

CHAPTER - I

Decrease In Fertiliser Use In Rupandehi Distret

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Introduction

Fertiliser must play an increasingly important role in the growth of Nepalese agriculture as scope for expanding cultivable land is extremely limited due mainly to the rugged and mountainous topography of the country. Higher agricultural production through the use of improved seeds and multiple cropping is universally associated with increased fertiliser use. Hence, the level of fertiliser use must rise by huge, unprecedented annual increments.

With a view to generating rapid growth in cultivators' demand for fertiliser, measures such as procurement of fertiliser through Agricultural Input Corporation, provision of institutional credit and extension services, land improvement extension of irrigation facilities and, above all, purposive land reform, were taken. Initially, these measures, no doubt, led to a rapid increase in the use of fertiliser. The use of total plant nutrients in terms of chemical fertiliser, while rose from 32575 metric tons in 2029/30 to 36779 Metric tons in 2030/31, fell to 31131 Metric Tons in 2032/33. Thus fertiliser consumption increased significantly until 2032/33. Consumption actually dropped (by over 18 percent) for the first time in the history of fertiliser use in the country.

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Differences occurred in the rate of decrease in fertiliser use as between regions and even from district to district within a region. Table 1 shows that the sales of fertiliser increased by 20 percent in 2033 in the Eastern region. However, the level of sales is relatively very low. The fall in fertiliser use was only 1 percent in the middle region. On the contrary, there has been considerable decrease in sales in the Western and Far Western region. The AIC has been hamstrung in boosting its sales mainly because of farmers - the ultimate users of fertiliser - not being able to buy their needs. Since this has become matter of concern to all, the present study is devoted to a critical analysis of the decrease in fertiliser consumption and evolve strategies to boost its consumption.

Objectives

The main objectives of this study may be stated as follows:-

- 1) to study details of the use of fertilisers such as the spread of fertiliser use and rates of application over a period of 5 years;
- 2) to assess the extent of decrease in use of fertiliser;
- 3) to examine the importance of economic and social factors such as the size of farms, land ownership, gross farm income and irrigation in affecting the effective demand;
- 4) to consider whether the cooperatives and other institutions were strong enough to undertake the responsibility of providing timely and reasonable credit; and
- 5) to throw light on fertiliser availability and distribution situation.

Methodology

In view of the paucity of relevant data essential for this study a survey was undertaken. Data were obtained from farmers by personal interview using a structured questionnaire.

The approach adopted was an intensive and detailed field survey of a small number of selected farmers. This method was adopted as it appeared that it would provide 'depth' to the study by making possible the collection and assessment of a great deal of qualitative material.

Selection of District

As fall in fertiliser use was the major problem to be studied, it was decided that in the country an area where there has been considerable decrease in fertiliser

consumption may be selected. As can be seen from Table 1 between regions the Western and within the region, Rupandehi experienced heavy fall in fertiliser consumption. Hence, Rupandehi was chosen for our study.

Selection of Villages

In the district, two villages, namely. Anandban and Bagauli, were selected for intensive study. Study villages were selected to include at least one village where potential existed for sustained growth in fertiliser use. The main criteria guiding selection were: (1) use of fertiliser and (2) irrigation facilities.

Anandban

The village is situated about 6 miles away north of Bhairahwa town - the head quarter of the district. It is half a mile away from the main metalled road between Bhairahwa and Pokhara. There is a branch of Nepal Bank Ltd. The village obtains water for irrigation from the network of Kacha Koolo* based on the river Tinav. Thus the village is irrigated.

Bagauli

Bagauli on the other hand is situated about 14 miles away south of Bhairahwa. The village is not connected by motorable road. There is no bank. Neither is there adequate irrigation facilities. Hence, the crop intensity in the village is also low.

Selection of Farmers

In making selection of the sample of farmers, the method adopted was stratified random sampling. All the cultivating families in a village were arranged in the descending order of the size of their cultivated holding and were divided into four groups. group I comprising the first 10 percent, group II the next 20 percent, group III the next 40 percent, group IV the last 30 percent. Six families were selected at random from the first group, four families from the second group, eight families from the third group, and six families from the fourth group, to constitute a sample of 24 farmers from each village. In all total cultivators interviewed were 48. It is necessary to note

* The water in the river Tinav is lifted through a dam across the river and through small surface ditches is allowed to run off into each holding. Farmers of several villages come together to build the dam with the help of stone, wood from jungle and jungali grass (syaula). In the event of heavy rain-fall the dam is washed away, and it is remade.

that from now onwards the first of these groups is referred to as 'big', the second as large, the third as, medium, and the fourth as small cultivators. The data for all cultivators were compiled from the information collected from the families in each of four classes of cultivators, by a weighting process*.

* To arrive at the weighted averages of all cultivators we have applied weights $1/10$, $2/10$, $4/10$ and $3/10$ to the respective class averages.

Table - I

VARIATION IN FERTILISERS SALES AMONG DISTRICTS WITHIN REGIONS

	(Quantity in Quintal)		Increase or Decrease %
	2032	2033	
Eastern Region	2652.23	3194.18	+20.43
1. Jhapa	638.00	1482.17	+132.28
2. Sunsari	959.00	1289.50	+34.41
3. Morang			
4. Saptary	415.50	230.50	-45.00
5. Siraha	470.85	10.00	-98.00
6. Dhankuta	168.88	178.14	-5.00
7. Udaypur	-	3.97	+100.00
Middle Region	81446.70	80480.55	-1.19
8. Chitwan	450.00	966.50	+115.00
9. Rautahat	1048.00	243.10	
10. Sarlahi	142.59	10.50	-99.23
11. Dhanusha +			
12. Mahotari	4294.00	1159.80	-73.00
13. Parsa +			
14. Bara	9881.75	6881.45	-30.37
15. Makwanpur	652.41	1076.70	-65.03
16. Kathmandu	65977.95	70142.50	+6.31
Western Region	15340.67	9134.94	-40.45
17. Nawalparasi	2955.50	1687.50	-42.92
18. Kaski	928.50	1045.50	+12.60
19. Kapilvastu	3025.50	1859.69	--28.55
20. Rupandehi	8421.17	4542.26	-46.07
Far-Eastern Region	3232.57	2080.50	-35.67
21. Dang	780.27	207.00	--73.47
22. Banke	1362.00	810.00	--40.53
23. Kailali	571.24	242.65	--57.45
24. Kanchanpur	202.50	201.55	-0.50
25. Surkhet	135.56	321.00	+138.00
26. Bardia	181.00	297.00	+64.08

Source: Agricultural Input Corporation.

CHAPTER - II

CHARACTERISTICS OF SAMPLE FARMERS

Before dealing with the use of fertiliser and its growth over a period, it would be pertinent to discuss the characteristics of the selected farmers. Hence this chapter is devoted to study the following characteristics of sample cultivators:

1. Size of Holding and its composition,
2. Value of owned assets,
3. Gross produce, sale proceeds and other Income,
4. Irrigation,
5. Crop pattern
6. Crop intensity,
7. Family Size,
8. Literacy Standard.

Size of Holding and Its Composition

The average size of holding for all farmers is almost identical in the two villages. Thus the comparison between the two villages which would follow will not be based on this account. A great disparity exists in the average size of farm among different groups of cultivators. Such disparity in the averages indicates the fact that a large amount of cultivated area is concentrated among big and large cultivators, area cultivated by the medium and small cultivators is, as a rule, small (Table -1)

The amount of land taken on lease reported by all farmers is not only low but also the same in both the villages. As regards four groups of cultivators it may be noted that except big cultivators in Anandban. The proportion of land taken on lease in the cultivated holding generally increases with the decrease in the size of cultivated holdings. Therefore, the relatively larger proportion of land taken on lease in the case of medium and small cultivators detracts considerably from the value of the size of cultivated holdings as an index of relative economic position (Table-2).

Value of Owned Assets

The value of assets is very much higher in Anandban than in Bagauli. Modern implement is of very high magnitude in Anandban. The value of assets declines with

the decline in the size of cultivated holdings. Land constitutes an important assets in all groups. No consistent pattern is seen in the variation of the proportions of cattle, implements, and houses to the total from class to class.

Irrigation

Nearly all cropped area is under irrigation in Anandban. Water for irrigation is obtained from the river Tinav. The situation of Bagauli is altogether different. In Bagauli, only 15 percent of the area is being irrigated by sources like bore-wells or wells.

The proportion of irrigated area is 100 percent for every group of cultivators in Anandban. In Bagauli, only big cultivators reported a sizable proportion of the cropped area under irrigation.* 12 percent and 18 percent of the area among large and medium cultivators reported to have been irrigated by Kacha well. But this irrigation is only of a protective nature. At the most it provides one irrigation to rabi crops and to a very limited amount of land. Thus cultivators in Anandban are placed in a very advantageous position from the point of view of assured irrigation (Table 3).

Intensity of Cropping

The availability of irrigation facilities in Anandban provided opportunities for double and multiple cropping. The intensity of cropping was 207 percent in Anandban as against 152 percent in Bagauli. In Anandban, the intensity of cropping goes down with the increase in the size of holding whereas in Bagauli the intensity differs little from class to class. This is due to the fact that farmers in Anandban have source of irrigation which has prompted them to make fuller use of both land and the irrigation potential (Table - 4)

Crop Pattern

The most important crop in the villages was paddy. The villages had over 43 percent crop area under paddy followed by over 26 percent under wheat. Keraw and masuri occupied 12 percent of the gross cropped area as compared to 2 percent in Bagauli. Tori and Maize accounted for a sizable proportion of the gross cropped area only in Anandban, On the other

* A few farmers from big group had the boring done and purchased the pumpset. It was reported that the energy crisis in recent years has weakened the effort in the directions of inergisation of pumpsets.

hand, sugar-cane had the sizable area with 8 percent followed by other crops with 17 percent in Bagauli. The same trend is observed among different groups of cultivators. The largest area is devoted to paddy and is followed by wheat.

Yield

The yield levels of paddy and wheat are high in Anandban than in Bagauli. This high level of crop yield is due to assured irrigation in Anandban. While the yield of paddy in Anandban increases with the decline in the size of holding, that of wheat does not show any consistent trend. However it is higher among big than among small cultivators. The variation in the yield levels of paddy and wheat does not show any consistent pattern. However, they are higher among big cultivators than among small cultivators (Table - 5).

Gross Produce, Sales Proceeds and other Incomes

The average gross produce per family is higher in Bagauli than in Anandban. This is mainly due to the fact that the data presented are in terms of quantity and not in terms of the value of gross produce. In Bagauli, farmers reported to have grown sugarcane in sizable quantity. This has swollen the amount of gross produce in Bagauli. However, the price of sugarcane is very much lower than that of other crops*. In both villages the amount of gross produce decreases with decline in the size of holding.

The value of sale proceeds is very high in Anandban. The value of sales proceeds is Rs. 3,546 as against only Rs. 1,886 in Bagauli. Further, we find a positive relation between the size of the holdings and the value of sales proceeds. It decreases sharply from big to small cultivators. This is because the smaller the size of cultivated holdings, lower would be the total output and after the family requirements for food are met the lower would be the marketable surplus. The value of other Income is also higher in Anandban than in Bagauli. However, variation in the value of other income does not show any consistent pattern from class to class of cultivators. It is higher among big than among small cultivators in both the villages.

Literacy Standard

The sample showed that relatively a higher proportion (45 percent) of farmers

* The price of sugarcane was Rs. 21 per quintal as against Rs. 125 for wheat and Rs. 160 for paddy.

in Anandban had education beyond primary level. On the other hand, the proportion of farmers having education beyond primary level was 22 percent only in Bagauli. While the proportion of literate persons was almost identical in the two villages, that of illiterate ones was higher in Bagauli than in Anandban. As regards the four groups, it may be noted that larger the farmers the higher the proportion of persons having education beyond primary level and smaller the cultivators the higher the proportion of illiterate among them.

Family Size

There is little difference in the average size of family and its age composition between the two villages. While the proportion of farmers under 16 years of age was higher in Anandban that above 16 years was higher in Bagauli. This implies a relatively heavy burden on Anandban to educate and support the youngsters. Among the different groups, the average size of family is higher among big and large cultivators than among medium and small cultivators.

It is apparent from the above analysis that the two villages are more or less similar as far as the ownership of land, size of holding, crop pattern and size of family are concerned. They do differ, however, in terms of assets owned, irrigation facilities, crop intensity, yield, gross produce, the value of sale proceeds and other income and literacy standard. As regards the four groups, predominance of big cultivators over large, that of the large over medium and that of the medium over small has been amply proved by our data.

Table - 1

AVERAGE SIZE OF CULTIVATED HOLDING PER FAMILY

Class of Cultivators	Anandban		Bagauli	
	Bigha	Katha	Bigha	Katha
Big	14	8	13	17
Large	5	18	6	2
Medium	3	3	3	6
Small	1	6	1	8
All	4	6	4	7

Table - 2

COMPOSITION OF THE AVERAGE SIZE OF FARM IN TERMS OF LAND OWNED, LEASED IN AND OTHERS AMONG GROUPS OF CULTIVATORS

Class of Cultivators/Items	Anandban		Bagauli	
	Bigha	Katha	Bigha	Katha
Big				
Owned Land	12	12 (87.50)	13	17 (100.00)
Land Taken on Lease	1	16 (12.50)	-	-
Others	-	-	-	-
Total	14	8 (100.00)	13	17 (100.00)
Large				
Land Owned	5	18 (100.00)	5	17 (95.90)
Land Taken on Lease	-	-	0	5 (4.10)
Others	-	-	-	-
Total	5	18 (100.00)	6	2 (100.00)
Medium				
Land Owned	2	16 (88.89)	2	16 (84.85)
Land Taken on Lease	0	7 (11.11)	0	4 (6.06)
Others	-	-	0	6 (9.00)
Total	3	3 (100.00)	3	6 (100.00)
Small				
Land Owned	1	3 (88.46)	1	5 (89.29)
Land Taken on Lease	0	3 (11.54)	0	3 (10.71)
Others	-	-	-	-
Total	1	6 (100.00)	1	8 (100.00)

(Figure in Bracket is Percentage to Total)

Table - 3

PROPORTION OF IRRIGATED, NON IRRIGATED AREA AS WELL AS SOURCE
OF IRRIGATION

	% irrigated area to the total culti- vated holding	% of non irri- gated area to the total cul- tivated holding	% Koolo irri- gated area to the irrigated area	% Boring irrigated area to the total irrigated area.	% Kacha Well irri- gated area.
ANANDBAN					
Class of Cultivators					
Big	100.00	-	100.00	-	-
Large	100.00	-	100.00	-	-
Medium	100.00	-	100.00	-	-
Small	100.00	-	100.00	-	-
All	100.00	-	100.00	-	-
BAGAULI					
Big	57.04	42.96	-	96.20	3.80
Large	12.30	87.70	-	-	100.00
Medium	18.18	81.82	-	-	100.00
Small	-	100.00	-	-	-
All	15.43	84.71	-	09.68	60.38

Table - 4

INTENSITY OF CROPPING AMONG FOUR GROUPS OF CULTIVATORS

(In Percentage)

CLASSES OF CULTIVATORS			
Anandban		Bagauli	
Big	186.71	Big	153.91
Large	200.00	Large	134.98
Medium	215.64	Medium	153.88
Small	256.33	Small	164.88
All	206.98	All	151.62

Table - 5

AVERAGE YIELD PER BIGHA OF THE MAJOR CROPS AMONG FOUR
GROUPS OF CULTIVATORS

(IN KG)

Class of Cultivators	Anandban		Bagauli	
	Paddy	Wheat	Paddy	Wheat
Big	1173	863	885	508
Large	2042	509	553	343
Medium	2133	507	794	723
Small	2190	717	567	320
All	2036	606	687	505

CHAPTER - III

FERTILISER USE

In this Chapter, we analyse fertiliser use among the four groups of cultivators in the sample area as well as growth in fertiliser consumption over a period of 5 years, viz; 029 to 033. In the preceeding Chapter, while studying the characteristics of sample cultivators in the two villages, we have found that substantial differentials exist among them in regard to the size of holding and its composition, amount of assets, irrigation facilities, gross produce, yield, the value of sale proceeds and other incomes. In the light of the above findings our objective now is to know whether these differentials are reflected in the variation of fertiliser use and its growth over the period.

Proportion of Farmers

The data in Table 1 show the proportion of farmers in the four size groups that had used fertiliser by the year indicated in to villages. The initial adoption of fertiliser use appears to be much faster for the high water availability village. 68 percent of the farmers in Anandban with good water had adopted fertiliser by 030 as compared with only 20 percent of the farmers in the poor water village, that is, Bagauli. The percentage of farmers using fertiliser went up much faster in both the vallages. But while increase has been continuous in Anandban, a decrease took place in the proportion of farmer using fertiliser in Bagauli in 033. Some farmers may have subsequently stopped using fertiliser in this village. Thus, it appears that a key factor in maintaining upward trend in the percentage of users has been the availability of water.

As regard the four groups, it may be noted that the small farmers lagged behind the large farmer's at the start but caught up rapidly in the 4rth and 5th year. A larger proportion of farmers among big and large groups had adopted fertiliser by 029-030 than had small farmers. It is interesting to note that every group in Anandban with good water has maintained the percentage of farmers adopting fertiliser over the period. In fact, the percentage of fertiliser user has increased in 033 as compared with that in the previous year among large and small cultivators. In Bagauli, on the other hand, only big cultivators with good water have been able to maintain the percentage of users among them. Rest of the groups with poor water

shows a decrease in the percentage of user in 033 as compared with that in the preceeding year. There seems to be a clear relationship between the percentage farmers adopting fertiliser in any group or village and water availability.

Consumption of Fertiliser per Family and per Reporting Family

The per family and per reporting family use of fertiliser is percented in Table 2. The average amount of fertiliser used per family and per reporting family went up much faster from 029 to 032 in both the villages. The averages are higher for Bagauli than for Anandban. This has been due to the fact a few farmers of big size-group in Bagauli reported to have used fertiliser very heavily thus swelling the averages for that village. The averages are exceptionally higher among big cultivators in Bagauli as compared with those among their counterparts in Anandban. It is clear from the table that except big group, all other groups in Bagauli used much lower quantity of fertiliser per family than their counterparts in Anandban. Thus, even the average amount of fertiliser used per family or per reporting family appears to have been influenced by improved water supply. Further although the year 033 is marked by a decrease in the per family consumption of fertiliser in both the villages, the decrease has been steeper in Bagauli.

The average use of fertiliser per family and per reporting family increases with the size of cultivated holdings. This indicates the larger fertiliser requirements of the bigger cultivators.

Spread of Fertiliser Use

Analysis of fertiliser practices of the four groups of cultivators between 029 and 033 in two villages shows that within each village the relative spread of fertiliser use on different crops are unequal. Wheat was fertilised most commonly in both the villages. Paddy was also fertilised, but the spread was lower than on wheat. Other crops such as sugarcane and Tori have been fertilised much less commonly. Fertiliser was used on a higher proportion of land devoted to wheat in Anandban than in Bagauli. The proportion of land devoted to paddy which received fertiliser was higher in Bagauli than in Anandban. Anandban and Bagauli are recent important success stories in the rapid fertiliser use. By 032 fertiliser was used on over 80 percent of the area in wheat. Similarly, percentage of land in paddy and other crops also increased. However, the year 033 is marked by a general decrease in the spread of fertiliser use. The percentage of land under wheat which received fertiliser went down in both the village. As for paddy and tori the data indicate that the spread of fertiliser use, though limited, increased

in Anandban. This shows trend in the use of fertiliser in favour of crops other than wheat. On the contrary, the proportion of land planted to paddy which received fertiliser decreased from 41 percent to 32 percent in Bagauli. Fertiliser was used on none of the land devoted to sugarcane.

As regard the four groups, while wheat was fertilised most commonly by every group of cultivators, paddy and other crops received fertiliser on a sizable proportion of land only among big cultivators (Table 3).

Rates of Fertiliser Use

The average rates of fertiliser application on different crops are presented in Table 4. The average actual use of fertiliser per bigha for paddy is lower than that for wheat. Between the two villages it was higher for Bagauli in every year, except 033. This is mainly due to the fact that a few farmer belonging to big group reported to have used very heavy doses of fertiliser per bigha in Bagauli. While the average rate of fertiliser use in Anandban increased from 12 kg. in 032 to 47 kg. in 033 that in Bagauli decreased. Thus, as for paddy in Anandban, there has been increase in both the proportion of fertilised areas as well as the rate of application.

The per bigha use of fertiliser on wheat is higher in Anandban than in Bagauli. The annual variation in the per bigha use of fertiliser does not show a consistent pattern. But both the villages showed a decrease in the average actual use in 033 as compared to that in the previous year. It is noteworthy that while per bigha dose of fertiliser for other crops increased in Anandban that decreased substantially in Bagauli.

In Bagauli, the per bigha use of fertiliser decreases with the size of the farm. This is not so in Anandban. The rates of application are more or less similar among the four groups of cultivators. Thus, the village in which the level of irrigation is the same among the four groups of cultivators is also the village in which the rates of application are more or less similar among these groups. The higher per bigha use of fertiliser among big group in Bagauli is due both to assured irrigation and better capacity to buy fertiliser. Further, there has been a general decline in the use of fertiliser per bigha among every group of cultivators in both the villages, except big cultivators in Anandban. The per bigha use of fertiliser for paddy, wheat and others increased over the period under discussion among big cultivators in Anandban.

Growth in Fertiliser Use

We may now examine the year-wise growth in fertiliser use. The growth will be assessed in terms of percentage increase (+) or decrease (—) in per family consumption of fertiliser and the area which received fertiliser in a particular year over the preceding one.

Increase (+) or Decrease (—) in per family consumption

Except 031, each year growth in fertiliser use was higher in Anandban than in Bagauli. Although both the villages experienced fall in the consumption of fertiliser per family in 033, the fall has been much higher in Bagauli. The decrease is only 18 percent in Anandban as against 46 percent in Bagauli. The variation in the growth of fertiliser consumption among the different groups of cultivators does not show any consistent pattern over the period. The year 033 is marked by a decrease in the level of fertiliser use per family among every group of cultivators. It is important to note that the decrease is much steeper among the small cultivators. Thus, between the villages Bagauli and among the four groups, the small cultivators have experienced a heavy fall in fertiliser consumption per family (Table 5).

Increase (+) or Decrease (—) in The Area Fertilised

Crop-wise data on the area which received fertiliser are presented in Table 6. Except the year 030, the proportionate increase in the area fertilised is higher in Bagauli than in Anandban. While Bagauli shows decrease of 27 percent in the area fertilised, Anandban shows an increase of 13 percent in 033. Further, there has been a decline in the area fertilised under every crop in Bagauli. On the other hand, in Anandban, there has been fall in the area fertilised only in the case of wheat. The area fertilised under paddy and other crops in fact increased. This indicates a shift in fertiliser use from wheat to other crops in Anandban.

We may now compare the percentage decrease in fertiliser consumption in sample area with that in the district as a whole. It is clear from the Table 1 in the first Chapter that consumption in the district went down by 46 percent in 033. Our data show that average consumption of fertiliser per family in the sample area went down by 34 percent in the same year. This leaves a gap of 12 percent between our data and that for the district as a whole. On the assumption that 12 percent of the total fertiliser sold by AIC was smuggled into India the account of 46 percent fall in

the consumption of fertiliser in the district is clear*. It is clear from the foregoing that the initial rate of adoption of fertiliser use in terms of number of additional farmers or in terms of increasing rates of application per unit of land as well as the growth in the proportion of land fertilised were higher in the village in which levels of irrigation were high. On the other hand, village with low levels of irrigation and in which levels of yield, gross produce, sale proceeds were also low showed low rates of adoption and effective demand. Further, good water village showed relatively low fall in per family consumption of fertiliser as against a substantial fall in poor water village. The village in which index of water availability was same for every group, showed little difference in the rate of adoption and the proportion of land fertilised among the four groups. But the village with differing water availability index among the four groups showed unequal rates of adoption and effective demand. However in both the villages the decrease in the per family consumption has been steeper among small cultivators. In Anandban, fall in per family consumption has been bigger on small farms even though an index of water availability was similar to that of big farms. Thus, sustained adoption of fertiliser requires something other than good availability of water.

* In my personal interview with the officials of the Land Reform Administration, District Agricultural Department, Custom and district Cooperative Department, it was learnt that fertiliser was diverted to meet the requirements of farmers in the adjoining areas of India. The reasons given for the diversion are (1) Scarcity of fertiliser in India, (2) relatively cheap fertiliser in Nepal, and (3) better quality. In this connection, an example of 34 arrests at one night was given by the district Agricultural Development Officer. All 34 persons carrying bags of fertiliser on their back, were trying to cross the border. However, no written document was made available. In Bagauli, it was reported that the manager of the Tharki Cooperative Society himself was involved in such activities. He earned enough money by selling fertiliser to Indians at a price substantially higher than the official one.

Table - 1

PROPORTION OF CULTIVATORS USED FERTILISER IN THE YEAR 029, 030,
031, 032 AND 033 AMONG THE FOUR GROUPS OF CULTIVATORS

Class of Cultivators	2029	2030	2031	2032	2033
		ANANDBAN			
Big	50.00	83.33	83.33	83.33	83.33
Large	50.00	75.00	75.00	75.00	100.00
Medium	12.50	75.00	87.50	87.50	87.50
Small	33.33	50.00	66.67	67.67	83.33
All	35.00	68.33	78.33	78.33	78.33
		BAGAU LI			
Big	16.67	50.00	66.67	100.00	100.00
Large	50.00	-	75.00	75.00	50.00
Medium	12.50	37.50	87.50	100.00	87.50
Small	-	-	16.67	83.33	66.67
All	16.67	20.00	66.67	90.00	75.00

Table - 2

AVERAGE QUANTITY OF FERTILISER USED PER FAMILY AND PER REPORTING FAMILY IN THE YEAR 029, 030, 031, 032 AND 033 AMONG THE FOUR GROUPS OF CULTIVATORS

(IN KG.)

Groups of Cultivators	2029		2030		2031	
	Per Family	Per Reporting Family	Per Family	Per Reporting Family	Per Family	Per Reporting Family
ANANDBAN						
Big	222	443	464	557	598	717
Large	125	250	206	275	238	317
Medium	56	450	168	233	157	179
Small	36	108	65	130	107	160
All	80	307	174	243	202	235
		2032		2033		
Big	814	976	774	929	-	-
Large	325	433	294	294	-	-
Medium	182	208	151	172	-	-
Small	127	185	47	56	-	-
All	257	323	210	237	-	-
BAGAULI						
		2029		2030		2031
Big	1167	7000	2008	4017	2142	3213
Large	19	38	-	-	84	112
Medium	9	75	28	75	87	100
Small	-	-	-	-	5	32
All	123	738	212	432	268	393
		2032		2033		
Big	2529	2529	1383	1393	-	-
Large	78	104	29	57	-	-
Medium	129	129	74	74	-	-
Small	36	43	23	34	-	-
All	331	338	180	194	-	-

Table - 3
SPREAD OF FERTILISER USE ON THE SPECIFIED CROPS

Class of Cultivators	Crop	Percentage of Areas Under Crops Which Received Fertiliser	2029	2030	2031	2032	2033
ANANDBAN							
Paddy			5.46	13.11	15.30	17.49	19.67
Big	Wheat		25.93	53.70	66.67	81.48	51.85
	Tori		-	-	11.11	16.67	55.56
Paddy Large	Wheat		-	2.47	-	-	20.62
	Tori		44.44	53.33	71.11	75.56	97.78
Paddy Medium	Wheat		-	-	-	-	-
	Tori		31.61	68.03	71.43	85.03	76.53
Paddy Small	Wheat		-	-	-	-	95.24
	Tori		41.23	58.77	93.86	93.86	57.89
Paddy All	Wheat		0.55	1.80	1.53	1.75	8.10
	Tori		36.49	60.88	77.62	85.43	72.71
			-	-	1.11	1.67	43.65
BAGAULI							
Paddy			29.25	62.16	54.84	85.92	74.95
Big	Wheat		44.44	61.11	97.22	100.00	88.89
	Sugarcane		-	46.82	52.28	100.00	-
Paddy Large	Wheat		20.59	-	20.59	-	-
	Sugarcane		7.14	-	62.86	71.43	42.86
Paddy Medium	Wheat		-	8.07	51.55	59.94	47.52
	Sugarcane		7.52	24.81	54.89	80.09	66.17
Paddy Small	Wheat		-	-	-	18.87	-
	Sugarcane		-	-	-	27.50	16.67
Paddy All	Wheat		-	-	-	84.27	61.80
	Sugarcane		7.04	9.44	30.22	40.82	31.50
Paddy	Wheat		8.88	14.61	44.25	81.60	62.47
	Sugarcane		-	4.68	5.23	17.55	-

Table - 4

RATES OF FERTILISER USE ON DIFFERENT CROPS (KG/BIGHA)

Crop	Year	Big Cultivators	Large Cultivators	Medium Cultivators	Small Cultivators	All Cultivators
ANANDBAN						
Paddy	029	98.00	-	-	-	9.80
	030	98.00	41.66	-	-	18.13
	031	114.71	-	-	-	11.47
	032	116.00	-	-	-	11.60
	033	122.56	10.00	-	107.59	46.56
Wheat	029	120.00	100.00	225.00	91.49	149.45
	030	111.03	123.08	134.00	116.42	124.25
	031	100.33	118.75	119.52	119.63	120.75
	032	135.45	152.94	116.40	142.06	133.31
	033	152.86	102.27	98.22	63.64	94.12
Others*	029	-	-	-	-	-
	030	-	-	-	-	-
	031	30.00	-	-	-	3.00
	032	45.00	-	-	-	4.50
	033	60.00	-	33.33	-	19.33
BAGAULI						
Paddy	029	131.25	14.29	-	-	15.98
	030	110.12	-	25.38	-	22.06
	031	123.33	32.00	37.10	-	33.57
	032	105.85	-	32.54	-	23.60
	033	88.49	-	31.76	-	21.15
Wheat	029	306.25	50.00	75.00	-	70.63
	030	254.55	-	58.18	-	48.73
	031	187.14	51.14	54.42	49.23	65.08
	032	213.75	62.40	63.00	34.94	69.24
	033	156.25	38.00	39.77	36.00	49.93
Others	029	-	-	-	-	-
	030	342.86	-	-	-	34.29
	031	329.11	-	-	-	32.91
	032	190.75	-	100.00	42.40	63.70
	033	-	-	-	30.77	10.13

* Sugarcane, Tori, etc.

Table - 5

PERCENTAGE INCREASE (+) OR DECREASE (-) IN THE USE OF FERTILISER
PER FAMILY AMONG THE FOUR GROUPS OF CULTIVATORS*

Class of Cultivators	2029	2030	2031	2032	2033
ANANDBAN					
Big	222	464	598	814	774
	-	+209.00	+128.88	+136.12	-4.91
Large	125	206	238	325	294
	-	+64.80	+15.53	+36.55	-9.54
Medium	56	168	157	182	151
	-	+200.00	-6.55	+15.192	-7.03
Small	36	65	107	127	47
	-	+80.56	+64.62	+18.69	-62.99
All	80	174	202	257	210
	-	+117.50	+16.09	+27.23	--18.29
BAGAULI					
Big	1167	2008	2142	2529	1383
	-	+72.07	+6.67	+18.08	-45.31
Large	19	-	84	78	29
	-	-	+342.10	-7.14	-62.82
Medium	9	28	87	129	74
	-	+211.11	+210.71	+48.28	-42.64
Small	-	-	5	36	23
	-	-	-	+620.00	-36.12
All	123	212	268	331	180
	-	+72.36	+26.42	+23.51	-45.62

* Percentage decrease (-) or increase (+) in each year over the preceding year.

Table - 6

AREA PUT UNDER FERTILISER CROP-WISE AMONG ALL CUTIVATORS

	2029		2030		2031		2032		2033	
	Bigha	Katha	Bigha	Katha	Bigha	Katha	Bigha	Katha	Bigha	Katha
ANANDBAN										
Paddy	0	10	1	6	1	8	1	12	3	0
	-	-	+160.00		+7.69		+14.29		+87.50	
Wheat	3	4	7	13	9	4	10	10	9	2
	-	-	+139.06		+20.26		+14.13		-13.33	
Other	-	-	-	-	0	2	0	3	1	14
	-	-	-	-	-	-	+50.00		+1033.33	
Total	3	14	8	19	10	14	12	5	13	16
	-	-	+141.89		+19.55		+14.49		+12.65	
BAGAULI										
Paddy	2	6	3	18	7	1	9	1	7	9
	-	-	+69.57		+87.77		+28.37		-17.68	
Wheat	2	2	3	11	7	10	10	8	8	3
	-	-	+69.05		+111.27		+38.67		-21.63	
Others	-	-	0	14	0	15	2	1	-	-
	-	-	-	-	+7.14		+173.33		-	
Total	4	8	8	03	15	5	21	10	15	12
	-	-	+85.23		+87.73		+40.52		-27.44	

CHAPTER - IV

FACTORS LEADING TO DECREASE IN FERTILISER USE

In the preceeding Chapter, the importance of water has been emphasized in the fall of fertiliser consumption. Village with good water had only 13 percent fall in the consumption per family as compared with 47 percent in poor water village. But the area with good water also experienced a fall. Thus, the availability of water is clearly not the only factor that has influenced the degree of fall in fertiliser consumption. This Chapter will analyse the various factors which constrained the use of fertiliser in the sample area. Such factors have been ascertained on the basis of reasons listed by the farmers in decreasing the consumption of fertiliser. Besides, institutional bottle necks have also been discussed.

Constraints of Fertiliser Consumption

Table 1 gives details of reasons given by the farmers in the sample. It may be noted that the shortage of money has constrained only small cultivators in both the villages. It is the small cultivators who lack own money to buy fertiliser and are generally weak in borrowing from the bank.

The proportion of farmers reporting uncertainty of return as a factor leading to decrease in fertiliser use is sizeable in survey villages. Non-availability of fertiliser and untimely supply appear to be a problem for at least 15 percent and 18 percent of the farmers in Anandban and Bagauli respectively.

More often, high price of fertiliser has constrained the farmers in increasing the usage of fertiliser. Over 73 percent of the farmers reported that high price of fertiliser constrained the use of fertiliser in both the villages. In order to know the validity of the statement of farmers we may examine the recent rise in the prices of fertilisers. The price index of fertiliser such as complex, urea, amonium sulphate and potash (028/29=100) increased by 84.53 percent, 60.05 percent, 99.72 percent and 84.85 percent in 032/32. The prices remained constant in 032/33 (Appendix -A). It may be noted that the farmer will go in for fertilisers only if in his judgement he finds its use economically viable. At the current level of prices of inputs, the use of fertilisers is not as

profitable as the farmer would like it to be. In fact, the high price has made the cost benefit ratio unfavourable and thereby inhibited the use of fertiliser.

Difficulty due to high rate of interest was reported by a sizeable proportion of farmers in both the villages. The rate of interest will be dealt at some length later in this Chapter.

Low price for crops is important as a factor leading to decrease in fertiliser consumption. We may note that the price index of crops like paddy, wheat and maize (029/30=10), while increased to 108.6 percent, 135.4 percent in 031/32, decreased to 86.4 percent, 68.7 percent and 109.2 percent in 032/33. The Price index of sugarcane showed continuous increase (Appendix B). Such a fall in the price has made the cost-benefit ratio unfavourable and reduced the incentive of farmers to use fertiliser at the previous scale.

Further, the proportion of farmer reporting low price for crops as an inhibiting factor is higher among big than among small cultivators.

Lack of water appears to be a major problem only for the farmers in Bagauli. The number of farmers reporting difficulty in obtaining water is indeed very high, i. e., over 98 percent. Water is not a problem for farmers in Anandban.

Sources of Fertiliser

Many farmers buy fertiliser from either the Union or Sajha. Other source is private dealers. The Union in Anandban and Sajha in Bagauli appear to be more important as a source of fertiliser. Small distance and good transportation led the farmers of Anandban to buy fertiliser directly from Union in Bhairawa. The importance of private dealer* as suppliers of fertiliser is decreasing (Table 2).

Source of Finance

Table 3 provides information about the source of finance for the purchase of fertiliser in the two villages separately. It is clear from the table that many farmers

* About 4 months before the present survey was undertaken the private dealers acted as sole agents of the AIC and the Union for arranging the of fertilisers for the needs of the cultivators. However, this practice of supplying fertilisers through the private dealers has been wound up; the Sajha institutions are acting as agents for arranging these supplies directly.

buy fertiliser with cash. The proportion of farmers buying fertiliser on credit is indeed low. Further, this proportion is higher in Anandban than in Bagauli. Among the groups, the proportion of farmers buying fertiliser on credit is lower among the small cultivators. With scanty resources the small farmers cannot prove themselves credit worthy. Thus, in respect of finance for fertiliser, requirements have been met to a large extent by out right cash payment by the farmers. Hence it would be essential to know why farmers prevented themselves from buying fertiliser on credit.

Difficulty in Borrowing

In the villages farmers were asked whether or not they experienced difficulty in obtaining fertiliser or credit. Table 4 summarises difficulty in borrowing. Before we deal with the data proper, it may be noted that many farmers did not care to respond to our questions, as they had not borrowed from the bank. The proportion of farmers reporting on difficulty in borrowing is higher than that reporting difficulty in borrowing. However, in view of the fact that many farmers have given up the practice of borrowing from the bank, even this low proportion of farmers reporting difficulty in borrowing should be taken with concern. Farmers' difficulty is that they have to approach the bank for loans many times. Some farmers also reported that the bank was not in position to give timely credit. It was mainly due to the long drawn loan procedure adopted by the bank. In some cases overdues of farmers precluded them from further credit even though reasons for the dues were legitimate*.

High Rate of Interest

Apathy on the part of farmers towards bank credit has also been due to the high rate of interest. The farmers who responded to the questions on rate of interest all reported the prevailing rate of interest to be either high or very high**. On being

* The rate of interest charged by the bank is 14 percent. In case a farmer fails to repay loans borrowed in due time, he will be charged 8 percent extra as penal rate of interest, in addition to 14 percent.

** A farmer reported that he was denied credit facility by the bank as he had not repaid previous loans on due date. According to the terms of the loans, they should have been cleared off immediately after paddy season. As the farmer lacked paddy for sale, he did not repay the loans. He hoped to repay the same from the proceeds which he would realise by selling sugarcane. Still he was prevented from getting credit facility.

asked at what rate of interest the farmers would borrow from the bank, a large number of farmers were prepared to pay 10 percent rate of interest.

Delay in Sanctioning Loans

The appropriate sowing season for wheat is between Ashwin 25 and Kartik 10. The Asuraina Samstha Submitted loan application to the bank on 5th Kartic 033. However, the loans were sanctioned after the sowing season was over, that is, on 12th Kartik 033. The delay in sanctioning loans prevented many farmers from using fertiliser during sowing season of wheat. Those, who used fertiliser made credit arrangements elsewhere to purchase inputs in cash.

Untimely Supply of Fertiliser

Even when loans were sanctioned in time by the bank, untimely supply of fertiliser inhibited the use of fertiliser in the rural areas. For wheat season the Tharki Samstha submitted loan application to the bank on 22nd Ashwin 033. The bank sanctioned loans on 26th Ashwin. After the loans were sanctioned by the bank, the Samstha approached the AIC with its headquarter at Bhairahwa. However, the fertiliser was not available in the stock of the AIC. Only after 5 days the fertiliser was made available to the Samstha. Lack of transportation facility further delayed the arrival of fertiliser in the village. This led many farmers to sow wheat without the use of fertiliser. On the other hand, the samstha had 20 quintals of unsold stock of fertiliser. This does not mean that the farmers were not keen to buy fertiliser. It was the untimely supply which hampered the sale of fertiliser.

Shortage in the Weight of Fertiliser

Farmers reported about the shortage in weight of fertiliser packs supplied by the AIC. In this connection, example given by the manager of the Tharki Samstha is worth noting. Each bag of fertliser ordinarily contains 50 kg. But all bags of fertiliser received by the samstha contained only 44 kg. of fertiliser each. Thus, for every bag of fertiliser there was a shortage of 6 kgs. In turn the manager compelled the farmers to accept the bag of fertiliser containing 44 kg. only. Thus, it is the farmer who incurred the loss of 6 kgs. per bag of fertilisers.

Complains were also heard about supplying decomposed fertiliser by the AIC. Lack of storage capacity for stock of fertiliser at the district headquarter and negligence in storing it properly may have contributed to such decomposition of fertiliser.

Table - 1

PROPORTION OF FARMERS REPORTING THE SPECIFIED REASONS AS
CONSTRAINTS IN FERTILISER USE

Class of Cultivators	Shortage of Money	Uncertainty of Return	Non-availability of Fertiliser	Untimely Supply	High Price of Fertiliser
ANANDBAN					
Big	-	33.33	-	-	83.33
Large	-	25.00	-	-	100.00
Medium	75.00	-	-	-	75.00
Small	100.00	16.67	16.67	33.33	50.00
All	60.00	13.33	50.00	10.00	73.33
	Excessive use spoils the crops	High rate of interest	Low price for crops	Lack of water	Poor or no increase in yield
Big	33.33	33.33	66.67	66.67	-
Large	-	25.00	50.00	-	-
Medium	37.50	-	25.00	-	25.00
Small	16.67	-	-	-	-
All	23.33	8.33	26.67	1.67	10.00
BAGAU LI					
	Shortage	Uncert.	Non-avai.	Untimely	High price
Big	-	16.67	-	33.33	100.00
Large	-	25.00	-	-	75.00
Medium	37.50	12.50	-	25.00	100.00
Small	33.33	16.67	-	16.67	100.00
All	25.00	16.67	-	18.33	95.00
	Excessive	High	Low price	Lack of	Poor or no.
Big	-	33.33	50.00	83.33	-
Large	-	25.00	25.00	100.00	-
Medium	-	25.00	25.00	100.00	-
Small	-	16.67	16.67	100.00	-
All	-	23.33	25.00	98.33	-

Table - 2

SOURCES OF FERTILISER

(In Percentage)

	Anandban				Bagauli			
	Sajha	Union	Dealer	Union+ Dealer	Sajha	Union	Dealer	Union+ Dealer
Big	-	50.00	-	33.33	50.00	16.67	-	33.33
Large	25.00	50.00	-	-	50.00	-	50.00	-
Medium	-	75.00	12.50	-	87.50	-	-	-
Small	-	33.33	50.00	-	83.33	-	-	-
All	5.00	55.00	20.00	3.33	75.00	1.67	10.00	3.33

Table - 3

SOURCE OF FINANCE FOR PURCHASE OF FERTILISER

(In Percentage)

Class of Cultivators	Anandban		Bagauli	
	Credit	Cash	Credit	Cash
Big	33.33	50.00	33.33	66.67
Large	50.00	25.00	25.00	75.00
Medium	25.00	62.50	12.50	75.00
Small	33.33	50.00	16.67	66.67
All	33.33	50.00	13.38	71.67

Table - 4

DIFFICULTY IN BORROWING AMONG ALL CULTIVATORS

	Anandban	Bagauli
1) % Farmers who had no difficulty in borrowing.....	50.00	26.72
2) % of farmers who had difficulty in borrowing.....	5.00	11.67
3) % Farmers who got credit in time.....	30.00	10.00
4) % Farmers who did not get credit in time.....	10.00	3.33
5) % Farmers reporting prevailing rate of interest to be:—		
a) Not so high.....	5.00	—
b) High.....	31.67	11.67
c) Very high.....	8.34	8.34
6) % Farmers reporting rates of interest at which they would like to borrow:—		
a) 10 %.....	28.33	5.00
b) 8 %.....	10.00	10.00
c) 5 %.....	—	3.33
7) Average percentage increase estimated by per reporting family, per bigha	62.10	53.90

Appendix - A

GROWTH IN THE PRICE OF FERTILISER BASE YEAR 028/29

(In Rupees Per Quintal)

Type of Fertiliser	2028/029	2029/030	2030/031	2031/023	2032/033
Complex 20:20:20	120.00 (100.00)	155.66 (129.72)	155.65 (129.72)	221.43 (184.53)	221.43 (184.53)
Compound 15:15:15	-	-	-	249.10 (100.00)	249.10 (100.00)
Urea 46%	137.00 (100.00)	153.50 (112.04)	153.50 (112.04)	219.27 (160.05)	219.27 (160.05)
Amonium Sulphate	83.00 (100.00)	100.00 (120.48)	100.00 (120.48)	165.77 (199.72)	165.77 (199.72)
Potash	84.00 (100.00)	89.50 (106.55)	89.50 (106.55)	155.27 (184.85)	155.27 (184.85)
Triple Super Phosphate	-	-	-	-	382.50 (100.00)
Single Super Phosphate	66.00 (100.00)	66.00 (100.00)	-	-	88.57 (134.20)

Source: AIC Office Bhairahwa.

Appendix - B

GROWTH IN THE PRICE OF CROPS BASE YEAR 2029/30

Crops of Paddy	2029/030	2030/031	2031/032	2032/033
Paddy	140.00 (100.00)	150.00 (107.1)	152.00 (108.6)	121.00 (86.4)
Wheat	195.00 (100.00)	210.00 (107.7)	264.00 (135.4)	134.00 (68.7)
Maize	144.00 (100.00)	145.00 (100.7)	166.00 (115.3)	150.00 (104.2)
Sugarcane	14.50 (100.00)	15.83 (109.2)	18.00 (124.1)	23.00 (158.6)

Source: Quoted from Krishi Rin Lai Prabhav Parne Kura Haru, kE Sankshipt Vivechna
 - Agricultural Development Yojana, Anusandhan Tatha Ayojana Vibhag, Bhadra
 - 2033.

CHAPTER - V

SUMMARY AND CONCLUSIONS

The quickest way to increase agricultural production in Nepal is to promote a rapid increase in the use of fertilisers. The consumption of fertiliser, which increased significantly till 031/32, declined considerably in 032/33. In Rupandehi district, the use of fertiliser had declined by over 46 percent in 032/33. This study of 48 farmers in Rupandehi District was undertaken to examine the cause of the present fall in fertiliser consumption and to evolve strategy for stimulating its consumption.

The sample was purposefully chosen from two different villages to represent two influences; namely, the effect of water availability and the effect of absence of it. The method adopted in selecting farmers was stratified random sampling. There were four categories of farmers—big, large, medium and small.

A study was undertaken on the socio-economic characteristics of the farmers. The characteristics examined were: size of holding and its composition, value of owned assets, gross produce, sale proceeds and other income, irrigation, crop pattern, crop intensity, family size and literacy standard. The two villages were more or less similar as far as the ownership of land, the size of holding, crop pattern and the size of family were concerned. They differed however, in terms of assets owned, irrigation facilities, crop intensity, yield, gross produce, sale proceeds, other income and literacy standard. Water availability significantly related to the crop intensity, yield, gross produce and sale proceeds. The village with higher water availability index had higher crop intensity yield, gross produce and sale proceeds. Substantial differentials existed among the four groups of cultivators with regard to size of holding, assets owned, gross produce and sale proceeds.

It is clear from the analysis of the past fertiliser use pattern that rapid growth of fertiliser use, despite widespread improvement in the price situation was confined to irrigated areas. Among the four groups of cultivators the growth was confined to class with high water availability index. Further the analysis showed that heavy fall in consumption of fertiliser took place in the village in which the levels of irrigation were low. On the other hand the decline in demand for fertiliser in irrigated areas was quite low. Under these circumstances, expansion in irrigated acreage will lead to continuous growth in cultivators demand for fertiliser. It will also check the fall in demand

should be properly stream-lined so as to give adequate and timely credit to farmers. It should be noted that the delay in sanctioning loans frustrate the very purpose of giving loans.

It was found that overdues of farmers precluded them from further credit even when reasons for the dues were legitimate. Such practice should be discouraged by the officials concerned. Concessions in terms of repayment whenever there is a bad harvest should be provided for.

The use of fertiliser in the rural areas was also hampered by the untimely supply of fertiliser. This was due mainly to the non-availability of fertiliser stocks in the district during sowing season. We may note that the time by which the supplies are to be made available is very important. It is inherent in the fertiliser business that the distribution channel has to be stocked for an appropriate length of time so that fertiliser is available to the farmer before the appropriate sowing season.

There was shortage in weight of fertiliser bags supplied by the AIC. Each bag supplied contained only 44 kgs. of fertiliser instead of 50 kgs. This led to a net addition to the financial burden of the farmers since while they paid price for 50 kgs. they received only 44 kgs. of fertiliser. This might have been due to poor warehousing facility. Fertilisers are subject to hazards like fire, rain, theft, etc. In this connection, the provision of proper and adequate warehousing facilities needs attention. Storing and handling of fertiliser have to be done very carefully.

The practice on the part of AIC to supply decomposed fertiliser was, indeed, very discouraging. It should be noted that decomposed fertiliser can not increase the yield of the land and hence will reduce whatever incentive the farmer has to use fertiliser. Every effort should be made to stop distribution of decomposed fertiliser in future. Once the fertiliser get decomposed, they should be discarded.

In brief, main factors which inhibited the use of fertilisers are lack of irrigation, non-availability of adequate credit when needed, high rate of interest, high prices, inefficient marketing and distribution. The relative prices of fertilisers and agricultural produce are important for ensuring favourable costbenefit, but the enduring solution lies in extension of irrigation facilities, improvement in dry farming technology and above all, purposive land reform.