

# CHAPTER FIVE

## LAND HOLDING PATTERN AND THE STATE OF AGRICULTURE

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Many things may be regarded as resources when it comes to agricultural development-people, land, animals, machinery, or even education. Farm size has constantly been shown to be related positively and highly to adoption behaviour. Because of the importance of this factor we initially enquired about the landholding pattern and landownership system of the respondents. Then we have gone for general discussion on their state of agriculture.

Table 5.1 reveals that by landownership status majority (84.80 per cent) of the respondents were small and marginal farmers. The proportion of medium and big landowners was relatively less (15.20 per cent). By size -class little less than half of the respondents had 'marginal' land holdings (48.20 per cent) and about one third (36.60 per cent) had 'small' sized land. The proportion of respondents with 'medium' and 'large' sized land holdings was 12.80 per cent and 2.40 per cent respectively. Thus it is seen that in the two districts under study, the cultivating community was mainly belonging to the categories of small and marginal landowners. It is therefore apparent that the land area available for cultivation is going to be limited.

The aforesaid situation reminds us that with an expanding agricultural population, the farm holdings are increasing in number, while shrinking in size. Small and marginal farmers are now growing relentlessly. As there is an emergence of larger segment of small and marginal farmers they would be generally 'resources poor'. They would remain to be information receivers rather than 'information seekers' and would be largely incapable of higher investment in farming. Most of the studies which have examined the relationship between

**Table 5.1: Distribution of Respondents by Landownership Status**

<u>Nature of land ownership</u>	<u>Distribution in percentage</u>
<b>A. Land ownership status</b>	
Marginal farmer (Less than 1 Ha)	48.20
Small farmer (1-2 Ha)	36.60
Medium farmer (Greater than 2 Ha but less than 4 ha)	12.80
Large farmer (Greater than equal to 4 Ha)	02.40
<b>B. Irrigated Area</b>	
Upto 1 ha	76.34
1 to 2 Ha	20.33
Above 2 Ha	03.31
<b>C. Source of Irrigation</b>	
Shallow Tube well	70.53
Deep Tube well	04.97
River Lift Irrigation	07.88
Pond and others	16.59
<b>D. Land Quality</b>	
i) Fertile land	
Less than 1 Ha	66.80
1 to 2 Ha	27.60
More than 2 Ha	05.60
ii) Ordinary land	
Less than 1 Ha	91.20
1 to 2 Ha	06.60
More than 2 Ha	02.20
<b>E. Type of cultivator</b>	
Supervisory	04.20
Self cultivator	94.80
Share cropper	01.00
Lessor	00.00

the two variables founds that the size of holding owned or operated by a farmer was positively related to his adoption behaviour.

### **Kitchen garden**

Only 35.40 per cent of the total respondents had kitchen garden. The average annual income from the kitchen garden was Rs.1627. Like agricultural land there was also a variation in the area and size of kitchen garden. Majority (70 per cent) of the kitchen garden owners had kitchen garden area upto 1 Bigha, 24.29 per cent had 1 to 2 Bighas and only 5.64 per cent above 2 Bighas.

### **Irrigated area and sources of irrigation**

Irrigation is an important pre-requisite of the adoption of new technology. Most of the earlier studies have examined the relationship between the availability of irrigation and adoption of new agricultural technology, and which was found positively related. In present study, 51.80 per cent of the respondents had agricultural land without any irrigation facility. Having no source of assured artificial water supply they had to depend on vagaries of nature. Only 48.20 per cent farmers were fortunate enough to enjoying irrigation facilities. Table 5.1 shows that among those fortunate farmers majority (76.34 per cent) of them had irrigated land up to 1 hectare and they were mostly small and marginal farmers. Only about 20 per cent farmers had irrigated land within the range of one to two hectares. About 24 per cent of the medium and large farmers had irrigation facilities in their land. On the whole, a better proportion of cultivated area owned by the marginal and small farmers was under irrigation.

Table 5.1 reveals that there are several sources of irrigation in the study village, namely Shallow Tube Well (STW), Deep Tube Well (DTW), River Lift Irrigation (RLI), pond etc. STW was found as the main source of irrigation. Majority (70.53 per cent) of the respondents used STW for irrigating their lands

followed by ponds (16.59 per cent). River Lift Irrigation facility was available only to 7.88 per cent of the farmers and for another 4.97 per cent Deep Tube Well which was their principal source of irrigation.

### **Quality of land**

The quality of land has an important bearing upon cropping pattern and agricultural production. Fertility of land depends on the type of soil. In general, loam, sandy loam and clay loam are considered good for crops and suitable for rice cultivation because of its nutrient base and water retaining capacity. Soil with high percentage of sand is considered as 'ordinary land' and on an average it provides poor yield.

Table 5.1 depicts that 66.80 per cent and 91.20 per cent farmers had fertile and ordinary land respectively, with a mean size of less than one hectare. Similarly, 27.60 per cent and 6.60 per cent farmers had fertile and ordinary land respectively with the size between one to two hectares. Fertile and ordinary lands with the size above two hectares are owned only by 5.60 per cent and 2.20 per cent farmers respectively.

### **Tenurial status**

Distribution of landowners by their tenurial status is shown in Table 5.1. Majority (94.80 per cent) of the landowners were self-cultivators who used to operate their land with their family labour taking the help of hired labourers in needs. The supervisory cultivators do not participate directly in agricultural field operations. They cultivate their land by deploying hired labourers. About four per cent respondents were 'supervisory cultivators'. On the other hand, only one per cent of the respondents were sharecroppers. Among the respondents there was no non-cultivating landowner or lessor.

**Table 5.2 : Cultivation of Major Crops by Type of Input used, Yield and Income**

Season	Crop	Average Cultivated Area in hectare	Type of Input (In Percentage)				Yield (ton/ Ha)	Average Net Income in Rs.
			0	1	2	3		
Pre <i>Kharif</i>	Jute H.Y.V.	0.32	03.14	31.01	26.29	39.55	01.60	2744.10
	Jute Local	0.25	25.00	45.00	20.00	10.00	01.30	1600.00
	Aus paddy H.Y.V	0.54	04.30	08.60	05.37	81.72	03.98	4779.56
	Aus paddy Local	0.35	34.89	32.88	15.43	16.77	01.47	1077.44
<i>Kharif</i>	Aman H.Y.V.	0.82	66.34	11.29	10.33	12.01	02.41	5199.25
	Aman Local	0.70	83.04	06.22	07.61	03.11	01.74	2877.26
Rabi	Wheat	0.20	01.33	19.64	04.90	74.10	01.57	0836.83
	Potato	0.34	00.00	09.95	00.00	90.05	22.47	5574.70
	Mustard	0.24	05.45	70.90	00.00	23.63	00.95	0741.81
	Vegetable and others	0.22	07.58	27.58	03.44	61.37	Not found	3470.68

Type of input used :

0 = applied no fertilizer

1 = only farm manure (FM)

2 = Farm manure with nitrogenous source of fertilizer

3 = Balanced dose of fertilizer i.e. FM and NPK (Nitrogenous Phosphatic Potassic)

## **Crop husbandry and agricultural implements**

In this section an attempt has been made to see the pattern of use of agricultural land by the types of crops grown in three agricultural seasons. The data showing the types of crop cultivated, their yield, nature of input used, mean cropped area and average net income from the cultivation of specific crop are presented in Table 5.2. Owing to humid environment and availability of irrigation a greater proportion of land was under cultivation.

During *per-kharif* season, the major crops cultivated by the farmers of the two districts were Jute and Aus paddy. A typical system of cultivation of delayed Boro paddy which is locally called as 'China Boro' was the major crop in Rabi-summer season. Like southern Bengal, agriculture in North Bengal is also primarily based on cultivation of paddy and that too is *rainfed kharif*. Gradual replacement of local varieties by H.Y.V. has enhanced the productivity of Aman paddy. Among the other crops grown in *Kharif*-season in a limited scale, mention may be made to pulses and vegetables.

As far as the Rabi season is concerned, wheat, potato, mustard were the major crops. Along with the artificial irrigation, the vegetable cultivation in the upland areas has increased to a considerable extent. Tobacco is an important cash crop of this region and which has been included under 'other crops' in the Table 5.2.

### **Cultivation of pre-kharif crops**

Jute is an important crop of this season. This fiber crop thrives well in moist heat. Out of total 500 respondents, 89 per cent and four per cent of them cultivated H.Y.V and local varieties of jute respectively. Average cultivated area under H.Y.V. and local jute was 0.32 Ha and 0.25 Ha respectively. It is to be noted that jute is pre-dominantly a marginal and small farmers choice crop. However the jute growers were in dire need of good market price. The average

net income from the cultivation of just was only Rs. 2744.10 for H.Y.V and Rs. 1600 for local variety. Input plays a commendable role for getting good yield of crops. It has been observed that only 39.55 per cent and 10 per cent H.Y.V and local variety of jute growers respectively used balanced dose of fertilizer i.e. farm manure and Nitrogenous-Phosphatic-Potassic (NPK) fertilizer. On the other hand about three per cent of H.Y.V. and 25 per cent of local variety jute growers did not apply any fertilizer at all. Thus from the point of view of fertilizer application in jute cultivation, the farmers were not very serious and well concerned.

With the advent of irrigation, the farmers of the two districts under study have started cultivating H.Y.V Aus paddy. Aus paddy of local variety is cultivated both under rainfed and irrigated condition. It has been observed that 18.60 per cent and 29.80 per cent of the farmers cultivated H.Y.V Aus paddy and Aus paddy of local variety respectively. The average yield of H.Y.V and local variety of Aus paddy was respectively 3.98 tones and 1.47 tones per hectare. The farmers were found quite aware about recommended practices of Aus paddy cultivation. Majority (81.72 per cent) of the growers of H.Y.V Aus paddy and 16.77 per cent growers of local Aus paddy applied balanced doses of fertilizer. The net average income from the cultivation of H.Y.V Aus paddy was also high i.e. Rs. 4779.56. On the other hand, yield of local Aus paddy was low and the average net return from the cultivation of the crop was somewhat poor i.e. Rs. 1077.44. Possibly, in order to reap the high return from H.Y.V Aus paddy the majority of its growers showed interest to apply balance dose of fertilizer in this cultivation.

### **Cultivation in *Kharif* season**

Like other parts of the state, North Bengal's agriculture is also pre-dominated by rice culture and that too is rainfed *Kharif* paddy. Therefore any

attempt to uplift agricultural production needs to be directed to *kharif* paddy. Continuous replacement of old indigenous varieties by suitable H.Y.V could be the only adoptable technology for rainfed cultivation as other management oriented efforts may face limitation due to rain dependent situation of *Kharif* paddy.

Like *pre-kharif* season, in the *Kharif* season also a sizeable portion of land was under cultivation of H.Y.V. Aman paddy. The average cultivated area of H.Y.V. Aman paddy was 0.82 Ha and it was marginally higher than the local variety (0.70 Ha). In the agricultural session under survey about 83 per cent of the respondents grew H.Y.V and 57.80 per cent grew local variety of *Aman paddy*. Thus due to their better out turn potentiality, the H.Y.V paddy has replaced the local or indigenous variety to a considerable extent. The average yield of H.Y.V paddy was 2.41 tones per Ha. In contrast, it was 1.74 tones per Ha in the case of local varieties. Here one may note that India's productivity in Aman paddy was 1.75 tones/Ha in the year of 1995-96. Thus as compared to the national average, the situation of North-Bengal was fairly good. The average net return from the cultivation of H.Y.V and local paddy was Rs. 5199 and Rs. 2877 respectively. As far as the fertilizer application is concerned, 66.34 per cent of the farmers who cultivated H.Y.V paddy did not use any fertilizer. For local paddy growers the corresponding proportion was 83.04 per cent. There was poor application of fertilizer to Aman paddy because most of the land under *kharif* paddy suffered from water logging due to prolonged monsoon in this season. Basically the economy of the two districts under study was agriculture based and in which rice occupies the prime importance.

Among the other crops which are cultivated in *kharif* season in a limited scale, mention may be made to pulses and vegetables. On the whole the farmers of these two districts are still rely mainly on the cultivation of Aman paddy as their principal *kharif* crop.

### **Cultivation of Rabi crops**

In Rabi season the average cultivated area under wheat was the lowest i.e. 0.20 Ha. only (see Table 5.2). Average yield of wheat was 1.57 tones / Ha and the average net return was only Rs. 836.83. It is seen that only 44.80 per cent of the farmers were involved in growing wheat. One underlying reason behind limited cultivation of wheat is that it can only grow properly under assured irrigation and appropriate application of certain inputs. It is well evident from Table 5.2 that among the farmers who cultivated wheat, 74.10 per cent of them however applied balanced fertilizer. It is important to note that despite various encouragements from the Department of Agriculture, the wheat cultivation in the state has decreased from 10 lakh hectares in 1990-91 to around 3 lakh hectares in 1994-95. Here one cannot simply ignore the question of monetary return from cultivation of certain cash crops in Rabi season and which ultimately influences the choice of crops in Rabi season. It has been observed that as compared to typical Rabi-summer paddy i.e. Aus H.Y.V, return from wheat was far below. The farmers even without taking into serious consideration the availability factor of assured irrigation supply during active growth period preferred to cultivate Rabi-summer paddy i.e. delayed Boro paddy.

Cultivation of certain cash crop particularly potato is much more capital intensive than other crops. Only 44.20 per cent farmers grew potato with an average highest net return of Rs. 5574.70. Majority of the potato growers followed scientific cultivation techniques. More than 90 per cent of them used balanced fertilizer. All the farmers applied fertilizer in cultivation of potato. The yield of potato was high (22.47 tones / Ha). However, a section of marginal and small farmers were less inclined to cultivate potato. To them, apart from irrigation, the unavailability of complementary inputs including credit was the major constraint in potato cultivation.

An important oilseed crop of Rabi season is mustard. It is grown in ordinary land and with minimum input. The out turn (productivity) of mustard was low i.e. 0.95 tone / Ha and the net average return was equally low i.e. Rs. 741.81. Among the respondents only 11 per cent grew mustard, of whom only 23.63 per cent applied balanced dose of fertilizer. Majority (70.90 per cent) of the mustard seed growers applied only nitrogenous source of fertilizer.

In terms of vegetable production West Bengal holds the highest position among the states in India. Sometimes it exceeds the state requirements as almost all types of vegetables are grown throughout the year. In some period of season, the supply exceeds the demand, leaving the farmers in a bewildering situation, as there is no appreciable return due to sudden fall of market price. In the two districts under study, irrigation facility has enhanced the area under vegetable cultivation. Over the years the farmers have increased their area under vegetable cultivation in a significant way. The mean cultivated area under 'vegetable and other crops' was 0.22 Ha and average net return from vegetable cultivation was quite high i.e. Rs. 3470.68. Majority (61.37 per cent) of the farmers applied balance dose of fertilizer in vegetable cultivation and only a few farmers (7.58 per cent) used no fertilizer. That indicates the farmers growing vegetables were well conscious for getting a good yield by application of recommended doses of fertilizer.

### **Ownership of agricultural tools**

Farmers of the surveyed districts in general were lagging behind in the ownership and use of modern agricultural tools. Leaving aside the question of ownership of tractor or power tiller, majority of the farmers even had no plant protection sprayer machine and much needed pumpset for irrigation. The percentage distribution of farmers possessing agricultural tools has been shown in Table 5.3. The Table however presents a rather bleak picture indicating poor

**Table 5.3: Distribution of Cattle and Agricultural Equipment**

<b>Equipment</b>	<b><u>Distribution in percentage</u></b>
<b>A. <u>Bullock</u></b>	
Upto 1 pair	73.80
Above 1 pair but upto 2 pair	14.40
Above 2 pairs	01.60
None	10.20
<b>B. <u>Milch Cattle</u></b>	
Upto 1 pair	53.20
Above 1 pair but upto 2 pair	12.80
Above 2 pairs	04.00
None	30.00
<b>C. <u>Sprayer</u></b>	
Only 1	36.80
More than 1	01.20
None	62.00
<b>D. <u>Thresher</u></b>	
Only 1	00.60
More than 1	00.00
None	99.40
<b>E. <u>Pumpset</u></b>	
Only 1	17.20
More than 1	00.20
None	82.00
<b>F. <u>Power tiller</u></b>	
Only 1	01.60
More than 1	00.20
None	98.20
<b>G. <u>Tractor</u></b>	
Only 1	00.20
None	99.80

ownership of a few modern agricultural implements like pumpset, sprayer, thresher, tractor, and power-tiller. Among the respondents, only 38 per cent had personal spray machine and 17.40 per cent pumpsets for irrigation. The possession of power-tiller, tractor and thresher was dismally low.

Bullock and other draught animals were the major animal power of agricultural sector. Farmers of the surveyed districts had to depend on it heavily for farming activity. Although the mechanisation in agriculture is in full swing, the role of bullock and other draught animals like oxen, calves etc; will continue to contribute a major share of power in farming business. For majority of farmers, bullock will remain the sole source of power without which it is very difficult to cultivate the land. Table 5.3 depicts that about 90 per cent of farmers had bullocks. Majority (73.80 per cent) of the farmers were having one pair of bullock and 16 per cent had more than that. Interestingly milch cattle were used in the North-Bengal villages both for milk and draught purposes. About 70 per cent farmers had milch cattle. Among cattle owners 53.20 per cent had one pair of cattle and 16.80 per cent owned more. It is thus observed that even in this age of new agricultural technology and mechanisation draught animals still serve as the main source of farm power for majority of the farmers. In this respect only an insignificant proportion (about one per cent) of farmers has gone for mechanisation.