion. Since agriculture was the main stay of people and land was the main source of state revenue, successive rulers tried to change existing land tenure according to their advantages. No great ruler entirely adopted old system of land tenure, nor did any ruler introduce an entirely new one. Thus, Bengal land tenure was always marked by continuity as well as change. Since land tenure is the inheritances of socio-political and traditional norms and values it should also be noted that land tenure should be analyzed from the historical point of view. So, the main objective of this chapter is to explore chronological steps taken by the government as well as superior authorities in different stages. It should be noted that land tenure system or agrarian relations are discussed not only from historical point of view but also from socio-economic point of view that may not ventilate actual historical evolution of land tenancy system. However, emphasis has been given on socio-economic issues in lieu of historical assessment.

3.1 Land Tenure in Ancient Period

Probably, the oldest laws were about land, which would determine the land tenure in ancient period. Historians as well as social scientists support the view that land tenure

was a combination of different sorts of rights in land of different classes of people. In ancient period, land was the common property of the community and belonged to settlers of the villages who cultivated it. The common features of ancient land tenure in Bangladesh (then Bengal) were as follows (*Banglapedia*, 2003, Vol. 6);

- a) Payment of a share of the produce of land to the head clan;
- b) The right of a family to cultivate land in its possession; and
- c) The power of the head of a *panchayet* to distribute land of the community to its families and to settle land disputes.

But many Indologists did not support the existence of this village community theory. They pointed out that Bengal village settlements developed in a highly scattered manner. Due to their dispersed nature, a well-knit social organization of village community did not develop in Bengal. Moreover, some believed that the king owned land. While on the other hand, some believed that the peasants owned land. Besides this view, some believed that the village community owned land.

The theory of peasant ownership may be partially accepted on the ground that peasants tilled the lands hereditarily and cultivate without any interference on payment of dues fixed by custom or by the king's law. The landlordism of the king has been mixed with peasant proprietorship, signifying that both had rights on land, one as the sovereign, and the other as the actual tiller. That is, the peasants enjoyed proprietary rights on land as an actual tiller and the king enjoyed it as a sovereign authority. The king had the right to impose tax and to expel a peasant from his holding. But the king's power to impose tax was limited by the customs and injunctions of the *Dharmashastras*. The power of expulsion of a tenant from his holding was limited by religious sanctions or by king's law. Thus entitlements on land were a combination of both the king and the peasants.

There were rent free and permanent tenure which were not normally be resumed by the king. This type of tenures were granted for maintenance of *Sangh* or *vihar* and other charitable purposes. Prior to 8th century AD, copper-plate inscriptions indicate that there were 3 types of land, which regulated the relation between the state and

the peasantry. These were *vastu* (homestead land) *ksetra* (plough land) and *khila* (cultivable wasteland) (*Banglapedia*, 2003, Vol. 6). The rent structure of these lands was different. But in the inscription of land grants and land sales, the prices appeared to be same for all types of land. This riddle cannot be solved for the absence of proper evidence. Another type of land was *Gochara* or pastureland. This type of land was tax-free and considered as common holdings. It was always mentioned in the inscriptions and was as marks of village boundaries. So, it can be said that in ancient Bengal, there was no unique land tenure system.

3.2 Land Tenure in the Medieval Period

Land tenure during the medieval period had been endowed with a lot of changes and progresses. Information about land tenure during Sultani period is not sufficient. The agrarian systems of the Sultans had borrowed its elements from the ancient systems of the Hindus and Buddhists. During the Mughal period, land tenure took different shapes and changes significantly. The following discussions depict the main features of tenurial relations of medieval period briefly.

3.2.1 Land Tenure in Sultani Period

During the Sultani period land system was not changed enormously. But the Sultani rulers had introduced many new tenurial terms and conditions for the existing agrarian institutions. It seemed that the Sultans collected land revenue mostly directly from the tenants as before. The provincial governors played vital role in this regard. There was an intermediate class *majumdars* who formed a rent receiving interest group as revenue farmers. But the *majumdars* were not perpetual tenure holders. They paid a fixed amount of revenue to the royal treasury from their collected land revenue. The Sultani rulers also made rent-free land grants to religious and charitable organizations.

3.2.2 Land Tenure in Mughal Period

The Mughal rulers substantially changed the land tenure system. In Mughal period, land belonged to the state under Mughal constitution; there had also some limited private ownership of land. But this ownership was exceptional. The government

engaged revenue collectors called *Zaminders* and *Talukders* who traditionally enjoyed revenue collecting right hereditarily. But *Zamindars* and *Talukdars* were perceived to be just revenue collectors. But the government had always right to dispose such revenue collectors (*Banglapedia*, 2003, Vol.6). They could not change the rate of rent without directives from the government. The *raiyyats* enjoyed hereditary customary rights on land, on the basis of the terms laid down in *Patta* and *kabuliyat*. There were two groups of *raiyyats*: *khudkasta* and *paikasta raiyyats*. The *khudkasta raiyyats* were permanent residents of a village and they enjoyed rights in land permanently. They could use the land as they liked so long they adhere to terms of *kabuliyat* or agreement. *Khudkasta raiyyats* were allowed to pay according to the *pargana* rate. This group of *raiyyats* was non-resident cultivators who moved from one village to another in search for cultivating land. They were basically migratory sort of peasants and they had no rights in land they cultivated. An assigned land called *Jagir*, for imperial officers was a remarkable feature of Mughal land tenure system. A *Jagir* comprised an area, which was estimated to yield in revenue an amount equivalent to the pay sanctioned for them. There were two types of *Jagirs*; temporary and permanent. *Jagir* was considered as *Zamindars* to *raiyyats*. In addition to *Jagirs*, the Mughal land tenure system provided for *lakhiraj* or rent-free grants. There were 3 types of *lakhiraj* (*Banglapedia*, 2003, Vol.6);

a) *madad-I-ma'sh* (aid for subsistence);

b) *inam – i – altamagha* (Hereditary grants for official family) and

c) WAQF (assigned to institutions like religious shrines, tombs and *madrashas*).

Madad-I-ma'sh grants were made to learned men, who would not take any employment. The *madad-I ma'sh* grants were not transferable. The *lakhiraj* grants; *inam – i – altamagha* was made hereditary for officials' family. Another kind of *lakhiraj* grants; WAQF was made for religious institution like, tombs and *madrashas*. From the above discussion it can be said that land tenure in Mughal

period was a combination of private ownership and state ownership. But state ownership was dominant and the Mughal authority fixed the land revenues.

3.3 Land Tenure in the East India Company and British Period

Between 1765 and 1950, the land tenure system underwent major changes. During the company period, the British authority had taken various administrative measures concerning land tenure that may be viewed as trial and error period. Prior to the establishment of British power in this region in the eighteenth century, the cultivating peasantry enjoyed security of tenure (as distinct from the idea of absolute ownership) on the land tilled by them on the condition that they would share their produce with *Zamindars*. On 12 August 1765, the East India Company was granted *Diwani* right by the Mughal emperor Shah Alam to collect revenue from Bengal, Bihar and Orissa.

3.3.1 Land Tenure during the Period 1765-1793(Trial and Error Period)

At the early stages of company period, the East India Company realized that the intermediaries (*Zamindars*) were in fact the owners of land. In general, they had been appointed by Mughal authorities to collect land revenue from the actual cultivators. They were 'revenue farmers' whose interests were distinctly different from the interests of those who themselves labored on the land.

During the *Double* government period (1765-1772), the Mughal system of revenue collection was retained almost same. The institutions of *Zamindars*, *Talukdars* and *Lakhirajdars* were operating without significant changes, which were introduced during Mughal period. The company carried out several experiment in land tenure system before the introduction of the *Permanent Settlement* in 1793.

In 1770, the procedure for land administration involved leasing out lands to the highest bidder for a period of 5 years. This procedure brings sufferings to landlords and to tenants. The old landlord had to bid for a higher amount to keep the estates in their possession, which in turn compelled the tenant to bear the burden of paying the additional amount. In 1772, the company decided to involve directly in land administration by employing collectors. In 1790, the system was replaced by decennial Settlement while still continuing the open auction method.

3.3.2 Permanent Settlement (1765-1793)

The main objective of the colonial rule was to construct a system, which will justify economically the Company's political dominance. In fact, the British colonial state was founded for facilitating the company's trade and commerce and also for "remitting [home] the surplus of revenues the country" to quote Warren Hastings (Serajul Islam, 1997). Since land revenue was the biggest source of government revenue, agricultural production had to be increased for increasing the government revenue. But it was impossible to achieve within the existing traditional agrarian relations. In this perspective company came to realize that traditional agrarian relations should be changed for having a more dynamic land tenure system that would lead to the capitalist mode of production in agriculture sector. In this context, Permanent Settlement was introduced.

On 22 March 1793, Lord Cornwallis, governor general of the company, declared Permanent Settlement that made *Zamindars* and *Talukdars* permanent proprietors of the land under their respective control (*Banglapedia*, 2003, Vol. 6). As a result, government revenue agents turned into landowners overnight. As a proprietor of land a *Zamindar* could transfer their land freely in the form of sale, gift, lease and so on. The revenue demand by the government was fixed upon *Zamindars* for perpetuity.

3.3.2.1 The Landed Property under Permanent Settlement

Under the rules of permanent settlement the *Zamindars* were declared the absolute proprietors of land, and as proprietors they were made legally entitled to use their land as they liked. Their lawful successors could inherit and divide that property among themselves according to the traditional laws of succession without any interference from the government. The rights to collect revenue were heritable and alienable. This meant that the *Zamindars* could lease out these rights to subordinate interest that could do the same with the rights thus obtained. In this way, a chain of intermediaries grew up between the government and the cultivators who were bearing the full burden of rent and other extractions. The landed property was made permanent institution by Permanent Settlement but its owners' right in land was made dependent on the punctual payment of government demand.

The execution of revenue sale law (popularly known as 'Sun-set law') was thus likely to unsettle the existing landed class quite significantly, because the revenue assessment of the permanent settlement was not based on any survey of asset; and consequently government demand was distributed highly unequally (Serajul Islam, 1999). The Permanent Settlement did not eliminate the rights of *raiya*s in land though the existence of such subordinate rights ran counter to property rights of *zamindars* (Cornwallis, 1793:Article VIII, Clause 1). Regulation No. 17 of 1793 provided that on the failure of the *raiya*s to pay increased rent, all their moveable, including standing crops was made liable to attachment and sale by the landlords without the intervention of the court (*Banglapedia*, 2003,Vol. 6). As a result, the proprietary right of *Zamindars* terminated the customary rights who were now just tenants-at-will of *Zamindars*. In this perspective, the Permanent Settlement of 1793 institutionalized the *Zamindars*. Under the Permanent Settlement system, lands were settled in perpetuity with the Zamindars regardless of their ownership. The company government remained silent about the status of *raiya*s under the *Zamindars*.

The concept of peasant proprietorship was totally abolished. Despite the claims made the intention of the Permanent Settlement Regulation was to protect the customary rights of tenants the cultivating class having no security of tenure.

3.3.2.2 Emergence of *Madhyasvatva* Tenures

Permanent Settlement was made a new form of property rights in land by the execution of revenue sale law (Sunset Law). In order to protect the estates from the operation of sunset law, the *Zamindars* began to lease their holdings to another class of perpetual rentiers and imposed the same terms and conditions on the leaseholders as they themselves had agreed to perform under permanent settlement. Generally these rights stood between the *Zamindars* and *raiya*s and thus properly these rights were called *Madhyasvatvas* or intermediate rights. *Madhyasvatvas* as a right was made as easily transferable and inheritable as the *Zamindari svatva*. The main groups of *Madhyasvatvas* were:

- a) *pattani svatva*; and
- b) *patitabad svatva*.

- a) ***Pattani Svatva***: It was entirely a rent-collecting device without having any relation to productive management of land. It pushed up the rent rate without leading to corresponding increase in wealth. The *Zamindars* divided their whole *Zamindary* into numerous lots. Every lot was settled with a tenure holder with the condition that he would enjoy a rent rate fixed perpetually, pay a cash in lieu of the favor and that his tenure would be sold in auction in default of payment of rent in time. This type of tenure was called *pattani*. The *pattani* system saved the *Zamindars* from the Revenue Sale Law (Sunset law) and also made them prosperous. Furthermore, *pattanidars*, again in search of security of tenure, created sub-*pattanis* below them and the process had obviously ruinous effects on the actual cultivators.
- b) ***Patitabad Svatva***: It was guessed that on the eve of permanent settlement about one-third or more cultivable lands of Bengal lay under the sway of nature (Cornwallis, 1788: Appendix 5). Under the pressure of permanent settlement *zamindars* found in *patitabad* a new source of income and safety. Tenurially and organizationally *patitabad* activities may be classified into four categories; *noabad*, *char-abad*, *bill abad* and *Sundarban-abad*.

Following the permanent settlement of 1793, the *Zamindars'* rights and prerogatives continued to grow. In Bangladesh region, they became de facto owners of the land though they did not cultivate it. In fact, the *Zamindars* settle their land temporarily with tenant, the actual cultivators. The cultivator paid rent in cash or kind to the *zamindars*. The *Zamindar* sent a fixed amount of this rent as land revenue to the ruling authority. The actual cultivators beard all the responsibilities and risks of cultivation. The tenants were ousted summarily by the *Zamindars* when cultivation fell behind in the payment of rent, or resisted demand for higher rents.

The period from 1793 to 1859 was marked by concern for defining in clear terms the landlord-tenant relationship and to provide security of the tenant (Shawkat Ali, 1981). Permanent Settlement ignored any rights in land among the actual tillers of the soil, now classified as "tenants" of the *Zamindars*. This settlement also established the *Zamindars'* right to fix their own terms of tenancy with their tenants

and made clear the land revenue payable by the Zamindars to the East India Company (and later to the British government of India) would be fixed in cash in perpetuity. The revenue paid to the state by the *Zamindars* was permanently fixed in amount; rents paid to the Zamindars by tenants were not. Finally, the settlement conferred upon the *Zamindars* certain proprietary rights. As a result, this period may be called the protection of rights of *Zamindars* (1793-1859).

In this way, a chain of intermediaries grew up between the government and the cultivators who were bearing the full burden of rent and other extractions. Deprived of nearly every bit of surplus from land a cultivator was destined to live in perpetual poverty, which forced him into bondage of indebtedness. A rapacious money-lending class identical with some of the landed interest was emerged. A poor cultivator could ill afford to escape the claws of either of them.

The last observation is critical. The land system of the Bengal region was oriented above all to the maintenance of the rights and prerogatives of a land holding elite whose primary function was to act in behalf of established authority in the collection of land revenue. Agrarian relations that evolved under permanent settlement were not only unjust, but also entirely inefficient. The long chain of intermediaries extracted surplus from land, but a very few of them were expended for socio-economic development. The different layers of middlemen mostly consumed rent. Those were with very big estates indulged in luxury and ostentatious consumption. The usurious money lending carried less risk and was more rewarding than investment in any productive activity. Consequently production suffered. Agriculture remained backward; and the demand for industrial goods from agricultural population remained low and stagnant. There was little diversification in the economy.

3.3.3 Land Tenure during the Period 1859-1885 (The Beginning of the Protection of the Rights of Tenants)

Tenurial Legislations during the period of 1859-1885 deal mainly with the statutory development of occupancy rights of tenants. It further lay down that the rent must be fair and equitable and at the same time recognized *Zamindars'* right to enhance rent on ground of increase in area and rise in value of the produce (Shawkat Ali, 1981).

This was first time that the tenants were given de jure rights on land for continuous occupation of land for 12 years. Act X of 1859 marked the beginning of a system, which sought to protect the interest of the tenants. So, this period is regarded as the beginning of the protection of the rights of tenants. In this Act, two serious defects were as (i) there was no definition or principle in the Act of what was fair and equitable and (ii) the tenant had great difficulty in providing 12 years continuous possessions due to the absence of proper records. This naturally led to a clash of interest between the tenants and the Zamindars resulting in agrarian disputes.

3.3.4 The Land System as Modified by the Bengal Tenancy Act of 1885 (Consolidation of the Protection of Rights of Tenants)

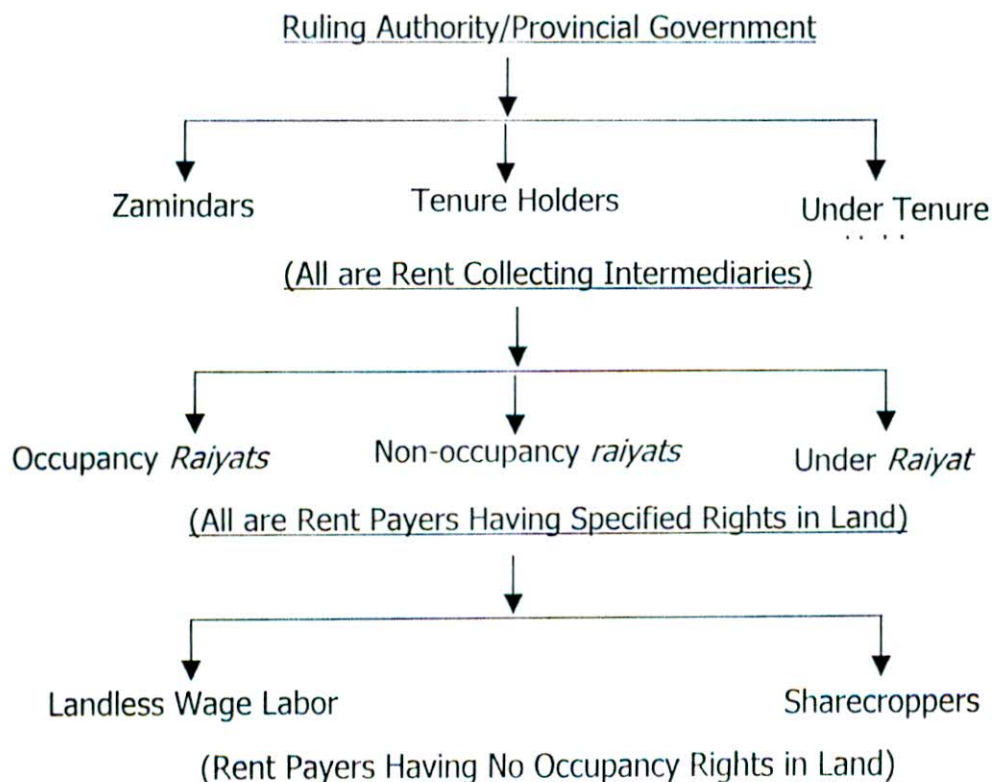
Periodically, during the nineteenth century, British authority intervened to establish regulations designed to protect cultivators from the *Zamindars'* abuses of power. But, British continued to be unsuccessful in enforcing such provisions, and the rights of the cultivating peasantry of the region also continued to deteriorate. In 1878, the Bengal Rent Law Commission was formed. The Bengal Tenancy Act (Act of VIII of 1885) was based on this Bill. The commission prepared a Bill for realization of undisputed arrears of rent recommended that it was desirable to undertake a complete revision of the Tenancy Law. Finally, in 1885 the British made a major attempt to establish an improved basis for landlord–tenant relations in the region. In that year, the Bengal Tenancy Act came into force. The Act established principles concerning landlord–tenant relations which, had it been fully implemented, would have provided the subsequent basis for tenant farmers either to maintain or to establish their own rights in land. At the outset, it should be noticed that no attempt is made in the following analysis to discuss every provision or details of the Act of 1885 as originally enacted and subsequently amended.

The Bengal Tenancy Act of 1885 modified the Permanent Settlement of 1793 drastically and it provides de jure recognition to the rights of others besides *Zamindars* in the agrarian hierarchy whereas the permanent settlement of 1793 ignores the full spectrum of customary rights in land and to confer proprietary rights to *Zamindars*. It gave legal, as well as responsibilities, of those whose status had not been recognized by the permanent settlement. This Act established the basis for all

subsequent legislation (even in contemporary Bangladesh) governing the relationships of people to the land in this region and its previous help to expose the structure of the traditional land system of Bangladesh.

The Bengal Tenancy Act of 1885 presented a version of the intricately stratified system of rights in land in the region that is now Bangladesh. At the apex of hierarchy was the ruling authority, the provincial government of Bengal. Below the provincial government, there were *Zamindars*, tenure holders and under tenure-holders (those who had rent collecting powers). In descending order, those were occupancy *raiyats*, non-occupancy *raiyats* and under-*raiyats* (all of whom were rent payers having specified rights in land). At the base were sharecroppers and landless wage laborers (whose rights in land were either tenuous or non-existence). Figure 3.1 represents in simplified form of hierarchy of interests in land in the Bengal region.

Figure 3.1 The Hierarchy of Interests in Land 1885-1950



Source: Jannuzi & Peach, 1980.

In practice, there were no clear-cut difference between a tenure-holder and a *raiyat*. In such circumstances, the Bengal Tenancy Act stipulated that local customs would

be the determinant in defining the nature of tenancy. Each holder of land in the agrarian hierarchy had specified rights and responsibilities in relation to his landholdings. A tenure-holder e.g. could have his rent raised by a *Zamindar* within the terms of Act, but having been raised, the rent could not then be altered again for 15 years. The *raiya*ts (i.e. tenants of landlords) could acquire a statutory right to land in their possession; even though this right to land was qualified and less complete than that of absolute owner.

By the Act of 1885, if a landlord sought to deny a tenant's potential claim to land by shifting him from plot to plot each year, breaking up continuity to possession, he could no longer do so. So long as a tenant could claim successfully continuous possession of some land in a village for 12-years period, his status as a 'settled *raiya*t'¹ having occupancy rights in land was assured. His right to land was protected by law; he could till the land himself or with hired labor; he could lease or even transfer his right in land by sale to another. But at the same time, he was himself a tenant of someone having a superior right to land; he therefore had a statutory obligation to pay rent and could not be evicted from the land in his possession under terms and conditions specified by law. In defining the rights of the *raiya*ts the act categorized them into two major groups: occupancy *raiya*ts and non-occupancy *raiya*ts. The rights of the occupancy *raiya*ts were declared not only hereditary but also transferable, on the condition of payment of transfer *salami* to the *Zamindars*. The non-occupancy *raiya*ts were those who till the lands for less than 12 years. Below the non-occupancy *raiya*ts or under *raiya*ts there were landless labor and sharecroppers whose rights in land were not defined and who continued to remain tenants-at-will of the land holding interests.

The rights of the under-*raiya*ts were similarly qualified by custom, wage, and law in the Bengal Tenancy Act, as amended, Law protected their rights in land. They held land so long as they paid rent to their landlords. *Bargadars* (sharecroppers in contemporary Bangladesh) did not have the qualified rights of tenants within the

¹ A *raiya*t (or tenant farmer) could become a settled *raiya*t by holding land continuously in his village for 12 years, but others might acquire an occupancy right to land simply by purchasing a section of land from a settled *raiya*t.

terms of the Bengal Tenancy Act. Thus a sharecropper's right to land was at best tenures and subject to conflicting interpretation of the Bengal Tenancy Act, as amended. That is, at the base of agrarian society there were no de jure rights in land. There was no ambiguity concerning the status of peasant having no claim whatsoever to land.

The Bengal Tenancy Act, even as latter amended, conferred no rights in land to cultivators working as wage laborers on the land of others. Under the Bengal Tenancy (amendment) Act of 1928, the right to transfer land made general. The *riyat* could transfer his holding without taking permission from the *Zamindar*, but the system of transfer *salami* was still maintained. Under Bengal Tenancy Act (amendment of 1939) the *salami* right of *Zamindar* was abolished. This Act (amendment) of 1939 made *raiya*s virtual owners of land and they now would transfer or use land in anyway as they liked. The *Zamindars* were now left only with receiving right (*Banglapedia*, 2003, Vol.6). The Bengal Tenancy Act of 1885 thus revised the original constitution of the permanent settlement drastically.

3.3.5 Consideration of the Protection of Tenants (1885-1938)

The Bengal Tenancy Act 1885 removed the inadequacies of the Rent Act of 1859 and made the cultivating class a settled tenant with occupancy rights in land. In addition, a tenant would also acquire occupancy rights in land who had been in possession of any land for 12 years, either by him or by inheritance and would also acquire the same rights in any new land that he bought under cultivation. Moreover, following guaranteed protections were as follows (Shawkat Ali, 1981);

- i. Right of cultivating class or settled tenant could not be disturbed in the event of the superior landlord selling his land;
- ii. He could not mortgage his holdings;
- iii. Tenant could sublet his holding for a period not exceeding nine years;
- iv. He could not be evicted for arrears of rent only and the holding could be sold out in Civil Court.

The guaranteed protection measures of Bengal Tenancy Act are indicative of the government's awareness of the need to prevent arbitrary harassment of the cultivating class who were previously completely at the mercy of *Zamindars*. Moreover, the establishment of regular machinery of government and the taking over the functions of Revenue, Security and Justice are considered as massive development of protection measures of cultivating class.

From the above discussion it is clear that land tenure system from 1793 till 1950 should confirm that the land system of that region were exceedingly complex. Though the Bengal Tenancy Act was many times amended after 1885, was seldom implemented rigorously in behalf of weaker sections of the cultivating peasantry and was repealed in 1950.

3.4 Land Tenure during Pakistani Rule

In the 1940s and afterwards, the issue of land tenure assumed a completely new dimension. The Land Revenue Commission under the chairmanship of Sir Francis Floud, submitted its report on March 21, 1940, recommended the abolition of *Zamindari* system along with the tenurial rights of other intermediaries. The commission also prescribed its replacement by a direct settlement between the state and the cultivators. But the recommendations of the commission could not implement due to the continuation of Second World War and the political turmoil of then British India. After the partition in 1947, the East Bengal Legislative took up the task of land reform. The East Bengal legislative assembly, in its 4th session formally passed the East Bengal State Acquisition and Tenancy Act (EBSATA) 1950, on February 16, 1950, on the basis of the Floud Commission, and it was a landmark in the history of tenurial legislation.

At a glance, the EBSATA of 1950 seems not only to repeal the Bengal Tenancy Act 1885 but also to invalidate the permanent settlement of 1793. It abolished all *Zamindari* and intermediaries and the rights were declared *maliks* or owner of land. The Act brought the tenants directly under the government. That is, it abolished all revenue farming.

3.4.1 The Salient Features of the EBSATA of 1950

Some provisions of the East Bengal State Acquisition and Tenancy Act 1950 (GOEP, 1959); are described below.

1. The Act abolished the *Zamindari* system and all intermediaries, so that actual owner of the land became the tenants under government. The peasant became direct tenants under the government and got the proprietary rights on their lands. These rights were made permanent, heritable and transferable.
2. Section 20 of the Act of 1950 contains the explicit provisions that have enabled landholding elite of Bangladesh to preserve their traditional rights and prerogatives in land. The former rent-receiving intermediaries were entitled to retain;
 - a) Their homestead land (lands covered by homestead dwelling units or other building considered to be adjuncts there to)
 - b) Land used for agricultural or horticultural purposes
 - c) Land considered either cultivable or being capable of being cultivated following reclamation and
 - d) The land area encompassed by water ponds.
3. "The government remained the lord superior and tenants or *rai-yats* became holder of land under the government. All *rai-yats* (to be called "*maliks*" henceforth) were to have permanent, heritable and transferable rights to use their land in any way they liked" (Kamal Siddiqui, 1997).
4. The most important change in the land tenure system was the imposition of a ceiling on the quantum of land to be owned or held by a family or body. The ceiling to landholding was fixed at 100 standard *bighas* (33.33 acres) of cultivable land per family or 10 *bighas* of such land per member of the family, whichever is larger, in addition to the homestead land up to a limit of 10 *bighas* per family. The ceiling was relaxable for plantation activities in tea, coffee, sugarcane and rubber, far cassia leaf gardens, orchards; large scale mechanized farming and large-scale dairy farming. The surplus or excess

land would now be available for settlement with the landless or marginal farmers in accordance with the rules or policy of the government.

5. Rent receiving interests and power of the estates belonging to religious institutions ("*waqful-lillah*" and "*waqful-aulad*" in the case of Muslims and "*debettor*" in the case of Hindus) were not to be exempted from state acquisitions.
6. To prevent reappearance of the intermediary interest subletting of agricultural land was strictly prohibited.
7. For acquisition of rent interest, compensation was payable on a graduated scale.
8. Compensation could be paid either in cash or in bond or both. The bonds would be non-negotiable and payable within forty annual installments would carry 3 per cent interest.
9. To prevent conversion of agricultural land to non-agricultural uses the transfer of agricultural lands to persons who are not bonafide cultivators was prohibited.
10. Maximum rent would not exceed one-tenth of the annual gross produce of the land.
11. The "bonded labor" system known as '*Nankar*' in Sylhet was prohibited or to be abolished².
12. No holding could be subdivided to the extent that the rent of any portion would be less than TK. 1.00.

3.4.2 Tenorial Measures in the Sixties

Some significant amendments of Act of 1950 were made from time to time. In 1957, the Revenue Department issued an order to redistribute acquired land by the state to the non-cultivators like ex-military men with long glorious service, refugees and ex-rent receivers with no land for consideration. But these lands were not freely

² Under this system, in lieu of using land the *Nankar* had to provide corvee (free labour) to his landlord.

redistributed. An applicant would get his share of land on payment of "*salami*". In August, 1957, the *salami* was set equal to the amount of 5 to 10 times of annual rent. In August 1958, it was made equivalent to 50% of the prevailing current market price of land. In 1962, it was enhanced to full market value of the land. Among the amendments, the revision of ceiling was to landholding from 100 *bighas* to 275 *bighas* per family by an Ordinance of 1964. Accordingly, some of the acquired land had to be given back to the previous owners after 1964.

3.4.3 Impacts of EBSATA of 1950

It was irony of fate that the goal of distributive justice and productive efficiency of the Act 1950, suffered seriously in subsequent years. Actually, it had given legal endorsement to the pattern of agrarian relations that had already been taken shape. The process of acquisition of rent receiving interests was very slow and only 443 estates were acquired by March 1956, though the Act came into force in 1951 (*Banglapedia*, 2003, Vol.6). It took more than 8 years to complete the process and even today, some rent receiving interests such as '*waqf*' and '*debtitor*' estates could not be taken. There was very little to be achieved in the matter of the redistribution of acquired land due to following reasons;

- a) Only a small number of *Zamindars*, hardly two percent of the total were big landlords;
- b) Lands of *raiyats* could not be taken over for redistribution;
- c) Lands could be redistributed among the family members through deeds showing each member as a separate households or even by way of *benami* transactions;
- d) The large landowners had the options to keep the superior plots to them and leave the inferior ones for government acquisition. As a result, most of the acquired lands were uncultivated or uncultivable.

It is obtained from the available statistics that the total area acquired under the Act of 1950 came to 163741 acres. Moreover, total acquired land by 1959 was 234746 acres, of which 68% was wasteland (Hossain, 1991). Abdullah (1976) calculates total

arable land that the government could take over under 1950 no more than 65496 acres. The net farm area in Bangladesh today covers about 22.5 million acres. This means that the Act of 1950 could contribute to the acquisition of hardly 0.3% of the total cropped area in Bangladesh (Hossain, 1991). The Act stated that the former rent receivers now transform into *maliks* by law of the state could retain such lands whether they tilled themselves or with members of their families or with the assistance of servants, or with hired labors, as well as *Bargadars*.

Actually, the Act of 1950 denied sharecroppers any rights in land and any means of acquiring them. It thereby enhanced the prerogatives of the land holding elite in relation to sharecroppers. The former rent-receivers now became *maliks*, having permanent rights in land so long as they could pay rent to the state. They could continue to till their lands by subletting them to others and continue to realize the *usufruct* of the land while relying on sharecroppers to assume all risks and responsibilities associated with the production of crop. From this perspective, the Act 1950 further institutionalized the traditional agrarian system but not changed the agrarian structure of this region.

The role of rent receiving land-holder (loosely classified as *Zamindars* but including others having property rights in land) was not in fact abolished; only the right act as an intermediary of state in the collection of land revenue was eliminated. These *Zamindars*, tenure-holders and others having rent receiving powers were converted in status to *maliks* (land holding tenant of the state). Their rights and prerogatives with respect to lands retained by them, in any substantial sense, were not diminished. Clearly, the Act of 1950 had nothing to do with changing the basic relationships of the people to the land. The traditional hierarchy was intact; the old rent-receivers remained the primary land holding group.

Although the provision of section 20 of the Act did nothing to upset hierarchy of interests in lands, they did impose a ceiling on the amount of land that could be retained by a landholder³. The provisions of the Act of 1950, did not threaten the

³ The ceiling was initially set at 100 standard *bighas* then raised to 375 *bighas* in 1961 by East Pakistan Ordinance No. 15 of 1961, and finally reduced to 100 *bighas* in 1972 by the government of the People's Republic of Bangladesh.

traditional agrarian structure of the country. This Act mainly provided the revenue collection of then East Pakistan with rationalization. It is now apparent that the Act did little to modify the traditional land system. From this perspective, the Act 1950 further institutionalized the traditional agrarian system but not changed the agrarian structure of this region.

3.5 Land Tenure After Liberation

There was a revolutionary change in the settlement policy of the government after liberation of Bangladesh. After the war of independence in 1971, the new government tried to look into the problems of agrarian relations and to improve it.

3.5.1 Land Tenure in the 70s

To fulfill the expectations of sacrificed citizens of the nation and to pave the war-torned economy along with ambitious plan for forming a socialist structure of the country, government had tried to restructure the existing agrarian relations by modifying the EBSATA of 1950. So, new government promulgated several presidential orders relating to land reform.⁴ The main provisions of then land tenure measures were as follows:

1. All land revenues including arrears and interest due on agricultural land up to April 14, 1972, were being waived.
2. Agricultural families with land holding under 25 *bighas* were exempted from payment of land revenue from April 14, 1972 (P.O. 96 of 1972). But land development tax was introduced later.
3. Imposition of a ceiling of 100 *bighas* per family on agricultural land (P.O. 98 of 1972).

This was relaxable in case of cooperative farming and organized plantation. In redistributing government land *salami* would not be taken and distribution would be

⁴ The presidential (Bangladesh) ordinances affecting rights in land include the following: a) The State Acquisition and Tenancy (Third Amendment) order, 1972(president's Order No. 96 of 1972); b) The Bangladesh Land Holding (Limitation) Order 1972(president's Order No. 98 of 1972, c) The Alienation of land (Distressed circumstances)(Restoration) Ordinance 1976(Ordinance No. 28 of 1976).

according to the following priority among the landless and near landless (i.e. owning less than 1.5 acres) agricultural families (The Bangladesh Observer, August 5, 1972);

- a) Agricultural families having no land
 - b) Agricultural families having no land other than homestead
 - c) Agricultural families having land including homestead but less than 1.5 acres
 - d) Families whose lands have been dilluvated
 - e) Agricultural families dependent on freedom fighters that either lost their lives or was permanently disabled
 - f) Agricultural refugee families undertaking cultivation themselves and
 - g) Other agricultural families.
4. It was also decided that the recovered land accreted 'char' lands by the rivers would not go back to original claimants (P.O. 135 of 1972).
 5. Prior to liberation, there was no uniform rent structure in the country. The land development tax ordinance 1976 was enacted to rationalize the revenue structure and to mobilize more domestic resources for development;
 6. 'Ijaradari' with respect of management of 'sairat mahal' (government landed property, such as hats and bazaars, water bodies, ferries, minor minerals, etc) was abolished.
 7. Agricultural land mortgage on exploitative terms was banned.
 8. Another amendment provided that if there is a sale document in respect of a piece of agricultural land also on agreement to return the land to seller or refund of the price by a certain date, these two documents would constitute a completely *usufrutuary* mortgage and the sold land would be refundable to the owner without payment on expiry of 7 years.
 9. The new laws have classified landholders as *maliks* but it has not been designed to protect the right of tillers who does have any rights on land.

Neither sharecroppers nor the actual cultivator were benefited from such type of law following independence.

Impacts of Land Tenure in the 1970s

It is no doubt that all these measures were fully and effectively implemented. The government could acquire a little amount of land. In that time, there were 5 million landless and marginal farmers. The government had only 4.5 lakh acres of total land for distribution (Hossain 1991). Failure of measures of 1972, the government, declared a series of drastic measures for evaluating the rural economy in 1975. According to them, the land ceiling was to be reduced to 70 *bighas* per family. The whole agriculture was sought to be brought under a system of compulsory cooperatives. The total output would have to be distributed according to the ratio of one-third for land, one-third for labor and another one-third for capital. In the management system of cooperatives there would have to be the proportional representation of land, labor and capital. But this policy could not be implemented owing to change in government in 1975. So, it could not have created much impact even if it had been a success.

3.5.2 Land Reform Ordinance 1984

The government took initiatives reform measures on the face of sharpening of contradiction in production relations and deepening the crisis in the economy owing to an alarming growth of population. Consequently, a Land Reform Committee was formed in 1982. The committee proposed several recommendations, which have 5 major recommendations;

1. Reduction of land ceiling from 33.3 acres to 20 acres;
2. Establishment of minimum wage rate (3.50 kg. Rice or equivalent in cash) for agriculture labors;
3. Decentralization and strengthening of survey and settlement administration;
4. Recognition and protection of rights of sharecroppers; and
5. Expansion of resource base of local government institutions.

On the basis of recommendations the government promulgated a new Land Reform Ordinance in 1984.

Salient Features of Land Reform Ordinance 1984

Far-reaching changes were also made in the rights of tenants by promulgation of Land Reforms Ordinance 1984. The main provisions of this ordinance were as follows:

1. The ceiling to ownership of agricultural land has been reduced further to 60 standard *bighas* per family. Excess land would be acquired by the state on the payment of compensation to the owners who would have the freedom to keep their preferred plots up to 60 *bighas* per family. The existing ceiling was not to be reduced but those family owning land up to 60 *bighas* were prevented from acquiring any more land.
2. Free distribution of *khas* land among only landless peasants was to be ensured (Kamal Siddiqui, 1988).
3. This law declared '*benami*' (proxy) transaction void. That is, *benami* transaction was declared illegal and punishable.
4. The most salutary provision in respect of security of tenure is the prohibition of eviction of agricultural tenants from his homestead land. That is no one could be evicted from his homestead.

Provisions about Sharecropping

Sharecropping arrangement is traditionally regarded unfair for the tenants for two reasons: Firstly, they can be evicted from land by the landowner at their convenience. Secondly, while sharecropper provided all or most of the production inputs, they usually receive only 50% share of the output. The land Reforms Ordinance, 1984 seeks to remove these two unjust and unfair provisions of sharecropping arrangement. The important laws are as follows:

1. The Ordinance provided that the landowner and sharecropper must sign a legal contract. Without signed legal contract sharecropping is illegal. The tenurial rights of the sharecropper were recognized; he was entering into a 5

years agreement with the landowner during which time he could not be evicted.

2. The period of contract shall be five years. But the contract can be terminated under conditions specified by law.
3. The output of the sharecropped land should be divided into 3 segments;
 - a) The landowner would receive one segment as rent;
 - b) The tenants should receive remaining segment for his labor; and
 - c) The remaining segment ($1/3^{\text{rd}}$) would be shared by landowner or by tenants according to the cost bearing incurred in cultivation. Thus half a century old demand for output share was conceded.
4. The minimum daily wage for agricultural labors was fixed at 3.5 kilograms of rice or its equivalent in cash.
5. The sharecropped land cannot be sold out to any persons other than the immediate relatives to the landowner or the sharecropper. If the sharecropper is unable to buy the land; it can be sold to other persons but the sharecropper retain the right of cultivation of land as per contract.
6. A landowner can rent out a maximum of fifteen *bigha* or five acres of land.

These recommendations were given legislative shapes, first in the Land Reform Ordinance 1984 and second in the Agricultural labor (minimum wages) Ordinance 1984. The Ordinances represent remarkable agrarian reforms from the viewpoint of social justice and economic efficiency. However, mere ordinances of laws do not bring about agrarian reforms.

Applicability of Land Reform Ordinance of 1984

Sharecroppers are insecure in sharecropping arrangement because they can be evicted by the landowner at their convenience due to the absence of signed legal contract. Tenants do not make long-term investments in land. Elahi and Mandal showed that 54% plots were shared out for period of one to three years. In their study, they found that about 74% plots were sharecropped for one to three year's

period. Only 9% and 6% plots were sharecropped for 4 years and 5 year respectively. The percentage of plots under sharecropping decreased consistently as the duration of sharecropping increased (Elahi and Mandal, 1988).

A Rin Saliahi Ain was passed in 1989 to give relief to the poor tenants who were compelled to sell their smallholding under distressing circumstances such as flood, draught or cyclone. Advance purchase of crops and deposit of blank stamp paper with signature or thumbs impression thereon were declared void.

In spite of its promulgation in 1984, the provisions of law are yet to be implemented. But the problem in Bangladesh today is so deep and complex that even if the reforms fully implemented, it will touch on the fringes of the issue. Agriculture Census 1996 reported that 61.90% of total tenanted lands were transacted under sharecropping (BBS, 1999). Mahbub Hossain and et all (2000) observed that in sample villages and in households transaction of rented land under sharecropping was 64% in 1999-2000. The sample survey conducted during the period January 2003 to November 2003 shows that about 43% lands were transacted under sharecropping which are mainly contracted for one-year basis. The 2nd highest of contractual arrangement was short term leasing arrangement (one year period) constituted 26.32% of total arrangements. Only 4.68% transacted lands were under *Khaikhalashi*, which is contracted on long duration (Field Survey).

From the above discussion it can be said that land tenure in Bangladesh is the result of socio-economic as well as historical evolution of land system under different government mechanism. The land tenure in Sultani period had not gone under remarkable changes. It was more or less same as ancient period. The Mughal ruler substantially changed the land tenure system. In sum, land tenure in Mughal period was a combination of private ownership and state ownership. But the state ownership was dominant and the Mughal authority fixed the land revenues. During the period of company rule and British rule land tenure had gone under substantial changes. The company carried out several experiment in land tenure system before the introduction of Permanent Settlement in 1793.

On 22 March, 1793, Lord Cornwallis, governor general of the company declared Permanent Settlement that made *Zamindars* and *Talukdars* permanent proprietors of land under their respective control. During the period 1968- 1950, the government was to take over the rent receiving interest in all lands bringing the cultivator in direct touch with the govt. The East Bengal Tenancy Act of 1950 was a landmark in the history of tenurial legislation. It abolished all *Zamindary* and intermediaries and the rights were declared *maliks* or owner of land. This Act brought the tenants directly under the Govt. It abolished all revenue framings.

After the liberation of Bangladesh, a revolutionary change in tenurial legislation has been taken place. The land reform measures were aimed at improving the overall conditions of the actual tiller of land. Far-reaching changes were made in the rights of tenants by the promulgation of Land Reform Ordinance 1984. Re-ceiling of landownership up to 60 *bighas* per family, distribution of *khas* land among only landless peasants, declaration of *benami* transaction illegal and punishable and prohibition of eviction of agricultural tenants from his homestead land were the major provisions of Land Reform Ordinance 1984. Moreover, this Ordinance seeks to remove the unjust and unfair provisions of sharecropping arrangements.

From the discussion, it can be concluded that there was no unique land tenure system in Bengal throughout its history. It has been changes accordance with the aim of ruling authority or by improving the condition of landholder and tenant but latter is given less emphasis. From the survey result it can be concluded that tenants are highly insecure in their tenancy rights. Increase in transacted land under short term leasing arrangement as well as other short duration of contract indicates the gradual commercialization of rental market for land, which in turn further entails the in security of tenant's rights in land.

Chapter 4

Land Distribution and Tenorial Condition

The ripples of the transformation of the economy reached rural areas to affect agricultural institutions. Extreme pressure of population on land, development of rural infrastructure (i.e. roads, schools, colleges, madrasas, hat, bazars etc.) and the building of houses for rural people have contributed to the tremendous decline of available cultivable land. Modernization of agriculture due to the adoption of new technology has made land and labor scarce. The traditional institutions surrendered to the emerging situation and new type of contractual arrangements evolved. The agrarian structure of Bangladesh is defined by a complex set of arrangements governing the relationship of people to the land. Land distribution and present land tenure system of Bangladesh is the result of East Bengal State Acquisition and Tenancy Act 1950, which abolished the *Zamindari* system introduced during the British colonial rule. The structure of land ownership consists of farm and non-farm holdings. The system of land tenure in Bangladesh is classified as owners, owner-cum-tenant and the tenant (BBS: Dec. 2002). In this chapter, in order to have a clear picture of the existing agrarian institutions as well as contractual arrangements, it has been tried to shed-light on the pattern of landownership and the existing tenorial system of Bangladesh. Moreover, the features of study area and the existing contractual arrangements have been documented in this chapter.

4.1 Specific Features of Bangladesh

Since this research is basically an empirical one and based on primary data, the researcher has to select such fields that could be representative for Bangladesh as a whole. To have a clear idea about area, first of all, it has been discussed overall physiographic, demographic, climatic conditions and agricultural practices of Bangladesh.

4.1.1 Location and Extent of Bangladesh

Bangladesh lies between $20^{\circ}34'$ and $26^{\circ}38'$ North Latitudes and between $88^{\circ}01'$ and $92^{\circ}41'$ East Longitudes. The total area of Bangladesh is 147570 sq. Kilometer (BBS: December 2002). Bangladesh is bounded by India on the North and the West, by India and Myanmar on the East and by the Bay of Bengal on the South.

4.1.2 Physiographic Structure of Bangladesh

Bangladesh is a delta, periodically ravaged by devastating floods and other natural disasters. Bangladesh can be divided into 3 major physiographic units; the hill, terrace and floodplain areas. These three categories can further be classified into 8 units; the hill areas, terrace areas, haor areas, river char land, coastal char land, river floodplains, peat areas and the Sundarbans (Hossain, 1991). The northern and eastern hills occupy about 12% of the country, the so-called terrace areas (the Madhupur and Barind Tracts) about 8% and floodplains the remaining 80% (Brammer, 1991).

4.1.3 Climate of Bangladesh

The climate of Bangladesh is, as a tropical monsoon climate having four main seasons, recognized as (Brammer, 1991);

- a) Pre-monsoon period (March-May): This is hot or 'summer' season with the highest temperature and occasional Nor-Westers' with thunderstorm rainfall and strong wind. Tropical cyclones seriously affect coastal areas.
- b) Monsoon (June- September): This is a period of highest rainfall, humidity and cloudness. Heavy rainfall may cause flood in different areas of Bangladesh.
- c) Post-monsoon (October-November): This is a hot and humid period with decreasing rainfall, but sunny and with heavy dew at night.
- d) Dry season (or winter), (December-February): This season is the coolest, driest and sunniest period of the year.

The maximum average temperature in winter season is 29°C and the minimum is 11°C . while in summer seasons, the average maximum temperature is 34°C and the average minimum is 21°C (Brammer, 1991). With a humid subtropical monsoon climate Bangladesh is suitable for the growth and cultivation of a wide variety of tropical and sub-tropical crop species such as rice.

4.1.4 Demographic Characteristics

According to population census 2001 (population data as on 22nd January), the total population of Bangladesh is 123.1 million of which 62.7 million are male and 60.4 million are female. Annual growth rate over (1991-2001) is 1.47% and population density is 834 per sq. km. The life expectancy at birth of the total population is 61 years. The distributions of population between urban and rural areas are 28808477 and 94342769 respectively (BBS, December 2002).

4.1.5 Agricultural Practices

The monsoon and the seasonal flooding determine agricultural practices in Bangladesh. Moreover, agricultural practices are highly influenced by a number of factors such as climate (rainfall, temperature and light), topography of the soil, soil structure, social values and customs, land tenure, fragmentation and sub-division of land, flood etc.

The crops in this country are grown throughout in 3 distinct cropping seasons. The 1st *Kharif* season starts in the end of March and continues up to the end of May. This is pre-monsoon season with moderate humidity. The 2nd *kharif* season or hot monsoon season covering the period from May to September is characterized by high humidity and low solar radiation. And the *rabi* season ranges from mid-October to early March, is a cool, winter dry season. In this season, there is negligible amount of rainfall, low humidity and high solar radiation. There are 3 rice-growing seasons, such as Aus, Aman and Boro. The *kharif* season is characterized by high soil moisture or flooding, and therefore, rice becomes the dominating crop of this

season. *Rabi* crops include Boro rice, wheat, mustard, groundnuts, potatoes, pulses and spices, vegetables etc. The agricultural practices and potential productivity of the crops are determined by four climatic factors; rainfall, evaporation, temperature and hours of light. Since Bangladesh is a humid tropical monsoon oriented region, agricultural practices or cropping patterns covers a wide variety of tropical and sub-tropical crop species. Climate of Bangladesh makes conditions suitable for growing tropical crops such as rice and jute in the warm rainy season, temperate crops such as wheat and potato in the winter season, and sub-tropical crops such as sugarcane and banana through out the year. High rainfall and seasonal flooding make conditions particularly suitable for rice cultivation. The cropping pattern and the intensity are more specially influenced by the time of onset of the monsoon rains, the amount and distribution of rainfall, the occurrence of natural calamities such as storms and cyclones and the length of flooding period.

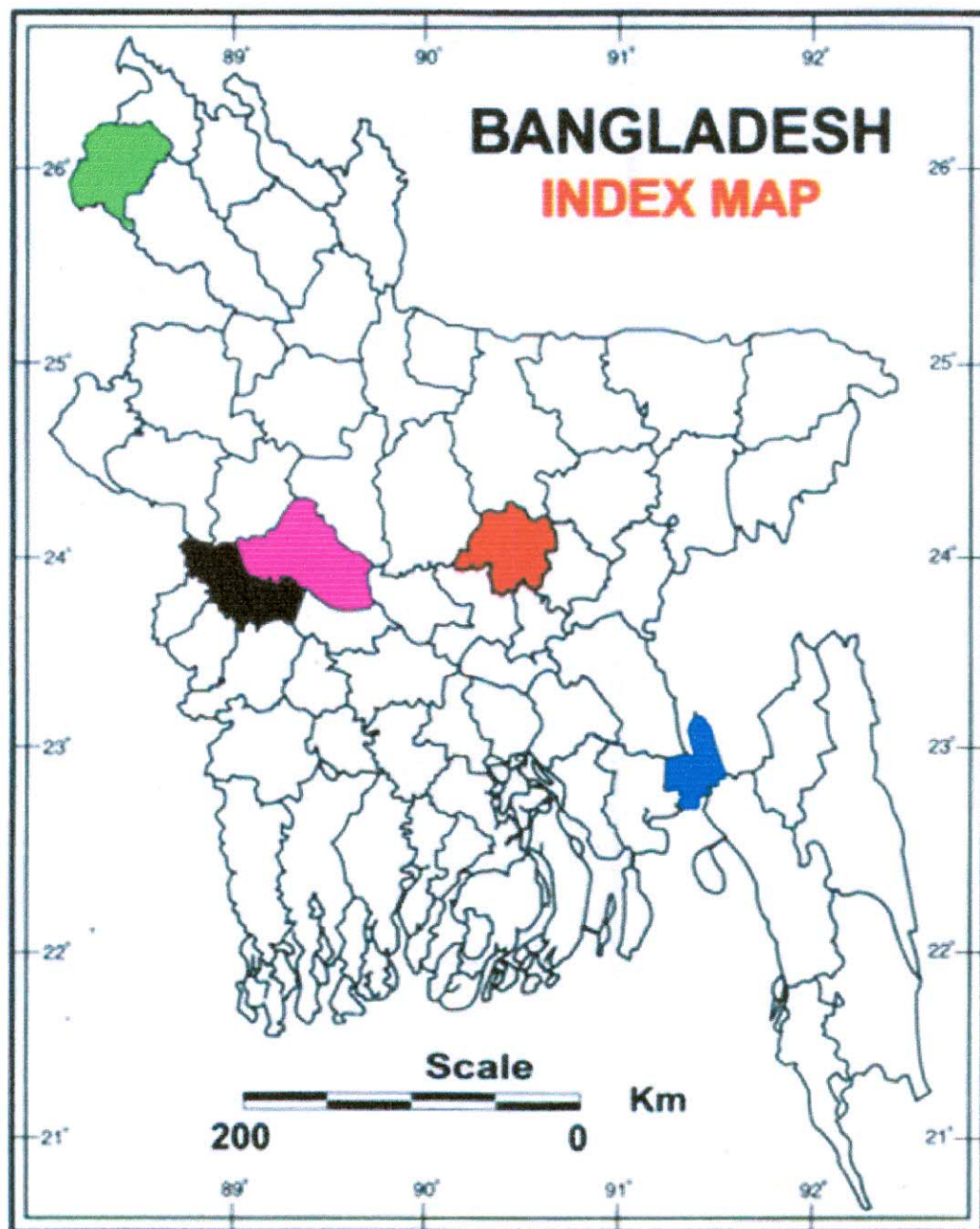
4.2 Salient Features of Selected Villages

For in-depth analysis it is required to have a clear idea about the study field that is essential for empirical study. Five villages are taken as study field. In this section major features of the study villages have been discussed. The fundamental objectives of this section are to discuss the salient features of study villages for having geographical, social and economic activities especially agricultural practices that have much impact on agrarian relations in rural areas of Bangladesh. Location of the study areas can be seen from the map of Bangladesh. Basic information of farm holdings, land tenure, land use under different crops etc. are explored in Table 4.1.

4.2.1 Location of the Study Areas

It is already mentioned that 5 villages/*maujas* were selected as sample area for having different agricultural practices and contractual arrangements from former 4 divisions of Bangladesh. The location of the study areas can be seen from the map of Bangladesh.

Map of Bangladesh

**Legend (Study areas)**

- | | |
|--|---|
|  Thakurgaon |  Gazipur |
|  Pabna |  Feni |
|  Kushtia | |

Table 4.1 Basic Information of the Study Villages

Features		Purandarpur	Kachubari	Pubail*	karamullahpur	Bariatakimara
No. of Holdings by Type	Total Holdings	124	1281	NA	667	684
	Non-farm Households	36	355	NA	239	289
	Farm Households	88	926/610**	NA	428	395
Farm Holdings	Small Farm Holdings	66	637/225**	466	403	319
	Medium Farm Holdings	20	252/240**	331	19	68
	Large Farm Holdings	2	37/55**	137	6	8
Land Tenure (in acres)	Owned Area	176	1864	NA	629	612
	Operated Area	198	2085	NA	509	667
	Land Taken from Others	47	448	NA	43	121
	Land Given to Others	25	227	NA	162	66
Land Use (in acres)	Cultivated Area	186	1900	NA	370	565
	Net Irrigated Area	93	675	NA	18	274
	Net Fertilized Area	95	1843	NA	313	371
Land Use under Different Crops (in acres)	Net Temporary Cropped Area	186	187	NA	340	--
	Gross Cropped Area	287	3251	NA	680	---
	HYV Aman Paddy	--	328	NA	5	449
	HYV Aus Paddy	--	1	NA	5	234
	HYV Boro Paddy	--	315	NA	1	--
	Local Paddy	177	1520	NA	624	19
	Wheat	10	567	NA	2	--
	Maize	--	--	NA	--	--
	Potatoes	--	97	NA	1	--
	Vegetables	--	21	NA	3	--
	Spices	2	108	NA	8	--
	Pulses	65	23	NA	29	--
	Oil Seeds	23	127	NA	1	--
	Sugarcane	--	7	NA	--	--
	Jute	10	126	NA	2	--
	Cotton	--	--	NA	--	--

Source: Agriculture Census 1996, Zila series Pabna, p. 356. (BBS, 2003:356). Zila series, Thakurgaon, p.230. Agriculture Census 1996, (2002) Block Supervisor of Pubail village and Annual Report, 2001-2002, upazila Gazipur, Agriculture Extension Directorate, Gazipur sadar, p. 3. *NA= Not Available Agriculture Census 1996, zila Series, Feni (BBS,2002:245) zila series, Kushtia, P.221. (BBS, 2003:221). **Block Supervisor of Kachubari

Purandar Village (Pabna)

The village Purandarpur is situated on the eastern bank of the river Guamani that is 6 kilometers away from the Upazila headquarters. Faridpur Upazila is in the northern border of Pabna district. The soil of this village is friable loam and the land remains dry during the winter season. Mainly two varieties of rice, such as local Aman and High Yielding Varieties (HYV) Boro are grown in this village. Beside this, a vast amount of land is used for Kheshari and Maskalai production. These two types of pulses are grown mainly for feeding the cattle. This village is in the large track of low laying areas where grasses are grown abundantly which supports cattle rearing through out the year.

Most of the cultivable lands (around 90% of total cultivable land) go under water for 5 months (from June to October) every year. That is why; only one crop is grown in almost all land during dry season (December to April). During the rainy season (from June to September) landless people and small farmers go on fishing and working their home-based dairy farms. Those who are literate and well off do not live in village due to lack of modern facilities and good communication system. Land use, land tenure and different types of holdings can be observed from the Table 4.1.

From the Table 4.1, it is observed that out of total 124 holdings 88 are farm holdings and rest (36) are non-farm holdings. An especial feature of this village is that operated area (198 acres) is greater than owned area (176). This indicates that a large number of holdings are cultivated rented land. Since this village is situated on the bank of the river Gumani and the Ichamati, and the Baral are flowing through the nearby village, this village is highly flood-prone. The major problems in agriculture in the village are low laying land, excessive or less rainfall, devastating and untimely flood and they cause heavy destruction to rising crops. As a result, farmers always remain under uncertainty in getting their harvest.

Kachubari Village (Thakurgaon)

The village Kachubari is situated around 12 kilometers away from the Thakurgaon sadar upazila headquarters. The Himalayan Piedmont plain occupies most of the land of Thakurgaon. The climate of Thakurgaon zila is temperate and pleasant. The

people of this village earn their livelihood mainly by cultivating land. The economy of this village is mainly agro-based. This village is well communicated with Upazila as well as Panchgarh zila headquarters and is flood-free area. So, varieties of crops are grown through out the year. Almost of the lands are triple cropped lands. Varieties of crops are grown throughout the year. In 3 crop seasons, such as *Kharif-1*, *Kharif-2* and *Rabi*, there are varieties of crops are grown. But paddy is predominating. Basic information of this village is given in Table 4.1.

Pubail Village(Gazipur)

All areas under Gazipur district fall within the physiographic unit known as Madhupur Jungle tract (Bhawal Garh). The terrace topology is not flat but consists of low rounded hills and ridges separated by a close pattern of shallow bids (valleys) of the Gazipur sadar upazila. The study village of this district is named as Pubail, which is situated on southern part of the district. Land of this village is fertile and with gray brown flood-plain clay. It is well communicated with district headquarters and with capital city Dhaka. Absentee landlords who live in Dhaka city own the major portion of land of south part. Absentee landlords own high lands of this village (small hill; locally known as *tilla*). Local farmers occupy mainly low lands that go under water for around six months in every year. They cultivate only Boro paddy during dry season. Since this village is adjacent to the capital city Dhaka and well communicated with it, the labor market of this area is tight and the wage rate is comparatively high. Labor is not abundant here compared to others regions. The market for produced rice is good.

Since the government publication on this village is not available, I have tried to collect primary data from agricultural personnel like Block Supervisor (BS), who is the field level government employee and is charged with lowest agricultural extension unit Block. There are 3 types of tenorial system are available in this village. They are *Barga* (sharecropping), *Pattan* (*Kat/ Bhuyata Kat*) and *Rehan* (cash rent/ short-term leasing). Rice is cultivated in 70% of total arable land (BS, Pubail Village). Since the village is surrounded by high land (*tilla*), the agricultural lands are mainly low and go under water for about six months. So, only boro rice is produced during dry season. In high land, varieties of fruits like jackfruit, guava, lemon,

banana, vegetables etc. are grown enormously. About 70% of arable lands are used in Boro production. The cropping intensity of this village is 156.22% (BS, Pubail Village). The basic information has been given in Table 4.1.

Village Karamullahpur (Feni)

The village Karamullahpur under Yakubpur Union Parishad of Dagonbhuiyan Upazila, is situated 2 kilometers away from Upazila headquarters. This area experiences seasonal flooded and has poor drainage system. Sometimes it has been flooded by accumulated rainwater during rainy season. This village is well communicated with Upazila headquarters as well as the district headquarters. Among the inhabitants of this village those who are well off live in town. Therefore, most of the landowners are absentee landowners. Major portions of male labor force have migrated abroad for better employment. Migration to abroad by local labor forces has made the labor market very tight.

The economy of this village is predominantly agricultural. Varieties of crops, namely local and HYV rice, wheat, vegetables are grown. Among the different crops, rice is the dominant and vegetables and jute follow it respectively (UAO, Dhagonbhuiyan: Feni). Rice is cultivated in 85% of total cultivable land. Out of total rice cultivated land 11%, 71% and 18% of land are used under Aus, Aman and Boro respectively (UAO, Dhagonbhuiyan: Feni). The cropping intensity of this village is 182%. The basic information of this village has been given in Table 4.1.

Village Bariatakimara (Kushtia)

The village Bariatakimara is situated about 8 kilometers away from sadar Upazila. The village Bariatakimara is completely occupied by Ganges river flood plain. The village Bariatakimara is in the Jagati Union and is well communicated with upazila sadar as well as zila headquarters. Well communicated with zila and the existence of industrial area have made labor market tight. The farmers those who are engaged in agricultural work have not gathered any skill outside of agricultural work. The literacy rate of this village is 30.5% and population density per sq. km. is 1433. The population growth rate is 4.21% and much higher than that of national rate. After discussion with Block Supervisor, it is found that there are 5 types of contractual arrangements in this village. These are:

- a) *Kat* mortgage;
- b) Short term leasing arrangement;
- c) Fixed crop rent;
- d) Sharecropping; and
- e) Part time leasing arrangements.

The basic information of this village is given in Table 4.1.

4.3 Socio-Economic Features of Respondents in the Study Area

The main objective of this section is to discuss the socio-economic conditions of tenant farm in the study area that may affect tenancy market as well as farming in tenanted land. It is required to explore the tenants' social status and their economic conditions for having actual socio-economic scenario of the tenant farm. To analyze the socio-economic situation of tenant farm, at the out set, the researcher would like to present their family structure, profession and their education.

4.3.1 Structure of Tenant Family

Here, the structure of tenant family is considered its inclusion of other family member as the parents or other relatives of the households. It is surprising that all the tenant family interviewed in the study areas were found to have been male headed. But the findings of Agriculture Census-1996 were that the ratio of male headed and female-headed farm family was 96.52: 3.48 (BBS, December 2002). So, a little change was found.

Table 4.2 Head of Tenant's Family

Area	Gender				Single			Joint		
	Male		Female							
	No.	% Within area	No. Of tenant	% Within area	No.	% Within area	% Of total	No.	% Within area	% of total
Thakurgaon	30	100	00	00	25	83.3	16.7	5	16.7	3.30
Gazipur	30	100	00	00	28	93.3	18.7	2	6.7	1.30
Pabna	30	100	00	00	27	90.00	18.0	3	10.0	2.00
Feni	30	100	00	00	21	70.00	14.0	9	30.0	6.00
Kushtia	30	100	00	00	28	93.3	18.7	2	6.7	1.30
Total	150	100	00	00	129	86.00	86.0	21	14.00	14.00

Note: National level data are not available.

Table 4.2 shows that 100% of the tenant farms were male headed. But in national level only 3.48% of rural households are male headed (BBS:July 1999). The cause of differences in result might be due to the inclusion of only tenant farm that are the poorest of the poor and illiterate class of the rural people. But on the other hand, national censuses include all rural households.

From the Table 4.2 it is observed that 86% of tenant families are single family and only 14% are joint family. The highest number (9) of joint family is found in Feni (30.00%) and the lowest number (2) is found in Gazipur and in kushtia (6.7%). The conclusion can be drawn from the survey result that the family structure has been drastically changed over the years. The values behind joint family concept have been shaken up. It may be the result of population pressure and poverty of the tenant family. This may lead to unwillingness to bear the burden of parents and other nearest relatives.

4.3.2 Occupation of Tenant Family

Socio-economic conditions and customs along with available opportunity of employment of tenant family determine the profession of a tenant. Moreover, education facilities and entitlement to have a proper education have made the tenant to adopt an alternative occupation. Structure of profession is the result of over all socio-economic and social status of the tenants. Table 4.3 shows the employment in agriculture (main occupation) and off- farm employment (optional occupation) of the tenant.

Table 4.3 Occupation of Tenant

Area	Employment in agriculture			Employment out of agriculture			Total	National level	
	No. Of tenant	% Within area	% of total	No. Of tenant	% Within area	% Of total		Agriculture	Non-agriculture
Thakurgaon	29	96.70	19.30	1	3.30	0.70	30	63.2%	36.8%
Gazipur	30	100	20.00	--	--	--	30		
Pabna	30	100	20.00	--	--	--	30		
Feni	30	100	20.00	--	--	--	30		
Kushtia	30	100	20.00	--	--	--	30		
Total	149	99.30	99.30	1	3.30	0.70	150		

Source: Field Survey & BBS: Dec. 2002.

It is observed from the Table 4.3 that almost 100% tenants' professions were agricultural activities. Only one tenant's profession is non-agricultural in Thakurgaon. Since the respondents are tenant farm, they are not engaged in off- farm activities. Moreover, as they are not trained with other profession there exists lack of employment opportunities in rural area; so rural people became bound to engage in agricultural activities. But at national level about 37% of rural labor force are engaged in non-agriculture sector. The difference between the national survey results and sample survey results is due to the inclusion of only tenant households in the sample. Since in the sample survey, the respondents are tenant farm only, they have no accessibility to avenues them out side of agriculture.

Analysis of section 4.1, 4.2 and 4.3 shows that physiographic structure, climate, demographic conditions and agricultural practices of Bangladesh differ from region to region. Moreover, survey findings reveal that cent percent of tenant family are male headed and single. Discussion of basic information of different study areas indicates that agricultural practices, land tenure and land use under different crops do not vary enormously among the regions. Employment of tenant farmers outside of agriculture is limited.

4.4 Structure of Agricultural Holdings

It should be noted that structure of agricultural holdings had been changed due to the changes of socio-economic conditions, and social norms and values along with increase in off-farm employment opportunities in rural areas.

4.4.1 Structure of Farm and Non-Farm Household

Obtained from the Agriculture Census 1996, the total numbers of households in the rural areas were 17.83 million (BBS: Dec. 2002). Out of total households 66.18% accounted for farm holdings and 33.82% for non-farm holdings. The number of non-farm holdings and farm holdings and their operated area enumerated in 1983-84 and 1996 Agricultural Censuses are given in the Table 4.4.

Table 4.4 Structure of Farm and Non-Farm Households.

Sectors	1983-84		1996		Annual growth rate (%) of households
	No. Of holdings	%of holdings	No. Of holdings	% Of holdings	
Farm	1005299	72.70	11798242	66.18	1.35
Non-farm	3772347	27.30	6029945	33.82	3.98
Total (All)	13817646	100.00	17828187	100.00	2.15

Source: BBS: Dec. 2002, Analytical Report, Agriculture Census 1996.

Table 4.4 reveals that rural households have been shifted from farming to non-farming occupations. Moreover, percentage of farm households decreases from 72.70% to 66.18%. On the other side, the number of non-farm household increases from 27.30 to 33.82 per cent. Over the period (1983-84 to 1996), the non-farm households, grows at a rate of about 4% per annum. While in the farm sector, it grows at a rate of 1.35% per annum. The growth rate of non-farm household is two times of rural households and it three times of farm households. Moreover, growth rate of all holdings over the period (1983-84 to 1996) was 2.15%. This change of structure of farm and non-farm households may be attributed to rural urban migration, and movement from farm to non-farm occupations within the rural areas and also the increase of off-farm employment opportunities, like rural trade, transport and other non-farm activities.

4.4.2 Distribution of Operated Area between Farm and Non-Farm Households

The distribution of total operated area between farm and non-farm households can be seen from the Table 4.5, which is enumerated in 1983-84 and 1996 censuses. According to agriculture census 1996, total operated areas were 20.48 million acres. Out of total operated area, 19.96 million acres of land were operated by farm households and 0.53 million acres by non-farm holdings (BBS: Dec. 2002).

Table 4.5 Operated Area of Farm and Non-Farm Households in Censuses 1983-84 and 1996.

Sector	1983-84		1996		Annual growth rate (average) (%)
	Area in acres	%	Area in acres	%	
Farm	22678464	98.52	19957144	97.43	-1%
Non-farm	341421	1.48	527417	2.57	4.54
All households	23019885	100.00	20484561	100.00	-0.92

Source: BBS: July 1999. Agriculture Census 1996.

From the Table 4.5, it is observed that operated areas by farm household were 98.52% in 1983/84 and 97.43% in 1996. Whereas, operated area by non-farm households were 1.48% in 1983/84 and 2.57% in 1996. Moreover, it is found that over a period of 12 years, operated area of farm holdings has been decreased by 1% on an average. But on the other side, average annual growth rate of operated area by non-farm holdings was 4.54% over the same period. In total consideration, operated area has been decreased on around 1% per year. The decrease in operated area further indicates that arable land has been decreasing for population pressure. Moreover, increase in operated area by non-farm holdings implies that land transaction in tenancy market has been increased.

4.4.3 Pattern of Land Distribution and Size of Holdings

The pattern of landownership or tenurial relation plays important role in the determination of power structure in rural Bangladesh. The description of rural Bangladesh as a "land of small farmers" (Abdullah et al, 1976) does not conceal the complexity of smallness coexistence with inequalitarian land distribution.

Table 4.6 Number of Holdings Owning Land and Their Operated Area of Different Size Classes.

Types of holdings		Number	Owned area (Area in acres)	Operated area (Area in acres)
All Holdings		17828184	20333346	20484559
Holding owning no Lands		1814569 (10.18)	00 (00.00)	433654 (2.12)
Holding Owning Lands		16013615 (89.82)	20333346 (100.00)	20050905 (79.88)
Holdings Owning Lands:	0.01-2.49	13645426 (85.21)	7745373 (38.09)	9647898 (47.10)
	2.50-7.49	1999389 (12.49)	8075843 (39.72)	7021516 (34.28)
	7.50+	368800 (2.30)	4512130 (22.19)	3381491 (16.50)

Source: BBS, November 2002, Estimated from Agriculture Census 1996.

Note: Figures in the parentheses are percentages.

From the Table 4.6, it is observed that in the rural area 89.82% of total households owned land and 10.18% of total households did not possess any land. Out of the holdings that owned land, 85.21% households were small farmer and 12.49% and 2.30% were medium and large farm households respectively. Out of total owned area 38.09% land were owned by the small farm holdings and 39.72% and 22.19% were possessed by the medium and large farm holdings respectively. From the Table 4.6, it is obvious that 2.30% households possessed 22.19% of total land. Another 12.49% of farm households owned 39.72% of total land. Only 38.09% of total lands were owned by the 85.21% of small farm households. It projects concentration of land holding in the hands of limited number of households. Out of total operated land of 20484559 acres, 2.12% were operated by the holdings that had not owned any land as tenant. Another 38.09% of farm households (small farmer) operated 47.10% of land indicating that mainly small farm households were engage in tenancy cultivation.

4.5 Land Distribution among Different Farm Sizes

The main objectives of this section are to analyze and to explore the nature of landownership of households. Land is an extremely scarce natural resource in Bangladesh. There has been a decline of cultivable land from 20157564 acres in 1983-84 to 17771339 acres in 1996 indicating that on an average nearly 2 lac acres of cultivable land are going out of agriculture every year (BBS: July 1999). Cultivated area per farm has been reduced from 2.00 in 1983-84 to 1.50 acres in 1996(BBS: July 1999). The distribution of land ownership in Bangladesh is heterogeneous along with growing pauperization and concentration of land within a few numbers of households after three decades of liberation despite measures taken by the successive governments with a view to establishing an egalitarian society and to establishing rights of actual tillers over land. Table 4.7 depicts the frequency distribution of land ownership of households classified into definite size classes.

Table 4.7 Distribution of Land Ownership (Owned Land) by Size-1996

Size class	Number of holdings			Owned Area (area in acres)		
	No. Of households	Ratio to total Household	Cumulative total	Area of households	Ratio of total area	Cumulative total
1	2	3	4	5	6	7
Owning no land	38250	0.00	0.00	3335	0.00	0.00
0.01-0.04	2851330	0.16	0.16	143048	0.01	0.01
0.05-.49	6403882	0.36	0.52	2231996	0.11	0.12
0.50-.99	2481950	0.14	0.66	1764032	0.09	0.20
1.00-2.49	3662024	0.21	0.87	5282762	0.26	0.46
2.50-4.99	1885890	0.09	0.95	4785865	0.24	0.70
5.00-7.49	505239	0.03	0.98	2767732	0.14	0.84
7.50-14.99	249342	0.01	1.00	2290790	0.11	0.95
15.00-24.99	40022	0.00	1.00	704681	0.03	0.98
25.00 acres +	10253	0.00	1.00	359105	0.02	1.00
Total	17828182	1.00	1.00	20333346	1.00	1.00

Source: BBS: Nov. 2002.

Concentration index, which is derived from the distribution pattern of land ownership among the households, can be estimated with the help of Lorenz Curve. From the Lorenz curve presentation, concentration index was 0.5924 in 1996 census and 0.5768 in 1983-84 censuses. This concentration index is high. This index (about 0.59) indicates that the degree of inequality of owned land is also high and a few members of landowners occupy the major portion of owned area. Since curvature of the Lorenz line is greater, the greater the relative degree of inequality (Appendix-IV-A).

The area between the "absolute equality" and the curve of "actual distribution" measures relative inequality of land ownership distribution among the households as well as population. The distribution of landownership is highly skewed because of about 20% of total ownership of land was distributed among 66% of total households while the ownership of the remaining area, 80% was occupied by about 34% of total households (BBS: Nov. 2002).

4.5.1 Distribution of Farm Holdings by Area

In order to have a clear idea about farm structure of agriculture in Bangladesh it is required to analyze the different sizes of farm holdings depending on operated area and landownership. Table 4.8 shows the different sizes of farm holdings by their operated area.

Table 4.8 Distribution of the Operated Area by Different Farm Holdings

Year	Farm ("000")	Size of Farms (area in acres "000")			
		Small	Medium	Large	Total
1960	21725	16.25(%)	64.84(%)	18.91(%)	100.00
1977	21960	18.75(%)	48.90(%)	32.35(%)	100.00
1983-84	22674	28.69(%)	45.07(%)	26.24(%)	100.00
1996	20208	41.10(%)	42.44(%)	16.45(%)	100.00
Total change	1517	24.85(%)	-22.4(%)	-2.46(%)	100.00

Source: BBS: Nov. 2002. Agriculture Census, 1996.

Table 4.8 shows that the areas operated by the farm holdings were 21.73 million acres in 1960, 21.96 million in 1977, and 22.67 million in 1983-84 and 20.21 million in 1996. The area of the farm holdings in 1996 decreased by 6.98% and 7.98% compared to 1961 and 1977, and 10.88% over 1983-84. It may be noted that the operated area of farm holdings in rural areas decreased due to the extension of urban areas and also growth of urban domain in the country. Moreover, rural infrastructure like, school, college, madrasa, hat, bazar, rural roads, mosque and above all increase in homestead area are the main causes for decrease in farm area.

The operated area under small farm holdings has been increased 24.85% and it decreased 22.4% under medium farm and 2.46% under large farm during the period 1960-1996. Out of the total operated area small, medium and large farms constituted respectively 41.10% and 42.44% and 16.45% in 1996. The changes of ownership of land distribution would make it clear. Table 4.9 shows the changes in ownership of land among different farm holdings.

Table 4.9 Changes in Ownership of Land Distribution of Farm Holdings

Farm size of landownership	Ag. Census 1983-84		Ag. Census 1996	
	% Household	% Owned land	% Household	% Owned land
0.05-2.49 (Small farm)	70.35	31.69	79.86	43.1
2.50-7.49 (Medium farm)	24.72	42.67	17.61	39.41
7.50-and above (Large farm)	4.94	25.64	2.53	17.48
All	100.00 (10045)	100 (21729)	100 (11798)	100.00 (19028)

Source: BBS (1986, 1996), Bimal Kumar Shaha (2001).

Form Table 4.9 it can be observed that the percentage of small farm households has been increased from 70.35% to 79.86% (9.51%) from 1983-84 to 1996. But their owned land has been increased from 31.69% to 43.1% (11.41%) by 1996. That is, growth of owned land by small households is slightly more than the growth of the number of households. The percentages of medium farm holdings have been decreased from 24.72% to 17.61% (7.11%) during the period 1983-84 to 1996. But their owned land area has been decreased 3.26% by 1996. While on the other hand, the percentage of large farms and the owned area have been decreased. Agriculture Census 1996 reported that 79.86% of households owned 43.1% and 17.61% of households owned 39.41% of total land respectively.

On the other hand, in 1996, only 2.53% of households owned 17.48% of total land. This indicates that decrease in large farm households go with proportionate decrease in land owning so that the relative proportion of households vis-a-vis land remain unchanged. As a result, distribution pattern of owned land, that is alarmingly skewed, has not undergone significant changes. From the Table 4.9, it is observed that a tremendous proliferation of small farms, relative consolidation of middle farms and relative decline of large farms have taken place over the period (1984-1996). These changes have been taken place within the existing framework of highly unequal land distribution.

4.5.2 Changing Pattern of Land Distribution in Number and their Operated Area

The changing pattern or variation in number and area of farm holding may pose a critical consideration due to their socio-economic and production impacts on agriculture sector. It also draws great attention of economists, social scientists, political leaders and government for making proper land policies and their implementation. Major issues covering land are encircled by ownership of landholding. The structure of farm holdings and its variation in number and area are considered with rural sector for standardization of results obtained from the previous sample censuses. Percentage distribution of farm holdings by their size is given in Table 4.10.

Table 4.10 Distribution of Farm Holdings in Number

Year	Farms (total)		Size of Farms					
			Small		Medium		Large	
	Total	Variation (%)	(%)	Variation (%)	(%)	Variation (%)	(%)	Variation (%)
1	2	3	4	5	6	7	8	9
1960	6139 (100)		51.62		44.89		3.49	
1977	6258 (100)	1.94	49.73	-1.89	40.84	-4.09	9.43	5.94
1983-84	9970 (100)	59.32	69.96	20.23	24.90	-15.94	5.14	-4.29
1996	11797 (100)	18.32	79.28	9.32	18.28	-6.62	2.44	-2.7

Source: BBS: Nov. 2002, Vol.3, p.23.

Note: I) Estimated from BBS data. II) Figures in parentheses are percentages.

Table 4.10 shows that farm holdings were 61.39 million in 1960, 62.58 million in 1977, and 99.70 million in 1983-84 and 117.97 million in 1996 respectively. The number of farm holdings has been increased 92.17% over the years from 1960 to 1996. And the average annual growth of farm holding was 2.56% over that period. After liberation, from 1977 to 1996 the growth of farm holdings were 77.64% and

average annual growth rate was 4.08%. The number of small farm holdings in 1996 increased by 27.66% and 29.55% compared to 1960 and 1977. The number of medium farm holdings in 1996 have been decreased by 26.61% and 22.56% compared to 1960 and 1977. While on the other hand, large farm holding in 1996 decreased by 1.05% and 6.99% compared to 1960 and 1977. From the Table 4.10 and data calculated from that table it is observed that there was an impact of increase in population on the number of farm. The increase in small farm holdings while on the other side decrease in medium and large farm holdings may be the result of demographic transition and the concept of micro-family values.

4.5.3 Changes in Average Farm Size

There has been a dramatic change in the farm sizes over the period 1960 to 1996. The changing pattern of farm holding by their sizes can be observed from the Table 4.11.

Table 4.11 Changes in Farm Size.

(Area in acres)

Years	Farms (total)	Size of farms		
		Small	Medium	Large
1960	3.54	1.11	5.11	19.20
1977	3.51	1.32	4.20	12.04
1983-84	2.27	0.93	4.12	11.64
1996	1.71	0.89	3.98	11.55

Source: BBS: Nov. 2002, Vol. 3

From the Table 4.11, it is observed that there was an impact of increase in population on the number and area of farms, which is reflected by a gradual decrease of average farm size. The average size of small farms decreased from 1.11 acres in 1960 to 0.89 acres in 1996 due to a significant increase of number of holdings by 92.17%. In case of medium farms, average size of farm has been reduced from 5.11 acres to 3.98 acres during the period of 1960 to 1996. Moreover, a dramatic decrease in average farm size in case of large farms has been taken place as estimated 19.20 acres in 1960 to 11.55 acres by 1996. This trend was also found in medium and large farms

4.6 Structure of Contractual Arrangements

Major changes in the structure of contractual arrangements have been taken place in Bangladesh agriculture. The 1960 Pakistan Census of Agriculture reported that almost all (91%) of tenanted lands were transacted under sharecropping system. The area under share tenancy declined from about 74% in 1983/84 to about 62% in 1996 (BBS, Dec. 2002). Moreover, survey findings reveal that the area under share tenancy were 43.27% (See Table 4.14). Obviously, in a land scarce and labor abandoned economy the owner of land is likely to win over the tiller. Allegedly, sharecropping is exploitative and act as disincentive to farmers to invest in agriculture and adoption of modern technology. Moreover, introduction of new varieties of seed since seventies reduced the tenants to replace traditional exploitative sharecropping by the less exploitative fixed cash rent tenancy system.

4.6.1 Present Scenario of Contractual Arrangements

At present, fixed rent tenancy and to the some extent annual or medium term leasing arrangements are evidenced in the tenancy market in Bangladesh. The Census of Agriculture-1996 reported a decline trend in the area under share tenancy from 74% to 61.90% over 12 years period (BBS: July 1999). In rural areas, tenant farmers are now willing to cultivate input intensive modern varieties of rice as the result of the fixed rent (especially short-term leasing arrangements) tenancy system. Per acre average cost was higher in traditional sharecropping than fixed cash rent system. The differences between sharecropping and cash rent leasing arrangements were due to the differences in rent charged by the landowners. Sharecropping tenancy arrangement is dominant in traditional rain-fed Aman varieties whereas cash rent tenancy arrangement is dominant in case of modern varieties Boro, which is highly irrigated.

Table 4.12 Present Structure of Contractual Arrangements

Holding Taking Land on Different Contractual Arrangements	Holdings		Area	
	Number (In 000)	Percentages	Acres (In 000)	Percentages
On sharecropping Basis	2724	54.83	2699	61.90
For Fixed Amount	543	10.92	502	11.50
On Lease	124	2.50	127	2.91
On Khaikhalashi	295	5.94	241	5.53
On Mortgage	1070	21.55	653	14.99
On Other Terms	212	4.26	138	3.17
Total	4968	100.00	4360	100.00

Source: BBS: July 1999, Agriculture Census 1996.

From the Table 4.12, it is observed that till now sharecropping is the dominant leasing arrangements in the tenancy market. Out of total 4.968 million of holdings, 2.724 million (54.83%) households were reported that they had taken land on sharecropping basis. Moreover, about 62% of tenanted lands were transacted under sharecropping basis. The 2nd highest amount of land (15%) was transacted under mortgage system. About 12% and 5.53% of land were transacted under fixed amount of crop rent and under *Khaikhalashi* respectively.

The so-called exploiting sharecropping tenancy is replaced by different fixed rent tenancy and medium term leasing arrangements. The area under share tenancy has declined from 91% of tenanted land area in 1960 to 74% in 1983-84 and further to 62% in 1996 (Hossain, 2000). On the other hand, area under fixed rent tenancy and other tenancy arrangements has increased from about 26% to 38%. Area under fixed rent tenancy and other arrangements is observed to grow at a high rate of 4.41% per annum, while area under sharecropping is declining at a rate of 0.32% per annum over the period 1984-1996 (Shaha, 2001). There are various types of sharecropping system. Among them 50:50 share systems is the most dominant in both censuses. In 1983-84 census, 90% of sharecropped area was under 50:50 share category, the figure decreased at 84% in 1996(BBS: July 1999).

At present, in case of input intensive modern varieties of rice production tenants are inclined to fixed rent arrangement while in case of rain fed local varieties they hire land on sharecropping basis. This may indicate that tenants are not willing to share additional output from input intensive modern varieties and also not willing to share risks in crop cultivation resulting from flood or draught. Thus, agrarian structure and institution are changing under pressure of market; social and demographic forces are adopting the new technologies. This is shown in Table 4.13.

Table 4.13 Changes in the Tenorial Arrangements

Rented/ leased in(operated) area	Census 1983-84			Census 1996			Change in leased land (area in '000' acres)	Average annual growth rate of leased land
	Area in '000' Acre	%of total leased land	%of Operated area under tenancy	Area in '000' Acre	%of total leased land	% Of operated area under tenancy		
Under sharecropping	2810	73.95	12.13	2699	61.90	13.36	-111	-0.33
Area leased on other terms	990	26.05	4.27	1661	36.10	8.22	671	5.65
Total area under tenancy	3800	100.00	--	4360	100.00	--	560	1.22
Total operated area	23170	--	16.40	20208	--	21.58	-2962	--

Source: BBS: July 1999, Dec. 2001), Estimated from BBS data, Agriculture Census 1996.

From the above discussion it is clear that till now sharecropping is dominant in leasing arrangement but its share is declining. However, cash rent and mortgage systems of leasing arrangements are taking place in lieu of sharecropping.

4.6.2 Empirical Findings

In order to have a clear idea about present structure of contractual arrangements, 5 regions have been chosen for collecting information from former 4 divisions of Bangladesh. The collected data imply that there are no basic differences between the survey results and the census results. Moreover, survey findings reveal that structures of contractual arrangements are changing which is similar to other censuses and studies. The following sections are devoted to present this scenario. Survey result shows that there are mainly 5 categories of contractual arrangements in Bangladesh agriculture, such as;

1. Sharecropping;
2. Fixed Crop Rent (fixed amount);
3. Short-Term Leasing Arrangements (for one year)
4. *khaikhalashi* (long term for indefinite time), and
5. *Kat/ Bhuyata Kat*(mortgage).

4.6.2.1 Area -Wise Picture of the Contractual Arrangements:

For better understanding about the existence of different types of contractual arrangements, it is required to analyze the existence of tenancy system in different regions of Bangladesh. Since land leasing is not on crop-wise basis but on mainly annual or crop-season basis, crop-wise data were not found in the study areas. So, annual or crop-season wise contractual arrangements are discussed.

Table 4.14 Contractual Arrangements in the Study Area

Form of Tenancy	Area (Area in acres)					Total
	Pabna	Thakurgaon	Gazipur	Feni	Kushtia	
Sharecropping	12 (33.33)	18 (47.37)	7 (21.875)	27 (87.10)	10 (29.41)	74 (43.27)
Fixed crop rent	1 (2.78)	1 (2.63)	0 (00)	0 (00)	6 (17.64)	8 (4.68)
Short-term leasing	20 (55.55)	0 (00)	8 (25.00)	3 (9.68)	14 (41.18)	45 (26.31)
Fixed cash (long term/ <i>khaikhalashi</i>)	2 (5.56)	4 (10.53)	1 (3.125)	0 (00)	0 (00)	7 (4.10)
<i>Kat/ bhuyata Kat</i>	1 (2.78)	15 (39.47)	16 (50.00)	1 (3.22)	4 (11.76)	37 (21.64)
Total	36 (100)	38 (100)	32 (100)	31 (100)	34 (100)	171 (100)

Source: Field Survey. Figures in the parentheses are percentages.

Table 4.14 shows that more than 55% of tenanted lands are transacted under short-term leasing arrangement in Pabna indicating that rental market is competitive. Since most of the cultivable lands of this area are inundated by flood almost every year, rice production depends on the nature. Sometimes, matured rice is washed away by flood. Moreover, tight labor market induces the landowner to rent out their land on short-term leasing arrangement instead of sharecropping. It also requires supervision work by the landowner to check cheating by the tenant. Thus, uncertainty in production and

tight labor market induce the landowners to rent-out land on short-term leasing arrangement. The second form of contractual arrangement is sharecropping. This is due to the shortage of cow feed (straw) and fuel for resident landowner. Other forms of tenancy arrangements are not significant.

Table 4.14 indicates that in Thakurgaon, sharecropping is the dominant form of tenancy arrangement. It constitutes more than 47% of tenanted land. The next form of tenancy arrangement is *Kat* (39.47%) system. In this system of tenancy arrangement, tenant pay a handsome amount of money for using land as long as the landowner would not be able to refund that paid up money.

In Gazipur, 50% of tenanted land is hired out on *Kat* system. The existence of off-farm employment opportunities, lower production cost of rice and high wage rate for labor induce tenant to rent in land on *Kat* system. Another common contractual arrangement in Gazipur is the short-term leasing arrangement. This is also the indication of better economic condition of tenant of that area. Here, around 22% of tenanted land is rented in under sharecropping.

In Feni, sharecropping is the main form of tenancy arrangement. It constitutes more than 87% of tenanted land. Higher production cost and low per acre production induces the tenants to rent in land under sharecropping contract. Tenant farmers are not willing to bear all risk of cultivation. Other forms of tenancy arrangements are insignificant.

In kushtia, nearly one-third of tenanted land is rented-out on sharecropping contract. The dominant form of tenancy arrangement is long term leasing arrangement (*khaikhalashi*). It constitutes more than 41% of tenanted land. From the above analysis and from survey findings it is evident that there are great differences in contractual arrangements in different regions in Bangladesh.

4.6.2.2 The Over-all Picture of the Contractual Arrangement

The existing forms of contractual arrangements in Bangladesh agriculture show that there are dramatic changes in the contractual arrangements. Table 4.15 shows the existing contractual arrangements in the study area as whole.

Table 4.15 Form of Tenancy Arrangements in the Study Area as a Whole

Form of tenancy		Frequency	Percentages
Rent In kind (47.95%)	Sharecropping	74	43.27
	Fixed crop rent	8	4.68
Rent In cash (52.05%)	Short-term leasing arrangement	45	26.32
	Kahikhalashi	7	4.09
	<i>Kat/ Bhuyata Kat</i>	37	21.64
Total (100%)		171	100.00

It is already mentioned that the survey was conducted during the period January 2003 to November 2003. From the Table 4.15 it is evident that out of total 171 respondents, 74 reported that they hired land on sharecropping basis, which was 43.27% of total tenant farm. The second highest of contractual arrangement was short-term leasing arrangement, which constitutes 26.32% of total arrangements.

The third highest is *Kat/ Bhuyata Kat* that constituted 21.64% of total arrangements. Fixed crop rent and *khaikhalashi* constituted 4.68% and 4.09% of total leased land respectively. The main cause of hiring land on sharecropping was the lack of capital of tenant farm. Because, tenant farms were severely poverty driven and they had not enough money to rent-in land on fixed cash rent basis. In fixed cash rent system a fixed amount of money has to pay to the landowner before cultivating the land. Moreover, land owners are also willing to rent out their land on short-term arrangement and desire to get produced rice as rent for feed their family members.

Another short-term contractual arrangement is leasing system in which usually tenant pays cash as rent at the beginning of the year. Since this system is contracted for 1 year, rent is paid only for a year to the landowner. As a result, tenants as well as landowners are willing to hire in or out land under this arrangement. In this tenancy system landowner can change rent every year that would pay more rent to them. On the other side, tenant can change and bargain rent as their will. Increase in short-term leasing arrangement indicates the gradual commercialization of rental market for land.

Another important leasing arrangement is *Kat/ Bhuyata Kat* in which a handsome amount of money has to pay for renting land and the interest or opportunity cost of that amount is considered as rent. This system is favorable to tenant but relatively solvent tenant can rent-in land on *Kat* system. On the other hand, this system of contractual arrangement is not favorable to landowner. Sometimes rural service men, local traders, large farmers and other financially solvent people are engaged in this type of leasing arrangement and they further lease out this tenanted land to the poor tenant on other tenancy arrangement. In this way they make profit from subletting land. Table 4.15 shows that 47.95% of tenanted lands are leased-out under rent in kind. Out of total tenancy arrangements 43.27% are of under sharecropping basis. The second largest form of tenancy arrangement is the short-term leasing arrangement. The third largest tenancy arrangement is *Kat*.

These findings show the gradual increase in cash rent arrangement, which agree with national survey findings. These changes are taking place in tenancy market due to the structural changes of rural economy that includes creation of non-farm employment opportunities, development of rural transport, increase in wage rate, and improvement in rural trade and above all monetization of rural economy. The dominating nature of cash rent tenancy arrangement indicates that both the landowner and the tenant are inclined to lease out or in land purely based on market condition. That is, lease market for land is going to be competitive in nature. Since cash rent leasing arrangement is going to play a major role in tenancy market and landowner does not share any cost and output from tenanted land, perhaps tenants are willing to cultivate land more intensively. This may lead to adopt modern practices of rice cultivation. The short-term leasing arrangement is found in case of mainly modern varieties of rice cultivation instead of local varieties. The existence of short-term leasing arrangement and sharecropping (mainly annual contractual arrangement) may exhibit no fundamental and permanent development of land.

4.6.2.3 Causes of Changes in Contractual Arrangement

The results of 1983-84 and 1996 censuses show that there has been a dramatic change in the structure of contractual arrangements. The exploiting sharecropping

arrangement is now giving away to fixed-rent tenancy arrangements. This may be due to change in the socio-economic condition as well as the introduction of new technology. The modern variety of rice production is highly input-intensive. The yield of modern varieties per acre depends on proper combination of labor, seed, fertilizer, irrigation and supervision. Increase in off-farm employment opportunities compared to the past, and development of rural infrastructure especially rural communication system along with peoples' attitude towards social prestige make the labor market for agricultural activities tight.

In the study area it was found that per day wage (8 hours) varies from Tk. 50.00 to Tk. 120.00. In Thakurgaon and in Pabna normal wage for an agricultural laborer was Tk. 50.00 to Tk.60.00 per day per person. But in Gazipur, Kushtia and Feni this wage rate was Tk. 100.00 per day. It rises to Taka.120.00 during peak season. Increase in wage rate induces landowner to lease out their land under fixed rent. The landowner does not bother any clumsy or labor market distortions. While on the other hand, the tenants are getting additional output from investing modern varieties when he leases land on fixed rent or medium term leasing arrangement. They employ additional labor in their tenanted land for better production that is not shared with landowner.

Another cause of changes in structure of contractual arrangement may be market forces. Due to the development of communication system in rural areas marketing for agricultural production has become more competitive. This may lead to the adoption of land lease under fixed rent tenancy arrangement. Improvement of social beliefs together with literacy rate induces farmers to protect their prestige and social status. Because, they think that sharecropping is one kind of wage laborer that is socially degrading. In case of landowner, they prefer fixed rent tenancy arrangement due to getting fixed amount of money prior to harvest. There is no risk in getting that money. That is why; they prefer fixed rent leasing arrangement. As a result, cash rent tenancy arrangements are going to play a major role in tenancy market and landowner does not share any cost and output and it leads the tenant to cultivate the lands more intensively. This may lead to adopt modern practices of rice cultivation. The short-term leasing arrangement is found in case of mainly modern varieties of rice cultivation instead of local varieties. The existence of short-term

leasing arrangement and sharecropping (mainly annual contractual arrangement) may exhibit fundamental and permanent development of land.

Area-wise sample survey indicates that there are great variations in the structure of land rental market among the regions. But combined analysis shows that about 44% of tenanted lands are hired under sharecropping whereas about 27% and 22% of tenanted lands are transacted under short-term leasing and under mortgage (*Kaf*) respectively. Because, tenant farms are severely poverty driven and they have not enough money to rent-in land on fixed cash rent basis and they are interested to rent-in land on sharecropping. Increase in short-term leasing arrangements indicates the gradual commercialization of rental market for land. The findings of 1983/84 and 1996 Censuses show that there have been dramatic changes in the structure of contractual arrangements. The exploiting sharecropping arrangement is now giving away to fixed cash rent tenancy arrangements due to the changes in socio-economic condition as well as increase in off-farm employment opportunities, development of rural infrastructure along with changes in people's attitudes towards social prestige. The above statistics shows that exploitative nature of sharecropping is not evident.

4.7 Landowners' Share in Tenancy Market

The objective of this section is to explore the share of landownership of different groups of landowners in the land rental market. The estimated share of land ownership of different groups of landlords in the tenancy market is based on the tenant's response. Since questionnaire was made for collecting data from the tenants so the response of landowners could not be found directly in the research; limited time and other limitations made it difficult to collect data from the landlords. The landowners are classified into four categories. They are i) relatives, ii) friends iii) resident and iv) absentee landowners.

In these 4 categories, relatives may either be resident landowners or be absentee landowners. Moreover, a tenant can lease land from any of the 4 categories of landowners at a time. Classification is made on the basis of residence as well as on relations with the tenant. The ownership status of different landowners has not been considered as it goes beyond the study. Since one tenant could rent-in land from

different landowners at a time, total respondents became 160 instead of 150. However, it is often observed that a landowner rent-out and rent-in some land at a time. It is very difficult to classify the pure tenant and pure landlord except absentee landowner. To have a clear picture of the share of different groups of landowners in rental market, it is required to analyze and to present their percentage share of land in the rental market on area-wise and on all regions as a whole.

4.7.1 Area-Wise Analysis of Share of Landownership in the Rental Market

In order to have an actual scenario of regional variation of landownership in the rental market area-wise analysis is made on the basis of survey findings.

Pabna

The percentage share of different types of landlords in Pabna can be observed from the Table 4.16

Table 4.16 Share of Land in Tenancy Market of Different Groups of Landowners in Pabna

Groups of landowner	No. Of tenant		Amount of leased land	
	Frequency	Percentages	Amount of land (In acre)	Percentages
Resident landowners	19	63.33	55.79	78.21
Absentee landowners	11	36.67	15.54	21.79
Total	30	100.00	71.33	100.00

Table 4.16 indicates that only two categories of landlord leased-out lands to tenants. These are resident landowners and absentee landowners. The former covers almost 63% of the tenants with more than 78% of the leased-out land. The rest 37% tenant covers with about 22% of leased-out land.

Gazipur

Share of landownership by different groups in tenancy market in Gazipur can be seen from the Table 4.17.

Table 4.17 Share of Land in Tenancy Market of Different Groups of Landowner

Groups of Landowner	No. Of Tenant		Amount of Leased Land	
	Frequency	Percentages	Amount of Land (in acre)	Percentages
Relatives	10	32.26	14	42.79
Resident Landowners	4	12.90	3.15	9.63
Absentee Landowners	17	54.84	15.57	47.59
Total	31	100.00	32.72	100.00

In Gazipur, we observe there are three categories of landowners: relatives, resident landowners and absentee landowners. Relative covers more than 32% of the tenants with 43% of the leased-out land. While resident landowners cover around 13% of the tenants with only 10% of land. The main group is the absentee landowners, which cover 55% of tenant with 48% of land. Implications of survey findings are that proximity to the capital city induces the well-off rural people to settle up in town and they leased-out their inherited land to the rural poor. Moreover, absentee landowners who live in capital city occupy a vast amount of land and they bought land for future use or extension of their industrial plots. Survey findings reveal that well-off farmers migrate outside of agriculture for having better employment. They leased out their land to their poor relatives who are considered as a tenant as well as caretaker of their land.

Feni

It is already mentioned that area-wise explanation of ownership of leased out land is made for having actual scenario of variation of ownership of land in the rental market. Table 4.18 shows the survey result of ownership of land in the rental market in Feni.

Table 4.18 Share of Landownership in the Rental Market

Groups of landowner	No. of Tenant		Amount of Leased Land	
	Frequency	Percentages	Amount of Land (in acre)	Percentages
Resident Landowners	6	20.00	7.8	23.81
Absentee Landowners	24	80.00	24.96	76.19
Total	30	100.00	32.76	100.00

Table 4.18 shows that only two types of landlord, resident landlord and absentee landlord rent-out lands in Feni. No lands were taken from relatives and from friends in Feni. Eighty percent tenants were taking land from absentee landowners and 20% were from resident landowners. Moreover, 76.19% and 23.81% of land were rented-out by absentee and resident landowners respectively. The implication of dominant share of absentee landowners in Feni is that migrant people from the rural area possess major parts of arable lands. Resident landowners hire out an insignificant amount of land. This depicts the unequal distribution of landownership in Feni.

Kushtia

The ownership of land in the tenancy market in Kushtia can be seen from the Table 4.19 that is the findings of sample survey.

Table 4.19 Landowners' Share of Land in Tenancy Market in Kushtia

Groups of landowner	No. of tenant		Amount of leased land	
	Frequency	Percentages	Amount of land (in acre)	Percentages
Relatives	4	12.50	4.66	3.75
Resident landowners	10	31.25	7.99	6.43
Absentee landowners	18	56.25	111.52	89.81
Total	32	100.00	124.17	100.00

In Kushtia, it is observed that 56.25%, 31.25% and 12.50% of tenants were taking land from absentee landowners, resident landowners and relatives respectively. Moreover, about 90%, 6%, and 4% of leased lands were rented-out by absentee landlords, resident landlords and relatives. This finding indicates that a significant role is played in rental market by absentee landowner.

Thakurgaon

Landowners' share of land in tenancy market by different groups in Thakurgaon can be seen from the Table 4.20.

Table 4.20 Landowners share of land in Tenancy Market in Thakurgaon

Groups of landowner	No. Of tenant		Amount of leased land	
	Frequency	Percentages	Amount of land (in acre)	Percentages
Relatives	19	51.35	15.23	53.38
Friends	1	2.70	1	3.51
Resident landowners	12	32.43	8.24	28.88
Absentee landowners	5	13.51	4.06	14.23
Total	37	100.00	28.53	100.00

Table 4.20 projects that about 52% and 32% tenant took land from relatives and from resident landowners covering about 53% and 29% of leased-in land. Another 14% of tenants took land from absentee landlord covering with 14% of leased land. The implication of the above statistics is that kinship play vital role in leasing arrangements in Thakurgaon and resident landowner's share of land in tenancy market is significant. But absentee landowners supply insignificant portion of land in the tenancy market and their role in contractual arrangements are not vital.

4.7.2 Regional Comparison of Landowners Share of Land in Rental Market

Table 4.21 shows the different categories of landowners in the rental market in different regions¹.

¹ Note: Relatives may both be resident and non-resident landowners. But in this study, relatives who are resident have included in resident landowners and those are non-resident relatives have been included in absentee landowners. That is, both resident and absentee landowners who are relatives of the tenant also included in relatives category to find out the role of kinship in tenancy market. Mahbub Hossain showed that about 36% of rented land was transacted between relations.

Table 4.21 Regional Comparison of Landowners Share of Land in Rental Market

Area		Relatives	Friends	Resident landlord	Absentee landlord	Area Total
Pabna	Numbers	0 (00)	0 (00)	19 (63.33)	11 (36.67)	30 (100)
	Area (In acres)	0 (00)	0 (00)	55.79 (78.25)	15.54 (21.75)	71.3 (100)
Gazipur	Numbers	10 (32.26)	0 (00)	4 (12.90)	17 (54.84)	31 (100)
	Area (In acres)	14 (42.79)	0 (00)	3.15 (9.63)	15.57 (47.58)	32.72 (100)
Feni	Numbers	0 (00)	0 (00)	6 (20.00)	24 (80.00)	30 (100)
	Area (In acres)	0 (00)	0 (00)	7.8 (23.81)	24.96 (76.19)	32.76 (100)
Kushtia	Numbers	4 (12.50)	0 (00)	10 (31.25)	18 (56.25)	32 (100)
	Area (In acres)	4.66 (3.75)	0 (00)	7.99 (6.43)	111.52 (89.52)	124.17 (100)
Thakurgaon	Numbers	19 (51.35)	1 (2.70)	12 (34.43)	5 (13.5)	37 (100)
	Area (In acres)	15.23 (53.38)	1 (3.51)	8.24 (28.88)	4.06 (14.23)	28.53 (100)
Total	Numbers	33 (20.63)	1 (0.35)	51 (31.88)	75 (46.88)	160 (100)
	Area (In acres)	33.89 (11.71)	1 (0.35)	82.97 (28.66)	171.65 (59.29)	289.51 (100)

Source: Field Survey.

Table 4.21 depicts that there are great variations of land ownerships in tenancy market. Out of 160 respondents, 33 were reported to have taken land from their relatives. Nineteen tenants were taking lands from relatives in Thakurgaon and ten were in Gazipur. No land was hired from relatives in Pabna and in Feni. Only 4 tenants were found in Kushtia to have rented-in land from relatives. About 32%, 51% and 12% suppliers of land in tenancy market were relatives in Gazipur,

Thakurgaon and in Kushtia respectively. As a whole, about 21% of tenants were taking land from their relatives. Mahbub Hossain showed that about 36% of rented land was transacted between relations (Hossain, 1977). The implication of land taking from relatives is that kinship plays a significant role in rental market. The above statistics shows that exploitative nature of sharecropping is not evident.

Another group of landowners was friends of the tenant farm. They did not supply any land to rental market except in Thakurgaon. But it is insignificant. A major supplier of land in rental market was resident landowner. About 63%, 13%, 20%, 31% and 34% were resident landowners in Pabna, Gazipur, Feni, Kushtia and Thakurgaon respectively. Moreover, the highest numbers of resident landowners were in Pabna and the lowest numbers in Gazipur. Higher production cost and uncertainty in production were the main causes of renting-out land by the resident landowners in Pabna. Since cultivable lands of this area have been inundated by flood in every year, the resident landowners are always trying to shift the entire risk of cultivation to the tenant. As a result, landowners always try to lease their land in short-term leasing arrangements (annually). Land leasing on annual basis provides more rent to the landowner. On the other side, tenants also prefer short-term leasing arrangements due to the small amount of money is being paid in this arrangement. The number of resident landowners both in Gazipur and Feni was insignificant. This implies that most of the landlords of these two areas are living out side their villages. Another implication of having small number of resident landlords is that these two areas are economically developed compared to other areas. As a whole, 51 were resident landowners covering 32% of total landowners in rental market.

The largest suppliers of land in rental market are absentee landowners with an exception of Thakurgaon. In Feni, absentee landowners are the highest. About 80% landowners in Feni are absentee landowners. The second highest are in Kushtia while the third highest in Gaziur. However, about 37% and 13% of landowners are resident landowners in Pabna and Thakurgaon respectively. The implication of having significant number of absentee landowners in rental market is that non-

cultivator as well as urban people occupies a major portion cultivable land. Out of total 160 landowners, 75 were absentee landowners covering about 47% of total landowners in rental market.

If we look into acreage-wise distribution of the above matter, we can see from Table 4.21 that share of land in rental market by relatives were 42.79% in Gazipur, 3.75% in Kushtia and 53.38% in Thakurgaon respectively. Table 4.21 depicts that the highest share of land in rental market by relatives in Thakurgaon and the lowest in Kushtia. The second highest was in Gazipur. But in Pabna and Feni, relatives owned no lands. However, relatives of the tenant owned 11.71% of total rented land. The implication of this statistics is that kinship plays significant role in land leasing. An insignificant amount of lands are owned by friends of the tenant covering only 0.35% of total lands in the rental market.

Resident landowners own a major portion of land in rental market. Out of the total land, the resident landowners in Pabna, Gazipur, Feni, Kushtia and Thakurgaon owned 78.25%, 6.43%, 23.81%, and 28.88% lands respectively. This statistics indicates that share of land in the rental market by the resident landowners varies significantly from region to region. Out of the total land, 28.66% lands are rented-out by the resident landowners.

The last and the most important group of landowner who is playing dominant role in the tenancy market is the absentee landowners that supply about 60% of rented-in land. Another group of landowners is absentee landowners. This group supplies 59.29% of total land in rental market. About three-fifths of total lands are rented-in from the absentee landowners. However, about 22%, 47%, 76%, 90% and 14% of the lands are rented-out by the absentee landowners in Pabna, Gazipur, Feni, Kushta and Thakurgaon respectively. This statistics shows that variation in landownership in rental market is significant which shows the uneven development of the economy of Bangladesh.

From the above discussion, it can be concluded that actual tiller is not owner of land and urban people who are not attached with agriculture possess major portion of land. Thus, the implication of this finding is that land distribution is uneven.

4.8 Form of Tenancy

Tenancy also determines the owner, the nature of landownership, the terms and conditions on which the land is cultivated by the owners themselves or by others. Land tenure system refers to the possession of rights to the use of land. People hold varying kinds of rights in the use of land and are said to belong to different tenure classes. In other words, tenure system implies the tripartite interrelationship among a) landlord, b) tenant and c) government or state concerned with regulating the use of land.

4.8.1 Tenancy By Farm Holdings

In Bangladesh, tenancy cultivation is widespread and growing over time. In a recent empirical work (Hossain and others: 2000) that was conducted a repeated study on large sample villages and households to see the changes in the tenancy system. They considered two periods: 1987 and 2000. These authors noted that the proportion of tenant farmers had been increased from 42% to 57% and the land under tenancy rose from 22% to 33% during the period under consideration. Households operating less than 0.497 acres (0.2 ha) and another 40% households owning land from 0.494 acres (0.2 ha) to 2.47 acres or (1.00 ha) cultivate nearly half of the total tenanted land. In other words, marginal and small households cultivated more than four-fifths of the total tenanted land. The form of tenancy in Bangladesh is categorized into three main groups: owners, the owner-cum-tenant and the tenant. Accordingly all the farms and their operated area are distributed among the three categories of farms. Table 4.22 shows the tenurial arrangements by category; number and area are found in different censuses.

Table 4.22 Form of Tenancy of Farms by Category

Tenancy by Category	Census 1960		Census 1977		Census 1983/84		Census 1996		Survey Results	
	No. In "000"	%	No. In "000"	%	No. In "000"	%	No. In "000"	%	No. In "000"	%
No. of Owner Holding	3731	60.77	3646	58.28	6239	62.58	11807	66.23	*	*
No. of Owner-Cum-Tenant Holding	2308	37.60	2575	41.16	3593	36.04	4206	23.59	105	66
Tenant Holding	100	1.63	35	0.56	137	1.38	1814	10.18	45	34
No. of Total Holding	6139	100	6256	100	9969	100	17828	100	150	100

Source: BBS, 2003, Agriculture Census 1996 and Field survey

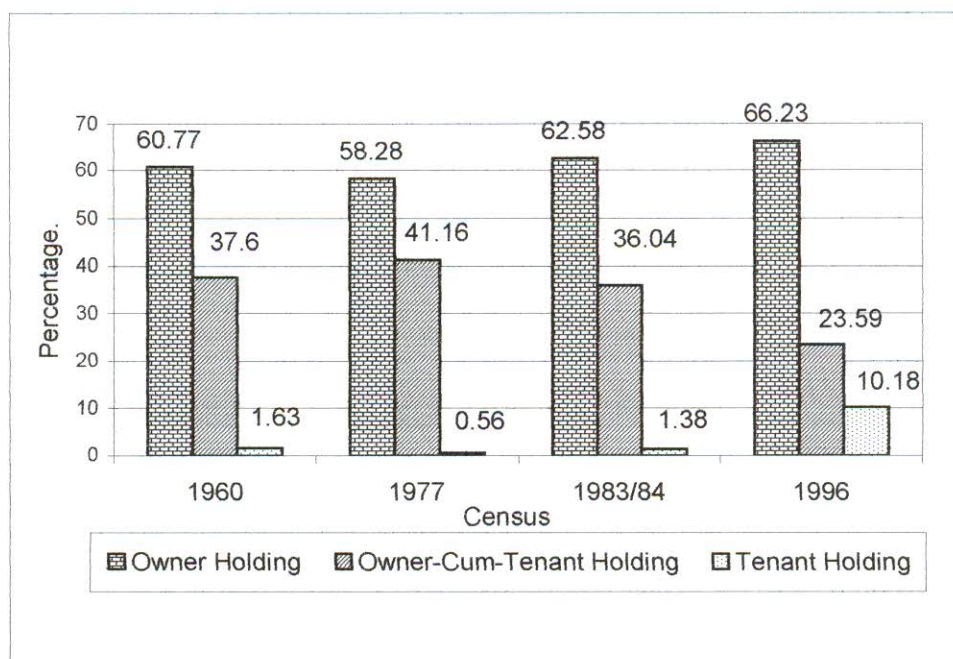
Note: *Since data included only tenant farmers, owner holdings are excluded from the respondents.

It is observed from the Table 4.22 that over the years 1960-1996, the composition of owner and tenant farm has remained almost same at 60:40 ratios. Agriculture Census 1996 reported that 11.80 million (66.23%) were owner farms, 4.20 million (23.59%) were owner-cum-tenant farms and 1.81 million (10.18%) were tenant farms respectively. Table 4.22 reveals that 10.18% were tenant farms in 1996 was much greater than the results of 1986-84 census, 1977 and 1960-sample survey. Most of the tenants were owner-cum-tenant farms who had some land of their own and rented in some land for better utilization of the farm establishments; i.e. family workers. This statistics showed that the number of owner farms were the largest.

Agriculture Census 1996 reports that the total holdings have been increased by 78.83% in 1996 compared to 1983-84 sample enumeration. The owner and owner-cum-tenant holding have been increased by 89.25% and 17.06% respectively. But the tenant farms have been tremendously increased by 1221.61%. So, average growth rate of total holdings over the 12 years span was 6.57%, whereas average growth rate of owner holdings and owner-cum-tenant holding were 7.44% and

1.42% respectively. But it was 108.80% for tenant holdings. Similarly, distribution of farm holdings by tenure and number can be seen from the figure 4.1

Figure 4.1 Form of Tenancy by Farm Holdings

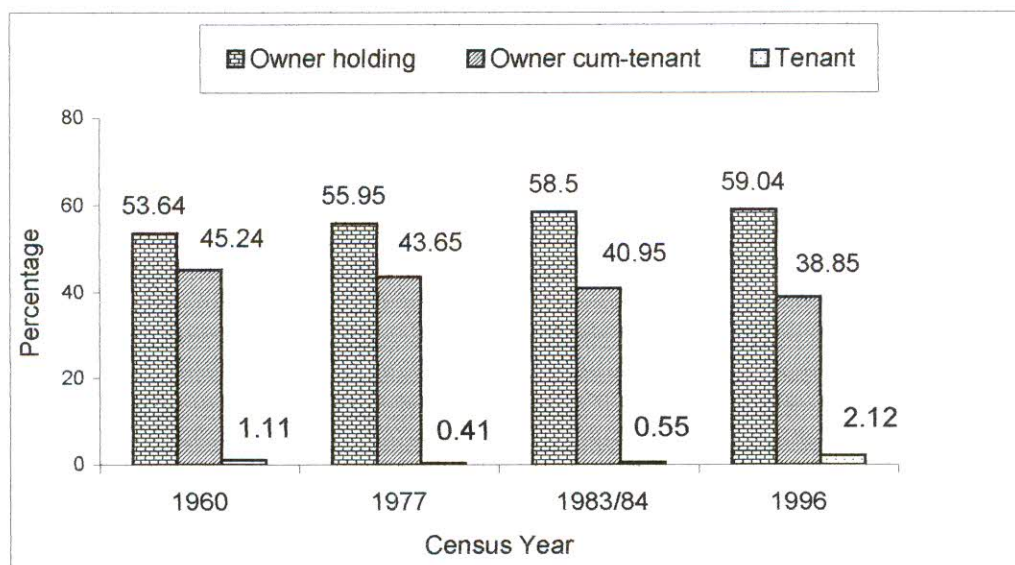


Source: Table 4.22

Survey findings reveal that out of the total tenant holdings 66% were owner-cum-tenant and 34% were tenant holdings.

4.8.2 Tenure of Farms and their Operated Area

Actual scenario of structural change of tenancy would be clear by presenting the operated area under different tenure classes. Moreover, exploring the operated area by different tenancy system is essential for better understanding of tenureship. To fulfill this requirement, the operated area by different tenancies in censuses 1960, 1977, 1983-84 and 1996 is shown in figure 4.2.

Figure 4.2 Tenure fo Farms and Their Operated Area

Source: Appendix-IV-D.

Figure 4.2, shows that operated area of owner holdings slightly increased over the years. The operated areas by owner holdings were 58.51% in 1983-84 and 59.04% in 1996. On the other hand, a significant part of farms were owner-cum-tenant farm operating 40.95% of operated area in 1983-84 and 38.85% of operated area in 1996. Tenant holdings constituted an insignificant part of the operated area (0.55% in 1983-84 and 2.12% in 1996).

Most of the tenants are owner-cum-tenants who have owned some land and rent-in land for better utilization of their farm resources (e.g. family labor, draft animals, farm equipment etc.). Moreover, figure 4.2 shows that average size of farms has been reduced for all types of tenure holders. Average size of owner-cum-tenant holdings decreased in both 1983-84 and 1996 censuses. This trend was observed in earlier censuses also. Estimated data from different censuses exhibit that total operated area has been decreased by 9.65% in 1996 compared to 1983-84. The owner and owner-cum-tenant farms' operated areas have reduced by 8.84% and 14.29% while the areas of tenants' farm have increased by 250.85% during the period 1983-84 to 1996. Specifically the number of tenant farms had increased by 250.61% and area by 250.85%. Perhaps there were landless farmers who were operating land taking from others without ownership.

4.8.3 Proportion of Area under Tenancy

The proportion of area under tenancy has increased from 17% of the operated area in 1983-84 to 22% in 1996. This change may be due to an increase in area under absentee landownership with the rapid rural- urban migration of rural people, and the abandonment of marginal landholdings in favor of taking up non-farm occupation by "resource poor" household (Hossain, 2000). The extent of tenancy observed to be higher for small and medium farms than for marginal and large farms in both censuses. This may be due to the reason that small and medium farms have more opportunity to make better utilization of their land by renting some more (Shaha, 2001).

Table 4.23 Distribution of Rented Lands by Different Farm Sizes and the Extent of Tenancy

Farm size (in acre)	1983/84				1996				Annual growth rate Rented in land
	Operated area "000"	Rented in land	%	Extent of tenancy	Operated area "000"	Rented in land	%	Extent of tenancy	
0.05-0.49	622	90	2.37	14.47	869	172	3.94	19.79	5.55
0.50-0.99	1152	258	6.79	22.40	1685	480	11.00	28.49	5.31
1.00-2.50	4800	1056	27.79	22.00	5752	1467	33.64	25.50	2.78
2.51-4.99	5879	1251	32.92	21.28	5638	1272	29.17	22.56	0.13
5.00 and above	10226	1145	30.13	11.20	6264	970	22.24	15.49	-1.19
All	22679	3800	100.00	16.76	20208	4361	100.00	21.58	1.15

Source: Shaha, January 2001.

Table 4.23 depicts that growth rate of rented land for all farms except large farms increases. Growth rate is higher for smaller farms than the medium farms.

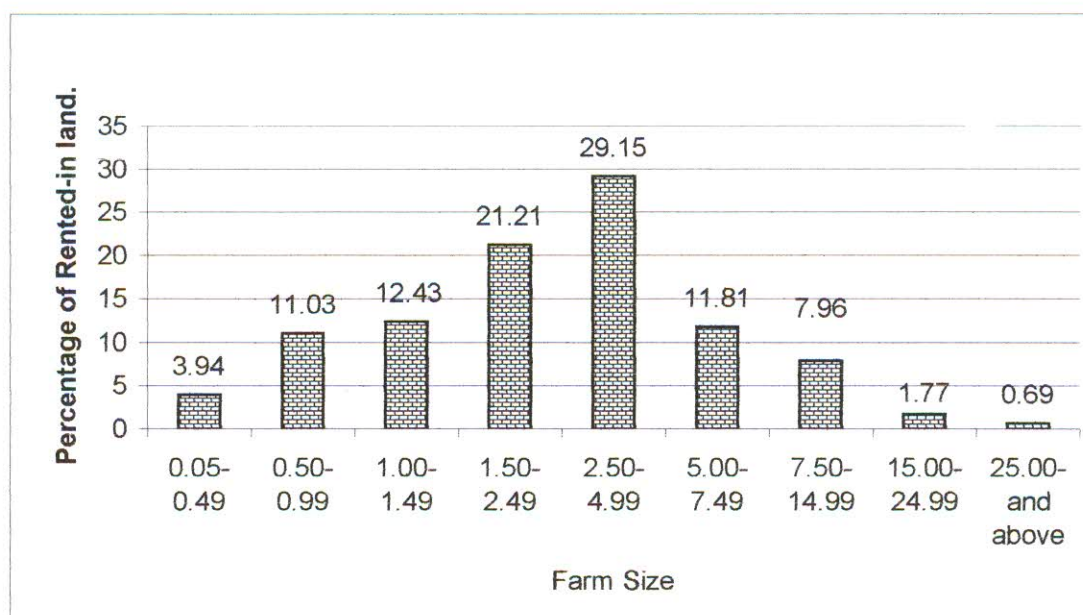
Table 4.24 Extent of Tenancy and Distribution of Leased Land under Different Farm Sizes in 1996

Agriculture Census 1996				
Farm Size (In acre)	Operated Area (in "000" acre)	Leased Area (in "000"acre)	% Of Leased Land (in acre)	Extent of Tenancy
0.05-0.49	869	172	3.94	19.79
0.50-0.99	1685	481	11.03	28.54
1.00-1.49	2071	542	12.43	26.17
1.50-2.49	3681	925	21.21	25.13
2.50-4.99	5638	1271	29.15	22.54
5.00-7.49	2939	515	11.81	17.52
7.50-14.99	2348	347	7.96	14.78
15.00-24.99	688	77	1.77	11.19
25.00-and above	289	30	0.69	10.38
All	20208	4360	100.00	21.58

Source: BBS, July 1999, Agriculture Census 1996.

Extent of tenancy = (leased land / operated land) × 100

Figure 4.3 Extent of Tenancy and Distribution of Rented-in Land



Source: Table 4.24.

Table 4.24, reveals that extent of tenancy is higher for small and marginal farms but for landless or very small farm and medium farm it is lower. As the farm sizes increases (after marginal farm) the extent of tenancy decreases. Managerial constraint of large farms and landless or very small farms has made them not to rent-in more land. That is, the ratio of tenanted land to operated land is higher for small and marginal farms but it is lower for very small/landless and medium and large farms. A similar presentation of extent of tenancy by category of farms sizes is shown in the figure 4.3. This figure shows that percentage of rented land increase as the farm sizes increases up to (2.50-4.99) category but it further decreases beyond the category of (2.50-4.99).

From the above discussion it is clear that pattern of tenancy has changed substantially. The underline causes of changes in pattern of tenancy may as follows:

- i. Insufficient creation of job opportunities in rural area compared to growth of rural labor force.
- ii. For better utilization of tenant's resources, e.g. family labor, farm equipment, etc.
- iii. Transformation of rural economy due to the improvement of rural infrastructure, such as roads and communication, pavement of large numbers of school and colleges, creation of employment opportunities outside of agriculture, social beliefs, etc.
- iv. Structural changes of rural economy may be the most important cause of changes in pattern of tenancy.
- v. Agricultural practices may have influences on tenancy.
- vi. Commercialization of rural economy, increase in agricultural labor wage, shirking of agricultural labor and the migration of landowner to urban areas are the main cause behind the changes in tenancy in Bangladesh.
- vii. Extreme pressure of population on limited land has made the agriculture dominated by small and marginal farms. The medium and large farm holdings

have been subdivided under demographic pressure leading to increase in small and marginal farms, which in turn induces them to rent-in land for employing their labor endowment.

4.9 Pattern of Land Distribution and Size of Tenant Holdings

This section is devoted to explain the structure of tenant farm and their land use under rice cultivation and to explore the tenurial condition of tenant farm for better understanding of actual scenario of tenancy conditions of the study areas. The analysis is made on the basis of collected data.

4.9.1 Regional Pattern of Land Distribution and Size of Tenant Holdings

Pabna

Table 4.25 reveals that in Pabna, 40% of tenant farms are landless and rented-in 22.88% of total leased land and they do not own any cultivable land but operate or cultivate 13.99% of total land of tenant farms. They use 100% of their tenanted land in rice cultivation. Fifty percent of total farms were small tenant farms (0.05-2.49) leasing 63.91% of total leased-in land. This group rent-in 75.29% of their total operated land. They own 24.71% of total operated land of this group. Moreover, they use 84.99% of total operated lands in rice cultivation and they use rest 15.01% of total operated land in other crops cultivation. They operate 51.89% of total land.

Table 4.25 Ownership Pattern and Use of Land of Tenant Farm: Pabna

Tenant Farm Size		Non-farm Households 0.00-0.04	Small Farm 0.05-2.49	Medium Farm 2.50-7.49	Large Farm 7.50 & above	Total
Frequency	Numbers	12	15	2	1	30
	%	40	50	6.67	3.33	100.00
Owned Land	Area (In acre)	00	8.94	8.25	9.90	27.09
	% Of Total Owned Land	00	33.00	30.454	36.54	100.00
	% Total Operated Land	00	24.71	65.74	88.16	38.86
Leased-In Land	Area (In acre)	9.75	27.24	4.30	1.33	42.62
	% Of Total Leased Land	22.88	63.91	10.09	3.12	100.00
	% Of Total Operated Land	100.00	75.29	34.26	11.84	61.14
Land Use under Rice Cultivation	Area (In acre)	9.75	30.75	9.24	10.89	60.63
	% Of Total Operated Land	100.00	84.99	73.63	96.76	86.97
Land Use under Other Crops	Amount (In acre)	00	5.43	3.31	0.34	9.08
	% Of total operated land	00	15.01	26.37	3.02	13.02
Total Operated Land	Area (In acre)	9.75	36.18	12.55	11.23	69.71
	% Of Total Operated Land	13.99	51.89	18.00	16.11	100.00

Medium tenant farms (2.50-7.49) rent in 10.09% of total leased land constitutes only 6.67% of total tenant farm. But the ratio of rented land and owned land of this group is 34.26: 65.74. They own 30.45% of total owned land and use 73.63% of total land in rice cultivation.

Only 3.33% tenant farms were large farm (7.50 and above) rented-in 3.12% of total leased land and they owned 36.54% of total owned land. The ratio of rented land to owned land of this group is 11.84: 88.16. They use 96.76% land in rice cultivation. The ratio of rented land and owned land of total tenant farm is 61.14: 38.86. Moreover, 86.97% of total lands are used in rice cultivation.

Gazipur

Table 4.26 reveals that 10% tenants are landless rented-in 10.67% of total leased-in land in Gazipur. They do not own any cultivable land but they operate 5.11% of total land. They use 90% of their tenanted land in rice cultivation.

Table 4.26 Ownership Pattern and Use of Land of Tenant Farm: Gazipur

Tenant Farm Size		Non-farm Households 0.00-0.04	Small Farm 0.05-2.49	Medium Farm 2.50-7.49	Total
Frequency	Numbers	3	24	3	30
	%	10	80	10	100
Owned Land	Area (In acre)	00	26.02	9.7	35.72
	% Of Total Owned Land	00	78.89	27.15	100
	% Total Operated Land	00	49.65	76.86	52.12
Leased in Land	Area (In acre)	3.5	26.39	2.93	32.81
	% Of Total Leased Land	10.67	80.44	8.90	100
	% Of Total Operated Land	100	50.35	23.14	47.88
Land Use under Rice Cultivation	Area (In acre)	3.15	47.95	9.97	61.08
	% Of Total Operated Land	90.00	91.50	79.00	89.13
Land Use under Other Crops	Area (In acre)	0.35	4.45	2.65	7.45
	% Of total operated land	10	8.50	21.00	10.87
Total Operated Land	Area (In acre)	3.5	52.41	12.62	68.53
	% Of Total Operated Land	5.11	76.48	18.42	100

Note: Total operated Land= Total own Land + Total leased in land.

Another 80% of tenants are small tenant farms that rent-in 80.44% of leased land and they use 91.50% of their total land in rice cultivation. The ratio of rented land to owned land of this group is about 50:50. This indicates that this group of tenants is hiring a significant portion of land combined with owned land due to the technical efficiency of tenant farm. They rent in land for better utilization of their resource endowments especially labor. They use about 91% of total land under rice cultivation. About 10% tenants are medium farm (2.50-7.49) rent-in 8.90% of total leased-in land. The ratio of leased-in land to owned land of this group is about 23:77 and own 27.15% of total owned land. But they use 79% of total land in rice cultivation. Sample survey shows that there are no large tenant farms in Gazipur.

Feni

Table 4.27 depicts that 53.33% of tenants are landless who rent in 64.90% of total leased land. Moreover, they do not own any cultivable lands but they are operating about 49% of total land. They use 100% land in rice cultivation.

Table 4.27 Ownership Pattern and use of Land of Tenant Farm: Feni

Tenant Farm Size		Non-farm Households (0.00-0.04)	Small Farm (0.05-2.49)	Total
Frequency	Numbers	16	14	30
	%	53.33	46.67	100
Owned Land	Area (In acre)	00	10.68	10.68
	% Of Total Owned Land	00	100	100
	% Total Operated Land	00	48.50	24.56
Leased In Land	Area (In acre)	21.26	11.5	32.67
	% Of Total Leased Land	64.90	35.10	100
	% Of Total Operated Land	100	51.50	75.41
Land Use under Rice Cultivation	Area (In acre)	21.26	20.92	42.18
	% Of Total Operated Land	100	94.31	88.11
Land Use under Other Crops	Area (In acre)	00	1.26	1.26
	% Of total operated land	00	5.69	11.89
Total Operated Land	Area (In acre)	21.26	22.18	43.44
	% Of Total Operated Land	48.94	51.06	100

Note: There are no medium and large tenant farms in Feni.

About 47% tenants are small tenant farms are leased-in 35.10% of total leased land. They are operating about 51% of total operated land. The ratio of leased-in land to own land of this group is about 52:48 indicating that this group hires more land compared to their owned land. Area as a whole, the ratio of leased-in land to own land is about 75:25 and about 88% lands are used under rice cultivation. So, land use under rice cultivation does not vary significantly among the regions as well as within the region. Table 4.27 shows that all the tenants are either landless or small tenant farms. There are no medium and large tenant farms. The implication of this statistics is that no medium or large farm does hire any land for better utilization of his or her resource endowments, especially family labor. So, it also indicates that there is an alternative employment opportunities of this area.

Kushtia

Table 4.28 depicts about 33% tenants are landless and they rent-in 79.10% of total leased-in land in Kushtia. But they operate about 65% of total land and they use almost cent (99.99) percent of tenanted land in rice cultivation.

Table 4.28 Ownership Pattern and Use of Land of Tenant Farm: Kushtia

Tenant Farm Size		Non-farm Households (0.00-0.04)	Small Farm (0.05-2.49)	Medium Farm (2.50-7.49)	Total
Frequency	Numbers	10	18	2	30
	%	33.33	60.00	6.67	100
Owned Land	Area (In acre)	00	13.45	15.54	28.99
	% Of Total Owned Land	00	46.40	53.60	100
	% Total Operated Land	00	35.96	88.60	18.93
Leased-in Land	Area (In acre)	98.22	23.95	2	124.17
	% Of Total Leased Land	79.10	19.29	1.61	100
	% Of Total Operated Land	100	64.03	11.40	81.07
Land Use under Rice Cultivation	Area (In acre)	98.21	32.88	13.53	144.62
	% Of Total Operated Land	99.99	87.91	77.14	94.42
Land Use under Other Crops	Area (In acre)	0.01	4.52	4.01	8.54
	% Of total operated land	0.01	12.09	22.86	5.58
Total Operated Land	Area (In acre)	98.22	37.4	17.54	153.16
	% Of Total Operated Land	64.13	24.42	11.45	100.00

Sixty percent tenants are small farms and they rent-in only 19.29% of total leased-in land. The ratio of leased-in land to own land of this group is about 64: 36. They operate 24.42% of total operated land. This group owns 46.40% of total owned land and they use 87.91% of total land in rice cultivation. Only 6.67% of tenants are medium farms that rent-in about 2% of leased-in land. The ratio of leased-in land to own land of this group is about 11:89. But they own 53.60% of total owned land. They use 77.14% of total operated land in rice cultivation. An area as a whole, the ratio of leased land to owned land is about 81:19. Moreover, they use 94% land in rice cultivation.

Thakurgaon

Table 4.29 shows that 13.33% tenants are landless and they rent-in 11.86% of the total leased land. They are operating 5.25% land. They use cent percent land in rice cultivation. This statistics indicates that compare to other regions, a very small number of tenants are landless and they operate an insignificant portion of land.

Table 4.29 Ownership Pattern and Use of Land of Tenant Farm: Thakurgaon

Tenant Farm Size		Non-farm Households 0.00-0.04	Small Farm 0.05-2.49	Medium Farm 2.50- 7.49	Large Farm 7.50 & above	Total
Frequency	Numbers	4	22	3	1	30
	%	13.33	73.33	10.00	3.33	100
Owned Land	Area (In acre)	00	22.17	7.5	7.5	37.17
	% Of Total Owned Land	00	59.64	20.18	20.18	100
	% Total Operated Land	00	48.95	77.72	88.23	55.73
Leased in Land	Area (In acre)	3.5	23.12	2.15	0.75	29.52
	% Of Total Leased Land	11.86	78.33	7.28	2.54	100
	% Of Total Operated Land	100	51.05	22.28	11.77	44.27
Land Use under Rice Cultivation	Area (In acre)	3.5	41.79	7.15	8.25	60.69
	% Of Total Operated Land	100	92.27	74.09	100	91.00
Land Use under Other Crops	Area (In acre)	00	3.5	2.5	00	6.00
	% Of total operated land	00	7.73	25.91	00	9.00
Total Operated Land	Area (In acre)	3.5	45.29	9.65	8.25	66.69
	% Of Total Operated Land	5.25	67.91	14.47	12.37	100

Note: Figures after decimal are rounded up.

About 73% tenants are small tenant farms (0.05-2.49) rent-in 78.33% of the total leased-in land. The ratio of leased-in land to own land of this group is about 51: 49. This means that about 52% operated lands are leased-in land. They use 92.27% land in rice cultivation and they own about 60% land. Ten percent tenants are medium farms (2.50-7.49) and rent-in 7.28% leased-in land in Thakurgaon. They own 20.18% land and the ratio of leased-in land to own land of this group is about 22:78. Medium tenant farm operate 14.47% land and they use about 75% lands in rice cultivation. Only 3.33% tenants are large farms that rent-in only 2.54% of total leased-in land in Thakurgaon. The ratio of leased land to own land of this group is 11.77:88.23. They use 100% land in rice cultivation. In the area as a whole, the ratio of leased land to owned land is 44.26:55.74 and 91% lands are used in rice cultivation.

4.9.2 Regional Pattern of Land Distribution and Size of Tenant Holdings

The pattern of tenurial relations in Bangladesh is the most intractable issue. The main objectives of this section are to explore the tenancy scenario along with existing pattern of tenant and to represent land use pattern in Bangladesh. Tenants are categorized into 4 groups on the basis of land ownership. It is observed from the survey result that almost one-third tenants are absolutely landless

Table 4.30 Structure of Tenant Holding and their Leased-in Land

Tenant Farm Size		Non-farm Households (0.00-0.04)	Small Farm (0.05-2.49)	Medium Farm (2.50-7.49)	Large Farm (7.50 & above)	Total
Frequency	Numbers	45	93	10	2	150
	%	34	63	6.67	1.33	100
Owned Land	Area (In acre)	00	81.26	37.99	17.4	136.65
	% Of Total Owned Land	00	59.47	27.80	12.73	100
	% Total Operated Land	00	42.00	76.96	89.32	34.29
Leased in Land	Area (In acre)	136.23	112.2	11.37	2.08	261.88
	% Of Total Leased Land	52.02	42.84	4.34	0.79	100
	% Of Total Operated Land	100	58.00	23.04	10.68	65.71
Land Use under Rice Cultivation	Area (In acre)	135.87	177.92	39.89	19.14	372.82
	% Of Total Operated Land	99.74	91.97	80.82	98.25	93.55
Land Use under Other Crops	Area (In acre)	0.36	15.54	9.47	0.34	25.71
	% Of total operated land	0.26	8.03	19.18	1.75	6.45
Total Operated Land	Area (In acre)	136.23	193.46	49.36	19.48	398.53
	% Of Total Operated Land	34.18	48.54	12.39	4.89	100

Note: I) Total land is the sum of rented in land and owned land. II) Here tenant farm size is categorized on the basis of owned land, which includes homestead land, and cultivated/operated land.

Survey findings reveal that 45 tenants do not own any land constituting 34% tenant holdings and they rent-in about 52% leased-in land. About 63% tenants are small tenant farms (0.05-2.49). Moreover, 63% tenants rent-in 42.84% leased-in land. The ratio of owned land to leased-in land of this group is 42:58, and they use about 92% land in rice cultivation.

About 7% tenant farms are medium farms and they rent-in 4.34% of the total leased-in land. The ratio of owned land to leased-in land of this group is about 77: 23. Moreover, they use 80.82% lands in rice cultivation. An insignificant number of large farms (1.33%) rent-in insignificant amount (0.76%) of land from leasing market.

Table 4.30, depicts that as the amount of owned land increases, the number of tenant farm and the amount rented-in land decreases. So, there is a negative relationship between the amount of owned land and the rented-in land. That is, the findings of the sample survey explain the relationship between landownership and rented-in land. This finding agrees with the results of Agriculture Census 1996. The census reported that tenant farms in the large groups had insignificant role in operating land because of small amount of land (0.58%) in their possession (BBS, November 2002). Agriculture Census 1996 showed that owner and owner-cum-tenant holdings had been increased by 89.25% and 17.06% respectively. But tenant farms have been increased tremendously by 1221.61%. However, the same trend was followed in case of area (BBS, Nov. 2002).

The owner and owner-cum-tenant farm areas have decreased by 8.84% and 14.29% respectively, while the area of tenant farms has increased by 250.85%. If we look at the comparative figures of the changing pattern of tenancy from 1960 to 1996, it would be clear that a significant variation in proportions by increasing the number of farmers in three groups is evident. Specifically the number of tenant farms had been increased by 250.61% and area by 250.85%. Probably they were landless farmers who were operating land taking from others without ownership.

But what is the main cause of this rising trend of tenancy? Many factors are accountable for this rising trend. But two factors are main; rural-urban migration and increased non-farm employment opportunities. Rapid rural-urban migration leads to increase in absentee landlord who would like to rent-out their land to their relatives. Development of communication system and other infrastructure in rural areas stipulated non-farm employment opportunities. This made labor market tighter and wage rates higher in the non-farm than that of farm activities. Comparatively capital-rich and better-educated households find it more profitable to lease-out land and engage themselves in off-farm economic activities. So, the supply of tenanted land has increased. This is shown in Table 4.31.

Table 4.31 Changes of Number and Area over the Previous Censuses

(Area in acre)

Tenancy by Type	Percentage Change					
	1977 over 1960		1983-84 over 1977		1996 over 1983-84	
	No.	Area	No.	Area	No.	Area
Total Holdings	1.90	1.08	59.36	3.25	78.83	-9.65
Owner Holdings	-2.28	5.42	71.12	7.97	89.25	-8.84
Owner-cum-Tenant Holding	11.55	-2.49	39.54	-3.14	17.06	-14.29
Tenant Holding	-65.01	-63.24	292.29	38.88	1221.61	250.85

Source: BBS, Nov. 2002, Agriculture Census 1996.

Table 4.31 shows the changing situation of operated area possessed by the three individual groups of cultivators, owner, owner-cum-tenant and tenant. It is observed from the Table 4.30, that the number of tenant farms has increased by 1221.61% over the 12 years span. Moreover, operated area by tenant farms had been increased by 250.85% over the period of 1983-84 to 1996. The sample survey was conducted during the period January 2003 to November 2003. So, the results of survey show that landless tenants that commensurate with the census result rent more than 52% of tenanted lands.

4.9.3 Pattern of Land Distributions under Rice Cultivation

About 73% gross cropped area are used under rice cultivation in Bangladesh agriculture (BBS, Dec. 2002). The findings of sample survey were that more than 93% lands are used under rice cultivation. Moreover, 65% lands are rent-in by different groups of tenant. Around 35% lands were owned land. In this study, total land is considered as the sum of rented-in land and owned land. Table 4.32 shows the structure of land ownership and the use of land in rice cultivation.

Table 4.32 Pattern of Land Distribution under Rice Cultivation

(Area in acre)

	Leased-in land	Owmed land	Land use under rice cultivation	Land use out of rice cultivation	Total land (2+3)
1	2	3	4	5	6
Total Amount	261.88	136.65	372.82	25.71	398.53
Percentage	65.71	34.29	93.55	6.45	100.00

Table 4.32, shows that about 93% land is used in rice cultivation. Since farms are economically on lower stairs of social ladder, achieving food security may be the main cause of renting land. This statistics imply that rice is the dominant crop in Bangladesh agriculture. The implication of relatively lower use of land in rice cultivation of small and marginal farms (0.50-1.49 and 1.50-2.49) is that they are efficient in land use. They use their operated land for producing other crop from which they can get more net return compared to rice cultivation. This type of farm is efficient in use of farm's resource use, especially labor endowments. From the above discussion, it can be concluded that as the own land increases, the amount of rented land decreases but the land use under rice cultivation remains more or less same except for medium tenant farms. Moreover, in total, 65.71% land is leased-in land and 93.55% land is used under rice cultivation.

From the foregone analysis it is observed that land tenure and land use under different crops do not vary enormously among the regions. Employment of tenant farmers outside of agriculture is limited. Pattern of land distribution and the structure of contractual arrangements have been changing for the past three decades. The structure of farm and non-farm holdings has been changes due to the rural-urban migration, movement from farm to non-farm occupation and the creation of off-farm employment opportunities in rural areas. National Agriculture Censuses of 1983/84 and 1996 reported that total operated area has decreased around 1% per year. The decrease in total operated area further indicates that arable land is decreasing owing to population pressure. In addition, increase in operated area by non-farm households imply that land transactions in tenancy market have increased. It is observed that a tremendous proliferation of small farms, relative consolidation of middle farms and relative decline of large farms have taken place over the last three decades within the existing framework of highly unequal distribution of land.

Chapter 5

Factors Affecting Contractual Arrangements

It is generally believed that most of the peasant economies are characterized with low savings, inequitable distribution of cultivable land and income, lack of off-farm employment opportunities along with vulnerable economic condition of farm households resulting from uncertainty in production which is highly related to land leasing. Recently, several economists have been trying to develop a general theory of optimizing behavior of landowning farmers as well as tenants. They also have devoted their attention to explain the determining factors, the determination of rental rate and the impact of changes in certain variables upon the existence of contractual arrangements.

The objectives of this chapter are to analyze the causes of renting land by the tenant farm under different contractual arrangements and to investigate the main causes of lease in/out of land in the tenancy market. In addition to this, it will focus on why marginal and small farmers are engaged in tenant cultivation in lieu of investing their financial and human resources in non-agricultural activities. Collected data do not include respondents from landowners due to the nature of questionnaire and scatter location of landowners. The landlords' views are analyzed on the basis of secondary data and different available related studies. Thus, empirical analysis is not done for landlords. Again, primary data are collected from the tenants' responses. So, tenants' decisions to rent-in land are given more emphasis.

5.1 Land Leasing Decision: Landlord's Perspective

The objectives of this section are to investigate into i) why landlords lease out land instead of hiring labor services and ii) why the contractual arrangements exist in Bangladesh? The investigation is carried out with respect to landlords' views. At the outset, theoretical analysis or traditional concept is analyzed for explaining the existence of tenancy. And then dominant socio-economic factors in leasing decisions are examined.

5.1.1 Theoretical Explanation behind of Leasing Out Land

In Bangladesh, as well as in South Asia, it is commonly argued and explained that traditional social values and norms prohibit many landlords from self-cultivating their land (Myrdal, 1968). Actually, landowners in the past did not cultivate their land for social prestige and earn their livelihood by rent out land to the actual tiller. They collected land rent from the tenant and part of that rent gave to the king or the state (Jannuzi and Peace, 1980). Manual work was considered degrading. The social position of a household in rural area was determined by the type of work the members did. Those who maintained their lives by manual work were considered in a society to be at the bottom rung of the social ladder. Usually, those who lived a decent life without working at all and supervised others were considered aristocrats in the society. For that reason every one tried to keep him far away from manual work in order to climb up the social ladder and education was used as a means of achieving this social mobility (Hossain, 1977).

Landownership is a status symbol that offers considerable social prestige and power. Owners of large chunks of arable land can build up a patron-client relationship with farm laborers and tenants that can be very useful in acquiring public offices or intimidating others in contentious situations. Many large non-cultivating owners may also prefer leasing out land to outright selling because renting land in small parcels can be done to a number of tenants; they in effect can create sub-ordinates who could be used to support them in village politics and local conflicts. These factors are no doubt important in explaining the existence of tenancy but they account for only a part of the rental market in Bangladesh agriculture.

So, everyone tried to keep far away from fieldwork in order to climb up the social ladder. Thorner and Thorner (1962) pointed out, "In India there is an age-old feeling that manual labor, physical work, is degrading; whenever possible, such work should be left to the lowly, to inferior persons. In the villages there is one sure sign by which successful cultivators tend to show their economic condition is improving and that they now wish to raise their social standing: they and members of their families stop doing the field work; instead, they engage others to do it for them, or they give the land out to tenants or crop sharers".

Such beliefs induced the landowners not cultivating their land and at the same time they wanted to hold land for inducement of economic and non-economic social factors. The landowners as well as rural people believed that the economic security and prestige were associated with landownership. To maintain a higher position in a social ladder and to create subordinates many large farmers rent out land in small parcels to a number of tenants instead of selling. These factors were no doubt important in explaining the existence of tenancy but they account for only a small part of the rental market in Bangladesh.

5.1.2 Natural Risk and Wage Rates in Tenancy

In a monsoon based rice cultivation like Bangladesh the natural risks and wage rate substantially affect the existence and regional variation of contractual arrangements, because it can influence the relative advantages of ownership cultivation with hired labor and cultivation through share tenants or not. Under behavioral postulate of risk aversion, the landowner can increase his income through rental contracts that shifts the risk entirely (fixed rent contract) or partially (share rent contract) to the tenant. Similarly, the tenant can increase his income by the shifting of entire risk to the landowner (wage contract) or by sharing it (share rent contract). Cheung (1969) has argued that the choice of contractual arrangement in farming is determined by the level of natural risk, which contributes to variation in output with the same level of inputs. He also pointed out another cause of existence of different types of contractual arrangement is the variation of transaction costs.

Thus, the existence of natural risks alone would imply that sharecropping is the mutually preferred arrangement, because it helps to disperse the risk by both parties. But according to Cheung, the share-rent contract involves the highest transaction costs because of its complexity compared to other arrangements. So, the choice of a contract is then determined by weighing the gains of risk dispersion and the cost of transacting resources associated with each contract.

Another theoretical model developed by Bardhan and Srinivasan (1971), who have argued that the level of wage rates and the area under cultivation determine existence of tenancy arrangement. In their model of crop-sharing tenancy, they have

found that a change in wage rate, which is exogenously determined, affects both the demand for and the supply of land under share tenancy. This affects the equilibrium amount of rented land. They pointed out that there is a positive relationship between the wage rate and the amount of land rent in. Because an increase in the wage rate may raise the supply of land in the rental market but lower the demand for such land, which in turn reduce the equilibrium level of rental share and an increase in the amount of land leased in. Thus, they have argued that there is a positive relationship between wage rates and land leased in. In other words, there is a negative relationship between wage rate and leasing out land by the landlords.

5.1.3 Structural Factors of Leasing Out Land

Hossain (1977), in his unpublished Ph. D. dissertation shows that the traditional hypotheses do not adequately explain the existence and regional variation of tenancy in Bangladesh. He argued that part of the explanation might also be lying in the nature of rice cultivation and property distribution. He pointed out that a) the degree of inequality in the distribution of land among cultivators and b) the importance of landless workers available for wage employment can affect the landowner's choice between ownership cultivation and tenancy.

Since rice cultivation is mainly monsoon oriented and seasonality exists in rice cultivation, so the required number of workdays during a year or a season cannot be estimated beforehand. So, landowners and also tenants find labor market basically casual in nature. Permanent labors are kept for minding cattle or for doing heavy fieldwork and supervising casual workers. Peak season labor shortages can add to the cost of cultivation for those dependent heavily on hired labor. It also hinders the availability of right number of workers at right time for those who rely on hired labor. Since rainfall arrives on every farm at a time in the area over which labor is immobile in the short-run, every cultivator becomes very busy simultaneously. Moreover, a very small farm holder wage laborers enter the labor market only after completing their job on their own farm. This shortage of labor supply can be substituted by labor saving machine in the production process. But in Bangladesh agriculture, labor saving technology or machine is hardly used. As a result, seasonality factor can set a limit to the size of farm that can be intensively cultivated with hired labor. Another finding of

that study was that the amount of land rented out by a farm would be related to the land and labor endowments of the family. The amount of land rented out would be positively related to the amount of surplus land because, given the scarcity of labor during peak seasons, the larger the amount of surplus land the more would be the cost of cultivation. Those who have surplus land (i.e. more than can be intensively cultivated with family workers) would rent out land to those have surplus labor.

Worker/land ratio of a cultivator family cannot be infinitely flexible. In monsoon-dominated agricultural practices rice cultivation is highly seasonal and irregular. The rigidity of worker/land ratio can add additional costs arising out of supervision of casual workers. The bidding up for labor may raise wage rates at peak periods. Moreover, in peak periods, bidding up for additional labor may raise wage rates that in turn raise the cost of cultivation. These costs depend on the nature of land distribution, which determines the demand, and supply of casual labor. That is, on the landowner's point of view, wage rate also induces to rent out land in the rental market. So, land distribution, labor endowments and monsoon oriented rice cultivation affect the extent of tenancy.

Another factor that is commonly observed in Bangladesh agriculture is the practice of transactions among relatives. If one wants to help poor relative he does not take into account how much surplus labor or surplus capital one has. Many absentee landlords are not aware of yield on land but he may be interested in getting a fair share of the produced. So, they can give land to one whom they trust, irrespective of his factor endowments. Another and also important is the scattered position of land which affect the existence of tenancy. Some plots would rent out for their distant position from the household. The cultivation of these distant plots by the landlords may be uneconomic. Survey findings show that in Pabna, this factor plays a vital role in tenancy.

5.1.4 Economic Factors

Agricultural production is known for its extreme seasonality of demand for labor. There is some risk in a great dependence on hired labor. The demand for labor fluctuates so much over the crop season that while substantial unemployment exists during lean seasons, the labor market is very tight during peak seasons (Ahmed, 1981). The

farmers depending on hired laborers may not have guaranteed supply of wage laborers at the right time and in the right amount. Apart from it, difficulties arise out when the laborer work less effort. But the production can vary greatly depending on the effort that the workers employ during the period they are at work. One-way of getting around this problem is close supervision of activities of workers. A member of the farm can work in field alongside hired workers or simply monitor work effort.

Taslim and Ahmed (1990) showed that the households are very much aware of the shirking problem. More than one-half of the respondent households were certain that hired laborers would shirk if they were not supervised. This is one reason for leasing out land. Another way of getting around the problem is to hire laborers who are paid a share of output they produce rather than a fixed wage. In such an arrangement hired workers have a direct interest in the output they produce and as such are less inclined to shirk. This type of hiring arrangement is quite prevalent in many countries; in the USA such agricultural laborers are known as sharecroppers and in parts of India are *Kishan* (Taslim and Ahmed, 1987). Agricultural production has to be planned, managed and executed by the members of the family and all other co-operating factors like bullocks, fertilizer, water, etc. have to be provided. If the farmer does not own or provide these factors or there are no members of his family available for undertaking the managerial function, share laborers are not suitable for employment.

The third method of obviating the shirking problem is to do away with hired laborers altogether. Leasing out land under various tenancy arrangements can do this. Nearly three-quarters of the respondent households who leased out land cited that shortage of family workers as the most important reason for leasing out land. If employment opportunities outside of agriculture exist, it would be an important factor for determining the actual availability of family workers for farming. If any member of the farm family can find an off-farm employment that yields an income greater than what he can produce in agriculture, it is rational for him to opt for out of agriculture. If all the adult male members of the family can find outside employment, which is more profitable than agriculture, the family can dispose of its entire arable land either by leasing or outside sale. Similarly, the number of family workers available for cultivation may be a decision variable influenced by outside earning opportunities.

5.2 Land Leasing: Tenant's Perspective

In this section it has been tried to find out the real causes of rent-in land by the tenant with a view to analyze the existence of different types of contractual arrangements. At the out set, it will be examined various socio-economic, cultural, social values and beliefs, economic and cultural factors that affect rent-in land of the tenant.

5.2.1 Socio-Economic Factors

In the leasing market, socio-economic condition of a tenant farm affect seriously in rent-in land due to his social desire. Many economists and social scientists pointed out that in general, there would be abhorrence to work as an agricultural or petty wage laborer. Till now, it is considered that agricultural and petty wage laborers are usually at the bottom rung of the social ladder. A farmer who is not already at the bottom rung would resist employing a part of his family labor as agricultural wage labor even though it is redundant or cannot be gainfully employed in the family enterprise.

Bliss and Stern (1981) mentioned that the member of the *Thakur* caste in the (Indian) village of Palanpur greatly used to dislike working for others and Nabi (1985) finds that the cultivating *Bradry* class of farmers in the (Pakistan) province of Punjab has a similar distaste for working for others in the locality. Taslim and Ahmed (1990) showed that this tendency is prevailing in Bangladesh also. They showed that the landed peasants who lease (in) some land have strong distaste for wage labor. But the landless tenants have not distaste for wage labor. They have reached this conclusion from empirical survey of two villages under the district of Narayangong.

5.2.2 Structural Factors

It is no doubt that structure of a tenant household affects land leasing. Because, highly monsoon oriented rice cultivation hinders the farm households to adopt agricultural wage employment as a profession for subsistence. The demand for agricultural labor is highly flexible and uncertain. To remove this uncertainty in a great deal, marginal and landless households rent in land for cultivation. Structural adjustments such as management and entrepreneurial skills of the households require leasing land by them. Leasing land from others can gainfully employ

management and entrepreneurial skills of a particular household, which are not marketable. Even if the households were to employ the excess family labor in the agricultural labor market it would get as little return as an ordinary labor gets. This type of under remuneration is more prevalent in case of work basis wage system. This system of wage giving now a day is dominant in the agricultural labor market especially during peak seasons. Bliss and Stern pointed out that leasing could be viewed also as a trade in managerial services from which both parties may gain.

A landowner with excess labor may also prefer renting land to employ his labor instead of hiring it out. There may be several reasons for this preference. Firstly, due to monsoon oriented nature of rice cultivation and the casual nature of employment in agriculture, a landowner with excess labor would not be certain about selling his excess labor in the labor market. Moreover, it is hazardous to find a job everyday. But if land is rented in, labor can be used in one's own way. In addition, when physical capability is at stake and at low levels of income, it is natural for one to avoid risk.

Secondly, by renting land one can work a longer time on one's farm whereas casual employment implies a standard time of work. One may prefer self-employment to wage labor for physical and social reasons. An owner cultivator, who has some surplus labor but does not want to hire it out, can use it if he rents in land. Furthermore, the amount of land rented-in by a share tenant would be positively related to surplus labor in the tenant family, because the rental share being fixed the landlord can increase his rent by giving more land to the tenant who has a higher amount of surplus labor. "The closeness of the association would depend on the pressure of the demand for casual workers which in turn depends on the degree of inequality in the distribution of land among cultivators and the proportion of wage-laborer families in the area"(Hossain, 1977).

Another structural constraint is the fuller utilization of bullock capacity and it is considered an important reason for land leasing (Taslim and Ahmed, 1990). They showed that 3/10th of the households cited this cause for leasing land. Moreover, their findings were that draught power plays vital role in the leasing decision. In Bangladesh, draught power is almost provided by draught animals like bullocks and

buffaloes. At least one member of the owner family is required to work with the bullocks if they are hired out because of the possibility of mistreatment of the bullocks by the hirers. Bullocks are valuable animals and it is not easy to replace them because large sum of money would be required to do so. This raises the cost of bullocks' labor substantially to those small farmers who have sufficient idle labor at their disposal. Planting or ploughing operation is very short lived due to the monsoon base rice cultivation. The simultaneous need for bullock services by all farms make the bullock labor market very tight during the plantation period. Owning bullock is also cost-effective. This structural disadjustment of bullock labor services may induce to take a decision of a farmer to rent in land (Taslim and Ahmed, 1990).

5.2.3 Economic Factors

The most important cause for land leasing by the tenant is economic factor. Survey findings reveal that employing self-labor and family labors of the tenant farm are the main cause of leasing land. That is, lack of employment opportunities outside of agriculture and the unskillness of tenant farmer outside of agricultural activities induce tenant farmers to lease in land to eke their subsistence level of income.

5.3 Findings of the Present Study

To have a real picture of reasons for land leasing in Bangladesh agriculture, 5 *maujas* were taken as study area from former 4 divisions for collecting related data. From the collected data decision has been drawn about the causes of land leasing in Bangladesh agriculture. It may entail the support to or disagreement with other studies.

5.3.1 Region-wise Analysis of Determining Factors of Land Leasing

The reason for leasing land in any area depends upon socio-economic condition of tenant as well as geographical situation along with agricultural practices of that area. Moreover, land quality, wage rate, prices of produced rice and weather may affect land leasing. Out of numerous reasons, 5 reasons are included in the model. Since tenant farm leases land from rental market, socio-economic conditions are considered in selecting the factors that affect leasing land.

In order to find out the real cause of renting land by the tenants, five alternative causes were raised upon the tenants and they were free to pick up any one or more causes at a time. It is observed from the survey sample that one tenant mentioned more than one reasons for leasing land at a time. Five alternative reasons are discussed in the questionnaire appended (Appendix-IX).

Factors Responsible Land Leasing in Thakurgaon

Socio-economic conditions as well as agricultural practices differ from one area to another, which may affect tenancy arrangements. As one of the objectives of the study is to analyze the types of variation existing in the tenancy market of Bangladesh, we place an importance on the regional analysis of the issue. Objectives of this study are to analyze the types of variations existing in Bangladesh agriculture, and to examine the causes; analysis is made on the basis of survey result. Table 5.1 shows the survey result about determining factors of land leasing in Thakurgaon.

Table 5.1 Factors Affecting Land Leasing in Thakurgaon

Reasons for Land Leasing	Yes		No	
	No. Of Respondents	% Of Total Respondents	No. Of Respondents	% Of Total Respondents
Use of Available Family labor	45	65.49	15	19.22
Use of Equipment	3	4.17	27	34.62
Acquire of Additional Crop	21	29.17	9	11.54
Others	3	4.17	27	34.62
Total	72	100.00	78	100.00

From the Table 5.1, it is observed that 65.49% respondents reported that they had rent-in land for using available family labor. Another determining factor of leasing land is acquiring additional crop. Out of 30 respondents 21 of them reported that they had rented in land for having additional crop. About 29% respondents reported that they had rented-in land for acquiring additional crop.

The underlining cause of acquiring additional crop is to make safety net against food shortages. Tenant farmers always try to keep a sound food supply for his family members through out the year. They are not accustomed to buying food

from market. This may be another cause of renting land by the tenant. Use of equipment is another cause of renting land constituting 4.17% of total causes. However, other causes also constitute 4.17%. This means that lack of alternative employment opportunities is the main cause of renting land by the tenant.

Factors Affecting Land Leasing in Pabna

From the Table 5.2, it is observed that use of available family labor and acquire of additional crop are dominating. About 60% respondents reported that they had taken land from others for using available family labor. This statistics indicates that lack of employment opportunities is the main cause of land leasing by the tenant.

Table 5.2 Factors Affecting Land Leasing in Pabna

Reasons for Land Leasing	Yes		No	
	No. Of Respondents	% Of Total Respondents	No. Of Respondents	% Of Total Respondents
Use of Available Family labor	44	59.45	16	21.05
Use of Equipment	5	6.76	25	32.89
Acquire Additional Crop	21	28.38	9	11.84
Others	4	5.14	26	34.20
Total	74	100.00	76	100.00

Another dominating cause of leasing land is to acquire additional crop. Since tenant farmers are vulnerable group in food security, they would try to make a safety net against food shortages. From the Table 5.2 it is found that use of equipment does not play significant role in land leasing. Vast use of power-tiller in all regions in rice cultivation reduces the use of drafts animal in tilling land. Thus, it can be concluded that agricultural mechanization in planting land has taken place in all over the country.

Factors Affecting Land Leasing in Gazipur

In study area of Gazipur, only one crop Boro is cultivated. The reasons for leasing land of this area are of similar to other areas as mentioned earlier. Table 5.3 shows the impact of different factors in leasing land.

Table 5.3 Factors Affecting Land Leasing in Gazipur

Reasons for Land Leasing	Yes		No	
	No. Of Respondents	% Of Total Respondents	No. Of Respondents	% Of Total Respondents
Use of Available Family labor	43	48.31	17	27.47
Use of Equipment	5	5.62	25	40.98
Acquire Additional Crop	18	20.22	12	19.67
Others	23	25.85	7	11.48
Total	89	100.00	61	100.00

Table 5.3 depicts that available family labor is the main cause of land leasing of this area. More than 48% respondents reported that they had rented-in land for using available family labor. Another factor that affect in leasing is acquiring additional crop constituting about one-fifths of the total causes. An exceptional finding is observed in Gazipur, which is other factor. The tenant of this area may have found land leasing is profitable. To earn profit, tenant may lease in land. From the above analysis it is evident that lack of employment opportunities is the main cause of land leasing.

Factors Affecting Land Leasing in Kushtia

In Kushtia, tenants are involved leasing land mainly for employing themselves in tenanted land. Since they do not know how to work outside of agriculture, so they are bound to engage them in agriculture either by selling labor or by renting land. Table 6.4 represents the sample survey result.

Table 5.4 Factors Affecting Land Leasing in Kushtia

Reasons for Land Leasing	Yes		No	
	No. Of Respondents	% Of Total Respondents	No. Of Respondents	% Of Total Respondents
Use of Available Family labor	30	51.72	20	32.60
Use of Equipment	5	8.62	25	27.17
Acquire Additional Crop	21	36.21	9	9.78
Others	2	3.45	28	30.43
Total	58	100.00	92	100.00

Table 5.4 reveals that about 52% respondents informed that they had been leasing land for employing their labor endowments. Another important determining factor of leasing land is to acquire additional crop, which constitutes more than 36% respondents. The implication of this statistics is that tenant farmers are vulnerable in food security. Since they are poverty-driven, so they always try to protect themselves against food shortages by making safety-net against food shortages.

Factor Affecting Land Leasing In Feni

Table 5.5 depicts that more than 67% respondents reported that they had leased-in land for using available family labor. Another important reason for leasing land of this area is to acquire additional crop, which is the further indication of vulnerability of food security of tenant farms. In sum, it can be said that employing labor force of tenant family is the main cause of leasing land.

Table 5.5 Factors Affecting Land Leasing in Feni

Reasons for Land Leasing	Yes		No	
	No. Of Respondents	% Of Total Respondents	No. Of Respondents	% Of Total Respondents
Use of Available Family labor	33	67.09	7	9.86
Use of Equipment	0	0.00	30	42.25
Acquire Additional Crop	21	26.58	9	12.68
Others	5	6.33	25	25.21
Total	79	100.00	71	100.00

5.4 Regional Comparison Factors Affecting Land Leasing

For better understanding of regional variations of affecting factors of land leasing, comparative analysis is made on the basis of survey results. Table 5.6 depicts the regional comparison of affecting factors of land leasing.

Table 5.6 Regional Comparison of Factors Affecting Land Leasing

(Figures in Percentages)

Reasons for Land Leasing	Area				
	Thakurgoan	Pabna	Gazipur	Kushtia	Feni
Use of Available Family Labor	65.49	59.45	48.31	51.72	67.09
Use of Equipment	4.17	6.76	5.62	8.62	00.00
Acquire of Additional Crop	29.17	28.38	20.22	36.21	26.58
Others	4.17	5.14	25.85	3.45	6.33
Total	100.00	100.00	100.00	100.00	100.00

Table 5.6 reveals that the highest number of respondents reported that they had leased-in land for using available family labor. The highest number of respondents (about 68%) in Feni, and the lowest numbers (about 48%) in Gazipur reported that they had rented-in land for using available family labor. Moreover, about 65% in Thakurgoan, 60% in Pabna and about 52% in Kushtia reported that they were renting land for the same purpose. This finding depicts that land leasing for using available family do not vary among the regions. That is, main cause behind renting land by the tenant whole over Bangladesh is same due to the lack of employment opportunities in rural areas.

Use of equipment for renting land does not play significant role whole over Bangladesh. Near about 5% respondents reported that they had rented-in land for using equipment. Another important factor that affects land leasing is the need for additional crop. About 29%% in Tahkurgoan, 28% in Pabna, 20% in Gazipur, 36% in Kushtia and 27% in Feni reported that they had rented-in land for acquiring additional crop respectively. From these statistics it can be concluded that vulnerability in food security play vital role in land leasing, which does not vary significantly among the regions. Other causes do not play significant role in land leasing in all regions. Thus, the regional comparison of affecting factors of land leasing implies that the use of available family labor and to acquire additional crop are the main factors of land leasing in all over Bangladesh, which agrees with regional findings.

5.5 Determining Factors of Land Leasing

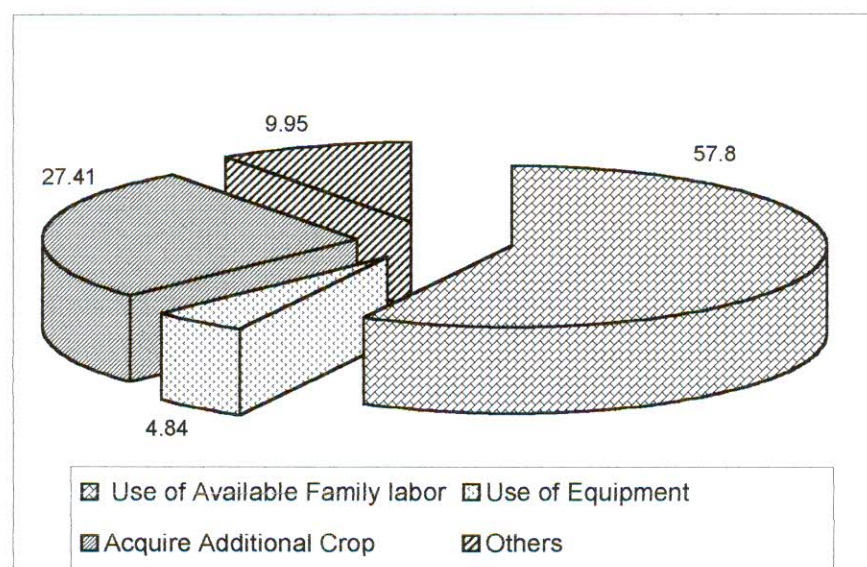
Since the socio-economic condition of tenant as well as agricultural practices more or less same and the problem of tenant farms do not vary significantly over the country, the reasons for leasing land remains more or less same whole over the country. After discussing the regional scenario of causes of land leasing, the reason behind land leasing by the tenant in Bangladesh agriculture has become nearly clear. For better understanding about factors affecting renting land it is require to explore the sample survey result, which is given below.

Table 5.7 Factors Affecting Land Leasing

Reasons for Land Leasing	Yes		No	
	No. Of Respondents	% Of Total Respondents	No. Of Respondents	% Of Total Respondents
Use of Available Family labor	215	57.80	85	22.49
Use of Equipment	18	4.84	132	34.92
Acquire Additional Crop	102	27.41	48	12.70
Others	37	9.95	113	29.89
Total	372	100.00	378	100.00

Table 5.7 depicts that 57.80% respondents reported that they had leased-in land for employing available family labor. Only 22.49 % respondents answered negative.

Figure 5.1: Share of Different Factors of Renting Land



Source: Table 5.3

Another important cause of land leasing by the tenant is to acquire additional crop. Out of total 150 respondents 102 informed that they had leased in land for having additional crop to provide food supply for their family member. Out of 20% of total respondent, 13.87% respondents reported that they had leased in land for purpose of ensuring food supply to their family. A similar explanation is explored in figure 5.1.

Foregone analyses discussed the reasons for rent in/out land by the tenants and landowners. The emphasis has been given on the factors affecting on leasing land. Moreover, the underline causes of differences in affecting factors of land leasing were of great importance. Survey findings reveal that there is a great variation of leasing land among the regions as well as within the region. From the survey result it is observed that mainly economic factor and the practices of agricultural activities play dominant role in leasing land by the tenant. Among the different reasons it is evident that employing labor force of a tenant family is the main cause of leasing land.

Moreover, it can be said that since the tenant farmers are mainly vulnerable groups of our society, they always try to make a safety net of food supply against food shortages and unavoidable circumstances. Other factors (e.g. using agricultural equipment and others) do not play major role in decision-making about renting land. In decision-making to rent in land employment of tenant's labor force and poverty (food security) play vital role. Lack of employment opportunities outside of agriculture are playing dominant role in land leasing land. The analysis shows that socio-economic, social values and norms and above all, economic factors affect decision to rent out land by the landowners. The disparities among the regions are also the result of above issues. That is, it can be concluded that unemployed labor force of tenant farm is the crucial factor of land leasing. Moreover, poverty and food security also play dominant role in leasing land.

Chapter 6

Productivity and Profitability of Tenanted Land

Cost of production in Bangladesh agriculture is high no doubt, but the return, if the land is properly cultivated, can more than compensate the cost. The main objective of this chapter is to examine the impact of inputs on output considering regional and seasonal variations in profitability on tenanted land under different contractual arrangements. In addition to this, a comparative analysis on costs and return from rice cultivation namely, Aman and Boro is done. It is found that Aus is not cultivated in the study areas. Accordingly, cost and return of Aus has not been estimated. Comparison of regional variation in cost and revenue of rice production has been analyzed. From the regional comparison, generalization has been made in Bangladesh context. Cost of production in this study has been estimated by summing up all the family supplied and purchased inputs used for producing rice in Aman and Boro seasons. Moreover, revenue is measured in taka and evaluated at the prevailing market price during the period of data collection. Likewise, costs were estimated in those growing seasons.

6.1 The Production Relation and Results

The first section of this chapter comprises of the impact of various inputs, namely labor, capital, fertilizer, irrigation and rent on output (rice production). For this purpose the OLS estimation method has been applied to the empirically specified regression model. For analyses, linear and Cobb-Douglas type model has been used as production models. The second section presents the productivity of tenanted land. For this purpose estimation of production costs and revenue generated have been computed considering regional and seasonal variation. Using costs and revenue figures, profitability of tenanted land has tested statistically. The production relation has been shown using the linear regression model (LRM) and Cobb-Douglas (C-D) type production function.

6.1.1 The Regression Model and Estimation: Aman

The main objective of this section is to estimate the response of output to the used input in Aman production. The survey result shows that Aman is produced in four regions except in Gazipur. Aman is mainly rain fed all over the country. To form a regression model and to estimate the nature of response of output to used inputs, inputs are categorized into capital, labor, fertilizer and rent. In regression model an estimating equation is developed to describe the pattern or functional nature of the relationship that exists among the variables.

Since production per acre yield (Y) is considered as a function of labor, capital, fertilizer, irrigation and land quality (rent), multiple regression model is developed for explaining the dependability of Aman production (Y) on independent variable. So,

$$Y_a = A + b_1 K_1 + b_2 L_2 + b_3 F_3 + b_4 I_4 + b_5 R_5 + u$$

Where,

Y_a = Estimated production (in value), A = intercept;

K = value of capital;

L = value of labor in money terms;

F = value of fertilizer;

I = cost of irrigation;

R = value of rent (proxy for land quality);

b's are regression coefficients: and

u = disturbance term.

Table 6.1 Regression Results for Aman

Model	Unstandardized coefficients		Standardized Coefficients	t-value	Significance
	b	Standard Error (e)	β		
Constant	8255.618	860.324		9.596	.000***
Capital	.636	.335	.186	1.898	.061
Labour	.500	.136	.399	3.692	.000***
Fertilizer	.523	.656	.077	.798	.427
Rent	-9.01E-03	.161	-.005	-.056	.955*

Dependent variable: production

*** Significant at 0.1% levels (highly significant), $R^2 = 0.282$,

$\overline{R^2} = 0.252$

*Significant at 5% levels.

From Table 6.1, the regression equation can be written as;

$$Y_a = 8255.618 + 0.636K + 0.500L + 0.523F - 0.009R$$

Where, Y_a = Estimated Value of Aman Production, K= Capital, L= Labor, F= Fertilizer and R=Rent.

The regression coefficients (b_i) are known as partial slope coefficients. In other words, it gives the 'direct' or 'net' effect of one unit change in any one explanatory variable on the mean value of Y_a , holding the values of other regressors constant. The standard error indicates the extent of the spread or scatter or dispersion of the points about the regression line. It estimates how dependable is the estimate. In the literature of statistics, the smaller this measure is, the more dependable the prediction is likely to be. It is used to qualify the estimate made with the regression equation by indicating the extent of the possible variation (or error) that may be present. The value of t-ratio of labor indicates that at the 1 percent level it is highly significant.

The values b_1 (0.636) measure the change in the mean value of Y_a , $E(Y_a)$, per unit change in K, holding the value of L, F, and R constant. For example, the value of coefficient, 0.636 is the change in average production, (Y_a) when one unit of capital (K) changes in the production process while the uses of other inputs remain constant. The positive coefficient of capital implies that there is a direct relationship between capital and production of Aman. The value of standard error e, for capital is 0.335, which shows the dispersion of capital use in Aman cultivation. The value is accepted at 6% level of significance.

The value of coefficient (0.5) measures the average change in production of Aman (Y_a) for one unit change in labor (L) assuming other inputs constant. The economic interpretation of coefficient of labor means that in Aman production if labor changes in one unit, average production of Aman will change by 0.5 units. The positive value of coefficient shows a positive relationship between production of Aman and labor input. The estimated standard error of labor is 0.136.

The estimated regression co-efficient of fertilizer is 0.523. This indicates that fertilizer explains more than 52% response of Aman production while remaining other inputs are constant. The estimated value of standard error (0.656) of fertilizer use is significant. The t-ratio (0.798) at 42.7% level of significance is not significant. The exceptional regression result is found in case of rent. The estimated value of regression coefficient is -0.009. This shows that (-9/10%) of a mean value of Y_a is explained by rent. The negative sign shows that increase in rent will decrease the average production of Aman. The estimated value of standard error of variable rent is 0.161, which indicates that variation of actual values from the regression line is small. The t-ratio (-0.056) indicates that at the variable is not significant.

The coefficient of determination (R^2), is very low (0.282), which indicates that the sample regression line is poorly fitted. The adjusted R^2 value also does not indicate any improvement. However, in social science studies, due to specification error of the model we may get lower value for R^2 .

6.1.2 Cobb-Douglas Type Productions Function for Aman

It is already mentioned that the C-D type production function is widely used in empirical work.

Table 6.2 Regrsson Results of C-D Function for Aman

Model	Unstandarized Coefficients		Standardized coefficients	t-value	Significance
	(β)	Standard Error	B		
(Constant)	7.219	.513		14.076	.000
Labor	6.899E-02*	.040	.191	1.715	.090
Capital	9.611E-02	.045	.218	2.135	.035
Rent	4.668E-03	.055	.008	.085	.933
Fertilizer	0.123	.037	.313	3.298	.001

Dependent variable: production. $R^2=0.277$, $\overline{R^2}=0.247$

From the Table 6.2, the Cobb-Douglas type production function of Aman can be written as

$$Q = AL^{\beta_1} K^{\beta_2} R^{\beta_3} F^{\beta_4}$$

The above function is non-linear which can be expressed alternatively as

$$\ln Q = \ln A + \beta_1 \ln L + \beta_2 \ln K + \beta_3 \ln R + \beta_4 \ln F + u$$

$$= A + \beta_1 \ln L + \beta_2 \ln K + \beta_3 \ln R + \beta_4 \ln F + u$$

Where $\ln A = A$.

This model is linear in the parameters, $A, \beta_1, \beta_2, \beta_3, \text{ and } \beta_4$, linear in the logarithms of regressand and regressors. The estimated C-D type production function of Aman as follows;

$$\ln Q = 7.219 + 0.06899 \ln L + 0.0964 \ln K + 0.004668 \ln R + 0.123 \ln F + u$$

The above linear-log model, which is the counterpart of C-D type production function of Aman, indicates the basic properties of C-D production function. The estimated value of $0.06899(\beta_1)$ is the partial elasticity of output with respect to labor. It measures the percentage change in output for a 1% change in labor, holding other inputs constant. The figure 0.06899 indicates that 1 unit increase in labor input will increase about 0.069 unit of output.

Similarly, the value of 0.0964, 0.004668 and 0.123 indicate that one unit increase in K, R and F while holding other inputs constant will increase about 0.0964, 0.005 and 0.123 unit of output respectively. These values are the partial elasticity of K, R and F respectively in the Aman production. The sum of $(\beta_1 + \beta_2 + \beta_3 + \beta_4)$ gives the information about returns to scale, i.e. the response of output to a proportionate changes in input. The sum of $(\beta_1 + \beta_2 + \beta_3 + \beta_4)$ is equal to $0.292768(0.06899 + 0.0964 + 0.004668 + 0.123)$. Since this sum is less than 1, there are decreasing return to scale in the production of Aman does imply that doubling the inputs will produce the output less than double.

If we compare the coefficient of determination for both the linear and C-D production function, none indicates any improvement over other form. The R^2 value (0.277) shows that the regression line is poorly fitted. However, the adjusted $R^2 (\overline{R^2})$ value does not show any improvement. In social science, specifically in agriculture, the lower value of these statistics is due to the specification error of the model.

6.1.3 Regression Results for Boro

Table 6.3 Regression Results for Boro

Model	Unstandardized Coefficients		Standardized Coefficients	t- value	Level of Significance
	b	Standard Error (e)	β		
Constant	21162.472	1439.450		14.702	.000
Capital	-1.061	0.494	-.163	-2.147	0.033
Labor	0.157	0.158	.072	.990	.324
Fertilizer	-3.440	0.518	-.580	-6.645	.000
Irrigation	0.7941	0.214	.345	3.708	.000
Rent	0.369	123	.219	2.986	.003

Dependent variable: production of Boro (in value term)

$$R^2 = 0.322, \quad \bar{R}^2 = 0.298$$

From the coefficient Table 6.3, regression equation for Boro production can be written as follows;

$$Y_b = 21162.472 - 1.061K + 0.157L - 3.440F + 0.794I + 0.369R + u$$

Figure 21162.472(a) is the intercept- the value of Y_b when K, L, F, R and I are zero.

This figure (21162.472) gives the mean or average effect on Y_b when all variables (i.e. K, L, F, I and R) are excluded from the model. However, its statistical interpretation is the average value of Y_b when all indigenous independent variables are set equal to zero. This value represents the higher role of error term. Nature based and monsoon oriented agriculture leads to higher disturbance term due to having uncertainty. Since the value of production is measured in monetary unit per acre, it is obviously a greater value of production. The coefficients are called the partial regression coefficients. The value $b_1(-1.061)$ measures the change in the mean value of Y_b for 1 unit changes in K, remaining the values of L, F, R and I are constant. The negative sign indicates negative 'direct' or the net effect of a unit change in K on the mean value of Y_b , when other indigenous independent variables are set equal to zero. Since capital is considered here as the sum of cost of seedbed preparation, ploughing and pesticides, these costs do not play direct role in the

changes of production. So, the negative coefficient of K results in negative change in Boro production. It means, only change in K while remaining other inputs constant will decrease production. This may be the result of nature of agricultural production.

The standard error of K (0.494) measures the dispersion of the sample data points about the multiple regression planes. The smaller the standard error, the stronger is the evidence that the estimates are statistically significant. The coefficient of L indicates that one unit change in L would change the average value of Y_b by 0.157 units. The standard error of labor is 0.158. The t-value is 0.990, and it is significant at 32% levels. It means that it is not statistically significant. Another major input used in the Boro production is fertilizer. The coefficient of F (-3.440) shows that average value of Y_b will change by -3.440 units if fertilizer will change by one unit assuming all other inputs constant. Only use of fertilizer in the production of Boro will decrease the value of output because, fertilizer cannot produce any more unit of output alone.

The estimated t-value (-6.645) indicates that it is highly significant. Since Boro production is artificially irrigated and it is impossible to produce Boro without irrigation during dry season, it is no doubt that irrigation play crucial role in the production of Boro. The estimated value of coefficient of irrigation is 0.794, which shows the average value of Y_b (0.794) will change by 0.794 units when irrigation is change by one unit, remaining other inputs constant. The estimated t-value (3.708) shows that it is highly significant.

Another component of cost is rent. Rent is paid either prior to production or to post of production in the form of cash or in kind. Whether the payment is made in kind or cash, rent does not play direct role in the production process. It may play role in the production indirectly when it is termed as land quality. Obviously, rent varies directly with the land quality. This will be explored in the subsequent chapter. The estimated coefficient of R values (0.369) shows that average value Y_b would change by 0.369 units if R is changed by 1 unit while other variables' are set equal to zero. The standard error of R (0.123) expresses that actual values of sampling distribution about regression line were less dispersed. The t-values indicate that it is significant.

The coefficient of determination (R^2), appears as of very small value (0.322). This indicates that the sample regression line is poorly fitted. The adjusted R^2 ($\overline{R^2}$) value (0.298) also does not indicate any improvement. However, in social science studies, due to the specification error of the model, may appear small value of R^2 .

6.1.4 Cobb-Douglas Type Production Function of Boro

Table 6.4 Results of the Cobb-Douglas Production Function Estimation for Boro

Model	Unstandardized Coefficient		Standardized Coefficients	t-value	Level of Significance
	α	Standard Error	β		
(Constant)	9.128	0.471		19.397	.000***
Irrigation	0.182	0.040	0.508	4.560	"
Labor	5.949E-02*	0.027	0.157	2.226	.028
Capital	-385E-02	0.039	-.074	-.977	.330
Rent	7.121E-02	0.026	.192	2.751	.007
Fertilizer	-0.213	0.028	-.806	-7.576	.000***

*Dependent variable is production *** Significant at 0.1% levels.

$$R^2 = 0.382, \quad \overline{R^2} = 0.360$$

From the above Cobb-Douglas type production, it can be written as following log linear model.

$$\ln Q = 9.128 + 0.182 \ln I + 0.05949 \ln L - 0.0385 \ln K + 0.07121 \ln R - 0.2130 \ln F + u$$

The above linear-log model is the counterpart of Cobb-Douglas type production function for Boro. The properties of this type production function are;

α_1 (=0.182) is the partial elasticity of output with respect to irrigation, (I) measures the percentage change in output for 1% change in irrigation, holding other inputs constant. Figure 0.182 indicates that 1 unit increase in irrigation would increase 0.182 unit of output. Similarly, the partial elasticities α_2 (=0.05949) and α_4 (=0.07121) shows that 1 unit increase in labor and rent will increase 0.05949 and 0.07121 unit of output respectively. Likewise, α_3 (= -0.0385) and α_5 (= -0.2130) are the partial elasticities of output with respect to capital and fertilizer respectively. The

negative sign implies that increase in either capital or fertilizer, holding other inputs constant would decrease output. The explanation of negative partial elasticities of output with respect to capital and labor may be as follows;

- a) There may be exhaustive in the use of seed, plough, and pesticide within the existing state of technology. To increase Boro production emphasis should be given on balanced input use.
- b) The negative sign of partial elasticities of output with respect to fertilizer indicates that increased use of fertilizer will reduce Boro production. Obviously, fertilizer includes chemical and non-chemical fertilizer but the portion of non-chemical fertilizer use in Boro production is not significant. Highly intensive use of chemical fertilizer reduces land quality that should be stopped. These findings imply that dependence on chemical fertilizer should be reduced.

But in case of irrigation, labor and rent, the partial elasticities are positive. The positive partial elasticities of output with respect to irrigation and labor indicate that increase in labor and irrigation use in Boro cultivation will increase total production up to the certain level. Moreover, partial elasticity of output with respect to rent (land quality) implies that increase in rent will increase in production.

The sum of partial elasticities ($\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5$) gives the information about returns to scale, i. e. the response of output to a proportionate change in input. The sum of ($\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5$) is equal to 0.0612 ($=0.182+0.05949-0.0385+0.07121-0.213$). Since this sum is less than 1, there are decreasing returns to scale in Boro production, doubling the all inputs will increase less than double the output. In other words, since the sum is less than 1, 1% increase in input will increase the output less than 1 % ($=0.0612\%$).

From the above regression results of the C-D production function for Boro, it is appeared that production of Boro is positively related with irrigation, labor and rent (land quality) but negatively with capital and fertilizer. That is, impact of three inputs (irrigation, labor and land quality) on output is positive. And the impact of two inputs (capital and fertilizer) on output is negative. The negative impact of capital and

fertilizer may be the excessive use of chemical fertilizer and the specification error of regressor (here, seed, plough and pesticide). Excessive use of chemical fertilizer, seed, plough and pesticide do not produce additional output within the existing state of technology. Moreover, Boro production requires balanced use of different inputs. The coefficient of determination (R^2) is very low (0.382), indicating that the regressors poorly explained output and the sample regression line is poorly fitted. The adjusted R^2 value (0.360) does not indicate any improvement. However, in social science studies, especially in agricultural production and in the specification error of model, lower R^2 value may arise.

6.2 Costs, Revenue and the Profit from Rice Production in the Tenanted Land

The following section presents production costs incurred in both Aman and Boro production. Cost of production is estimated in monetary unit. To have a clear picture of variation of costs in different regions, regional consideration is made.

6.2.1 Regional Analysis of Costs of Aman Production

Pabna

At first, cost incurred for Aman production in Pabna district is represented in Table 6.5.

Table 6.5 Per Acre Cost of Aman Production in Pabna

Inputs	Labor	Capital	Rent	Fertilizer	Total
Average Costs(in TK.)	1600	861.67	4436.67	196.67	7095.00
Percentage	22.55	12.14	62.53	2.77	100
Minimum (in Tk.)	900.00	750.00	2250.00	90.00	4440.00
Maximum (in Tk.)	2400.00	900.00	6000.00	300.00	9450.00
SD	427.96	52.56	1613.90	68.51	1826.05
CV	26.75	6.10	36.38	34.84	25.74

Note: i) Total respondents 9. ii) Non-irrigated rice.

Table 6.5 depicts that a small portion of tenants (9 out of 30) leased-in land for producing both Aman and Boro. Since Aman production requires less capital, labor and fertilizer and no irrigation, landowners are not willing to lease out Aman producing land. Thus, mainly Boro producing land is leased-in under different contractual arrangements. Per acre cost incurred in Aman cultivation is Tk.7095.

Labor, capital, rent and fertilizer contribute about 22%, 12%, 63% and 3% costs respectively. The lowest contribution to cost is contributed by capital and the highest by rent. High cost of hiring land is due to the less supply of Aman producing land in tenancy market and the lower production cost, which induces the landowners to cultivate land by hiring labor. The standard deviation (SD) and the coefficient of variance (CV) show that there is a significant difference in labor cost. It may be the result of under estimation or no calculation of self-labor cost by the tenant. Use of capital in Aman production does not vary significantly. It is due to the absence of alternative use of capital. The contribution of rent is the highest to AC due to the high demand for Aman producing land.

The SD and CV of hiring cost of land (rent) show that there are discrepancies in rent payment. The absentee landowners owned most of the Aman cultivated lands. Only a small portion of Aman cultivated land comes into lease market from the non-resident landowners. Land leasing from absentee landowners depends on tenant-landowners relationship. On the contrary land leasing from resident landowners depends only on rent. This leads to larger differences in rent rate.

Feni

Per acre cost incurred in Aman cultivation in Feni can be seen from Table 6.6.

Table 6.6 Per Acre Cost of Aman Production in Feni

Inputs	Labor	Capital	Rent	Fertilizer	Total
Average Costs (in Tk.)	5952.30	1765.90	4843.30	1027.00	13588.50
Percentage	43.80	13.00	35.64	7.56	100
Minimum (in Tk.)	4620.00	990.00	2700.00	600.00	10878.00
Maximum (in Tk.)	7890.00	3600.00	6435.00	1461.00	15240.00
SD	925.79	848.10	1275.00	275.38	1336.37
CV	15.55	48.03	26.33	26.81	9.83

Table 6.6 reveals that hundred percent tenant cultivate Aman in Feni. Contribution of Labor, capital, fertilizer and rent were about 44%, 13%, and 36% and 8% of per acre cost respectively. The estimated SD and CV of per acre cost are 1336.37 and 9.83, which indicate the significant variation of individual cost items. Labor is on the top position (43.80%) on the cost items. This may be attributed by the following causes.

- a) This area is commercialized and the significant portions of people work in abroad, which leads to tight labor market in that area.
- b) Most of the tenant farmers are engaged in local trading activities instead of engaged in agriculture, which are relatively degrading in the local society resulting high wage rate compared to other districts.
- c) Rent is another dominant cost component in the production process. It constitutes 35.64% of AC. The lowest contribution to AC is of fertilizer. It indicates that fertilizer used in this area is not more significant and does not vary enormously from tenant to tenant.

Kushtia

Variations in cost among and within the areas are inevitable. Table 6.7 shows the contribution of different inputs to AC incurred in Aman production.

Table 6.7 Per Acre Cost of Aman Production in Kushtia

Inputs	Labor	Capital	Rent	Fertilizer	Total
Average Costs (In Tk.)	3363.70	826.00	3469.00	1035.00	8693.70
Percentage	38.69	9.50	39.90	11.91	100
Minimum Costs (In Tk.)	1800.00	690.00	2250.00	135	6915.00
Maximum Costs (In Tk.)	6300.00	1140.00	5400.00	1500	13080.00
SD	791.16	118.11	957.62	268.85	1414.38
CV	23.52	14.30	27.61	25.98	16.27

Note: i) Total number of respondents 30. ii) Non-irrigated rice.

Table 6.7 depicts that out of average cost (AC) about 39%, 10%, 40% and 12% are contributed by labor, capital, rent and fertilizer respectively. Hired cost of land (rent) also varies from one tenant to another. But its CV shows that rent distribution among different tenant with respect to total cost consideration is not large. Use of capital and fertilizer does not vary significantly among the tenants. Their estimated CV and SD indicate that cost of capital varies more than that of fertilizer. In total cost consideration, SD and CV are 1414.38 and 16.27 respectively. These imply that within the area, variation of total cost is not ambiguous but rather even.

Thakurgaon

The contribution of different factors to total cost incurred in Aman production is shown in Table 6.8.

Table 6.8 Per Acre Cost of Aman Production in Thakurgaon

Inputs	Labor	Capital	Rent	Fertilizer	Total
Average Costs (In Tk.)	1570.80	1000.00	3364.50	908.10	6828.40
Percentage	23.00	14.64	49.27	13.30	100.22
Minimum Cost (in Tk.)	399.00	300.00	1425.00	399.00	3879.00
Maximum Costs (In Tk.)	2316.00	1959.00	5400.00	1500.00	9774.00
SD	468.20	490.69	1343.80	220.12	1603.87
CV	29.85	49.07	39.94	24.24	23.49

Note: i) Total respondents are 30; ii) Non-irrigated rice.

Table 6.8 shows that average cost (AC) of Aman production in Thakurgaon is amounted to Tk.6828.40. Out of this AC (6828.40), hiring cost of land is almost 50%, whereas contribution of labor, capital and fertilizer to AC are 23%, 14.64% and 13.30% respectively. The estimated value of CV is less than the estimated value of SD delineates the lower variation in cost. The SD of labor cost is less than the SD of capital cost. It implies that labor engaged in production is more even than that of capital investment, which is the indication of inequalitarian status of tenants. Variation in cost of hiring land (rent) is large due to differences in land quality. In sum, within the area as well as in the production of individual tenant, cost incurred in Aman cultivation has a great difference.

6.2.1.1 Regional Variation of Cost of Aman Production

Previous analysis shows the existence of variation in cost structure in Aman cultivation. Input's contribution to cost varies from one area to another and from one tenant to another. Table 6.9 reveals the comparative cost analysis derived from sample survey.

Table 6.9 Variations of Inputs Costs in Aman Production (Costs in Taka)

Inputs		Pabna	Feni	Kushtia	Thakuraon
Labor	Average	1600	5952.30	3363.70	1570.80
	Percentages	22.55	43.80	40.07	22.95
Capital	Average	861.76	1765.90	526.00	1000
	Percentages	12.15	13.00	6.27	14.62
Rent	Average	4436.67	4843.30	3469.00	3364.50
	Percentages	62.53	35.65	41.33	49.16
Fertilizer	Average	196.67	1027	1035	908.1
	Percentages	2.77	7.54	12.33	13.27
Total	Average	7095.10	13588.50	8393.10	6843.40
	Percentages	100.00	100.00	100.00	100.00

Note: i) Figures are rounded up after decimal. ii) Aman is not cultivated in Gazipur. ii) Non-irrigated rice.

Table 6.9 shows that the highest labor cost is incurred in Feni and the lowest in Thakurgaon. The second lowest labor cost is incurred in Pabna and the second highest in Kushtia. Labor cost is more or less same both in Pabna and in Thakurgaon. But in Feni and Kushtia it differs significantly. The main causes of differences in average labor cost among the regions are the employment opportunities. In Feni, migratory populations are high and in Kushtia there is an industrial area adjacent to the study area. Proximity to industrial area and the migration of rural people to abroad has made the high wage rates in Kushtia and Feni. Moreover, within the region, about 22% labor cost in Pabna, 44% in Feni, 40% in Kushtia and 23% in Thakurgaon respectively. This finding is the further indication of disparities in employment opportunities among the regions.

The average costs of capital are more or less same for all regions except for Kushtia. The highest percentages of costs are contributed by capital in Feni and the lowest in Kushtia. The implication of insignificant variations of capital costs is that agricultural practices do not vary enormously among the regions. The highest amount of cost is incurred by rent in all regions. Rent is more or less same in Pabna and Feni but

higher than similar amount for Kushtia and Thakurgaon. The rent cost contributed about 63% in Pabna, 36% in Feni, 41% in Kushtia and 49% in Thakurgaon. Availability of Aman cultivable land is low compared to its demand, raises the rent for it in Pabna. In Feni, there are a large number of absentee landowners who are supplying land in rental market resulting reduced rent. The underline implication of insignificant variation of rent for all regions is that the supply of land relative to its demand is lower in all over Bangladesh.

The lowest fertilizer costs are found in Pabna (3%) but in other regions fertilizer costs are higher and more or less same. Traditional variety of Aman is cultivated in Pabna, which does not require fertilizer. In Feni, Kushtia and in Thakurgaon fertilizer was contributed about 8%, 12% and 13% costs respectively.

6.2.1.2 Cost Analysis of Aman (whole area)

From Table 6.10 it is found that cost of different inputs used in production was estimated in terms of monetary unit for having unitary measure of cost of production. Different inputs are measured in different units in the study area as well as in Bangladesh. Moreover, types of wage payments are also different. Cost incurred in rice production, contributed by different inputs, is broadly classified into 5 categories. These inputs are irrigation, labor, capital, land and fertilizer. Table 6.10 shows the contribution of different inputs to cost.

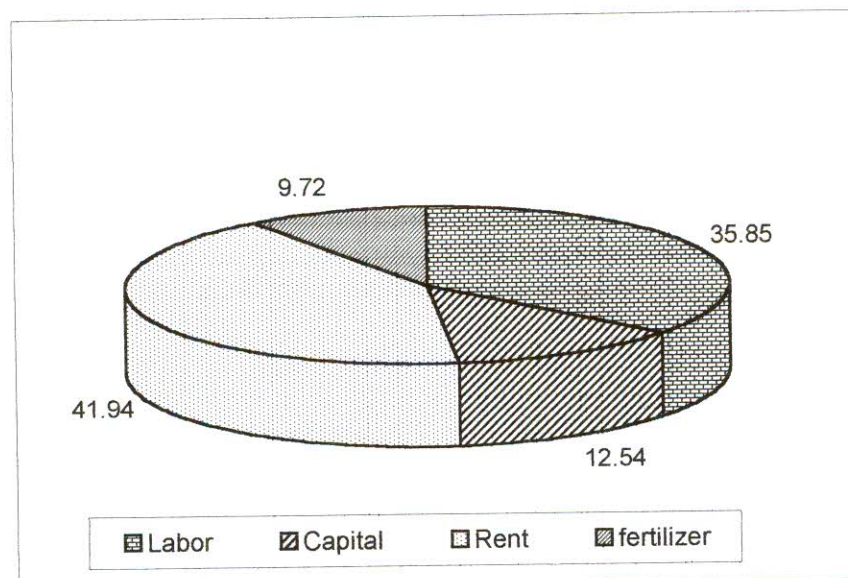
Table 6.10 Share of Different Inputs to Per Acre Cost in Aman Production

Statistics	Labor	Capital	Rent	Fertilizer	Total
Average Costs (In Tk.)	3371.33	1179.52	3945.00	914.12	9405.42
Percentages	35.85	12.54	41.94	9.72	100.05
Minimum Cost (In Tk.)	399.00	300.00	1425.00	90.00	3879.00
Maximum Costs (In Tk.)	7230.00	3600	6435.00	1500.00	15240.00
SD	1841.69	675.66	1396.90	337.95	3124.00

Note: i) Total Number of Respondents 99. ii) Non-irrigated rice.

The estimated per acre AC (Average cost) of Aman is Tk.9405.42. Out of AC, 35.85%, 12.54%, 41.94% and 9.75% costs are contributed by labor, capital, rent and fertilizer respectively. The composition of various input costs in Aman production can be seen from the figure 6.1.

Figure 6.1 Composition of Various Input Cost in Aman Production



Source: Table 6.10

Average cost of Aman production varies from farmers to farmers due to hidden cost, which could not be measured.¹ From the above findings it is clear that there are significant differences in the cost of Aman production. One cause of these differences is the use of local seed and HYV (High Yielding Varieties). Actually, in Pabna, traditional variety of Aman is being cultivated. This variety of Aman does not require any fertilizer and in turn its production per acre is low. However, in Kushtia, Feni and in Thakurgaon HYV are used and its production is highly fertilizer intensive. The last and the most important cause of variation of labor cost is the result of proximity to the town of the study area, employment opportunities, off-farm employment opportunities, market accessibility, and so on. That is why; a significant variation in cost incurred in Aman production is evident.

6.2.2 Cost of Boro Production

In the following section cost of Boro production is discussed. Boro production in Bangladesh is highly intensive to irrigation, fertilizer, and pesticide and also to labor. The present section introduces the cost incurred in Boro production along with their variations.

¹ Hidden cost may be the cost of removal of weed, fence-making, guard against the attack of cattle, goat, and sheep, which are not estimated normally by the tenants.

6.2.2.1 Regional Analysis of Cost of Boro Production

To have a better understanding of cost scenario of Boro production, which is entirely artificially irrigated all over the country, requires region-wise analysis of cost structure.

Pabna

From the Table 6.11 it is observed that 33.04% and 22.71% costs are contributed by irrigation and labor respectively. Meanwhile, capital and fertilizer incur 6.45% and 9.87% of costs respectively. The second largest (27.93%) contribution to AC is by rent. The SD and CV of irrigation cost are estimated at 1045.26 and 12.78, which would imply that the existence of greater variation in irrigation cost. Since irrigation costs are paid in terms of produced crop, its variation depends on the per acre production of rice. The contribution of labor cost to AC is 22.71% and its SD and CV are 1090.99 and 15.82 respectively.

Table 6.11 Per Acre Cost of Boro Production in Pabna

Inputs	Irrigation	Labor	Capital	Rent	Fertilizer	Total
Average Costs (In Tk.)	5429.40	3732.50	1060.10	4590.10	1621.50	14433.60
% Of total Average	33.04	22.71	6.45	27.93	9.87	100.00
Minimum Costs (In Tk.)	3375.00	750.00	450.00	507.00	900.00	13380.00
Maximum (In Tk.)	7560.00	6450.00	1815.00	7215.00	2400.00	19365.00
SD	1045.26	1090.99	263.56	1333.33	282.64	1586.59
CV	12.78	15.82	45.83	23.17	26.52	9.66

Note: Number of respondents are 30.

The contributions of capital and fertilizer to cost were 6.45% and 9.87% respectively. Another important input used in Boro production is fertilizer. Rent also contributes significantly to the cost. About 28% costs were contributed by rent. Another important factor of Boro production is fertilizer, which contributed about 10% costs. But the variation of fertilizer use among the tenants as well as average cost consideration is high due to the nature and location of cultivated land and the economic conditions of the tenants.

Gazipur

Table 6.12 describes per acre cost of Boro production in Gazipur. The contributions of irrigation, labor, capital and fertilizer were 11.28%, 25.98%, 9.73%, and 2.69% respectively. Rent involves more than 50% costs. It is due to the fact that soil quality of this area is suitable for Boro production that reduces the irrigation, capital and fertilizer costs. The soil of this area is floodplain-clay in nature, which is suitable for Boro production. Lower cost of production induces the tenant farmers to rent-in more land that raises rent.

Table 6.12 Per Acre Cost of Boro Production in Gazipur

Inputs	Irrigation	Labor	Capital	Rent	Fertilizer	Total
Average Cost (In Tk.)	1493.50	3440.40	1289.10	6663.90	355.80	13242.70
Percentages	11.28	25.98	9.73	50.32	2.69	100.00
Minimum Cost (In Tk.)	1131.00	1977.00	1044.00	1800.00	195.00	8031.00
Maximum Cost (In Tk.)	1980.00	5514.00	1698.00	12480.00	990.00	18513.00
SD	227.99*	635.13	167.54	2157.64	199.06	2215.88
CV	15.27	18.46	12.10	32.38	55.95	16.73

Source: Field Survey. *Figures after decimal are rounded up *Number of respondents 30.

The SD and CV of irrigation cost are 227.99 and 15.27 implies that variation of irrigation cost is insignificant among the tenants. The second largest cost is incurred by labor. The SD and CV of labor cost were 635.13 and 18.46 respectively. The implication of these statistics is of much difference in cost incurred by labor due to the existence of off-farm employment opportunities. The proximity to capital city raises wage rate that induces the tenants themselves to work on their tenanted land. The tenants often do under estimate the value of self-labor costs.

The SD and CV of capital cost are estimated at 167.54 and 12.10 that would imply that the variations of capital use among the tenant farms were insignificant. Moreover, considering total cost, its variation is very small. Fertilizer use differs from one tenant to another. Cost incurred by the fertilizer is so small that its variation in total cost consideration is negligible.

Feni

Table 6.13 shows the cost sharing of different inputs in Feni. About 36% and 31% costs are contributed by labor and rent respectively. While on the other hand, cost incurred by irrigation, capital and fertilizer are 14.64%, 11.15% and 6.61% respectively. That is, irrigation, capital and fertilizer jointly incurred about one-third of total costs.

Table 6.13 Per Acre Cost of Boro Production in Feni

Inputs	Irrigation	Labor	Capital	Rent	Fertilizer	Total
Average Costs (In Tk.)	2593.33	6543.89	1975.00	5432.44	1170.89	17715.56
Percentages	14.64	36.94	11.15	30.66	6.61	100.00
Minimum Cost (In Tk.)	2400.00	4800.00	990.00	2700.00	600.00	15243.00
Maximum Cost (In Tk.)	3300.00	7890.00	3930.00	7497.00	1650.00	20913.00
SD	331.60*	1035.00	905.18	1258.78	310.48	1711.08
CV	12.79	15.82	45.83	23.17	25.52	9.66

Note: i) Figures after decimal are rounded up. ii) Number of respondents is 27.

The value of SD and CV of irrigation cost are 331.60 and 12.79 respectively, which implies that variations of irrigation costs among the tenants are significant. The SD and CV of labor costs are 1035.00 and 15.82 respectively, which indicates larger variation in labor cost relative to total cost. It might be due to the high wage for labor that induces the tenant to work on their tenanted land for saving wage cost. In most cases, perhaps, the tenants underestimate their labor cost when they work on their self-cultivated land. Capital use in tenanted land varies from tenant to tenant which resulted in higher values of SD and CV. Fertilizer use is also lower compared to other input use. But the variation in fertilizer use is significant. Finally, the most important cost, of course, the hiring cost of land (rent) varies significantly from one tenant to another.

Kushtia

Existence of industrial area adjacent to the study area of kushtia raises the wage rate. About 30% and 26.76% costs are contributed by irrigation and labor respectively. On the other hand, capital and fertilizer respectively contributed 7.41%

and 9.24% costs. More than 27% cost are incurred by rent. Table 6.14 presents the cost sharing of different inputs in Kushtia

Table 6.14 Per Acre Cost of Boro Production in Kushtia

Inputs	Irrigation	Labor	Capital	Rent	Fertilizer	Total
Average Cost (in Tk.)	4715.50	4332.60	1200.00	4445.70	1496.00	16189.80
Percentages	29.13	26.76	7.41	27.46	9.24	100.00
Minimum cost (in Tk.)	3600.00	1800.00	900.00	2250.00	900.00	12975.00
Maximum (in Tk.)	5580.00	8775.00	180.00	9000.00	2100.00	23925.00
SD	534.20	1040.33	273.71	2110.94	299.45	2712.96
CV	11.33	24.01	22.81	47.48	20.02	16.76

Note: Number of respondents is 30.

In irrigation cost, larger variations are due to the different sorts of its payment. Irrigation costs are paid as a fixed portion of total produced ranging from one-fourths to one-sixths of total produced depending on soil quality and location of cultivated land. This resulted in the high estimated SD value of irrigation. The proximity to industrial area makes the labor market comparatively tight that raises the wage rate. To lower the production cost, some tenants use their family labor in tenanted land. But some tenants employ hired labor and consequently higher labor cost involve their tenanted land. As a result, differences in labor cost become significant. The SD and CV of capital use are 273.71 and 22.81 respectively. The implication of larger value of SD is that cost differential is very high among tenants.

Thakurgaon

Contribution of irrigation and rent to AC are 27.87% and 36.19% respectively. Similarly, the contribution of labor, capital and fertilizer to AC are 14.24%, 9.50% and 12.35% respectively. Though the contribution of labor, capital and fertilizer are lower compared to the contribution of irrigation and rent, yet their differences are significant. The highest order differences are found in rent giving. The SD and CV of rent are 3093.662 and 62.21 respectively. Table 6.15 summarizes the cost sharing of different inputs in Boro production in Thakurgaon.

Table 6.15 Per Acre Cost of Boro Production in Thakurgaon

Inputs	Irrigation	Labor	Capital	Rent	Fertilizer	Total
Average Cost(In TK.)	3830.89*	1957.07	1306.18	4973.14	1697.79	13743.64
Percentages	27.87	14.24	9.50	36.19	12.35	100.95
Minimum (In Tk.)	1098.00	600.00	597.00	1425.00	600.00	7962.00
Maximum (In Tk.)	5199.00	3699.00	2388.00	9900.00	3999.00	21942.00
SD	1173.57	643.04	526.45	3093.66	696.86	3943.41
CV	30.63	32.86	40.30	62.21	41.04	28.69

Note: i) Figures after decimal are rounded up. ii) Numbers of respondents are 28.

The SD and CV of labor costs are 643.04 and 32.86 respectively indicate that labor use in tenanted land varies enormously, whereas relative variations of labor use are not significant. Capital use in Boro cultivation in Thakurgaon also varies insignificantly. But rent giving by the tenants varies enormously. Fertilizer use does not vary significantly. It's SD and CV is 696.86 and 41.04 respectively.

6.2.2.2 Regional Comparison of Cost of Boro Production

Discussion in the last section shows the variation of cost sharing of different inputs within the regions. Input's contribution to cost incurred in Boro production varies from region to region and from one tenant to another. Table 6.16 shows the comparative cost analysis of Boro Production.

Table 6.16 Per Acre Cost of Boro Production (whole area)

		Pabna	Gazipur	Feni	Kushtia	Thakurgaon
Irrigation	Average Cost (In Tk.)	5429.40	1693.50	2593.33**	4715.50	3830.89
	Percentages	33.04	12.60	14.64	29.13	27.83
Labor	Average Cost (In Tk.)	3732.50	3440.40	6543.89	4332.60	1957.07
	Percentages	22.71	25.59	36.94	26.76	14.22
Capital	Average Cost (In Tk.)	1060.10	1289.10	1975.00	1200.00	1306.18
	Percentages	6.45	9.59	11.15	7.41	9.49
Rent	Average Cost (In Tk.)	4590.10	6663.90	5432.44	4445.70	4973.14
	Percentages	27.93	49.57	30.66	27.46	36.13
Fertilizer	Average Cost (In Tk.)	1621.50	355.80	1170.89	1496.00	1697.29
	Percentages	9.87	2.65	6.61	9.24	12.33
Percentages (Total)		(100.00)	(100.00)	(100.00)	(100.00)	(100.00)
Total (In Tk.)		16433.60	13442.70	17715.55	16189.80	13764.57

Note: Figures after decimal are rounded up.

Table 6.16 shows that the lowest average irrigation cost is incurred for Boro production in Gazipur (1693.50) and the highest in Pabna (5429.40). Because, the soil of Gazipur is floodplain-clay, lands are low laying land requires minimum irrigation. Moreover, irrigation costs are paid in terms of money based on irrigation requirement for a specific plot. This could lead to lower average irrigation cost in Gazipur. But in Pabna irrigation costs are paid in terms of produced crop ranging from one-fourths to one-fifths of the total produce. Since average production was the highest (previously shown) in Pabna, naturally it would raise the irrigation cost. Real irrigation cost in Pabna might be lower than the actual cost. It has been found that water suppliers make a profit in excess of irrigation cost.² About 33%, 13%, 15%, 29% and 28% costs are contributed by irrigation in Pabna, Gazipur, Feni, Kushtia and Thakurgaon respectively.

About 23%, 26%, 37%, 27% and 14% costs are contributed by labor in Pabna, Gazipur, Feni, Kushtia and Thakurgaon respectively. Average labor cost is highest in Feni but lowest in Thakurgaon due to the absence of alternative employment opportunities. In Pabna, and Kushtia, the estimated labor costs incurred in Boro cultivation are almost same. In Kushtia, there are different industries adjacent to the study area. The proximity to the capital city, where exists different types of employment opportunities raises the wage rate in Gazipur. The lower labor cost in Gazipur is the result of soil quality and wage payment. Since the soil of this region is floodplain-clay, weeds and harmful plants are not grown enormously. This requires less labor for weeding. Moreover, for harvesting wages are paid in terms of money resulted lower wage cost. In Pabna, labors are employed on the basis of work effort; i.e. wages are paid on the basis of volume of work, not on the basis of time. Moreover, payments of hired labor for harvesting are given in terms of harvested crops and the wage rate is a fraction of harvested crop that vary with the volume of production.

The lowest average cost of capital is found in Pabna and highest in Feni. Cost of capital includes cost of seedlings, cost of ploughing, cost of pesticides and cost of preservation. In Pabna, tenants do not use any pesticide. But in Feni, tenants use huge amount of pesticides, which accounts for higher cost of capital. However, costs of capital are more or less same in other regions.

² Water suppliers are usually large farmers whose ownership of land were more than that of others. They bought shallow tube-well and supply water for a fixed portion of total produced.

The highest average rent is observed in Gazipur whereas Kushtia has the lowest. In Gazipur, only one crop, Boro is produced but the rent is given for a specific time period, not for the crop. As a result, whole amount of rent has been considered for Boro that raises the average rent cost for Boro. On the other hand, in Kushtia, two crops, Aman and Boro are produced on which rent is divided into two parts. This is the main cause of lowest rent in Kushtia and highest in Gazipur. Table 6.16 depicts that about 28%, 50%, 37%, 27% and 36% costs are contributed by rent in Pabna, Gazipur, Feni, Kushtia and in Thakurgaon respectively. A lion's share of the total costs is incurred by rent in all regions.

Variations of rent among the regions imply that lease market for land is highly distorted due to the variations of employment opportunities in the regions. Another implication of this distorted lease market for land is that there would be no unique land policy to facilitate advantageous land reform for economic development of Bangladesh.

Finally, most important cost component is fertilizer cost incurred in Boro production, which is lowest in Gazipur and highest in Thakurgaon. The differences between highest and lowest cost of fertilizer is large (1697.8-355.80). It is due to the differences in land quality, regional variation in market prices of fertilizer and the extent of fertilizer use. The highest fertilizer cost in Thakurgaon is the result of both fertilizer local market price and its higher use. However, the percentage contributions of fertilizer to total cost are nearly same in other regions.

6.2.2.3 Cost Analysis of Boro (whole area)

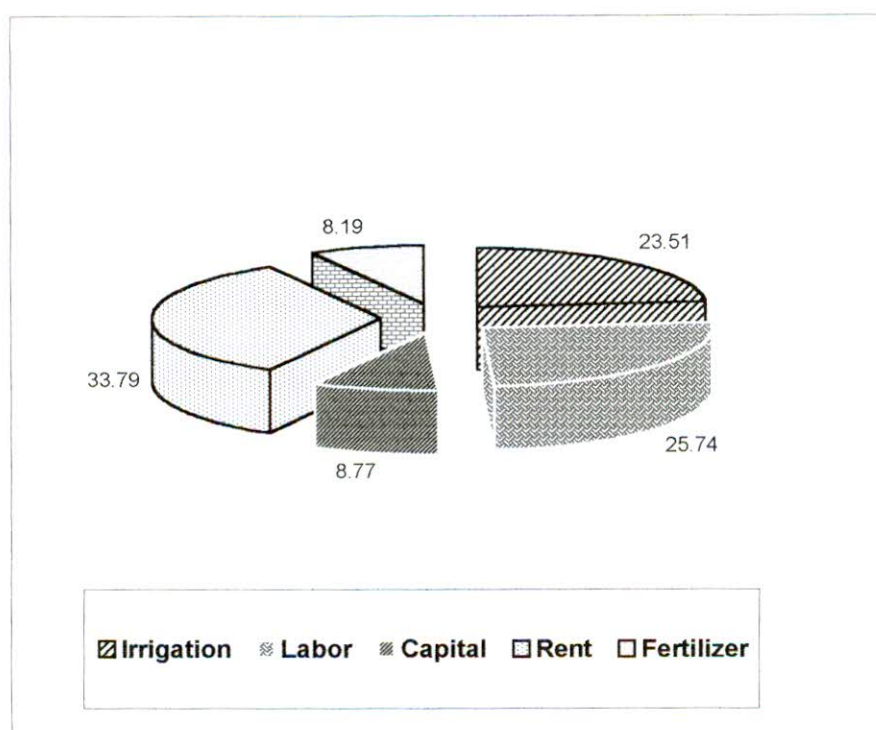
It is observed from the Table 6.17 that cost sharing of different inputs is not same. Moreover, it's variation in the study area as a whole is significant.

Table 6.17 Sharing of Different Inputs to Per Acre Cost in Boro Production

Statistics	Irrigation	Labor	Capital	Rent	Fertilizer	Total
Frequency	145	145	145	145	145	145
Average (In Tk.)	3630.60	3976.88	1354.30	5220.10	1264.49	15442.20
Percentages in total	23.51	25.74	8.77	33.79	8.19	100.00

Table 6.17 reveals that about 23%, 25%, 9%, 8% and 34% costs are contributed by irrigation, labor, capital, fertilizer and rent respectively. That is, one-third of the cost is incurred by rent, whereas one-half is contributed jointly by irrigation and labor. Capital and fertilizer contribute only one-sixths of the total cost. Table 6.17 delineates that there is a similarity in the variation of costs incurred by different inputs except for fertilizer. Cost sharing of different inputs is shown in figure 6.2.

Figure 6.2 Composition of Various Input Cost in Boro Production



Source: Table 6.17.

6.3 Production Analysis

In order to examine the variation of profitability of tenanted land, total production is estimated both in quantity and in value. The value again is calculated on the basis of market price during the survey period (January 2003 to November 2003). Comparison is made among the areas for having better understanding about tenancy. Analysis is made for only Aman and Boro production. Aus production is excluded from the analysis.

6.3.1 Production of Aman

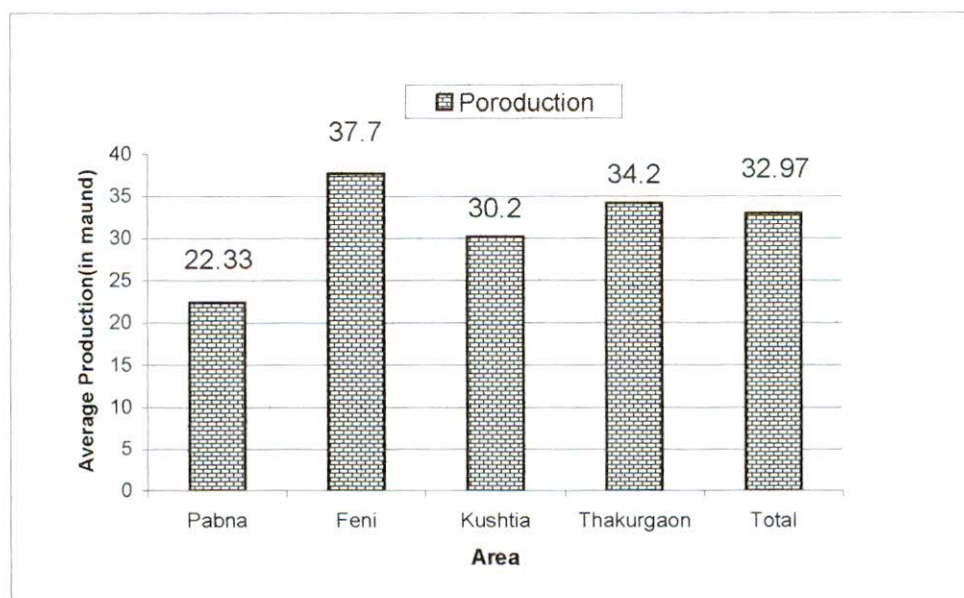
Collected data show that there exists variation in Aman production among different areas. To have a better understanding of regional variation in Aman production, it requires over all analysis of Aman production in different regions. Table 6.18 shows the combined scenario of Aman production.

Table 6.18 Per Acre Production of Aman in 2003

Area	Pabna	Feni	Kushtia	Thakurgaon	Combined
No. of tenant	9	30	30	30	99
Average Production (In maund)	22.333	37.70	30.20	34.20	32.97
Minimum (In maund)	15.00	27.00	21.00	24.00	15.00
Maximum (In maund)	30.00	45.00	42.00	48.00	48.00
SD	4.43	4.43	6.10	6.28	7.09
CV	20.23	11.77	20.11	18.37	21.50

Note: i) Production In Maund (1 maund=40Kg.) ii) Aman is not cultivated in Gazipur.

Table 6.18 shows that combined per acre production (AP) of Aman is 32.97 maunds. In Pabna and in Kushtia, per acre productions are 22.333 maunds and 30.2 maunds respectively. But in Feni and in Thakurgaon average productions of Aman are 37.7 maunds and 34.2 maunds respectively. It is observed that AP of Aman in Pabna and in Kushtia is lower than that of combined average production (AP) of Aman. But in Feni and in Thakurgaon it is more than that of combined AP. The SD of combined per acre AP is 7.09. On the other hand, it is 4.43 in Pabna and Feni, 6.10 in Kushtia and 6.28 in Thakurgaon respectively. This statistics describes that variation in per acre Aman production among the regions is greater than that of within the regions. The variation of per acre AP is, more or less, same both in Pabna and Feni. Moreover, it is also nearly same in Kushtia and in Thakurgaon. The estimated CV of combined AP is 21.50. But the regional values of CV are nearly equal to the combined value except for Feni. It indicates that variation among the regions in respect to regional variation does not vary more significantly. But it was low in Feni. Figure 6.3 represents the scenario graphically.

Figure 6.3 Per Acre Production of Aman

Source: Table 6.18

6.3.2 Production of Boro

It is not required to mention that Boro is irrigated artificially and highly fertilizer, labor and irrigation intensive. It is grown in dry season (from January to May), and its production is higher than Aman. The analysis of Boro production can be observed from the Table 6.19.

Table 6.19 Per Acre Production of Boro In 2003

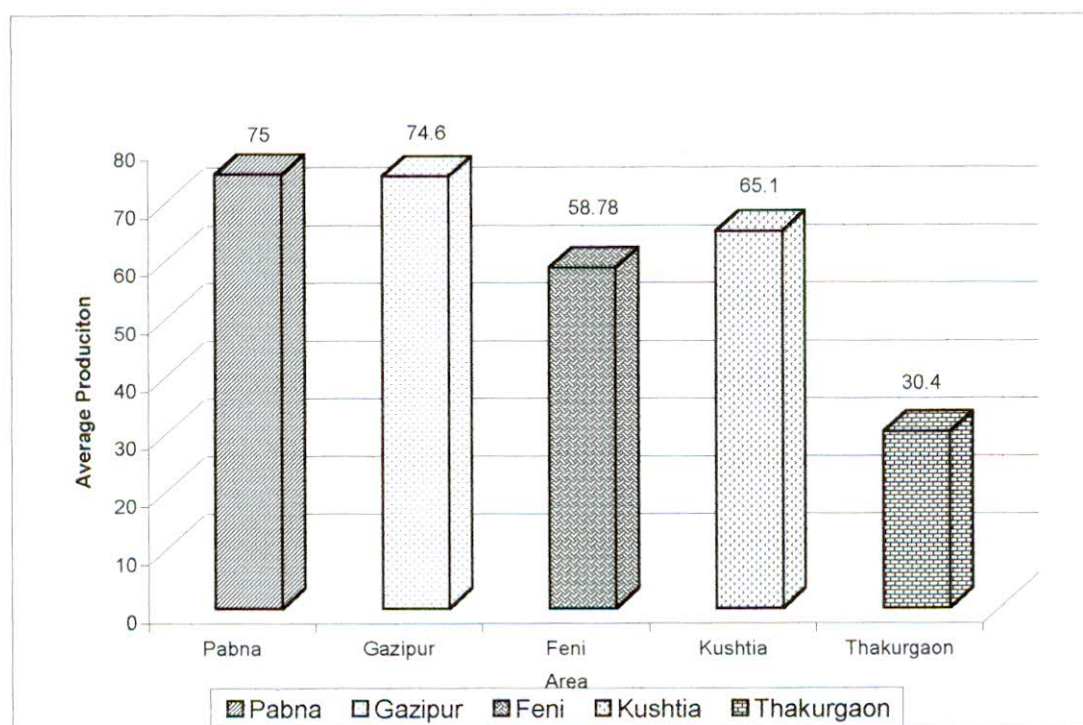
Area	Pabna	Gazipur	Feni	Kushtia	Thakurgaon	Combined
No. of tenant	30	30	27	30	30	145
Average Production (In Maund)	75.00	74.60	58.78	65.10	30.40	67.53
Minimum Production (In Maund)	54.00	57.00	45.00	54.00	24.00	45.00
Maximum Production (In maund)	90.00	84.00	81.00	75.00	57.00	90.00
SD	10.24	5.50	10.83	5.85	6.90	10.63
CV	13.66	7.37	18.42	8.99	22.70	15.73

Source: Field Survey. 1 *maund* = 40 kilograms.

Average production of Boro is the highest in Pabna and the lowest in Thakurgaon. The estimated values of SD are 10.24 in Pabna, 5.50 in Gazipur, 10.83 in Feni, 5.85 in Kushtia and 6.90 in Thakurgaon respectively. The combined SD of AP is 10.63 maunds. The estimated values of SD imply that the variation of AP in Boro among the regions is larger than within the regions. Moreover, the lowest variation within the region is found in Gazipur and the highest in Feni. Since the soil of Gazipur is highly suitable for Boro production and does not require huge fertilizer application, per acre production does not vary enormously. However, Boro production requires more use of fertilizer as a whole that ensures the variation in production.

The value of CVs indicates that variation of per acre AP among the regions is greater than the variation within the regions. A similar graphical representation is shown in figure 6.4.

Figure 6.4 Per Acre Production of Boro(in maund)



Source: Table 6.19

6.4 Returns from Rice Production

Returns from rice production are estimated by region-wise and crop-wise to get the actual picture of profitability of tenanted land. Returns from by-products (i.e. from straw) are calculated on the basis of prevailing market price and on per acre. Returns from by-products are included in the total returns in terms of money. Since rice is mainly categorized into Aus, Aman and Boro, and Aus cultivation is not found in the study area, analyses are being made only for Aman and Boro.

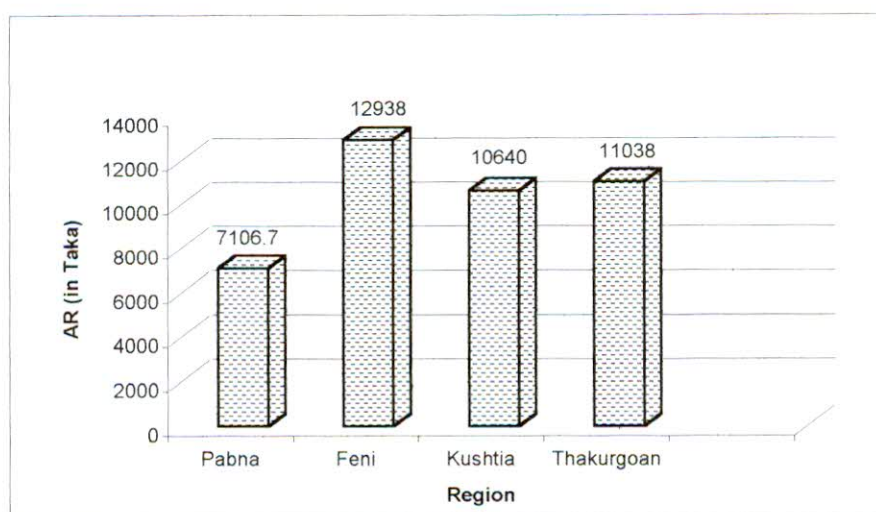
6.4.1 Returns from Aman production

Table 6.20 Per Acre Returns (AR) from Aman

Statistics	Pabna	Feni	Kushtia	Thakurgaon
No. Of Tenant	09	30	30	30
Average Returns (in Tk.)	7106.70	12938.00	10640.00	11038.00
Minimum returns (in Tk.)	5100.00	8940.00	8100.00	8400.00
Maximum (in Tk.)	9480.00	16200.00	15240.00	14040.00
SD	1499.40	1692.10	1924.20	1477.10
CV	21.10	13.08	18.08	13.38

Note: Aman is not cultivated in Gazipur.

Figure 6.5 Per Acre Revenue from Aman Cultivation



Source: Table 6.20

Table 6.20, shows that per acre return (AR) from Aman production was Tk. 7106.70 in Pabna, Tk. 12938.00 in Feni, Tk.10640.00 in Kushtia and Tk. 11038.00 in Thakurgaon respectively. The lowest returns accrued from Aman production in Pabna and the highest in Feni. Similarly, AR accrue from Aman production in different regions can be seen from figure 6.5. This type of Aman is traditional variety that does not require any fertilizer resulting in lower production. The SD of AR in different regions indicates that there exists significant variations in AR accrued from Aman production in different regions.

Actually, absolute dispersion of returns from Aman production within the regions is larger than the relative dispersion of revenues among regions. This can be seen from the CV values of returns from different regions. It is logical to comment that the variation of AR from Aman production does not differ significantly within the regions compared to among the regions. From the above survey result it can be comment that returns accrued from Aman production differs enormously from area to area.

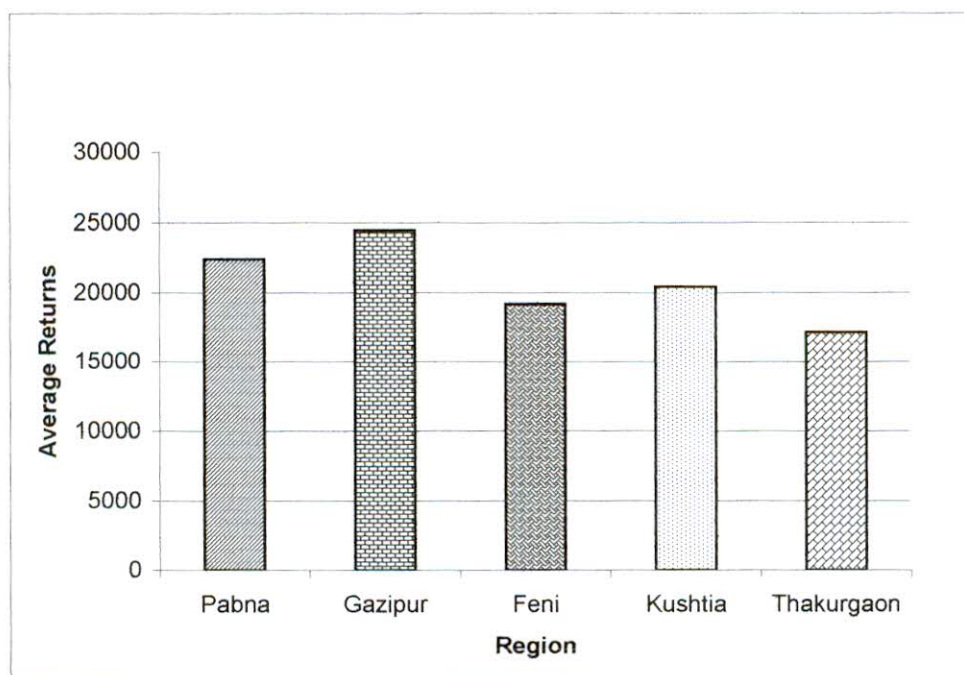
6.4.2 Returns from Boro Production

Survey findings reveal that Boro is produced in all the study areas. The production and returns from Boro cultivation are much higher than that of Aman. Returns from Boro production in tenanted land can be seen from the Table 6.21.

Table 6.21 Per Acre Returns from Boro Production

Statistics	Pabna	Gazipur	Feni	Kushtia	Thakurgaon
No. of Tenant	30	30	27	30	28
Average Returns (in Tk.)	22393.00	24483.00	19168.00	20432.00	17147.00
Minimum Returns (in Tk.)	15000.00	18300.00	14820.00	12300.00	13200.00
Maximum Returns (in Tk.)	28800.00	29220.00	24180.00	24120.00	21600.00
SD	3787.60	2314.70	2667.40	2484.10	2345.90
CV	16.91	9.45	13.92	12.16	13.68

Figure 6.6 Per Acre Returns (AR) from Boro Cultivation in Different Region (in taka)



Source: Table 6.21.

Table 6.21 exhibits the significant variation in AR from Boro production among the regions is not evident. The lowest AR is accrued from tenanted land in Thakurgaon and the highest in Gazipur. In Gazipur, average production was the second highest (74.6 *maunds*, Table 6.19) and the price of rice is also high due to its proximity to capital city Dhaka. The values of SDs of AR accruing from Boro production are found almost same. These values imply that variations of returns from Boro production are more or less same in all regions. It slightly differs from one region to another. Within the region, its variation is noticeable. The values of CVs indicate that relative variation of returns accruing from Boro production is less than the absolute variation within the region. The estimated value of CV ranges from 9 to 17, which indicate that among the regions returns from Boro production do not vary significantly for country as a whole.

6.4.3 Comparison of Returns from both Aman and Boro Production

To have a better understanding of regional variation of returns from tenanted land in rice cultivation, it is required to compare the returns between Aman and Boro production. This can be seen from the Table 6.22.

Table 6.22 Comparison of Per Acre (AR) Returns from Aman and Boro

	Aman				Boro			
	No. of Tenant	Average Returns (in Tk.)	SD	CV	No. of Tenant	Average Returns (In Tk.)	SD	CV
Total	99	11136	2309.80	20.74	145	20806.00	3742.20	17.99
Pabna	9	7106.70	1499.40	21.10	30	22393.00	3787.60	16.91
Gazipur	00	00	00	00	30	24483.00	2314.70	9.45
Feni	30	12938.00	1692.10	13.08	27	19168.00	2667.40	13.92
Kushtia	30	10640.00	1924.20	18.08	30	20432.00	2484.10	12.16
Thakurgaon	30	11038.00	1477.10	13.38	28	17147.00	2345.90	13.68

Source: Field Survey.

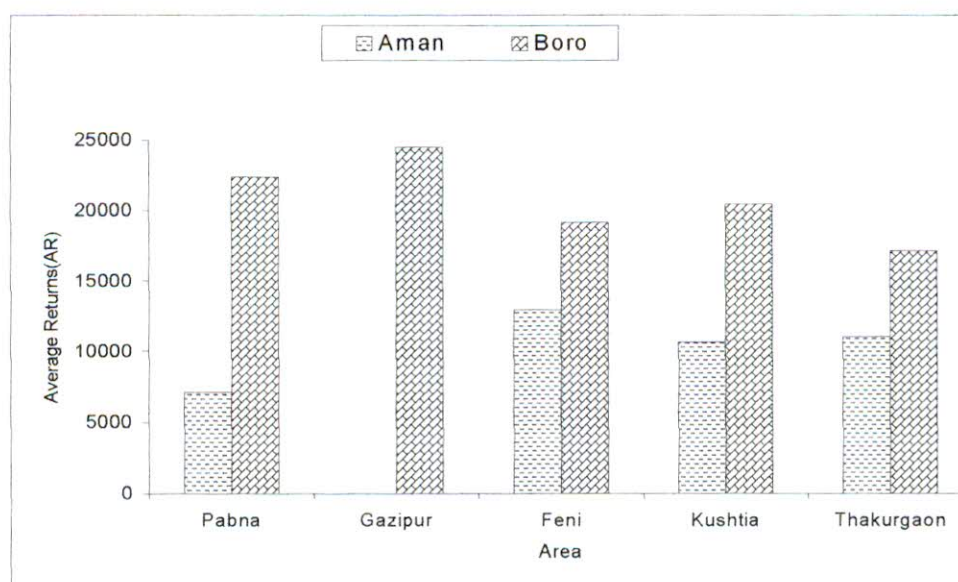
Table 6.22 depicts that combined AR from Aman production is nearly equal to total regional average returns except in Pabna. Since Pabna is flood-prone, traditional variety of Aman is cultivated in inundated land. This traditional variety requires low fertilizer, pesticides and labor giving lower production. From this statistics it can be concluded that there are great differences in returns from Aman production between flood-prone and flood-free area. The values of SDs show that there are significant variations in returns accruing from Aman production in all regions. The highest variation has been estimated in Kushtia and the lowest in Thakurgaon. The values of CV imply that among the regions variation in AR is lower than that of absolute variation within the region, i.e., absolute variation in returns from Aman is higher than that of relative variation.

In case of Boro, the scenario is different. The estimated values of AR accruing from Boro in different regions are almost same. Moreover, compared to combined AR (for

all regions) the regional values differ slightly. The estimated values of average returns from Boro production are Tk.22393.00 in Pabna, Tk.24483.00 in Gazipur, 19168.00 in Feni, Tk.20432.00 in Kushtia and Tk.17147.00 in Thakurgaon respectively. In combined, the estimated value of AR was Tk. 20806.00. The values of SD of returns from Boro in different regions do not vary enormously except in pabna. It implies that within and among the regions, the dispersion of average return (AR) is more or less same.

Considering, area as a whole, its differences are not noticeable. The estimated values of regional CVs are 16.91 in Pabna, 9.45 in Gazipur, 13.92 in Feni, 12.16 in Kushtia and 13.68 in Thakurgaon respectively. Moreover, the estimated value of combined CV is 17.99. The above statistics implies hat relative dispersion among the regions is more or less same. However, it is also nearly same for all regions. Comparison of AR is shown in figure 6.7.

Figure 6.7 Comparison of Average Returns from both Aman and Boro Production



Source: Table 6.22

6.4.4 Comparisons of Total Returns Both from Aman And Boro³

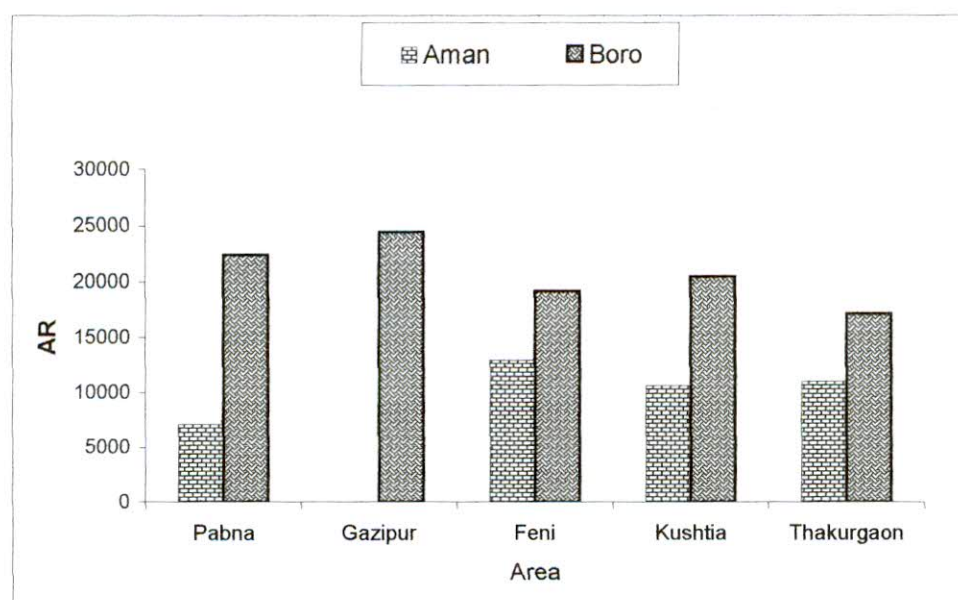
It is already mentioned that returns from tenanted land is the sum of returns from rice and by-products. The foregoing analyses have not included returns from by products (straw). It is mentioned that total returns would not be equal to the sum of average returns from Aman and from Boro. Because, out of the total 150 respondents only 99 respondents reported that they would cultivate Aman during the survey period. On the contrary, out of the total 150 respondents (tenant), 145 of them reported that they had produced Boro. Moreover, 99 tenant farmers had cultivated both Aman and Boro simultaneously. So, for these reasons, total returns would not be equal to the sum of average returns from Aman and from Boro. Moreover, aman is not produced in Gazipur. To have a crop-wise estimate of profitability of leased-in land, it is required to estimate cost and return from producing Aman and Boro separately. Moreover, same land may be used to produce for both for Aman and Boro. So, total analysis is essential. Table 6.23 fulfills this requirement.

Table 6.23 Comparison of combined Average Returns both Aman and Boro

(Figures In Per Acre)

		Pabna	Gazipur	Feni	Kushtia	Thakurgaon	Combined (For all regions)
Aman	Average (In Tk.)	7106.70	--	12938.00	10640.00	11038.00	11136.00
Boro	Average (In Tk.)	22393.00	24483.00	19168.00	20432.00	17147.00	20806.00
Total (Boro+Aman)	Average (In Tk.)	24825.00	24483.00	29415.00	20808.00	27049.00	27369.00

³ Note: The total means are not equal to the sum of mean of Aman and Boro. Because, Aman was cultivated by only 99 tenants whereas Boro was by 145 tenants. Moreover, some tenants cultivate both Aman and Boro in the same leased land. So, combined mean (Combined mean = $(x_1n_1 + x_2n_2)/(n_1 + n_2)$) would not be applicable in this context.

Figure 6.8 Comparison of AR(Boro+Aman) in Different Regions

Source: Table 6.23

Table 6.23 reveals that combined AR from Aman production is Tk.11136.00 and from Boro is Tk.20806.00. But combined AR from both Boro and Aman production is Tk.27369.00. Moreover, estimated values of combined AR (Boro+Aman) are Tk.24825.00 in Pabna, Tk.24483.00 in Gazipur, Tk.29415.00 in Feni, Tk.20808.00 in Kushtia and Tk.27049.00 in Thakurgaon respectively. From Table 6.23 it is clear that returns from Boro production are higher than the returns from Aman production. The highest returns from Aman are earned in Feni and the lowest in Pabna. On the other hand, in Boro production, the highest returns are earned from Gazipur. Figure 6.8 represents the combined average returns from Aman and Boro production.

6.5 Profitability Measurement of Tenanted Land

The main objective of this section is to measure the profitability of tenanted land. Before going to discuss the profitability of tenanted land, at first it is necessary to explain the meaning of profitability, which is the adjective of the word 'profit'. In economics, profit is the difference between total revenue and total cost.

Michael P. Todaro (1985), in his famous book wrote, "Profit is the difference between the market value of output and the market value of inputs that were employed to produce that output. Alternatively, a firm's or farm's profit can be defined as the difference between total revenue and total cost". Here, profit is defined as the difference between total returns (average returns) total cost (average cost). That is, a net return from rice cultivation may be considered as profit.

The main goal of the tenant is to get an income either in the form of direct consumption or in cash. So that, covering all the costs, they can make a profit. To find out how far they have succeeded in achieving their goal, it is required to consider the returns both from Aman and Boro production. Profitability to the tenants can be estimated in different ways. Since costs and returns are estimated separately for Aman and Boro, profitability to tenant from leased-in land has been calculated separately for Aman and for Boro. Moreover, comparison of profitability to the tenant has been made regionally. Combined profitability is estimated by considering total revenue and total cost as well as AR and AC. Since costs and returns are estimated per acre, it might be logical to use the technique of $(AR)/(AC)$ ratio. For simplicity, it is done only for both Aman and Boro.

Tenant's profit from leasing land can be measured either in $(TR)/(TC)$ or $(AR)/(AC)$ ratio. At the outset, profit of a tenant farm has been estimated by using AR and AC ratio for different regions. Then it is accumulated for all regions. Another method, which is used in this study, is total returns/total cost (TR/TC) ratio for individual farmer as well as for all regions.

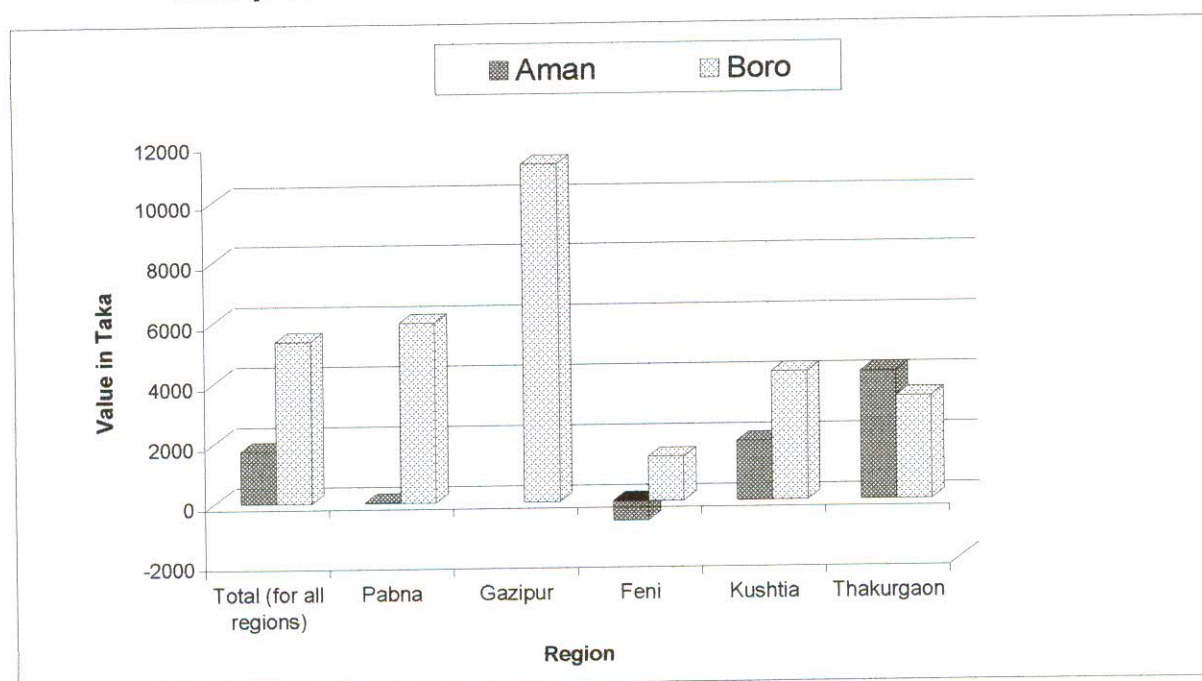
6.5.1 Regional Estimation of Profitability of Tenanted Land

Here profitability is measured by using AR and AC ratio for individual tenant. The ratio of AR to AC is measured for regional consideration and then it is compared to all regions as a whole (combined). Table 6.24 shows the comparison of these estimates.

Table 6.24 Comparison of AR/ AC Ratio for Aman and Boro (Figures in taka per acre)

	Aman			Boro		
	AR	AC	AR/AC	AR	AC	AR/AC
Combined	11135.76	9405.42	1.182	20806.14	15442.24	1.347
Pabna	7106.67	7095.00	1.00	22393.00	16433.60	1.363
Gazipur	---	--	--	24483.00	13242.70	1.849
Feni	12938.00	13588.50	0.95	19167.78	17715.56	1.082
Kushtia	10640.00	8693.70	1.22	20432.00	16189.80	1.262
Tahkurgaon	11038.00	6828.40	1.62	17147.14	13743.64	1.248

Figure 6.9 Comparison of Profitability of Tenanted Land for Aman and Boro production



Source: Table 6.24

Table 6.24 depicts that in case of Aman, combined AR/AC ratio is 1.182, which implies that tenants are getting net returns/profit from tenanted land in area as a whole. The regional variations of profitability of leased-in land are observed from the survey result. In Pabna, neither loss nor profit is earned from leased-in land in Aman production. In Feni, tenants are making negative profit (loss) from their leased-in

land in Aman production. But in Kushtia and Thakurgaon, land leasing is profitable in case of Aman cultivation. The highest profit is earned in Thakurgaon.

In Boro production, findings of survey reveal that combined AR is greater AC ($AR/AC > 1$) indicating that land leasing is profitable in study area as a whole. The value of AR/AC ratio is 1.347, i.e. 13.47% profits are making in Boro production in all regions. The estimated AR/AC ratio in Pabna is 1.363, in Gazipur 1.849, in Feni 1.082, in Kushtia 1.262 and in Thakurgaon 1.248 respectively. That is land leasing is profitable for Boro production in all regions.

Comparison of profitability between Aman and Boro, reveals that for all regions, profit accruing from Boro production is higher than that of Aman. Because, $1.347 > 1.182$. Profit margin is the lowest in Feni for Boro production and is the highest in Gazipur. Among the regions, profit earnings ranges from 10.82% to 18.49%. Thus, the variation of profitability of tenanted land from region to region is not enormous. A similar representation of profitability of tenanted land for both Aman and Boro production can be seen from figure 6.9.

6.5.2 Regional Comparison of Profitability Tenanted Land

Profit can be defined as the difference between total revenue and total cost. That is,

$$\Pi = TR - TC$$

Where, Π = Profit, TR = Total Returns, and TC = Total Cost.

Or it may be defined as the ratio of total returns to total cost, i. e. TR/TC.

If $TR/TC = 1$, then no loss nor profit,

$TR/TC > 1$, then there is profit, and

$TR/TC < 1$, then there is loss.

For simplicity, at the outset, total cost and total returns (revenues) from Aman and Boro cultivation are estimated by summing up all number of tenants. Then regional total cost and total returns are estimated by summing up for all tenants. That is, total cost is the sum of all tenant's total cost incurred in Aman and Boro production. Similarly, TR is the sum of all tenant's returns coming from both Aman and Boro

cultivation. Table 6.25 depicts the regional as well as for all regions as a whole, TR/TC ratio for Aman and Boro.

Table 6.25 Comparison of TR and TC Ratio for Aman and Boro

(In taka per acre)

Regions	Aman			Boro		
	Total Cost (TC)	Total Revenue (TR)	TR/TC ratio	Total Cost (TC)	Total Revenue (TR)	TR/TC ratio
Combined (For all regions)	931137.00	1102440.00	1.184	2239125.00	3016890.00	1.347
Pabna	63855.00	63960.00	1.00	493008.00	671790.00	1.363
Gazipur	00.00	00.00	--	497281.00	734490.00	1.849
Feni	407655.00	388140.00	0.95	478320.00	517530.00	1.082
Kushtia	260811.00	319200.00	1.22	485694.00	612960.00	1.262
Thakurgaon	204852.00	331140.00	1.62	384822.00	480120.00	1.248

Table 6.25 depicts that both AR/AC and TR/TC ratios are equal in value (AR/AC ratio is given in Table 6.24). In Aman production, combined TR/TC ratio is 1.184, i. e. $TR/TC > 1$, so that land leasing is profitable for Aman production and in case of Boro $TR/TC = 1.347 > 1$, that entails positive profit to the tenant farms. Exception result is found in Feni, where $TR/TC = 0.95$, which results negative profit to the tenants.

In Boro production combined TR/TC ratio is 1.347 that produces positive profit to the tenant from leased-in land. Positive profit is earned from leased-in land in Boro production in all regions. Moreover, variations of profit margins are not significant. The estimated value of profit margins ranges from 1.082 to 1.849. In addition to this, in Aman production, loss is incurred in Feni but in case of Boro cultivation no loss is incurred in any region.

6.5.3 Individual Measurement of Profitability of Tenanted Land

Previous section dealt with area wise comparison of profitability of tenanted land. It did not analyze the individual returns and cost incurred in Aman and Boro production. For in-depth analysis it is required to estimate individual cost and returns from tenanted land for Aman and Boro production. Table 6.26 shows the profitability of tenanted land in Aman and Boro production.

Table 6.26 Profitability of Tenanted land for Producing Aman and Boro by Using TR/TC Ratio

Region	Aman			Boro		
	TR/TC<1	TR/TC>1<2	TR/TC>2	TR/TC<1	TR/TC>1<2	TR/TC>2
Pabna	4	5	0	2	28	0
Gazipur	00	00	00	00	20	10
Feni	20	10	0	9	18	0
Kushtia	3	27	0	3	27	0
Thakurgaon	0	21	9	6	20	2
Total	27	63	9	20	113	12

It is observed from Table 6.26 that out of 99 tenants 27 of them are incurring loss in Aman production. In Pabna, out of 9 tenants 4 of them incur losses in Aman production. This number is the highest in Feni (20 out of 30 tenants) and in Kushtia it is 3. No tenants are making loss in Thakurgaon. In Feni 66.33% and in Pabna 44.44% tenants are incurring loss in Aman production. The ratio of TR/TC>1 but less than 2 were found for 63 tenants. Meanwhile, out of 99 tenants, only 9 tenant's TR/TC ratio was greater than 2.

In Boro production, out of 145 tenants only 20 tenants were making losses. Out of 125 tenants, the ratio of TR/TC was greater than 1 for 113 tenants. But TR/TC >2 were for 12 tenants. From above survey findings it is evident that over all profit accrue from Boro cultivation is higher than that of Aman cultivation in tenanted land.

From the foregone analysis it is clear that there are enormous variations in cost, returns, production and profitability of tenanted land in rice cultivation among as well as within the regions. Regression models both for Aman and Boro show that there is a positive relationship between input and output. A similar result is found by using Cobb-Douglas type production function. The sum of partial elasticities of output with respect to input indicating the decreasing returns to scale in Boro production.

From the regression result it is observed that the response of average production of Aman with respect to input use is very high with capital, labor, fertilizer whereas lower with rent. The smaller value of R^2 may be the cause of highly dependence of

Aman production on rainfall. As such, Aman production is less capital, labor and fertilizer intensive. From the analysis of regional variation of production and revenue, it can be concluded that there are great differences in returns from Aman between flood-prone and food-free area with respect to production and revenue. It is found that AR from Boro production is higher than that of Aman. Not only this, variation of returns from Aman is higher than that of Boro.

The survey result shows that the main cause of differences in AC among different regions is the existence of alternative employment opportunities in that area. Among the cost item both in Aman and boro cultivation, labor cost was the second position. Moreover, variation of labor cost among the regions is higher than that of within the regions indicating the economic development in rural Bangladesh is not even. It is found that the contribution of hired cost of land (rent) is the highest in Aman and Boro production whereas the contribution of fertilizer is the lowest in said crops. The average estimated value of rent in different regions shows that there are no significant variations of rent within as well as among the regions. Moreover, rent differs enormously among the regions, which imply that lease market for land in Bangladesh is highly distorted. Another implication of this distorted lease market is the absence of unique land policy to result advantageous land reform for economic development of Bangladesh. The variation in irrigation cost differs among the regions due to the variation of land quality and the nature of payment of irrigation cost. Variations of market prices among the regions indicate that the market for fertilizer is highly distorted due to mismanagement of fertilizer distribution. From the above explanation it can be concluded that the variation net returns (profit) from tenanted land among the regions as well as within the regions is evident. It also varies between Aman and Boro and among the tenants. Moreover, AC and AR of Boro production are higher than that of Aman. In addition to this, net returns from Boro production are higher than that of Aman production.

Chapter 7

Productivity and Profitability under Various Contractual Arrangements

The main objectives of this chapter are to find out the nature of resource allocation, vis-à-vis, yield per acre, per acre profitability of tenanted land and to estimate net returns (profit) from tenanted land under different tenancy arrangements to the tenants and to landlords. Moreover, efficacy of tenurial arrangements is examined from the landowners' as well as tenant's point of view. To do this, empirical findings are compared with existing mainstream of tenancy theories. Profitability of tenanted land is measured for producing Aman and Boro under different contractual arrangements.

7.1 Productivity under Different Contractual Arrangements

The efficiency of tenanted land on different contractual arrangement can be estimated by examining the productivity and efficiency of input use under different tenancy contract¹. To examine the productivity and efficiency of input use under different tenancy arrangements, it is required to test for productivity and input use under tenancy contracts. Bell (1977) has argued that the best procedure for testing the differences in productivity of land under tenancy system is to compare yield on own land and rented lands of owner-share croppers (owner-cum-tenant cultivators). Here, we focus on cultivation practices of tenants under different contractual arrangements in different regions. For testing the differences in distributive efficiency of tenanted land under different contractual arrangements, F- test is used.

Aman Cultivation

From Table 7.1, it is observed that lowest average revenue (Tk.11051.38) is accrued from sharecropped land and the highest (Tk.12180.00) revenues accrued from mortgaged (*kaf*) land.

¹ Here, productivity is considered per acre average returns.

Table 7.1 Efficiency of Different Contractual Arrangements for Aman Cultivation.

Arrangements	No. of Cases	Average Revenue (In Tk.)	SD of Average Revenue	Average Cost (In Tk.)	SD of Average Cost	F-value	
						Average Revenue	Average Cost
Sharecropping	58	11051.38	2440.894	10496.59	2958.508	6.44*	1.98
Fixed Crop Rent	7	10002.86	1071.47	7854.00	813.93		
S.T. Leasing	21	10505.71	2661.86	8698.00	2617.65		
<i>kat</i>	19	12180.00	2127.35	7055.38	2736.48		

* Significant at 5% level (significant)

Moreover, highest average cost (AC)(Tk.10496.50) is incurred on sharecropped land and the lowest AC (Tk.7055.38) on mortgaged/*kat* land. These differences in AC and average revenues (AR) are statistically significant. F-test for AR and AC in different leasing system shows that the differences in average revenue among contractual arrangements are significant but the differences in average cost among contractual arrangements are not significant. So, it can be said that resource allocation under sharecropping system is inefficient relative to other fixed rent and other cash rent system. This indicates that mortgage/*kat* system of land leasing is more productive relative to other contractual arrangements.

Boro Cultivation

Table 7.2 expressed that the lowest average revenues (Tk.18145.71) were earned from fixed crop rent and the highest average revenues (Tk.23280.00) were accrued from *Khaikhalashi*. On the other hand lowest AC (Tk.12679.06) was incurred in mortgaged (*kat*) land but the highest AC (Tk.17179.19) was incurred in sharecropping system. F-values indicate that in Boro production productivity of sharecropping is also low relative to other form of tenancy arrangements. F-value indicates that the differences are highly significant.

Table 7.2 Efficiency of Different Contractual Arrangements for Boro Cultivation

Arrangements	No. Of Cases	Average Revenue (In Tk.)	SD of Average Revenue	Average Cost (In Tk.)	SD of Average Cost	F-value	
						Average Revenue	Average Cost
Sharecropping	63	19742.86	3385.96	17179.19	2695.76	17.15**	3.07*
Fixed Crop Rent	7	18145.71	1546.81	13841.14	2036.03		
S.T.Leasing	46	21849.13	3356.06	15268.76	1899.39		
<i>Khaikhalashi</i>	3	23280.00	626.42	14644.00	2586.97		
<i>kat</i>	34	21312.35	4547.99	12679.06	2740.56		

** Significant at 1% level (highly significant)

* Significant level at 5% level (significant).

But in average cost, F-value shows that differences in cost incurred in Boro cultivation on different contractual arrangements are significant at 5% levels. This implies that land leasing on mortgage (*kat*) is productive relative to other contractual arrangements.

7.1.1 Comparison of Productivity Between Aman And Boro under different Contractual Arrangements

We comment on the performance of different contractual arrangements in production of Aman and Boro by using t-test for giving the statistical base for differences in productivity of different contractual arrangements. To compare the productivity of different tenancy system for producing Aman and Boro, it has to be examined both revenue and cost of said crops. As already mentioned, the best procedure for testing the differences of productivity between Aman and Boro under different contractual arrangements is to compare average cost as well as average revenues for both Aman and Boro. To do this, t-test is used.

Table 7.3 Results of the t-test for Cost Variation

Arrangements	Aman			Boro			t-value
	N	Average Cost (In Tk.)	SD of Average cost	N	Average cost (In Cost)	SD of Average cost	
Sharecropping	58	10496.59	2958.508	63	17179.19	2695.76	5.96*
Fixed crop rent	7	7854.00	813.93	7	13841.14	2036.03	7.22*
S.T. leasing	21	8698.00	2617.65	46	15268.76	1899.76	10.33*
<i>Khailkhalashi</i>				3	14644.00	2586.97	
<i>kat</i>	19	7055.38	2736.48	34	12679.06	2740.56	7.17*

* Significant at 5% level (significant)

Table 7.3, depicts that the differences between AC of Aman and Boro under different contractual arrangements are evident. Moreover, AC of Aman for all contractual arrangements is lower than the AC of Boro. The t-values show that the differences between average cost of Aman and Boro in different contractual arrangements are highly significant. That is, differences are significant at 5% levels. Table 7.4 exhibits the performance of different contractual arrangements both for Aman and Boro cultivation. The t-values indicate that the differences of average revenue between Aman and Boro cultivation on each type of tenancy arrangements are significant.

Table 7.4 Results of the t-test for Productivity Variation

Arrangements	Aman			Boro			t-value
	N	Average Revenue (In Tk.)	SD of Average Revenue	N	Average Revenue (In Tk.)	SD of Average Revenue	
Sharecropping	58	11051.38	2440.894	63	19742.86	3385.96	7.87*
Fixed crop rent	7	10002.86	1071.47	7	18145.71	1546.81	11.45**
S.T. leasing	21	10505.71	2661.86	46	21849.13	3356.06	14.87*
<i>Khailkhalashi</i>				3	23280.00	626.42	
<i>kat</i>	19	12180.00	2127.35	34	21312.35	4547.99	9.93**

** Significant at 1% level

* Significant at 5% level.

From the above analysis it is clear that productivity of tenanted land under different tenancy arrangements is higher for Boro cultivation as compared to Aman. Moreover, both AR and AC are higher for Boro cultivation. So, it can be concluded that resource allocation is efficient with respect to production for Boro cultivation than Aman cultivation.

7.2 Factors Affecting Returns from Tenanted Land

As already mentioned earlier, the main objective of this study is to examine the efficiency of various types of contractual arrangements with respect to rice production and to examine the profitability of tenancy arrangements. To fulfill these objectives, this section sheds light on the nature of association between returns from tenanted land and their determinants. The analysis is carried out on two cropping seasons: one for Aman and another for Boro. In order to examine the relationship between profitability and their determinants multiple linear regression analysis is done.

7.2.1 Landlord's Share

From the landlord's point of view profitability is measured as rent income per acre from leased-out land while the opportunity cost of leased-out land is not taken into account. That is, per acre rent income is defined as rent of a landlord for leasing-out land.

For building up the model, per acre production (land quality), form of tenancy (sharecropping, fixed crop rent, S.T. leasing, *Khaikhalashi* and *kat* /mortgage), cost sharing in production and the nature of landlord (absentee and resident) are taken as explanatory variables. It should be noted that nature of tenancy, cost sharing in production and the nature of landlord (absentee and resident) are taken as dummy variables because of data inadequacy. Cost sharing in production is taken as dummy variable because of landlords were sharing cost only on sharecropping and reported that they had borne half or one-third of total costs. However, these costs were not borne regularly. Since this analysis is made for different contractual arrangements but not for only sharecropping, cost sharing could not be quantified for estimation.

The Regression Model Used

Here, stepwise forward regression is used. It should be noted that there exist multicolinearity among the explanatory variables. For example, fertilizer cost and irrigation cost, land quality and irrigation are correlated and so on. For removing multicolinearity, multivariate statistical technique, such as factor analysis, ridge regression or stepwise regression, etc. can be used. To save space and time, we do not present correlation matrix for detection of multicolinearity but only R square

values are considered here (Appendix- VII-A, VII-C, VII-E and V-G, 'enter' method of regression). Two models are developed here on the basis of sample of Aman and Boro cultivation. A summary of the regression output using 'stepwise' method for two crop seasons are as follows.

7.2.1.1 Factors Affecting Landlord's Share from Aman

Model for Aman: Summary of the regression output for the profitability of leased out land on Aman production is given below.

Table 7.5 Model summary: Stepwise Regression Results

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.588 ^a	.345	.338	1155.1806
2	.625 ^b	.390	.377	1120.8819
3	.670 ^c	.450	.431	1070.7351

a) Predicators: (constant), Sharecropping (SH).

b) Predicators: (constant), Sharecropping, *kat* (SH, KA).

c) Predicators: (constant), sharecropping, *kat* and Per Acre Average Revenue (land quality)(SH, KA, and AR).

Table 7.6 Analysis of Variance: (ANOVA)

Model		Sum of Squares	df	Mean square	F-value	Significance
1	Regression	6.5E+07	1	6.5E+07	49.034	.000***
	Residual	1.2E+08	93	133442		
	Total	1.9E+08	94	--		
2	Regression	7.4E+07	2	3.7E+07	29.429	"
	Residual	1.2E+08	92	1256376		
	Total	1.9E+08	94	--		
3	Regression	8.5E+07	3	2.8E+07	24.773	"
	Residual	1.0E+08	91	1146474		
	Total	1.9E+08	94	--		

*** Significant at 0.1% level (highly significant)

a) Predicators: (constant), Sharecropping.

b) Predicators: (constant), Sharecropping, *kat*.

c) Predicators: (constant), sharecropping, *kat* and Per Acre AR (land quality).

Table 7.7 Variables in the Equation (coefficients)

Model	Variables	Unstandardized Coefficients		Standardized Coefficients (β)	t-statistics	Significance
		a	Standard deviations			
1	Constant	2951.625	182.650	--	16.150	.000***
	Sharecropping	1680.920	240.049	.588	7.002	"
2	(Constant)	3349.726	234.071		14.311	"
	Sharecropping	1298.905	275.284	.454	4.718	"
	<i>kat</i>	-884.668	339.789	-.251	-2.604	.011*
3	(Constant)	1749.807	557.389		3.139	.002
	Sharecropping	1211.659	264.438	.424	4.582	.000***
	<i>kat</i>	-1184.676	338.412	-.335	-3.501	.001***
	AR	.153	.049	.255	3.134	.002**

Dependent variable: Landlord' share (rent).

*** Significant at 0.1% level (highly significant), ** Significant at 1% levels

* Significant at 5% levels.

From the stepwise regression results (model 3) it is observed that only 3 explanatory variables (sharecropping, *kat* and AR) explain the average changes in rent income/ landlord's share in the model. Other variables are automatically excluded from the model (see Appendix-VII-B, "Excluded Variables" Table).

So, regression equation for rent can be written as;

$$Y_{LA} = a + a_1 SH - a_2 KA + a_3 AR + u$$

Where,

Y_{LA} = landlord's share (rent) from leasing-out land on Aman production, a = constant, AR = Average returns (land quality (LQ) or productivity), SH = Sharecropping, KA = *kat*, u = disturbance term, a_1 , a_2 , and a_3 coefficients.

Regression techniques carried out in this section have some unique aspects. From the model summary (Table 7.5, model 3) it is observed that the value of R (coefficient of multiple regressions) is positive. So, landlord's income from leasing out land is positively correlated with the explanatory variables. The value of R^2 (.450) indicates that the explanatory variables explain 45% of average rent income/landlord's share of landlord (Table 7.5, model 3).

F-value (24.773) indicates that the results obtained from regression output are highly significant. That is, it is significant at 0.1% levels (Table 7.6). The coefficient Table (Table 7.7) indicates that coefficients of α_1 (=1211.659) and α_3 (=0.153) are positive whereas α_2 (= -1184.676) is negative. The positive value of α_1 (1211.659) indicates that landlord's share is positively related with sharecropping. In sharecropping, landlord's share (Y_{LA}) is a fraction of total produced. As a result, landlord's income is positively related with sharecropping. The value of α_3 (0.153) is also positive. It indicates that as the land quality (AR) increases the landlord's share will also increase. The negative value of α_2 (-1184.676) implies that landlord's share is negatively related with this form of tenancy (*kaf*) system. Under this form of tenancy, a handsome amount of money is paid to the landlord, which would remain intact over the years. So, the landlord's rewards would decrease as the amount of rented-out land increases. In concluding remarks it can be said that in Aman production the form of tenancy and land quality (average revenue) play vital role in landlord's share.

7.2.1.2 Factors Affecting landlord's share from Boro

A stepwise regression result of landlord's share (rent) in Boro production is given below.

Table 7.8 Model summary: *

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.590 ^a	.348	.343	1800.6657
2	.664 ^b	.441	.433	1672.2144
3	.761 ^c	.579	.571	1655.9909
4	.769 ^d	.591	.580	1440.2760

* Dependent variable: Rent (landlord's rewards)

- a) Predicators: (constant), CS (cost sharing)
- b) Predicators: (constant), CS (cost sharing), AR Per acre
- c) Predicators: (constant), CS (cost sharing), AR Per acre, Sharecropping
- d) Predicators: (constant), CS (cost sharing), AR Per acre, Sharecropping, S.T. Leasing (STL).

Table 7.9 Analysis of variance: ANOVA

Model		Sum of squares	df	Mean squares	F-value	Significance
1	Regression	2.5E+08	1	2.5E+08	76.207	.000***
	Residual	4.6E+08	143	3242397		
	Total	7.1E+08	144			
2	Regression	3.1E+08	2	1.6E+08	56.088	"
	Residual	4.0E+08	142	2796301		
	Total	7.1E+08	144			
3	Regression	4.1E+08	3	1.4E+08	64.759	"
	Residual	3.0E+08	141	2119910		
	Total	7.1E+08	144			
4	Regression	4.2E+08	4	1.1E+08	50.658	"
	Residual	2.9E+08	140	2074395		
	Total	7.1E+08	144			

*** Significant at 0.1% level (highly significant)

- Predictors: (constant). CS (cost-sharing)
- Predictors: (constant). CS (cost-sharing), AR per acre,
- Predictors: (constant). CS (cost-sharing), AR per acre, (SH) sharecropping
- Predictors: (constant). CS (cost-sharing), AR per acre, (SH) sharecropping, S.T.L
- Dependent Variable: Rent.

Table 7.10 Variables in the Equation: Coefficients Table

Model	Variables	Unstandardized coefficients		Standardized coefficients	t-statistics	Significance
		B	Standard Error	Beta (β)		
1	Constant	4595.669	165.765		27.724	.000**
	CS (cost-sharing)	6706.883	768.288	.590	8.730	"
2	Constant	748.375	803.293		.932	.353
	CS (cost-sharing)	7126.98	718.657	.627	9.917	.000**
	AR	.183	.038	.308	4.880	"
3	Constant	-932.351	741.752		-1.257	.211
	CS (cost-sharing)	4907.615	705.626	.431	6.95	.000**
	AR	.233	.033	.393	6.80	"
	Sharecropping (SH)	1933.217	284.090	.433	6.805	"
4	Constant	-881.508	734.176		-1.201	.232
	CS (cost-sharing)	4842.492	698.751	.426	6.932	.000**
	AR	.243	.033	.409	7.257	"
	Sharecropping (SH)	1929.605	281.029	.432	6.866	"
	STL (short term leasing)	-490.562	242.458	-.111	-2.023	.045

*** Significant at 0.1% level (highly significant)

From the regression results it is observed that landlord share (rent) in Boro cultivation is associated with 4 explanatory variables. Other variables are excluded from the model automatically (Appendix-VII-D, excluded variables for Boro).

So, regression equation can be written as,

$$Y_{LB} = B + B_1CS + B_2AR + B_3SH + B_4STL + U_i$$

Where, Y_{LB} = Landlord's share or rent income from Boro production;

B=Constant; CS= cost sharing in Boro production; AR= per acre rent income; SH= sharecropping; STL= short term leasing; and B_1, B_2, B_3 and B_4 are the coefficients.

From the model summary (Table 7.8), it is observed that the value of R (coefficient of multiple regressions) is positive and equal to 0.769 indicating that landlord's share in Boro production is highly related to explanatory variables. The R^2 value (.591) indicates that the regressors explain about 60% of average rent income jointly. In ANOVA Table (Table 7.9, model 4) F-value is 50.658, which is significant at 0.1% levels.

The coefficients Table (Table 7.10) indicates that coefficients of B_1 , B_2 and B_3 are positive and B_4 is negative. The positive value of B_1 (4842.492) is large. The larger value of B_1 indicates that cost sharing in Boro production has much impact on landlord's share. The value of B_2 (.243) implies that about 25% of landlord's average rent income (landlord's share) is explained by land quality (per acre revenue). The value B_3 and B_4 indicate that form of tenancy (SH and STL) have much impact on landlord's income. The coefficient B_3 indicates that sharecropping has positive impact on landlord's share whereas the value of B_4 shows that STL has negative impact on landlord's income. In sharecropping landlord's share is a fraction of total production. As a result, increase in production will also increase landlord's share and vice versa. In STL arrangement a fixed amount of money is paid to the landlord prior to harvest. Uncertainty of agricultural production induces a little number of tenants to take a risk. Moreover, in STL arrangement rent is fixed up by considering previous production. The tenant considers average rent rate and production on fixing up rent. For these reasons, landlord's share is negatively related with STL arrangement. From the regression result it is clear that in Boro cultivation form of tenancy, cost sharing and land quality have large impact on landlord's share (rent).

Comparison of Regression Results between Aman and Boro

From the model summary of the two regression models it is observed that the value of R^2 is .450 for Aman and .580 for Boro. The larger value of R^2 in case of Boro indicates that the explanatory variables have larger impact on landlord's share in Boro than that of Aman. The differences in R^2 values are due to the existence of high degree of uncertainties in Aman cultivation because of complete dependence on rain feeding. Moreover, the larger value of R in case of Boro cultivation indicates that landlord's share is highly associated with explanatory variables. Since Boro production is artificially irrigated and the natural impact on Boro production is lower than that of Aman production, it can be concluded that uncertainty in rice cultivation has much impact on landlord's income from leasing out land.

7.2.2 Factors Affecting Tenant's Share

The main objective of this section is to examine the association between net returns from tenanted land and its determinants. The analysis is carried out on Aman and Boro seasons. Multiple linear regression technique is used to examine the association between profitability and its determinants. Here, dependent variable is net returns from leased-in land. Net returns from tenanted land to the tenant are defined as per acre average net returns from Aman and Boro cultivation. That is, from tenant's point of view, a net return from rented-in land is considered as average revenue (AR) earnings minus average cost (AC) including hired cost of land. So, per acre net returns from hiring land is considered as profit to the tenant. Explanatory variables are analyzed in conceptual framework on the methodology chapter. However, form of tenancy and cost sharing in cultivation are taken as dummy variables because of insufficient data. In addition, for analyzing profitability of tenanted land from tenant's perspective production costs (cost of labor, cost of capital, cost of fertilizer, cost of irrigation and hiring cost of land (rent)) are also included in the explanatory variables.

7.2.2.1 Factors Affecting Tenant's Net Returns from Aman Production

As like as previous section, to remove multicollinearity of regressors "stepwise" regression model is used. To save space and time we don't present correlation matrix for detection of multicollinearity. But only R^2 value is considered here

(Appendix-VII-E 'enter' method). Two models, one for Aman and another for Boro are developed. A summary of the regression output using 'stepwise' method for the two models is presented here.

Table 7.11 Model for Aman: Stepwise Regression Results

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.628 ^a	.394	.388	2235.4538
2	.749 ^b	.561	.551	1913.6559
3	.974 ^c	.948	.946	663.4477
4	.994 ^d	.988	.988	314.7759
5	1.000 ^e	1.00	1.00	45.1184

a) Predicators: (constant), Rent (R) * dependent variable: tenant's net returns.

b) Predicators: (constant), Rent, AR

c) Predicators: (constant), Rent, AR, labor cost

d) Predicators: (constant), Rent, AR, labor cost, cost of capital

e) Predicators: (constant), Rent(R), AR, labor cost (W), cost of capital (K) and cost of fertilizer (F).

Table 7.12 Analysis of variance: ANOVA

Model		Sum of Squares	df	Mean squares	F-values	Significance
1	Regression	3.2E+08	1	3.2E+08	63.113	000***
	Residual	4.8E+08	97	4997254		
	Total	8.0E+08	98			
2	Regression	4.5E+08	2	2.2E+08	61.244	"
	Residual	3.5E+08	96	3662079		
	Total	8.0E+08	98			
3	Regression	7.6E+08	3	2.5E+08	574.263	"
	Residual	4.2E+07	95	440162.8		
	Total	8.0E+08	98			
4	Regression	7.9E+08	4	2.0E+08	1995.302	"
	Residual	9313884	94	99083.877		
	Total	8.0E+08	98			
5	Regression	8.0E+08	5	1.6E+08	78591.530	"
	Residual	189317.6	93	2035.674		
	Total	8.0E+08	98			

*** Significant at 0.1% level (highly significant) * dependent variable: tenant's net returns.

- a. Predicators: (constant), Rent
- b. Predicators: (constant), Rent, AR
- c. Predicators: (constant), Rent, AR, labor cost
- d. Predicators: (constant), Rent, AR, labor cost, cost of capital
- e. Predicators: (constant), Rent, AR, labor cost (W), cost of capital (K) and cost of fertilizer (F).

Table 7.13 Variables in the Equation (coefficients)

Model	Variables	Unstandardized coefficients		Standardized coefficients	t-ratio	Significance
		A	Standard Error	β		
1	Constant	6796.538	676.132	--	10.052	.000**
	Rent	-1.284	.162	-.628	-7.944	"
2	Constant	1702.369	1024.017	--	1.662	"
	Rent	-1.443	.141	-.706	-10.244	"
	AR	.514	.085	.415	6.030	"
3	Constant	-644.674	365.877	--	-1.762	.081 NS
	Rent (R)	-1.036	.051	-.507	-20.248	.000***
	AR	.934	.034	.755	27.872	"
	Labor cost (w)	-1.169	.044	-.753	-26.572	"
4	Constant	-768.688	173.727	--	-4.425	"
	Rent (R)	-.945	.025	-.462	-38.075	"
	AR	.989	.016	.800	61.100	"
	Labor cost (w)	-1.081	.021	-.697	-50.380	"
	Cost of capital	-.972	.054	-.230	-18.111	"
5	Constant	-14.747	27.329	--	-.540	"
	Rent	-.995	.004	-.486	273.744	"
	AR	1.002	.002	.810	430.325	"
	Labor cost (w)	-1.006	.003	-.648	307.176	"
	Cost of capital (K)	-1.007	.008	-.238	130.589	"
	Cost of fertilizer (F)	-.995	.015	-.118	-66.950	"

Dependent variable: net returns.

*** Significant at 0.1% level (highly significant), NS= Not Significant.

Above stepwise regression result (model 5), depicts that tenant's net returns from tenanted land on Aman cultivation is associated with 5 explanatory variables (R, AR, W, K and F). Other variables are automatically excluded from the model (Appendix-VII-F, excluded variables). Thus, regression equation can be written as;

$$\Pi_{TA} = A + A_1R + A_2AR + A_3W + A_4K + A_5F + u$$

Where,

Π_{TA} = The value of net returns from Aman cultivation

A = constant

R = rent for tenanted land in Aman cultivation

AR = average revenue in Aman cultivation

W = labor cost in Aman cultivation

K = cost of capital

F = cost of fertilizer and, A_1, A_2, A_3, A_4 and A_5 are coefficients.

The regression results have some unique characteristics. From the model summary (Table 7.11), it is observed that the value of R (coefficient of multiple regression) is positive and equals 1 (in model 5). Moreover, the value of R^2 (coefficient of determination) is equal to 1. The value of R implies that the dependent variable (net returns) has a perfect relationship with explanatory variables. And the value of R^2 (1.00) shows that cent percent per acre net returns are explained by 5 explanatory variables. Table 7.12 indicates the overall results are highly significant at 0.1% levels.

From the coefficients Table 7.13 it is observed that coefficients A_1, A_3, A_4 and A_5 (model 5) are negative and A_2 is positive. The positive value of A_2 (1.002) indicates that about cent percent per acre net returns are explained by AR (land quality) in Aman production. Other explanatory variables have negative impact on net returns. From the regression results it can be concluded that only land quality

has positive effect on profit but other explanatory variables rent, cost of capital, cost of fertilizer, and labor cost have negative impact on net returns. Other variables such as form of tenancy, cost-sharing in Aman cultivation have no effect on net returns.

7.2.2.2 Factors Affecting Tenant's Net Returns form Tenanted-in Land on Boro Cultivation: Regression Results

To remove multicollinearity of explanatory variable 'stepwise' regression model is used. Correlation matrix is not presented for saving space and time. Only R^2 value is considered (for observing multicollinearity please see Appendix-VII-G).

Model for Boro

Table 7.14 Model for Boro: Regression Results

Model	R	R^2	Adjusted R^2	Standard error of the Estimate
1	.766 ^a	.587	.584	3055.1110
2	.847 ^b	.718	.714	2533.7530
3	.916 ^c	.839	.835	1923.3458
4	.989 ^d	.978	.977	710.9850
5	.996 ^e	.991	.991	447.6885
6	1.00 ^f	1.000	1.000	48.6567

Dependent variable: Net Returns

- a) Predicators: (constant), AR,
- b) Predicators: (constant), AR, W,
- c) Predicators: (constant), AR, W, rent(R),
- d) Predicators: (constant), AR, W, rent, irrigation cost,
- e) Predicators: (constant), AR, W, rent, irrigation cost (I), cost of capital
- f) Predicators: (constant), AR, W, rent, irrigation cost, cost of capital, and cost of fertilizer.

Table 7.15 Analysis of Variance: ANOVA

Model		Sum of Squares	df	Mean square	F-ratio	Significance
1	Regression	1.9E+09	1	1.9E+09	203.286	000***
	Residual	1.3E+09	143	9333703		
	Total	3.2E+09	144			
2	Regression	2.3E+09	2	1.2E+09	180.728	"
	Residual	9.1E+08	142	6419904		
	Total	3.2E+09	144			
3	Regression	2.7E+09	3	9.0E+08	244.241	"
	Residual	5.2E+08	141	3699259		
	Total	3.2E+09	144			
4	Regression	3.2E+09	4	7.9E+08	1563.484	"
	Residual	7.1E+07	140	505499.7		
	Total	3.2E+09	144			
5	Regression	3.2E+09	5	6.4E+08	3197.480	"
	Residual	2.8E+07	139	200425.0		
	Total	3.2E+09	144			
6	Regression	3.2E+09	6	5.4E+08	227514.1	"
	Residual	326711.8	138	2367.477		
	Total	3.2E+09	144			

Dependent variable: Net Returns.

*** Significant at 0.1% level (highly significant)

Table 7.16 Variables in the Equation (coefficients)

Model	Variables	Unstandard Coefficients		Standardized coefficients	t-statistics	Significance
		B	Standard error	Beta		
1	Constant	-14818.0	1438.052	--	-10.304	.000**
	AR	.970	.068	.766	14.258	"
2	Constant	-10880.8	1287.486	--	-8.451	"
	AR	.972	.056	.768	17.226	"
	Labor (W)	-1.000	.123	-.362	-8.118	"
3	Constant	-9106.420	992.478	--	-9.175	"
	AR	1.077	.044	.851	24.462	"
	Labor (W)	-.998	.094	-.361	-10.674	"
	Rent (R)	-.762	.074	-.357	-10.268	"
4	Constant	-3716.810	408.866	--	-9.091	"
	AR	1.103	.016	.871	67.667	"
	Labor (W)	-1.102	.035	-.399	-31.720	"
	Rent (R)	-1.021	.029	-.479	-35.493	"
	Irrigation (I)	-1.146	.038	-.394	-29.864	"
5	Constant	-1562.773	296.569		-5.270	"
	AR	-1.068	.011	.843	101.213	"
	Labor	-1.018	.023	-.368	-45.015	"
	Rent	-1.018	.018	-.477	-56.192	"
	Irrigation	-1.242	.025	-.426	-49.600	"
	Capital	-1.048	.072	-.127	-14.632	"
6	Constant	93.091	35.703		2.607	"
	AR	.998	.001	.788	758.334	"
	Labor	-1.004	.002	-.363	-407.994	"
	Rent	-1.000	.002	-.469	-505.878	"
	Irrigation	-1.0007	.003	-.346	-288.986	"
	Capital	-1.012	.008	-.123	-129.874	"
	Fertilizer	-.994	.009	-.132	-107.840	"

Dependent variable: net returns *** Significant at 0.1% level (highly significant).

From the above regression results it is observed that tenant's per acre net return is associated with 6 explanatory variables (Table 7.16, model 6). Other variables are automatically excluded from the model due to the absence of association of dependent variable with these explanatory variables (Appendix-VII-H, excluded variables). So, regression equation for net return (Π) can be written as;

$$\Pi_{IR} = B + B_1 AR_h + B_2 W_h + B_3 R_h + B_4 I_h + B_5 K_h + B_6 F_h + U_i$$

Where, Π_{IH} = the value of net return from tenanted land in Boro

AR_h = Per acre returns from Boro production

W_h = Per acre labor cost in boro production

R_h = Per acre hiring cost of land (rent)

I_h = Irrigation cost

K_h = Cost of capital

F_h = Cost of fertilizer

B_1, B_2, B_3, B_4, B_5 And B_6 are the coefficients.

From the stepwise regression model summary (Table 7.14) it is observed that the values of R (coefficient of multiple regressions) and R^2 (coefficient of multiple regression determination) are equal to 1. The value of R (1.00) implies that there is a perfect positive relationship between net returns and the explanatory variables. Moreover, R^2 value (1.00) indicates that 100% of per acre net returns from Boro production are explained by all explanatory variables jointly.

7.3 Efficiency Under Various Contractual Arrangements

In this section, to examine the efficiency of different types of contractual arrangements, efforts have been made to find out what type of contractual arrangement provides more net returns in rice cultivation. Since, Aman and Boro are produced in the study area, analysis is limited only to Aman and Boro cultivation in different tenurial arrangements.

Investigating the study area, it is found that there are broadly 5 categories of contractual arrangements. According to Agriculture Census-1996, there are 6 categories of tenurial arrangement in Bangladesh (BBS, 1999).² After completion of field survey, it

² Six categories of tenancy arrangements are a) sharecropping b) Fixed crop rent, c) leasing arrangements, d) *Khaikhalashi*, e) mortgage (*kat*) and f) other contracts.

seems reasonable to classify the existing contractual arrangements in 5 categories. However, it is also found that same type of contractual arrangement is known in different names in different regions. Efficiency of different types of contractual arrangements has been examined in crop season basis (i.e. Aman and Boro).

7.3.1 Landlord's Share in Aman Production

To have a clear picture of landlord's share from hiring out land under different contractual arrangements it is required to compare the share from hiring out land on different tenorial arrangements. This can be observed from the Table 7.17.

Table 7.17 Net Earnings from Leased-out Land in Aman Cultivation

Contractual arrangements	No. of respondents	Average value of rent (In Tk.)	Standard deviation	F-value
Sharecropping	58	4610.1724	1113.7952	22.46*
Fixed crop rent	7	3450.00	1221.6792	
S.T. Leasing	21	3578.5714	1443.6561	
<i>kat</i> (mortgage)	19	2533.4211	1213.5783	

* Significant at 5% level.

Table 7.17, shows that landowner gets the highest rent (Tk.4610.1724) from sharecropping arrangements and lowest (Tk.2533.42) from *kat* system. Another two types of arrangements (fixed crop rent and S.T. Leasing) provide nearly same rent income to the landlord. From the landowner's point of view, it can be said that leased-out of land on sharecropping is more profitable compared to other tenancy arrangements. For testing the differences in profitability of leasing out of land on different contractual arrangements F-test has been used for average values of rent of different arrangements. F-value (22.46) confirms the differences in average values of rent earnings from leased-out land.

7.3.2 Comparison of Landlord's Share from Leased-out of Land on Boro Cultivation

From Table 7.10 below, it is observed that the highest average rent (Tk.6582.048) is earned from hiring out land on sharecropping and the lowest (Tk.3621.429) mean rent is earned from fixed crop rent system.

Table 7.18 Results of F-test for Rental Variation under Differences Arrangements

Arrangements	No. of respondents	Average value of rent(In Tk.)	Standard deviations	F-value
Sharecropping	63	6582.048	2017.054	19.81*
Fixed crop rent	7	3621.429	1047.957	
S.T. Leasing	46	4219.239	1446.64	
<i>Khaikhalashi</i>	3	4875.00	2146.363	
<i>kat</i>	34	4073.118	2137.775	

*Significant at 5% levels (significant).

The second lowest average rent is earned from leased-out land on *kat* system. So, from the landowner's point of view hiring out of land on sharecropping basis is profitable. Statistically, the differences in average rent earnings from different contractual arrangements are highly significant. F-value (19.81) indicates that the differences in rent income from leased-out land on different tenancy arrangements are significant at 5% levels.

7.3.2.1 Comparison of landlord's share on Aman and Boro

Empirical evidences indicate that landlord's share is also high in case of Boro cultivation. Table 7.11, depicts that there are differences in rent earnings between Aman and Boro. To measure whether these differences are statistically significant or not, t-test has been used for differences in average value of rent under contractual arrangements for Aman and Boro.

Table 7.19 Results of t-test for Rental Variation Under Different Arrangements for Aman and Boro

Arrangements	Aman			Boro			t-value
	N	Average value (in Tk.)	SD of average value (in Tk.)	N	Average value (in Tk.)	SD of average value (in Tk.)	
Sharecropping	58	4610.17	1113.7852	63	6582.051	2017.05	6.73**
Fixed crop rent	7	3450.00	1221.68	7	3621.43	1047.96	0.28
S.T. Leasing	21	3578.57	1443.66	46	4219.241	1446.64	1.68
<i>Khaikhalashi</i>				3	4875.00	2146.36	
<i>kat</i>	19	2533.42	1213.58	34	4073.12	2137.77	3.34*

** Significant at 1% levels * Significant at 5% level

Note: Figures after decimal are rounded up.

Table 7.19 reveals that the differences in rent earnings from Aman and Boro under sharecropping and *kat* system are highly significant. But the differences in rent earnings on fixed crop rent and S.T. Leasing arrangements are not significant.

7.3.3 Tenant's Net Returns from Different Contractual Arrangements

In this section, attempts have been to find out what type of contractual arrangement is more profitable to the tenant in rice cultivation. Efficiency of different types of contractual arrangements has been examined in crop season basis (i. e. Aman and Boro).

7.3.3.1 Net Returns from Aman

Table 7.20 Comparison of Profitability in Aman Production

(Figures in taka per acre)

Items		Sharecropping	Fixed crop rent	S. T. Leasing arrangement	<i>kat</i>
Revenue	Total	640980.00	70020.00	220620.00	231420.0
	Average	11051.38	10002.86	10505.71	12180.00
	SD	2440.894	1071.47	2661.86	2127.35
	CV	22.09	10.71	25.34	17.47
Cost	Total	608802.00	54978.00	182658.00	134052.00
	Average	10496.59	7854.00	8698.00	7055.37
	SD	2958.502	813.93	2617.65	2736.48
	CV	28.18	10.36	30.09	38.79
AR/AC		1.05	1.27	1.21	1.73

Source: Field Survey.

Note: Lands were not rented-in under *khaikhalashi*.

Considering the average return from different contractual arrangement, it is evident that the lowest average return (Tk.10002.86) is accrued from fixed crop rent and the highest (Tk.12180.00) from *kat* system. This is due to the nature of rent payment to the landowner. In sharecropping, landowner gets a part of the total produce as rent.³ As a result, the return of extra care and investment in Aman production is being divided between tenant and landowner. In the extreme case, *kat* system

³ There are different types of share in the total produce in Bangladesh. But 50: 50 shares are dominant. The 1/3:2/3 sharecropping is also existing in different areas.

produces highest average returns. In this arrangement, all liabilities and responsibilities as well as benefits from cultivation go to tenant. The standard deviation of average revenue from short term leasing arrangement is highest and it is lowest for fixed crop rent system. The larger value of standard deviation of average returns from short term leasing indicates that there are great variations in returns from Aman.

Cost incurred in Aman cultivation under different tenancy arrangements reveals that average cost was the highest (Tk. 10496.59) in sharecropped land and was the lowest (Tk.7055.37) in *kat* system. The second highest (Tk. 8698.00) was in short term leasing system. The third highest was estimated at Tk.7854.00 under fixed crop rent system. The main cause of high average cost of producing Aman under sharecropping is the highest rent (hired cost of land). The differences in costs incurred in Aman cultivation depend on hired cost (rent) of land. Other input cost remains more or less same in different tenurial arrangements. In short term leasing arrangements terms of contract is for very short period that raises rent rate. Land is leased out mainly for one-year period. As a result, a huge amount of money is not required and total return from cultivation goes to tenant's pocket (till). This inspires the tenants to get land at higher rent.

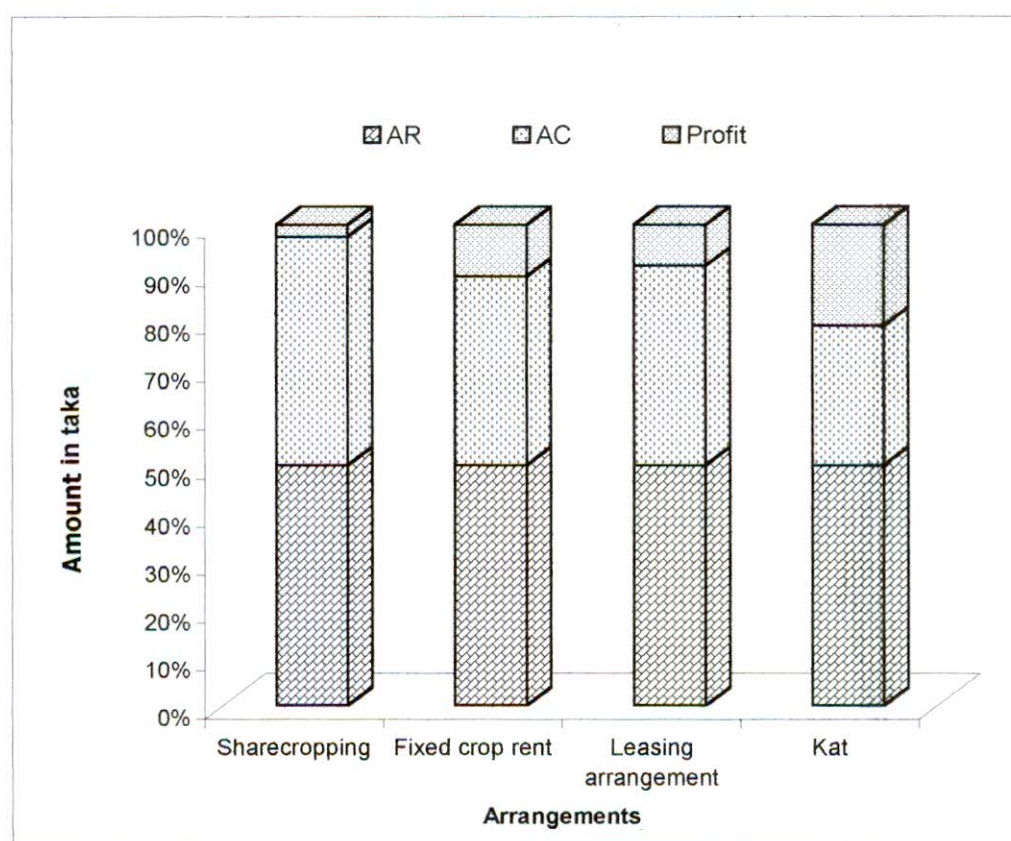
Under *kat* system, a large amount of money has to be paid to the landowner for indefinite period. But this amount of money remains intact year after year irrespective of intensive use of land. The tenant will cultivate the land as long as the landowner can refund money to the tenant. This system is lucrative to the local traders, service holders, well-off farmers and local rich man. In this case, tenant feels very lucky to get such a chance due to the absence of sound monetary system. Lack of opportunity to invest idle cash in rural areas induces the farmers to invest their savings in this type of land leasing. The only cost of renting land under this type of arrangement earns interest on the paid amount. Considering local market interest as well as national interest rate in the banking system, 10% interest rate has been taken for measurement.

Standard deviation of cost incurred is also high in sharecropped land. The standard deviation of cost incurred in Aman production has been estimated at Tk.2736.48

under *kat* system. This is due to the existence of disparities in well-off families among the areas. Rent is high in those areas that are industrially developed compared to underdeveloped area.

Moreover, proximity to the large city or town generates employment opportunities for the unemployed tenant that would lead to bid for land in the lease market. This might be the cause of divergence of rent. The last and the most important statistics of revenue and cost scenario is average revenue-average cost (AR/AC) ratio. The lowest ratio (1.05) is found under sharecropping and the highest is (1.73) in *kat/bhuayata kat*. The estimated AR/AC ratios are 1.21 and 1.27 under short term leasing (fixed rent, s.t.) and fixed crop rent respectively. Similarly, net returns from different types of contractual arrangements are shown in Figure 7.1.

Figure 7.1 Comparison of Profitability of Different Contractual Arrangements for Aman



Source: Table 7.20

From Figure 7.1, it is seen that the highest profit is earned from Aman cultivation under *kat* system and the lowest profit is earned under sharecropping. From the above analysis it can be said that land leasing under *kat* system is the most profitable and sharecropping is the least profitable. The third position in profitability is fixed crop rent is followed by short term leasing arrangement.

7.3.3.2 Comparison of Net Returns from Aman

For testing the differences in profitability among different contractual arrangements in Aman cultivation F-test is used. Analysis of previous section reveals that there are great differences in profit accruing from different contractual arrangements in Aman production. Statistically, these differences can be examined by using F-test. Table 7.21 shows the result of F-test for differences in profitability of various arrangements.

Table 7.21 Results of F-test for Productivity Variations in Aman Cultivation.

Arrangements	Number of respondents	Average Value of net return (In Tk.)	Standard deviation of average value of profit	F-value
Sharecropping	58	554.79	2177.29	20.41*
Fixed crop rent	7	2148.86	1625.85	
S.T. leasing	21	1807.71	3318.37	
<i>kat</i>	19	5124.63	2920.77	

* Significant at 5% levels (significant).

Note: Lands were not Rented-in under *Khaikhalashi* in Aman Cultivation.

Table 7.21, represents the variations in net returns from different contractual arrangements. The highest return is earned from tenanted land on *kat* system and the lowest from sharecropping. These differences are highly significant as the F-value is 20.41. The study supports the Marshallian theory of sharecropping where he pointed out that under sharecropping resource allocation became inefficient. Moreover, Marshallian theory explains why sharecropping is inefficient compared to other form of tenancy arrangements. If this finding is true for Aman cultivation, it is logical to say that among different types of contractual arrangement sharecropping is inefficient with respect to production. Since the tenants in sharecropping make no advance payment, comparatively poor tenants are willing to rent in land under sharecropping basis. The poor tenant cannot supply adequate and balanced inputs for cultivation. Thus, inability to use modern cultural practices (e.g. irrigation, HYV, fertilizer, etc.) may result lower production.

7.3.3.3 Net Returns from Boro

In order to measure the profitability/net returns from tenanted land, per acre profitability has been measured for leased-in land on different contractual arrangements. Table 7.22 depicts the profitability of different types of contractual arrangements for Boro.

Table 7.22 Comparison of Profitability of Under Various Contractual Arrangements for Boro Cultivation

(In taka)

Form of contractual arrangements		Crop Rent		Cash Rent		
		Sharecropping	Fixed crop rent	S.T.Leasing	<i>Khaikhalashi</i>	<i>kat</i>
Frequency		63	7	46	3	34
Revenue	Total	1243800	127020.00	1005060.00	69840.00	724620.00
	Average	19742.86	18145.71	21849.13	23280.00	21312.35
	SD	3385.96	1546.81	3356.06	626.42	4547.99
	CV	17.15	8.52	15.36	2.69	21.34
Cost	Total	1082289.00	96888.00	702363.00	43932.00	431088.00
	Average	17179.19	13841.14	15268.76	14644.00	12679.06
	SD	2695.76	2036.03	1899.39	2586.97	2740.56
	CV	15.69	14.71	12.44	17.67	21.61
Profit (AR-AC)		2563.19	4304.57	6580.37	8636.00	8633.29
AR/AC		1.15	1.31	1.43	1.59	1.68

Source: Field Survey

The total number of respondents was 150. As because of some tenants are leasing lands under different tenancy arrangement at a time, sum of Boro cultivators were 153. In other words, one tenant might lease in land on different tenancy arrangements. The total return and the total cost cannot be compared due to its frequency variation. Average statistics are more suitable for comparison of profitability among different arrangements. It is clear from the Table 7.22 that the highest average revenue is accruing from *khaikhakashi* arrangement and the lowest average revenue was accruing from the fixed crop rent land. The second highest return is accrued from short term leasing system. Average figures depict that the difference of average revenues (Tk.23280-Tk.21312) among cash rent system are small. But it significantly varies between crop rent and cash rent system.

However, survey result shows that cash rent tenancy arrangements give more return than those of crop rent tenancy arrangements whether the rent is paid on the basis of total production or on the basis of pre determined fixed rate. Among the cash rent

arrangements, highest average returns are accrued from *Khaikhalashi* arrangement. Standard deviation of returns accruing from tenanted land is the highest in *kat* and is the lowest in *Khaikhalashi*.

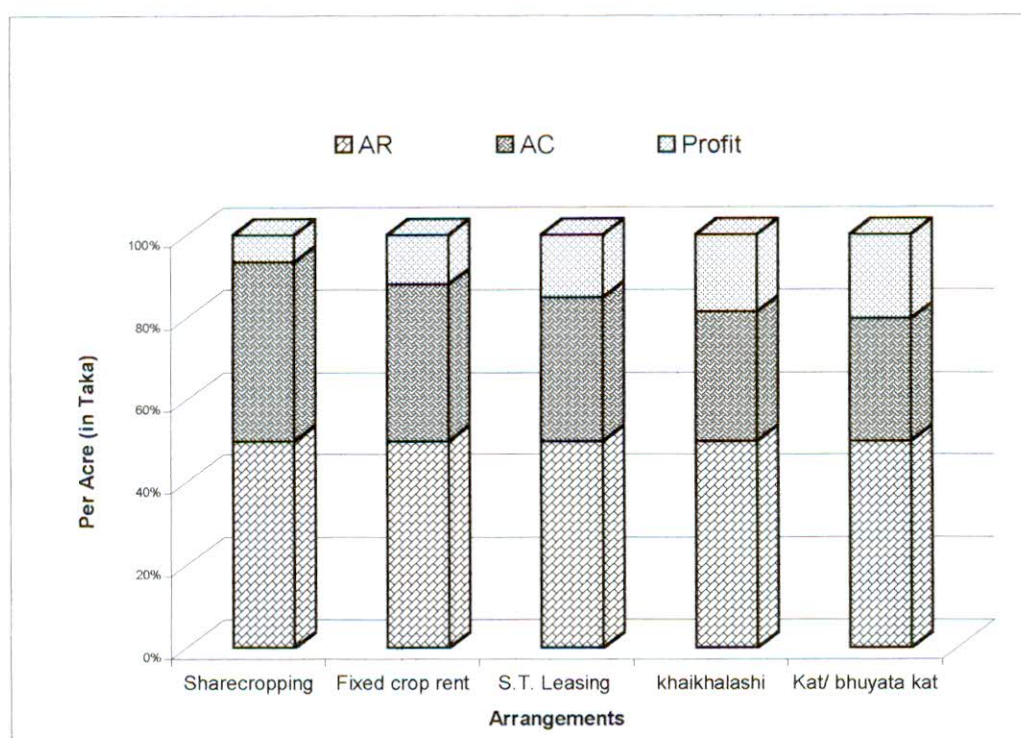
The estimated values of covariance show the relative variation of revenue accruing from different tenancy arrangements. The highest estimated value of covariance is in case of *kat* and lowest in *Khaikhalashi*. The 2nd lowest covariance is found in case of sharecropping that is the indication of significant relative variation of returns from sharecropping compared to other tenancy arrangements. Average cost incurred in Boro cultivation shows the highest cost (Tk.17179.19) involvement for sharecropping and lowest for (Tk.12679.76) *kat* arrangement. The average costs incurred in Boro production estimated at Tk.13841.14, Tk.15268.76 and Tk.14644 in fixed crop rent, short term leasing and in *Khaikhalashi* respectively. Since rent is a share of total product in sharecropping, it may be the cause of higher cost in Boro production. Moreover, in short term leasing arrangement, rent is paid for annually in most cases. The bid for tenanted land may raise the hired cost of land. However, short-lived tenancy arrangement is favorable to both the tenant and the landlord.

The lowest average cost is incurred in Boro production under *kat* system, as because a large amount of money is paid for leasing land and the absence of alternative opportunity to invest savings in rural areas; it entails the lower cost of paid-up money. On an average, 10% interest rate is taken as the cost of renting land under *kat* system. The scenario may change if interest rate changes. Moreover, 10% interest rates do not reflect actual opportunity cost of paid up money for renting land.

The estimated value of standard deviation for cost incurring on Boro production under different tenancy arrangement were 2695.76, 2036.03, 1899.39, 2586.97 and 2740.56 in sharecropping, fixed crop rent, short-term leasing arrangement, in *Khaikhalashi* and in *kat* system respectively. The estimated standard deviation of AC is highest for *kat* system and lowest for short-term leasing arrangement. The large value of standard deviation for *kat* system indicates that there is a great disparity among the tenants' in paying rent. Likewise, cost incurred in other forms of tenancy arrangement differs insignificantly.

The last and the most important statistics for comparing the efficiency of profitability of different types of contractual arrangements is average revenue/average cost (AR/AC) ratio. The estimated ratio is highest in *kat* system and is lowest in sharecropping. The estimated values of AR/AC ratios are 1.15, 1.31, 1.43, 1.59 and 1.68 in sharecropping, fixed crop rent, in short term leasing arrangement, *khaikhalashi* and in *kat* system respectively. From the figure 7.2, it can be seen that net returns (profit) from Boro production on different tenancy arrangements differs significantly. The highest amount of profit/net return is earned from *kat* system and the lowest from sharecropping. The net returns from different tenancy arrangements would be clear from the figure 7.2.

Figure 7.2 Comparison of Per Acre Profitability of Different Contractual Arrangements for Boro



Source: Table 7.22

From the above discussion, it can be concluded that sharecropping is inefficient tenancy arrangement relative to other form of cash rent tenancy arrangement in Boro cultivation. On the contrary, *kat* system is the most profitable to the tenant compared to other forms of tenancy arrangement.

7.3.3.4 Comparison of Net Returns from Boro

From the previous section it is clear that the highest return comes from tenanted land on *kat* system and the lowest profit is earned from sharecropped land. Moreover, there are great differences in net returns from different types of tenancy arrangements. To have a statistical base of these findings F-test has been applied. Table 7.23 shows the result of F-test for differences in profitability among contractual arrangements.

Table 7.23 Variation in Productivity for Boro Production

Arrangements	No. of respondents	Average value of net returns (In Tk.)	SD of net returns	F-Value
Sharecropping	63	2563.19	3926.87	17.91*
Fixed crop rent	7	4304.57	2145.32	
S.T. Leasing	46	6580.37	3481.64	
<i>Khaikhalashi</i>	3	8636.00	2893.56	
<i>kat</i>	34	8633.29	4919.03	

* Significant at 5% levels.

F-value (17.91) indicates that the differences in per acre net returns from Boro cultivation among tenancy arrangements are highly significant.

7.4 Comparison of profitability between Aman and Boro

To compare the profitability of Aman and Boro production under various tenancy arrangements it is required to examine the net returns (profit) from Aman and Boro cultivation under various contractual arrangements.

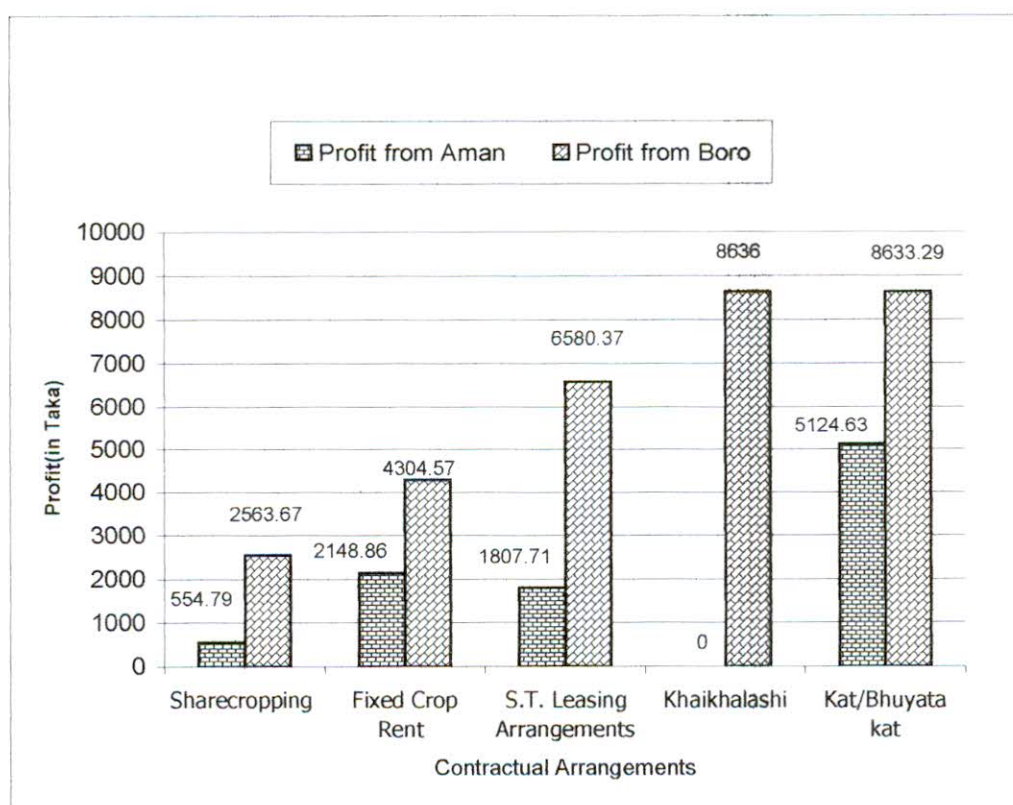
In this section comparison is made for examining the profitability of different contractual arrangements for producing Aman and Boro. This is shown in Table 7.24.

Table 7.24 Comparison of Profitability between Aman and Boro under Different Arrangements

Contractual Arrangements	Aman			Boro		
	AR	AC	Profit/Net Returns (Π)	AR	AC	Profit/Net Returns (Π)
Sharecropping	11051.38	10496.59	554.79	19742.86	17179.19	2563.19
Fixed crop Rent	10002.86	7854.00	2148.86	18145.71	13841.14	4304.57
S.T. Leasing	10505.71	8698.00	1807.71	21849.13	15268.76	6580.37
<i>Khaikhalashi</i>	00.00	00.00	00.00	23280.00	14644.00	8636.00
<i>kat</i>	12180.00	7055.37	5124.63	21312.35	12679.06	8633.29

Table 7.24 reveals that net return or profit in Boro production is higher than that of Aman production under all sorts of contractual arrangements. That is, land leasing is more profitable in Boro cultivation than Aman production under any form of contractual arrangements. A similar scenario is presented in figure 7.3.

Figure 7.3 Comparison of Profitability between Aman and Boro under Different Contractual Arrangements



Source: Table 7.24.

From the last section it is observed that there is a great difference of net return/profit earning between Aman and Boro production under all types of tenancy arrangements. Profit is always higher in Boro production irrespective of tenancy system. This is shown in Table 7.25.

Table 7.25 Variation in Profit for Boro and Aman Under Differences Arrangements

Arrangements	Aman			Boro			t-value
	Frequency	Average value of net returns/ profit (In Tk.)	SD of profit	Frequency	Average value of net returns/ profit (In Tk.)	SD of net returns/ profit	
Sharecropping	58	554.79	2177.29	63	2563.67	3926.87	3.52**
Fixed crop Rent	7	2148.86	1626.85	7	4304.57	2145.32	2.12
S.T. Leasing	21	1807.71	3318.37	46	6580.37	3481.64	5.38**
<i>Khaikhalashi</i>	00	00	00	3	8636.00	2893.56	
<i>kat/Bhuyata kat</i>	19	5124.63	2920.77	34	8633.29	4919.03	3.26*

** Significant at 1% levels * Significant at 5% levels

The t-test result expresses that differences in profitability accrued from Aman and Boro are highly significant on sharecropping, from short-term leasing, and *kat* system but not significant on fixed crop rent system. From the foregone analysis, it is clear that sharecropping and fixed crops rent arrangements (crop rent arrangements either it is fixed or not) are an inefficient mode of production in terms of productivity and resource allocation both on Aman and Boro cultivation.

7.5 Verification of Findings with the Theories on Share Tenancy

In this section, efforts have been made to compare the findings of survey relating to resource use and productivity of different contractual arrangements with the existing theories on share tenancy. The summarized propositions relating to resource use under tenancy contracts are given below:

1. Resource allocation under fixed rent tenancy arrangements as efficient as owner cultivation. That is, fixed rent tenants are as efficient in resource allocation as owner cultivators (Marshall, 1966).
2. In sharecropping labor use is less, lower intensity of cultivation and output per acre compared to owner and fixed rent cultivation if the sharecropper are free to choose the amount of land and labor (Marshall, 1966, Bardhan & Srinivasan, 1971 and Bell, 1977).

3. Landowners can ensure efficient resource allocation on sharecropped tenancies by stipulating 'appropriate' inputs. This can be done by contracting short term leasing arrangements with many tenants and regular supervision (Marshall, 1966 and Cheung, 1969).
4. Landlords can ensure efficient resource allocation in sharecropping by sharing cost with their tenants in same proportion as the rental share (Bliss and Stern, 1982).
5. Sharecropping contracts with appropriate input stipulation are equivalent to a combination of owner cultivation (wage cultivation) and fixed rent contract (Newberry, 1977).

From the above propositions it is clear that sharecropping contracts are allocatively efficient (propositions 3 to 5) if following conditions are fulfilled;

- a) Contracts to be short-term;
- b) Sharecroppers have to be on security of tenure;
- c) Inputs are stipulated by landlord;
- d) Efficiency in sharecropping is achieved when landlords share cost of inputs in the same proportion as the rental share; and
- e) Landlords closely supervise cultivation on sharecropped land.

All of the theoretical approaches to sharecropping are not fully relevance with Bangladesh's tenurial arrangement. No theory is consistent with "owner-cum-tenant" cultivation, but it is common phenomenon in tenurial system in Bangladesh. The economic analysis of sharecropping is concentrated on comparison of the so-called owner-cultivation with the pure tenant cultivation. The Marshallian explanation of sharecropping does not indicate the actual behavior of using less variable input by the tenant than by the landlord.

A study of tenancy relationship in Bangladesh by Zaman did not reach any definite conclusion (Zaman, 1973). Zaman argued that limited supply of institutional credit to sharecropping is more severe constraint than the terms and conditions of sharecropping argument. That is, argument of sharecropper is less disfavored and

complex than getting institutional credit. But in recent years, landless farmers and sharecroppers are getting credit from different NGOs whether that credit is economically viable or not. In case of Bangladesh agriculture, there are different types of problems in cultivation for both the landowner and the tenant. Increase in price of fertilizer, irrigation cost, wage rate and other input cost for production induces landowner to lease out land. Both tenant and landlord think that land leasing under fixed rent tenancy gives them more return than share tenancy.

Tenant argued that though land leasing is not profitable yet they cultivate land due to lack of suitable employment opportunities. Moreover, cost incurring in production is spread out through the season, but revenue from cultivation can be obtained at a time. That's why, they leased-in land for getting whole year's cost at a time. Another argument obtained from the tenant after interviewing them is that there are no suitable banking channels in rural areas, which may provide reliable and lucrative interest on small deposits. Tenant's small savings have to invest in tenanted land. Tenant farmers do not consider economic or opportunity cost of their investment. They are accustomed to cultivate tenanted land whether it is profitable or not.

Since Boro cultivation is artificially irrigated and the influence of natural calamities on Boro production is lower than that of Aman, it can be concluded that uncertainty in rice cultivation has much impact on landlord's income from hiring out land. So, from the landowner's point of view, hiring out of land on sharecropping basis is profitable in Boro production also. Among the different types of contractual arrangement *kat* system provides highest amount of profit. Sharecropping renders the lowest profit to the tenant due to the highest rent for sharecropping. The study supports the Marshallian theory of sharecropping where he pointed out that under sharecropping arrangement resource allocation is inefficient. Considering this finding acceptable, it is justified to say that among different types of contractual arrangements sharecropping is inefficient with respect to production in Bangladesh agriculture. Variations in profit from different contractual arrangements depend on hiring cost of land (rent). Other input costs remain more or less same under different contractual arrangements. However, tenancy cultivation, either in crop rent basis or in cash rent basis is profitable. But it is more profitable under cash rent basis.

Chapter 8

Summary, Conclusion and Recommendations

Agriculture sector is the single most contributors to income and employment generation and a vital element in the country's challenges to self-sufficiency in food production, reducing rural poverty and to foster sustainable economic development. It is very difficult to imagine the country's sustenance and even development without development of agriculture sector, which is the central point of rural economy. Agriculture has been considered life-blood of the economy in general and rural economy is particular for its contribution to employment and production. Agricultural production and employment opportunities are circled around land. Since land is the key factor of agricultural production, right of land use is an effective component for achieving economic growth and sustainable development of the country. To attain these goals and to make this sector commercially profitable priority should be given to actual operator of land. Prevailing contractual arrangements and tenurial conditions are playing vital role for achieving these goals and are subjects of great concern and discussions. So, this study has explored the actual scenario of agrarian relations and examined the profitability of tenanted land.

8.1 Summary and Findings

This section discusses the main findings of the study. In ancient period, land was the common property of the community and belonged to settlers of the villages who would cultivate land. The landlordism of the kings had been blended with peasant proprietorship signifying that both had rights to land, one as the sovereign, and the other as the actual tiller. Moreover, rent-free and permanent tenures were granted for *Sangh* or *Bihar* and charitable purposes. There were 3 types of land as; a) *vastu* (homestead land) b) *ksetra* (plough land) and c) *khila* (cultivable wasteland).

The land tenure in Sultani period had not undergone any remarkable changes. It was more or less same as the ancient period. The Mughal ruler substantially changed the land tenure system. In general, land belonged to the state. But the emperor employed

revenue collector called *Zamindars* and *Talukdars* who were traditionally enjoying revenue-collecting rights hereditarily. The *raiyats* enjoyed hereditary customary rights in land on the basis of the terms laid down in *patta* and *kabuliyat*. In Mughal period, Mughal land tenure system provided assigned land or rent-free grants. The institution of *Zamindars* and *Talukdars* were operating without significant changes.

During the company and British rule, land tenure had witnessed substantial changes. Permanent Settlement turned the government revenue agents into landowners overnight. The concept of peasant proprietorship was thus totally abolished. So, this settlement is considered as the safeguard of the protection of the rights of *Zamindars*. The Bengal Tenancy Act of 1885 modified the Permanent Settlement drastically and it gave de jure recognition to the rights of others besides *Zamindars*. The Act of 1885 even as amended latter conferred no rights to land to cultivators working as wage laborers on the land of others. However, the Bengal Tenancy Act is considered the beginning of protection of rights of tenants. In the 1940s and afterwards, the issue of land tenure assumed a completely new dimension. The East Bengal State Acquisition and Tenancy Act (EBSATA) 1950, was a landmark event in the history of tenorial legislation. The EBSATA of 1950 not only repealed the Bengal Tenancy Act 1885 but also invalidated the Permanent Settlement of 1793. It abolished all revenue farming.

After liberation war, land tenures had been drastically changed. Waiving of all revenues including arrears and interest up to April 14, 1972, exemption of rent of agricultural land up to 25 *bighas*, imposition of a ceiling of 100 *bighas* of land per family, and void of land mortgage on exploitative terms and conditions were the major initiatives of the then government in land system. Fixation of minimum daily wage for agricultural labor, distribution of produce from sharecropped land among labor, capital and land, and the restriction of rent out of land by the land owner not more than 15 *bighas* were the major provisions of land Reform Ordinance 1984. Re- ceiling of landownership up to 60 *bighas* per family, distribution of *khas* land among only landless peasants, declaration of *benami* transaction illegal and punishable and prohibition of eviction of agricultural tenants from homestead land were the other major provisions of Land Reform Ordinance 1984.

The survey result depicts that the values of joint family concept have been given away due to population pressure and the poverty of the tenant family. About cent percent of tenants' occupation are agricultural activities due to the lack of employment opportunities outside agriculture in rural areas. Agriculture Census reported that all types of farm holdings have been increased at a rate of 2.15% over the period (1983/84-1996). The degree of inequality of owned land is high and the major portions of arable land are occupied by a few numbers of landowners. Extension of urban areas, development of rural infrastructure and widespread homestead area reduced the operated area by all farms. National Agriculture Censuses of 1983/84 and 1996 reported that growth rate of owned land of small farmers was slightly more than the growth rate of their households. In case of medium farm, both the number and owned area has been decreased during the period 1983/84-1996. On the other hand, percentages of large farms and their owned area have been decreased. That is, extreme pressure of population on limited land made agriculture dominated by small and marginal farms. The medium and large farm holdings have been subdivided under demographic pressures, leading to an increase in the number of small and marginal farms.

There existed a number of contractual arrangements in Bangladesh agriculture. Among them sharecropping has been playing dominant role (61.90%) in the tenancy market, followed by land leasing under mortgage/kat system (14.98%). Sample survey reveals that in Pabna, short-term leasing arrangement (leasing) plays dominant role but in Thakurgaon, Feni and Kushtia, sharecropping is dominant, whereas in Gazipur, about 50% of tenanted land is rented-in under mortgage (kat) system. There are great variations in landownership in tenancy market. About 23% landowners in tenancy market are relatives of the tenants indicating significant role of kinship in rental market. So, it can be said that exploitative nature of sharecropping is not evident. The largest number of land suppliers in rental market is absentee landlords in all regions except in Thakurgaon.

A major suppliers of land in rental market are resident landowners who rented-out about 29% of the total tenanted land in Bangladesh. According to different censuses

reports composition of owner and tenant farms ratio has remained almost same at 60: 40 during the period from 1960 to 1996. Average growth rate of total holdings during the period 1983/84-1996 was 6.57%, whereas average growth rate of owner holdings and owner-cum-tenant holdings were 8% and 2% respectively. On the other hand, growth rate of tenant holdings were about 109% during the same period. It points out that a lion's share of rented land were rented by landless and smaller farms implying that mainly landless and smaller farms were renting land from rental market. Area-wise analysis shows that there is a great variation of land leasing by the tenant farms among the districts. The structure of landownership in rental market has undergone major changes. Another important finding of sample survey is that about 94% land of tenant farms are used in rice cultivation.

A number of reasons for land leasing by the tenants have been documented in this study. Both theoretical and empirical experiences are examined with the help of theoretical and empirical studies. Socio-economic factors, psychological concept, structural factors, such as, flexibility and uncertainty of getting employment in agricultural labor market, non-marketability of management and entrepreneurial skills of tenants, hazards to find a job everyday, utilization of farm equipment, specially farm's labor force and to work on one's farm for longer period of time, are the main causes of leasing land by the tenant farms.

Regional analysis land leasing reveals that about 63% respondents in Thakurgoan, 60% in Pabna, 48% in Gazipur, 52% in Kushtia and 67% in Feni reported that they had taken land from others for employing their labor endowments. Another dominant factor of land leasing is to get excess crop. Survey result shows that about 29% respondents in Thakurgoan, 28% in Pabna, 20% in Gazipur, 36% in Kushtia and 27% in Feni reported that they had leased-in land for getting excess crop. Another two factors (to use agricultural equipment and others) do not affect significantly on taking land from others by the tenants. Moreover, combined analysis of sample survey reveals that about 58% respondents had rented-in land for using their labor force. Another important factor is to get excess crop constitutes about 28% of the total respondents.

Impacts of inputs on output, costs and returns from rice cultivation under different tenurial arrangements are discussed in this study. The regression model for *Aman* shows that there is a positive relationship between input and output in *Aman* production. The estimated value of R^2 (0.282) indicates that on an average, capital, labor, fertilizer and rent explain 28.20% of *Aman* productions jointly. The smaller value of R^2 may be due to the higher dependent on the rainfall of *Aman* cultivation and of specification error of model. A similar result is found by using Cobb-Douglas type production function. The value of R^2 (0.277) in Cobb-Douglas production function indicates that about 28% variations of output are explained by different inputs jointly. The sum (0.292768) of partial elasticities ($\beta_1 + \beta_2 + \beta_3 + \beta_4$) of output with respect to different inputs shows the decreasing return to scale in *Aman* production. Regression model for *Boro* depicts that on an average 32.2% ($R^2 = 0.322$) of the average variation of output (Y) are explained jointly by labor, capital, fertilizer and irrigation and by rent. Cobb-Douglas type production function for *Boro* indicates that production of *Boro* is directly related to irrigation, labor, and rent (land quality), whereas it is indirectly related to capital and fertilizer. The negative partial elasticity of output with respect to capital implies that use of capital may be exhausted (seed+plough+pesticide) within the state of technology. Moreover, negative partial elasticity of output with respect to fertilizer may be the indication of excessive use of chemical fertilizer, which would reduce total production. The sum of partial elasticities (0.0612) of output with respect to inputs indicates the decreasing returns to scale in *Boro* production.

Regional comparison depicts that production cost of *Aman* varies significantly among the regions. The highest labor cost was incurred in Feni and the lowest in Thakurgaon. The differences in labor cost depend on the availability of off-farm employment opportunities and the supply of labor. Huge migration of labor force in Feni and proximity to industrial area in kushtia raise labor cost in *Aman* production respectively. In Pabna, production of *Aman* requires least cost. As a result, the landowners do not want to rent-out *Aman* cultivating land. The least cost of *Aman* production induces the tenant to bid for land in tenancy market and in effect raises rent for *Aman* producing land. However, rent is the highest contributor in cost

implying that demand for land is high relative to its supply in all regions. Thus, it can be concluded that lack of off-farm employment opportunities in rural areas represent the poverties of rural people. Aman production does require minimum fertilizer in Pabna incurring lowest fertilizer cost. In other regions, differences in fertilizer cost are the result of market distortions. Cost of capital is more or less same in all regions except in Kushtia. Cost of capital does not vary significantly among the regions. The highest amount of cost is incurred by rent. It accounts for 63% in Pabna, 36% in Feni, 41% Kushtia and 49% Thakurgaon of the total cost respectively. Among the costs, fertilizer marked the lowest. This factor accounts for about 3% in Pabna, 8% in Feni, 12% Kushtia and 13% in Thakurgaon respectively.

Survey findings reveal that the highest amount of irrigation cost is incurred in Boro production in Pabna and the lowest in Gazipur. However, irrigation costs are more or less same in Gazipur, Kushtia and in Thakurgaon. In Pabna, irrigation costs are paid in terms of produced crop, whereas, in Gazipur it is paid in terms of money. The soil of Gazipur is flood-plain clay and low lying and thus requires minimum irrigation. Therefore, soil quality and the nature of payment of irrigation cost is the main causes of variation of irrigation cost in the sample districts.

Availability of alternative employment opportunities, nature of wage payment and soil quality are the main causes of differences in labor cost. Survey findings reveal that labor cost ranks the highest in Feni and the lowest in Thakurgaon. The lowest average cost of capital is found in Pabna and the highest in Feni. The highest rent is paid for rented-in land in Gazipur and the lowest in Kushtia. About 28%, 50%, 37%, 27% and 36% costs are contributed by rent in Pabna, Gazipur, Feni, Kushtia and Thakurgaon respectively. Thus, a lion's share of cost is incurred by rent in all regions. The implication of the highest contribution of rent to total cost is that in all regions demand for land is higher relative to its supply. The underline implication of higher demand for land in tenancy market is that tenants are bound to rent-in land for employing their labor endowment due to the unavailability of non-agricultural activities. The most important component of cost is fertilizer, which marks the lowest in Gazipur and the highest in Thakurgaon. This is due to the differences in soil quality and the variation of market prices of fertilizer and its use.

The lowest per acre cost of *Aman* cultivation was in Thakurgaon and the highest in Feni. Per acre cost of *Aman* production was more or less same in Pabna, Kushtia and in Thakurgaon. It is found that there is no significant difference in the production of *Aman* among the regions except in Pabna. The average cost of capital is the lowest in Pabna and the highest in Feni. Another important finding of survey was that cost of fertilizer incurred in *Boro* cultivation was the highest in Thakurgaon and the lowest in Gazipur. The survey result shows that the variation of *Aman* production within the region compared to among the regions is not significant. Survey findings showed that the average product (AP) of *Aman* was the lowest in Pabna and the highest in Feni. In Pabna, traditional variety of *Aman* is produced which does not require any fertilizer and results in lowering AP. In *Boro* production, the highest average product was found in Pabna and the lowest in Thakurgaon. Average production of *Boro* is more or less same in Pabna, Gazipur, Feni and in Kushtia except Thakurgaon.

Survey findings reveal that returns from *Aman* production was the highest in Feni and the lowest in Pabna. This is due to the lowest per acre production of *Aman* in Pabna and the variation of prices of rice between two regions. The highest returns are accrued from *Boro* production in Gazipur and the lowest in Thakurgaon. This is due to the differences in production and regional market prices of rice. Revenue analysis indicates that per acre returns accrue from *Boro* production is higher than that of *Aman*. Moreover, variations of returns from *Aman* are higher than the variations of returns from *Boro*. Besides, regional variations of returns from *Aman* are higher than that of *Boro*. The variation of per acre returns within the regions does not differ largely relative to total variation among the regions. But total variation relative to regional variation is higher.

This study measures the variations of profitability of tenanted land among the regions as well as within the regions both for *Aman* and *Boro* cultivation. Regional estimation of profitability indicates that land leasing is profitable to the tenant both for *Aman* and *Boro* production. But profit (net returns) earnings from *Boro* cultivation are higher than that of *Aman* cultivation in all regions. Moreover, in *Aman* production, some tenants get negative profit, but in *Boro* production no loss is

incurred in any regions. Measurement of variation of profit or net returns from tenanted land indicates that out of 99 tenants 27 of them are getting loss in Aman production, whereas in Boro production out of 145 tenants 20 of them are getting loss. In area wise, the highest number of tenants is getting profit from Aman cultivation in Kushtia and the second highest from Thakurgoan. But in Boro production, the highest number of tenants is getting profit in Gazipur and the lowest number in Feni. Moreover, the highest amount profit is earned from Boro cultivation in Gazipur and the lowest amount in Feni and in Thakurgaon. From the foregone analysis it is clear that there are enormous variations in cost, revenue, production and profitability in tenanted land in rice cultivation among the regions as well as within the regions.

Efficiency is measured in terms of per acre yield, input use, and landlord's share and per acre tenant's net returns (profit) from different tenancy arrangements. Moreover, in this study, productivity and profitability of tenanted land on different tenancy arrangements are examined. Empirical findings reveal that in Aman cultivation lowest per acre return (AR) is earned from fixed crop rent arrangement and the highest from *kat* system. Comparison of AC incurred in Aman production reveals that AC was the highest under sharecropping and it was the lowest under *kat* system. In Boro production, highest average return (AR) was earned from *khaikhalashi* and the lowest from fixed crop rent arrangement. However, per acre cost was the highest in sharecropping and the lowest in *kat* system on Boro cultivation.

Survey findings depict that landlord's share is positively related to sharecropping and land quality (land productivity) and negatively related to *kat* system in Aman production. In Boro production, landlord's share is positively related to cost sharing, land quality and to sharecropping but negatively related to short-term leasing arrangement. Ridge regression results reveal that explanatory variables have larger impact on landlord's share in Boro production than that of Aman production. Tenant's profit (net returns) from tenanted land is perfectly related with explanatory variables in Aman production. Regression results depict that only land quality has a positive impact on tenant's profit (net returns) but other explanatory variables, such

as rent, cost of capital, cost of labor and cost of fertilizer have negative impact on profit. Variables such as form of tenancy, cost-sharing in production have no impact on tenant's profit. Similar results have been found in Boro cultivation.

Survey results show that landowners' share from sharecropping is the highest and the lowest from *kat* system in Aman production. Fixed crop rent and short term leasing arrangements provide more or less same rent income to the landlord. In Boro production, landlord gets highest returns from sharecropping and lowest from fixed crop rent system.

Survey findings reveal that renting land on *kat* system is the most profitable and sharecropping is the least profitable to the tenant in Aman production. Other two types of arrangements provide more or less same net returns (profit) to the tenant. In Boro production tenants get the highest net return (profit) from *khaikhalashi* and the lowest from sharecropping. The second highest amount of profit (net return) is earned from *kat* system and second lowest profit/net return is earned from fixed crop rent. Moreover, from the survey findings, it is observed that larger profit is earned from Boro cultivation than Aman cultivation irrespective of tenancy arrangements. The differences of profit earnings from different tenancy systems both on Aman and Boro cultivation are highly significant.

8.2 Conclusion

The evidences presented in this study demonstrate that Bangladesh agriculture has already gone through major structural and tenurial changes with the advent of socio-economic and political changes. Land tenure in Bangladesh is the result of socio-economic as well as historical evolution of land system under different government mechanism.

It is clear that pattern of land distribution and the structure of contractual arrangements have changed during the past 3 decades. The extent of tenancy has been enlarged due to an increase in area under absentee-landownership with tremendous increase in rural-urban migration of the rural populace and the abandonment of marginal farmers taking up off-farm occupations. Increase in

operated area by non-farm households imply that land transaction in tenancy market has been increased. It is observed that a tremendous proliferation of small farms, relative consolidation of middle farms and relative decline of large farms have been taken place over the last two and a half decades. The structure of farm and non-farm holdings has been changed due to the rural-urban migration, movement from farm to non-farm occupation and the creation of off-farm employment opportunities in rural areas. These changes have been taken place within the existing framework of highly unequal distribution of land.

Decrease in large farm household goes with proportional decrease in land owning so that relative proportion of household's vis-à-vis land remain unchanged. As a result, distribution pattern of owned land that is alarmingly skewed has not undergone significant changes and marginalization of farm holdings has been proliferated. That is, land tenure situation has also undergone substantial changes. Area-wise sample survey indicates that there are great variations in the land rental market among the regions. But combined analysis shows that about 44% of tenanted lands were rented-in sharecropping whereas about 27% and 22% tenanted lands were transacted under short-term leasing and under mortgage (*kat*) respectively. Since, tenant farms are severely poverty driven and they have not enough money to hire land on fixed cash rent basis they are usually interested to hire land on sharecropping basis. Increase in short-term leasing arrangements indicates the gradual commercialization of rental market for land. The exploiting sharecropping arrangement has been given away to fixed cash rent tenancy arrangements due to the changes in socio-economic condition, increase in off-farm employment opportunities, development of rural infrastructure and the changes in people's attitudes towards social prestige. So, it can be concluded that a dramatic changes in the contractual arrangements have been taken place in the agriculture of Bangladesh.

The existence of significant number of absentee landowners in rental market implies that non-cultivator as well as urban people occupies a major portion of land. About 47% landowners in rental market are absentee landowners supplying about 60% of land in rental market indicating that actual tiller is not owner of land and the major portion of cultivable land are occupied by urban people who are not involved in

agriculture. That is, absentee landowners are playing dominant role in tenancy market. Considered the operated area by different tenure holders, it is indicated that owner and owner-cum-tenant farms' operated areas have been reduced by 8.84% and 14.29% respectively. While the operated areas of tenant's farm have been increased by 250.85% during the period 1983/84 to 1996. Perhaps there were landless farmers who were operated land taking from others without ownership. Extent of tenancy is higher for small and marginal farms but for landless or very small farms and for medium farms it is lower. As the farm size increases (after marginal farms) the extent of tenancy decreases. Land use under rice cultivation is lower for small and marginal farms but higher for very small farms and large farms. The implication of relatively lower use of land in rice cultivation of small and marginal farms (0.50-1.49 and 1.50-2.49) is that they are efficient in resource use, specifically farm's labor endowments. From the above discussion it can be concluded that land use under rice cultivation remains more or less same except for medium tenant farm.

Socio-economic conditions of a tenant farm, social values and norms and above all, economic factors affect the decision to rent out land by the landowners. From the survey result it is observed that mainly economic factor and the practices of agricultural activities play dominant role in leasing land by the tenant. Among the different reasons employing labor force of a tenant family is the main cause of leasing land. Since the tenant farmers are of mainly vulnerable group of our society, they always try to have a safety net of food supply against food shortages and to protect themselves from unavoidable circumstances. That is, it can be concluded that poverty, food security and unemployed labor force of tenant farm are the crucial factors of land leasing. That is, small and marginal farms rent in land to eke out their subsistence level of income and to employ their labor resources. It is observed that there are enormous variations in cost, revenue, production and profitability of tenanted land in rice production among the regions as well as within the region.

Regression results shows that *Aman* production is highly responsive to capital, labor and fertilizer whereas lower to rent. The small value of R^2 may be the cause of higher dependent on the rainfall of *Aman* production. The main cause of differences in AC among different regions is the existence of alternative employment

opportunities of that area. The contribution of hired cost of land (rent) is the highest whereas the contribution of fertilizer is the lowest in rice production. Variations of rent within the regions are significant but among the regions are not. The hired cost of land (rent) differs enormously among the regions implying that lease market for land in Bangladesh is highly distorted. Irrigation cost differs among the regions due to the variation of land quality and the nature of payment of irrigation cost. The significant differences in labor cost implying the differences in wage rate and employment opportunities in different areas of Bangladesh. Variations of market prices for fertilizer among the regions indicate that market for fertilizer is highly distorted due to the mismanagement of fertilizer distribution. However, the sum of partial elasticity was less than one, which would indicate that there were decreasing returns to scale in *Boro* production.

Revenue analysis indicates that AR accrues from *Boro* production is higher than that of *Aman*. Moreover, regional variation of returns from *Aman* is higher than the variation of returns from *Boro*. There is a great difference in return from *Aman* production between flood-prone and flood-free area. Thus, it can be concluded that the variation of returns from tenanted land among the regions as well as within the regions is evident. It also varies between *Aman* and *Boro* and among the tenants.

From the survey findings, it can be concluded that sharecropping and fixed crop rent arrangements (crop rent arrangements either it is fixed or not) are an inefficient mode of production in terms of productivity and resource allocation both on *Aman* and *Boro* production. Since per acre lowest AR is earned from fixed crop rent arrangement and the highest from *kat* system in *Aman* cultivation, it can be concluded that *kat* system is the efficient mode of production with respect to rice production. In *Boro* production, highest per acre AR is earned from *Khaikhalashi* and the lowest from fixed crop rent indicating that *khaikhalashi* is the efficient mode of production with respect to production. So, cash rent tenancy (*kat/khaikhalashi*) is an efficient arrangement with respect to production relative to crop rent tenancy.

Since cultivation of *Boro* is artificially irrigated and the impact of natural calamities on *Boro* production is lower than that of *Aman*, it can be concluded that uncertainty in

rice production has much impact on landlord's income from hiring out of land. Landlords get highest rent income from sharecropping but the least from *kat* system. So, from the landowner's point of view, hiring out of land on sharecropping basis is profitable in Boro cultivation also.

Among the different types of contractual arrangement *kat* system provides highest amount of profit to the tenants. Sharecropping renders lowest profit to the tenant due to the highest rent payment under sharecropping. The study supports the Marshallian theory of sharecropping where he pointed out that under sharecropping arrangement resource allocation is inefficient. If this finding is true, I would like to say that among different types of contractual arrangements sharecropping is inefficient with respect to production in the agriculture of Bangladesh. The variation of profit from different contractual arrangement depends on hired cost of land (rent). However, tenancy cultivation, either in crop rent basis or in cash rent basis is profitable. But it is more profitable under cash rent basis.

8.3 Policy Recommendations and Further Research

8.3.1 Policy Recommendations

The economy of Bangladesh is primarily dependent on agriculture. It is impossible to reduce rural poverty and to raise the living standard of rural people without establishing agriculture as a profitable sector. Therefore, it is necessary to develop the agricultural production system in order to make it a more dynamic and commercially profitable sector. However, primary objective of this section is to suggest some recommendations that would help modernize and diversify the entire agricultural system. In addition, the purpose of this section is to suggest some pragmatic policies, which will be suitable for present agrarian relations. To plan an appropriate policy, it is required to trace out the problems that are barriers to agricultural development.

It is very often argued that the primary impediment to agricultural development in the most LDCs is the existing agrarian structure. In context of tremendous changes in tenurial system with the advent of modernization and commercialization of agriculture, a

viable tenurial policy for Bangladesh is essential to protect the rights of actual operators of land. A desirable agrarian policy is required for changes in agrarian system as the study conveys.

Findings of the study depict that structure of farm and non-farm households has been changing within the existing framework of highly unequal distribution of land. Moreover, pattern of land distribution, which is alarmingly skewed, has not undergone significant changes and the marginalization of farm holdings has been proliferated. The operated area by owner and owner-cum-tenant holdings has been reduced by 8.84% and 14.29% respectively. Meanwhile, operated area of tenant holdings has been increased by 250.85% during the period 1983-84 to 1996. Survey findings agree with the census result. So, measures should be taken to protect the interests of small and marginal farmers and the tenant. In this context, policy should be taken to stop marginalization and landlessness of farm holdings. For achieving this goal, following steps should be taken into consideration.

- i. Employment opportunities should be expanded in rural areas by establishing agro-based small and cottage industries along with non-farm activities.
- ii. Professional and technical education facilities should be expanded for rural poor for training up them. As such, they would be able to find out job outside of agriculture
- iii. To create opportunities for employment, agro-processing and agro-based industries should be established.

The structure of tenancy has also gone through substantial changes. Various cash rent tenancies are taking place in lieu of sharecropping. Sharecropping is the least profitable to the tenant. On the contrary, it is the most profitable to the landlord. That is, policy should be taken to stop sharecropping arrangements. Cash rent tenancy is more profitable to the tenant whether it is short term or long-term basis. In order to protect the interest of the tenant initiatives would be such that tenant can rent-in land on cash rent basis. In addition to this, *kat* system renders highest net returns to the tenant. As such, a credit scheme should be established for tenant so as to they rent-in land on cash rent basis.

Survey findings reveal that absentee landowners are supplying about 47% land in rental market. They play dominant role in tenancy market. Policy should be taken to ensure maximum utilization of land, through initiative disincentive to hold arable land by the absentee landowners. As such, enforcement of rules and regulations should be strengthened in order to bar holding of land by absentee landowners. From this study, it is observed that returns from tenanted land are low in flood-prone areas than flood-free areas. That is, initiative should be taken to control flood as far as possible.

Excessive use of chemical fertilizer reduces soil fertility and productivity. To preserve and develop land quality balanced use of fertilizer should be emphasized. The expansion of modern agricultural practices together with intensified cultivation had led to an increasing demand for fertilizer. As a result of imbalanced use of fertilizer, the fertility of land is declining on the one hand and the potential yield is not achieved on the other. Survey findings depict that there is negative relationship between fertilizer use and rice production. This is the implication of excessive use of chemical fertilizer. In this respect, it is important to adopt such a policy so as to encourage the farmers in using balanced fertilizers and at the same time protecting the soil fertility. So, supply of non-chemical fertilizer and motivation programs should expand to convince the tenant farmers to use non-chemical fertilizer use. However, seed technology, within the existing framework of agrarian system should be expanded. This study reveals that land quality varies significantly among the regions. Since land quality is not same for all the regions, agricultural practices are also different among the regions. So, government should initiate a move to ensure proper use of soil quality as per demand of locality.

From the study result it is appeared that tenants are using different varieties of seeds, such as, local variety and HYV. Per acre Aman production is the lowest in Pabna due to use of local varieties. As the Boro cultivation is mainly irrigation and technology based, the production of Boro is more than Aman. So, production can be increased within the existing tenancy system. Use of HYV requires intensive research

on seed technology. So, improved technology-based seed production, seed multiplication and related farm activities should be declared as industrial enterprises in the industrial policy. Both public and private sectors should be encouraged to produce and marketing seeds.

Variations of natural calamity, such as, drought, rainfall etc is the major causes of lower production of rice. Survey findings reveal that Aman production is lower than Boro production because Aman is rain fed and Boro is irrigated. Moreover, tenants are uncertain in getting their product from rain-fed rice, Aman than irrigated rice, Boro. Measures should be taken to reduce uncertainty in getting their production. Uncertainty can be shrink down by expanding irrigation facilities.

Disparities in hired cost of land (rent) among the regions originated mainly from differences in employment opportunities. To reduce the disparities in employment opportunities bottom-up planning and its implementation are essential based on local resources.

Initiatives that are important for balanced and sustainable growth for productivity of agriculture require smooth supply of fertilizer. Enforcement of concerned rules and regulation should be strengthened in order to ensure good quality of fertilizer in proper time at the farmers' level. However, increasing real income of the tenant purchasing power should be increased.

Huge numbers of brickfields are the causes of deterioration of soil quality and the decline of arable lands for cultivation. Thus, acquisition of land in excess of requirement for non-farm agricultural purposes, such as house building, brickfield etc. should be stopped.

To ensure maximum utilization of land, bottom-up planning through peoples' participation and its implementation should be started from village level. Maximum utilization of land should be ensured through promotion of inter-cropping with the main crops.

From the survey results it is clear that two factors, employing labor force and getting excess crop are the main causes of leasing land by the tenants. So, pragmatic initiatives for creation of employment opportunities in agriculture sector as well as out side agriculture in rural areas have to be taken. In addition to creation of employment opportunities, steps should be taken for making safety net of food supply against food shortages and unavoidable circumstances.

Since land quality, labor cost and local market prices of fertilizer differ significantly among the regions, it is required to adopt such a policy initiative, which reduces disparities of employment opportunities and distorted market prices.

The most critical issue concerning sustainable development is how to stop the alarming downward trend of the availability of cultivable land and to increase productivity of available land resources. With negligible scope for area expansion, as most of the arable lands of Bangladesh are under cultivation, future growth will have to continue relying on raising productivity per unit of land. One way to increase in productivity of land is to intensify farming that could hardly be achieved. Because, cropping intensity has already been exceeded 175% that is one of the highest in the world. For this reason, continuous efforts should be made towards developing new improved varieties. It is also felt that the agricultural sector has by no means exploited its full potential for production. However, it is required green revolution for narrow down the gap between actual and potential yields within the existing set of tenancy relationships. Moreover, the growth of crop production and achieving self sufficiency in food production depend almost on technological progress is not only deceiving but also detrimental to the long-term sustainable development of the country. Aside from the fact, Bangladesh is prone to frequent natural disasters that play a part in determining the productivity and thus sustainable agricultural development requires checking the natural calamities as far as possible.

8.3.2 Suggestions for Further Research

It is well known that no research can cover every aspect of the research problem. For the present study researcher has tried to cover a wide range of issues regarding the existing contractual arrangement in Bangladesh. Instead of this effort a number issues are yet to be dealt with.

- i. Further research is required for prescribing pragmatic land reform that will protect the right of actual operator of land. In addition to this, research should be aimed at suggesting measures to stop marginalization and landlessness of farm holdings.
- ii. Since land leasing is profitable to the tenant and the leasing market is changing with the changes in socio-economic condition, land reform demands further in depth assessment within the existing framework of landownership and tenancy arrangements. Since rent earning does not depend on land development and the landowner gets a fixed amount of cash prior to cultivation, he would not be aware of improving the land quality. As a result, in the long run, the land quality may deteriorate. This may require further in depth study.
- iii. Absentee landlords play vital role in tenancy market. Formulation and enforcement of rules and regulations to bar holding of arable land by the absentee landlord requires further in-depth study, which is beyond of this study.

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Appendices

Appendix I-A

Population by Economic Category, Sex and Residence

Economic Category	1990-91 LFS			1995-96 LFS			1999-2000 LFS(P)		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
National	31.1	20.1	51.2	34.7	21.3	56.0	37.5	22.8	60.3
	30.5	19.7	50.2	33.9	20.8	54.5	36.1	21.9	58.1
	0.6	.04	1.0	0.9	0.5	1.4	1.4	0.9	2.2
Urban	26.0	31.9	57.9	27.5	38.3	65.8	10.2	21.2	31.3
	0.1	9.5	9.6	.01	11.9	12.0	0.2	12.7	13.0
	25.9	22.4	48.3	27.4	26.4	53.8	9.9	8.5	18.4
Rural	6.6	2.1	8.7	7.4	2.8	10.2	7.8	3.4	11.2
	6.5	1.9	8.4	7.0	10.6	9.7	7.4	3.2	10.6
	0.1	0.1	0.2	0.3	0.6	0.4	0.4	0.2	0.6
Civilian L. F.	5.4	7.9	13.4	6.3	9.3	16.6	2.6	6.6	9.3
	6.1	3.1	3.2	0.0	4.3	4.4	0.1	4.3	4.3
	5.4	4.8	10.2	6.3	5.0	12.2	2.6	2.4	5.0
Not in Civilian L. F.	24.4	18.0	42.5	27.3	18.5	45.8	29.6	19.4	49.1
	23.9	17.7	41.7	26.7	18.1	44.8	28.7	18.8	47.5
	0.5	0.3	0.8	0.6	0.3	0.9	0.9	0.6	1.6
a) Employed b) Unemployed	20.5	24.0	44.5	21.2	28.1	49.3	7.5	14.4	22.1
	0.1	6.4	6.5	0.1	7.5	7.6	0.2	8.5	8.6
	20.4	17.6	38.0	21.1	20.6	41.7	7.3	6.1	13.4

Source: statistical Pocketbook 2001, P.153. (LF survey, 1990-91, 195-96 and 1999-2000,BBS.

Note: HW: Housewives, HH=Household; LE= Labor Force

Indicators of Labor and Manpower Sector

Characteristics		LFS 1990-91	LFS 1995-96	LFS 1999-2000(P)
Total Civilian Labor Force (million)	Male	31.1	34.7	37.5
	Female	20.1	21.3	22.8
	Both Sex	51.2	56.0	60.3
Active Civilian Labor Force (Employed Pop. Million)	Male	30.5	33.8	36.1
	Female	19.7	20.8	22.0
	Both Sex	50.2	54.6	58.1
Unemployed (million)	Male	0.6	0.9	1.4
	Female	0.4	0.5	0.8
	Both Sex	1.0	1.4	2.2
Female Labor Force	Number (million)	20.1	21.3	22.8
	Percent of C.L.F.	39.3	38.0	32.2
Agriculture:	Number (million)	34.4	34.5	36.7
	Percent of Total	68.5	63.2	63.2
Non-Agriculture:	Number (million)	15.8	20.1	21.4
	Percent of Total	31.5	36.8	36.8

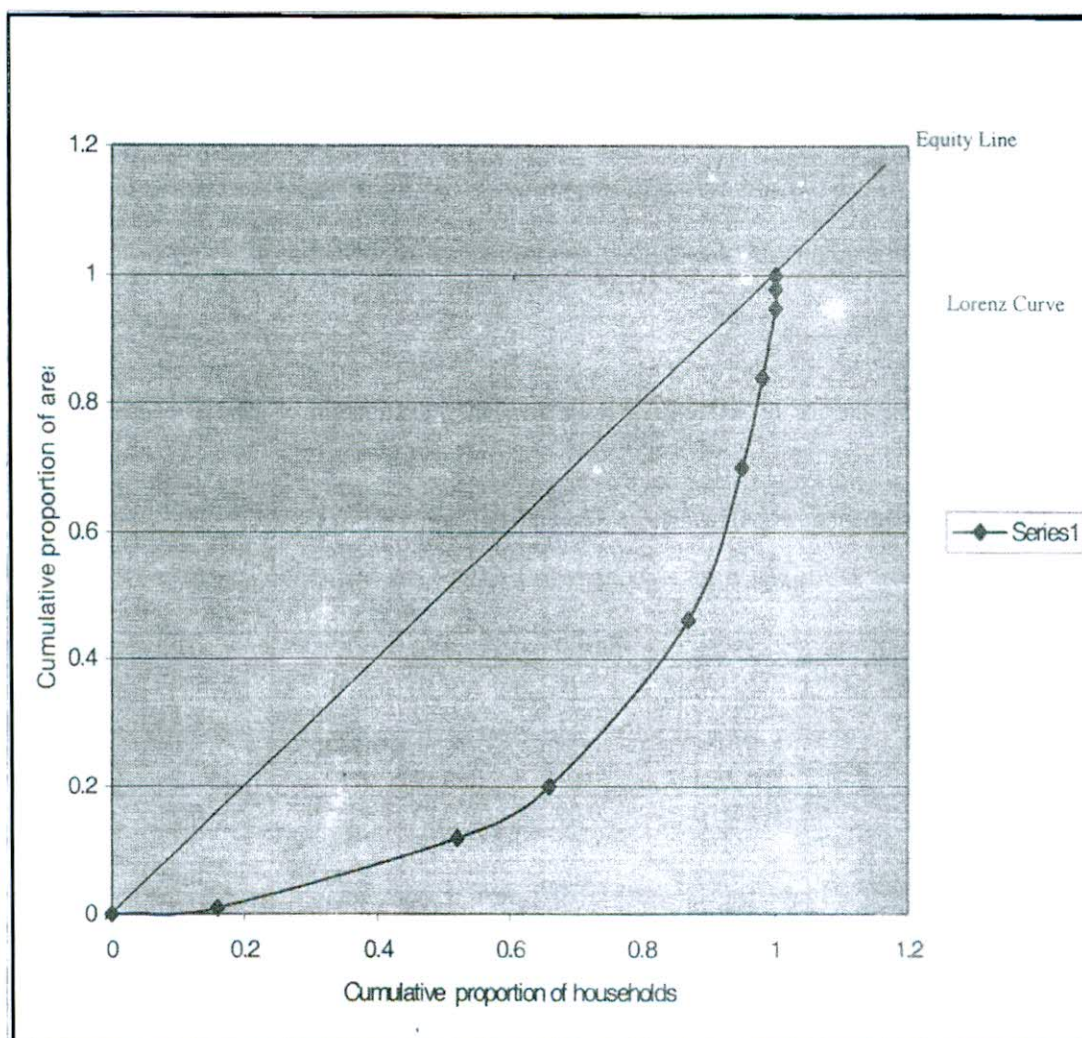
Source: BBS: Statistical Pocketbook 2001, P.152.

Appendix –I-B
Sectoral Share of GDP of Bangladesh at Constant Prices
(Percentage)

Year	Agriculture	Industry	Others/services
1972-73	62.0	6.3	31.7
1973-74	57.0	6.7	36.3
1974-75	55	10.1	34.9
1975-76	54.3	10.0	35.7
1976-77	52.0	10.3	37.7
1977-78	53.2	10.3	36.5
1978-79	50.7	10.4	38.9
1979-80	49.5	10.8	39.7
1980-81	48.8	10.6	40.7
1981-82	48.8	10.7	40.5
1982-83	49.30	10.10	40.60
1983-84	48.30	10.10	41.60
1984-85	41.76	9.86	48.38
1985-86	41.34	9.69	48.97
1986-87	39.84	10.04	50.12
1987-88	38.43	9.82	51.75
1988-89	37.08	9.84	53.08
1989-90	38.26	9.90	51.84
1990-91	37.60	9.80	52.60
1991-92	36.90	10.1	53.00
1992-93	35.90	10.5	53.6
1993-94	34.60	10.9	54.5
1994-95	32.80	11.3	55.9
1995-96	25.68	24.87	49.45
1996-97	25.87	25.01	49.12
1997-98	25.34	25.72	48.94
1998-99	25.28	25.70	49.02
1999-2000	25.57	25.71	48.72
2000-01	25.03	26.20	48.77
2001-02(p)	24.56	26.54	48.90

Appendix-IV-A

Ratio Distribution of Land Ownership by Class in Bangladesh



Appendix-IV-B

Tenurial arrangements by Farm Size Categories: 1983/84.

19883/84												
Tenurial Arrangements	% of Holding						% of Area					
	0.05-0.49	0.50-0.99	1.00-2.49	2.50-4.99	5.00& above	All	0.05-0.49	0.50-0.99	1.00-2.49	2.50-4.99	5.00& above	All
Sharecropping	53.57	59.95	56.48	68.53	62.22	63.94	51.71	37.67	71.85	77.10	71.67	71.83
Fixed Rent	12.69	13.71	11.81	11.04	13.43	12.24	11.24	7.73	9.85	8.13	11.07	9.81
Lease	1.78	1.91	1.02	1.14	1.81	1.26	1.10	0.71	1.03	1.04	1.79	1.26
Khaikhalashi	4.86	4.35	4.63	5.15	7.15	5.06	4.32	2.28	3.45	3.23	4.93	3.84
Mortgage	15.85	16.30	13.16	12.03	13.19	13.72	13.86	8.28	8.77	6.48	6.38	7.71
Others	11.25	4.51	2.70	2.10	2.20	3.78	17.77	5.68	5.04	3.98	4.16	5.55
All	100.00 (477.5)	100.0 (656.6)	100.00 (468.8)	100.0 (989.5)	100.0 (509.3)	100 (4098.7)	100 (99.6)	100 (438.6)	100 (1087.8)	100 (1280.0)	100 (1154.4)	100 (3915.0)
Sharecropping	48.94	54.43	57.18	57.51	50.99	54.83	51.74	56.96	62.78	66.25	59.13	61.90
Fixed Rent	9.96	10.65	10.89	11.18	13.52	10.93	9.88	10.60	11.18	11.09	13.31	11.51
Lease	1.99	1.97	2.23	3.14	5.07	2.50	2.33	1.87	3.14	2.91	4.85	2.91
Khaikhalashi	5.98	5.19	5.23	6.75	9.86	5.94	5.81	4.99	6.75	4.88	8.26	5.53
Mortgage	24.03	23.72	21.19	18.98	16.90	21.54	23.26	21.62	18.98	12.67	10.84	14.98
Others	9.09	4.02	3.27	2.44	3.66	4.27	6.98	3.95	2.44	2.20	3.61	3.17
All	100 (8030)	100 (1117)	100 (1836)	100 (859)	100 (355)	100 (4968)	100 (172)	100 (481)	100 (1467)	100 (12710)	100 (969)	100 (4360)

Source: BBS, 1986, 1999.

Note: Figures in the Parentheses are in thousand (area in thousand acres).

Appendix -IV-C

Tenancy of Farms by Type

Tenancy by type	Census-1960			Census-1977			Census-1983/84			Census-1996		
	No.	%		No.	%		No.	%		No.	%	
No. Of total holdings	6139480	100.00		6256000	100.00		9969500	100.00		17828190	100.00	
No. of owner holdings	3731110	60.77		3646000	58.28		6239000	62.58		11807551	66.23	
No. Owner-cum-tenant holdings	2308330	37.60		2575000	41.16		3593200	36.04		4206072	23.59	
No. Tenant holdings	100040	1.63		35000	0.56		137300	1.38		1814595	10.18	

Source: BBS (November 2002), Analytical Report Ag. Cencus-1996, p.30.

Appendix-IV-D

Tenure of Farms and Their Operated Area

Tenancy by Type	Census-1960			Census-1977			Census-1983/84			Census-1996		
	Area	% of Operated area		Area	% of Operated area		Area	% of Operated area		Area	% of Operated area	
Total holdings	21725827	100.00		21960000	100.00		22673500	100.00		20484561	100.00	
Owner holdings	11653910	53.64		12286000	55.95		13265600	58.51		12093126	59.04	
Owner-cum-tenant holdings	9829813	45.24		9585000	43.65		9284300	40.95		7957785	38.85	
Tenant holdings	242104	1.11		89000	0.14		123600	0.55		433649	2.12	

Source: BBS (November 2002), Analytical Report Ag. Cencus-1996, Vol. 3, Pp.30-31.

Appendix –VII-A

Regression Results: (Enter Method)
Landlord's rent income from Aman Cultivation.
Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.701 ^a	.492	.431	1070.8258

Predictors: (Constant), ABL, KA, FRS, STL, FCROP, AR (PRODUCTIVITY), CS, SHC, LNTL

Where, ABL=absentee landlord, LNTL=*Khaikhalashi* (Long term leasing), KA=*kat/Bhuty* kat, AR= Per Acre Average Revenue (Land quality/ productivity), FCROP=Fixed crop rent, CS= Cost sharing, STL= short term easing, RSL= resident landlord and SHC= sharecropping, FRS= Fixed Rent (short-term),

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	9.3E+07	10	9321	8.129	.000 ^a
Residual	9.6E+07	84	1146668		
Total	1.9E+08	94			

a. Predictors: (Constant) ABL, RSL, KA, FRS, STL, FCROP, AR (PRODUCTIVITY), CS, SHC, LNTL

b. Dependent Variable: Rent.

Coefficients^a

Model	Unstandardized coefficients		Standardized coefficients	t-value	Sig.
1	B	Std. Error	β		
	Constant	525.656	996.168	.528	.599
	AR (LQ)	.178	.051	.295	.001
	SHC	1796.312	452.965	.628	.000
	FCROP	771.203	603.509	.143	.205
	FRS	796.708	446.470	.230	.078
	KA	-822.541	455.742	-.233	.075
	CS	-51.346	625.840	-.008	.935
	STL	-343.270	719.227	-.121	.634
	LNTL	-114.049	732.570	-.040	.877
	RSL	704.958	470.892	.234	.138
	ABL	410.741	486.719	.125	.401

a. Dependent Variable: Rent.

Appendix –VII-B
Landlord's Share in Aman Cultivation
Stepwise Regression Results

Excluded Variables

Model		Beta in	t-value	Sig.	Partial correlation	Colinearity statistics
						tolerance
1	AR (LQ)	.174a	2.109	.038	.215	.997
	FCROP	.055a	.632	.529	.066	.938
	FRS	.187a	1.956	.053	.200	.749
	KA	-.251a	-2.604	.011	-.262	.716
	CS	-.009a	-.098	.922	-.010	.826
	STL	-.045a	-.528	.599	-.055	.997
	LNTL	.056a	.662	.510	.069	.999
	RSL	.053a	.629	.531	.065	.998
	ABL	-.012a	-.144	.886	-.015	.993
2	AR (LQ)	.255b	3.134	.002	.312	.917
	FCROP	-.020b	-.228	.820	-.024	.833
	FRS	.096b	.904	.368	.094	.596
	CS	-.006b	-.066	.948	-.007	.825
	SHTL	-.104b	-1.237	.219	-.129	.935
	LNTL	.118b	1.405	.163	.146	.934
	RSL	.071b	.870	.387	.091	.991
	ABL	-.014b	-.173	.863	-.018	.993
3	FCROP	-.002c	-.023	.981	-.002	.829
	FRS	.138c	1.363	.176	.142	.586
	CS	.018c	.210	.834	.022	.819
	STL	-.069c	-.851	.397	-.089	.916
	LNTL	.085c	1.048	.298	.110	.917
	RSL	.106c	1.348	.181	.141	.973
	ABL	-.038c	-.479	.633	-.050	.984

- a. Predicators in the model: (Constant), SHC
b. Predicators in the model: (Constant), SHC, KA
c. Predicators in the model: (Constant), SHC, KA, AR (Productivity)
d. Rent.

Appendix –VII-C

Landlord's Share (Rent) in Boro Cultivation (Enter Method)

Model Summary

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.781a	.611	.578	1442.5855

- a. Predictors: (Constant), ABL, LNTL (*Khaikhalashi*), KA, AR (Productivity/LQ), FCROP, CS, STL, STL, RSL, SHC.

Where, ABL=absentee landlord, LNTL= Long term leasing, KA=*kat/ Bhutya kat*, AR= Per Acre Average Revenue (Land quality/ productivity), FCROP=Fixed crop rent, CS= Cost sharing, STL= short term easing, RSL= resident landlord and SHC= sharecropping, FRS= Fixed Rent (short-term), FRLK= Fixed Rent (long-term)

ANOVA^b

	Model	Sum of Squares	df	Mean Squares	F	Sig.
1	Regression	4.3E+08	11	3.9E+07	18.958	.000 ^a
	Residual	2.8E+08	133	2081053		
	Total	7.1E+08	144			

- a. Predictors: (Constant), ABL, LNTL (*Khaikhalashi*), KA, AR(Productivity), FCROP, CS, STL, RSL, SHC.

- b. Dependent Variable: Rent.

Coefficients^a

	Model	Unstandardized coefficients		Standardized coefficients	t-value	Sig.
		B	Std. Error	β		
1	Constant	963.567	1248.302		.772	.442
	AR	.240	.035	.404	6.946	.000
	CS	4542.994	731.336	.399	6.212	.000
	SHC	1064.063	517.439	.238	2.056	.042
	FCROP	-613.927	754.383	-.059	-.814	.417
	FRS	-960.051	503.322	-.202	-1.907	.059
	FRLK	-400.049	991.375	-.026	-.404	.687
	KA	-1104.325	540.054	-.211	-2.045	.043
	STL	-1240.543	934.314	-.280	-1.328	.187
	LNTL	-713.808	936.789	-.161	-.762	.447
	RSL	-17.167	502.203	-.004	-.034	.973
	ABL	-42.083	527.215	-.008	-.080	.936

- a. Dependent Variable: Rent

Appendix-VII-D
Landlord's Share in Boro cultivation
Stepwise Regression Results
Excluded Variables"

Model	Beta in	t-value	Sig.	Partial correlation	Collinearity statistics	
					Tolerance	
1	AR	.308a	4.880	.000	.379	.986
	SHC	.335a	4.672	.000	.365	.775
	FCROP	-.100a	-1.482	.141	-.123	.988
	FRS	-.151a	-2.166	.032	-.179	.917
	FRLK	.018a	.271	.787	.023	.995
	KA	-.163a	-2.397	.018	-.197	.950
	STL	.067a	-.991	.323	-.083	.995
	LNTL	.042a	.617	.538	.052	.997
	RSL	.020a	.293	.770	.025	.955
	ABL	-.025a	-.365	.716	-.031	.978
2	SHC	.433b	6.805	.000	.497	.737
	FCROP	-.048b	-.742	.460	-.062	.958
	FRS	-.209b	-3.252	.001	-.264	.892
	FRLK	-.009b	-.141	.888	-.012	.987
	KA	-.180b	-2.857	.005	-.234	.948
	STL	-.113b	-1.794	.075	-.149	.975
	LNTL	.091b	1.431	.155	.120	.974
	RSL	-.021b	-.320	.750	-.027	.939
	ABL	.007b	.114	.909	.010	.967
3	FCROP	.005c	.082	.935	.007	.940
	FRS	-.068c	-1.092	.277	-.092	.761
	FRLK	.025c	.454	.651	.038	.979
	KA	-.031c	-.498	.619	-.042	.794
	STL	-.111c	-2.023	.045	-.169	.975
	LNTL	.089c	1.611	.109	.135	.974
	RSL	-.017c	-.292	.771	-.025	.939
	ABL	-.001c	-.011	.991	-.001	.967
4	FCROP	.019d	.340	.735	.029	.925
	FRS	-.047d	-.747	.456	-.063	.736
	FRLK	.041d	.739	.461	.063	.961
	KA	-.075d	-1.176	.241	-.099	.721
	LNTL	-.215	-1.122	.264	-.095	7.913E-02
	RSL	-.007d	-.126	.900	-.011	.932
	ABL	-.012d	-.209	.835	-.018	.957

- a. Predictors in the Model: (Constant), CS
- b. Predictors in the Model: (Constant), CS, AR
- c. Predictors in the Model: (Constant), CS, AR, SHC
- d. Predictors in the Model: (Constant), CS, AR, SHC, STL
- e. Dependent Variable: RENT

Appendix-VII-E

Tenant's Share (Net Returns): From Aman Production

Regression Results: Enter Method

Model summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	1.000a	1.000	1.000	46.0627

a. Predictors: (Constant), SHC, F, K, FCROP, AR, CS, KA, R, L, FRS

Where, SHC= Sharecropping, F= Fertilizer, K= capital, FCROP= Fixed crop rent, CS= cost sharing, KA= kat, R= rent, L=labor and FRS= fixed rent (short-term).

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	8.0E+08	10	8.0E+07	37701.242	.000a
Residual	186716.3	88	2121.777		
Total	8.0E+08	98			

a. Predictors: (Constant), SHC, F, K, FCROP, AR, CS, KA, R, L, FRS

b. Dependent Variable: Profit.

Coefficients^a

Model		Unstandarized coefficients		Standardized coefficients	t-value	Sig.
		B	Std. Error	β		
1	Constant	-7.574	34.955		-.217	.829
	AR	1.003	.003	.811	363.441	.000
	K	-1.007	.009	-.238	-118.073	.000
	L	-1.006	.004	-.648	-240.428	.000
	F	-.999	.017	-.118	-58.314	.000
	R	-.998	.005	-.488	-200.689	.000
	CS	9.678	33.715	.001	.287	.775
	FCROP	-6.457	25.083	-.001	-.257	.797
	FRS	-3.704	19.477	-.001	-.190	.850
	KA	-10.830	20.254	-.002	-.535	.594
	SHC	2.876	20.610	.000	.140	.889

a. Dependent variable: Rent.

Appendix-VII-F

Tenant's Share (Net Returns): From Aman Production
Stepwise Regression Results
Excluded variables ^f

	Model	Beta in	t-value	Sig.	Partial Correlation	Colinearity statistics
						Tolerance
1	AR	-.415a	6.030	.000	.524	.965
	K	-.201a	-2.479	.015	-.245	.899
	L	-.379a	-5.026	.000	-.456	.879
	F	-.187a	-2.421	.017	-.240	.995
	CS	.208a	2.635	.010	.260	.948
	FCROP	-.021a	-.267	.790	-.027	.990
	FRS	-.073a	-.916	.362	-.093	.981
	KA	.359a	4.287	.000	.401	.755
	SHC	-.194a	-2.052	.043	-.205	.676
2	K	-.374b	-5.750	.000	-.508	.810
	L	-.753b	-26.527	.000	-.939	.682
	F	-.308b	-4.894	.000	-.449	.933
	CS	.274b	4.231	.000	.398	.928
	FCROP	.028b	.414	.680	.042	.976
	FRS	-.024b	-.349	.728	-.036	.967
	KA	.216b	2.654	.009	.263	.653
	SHC	-.105b	-1.263	.210	-.129	.653
3	K	-.230c	-18.111	.000	-.882	.769
	F	-.102c	-4.314	.000	-.407	.827
	CS	.013c	.488	.627	.050	.774
	FCROP	.025c	1.049	.297	.108	.976
	FRS	.024c	1.007	.316	.103	.962
	KA	-.017c	-.549	.584	-.057	.594
	SHC	-.027c	-.923	.358	-.095	.646
4	F	-.118d	-66.950	.000	-.990	.823
	CS	-.052d	-4.336	.000	-.410	.718
	FCROP	.015d	1.339	.184	.138	.974
	FRS	-.003d	-.291	.772	-.030	.945
	KA	.003d	.222	.824	.023	.591
	SHC	-.007d	-.531	.596	-.055	.642
5	CS	.002e	.758	.451	.079	.589
	FCROP	.000e	-.265	.791	-.028	.954
	FRS	-.001e	-.463	.645	-.048	.944
	KA	-.002e	-.759	.450	-.079	.590
	SHC	.002e	.895	.373	.093	.639

- a. Predictors in the Model: (Constant), Rent
- b. Predictors in the Model: (Constant), Rent, Average Returns,
- c. Predictors in the Model: (Constant), R(Rent), AR, W(Labor Cost)
- d. Predictors in the Model: (Constant), R(Rent), AR, L,K(Cost of Capital)
- e. Predictors in the Model: (Constant), R(Rent), AR, L,K,F(Cost of Fertilizer).
- f. Dependent Variable: net returns (profit)

Appendix-VII-G

Profitability of Boro (Tenant's Share/net profit):
Regression model (enter method):

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1.000a	1.000	1.000	48.7991

a. Predictors: (Constant), SHC, F, FRLK, FCROP, L,K, AR, KA, CS, I (Irrigation), R, FRS

ANOVA^b

Model	Sum of squares	df	Mean Squares	F	Sig.
1 Regression	3.2E+09	12	2.7E+08	113094.9	.000a
Residual	314337.9	132	2381.348		
Total	3.2E+09	144			

a. Predictors: (Constant), SHC, F, FRLK, FCROP, L,K, AR, KA, CS, I (Irrigation), R, FRS

b. Dependent Variable: Profit

Coefficients

Model		Unstandardized coefficients		Standardized coefficients	t-value	Sig.
		B	Std. Error	β		
1	Constant	111.810	42.960		2.603	.010
	AR	.999	.001	.789	668.554	.000
	K	-1.012	.008	-.123	-126.154	.000
	L	-1.005	.003	-.364	-358.686	.000
	F	-.996	.009	-.133	-106.203	.000
	I	-1.009	.004	-.346	-272.609	.000
	R	-1.004	.003	-.471	-325.162	.000
	CS	34.486	31.481	.001	1.095	.275
	FCROP	-17.235	25.276	.001	-.682	.497
	FRLK	-6.408	33.893	.000	-.189	.850
	FRS	-2.594	17.752	.000	-.146	.884
	KA	-19.301	18.905	-.002	-1.021	.309
	SHC	4.166	17.717	.000	.235	.814

a. Dependent Variable: Profit.

Appendix-VII-H

Tenant's net returns (profit): From Boro Production
Stepwise Regression Results : Excluded variables^g

Model		Beta in (β)	t-value	Sig.	Partial Correlation	Colinearity statistics
						Tolerance
1	K	-.146a	-2.708	.008	-.222	.955
	L	-.362a	-8.118	.000	-.563	1.000
	F	-.286a	-5.257	.000	-.404	.824
	I	-.215a	-4.238	.000	-.335	1.000
	R	-.358a	-7.679	.000	-.542	.946
	CS	-.188a	-3.610	.000	-.290	.986
	FCROP	.074a	1.372	.172	.114	.974
	FRLK	.027a	.501	.617	.042	.991
	FRS	.031a	.559	.577	.047	.964
	KA	.328a	7.033	.000	.508	.994
2	SHC	-.348a	-7.349	.000	-.525	.938
	K	-.050b	-1.048	.297	-.088	.886
	F	-.291b	-6.806	.000	-.497	.824
	I	-.252b	-6.377	.000	-.473	.990
	R	-.357b	-10.268	.000	-.654	.946
	CS	-.299b	-7.640	.000	-.541	.922
	FCROP	.058b	1.295	.198	.108	.972
	FRLK	.008b	.184	.854	.015	.988
	FRS	.028b	.610	.543	.051	.964
	KA	.256b	6.260	.000	.466	.938
3	SHC	-.283b	-6.924	.000	-.504	.896
	K	-.015c	-.419	.676	-.035	.878
	F	-.346c	-14.521	.000	-.775	.810
	I	-.394c	-29.864	.000	-.930	.900
	CS	-.106c	-2.301	.023	-.191	.518
	FCROP	.013c	.364	.716	.031	.956
	FRLK	-.008c	-.235	.815	-.020	.986
	FRS	-.119c	-3.328	.001	-.271	.832
	KA	.156c	4.517	.000	.357	.840
	SHC	-.077c	-1.650	.101	-.138	.519
4	K	-.127d	-14.632	.000	-.779	.819
	F	-.139d	-10.263	.000	-.657	.486
	CS	.003d	.194	.846	.016	.495
	FCROP	.014d	1.093	.276	.092	.956
	FRLK	.004d	.291	.771	.025	.985
	FRS	-.002d	-.105	.916	-.009	.763
	KA	.003d	.215	.830	.018	.721
	SHC	-.013d	-.757	.451	-.064	.512
5	F	-.132e	-107.840	.000	-.994	.485
	CS	-.019e	-1.712	.089	-.144	.486
	FCROP	.002e	.245	.807	.021	.946
	FRLK	.000e	-.037	.971	-.003	.984
	FRS	.000e	.016	.988	.001	.763
	KA	-.002e	-.264	.792	-.022	.720
	SHC	-.002e	-.141	.888	-.012	.509
6	CS	.002f	1.431	.155	.121	.474
	FCROP	-.001f	-.635	.527	-.054	.945
	FRLK	.000f	-.057	.955	-.005	.984
	FRS	.000f	.393	.695	.034	.763
	KA	-.002f	-1.558	.121	-.132	.720
	SHC	.002f	1.264	.208	.107	.509

- a. Predicators in the model:(constant),AR
b. Predicators in the model:(constant), AR, L
c. Predicators in the model:(constant), AR, L, R
d. Predicators in the model:(constant), AR, L, R, I
e. Predicators in the model:(constant), AR, L, R, I, K
f. Predicators in the model:(constant), AR, L, R, I, K, F
g. Dependent variable: Profit.

Appendix-IX

Serial No. of Questionnaire

Contractual Arrangements for Rice Cultivation in Bangladesh
(A Questionnaire Schedule for Data Collection on an Academic Research)

1. Information of a Tenant:

Farmer's Address	
Name of a farmer	
Village	
Union	
Upazila	
Zila	

1.1 Personal Information of a Tenant:

- a) Name of household's head
- b) Form of a household Single ☐ Joint ☐
- c) Age of a Farmer
- d) Gender: Male ☐ Female ☐
- e) Profession: Main ☐ Optional ☐
- f) Father's profession Agriculture ☐ Service ☐ business ☐ labor Others ☐
- g) Educational qualification: Illiterate ☐ Primary ☐ Secondary ☐ H. Secondary Graduation ☐ Post Graduation ☐ Others ☐

1.2 Information about Family Members:

S. No.	Name	Age	Gender	Relation with Household	Marital Status	Occupation		Education
						Main	Optional	
1.								
2.								
3.								
4.								

2. Land Ownership:

Own land (1)	Home stead (2)	Pond/Ditch (3)	Garden (4)	Leased in land (5)	Leased out land (6)	Amount of land in rice cultivation (7)	Total land (8)

3. Information about Leasing out/in Land

- 3.1 (a) Why do you leased in land? 1.To use available family labor ☐ 3. Use of equipment
 4. Acquire additional Crop ☐ 5.Others. ☐ (b) Why do you lease out land? 1.Impossible to cultivate own total land. ☐ 2. Problems of taking care of it ☐ 3. Increase in cost. ☐
 4. Want of labor. ☐ 5. Others ☐ (c) Why do you lease out land in different arrangements? (i) To get additional returns. (ii) Due to scattered location of plots (iii) Inability of tenants' to cultivation cost (iv) To handle tenants (v) Others.

3.2 Amount of leased in land in different years (in acre)

Form of Arrangements	What Amount of Leased in Land from whom						2000			2001			2002		
	Relative	Friends	Resident Land lord	Absentee Land lord	Others	For How Time	Aus	Aman	Boro	Aus	Aman	Boro	Aus	Aman	Boro
Sharecropping															
Fixed crop rent															
S.T. Leasing															
<i>Khaikhalashi</i>															
<i>Kat/ Bhuyata kat</i> (mortgage)															

3.3 Amount of leased out land in different years (in acre)

Form of Arrangement	What amount of leased out land to whom						2000			2001			2002		
	Relative	Friends	Resident land lord	Absentee land lord	Others	For how time	Aus	Aman	Boro	Aus	Aman	Boro	Aus	Aman	Boro
Share cropping															
Fixed Crop rent															
Short Term Leasing															
<i>khikhalashi</i>															
<i>Kat/ Bhyta kat</i>															
Total															

3.4 Causes of changes in land lease in different years

In case of share cropper	b) Will of landlord.	☐	In case of land lord	b) Will of sharecropper.	☐
	c) Changes in rent.	☐		c) Changes in rent.	☐
	d) Changes in production.	☐		d) Changes in production.	☐
	e) Increase in employment on non-agricultural sector.	☐		e) Changes in c.	☐
	f) Friendship.	☐		f) Problems of taking care of.	☐
	g) Competition among sharecropper	☐		g) Others.	☐
	h) Others.	☐			

4. Use of Factors of production

Agricultural Equipment		Owned land	Form of Arrangements				
			Sharecropping	Fixed crop rent	Short term leasing	<i>khaikhalashi</i>	<i>Kat</i> or Mortgage
Seed	Local						
	HYV						
Fertilizer							
Irrigation							
Plough							
Power-tiller							
Pesticide							
Labor	Own						
	Family						
	Hired						
	Exchange						
Total							

5. Information about Production:

8. Information of Sharecropping (per Acre)

Amount of land leased in							Leased out land						
Amount	For how time the land is leased- in	Portion of rent in production				Causes of changes in rent	Amount	For how time the land is leased out	Portion of rent in production				Causes of changes in rent
		Aus	Aman	Boro	Total				Aus	Aman	Boro	Total	

9. Information about Credit

From Whom	How much	What purpose	Used for what	Availability of credit	Cost of credit		Time of loan of repayment
					Interest	Incidental Expenses	
Scheduled Bank							
Private Bank							
NGO							
Cooperatives							
Traders/dealers							
Moneylenders							
Landowner							
Friend/neighbor							
Others							
Total							

10. Information about Credit

- a) Land leasing is profitable ☐ not profitable ☐ or none ☐
- b) Why is it Profitable? (1) Revenue is high relative to cost ☐ (2) Own and Family labor can be used ☐ (3) Draft powers can be used ☐ (4) Whole year's cost can get in a time ☐ (5) No employment opportunities at all ☐ (6) Social status is geared up ☐ (7) Others ☐
- c) Why is it not profitable? (1) High rent ☐ (2) high price of fertilizer ☐ (3) high cost of irrigation ☐ (4) high price of labor ☐ (5) high price of seed ☐ (6) low price of rice ☐ (7) others ☐
- d) What type of leasing arrangement is the most Profitable? Share cropping ☐ fixed crop rent ☐ Short term Leasing ☐ *kat/khaikhalasi* ☐ bhyata kat ☐

11. Information of price :

- a) Price of produced rice is low, ☐ high ☐ and normal ☐
- b) Why it is low? High cost relative to price ☐ low production ☐ low quality of rice ☐ others ☐
- c) When do you sell rice? i. In time of harvest ☐ ii. After harvest ☐ iii. In high price time ☐ iv. Others time ☐
- d) i. Price is high ☐ ii. Low ☐ or iii. Sufficient ☐

12. a) Please mention some problems one land leasing

(b) How can the problems be solved ?

13. Please give your (Enumerator's) Comments / opinion / experience about arrangements.

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