

GROUP FARMING IN KERALA

AN ILLUSTRATIVE STUDY

**Dissertation submitted in partial fulfilment of the
requirements for the award of the degree of
Master of Philosophy
in
Applied Economics
of the Jawaharlal Nehru University, New Delhi**

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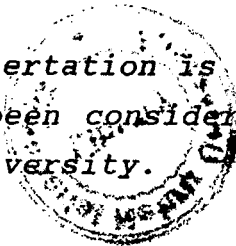
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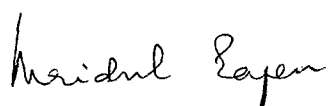
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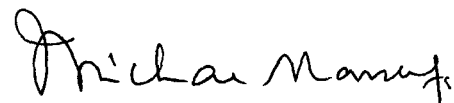
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CHAPTER 1

INTRODUCTION

The agricultural sector is of great importance in the economy of the state of Kerala, accounting for about 35 per cent of the state's income. It provides employment to more than 40 per cent of the working population and supplies raw materials for a large number of traditional industries (Sreekumaran Nair G., 1988). However, the dynamism which marked the agricultural scenario in Kerala during the first Four Plan periods¹ seems to have suffered a set back from the mid seventies, showing a situation of relative stagnation since then. This is particularly true in the case of paddy production, which has shown a continuously declining trend since the mid-seventies.

Since the declining trend in agricultural production has provoked a number of studies, a brief discussion which will bring out the major issues and trends in that sector of Kerala's economy is necessary.

Analyzing the growth performance of agriculture (all crops) in Kerala during 1952-53 to 1978-79, P.P.Pillai (1983) observed that from a moderate rate of growth of 2.76 percent per annum between 1952-53 to 1960-61, it moved up to 4.37 percent during the next period, ie., 1960-61 to 1970-71; then declined to 1.87 percent per annum in the subsequent period, 1970-71 to 1974-75 and registered a negative growth rate of 2.99 percent from 1974-75 to 1978-79. Hence he identified the period from 1960-61

to 1970-71 as a period of accelerated growth in Kerala's agriculture and the period from mid-seventies as a period of decline.

P.K.Sivanandan (1985) also noticed similar patterns. His analysis of the growth trends of production of all agricultural crops in Kerala during 1960-61 to 1982-83 indicated that up to 1975-76 there was a positive growth rate in production of which more than two third was contributed by growth in area and a little less than one fourth by yield. However, from 1975-76 the growth rate started decelerating and it became negative from 1978-79².

A disaggregated analysis of the crops into food grains and non-food grains groups showed diverging growth trends. During the sub-period 1960-61 to 1975-76 the production of non-food grains sector showed a growth rate almost double that of food grains (3.60 percent and 1.99 per cent respectively). In this the contribution of growth of area in explaining production increases was nearly 80 per cent for non-food sector, while it was only 47 per cent for the food grains sector. In the second sub-period, from 1975-76 to 1982-83, there was a sharp fall in the growth rates of production under both groups, but the fall was sharper under non-food grains sector. It was noticed that for the food grain crops the decline was mainly due to the sharp decline in the cropped area and for the non-food crops due to a decline in yield³.

K.P.Kannan and K.Pushpangadan (1988), characterized the

agricultural sector since the mid-seventies as one of stagnation⁴ based on an empirical analysis of the growth performance of important crops⁵ in Kerala from 1962-63 to 1985-86. Their conclusion is based on the declining output growth for all crops contributed by declining growth in area and no trend⁶ in the growth rate of yield. This pattern is attributed mainly to a sharp decline in output of paddy, contributed by a much bigger decline in area despite a positive growth rate in yield during the period of reference.

A study sharply in contrast to the above is that of D.Narayana (1990). He does not subscribe to a stagnation thesis arguing that the period from mid seventies could very well be the down trend of a cycle. He suggests that the explanations for agricultural deceleration and stagnation since the mid seventies are founded on a rather simplistic analysis of the observed data and suffer from serious methodological weaknesses. The main source of weakness being the rather mechanical application of the methods of analysis appropriate to an agricultural economy predominated by seasonal and annual crops to an agricultural economy predominated by tree crops. In estimating the agricultural growth rate of Kerala, Narayana suggests, one should take into account the structural characteristics of tree crops⁷. They are: (I) the long life span of tree crops, (II) the moderate pre-bearing period, and (III) yield profile of the tree over the bearing period. Each of these has a role in shaping the output and yield paths in an economy.

Hence the production of tree crops, may be only

fluctuating due to their structural characteristics. And since Kerala's agriculture is dominated by tree crops the fluctuations in them would clearly show up in the over all agricultural performance. However the production of paddy, which forms 90 per cent of the food grains cultivated in the state, has shown a phenomenal decline since the mid seventies. P.G.K.Panikar (1980) who examined the trend in area, production and yield of Paddy in Kerala from 1960-61 to 1978-79 observed that the area under paddy in Kerala which was about 779 thousand hectares in 1960-61 increased consistently during the sixties and first half of the seventies, till it reached over 881 thousand hectares in 1974-75. Since then the area under paddy declined steadily. Production of paddy also followed a similar pattern. The yield, showed an increasing trend, though it was marginal. Studies by P.K.Sivanandan (1985), P.S.George and Chandan Mukherjee (1986), and K.P.Kannan and K.Pushpangadan (1988) have confirmed this pattern and showed that the declining trend in area and production of paddy has continued to the various periods of their respective studies. The data for the latest year, ie., 1989-90, however, shows an increase in area, production and yield (See Table 1.1).

Table 1.1
Trends in Area, Production and Yield of Paddy in Kerala
(1970-71 to 1989-90)

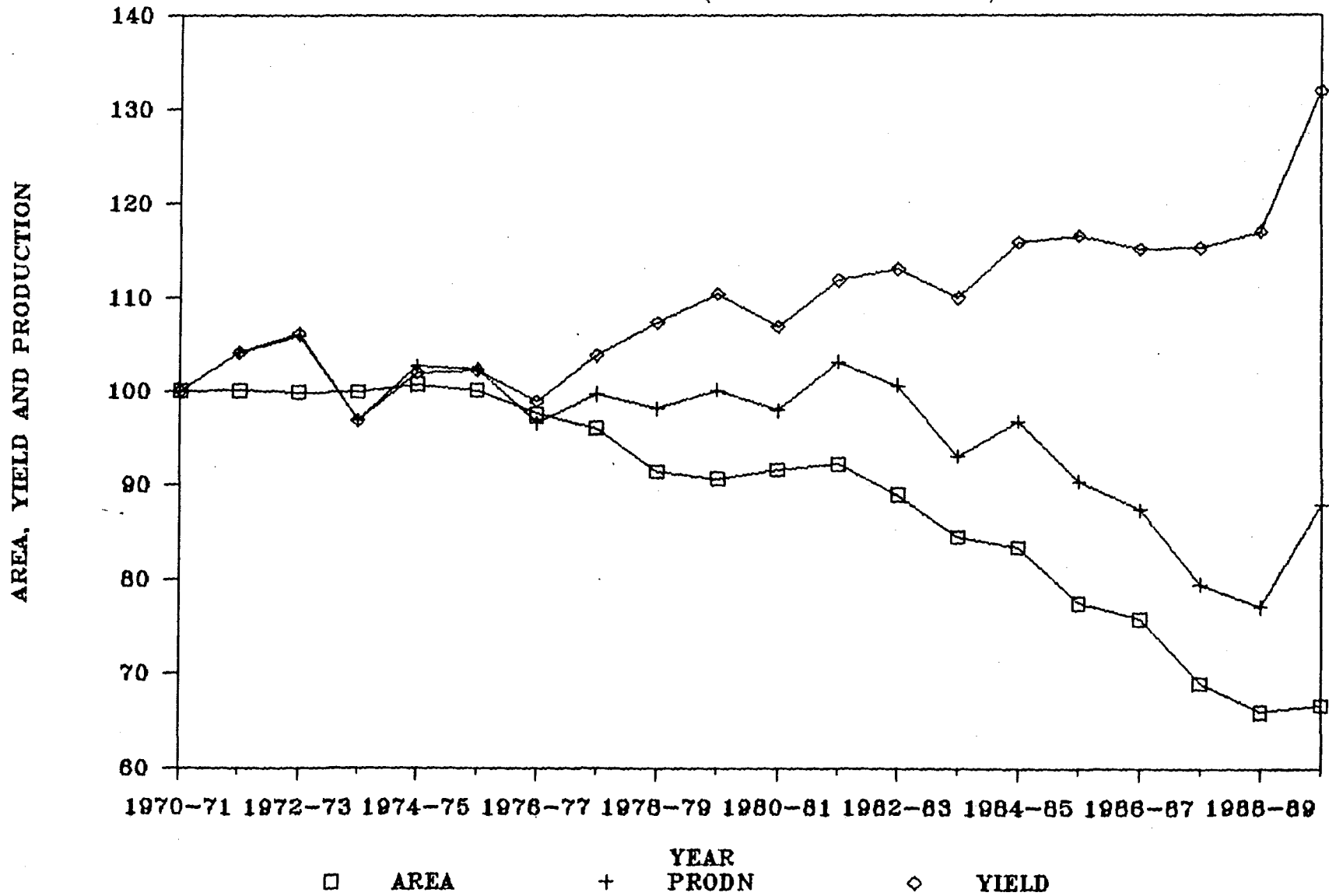
Year	Area (000ha.)	% change over pre vious year	Product ion (000 tons)	%change over pre vious year	Yield (kgs/ha)	%change over pre vious year
1970-71	874.93		1298.00		1484	
1971-72	875.16	0.03	1351.74	4.14	1545	4.11
1972-73	873.70	-0.17	1376.37	1.82	1575	1.94
1973-74	874.68	0.11	1257.07	-8.68	1437	-8.76
1974-75	881.47	0.78	1333.93	6.11	1513	5.28
1975-76	876.02	-0.62	1329.40	-0.34	1518	0.33
1976-77	854.37	-2.47	1254.00	-5.67	1468	-3.25
1977-78	840.37	-1.64	1294.64	3.24	1541	4.57
1978-79	799.24	-4.89	1273.32	-1.64	1593	3.37
1979-80	793.27	-0.75	1299.70	2.07	1638	2.82
1980-81	801.70	1.06	1271.96	-2.15	1587	-3.11
1981-82	806.89	0.65	1339.39	5.10	1660	4.60
1982-83	778.49	-3.52	1306.19	-2.47	1678	1.08
1983-84	740.08	-4.89	1207.91	-7.42	1632	-2.74
1984-85	730.37	-1.40	1255.90	3.96	1720	5.35
1985-86	678.28	-7.12	1173.05	-6.50	1729	0.52
1986-87	663.80	-2.21	1133.78	-3.40	1708	-1.21
1987-88	604.08	-8.80	1032.61	-8.90	1709	0.06
1988-89	577.56	-4.47	1002.33	-1.90	1735	2.57
1989-90	583.39	1.10	1141.23	12.74	1956	11.58

Source: Govt. of Kerala, Economic Review (various issues).

Thus, as is shown in table 1.1 and graph 1.1, despite an improvement in yield, Paddy production in Kerala has been showing a declining trend since the mid seventies⁶. This is mainly because of the fact that the increase in productivity has been more than offset by the decline in area under the crop. The state has lost about 3 lakh hectares under paddy cultivation during the last fifteen years.

INDICES OF AREA, PRODUCTION AND YIELD

OF PADDY IN KERALA (1970-71 to 1989-90)



Geemol Unni (1983) who examined the shift in cropping pattern in Kerala from 1960-61 to 1978-79, found that it has occurred in favor of coconut crop at the expense of paddy. A study made by C.Gopinath and C.S Sundaresan (1990) also, based on a survey in Trivandrum and Malappuram districts, showed major shifts in crop cultivation; from paddy and tapioca to coconut and rubber (see Table 1.2).

Table 1.2
Crops Shift (Percentage of Farmers)

Crop	Trivandrum Dt.		Malappuram Dt	
	% of Farmers Discontinued	% of farmers Added	% of farmers Discontinued	% of farmers Added
Paddy	50.00	0.00	81.50	0.00
Tapioca	46.40	1.20	8.50	0.00
Banana	0.00	6.00	6.60	5.10
Plantain	0.00	1.20	0.00	0.00
Coconut	0.00	52.00	0.00	83.00
Rubber	0.00	29.80	0.00	8.50
Pepper	0.00	4.80	0.00	0.00
Others	0.00	1.20	0.00	0.00
No shift	3.60	3.60	3.40	3.40
TOTAL	100.00	100.00	100.00	100.00

Source: C. Gopinath and Sundaresan C.S (1990).

It was observed that during the period 1979 to 1989 fifty per cent of the surveyed farmers in Trivandrum district discontinued cultivation of paddy, on their land. Amongst the new crops introduced were coconut (52 per cent), rubber (29.8 per cent), banana (6 per cent) and pepper (4.8 per cent). Similarly in Malappuram district 81.5 per cent of the farmers discontinued paddy cultivation. The new crops introduced by farmers were coconut (83 per cent), arecanut (8.5 per cent) and banana (5.1 per cent)⁹. Macro data also suggests this pattern. Table 1.4 presents the area under some important crops in the state. We observe a

significant decline in the area under paddy and increase in the case of coconut and rubber. Various reasons have contributed to the switching over from paddy to other crops, despite the Kerala Land Utilization Order which was passed in 1967, under the Essential Commodities Act, 1955¹⁰.

Table 1.3
Area under Some Important Crops in Kerala
1975-76 to 1989-90 (area in '000 ha)

	Paddy	Coconut	Rubber
1975-76	876.02	673.00	206.70
1980-81	801.70	651.37	237.80
1985-86	678.28	704.68	336.32
1986-87	663.80	706.10	347.81
1987-88	604.08	778.37	358.95
1988-89	577.56	816.88	366.50
1989-90	583.39	878.89	376.00

Source: Govt. of Kerala, Economic Review, 1990
Govt. of Kerala, Statistics for Planning, 1987

The increasing cost of cultivation, hence declining profitability, has been put forward as one of the major factors responsible for this shift. (Geemol Unni, 1983; P.S. George, 1980; P.G.K. Panikar, 1983; K.P. Kannan and K. Pushpangadan, 1988.) Profitability of a crop is determined by input costs and output prices. It has been found that over the past two decades the cost of inputs for paddy cultivation, particularly the wage rate of labourers, has risen disproportionately to the price of paddy. (see Table 1.4). While the price of paddy increased around three times during the period 1970-71 to 1988-89, the cost of labour which contributes a substantial portion of the total cost of cultivation of paddy registered almost a six fold increase. To put it differently, if one could buy one man day of labour with

Table 1.4
Movement of Farm Price of Paddy and Daily Male Agricultural Wages, 1970-71 to 1988-89. (in Rupees)

Year	Farm Prices of paddy	Agri'l Daily wages of paddy worker (Men)	Kg. of paddy required to buy one man days of labour
1970-71	90.53	5.09	5.59
1975-76	158.00	8.57	5.39
1980-81	179.78	11.13	6.21
1981-82	182.72	12.74	6.96
1982-83	253.87	13.29	5.23
1983-84	230.78	15.86	6.89
1984-85	225.18	23.60	10.49
1985-86	242.25	26.08	10.78
1986-87	248.24	28.36	11.43
1987-88	277.43	30.36	10.96
1988-89	302.79	31.95	10.58

Source: Govt. of Kerala, Economic Review, (various Issues)

5.59 kgs of paddy in 1970-71, the amount of paddy thus required for the same increased to 10.58 kgs by 1988-89. The prices of other inputs like fertilizers and pesticides also have shown disproportionate increases.

The distributional problems in agricultural inputs also had influenced cultivation of paddy. C.Radhakrishnan (1979) had noted much unevenness in the distribution of agricultural inputs between different regions (districts) of Kerala. For instance, the districts of Quilon and Malappuram were found to be deficient in fertilizers, irrigation, tractors and oil engines. And in some other districts progress in tractorisation was not accompanied by corresponding progress in fertilizer-application and irrigation and vice-versa. The availability of the 'model inputs'¹¹, the returns to which would be higher if they were available as a package, is a crucial factor in agricultural production, especially for paddy.

Thus, over the past few years, the paddy grower is facing a difficult situation in which cost of cultivation has been increasing without any commensurate increase in price. Under such circumstances, paddy cultivators have tended to shift to other crops, which are mostly perennial in nature, less labour demanding and are more remunerative.

Another reason for the shift from paddy to other crops, is the differences in the movement of price of various crops. (see Table 1.5). It is seen that while the price of paddy

Table 1.5.
Average Farm Prices of Some Important Agricultural Commodities
(1970-71 & 1987-88)

Sl. commodity No.	Unit	1970-71	1987-88	%increase in price
1 Paddy	Quintal	90.25	261.24	178.49
2 coconut (with husk)	100nuts	56.68	276.72	397.80
3 Tapioca	Quintal	20.59	103.67	473.60
4 Banana	100nos	16.69	67.70	305.60
5 Pepper	Quintal	616.90	4413.07	615.00
6 Ginger	Quintal	271.98	1621.56	496.20
7 Cashew nut	Quintal	139.80	1094.88	683.18
8 Rubber	Quintal	429.68	1775.00	313.10

Source: Govt. of Kerala, Statistics for Planning (various issues)
Note: The prices quoted for rubber are the market prices of rubber in Kottayam market and are collected from the Bureau of Economics and Statistics, Trivandrum.

increased only by 178.49 per cent during the period 1970-71 to 1987-88, those of tapioca, coconut, banana, pepper, ginger etc. have registered more than 300 per cent increases. If one could buy a coconut with 0.68 kg of rice in 1970-71, the amount of rice required to buy a coconut increased to 1.06 kgs in 1987-88 (see Table 1.6). Geemol Unni (1983) has calculated the cost and

Table 1.6
Kg. of Paddy Required to Buy a coconut

YEAR	KG. OF PADDY REQUIRED TO BUY A COCONUT
1970-71	0.63
1975-76	0.37
1980-81	0.91
1981-82	0.64
1982-83	0.69
1983-84	0.96
1984-85	1.31
1985-86	0.61
1986-87	0.99
1987-88	1.06

Source: Calculated from farm prices given in, Govt. of Kerala, Statistics for planning (various issues).

returns of both paddy and coconut and found that net returns per unit cost of coconut on average were about ten times higher than that of paddy in 1974-75. P.K.Sivanandan (1985) also suggested that the movement of relative price of paddy and shifting of area from paddy to coconut were somewhat correlated. Till 1968-69, when relative price of paddy with respect to coconut went up, there was no shift away from paddy. However, the relative price became unfavorable^{1 2} from 1968-69, and that appears to be the main reason for substitution of paddy by coconut. But, since coconut is a long gestation crop, there was a lagged response in area adjustment to price changes. (P.K.Sivanandan, 1985, p.139).

Thus possibly due to the substantial increase in the imports of rice from elsewhere in the country, price controls and distribution arrangements for rice, its price has been relatively depressed.

A third factor which could have induced cultivators to shift from paddy cultivation is the problem of managing labour. The frequent labour troubles, especially in the case of paddy operations in which labour has a critical control¹³, led to degeneration of labour relations¹⁴, making the managerial aspect of cultivation difficult¹⁵. So the cultivators increasingly turned to those crops like coconut in which there is less confrontation with labour and in which labour plays a less critical role.¹⁶

Another reason for the loss of paddy lands is the increasing demand for land for non-agricultural purposes like construction of houses and real estate. The price of land has been pushed up by the fancy prices offered for housing sites, especially since the Gulf boom. Kerala being a densely populated area, availability of waste land suitable for house construction is increasingly becoming scarce. Hence people are forced to turn to paddy land, which is relatively cheaper, due to its low returns. And since the land values are high, the owners of paddy land have an incentive to sell it for house construction rather than to continue using it for paddy cultivation. Hence throughout Kerala one can see paddy lands being reclaimed as housing sites.

Besides the tendency of conversion of paddy lands to garden lands and construction sites, in the face of declining profitability of paddy cultivation, other types of responses are also noticed. One such reaction is the practice of leaving the

paddy land fallow (Namboodiri, 1986). Macro data on fallow land also suggest this tendency. (see Table 1.7).

Table 1.7
Area Under Current Fallow in Kerala

Year	Area (in hectares)	% of Total Land
1970-71	24000	0.62
1975-76	36559	0.94
1980-81	43579	1.12
1985-86	43247	1.11
1986-87	44258	1.14
1987-88	47605	1.23

Source: i) Govt. of Kerala, Timely Reporting Survey on Agricultural Statistics, 1985
ii) Govt. of Kerala, Statistics for Planning, (various issues).

1.1 Implications of the Decline in Area and Production of Paddy in Kerala

Due to the afore-mentioned developments in the paddy sector, its area and production has been on the decline in Kerala. Decline in production has significant implications for the socio-economic scenario of the state as a whole. Paddy is grown in 30.95 per cent of the net area sown in the state and contributes about 45 per cent of the state's requirement of rice. It provides 105.14 million man days of employment to the agricultural labour and contributes 19.23 per cent of the state's agricultural income (Suseelan, 1988). Paddy cultivation is one of the most labour intensive activities. So the trend towards a shift in area from low value paddy crop to high value commercial crops, though in itself justifiable from the point of view of profitability, has an adverse impact on employment opportunities¹⁷, income distribution and per capita consumption of food.

In shifting to other crops, wet land which is most appropriate for paddy cultivation, is levelled and made dry, making it no more fit for paddy cultivation. While this shift itself involves considerable investment, a reversal of this is much more difficult. Hence from the point of view of long term considerations it is essential that land should be used for appropriate cultivation.

Rice is the staple food of the people of Kerala. The current level of production within the state meets only about 40 per cent of the domestic requirements. (see table 1.8). Meanwhile the population has been growing at an annual rate of 1.79 per cent resulting in a widening of the gap between internal production and internal requirements. If production does not increase adequately, it would necessitate greater dependence on outside supplies with all the associated uncertainties¹⁸. Similarly, the decline in the area under paddy is likely to have a negative effect on the supply of paddy straw, the main source of roughage for feeding the bovine population in the state (Thara S. Nair, 1988).

Table 1.8
Population, Production of Rice and Import of Rice to Kerala

Year	Population of Kerala (in Lakhs)	Productn of Rice	Import of Rice	Imports as %of requirements
1970-71	214.70	12.98	7.47	36.52
1975-76	239.50	13.29	9.02	40.43
1980-81	254.00	12.71	15.75	55.34
1981-82	257.90	13.39	12.05	47.36
1982-83	261.40	13.06	13.05	49.98
1983-84	264.90	12.07	13.06	51.96
1984-85	268.40	12.55	14.60	53.77
1985-86	272.03	11.73	16.50	58.44
1986-87	275.70	11.33	16.60	59.43
1987-88	279.40	10.32	15.50	60.03
1988-89	283.15	10.02	12.70	55.60

Source: Govt. of Kerala, Economic Review (various issues)

Though commercial crops specialization, has its advantages, putting all eggs in one basket has its attendant risks, especially since the price of commercial crops are often found to depend on factors beyond the control of forces within Kerala - its competitiveness in the national and international market. For instance, although currently the price of natural rubber in the home market (Rs.2110/Qtl) is much above the prevailing prices in the international market (Rs.1980/Qtl)¹⁹, the protection afforded to it in the domestic market keeps out the foreign rubber. And if the protection is withdrawn the market for Kerala's rubber will slump.

Due to heavy imports of rice the state incurs large amounts in the form of transportation and storage costs besides the heavy expenditure of the Central Government in the form of subsidy²⁰. The question of subsidies has come under serious consideration these days in the context of large investible funds being used for non-developmental purposes and the dampening

effect it has on the market prices of the subsidized items. In the event of a withdrawal of the subsidy, it would be a severe burden on the state if increasing quantities of rice are to be imported to make up for the gap between production and the state's consumption requirements. The loss in the process of transportation and storage is also noticed to be substantial. Besides, the rice that is imported into the state has often been found to be of poor quality resulting in much wastage. All these factors have a telling effect on the State's financial resources, affecting the investment in development activities.

Above all ecological considerations also call for sustaining paddy cultivation. Shifting from paddy cultivation to other crops means levelling of the paddy lands. In this process the numerous ponds and water channels also gets levelled which in turn will lower the water table of the land, causing serious ecological damage. (T.Kochery, 1989 ; V.C.Jacob, 1990).

From the preceding arguments, it is clear that maintaining and maximizing paddy production in the state is very essential. In the past the Governments have launched various programmes like Intensive Area Development Programme (IADP), Intensive Paddy Development Programme (IPDP) which is commonly known as the Yela Programme, Paddy Boosting Programme (PBP), Training and Visit Programme (T & V) etc. for increasing paddy yields and production. Most of these programmes faded after the initial enthusiasm. An evaluative study on the IPDP Programme made by the State Planning Board (1977) reported that the Programme had not resulted in a break through in paddy production

or any significant reduction in cost. Pointing out the shortcoming of the Programme, Ramachandran (1980) observed that in its (IPDP Programme) implementation the basic community approach was lost sight of. Major efforts were concentrated on an individual approach rather than an area approach with the former approach having reached a plateau.

In this context, with the avowed purpose of revitalizing the rice economy of the state the Government of Kerala introduced 'Group Farming' in paddy cultivation in 1989. It refers to a set of new farm management practices. Cultivators are organized area-wise and land and other resources pooled together, but the cultivators' rights over land, produce etc. are preserved. Hence it differs from co-operative and collective farming in the aspect of ownership. Paddy field operations are undertaken in common to derive economies of scale. It thus seeks to cut cost and make paddy cultivation more profitable. Under this programme, the cultivator-labourer relation is sought to be improved by giving participation to workers in the Karshika Vikasana Samithy which has a major role in the implementation of the Programme. It also hopes to facilitate technological diffusion in to the paddy sector. (Govt. of Kerala, 1989).

Systematic collection and processing of field data for an estimate of the effect of Group Farming on paddy production in the state is yet to be done. Hence any macro assessment of the Programme cannot be made. However the Government has already announced that it is a big success; and that on an average the cost of cultivation has been reduced by Rs.1000/ha. and paddy

production has increased by 500 kg/ha in the group farmed area. The net benefit consequent on the improvement in production and reduction in cost of cultivation is estimated to be around Rs.2500 per hectare [see, Govt. of Kerala 1989 b, p.6; 'The Hindu', 1990 and Govt. of Kerala, Economic Review, 1990.]

The major objective of the present study is to examine the operation of Group Farming and its impact on production and cost of Paddy cultivation. With this perspective in mind the study is carried out with the following specific objectives.

1.2 Objectives of the study

- i) To examine the rationale behind the introduction of group farming in Paddy cultivation in Kerala.
- ii) To examine the structure and organization of Group Farming.
- iii) To assess the impact of group farming on costs, returns and profitability of Paddy cultivation.
- iv) To analyze the possible unevenness of the impact of the Programme on different size of holdings and in different padasekharams²².
- v) To examine the effect group farming has made on agricultural labourers.

1.3 Methodology and Source of Data

There are not many studies on Group Farming. Available literature has been made use of to get an idea of its nature and organization. Information on the status of group farming in Kerala was collected mainly from the Agriculture Department of

the Government of Kerala and government publications.

Published data are not available to study the impact of the Group Farming Programme. Hence we undertook a farm level survey in a panchayat in Trivandrum district. In order to study the possible effect of group farming on agricultural labourers, given the Programmes emphasis on technology transfer, another survey among the laboures was conducted in the same area. The methodology followed for the surveys is given in the respective chapters where the results of the surveys are analyzed.

The results from the analysis of the primary level investigation and available secondary data were employed to serve the objective of the present study.

1.4. Limitations of the Study

The present study, it is hoped, could be a pointer to the working of the group farming system in the paddy cultivation of Kerala and would be of help to correct the drawbacks, if any, of the Programme.

However there are certain limitations which may be taken into account. One of the limitations of the study is its limited coverage. Since primary data is collected only from a panchayat, generalization of the results from it is prone to errors.

The survey area is situated near Trivandrum city. This proximity to an urban area may have influenced the functioning of the Programme in various ways. For instance, the nearness to city would have a) given the cultivators better access to information and services, b) included a larger proportion of cultivators depending relatively less on agriculture as their main source of income, and hence less interested in agricultural programmes.

Another limitation of the study is its timing. It is only two years since the programme was inaugurated in Kerala. This may be a rather short period to make an accurate assessment of the Programme. Therefore the study is designed more as an illustrative rather than an evaluative study.

1.5 Scheme of Study

The study is arranged as follows:

Besides the introductory chapter it has six chapters. Chapter 2 discusses the rationale of group farming and its relevance to paddy cultivation in Kerala.

In chapter 3 an attempt is made to give a brief account of the structure and organization of group farming as introduced in the state. An outline of the group management in agriculture, in a historical perspective is also given in this chapter.

The main content of chapter 4 is an analysis of the working of group farming as practiced in the survey area. An idea of the

socio-economic aspects of the survey area that are relevant for our study is also given there in.

The impact group farming has made on the cost, returns and profitability of paddy cultivation is assessed in the fifth chapter. Its impact on the different size of holdings is also worked out in this chapter.

The sixth chapter discusses briefly the effect group farming has made on the agricultural labourers. An attempt to provide a perspective on the labour situation in the paddy sector of Kerala is also made in this chapter.

The last chapter presents the conclusions and policy implications that have emerged from the study.

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Notes

1. The growth rate in agricultural production (3.4 per annum) maintained during 1960-61 to 1975-76 has been higher than the all India growth rate of 2.8 per cent.
2. We notice a discrepancy in the cut-off period identified by P.P.Pillai (1983) and P.K.Sivanandan (1985) from which deceleration in agricultural production began in Kerala. While Pillai mentioned 1974-75 as the cut-off period, Sivanandan has identified it as 1975-76. Similarly, while Pillai suggested that the negative growth began in 1974-75, Sivanandan has mentioned it as 1978-79. The difference in base year used (While Pillai has taken the triennium 1959-61 as the base year, Sivanandan used 1971-72.) contributed mainly to this discrepancy.
3. This decline in yield is perhaps explained by, as P.K.Sivanandan (1985) himself suggests, the fact that data for total planted area was used for calculating yield which can give misleading results. For example in the case of Rubber during the first part of the second sub period there was a slow growth rate in area expansion and during the second part (1978-79 onwards) the growth rate in area was very high; almost four times that during the first part.
4. Stagnation is a state of production where there is no significant increase or decrease.
5. The important crops include Paddy, Coconut, Tapioca, Rubber, Cashew, Pepper, Bananas, Coffee, Tea, Arecanut, Cardamom and Sesamum.
6. It means the yield rate is fluctuating erratically.
7. Tree crops include mainly Rubber, Coconut, Arecanut, Coffee and Tea.
8. We notice, however, a significant change in trend in 1989-90 in area, production and yield. This is attributed to the effect of group farming introduced in 1989 (Economic Review, 1989). It is possible that this change is also contributed by the revitalization of the agricultural sector undertaken by the government as part of its development policy because we see a steady increase in yield from 1987-88.
9. In these two districts we see the shift mainly in favour of coconut. This may be because coconut is the major tree crop in this area. In the districts of central Kerala where rubber is the major crop the shift could be mainly to rubber.

10. The order empowers the government to direct every holder of land not to leave any land fallow, not to cultivate any other food crops than the one grown during the three years immediately before the commencement of the order or attempt to convert such land for any other purposes. Clause three of the Order gives blanket powers to the government. It states that "notwithstanding anything contained in any law, order, custom or practices for time being in force, if the state government are satisfied that it is necessary or expedient to increase the production of food crops in any area, they may by order published in the Gazette, direct that every holder of land in that area shall grow, over such portion of his land and within such period as may be specified, in addition to any crop he may have grown over such land." (GoK, Kerala Land Utilization Order, 1967, pp.1-2).
11. They include seed, fertilizer, pesticides, irrigation, finance, tools and machinery.
12. The depression in the price of paddy seems to be closely related to the expansion of subsidized Public Distribution of rice in Kerala. A major expansion of rationing in Kerala occurred in 1964, when food shortage throughout India led to the curtailment of private interstate trade in food grains. The Civil Supplies Department of Kerala assumed responsibility for collecting and organizing available food grains and regulating their distribution through licensed ration shops. From 1966, under the provisions of the Kerala Rice and Paddy (Procurement by Levy) Order, paddy was collected from local producers. In 1970 for instance, 125 thousand tonnes of paddy was procured through levy which formed 6.83 per cent of the total paddy produced by the state. (For more details regarding paddy procurement through producer levy, see V.Panikulangara, 1976) A portion of the rice distributed through ration shops was from local levy procurement. The procurement price of Paddy realized by farmers was very much below the farm price of paddy. For example in 1966-67 the procurement price of paddy was Rs.43.81 per Quintal, while the Farm Price was Rs.106.76 and in 1974-75 they were Rs.74.00 and 246.23 respectively. When the farm price of paddy was expressed as a percentage of the levy price, it was 206 in 1966-67 and 333 during 1974-75 (George P.S.,1979). These interventions of the state controlled and restricted the price of paddy compared to that of other crops making the price movements unfavorable to paddy.
13. It is seen that the demand for wage increases were invariably put forward just before the start of crucial paddy cultivating operations like the harvesting, land preparation, ploughing etc. (Kannan, 1990).
14. For a history of the organization of agricultural labourers see A.V.Jose (1977), in which he traces the development of Trade Unionism and the labour-cultivator

relation in Palghat and Kuttanad, the two main paddy producing centres of Kerala.

15. Due to Union and Government interventions, it is not only the control over wages that the farmers have lost but also, especially in places like Kuttanad, they lost decision making power regarding the size of work force to be employed and mechanization of operations (Kannan,1990).
16. With regard to coconut cultivation, the workers have a critical control only in plucking coconut. In the case of paddy however, they can hold the land owners to ransom on a number of operations like ploughing, re-planting, weeding, harvesting and threshing. And also the number of workers required for paddy cultivation is considerably more than coconut. It is estimated from the "Report on Cost of Cultivation of Important Crops in Kerala for 1984-85" published by the Department of Economics and Statistics, that on an average about 160 labour days per hectare are required for the cultivation of paddy while coconut cultivation requires only about 75 labour days per hectare.
17. We have seen that the area under paddy has sharply declined by about 3 lakh hectares during the period 1974-75 to 1989-90. As mentioned earlier paddy cultivation requires about 160 man days and coconut cultivation about 75 labour days (see End Note 9). If we adopt this norm, it will present a staggering loss of 4.8 crores of man days due to the decline of 3 lakh hectares of paddy cultivation in the state. If we assume that all the land lost to paddy cultivation is gained by coconut cultivation the additional labour days created in the coconut sector is around 2.25 crores of labour days. Even then there is a net loss of 2.55 crores of labour days due the shift from paddy cultivation.
18. For instance in 1973 it was decided (at an AICC session) that the entire food economy should be returned to the control of the state governments rather than following the all-India approach - i.e., an approach in which Central Government took the lions' share of the responsibility in food procurement. While this new policy benefited food surplus states (since market forces were released into the process of food grain procurement), deficit states were badly affected. Thus, the poor ration-dependent people of Kerala were in an even precarious position than when rationing was based on what the State was able to procure from the Centre and other neighboring states. (T.V.Sathyamurthy, 1985).
19. Prices in the international market is calculated from the price of rubber quoted in "Asia Week", May 24, 1991.

20. While the State Government recovers its operating costs of public distribution from the consumers, the Central Government incurs substantial amounts in the form of consumer subsidy on food grains supplied to the state. The FCI acts on behalf of the central government to arrange procurement and distribution. The price of grains are fixed by the Central Government. The total cost of sales incurred by the FCI is often higher than the issue price fixed by the Central Government. This differences between the cost of sales and the issue price is met in the form of consumer subsidies by the Government of India (P.S. George, 1979). The Central Government subsidy for rice distribution in Kerala for the years 1975-76 to 1979-80 is given in the table below. It was estimated using the rates of consumer subsidy and quantity of rice supplied to the state.
- Consumer Subsidy for Rice Incurred by the Government of India for the Public Distribution in Kerala, 1975-76 to 1979-80.

Year	Rate of Subsidy (Rs. per Qtl.)	Rice Imported to Kerala (lakh tones)	Total Amount of Subsidies on Rice (Rs. in lakhs)
1975-76	0.90	9.02	81.18
1976-77	1.26	15.03	189.38
1977-78	9.28	16.20	1503.36
1978-79	19.06	5.32	1013.99
1979-80	17.71	7.72	1367.21

Source:

Data on the rate of subsidy is taken from Kahlon and Tyagi (1983) and the data on rice import is collected from Govt. of Kerala, Economic Review, 1977-78 and 1980-81.

22. A padasekharam is a contiguous stretch of wet land bound by a river, canal or garden lands which is a homogeneous physical entity.

CHAPTER 2

THE RATIONALE OF COOPERATION IN FARMING

The prevalence of tenant-cultivation and adverse land-man ratio are considered two limiting factors of agricultural development in India (A.M.Khushro and A.N.Agarwal, 1961). In the former case cultivation gets separated from ownership, insecurity of tenure and rack-renting take place, surplus flows into the hands of exploitative non-investing and conspicuously consuming elements and the motivation for investment and increased output on the part of the cultivator is decreased. This calls for a set of far-reaching reforms, chief among which is the abolition of absentee landlordism and tenancy legislation.

In Kerala, the Land Reforms (Amendment) Act which came into effect in 1970 abolished tenancy. With this it was hoped, that as the actual tillers¹ had become owners of land, agricultural productivity would increase. But contrary to expectations, production stagnated in the period following land reforms. Why did not land reforms produce the expected results? According to a study (K.N.Raj and P.K.M.Tharakan, 1983) the decline in the rate of growth of output in agriculture from the early 1970s (the time from which land reforms came in to effect) cannot be traced to land reforms as such. Rather, it is due to a "combination of circumstances": of non-availability of land for further extension of cultivation and technological lapses. The technological lapses consisted of the lack of attention paid to the location and type of irrigation projects undertaken during

this period as well as to other related aspects of planning in the agricultural sector. So difficulties were faced in raising the yield per unit of cropped area on land that was either too heavily dependent on rainfall alone or could not be easily reached by reservoir-based surface irrigation.

The land ceiling, taking over and distribution of surplus land etc. as per the Land Reforms Act, created a good number of new owners of land, most of them small and marginal. As the Table 2.1 shows, large holdings registered a sharp decrease in number. Subdivision and fragmentation of holdings continued due to increase in population². The situation resulted in the creation of many uneconomic holdings and homesteads which were unable to sustain farming families. Since plantations, private forests, and land belonging to religious, educational and charitable institutions were exempted from the ceiling limit it was mainly the paddy and coconut lands which got subdivided.

Table 2.1

House hold ownership holdings in Kerala, 1966/67 and 1971/2

Size class of ownership holdings (acres)	Number of House holds (000)		Area (000 million)	
	1966/7	1971/2	1966/67	1971/2
0.00	2027 (%)	730 (%)	- (%)	- (%)
0.01-0.99	903 (60.0)	1805 (70.4)	348 (10.2)	514 (17.7)
1.00-4.99	472 (31.4)	646 (25.2)	991 (29.2)	1382 (47.6)
5.00-24.99	119 (7.8)	111 (4.3)	1036 (32.4)	931 (32.1)
25.00 & >	10 (0.7)	2 (0.1)	1021 (30.1)	79 (2.7)
0.01 & >	1504 (100)	2564 (100)	3396 (100)	905 (100)
Total (0.00 & >)	3531	3294	3396	2904

Source: Land Reforms Survey of Kerala : Report; NSS Survey 1971/72, in K.N.Raj and P.K.M.Tharakan (1983).

Those who found their holdings insufficient to make a living took up other occupations. When agriculture ceased to be the principal source of occupation and income, naturally they lost interest in improving the land assets and became part time farmers (T.Janardhanan Nair, 1989).

The farmers and farm workers who had broadly united in their struggle against the oppressive regime of landlords earlier, no more had the same imperative for unity of interest after Land Reforms. Thereafter their interests began to diverge and tension mounted in their relationship³ (A.V.Jose, 1977; N.Krishnaji,1979). The main contention in the estranged relationship was the wage question, as the new owners wanted to invest additional labour at cheap rates on their holdings. The militancy of the agricultural workers had far reaching results. The farmers responded by showing reluctance in making additional investments requiring labour on land. In some cases this led to failure in maintaining infrastructural facilities of irrigation and drainage canals, which were put up earlier by either community or individual efforts. This affected crops. (T.Janardhanan, 1989). In many cases these water structures were totally abandoned or filled up and converted to garden crops or for other purposes. These developments also made farmers reluctant to adopt the latest technology in the field of agriculture. The use of agricultural machines like tractors, tillers etc. which would reduce cost of ploughing were opposed by workers on the ground of contraction in employment opportunities (K.P.Kannan, 1990)⁴. The fragmented holdings were not sufficient to support many farming families. So they had to work elsewhere

also for their livelihood. However, they clung to their land since it offered them security in an economy which did not otherwise provide extensive social security.

This brings us to the second factor that A.M.Khusro and A.N.Agarwal (1961) have mentioned as contributing to the loss of incentive in farming, ie; the adverse land-man ratio. This is a situation of many holdings of too small and uneconomic size. This leads to wastage and under-utilization of man power and bullock-power, raises per unit costs and inhibits increases in output. It reduces consumption levels and efficiency of labour and leaves little or no surplus for marketing or for ploughing-back for improvements. Incentives to produce more are badly distorted. This set of difficulties obviously calls for an enlargement of the size of cultivation units and an organization which will remove the disproportionality between the inputs of land, labour and capital (A.M.Khusro and A.N.Agarwal,1961). Steps will therefore have to be taken to enlarge the size of farms. This may be done by (1) acquisition of small holdings by the state and converting them into collective state farms, (2) bigger land holders acquiring the interests of small holders and (3) pooling of lands of the small holders in a co-operative form for the purpose of farming, each land holder retaining his title to the land. The first two measures involve loss of individual ownership. Since land owners are strongly attached to their land, however small it be, these two measures would not find favour with them. Hence was proposed the system of co-operatives⁵ in Indian farming.

However there were arguments against co-operative farming also (C.B.Mamoria, 1983). We give them in brief below.

a) Co-operative farming being a more rational organization, would enable to get the same work to be done with less people and therefore would create unemployment. It would inevitably involve mechanization of farms, which would further aggravate unemployment.

b) Co-operative farming is alien to the traditions and feelings of our people. So it cannot be introduced without some force or incentives.

c) Even if there were some economies in a co-operative farm, the increasing inefficiency of the human factor (quality of labour and management) would effectively counter such economies. Human nature being what it is, people would not work on a co-operative farm as they would on a private farm and managerial and supervisory cost of co-operative farms would be higher than those in family farms.

d) Co-operative farming has been mooted mainly as a remedy to relieve the acute pressure on agriculture arising from the unfavorable land-man ratio and the consequent diseconomies of scale. However the main assumption on which the cooperative principle rests, ie; economies of large scale agricultural production, itself has become a point of debate.

Following the publication of the Farm Management Survey (FMS) in the mid-fifties, the issue which attracted considerable attention was the alleged inverse relation between yield per acre and size of holding. The debate started with the publication of Sen's (1962) paper where he listed three propositions which were "found to be broadly valid in Indian Agriculture", one of which was that "by and large, productivity per acre decreases with the size of holding". However, subsequent studies based on aggregated FMS data (viz., A.M.Khusro, 1964; Krishna Bharadwaj, 1974; A.Rudra and Chattopadhyay, 1976) and disaggregated data (viz., A.P.Rao, 1967; A.Rudra, 1968a, 1968b; Hanumantha Rao, 1966; Saini G.R, 1971; Usha Rani, 1971 and Bhattacharya N. and Saini G.R, 1972) have produced a far from uniform picture. A.M.Khusro (1964), Hanumantha Rao (1966) and Saini G.R (1971) concurred with A.K.Sen's proposition and made generalizations of the inverse relationship in Indian agriculture. Various explanations were put forward for the observed tendency. They can be grouped in to the following categories.

i) Technique-based: that the small holders are using superior methods of production. A.K Sen suggests in this context;

"because of personal participation and supervision that small business allows, a small holding may permit the use of some techniques - efficient ones - that cannot be used in large holdings. Some techniques require not only inputs in the usual sense but also loving care ... It may be difficult to make a paid labour to do what the owner himself would" (A.K.Sen, 1964a, p.326).

ii) Fertility based: that land on small farm is intrinsically superior in quality. A.K Sen's explanation of the declining soil fertility by size of farm is as follows:

" If two pieces of land are of the same size but holding A is more fertile than holding B, the former will provide a greater opportunity of earning income, so that family size may expand faster in the former case. This will lead to quicker subdivision of A than B, and soon a correlation may be established between smallness of the size of the holdings and the fertility of soil" (A.K.Sen, 1964a, p.326)

iii) Labour-based: that the higher productivity in small farms is due to greater intensive application of inputs like labour, bullock power etc. In big farms which are generally wage based labour will not be applied beyond the point where marginal productivity of labour is equal to the wage rate. But on small farms which are usually family based, labour will be applied more freely up to the point where marginal productivity reaches its limit. This is because small farmers want to maximize output per acre (since their self-supplied labour is 'costless') whereas large farmers want to maximize profits (since they have to pay hired labour). (K.Bharadwaj, 1974).

iv) Intensity based: that in small farms intensity of cropping is higher than that of big farms, which in turn results in higher productivity in small holdings. (K.Bharadwaj, 1974; A.Rudra, 1968b).

Studies by Krishna Bharadwaj (1974), A.P.Rao (1967), A.Rudra (1968 a&b), Usha Rani(1971), and M.Chattopadhyay and A.Rudra (1976) have expressed reservations about the universal validity of the inverse relationship. What is also mentioned in some studies (Usha Rani, 1971; A.Rudra and A.K.Sen, 1980; Hanumantha Rao, 1975 and M.Ghosh, 1986) is the possibility of a

weakening or disappearance of the inverse relationship particularly in the regions that have experienced new agrarian technology, because even if small farmers have certain advantages over large farmers in labour intensive techniques, these are expected to be counter-balanced or even superceded as capital intensive techniques are adopted by large farmers in a situation of unequal access to capital resources. M.Ghosh (1986) even found a reversal in the inverse relation since the introduction of the new agrarian technology. However this reversal in the inverse relationship appears to be a short lived one. Hanumantha Rao observes in this context:

"In the early phase of green revolution, large farmers owing to better access to capital resources, stepped up yields per acre at a faster rate than small farmers. Because of this, in areas experiencing technological change, the inverse relationship between farm size and output per acre began to disappear. In course of time, however, the supply of institutional credit for the less developed regions and small farmers improved significantly. As a result of this and also because of improved extension services, the use of new seed-fertilizer technology among farmers caught up with that among large farms. And, because of the continued advantage that small farmers have in respect of cropping intensity, the inverse relationship between farm size and output per net operated acre has started reappearing" (Hanumantha Rao, 1989, p.395).

The agricultural structure of Kerala is characterized by tiny holdings. The average size of operational holding is only 0.36 hectare and more than 90 per cent of the holdings are below one hectare (Govt. of Kerala, 1989). These holdings are below economic size by any standard. In the small holdings cultivators cannot even fully utilize the family labour power or the service of a pair of bullocks. Consequently a great deal of wastage arises, making cost of cultivation higher than what it would otherwise be. A high-cost production structure, relative

to the output which is largely or wholly self consumed, leave little room for saving and capital formation in the conventional sense. Therefore, in so far as technical change itself is closely related to capital formation, techniques remain primitive and unproductive. In this context, strong arguments have appeared in favour of cooperation in farming. By undertaking the farming operations on a cooperative basis, it is felt, much of the problems arising out of fragmented holding could be resolved. (Gopalakrishnan, 1989). Some of the instances cited are the following.

Irrigation is a crucial element for progressive farming, since the efficient use of fertilizers largely depends upon an adequate water supply. So sinking of tube wells etc. where there is no canal facilities becomes necessary. But, in a structure where an overwhelming majority of the holdings are small, operation of equipments such as tube wells is not economically viable, due to its indivisibility. Similar is the case of modern equipments such as tractors, power tillers, threshers etc. These difficulties, it is argued, can be overcome, if the small cultivators are organized in a co-operative form. (Govt. of Kerala, 1989a; Gopalakrishnan, 1989).

Cultivators can introduce improved seeds and fertilizers, chemicals for plant protection, irrigation facilities, improved implements, etc., only if they have necessary financial resources available. It was found that larger farms are usually the first to introduce technological innovations (Hanumantha Rao, 1989; Sunil Mani, 1985). This is because of

their better accessibility and facilities. The small cultivator, even if he is willing to adopt progressive farming methods, in most cases is unable to find the necessary capital for investment in his small holdings. However when resources are pooled together they will be in a better situation to find the necessary finance for the investments. (Schiller, 1957).

For the numerous small land holders in Kerala much of their investment fund has to come in the form of credit. However it was observed that most of them have no access to institutional credits. This was because access to credit, other things being equal, is a function of assets. The holdings of small land holders were not even of a minimum size to put as collateral for security. Since institutional credits were not available small holders depended on non-institutional agencies, paying much higher interests. Thus the cost of credit was also found to be higher for small landholders (C.Narayana Kurup, 1976). In this context, if the small holders combine together in a cooperative form it should provide them better accessibility to financial sources because their combined holding would be in a better position to provide adequate security. And co-operative, will be in a position to ensure the payment of installments by collecting from the members in kind, a part of the produce raised.

If cultivators of an area could come together and agree to cultivate contiguous fields with the same crop, and follow a common crop rotation and unification of the cropping scheme, it would not only facilitate the use of machinery, but would also economize water, as well as simplify pest control and watch and

ward requirements, resulting in higher returns to both capital and labour. The unit cost on fertilizers and pesticides also could be reduced noticeably if they are purchased and transported in common. (Gopalakrishnan, 1989).

It is also felt that cultivation could be intensified in a cooperative system of farming, since it is in a better position to introduce new technologies which would reduce the inter crop period. In such situation even labourers stand to gain since more intensive cultivation would increase their employment opportunities.

Thus various arguments have been put forward in favour of and against co-operative farming. We can also visualize a system of farming where the advantages of both scenarios are obtained, ie., the scale advantages of large scale farming and incentives of individual ownership. The 'Group Farming' system introduced in the paddy cultivation in Kerala was designed in such a manner.

2.1 Group Farming in Paddy Cultivation: A New Approach

As seen in the first chapter the main reason for the decline of paddy cultivation in Kerala was its decreasing profitability. The cost of production is on the increase without any commensurate rise in the price of the produce with the result that paddy cultivation usually ends with an unfavorable return. Due to this, increasing number of farmers have abandoned Paddy cultivation and switched over to the cultivation of more

remunerative crops like coconut, tapioca, rubber and banana. Quite a few of them have sold their lands for non-agricultural purposes like construction of building and brick making.

The reversing of this trend and the rehabilitation of Paddy farming requires that it be made into a remunerative avocation. The different alternatives available to make paddy cultivation more profitable are; a) increase the price of paddy, b) reduce the cost of cultivation and c) increase the yield per unit of area. Among these, the first one will not find favour with consumers and will have political repercussions. Reduction in cost through a wage cut also is not feasible because the organized strength of labourers is in a position to resist any such effort. Thus the possible measure narrows down to increasing the yield per unit of area and reducing the cost of cultivation other than wage rates.

Studies and experiments have shown that there is immense scope for increasing the productivity of paddy. Demonstrations conducted by the Kerala Agricultural University showed that in the conditions of Kerala, a productivity of 5000 to 7000 kg/ha is within reach against the present production of 1700 kg/hectare (Kerala Agricultural University, 1977,p.20). This gap between the potential and the yield is to be narrowed if the return from paddy cultivation is to be made remunerative. It essentially means adoption of a new technology and managerial practices, with emphasis on higher yield, low-cost investments and higher profits.

About 20 per cent of the cost of cultivation of paddy is for the preparation of fields (Govt. of Kerala, 1971, p.26). If cattle power is replaced by machine power, the cost of preparatory tillage could be reduced by half. As against 32 pairs of cattle required for the preparatory cultivation in a hectare of land, only nine hours of tractor ploughing would be needed (Gopalakrishnan, 1989). Further the time taken for the operation is reduced substantially and consequently the turn over period between two crops gets shortened (in Kerala most of the cultivators do not maintain animals for farm operations because of high cost. So they have to depend on others, for whose service they would have to wait long during the season causing much delay in operations). This in turn will help the crop to escape maladies like drought and incidence of pests and diseases and will help economize the use of irrigation water.

Scientific water management and integrated pest management are two of the cardinal practices of efficient farm management in Paddy. But these are essentially area programmes which cannot be effectively practiced by individual farmers on their tiny holdings.

The present individualistic system of cultivation in which every cultivator raises his crop according to his own convenience and suitability, largely without any references to the neighboring cultivators, (in fact one comes across fields planted with different varieties of seed and in different stages, in the same Taluk and even in the same Padasekharam at a point of time) results in situations which are not conducive for

practicing the new technology which includes many practices that have to be implemented as area programmes.

The question that emerges is: how should the cultivators with different attitudes, different size-holdings and different social and economic status can constitute some form of group for joint cultivation. In Kerala Co-operative Farming and Joint Farming have been tried in the past to organize the cultivators for increasing output and profitability (C.Bhaskharan and A.G.G. Menon,1990). But these experiments were not very successful.

The farmers by nature are individualistic. They have psychological attachment towards their land, however tiny it may be. They do not like to have any infringement on their rights over the land or on their freedom to sell the produce. Therefore a system which does not take away the ownership of the land from the cultivators and which does not interfere with their freedom to use the farm produce according to their liking, while at the same time helps them in overcoming the problems associated with uneconomic holding size, has been evolved in the form of 'Group Farming'.

In this system of farming, while the farmers' rights over the lands and their freedom to sell the produce are preserved, the different farm operations, such as raising nursery, soil preparation, irrigation and drainage, plant protection, processing, etc., are executed collectively. Only the collectivisation of management is aimed at without interfering with the farmers' rights and freedom over the lands and farm produce. We discuss this in greater detail in the next chapter.

Notes

1. R.J.Herring observes in this context," the agrarian structure of Kerala at the time of the 1969 (land) reforms were being formulated was such that the abolition of tenancy per se, as a legal form, would have a class-differentiated impact. Most of the area leased in was controlled by tenant operators with holdings larger than the median holding size, a significant number of whom owned land as well. Landlords leased in land, particularly large landlords. The relatively few tenants with large operational holding controlled a disproportionate share of the area leased in by tenants.
These characteristics of the agrarian structure made the abolition of land lordism and the vesting of ownership to tenants a potential boon not only to the poor peasants, but to rich peasants as well. More over, because the larger holdings contained a high percentage of leased-in land, whereas the poorest, landless tenants had very small holdings, conferring ownership rights on tenanted land was certain to benefit relatively rich peasants more than relatively poor ones. Though households with holdings greater than five acres constituted only 8.1 per cent of the households with interest in land in 1968, they controlled 44.4 per cent of the leased in area including 61.8 per cent of the leased in area including 61.8 per cent of the leased in wet lands" (R.J. Herring, 1980. pp. A.66-A.67). (Also see, P.K.M.Tharakan, 1982, p.31).
2. Large scale subdivision and fragmentation of land takes place due to partitioning of land among members of a house hold, which creates newly formed households cultivating smaller pieces of land. In Travancore, the decade preceding 1931, following the passing of regulation for the partition of tarawad (ie., joint family) properties of certain communities, over 400 thousand acres of land owed by these communities alone was partitioned. In respect of the Nayar community (which accounted for 83 per cent of the partition deeds created shares of less than an acre each. A subdivision of this magnitude must have contributed significantly to the emergence of small peasants as the most numerous category in the countryside (Krishnaji, 1979, p.10)
3. The landless agricultural workers, tenants and peasants were united in their struggle against "land-lordism". Eventually when tenancy was abolished through an amendment of the Kerala Land Reforms Act of 1969 and the former tenants acquired ownership rights to the land they cultivated. (A good number of these were fairly big holdings). Since the abolition of tenancy a

movement which developed was the successful struggle for higher wages for agricultural workers. Now the agricultural workers, peasants (a good number of them being former tenants) who once stood together against the land lords found themselves on two sides of the fence. Because it is not only "capitalist land lords" who employed wage labourers, but rich and middle peasants also did so. In Kerala even among households operating areas between 1 to 2 hectares about 39 per cent rely on the wage labour. Even more striking is the datum for the size class between 0.5 to 1 hectares: in about 30 per cent of these households work is done largely by wage labour (N.Krishnaji, 1979).

4. For instance, in Kuttanad when farmers tried to introduce tractors for ploughing in the late sixties, the ploughmen, who were organized as a category-union under agricultural labourers union, resisted the attempt with the help of all agricultural labourers. They insisted on ploughing the fields whether or not they had already been ploughed by tractors and insisted on being paid. For more details see Kannan (1990).
5. Based on some differences in the organization of cooperatives various types of cooperative farming societies have been visualized, viz; i) Cooperative Better Farming Societies, ii) Cooperative Tenant Farming Societies, iii) Cooperative Joint Farming Societies and iv) Cooperative Collective Farming Societies. For a detailed discussion on these forms of societies see, C.B.Mamoria (1983).

CHAPTER 3

STRUCTURE AND ORGANIZATION OF GROUP FARMING

Introduction

Group Farming, as it was introduced in the paddy sector of Kerala, is not without precedence. There have been pioneering efforts in such form of farming in France, Spain, Japan, Taiwan, Malaysia etc.. In the first section of this chapter we shall briefly deal with the development of group farming in some of the above mentioned countries. Micro level experiments of group farming in paddy cultivation have been attempted in Kerala itself before it was extensively introduced. A review of these experiments is given in the second section. The structure and organization of group farming introduced in the paddy sector of Kerala is discussed in the final section of this chapter.

3.1 Group Farming Efforts Abroad

In Europe, with the onset of large scale commercial ventures in manufacturing, there was a corresponding onslaught on the farming sector as well. The farmers found themselves too weak compared to industrial and financial combine from and through whom they had to purchase inputs and market outputs increasingly. In this context there was the need for concentration and mechanization in the farming sector as well. At the same time, it was essential to safeguard the family farm, which was the most effective framework for protecting the dignity of the farmer and his interest in work. A solution to this was

sought in the form of farming groups, which could raise farmers' incomes through a lowering of costs, by making better use of inputs and more efficient organization of work. On the basis of such a rationale group farming was initiated in France from the early years of the 1960s. It got real momentum when measures were specifically adopted for it by the French Ministry of Agriculture. At the end of 1970s there were about 2200 group farming groups in France covering 200,000 hectares and involving 6,000 farmers (OECD¹, 1980).

In Spain, the first group farming groups appeared in the 1950s. They were spontaneously set up in various forms by farmers who were facing very difficult conditions, in particular the decline in the available labour force in regions where there was a considerable rural exodus². In a number of cases the partnership was formed by the establishment of a co-operative for the pooling of agricultural equipment as this was the only means to achieve mechanization of farming operations.

Group Farming in Spain took a wide variety of forms. A classification of groups by order of size provides the following picture.

a) Large Groups

These were generally co-operatives with 30 to 50 members farming on an average 800 to 1000 hectares in non-irrigated zones. In irrigated areas the size of farms was around 300 hectares.

b) Medium-sized groups

These included no more than six to ten members. They generally farmed between 150 to 300 hectares of non-irrigated land. These groups were often setup on the initiative of young farmers who were anxious to introduce mechanization (due to labour shortage, but could not afford mechanization alone) and considered group farming as their only chance of staying on the land.

c) Family Groups

These groups had some three to five members and mostly farmed between 100 and 150 hectares.

d) Livestock Groups

These groups, which were concerned with only one sector of production, formed an absolutely separate category as they were mostly enterprises using no land. They had an average of three to eight members and included not only farmers but also veterinarians, dealers in cattle and small local industrialists. They represented a kind of partnership to which the farmers contributed their work and the small piece of land needed for the site, while the non-farmers had an opportunity for investment in activities which were related to their principal business.

In 1970 there were around 2700 group farming groups in Spain. (OECD, 1980).

Another country in which group framing was practiced to some extent was Japan. In 1968 there were about 6760 farming groups in Japan, but practically all of them were small and only partially integrated. The average number of members was eight but as individual holdings in Japan were often under one hectare the group farming area remained small. Apart from these declared groups, there were about 6300 de facto groups based on mutual agreements without any formally constituted partnership. These were rice-growing enterprises grouping a number of farmers in a particular village, including some part-time farmers wishing to lighten the work load on their holdings. Some of these would apparently even prefer to devote themselves entirely to their non-agricultural activities and entrust their land to a group likely to work it more profitably³. (OECD, 1980).

Malaysia had been experimenting with various forms of group farming systems; from the loosely structured farm co-operative to a well defined, well structured and centralized land development scheme. Many departments and authorities were setup at state and federal levels to promote these various group farming activities. The farmers divided the operations between them. For instance, in a Sugarcane Group Farm in North Peninsular Malaysia which had a total area of 5000 hectares with 446 farmers, the latter were divided into groups of 20 and each group was generally assigned to do a specific task anywhere within the field (C.Bhaskaran & A.G.G Menon, 1990; Durga P. Paudyal, 1990).

Studies have shown that decisive economic benefits accrued due to group farming in these countries. For example, in the case of a representative sample studied in the region of Aranda De Duero (Spain), it was shown that while before grouping the farmers of eight co-operatives together made a loss of about 20 million pesetas, after group farming it was possible to make a profit of more than 10 million pesetas. (OECD, 1980)

3.1.1 Some Aspects of the Formation and Operation of These Groups

Under the group farming scheme the partners' contributions formed the capital base which was to be managed jointly. It consisted primarily of land and secondly of contributions in kind (seed, fertilizers) or in cash, enabling the group to acquire inputs other than land: equipment, machinery, fertilizers etc. The labour and skill of the member partners represented a third type of contribution.

The members of the group continued to retain the ownership of their land. Land was therefore merely made available to the group for cultivation under an overall production programme.

In France legislation on group farming required the partners to be farmers, where as in Spain the group could include partners whose main activity was not or had ceased to be farming and who contributed their land but not their labour. And again, the Spanish legislation on co-operatives, stated that the number of members should not be less than 15, on the principle that

joint problems would be easier to solve if the co-operatives had a reasonable number of members. In France, however, the number of partners need not be more than ten.

In most of these countries state encouragement was given to group farming. Aid (which mainly consisted of tax relief and grant) was given on a selective basis after a study of the case of each group. The government authorities have avoided taking any specific attitude on this subject and even in France where group farming groups have standard statutes, legislation merely provides a frame work. It has thus been possible for individual initiatives to develop free from any constraints, which has led to a wide variety of experiments in organization. However, to avoid the formation of groups that are non-viable or merely set up to obtain state aid, groups are required to submit their statutes for the approval of qualified bodies (OECD, 1980).

3.2 Group Farming Experiments in Kerala

There are not many success stories of group/co-operative farming in India. Co-operative farming societies in the organized sector were started in India after World War II for the settlement of ex-army personnel and after the partition of the country for rehabilitating displaced people. Later a number of cooperative farms have been organized in U.P., Maharashtra and Punjab. These were mainly formed to undertake cultivation of Government waste land (C.B.Mamoria, 1983). However, many of them were "cooperative" / "Group" only in name, but actually operated as individual family farms. The Gambhira Farming Society

(Gujarat) and the Vithal Farming Society (Maharashtra) are two successful examples of co-operative farming system in India (C. Bhaskaran & A.G.G. Menon, 1990).

In Kerala a number of pioneering efforts have been initiated in group management of farming before it was introduced on an extensive scale in the paddy cultivation of the state. Some of the important experiments are given below.

Under the auspices of the Travancore Fertilizers and Chemicals (FACT) Ltd. joint cultivation was conducted, organizing the farmers of Andoorkonam Yela in Trivandrum in 1968. This attempt produced positive results. Though such demonstration experiments were repeated in Trichur, Malappuram and Eranakulam districts no attempt was made to follow them up, especially the spirit of group effort which was initiated by the programme.

In 1971-72, the State Department of Agriculture launched the Intensive Paddy Development Programme (IPDP) popularly known as the Yela programme. The programme envisaged organizing 'progressive' farmers and collectivizing the farm operations. But it did not make any significant breakthrough (Govt. of Kerala, 1977). Pointing to its shortcomings Ramachandran (1980) observed that in its implementation the basic community approach was lost sight of, with major attention being concentrated on individual 'progressive' farmers.

The Centre for Water Resources Development and Management (CWRDM), has been organizing 'Federated Farming' on

the pattern of group farming in the command area of the Kuttiyadi Irrigation Project. It organized 59 federated farming units during 1979-1988, which gave encouraging results in respect of costs and productivity. It was noticed that an average yield of 4.50 tonnes per hectare of paddy was obtained in the Federated Units against 2.63 tonnes per hectare received in the neighboring plots (for details see Chackacherry and Jayakumar, 1990 a & b.). The Command Area Development Authority (CADA) of Kerala, and the Kerala Agricultural University also experimented with group farming in small units. The field experience of these institutions revealed that productivity and profitability could be augmented even in small holdings and that the programme found favor with the cultivators. It is against these encouraging micro level experiences that the Government of Kerala introduced group farming in paddy cultivation on a massive scale from the Virippu (Autumn) season of 1989.⁴

3.3 Structure and Organization of Group Farming in Kerala.

The literature on Group Farming in Kerala is scanty. As evident from Government documents, the main features, structure and organization of Group Farming introduced in Kerala are as follows.

3.3.1 Main Features of Group Farming

i) Individual ownership of land/capital resources is retained as such and the yield obtained from the plot of each member of the group is retained by him/her and he/she has to share the

production costs and other costs, if any, incurred during production.

2) Field level organization viz., committees of the land owners of Padasekharams are formed and farm operations like soil preparation, purchase of inputs, water management, plant protection etc. are undertaken on a group basis.

3) The area and group size are not restricted, however Padasekharams with an area of 10 to 50 hectares are considered more suitable for effective and efficient utilization of infrastructure and resources and for group interaction.

4) There is involvement of governmental departments, financial institutions, fertilizer manufacturers/agencies and local panchayat in the planning and implementation of activities.

5) Group cohesion is expected to be maintained through appropriate leadership and by encouraging a democratic and participatory decision making processes. Subsidies are given as incentives.

6) Sufficient flexibility is maintained in deciding on the technological parameters as well as group dynamics depending on the situation obtaining in the area/group. However, the activities selected are those which are meant to reduce cost of production, increase production and productivity and increase net incomes. (Govt. of Kerala, 1989a & Menon, 1989).

3.3.2 Major Activities Envisaged Under Group Farming

The major activities envisaged under group farming are:

- i) Soil testing programme to find out the fertility deficiency of the group farming areas and to assess the quantity of soil ameliorates required for it.
- ii) Opening of retail outlets for fertilizers, pesticides and green manure seeds within easy reach of padasekharam. Fertilizer is to be made available, with the help of fertilizer companies, at the field site.
- iii) Fertilizer application based on soil testing data and joint transportation of fertilizers.
- iv) Action plan for land development and water management for each padasekharam and implementing these works through group activity with the help of rural financing institutions.
- v) Introduction of power tillers and tractors for land preparation.
- vi) Consolidation of farm operations like tilling, sowing, raising nursery, fertilizer application, plant protection, irrigation and purchase of fertilizers and plant protection chemicals.
- vii) Organization of Agro-clinics to handle post sowing/transplanting crop care.
- viii) Integrated pest management and need-based application of pesticides.
- ix) Acquisition of modern equipments and machinery such as tractors, tillers, pump sets, sprayers, harvesting machines etc. for each group with the assistance of financial institutions and the Department of Agriculture. (Govt. of Kerala, 1989 a&b).

An examination of the activities enlisted above shows that the Group Farming Programme also envisages a large scale technology transfer to the cultivators in terms of spread of scientific cultivation practices like test based application of fertilizers, integrated pest management, chemical weed control and mechanized field operations. In the execution of the Programme the Krishi Bhavans established in most of the

Panchayats and posted with a qualified Agricultural Officer and Extension Officers are assigned a major role. Krishi Bhavans are expected to organize and co-ordinate the programme. They are to assess the requirements in respect of soil ameliorants, and inputs like seed, fertilizer, agricultural machinery, etc., sufficiently in advance of the cultivation season and make arrangements to supply them. Krishi Bhavans are to conduct Agro-clinics on specific days close to each Padasekharam to handle post sowing/transplanting crop care. It is also expected of the Krishi Bhavan, together with the Padasekharam Committee to generate local enthusiasm and organize voluntary forces for providing infrastructural requirements.

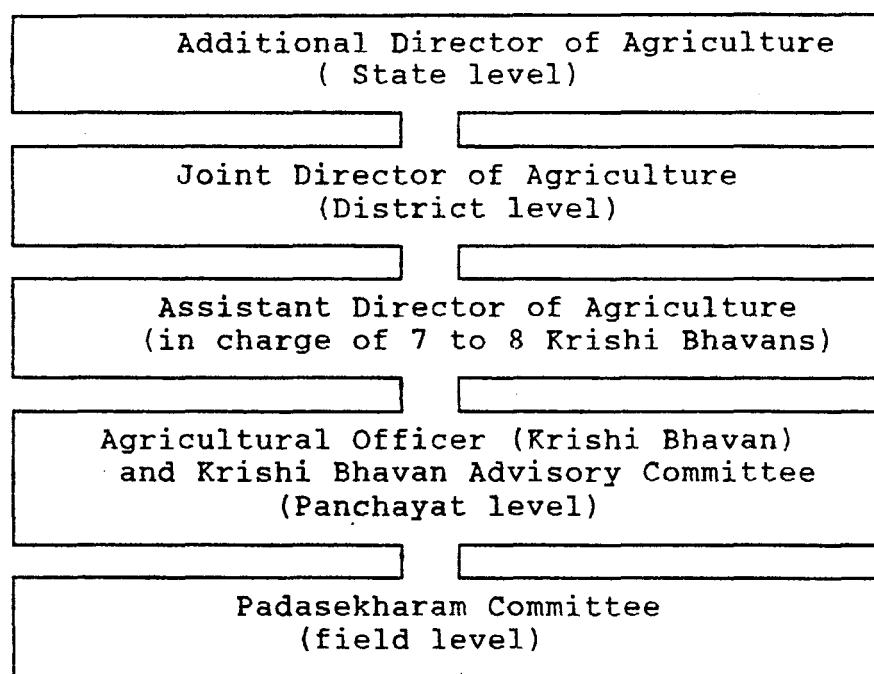
3.3.3 Organizational System

One of the important aspects of group farming has been its emphasis on the principle of people's participation. Experience has shown that many well intentioned agricultural programmes have been generally made ineffective due to bureaucratic entanglement and lack of popular participation. (Ramachandran, 1980; N.Mohanan, 1989). Due to its very nature bureaucratic management fails to take into account the felt needs of the people. On the other hand there is also evidence (in India and other countries) of successful programmes where the community assumed the major responsibility in their implementation (UNO, 1989). In this context the Government of Kerala had declared its policy of popular participation in the various development programmes and Group Farming in paddy cultivation is an important one among them⁵

Though the organizational structure of the Group Farming Programme (see the Chart 3.1 below) appears to be elaborate, there is in fact considerable flexibility and peoples participation in the implementation at the lower level.

Chart 3.1

Organizational Structure of Group Farming



At the State level, the Additional Director, assisted by a Task Force is the Chief Co-ordinator of the Group Farming Programme.

At the district level, the Joint Director of Agriculture is the principal co-ordinator and officer responsible for the programme. The district level Agricultural Development Advisory Committee under the Chairmanship of District Collector is to meet as often as is necessary to give active guidance for

the activities undertaken in the district.

The Assistant Director of Agriculture in charge of 7 to 8 Krishi Bhavans is responsible for channelizing the available resources. He also undertakes intra-departmental co-ordination which includes making available institutional finance.

The Agricultural Officer of Krishi Bhavan (and his/her Staff) and the Krishi Bhavan Advisory Committee which besides the Officer includes the Chair person of the Panchayat Krishi Vikasana Samithy, farmer representatives, representatives of local institutions, farmers organizations and agricultural labour organizations is the agency responsible for the implementation of the programme at Panchayat level.

At the field-level, for each participating Padasekharam there is a Padasekharam Committee directly responsible for the activities undertaken in the Padasekharam. It consists of land owners representatives and Agricultural Officer/staff of Krishi Bhavan. It is the function of the Committee to organize group actions such as community nursery, land preparation, on farm development works, maintenance of field and drainage channels, bulk purchase of inputs, etc. It has to ensure that the various facilities and subsidies offered by government and departments and quasi-government institutions are taken advantage of and used by the landowners in the groups. A convener, elected by the committee looks after the day to day functioning of the group.
(Govt. of Kerala, 1989,b)

3.3.4 Subsidies⁶

A variety of subsidies are announced to the cultivators under Group Farming⁷, some of which were already in existence under the Intensive Paddy Development Programme.

The main subsidies offered are the following:

- i) Group farm subsidy for manure at the rate of 40 paise per cent or Rs.100 per hectare.
- ii) Community nursery subsidy of Rs.2000 per hectare of nursery.
- iii) In the case of soil ameliorants an assistance of 50 per cent of the cost but not exceeding Rs.750 per hectare will be given.
- iv) An assistance of 50 per cent of the cost is given on the purchase of plant protection chemicals and weedicides. However, the maximum assistance will be Rs.100 per hectare.
- v) In case of purchase of sprayers 50 per cent of the cost will be subsidized, with a maximum of Rs. 400 for hand sprayers and Rs.1000 for power sprayers.
- vi) In case of land development works like levelling, bunding, digging/renovation and repairs of irrigation/drainage channels, flow control devices, check dams etc. financial assistance of 50 percent of the cost or Rs.10000, whichever is less will be given.

Among these subsidies item (i) is given in cash to all the cultivators of the group farming area according to the paddy land ownership. The Karshika Vikasana Samithy constituted for each Krishi Bhavan would have to select the components under the schemes (ii) to (vi) based on the needs of the padasekharam, subject to the condition that total assistance will not exceed Rs.2500/hectare for HYVs and Rs.1000/hectare for Traditional Varieties for each season for the components of (iii) to (vi).

Chart 3.2

Classification of Subsidies According to Type

In Cash	In Kind
1. Subsidy for the purchase of manure. 2. Community Nursery 3. Land development works	1. Soil Ameliorants 2. Plant protection chemicals and Weedicides 3. Sprayers

According to the estimates supplied by the agricultural Department of the Government of Kerala, Rs.50 lakhs were distributed under the above heads during 1989-90. The financial target for the year 1990-91 is Rs.261.30 lakhs.

3.3.5 Growth of Group Farming

During 1989 Virippu (Autumn), when Group Farming was inaugurated, it was introduced in 61,224 hectares, involving over 1.6 lakh farmers and covering more than 3,000 padasekharams. This constituted 25.13 per cent of the total area cultivated in the state in that season. Since then more area was brought under the Programme (see Tables 3.1 and 3.2).

Table 3.1

Season-wise Details of Area Covered, No. of Padasekharams Involved, Farmers Participating and Agro-Clinics Organized Under Group Farming in Kerala

Season	Area covered (hectares)	% of total area in the season	No of Padasekharams	No of Farmers Participating	Agro-Clinics Organized
1989-90 (Virippu/Autumn)	61224.44	25.13	3063.00	162640.00	1885.00
1989-90 (Mundakan/Winter)	62722.00	23.35	2978.00	171606.00	2138.00
1989-90 (Punja/Summer)	51321.55	72.10	807.00	107033.00	764.00
1990-91 (Virippu/Autumn)	142865.79	58.65	5043.00	367119.00	3053.00
1990-91 (Mundakan/Winter)	201610.00	75.00	5914.00	421140.00	-

Source The data of 1989-90 Kharif is from Govt. of Kerala (1989,b).
The rest are unpublished data collected from the Agricultural Department

Table 3.2

District-wise Details of Krishi Bhavans Involved, Area Covered,
Number Of Padasekharams Involved and Farmers Participating in
Group Farming During the Virippu (Autumn) Season of 1989-90 and 1990-91.

Name of District	Area (hectares)		No of Farmers		No. of Krishi-Bhavans		No. of Padasekharams	
	1989-90	1990-91	1989-90	1990-91	1989-90	1990-91	1989-90	1990-91
Trivandrum	3363.00	6642.00	15801.00	30908.00	84.00	84.00	274.00	476.00
Quilon	4014.00	10599.00	16259.00	42221.00	70.00	73.00	179.00	478.00
Pathanamthitta	1690.00	2360.00	6278.00	9440.00	40.00	43.00	158.00	186.00
Alleppy	3587.00	13512.00	10935.00	36691.00	44.00	64.00	167.00	329.00
Kottayam	4613.60	7160.90	9858.00	15524.00	56.00	49.00	155.00	211.00
Idukki	935.00	1422.00	2999.00	3468.00	28.00	21.00	45.00	54.00
Eranakulam	4763.00	18286.00	14687.00	50225.00	85.00	85.00	246.00	455.00
Trichur	8560.00	19500.00	15990.00	45240.00	78.00	79.00	298.00	547.00
Palghat	13885.00	35497.15	21997.00	55241.00	87.00	88.00	447.00	946.00
Malappuram	4495.00	13283.00	10641.00	27468.00	98.00	98.00	239.00	471.00
Calicut	1397.84	1716.00	5026.00	5601.00	67.00	61.00	165.00	184.00
Wayanad	2696.00	-	4966.00	-	25.00	-	142.00	-
Cannanore	5025.00	7486.74	21729.00	32857.00	81.00	82.00	414.00	487.00
Rasargode	2200.00	5401.00	5474.00	12235.00	37.00	37.00	134.00	229.00
TOTAL	61224.44	142865.79	162640.00	367119.00	898.00	864.00	3063.00	5043.00

Source: For the year 1989-90, Govt. of Kerala (1989,b) and for the year 1990-91 unpublished data obtained from Department of Agriculture, Government of Kerala.

Note: 1.Data for Wayanad for the year 1990-91 is not available
2.The figures for 1990-91 are targets.

During 1989-90 the total area brought under group farming (including 3 seasons) was 175.27 thousand hectares, which is about 30 per cent of the total area under paddy cultivation in the state (see col.6 of Table 3.3). District-wise analysis reveals that in Cannanore, Trichur and Pathanamthitta about 50 per cent of the paddy land has already been brought under group farming while in Palghat, Wayanad and Kasargode only about 20 per cent has been brought under the programme. During the Punja season (Summer) 80 per cent of the group farmed area was in three districts- Trichur, Alleppy and Eranakulam. This is because summer paddy is cultivated mainly in these districts only.

Table.3.3

District-wise and Season-wise Distribution of Area Under Group Farming in 1989-90
(area in hectares)

(1)	(2)	(3)	(4)	(5)	(6)
Name of District	Area During Virippu(Autumn)	Area During Mundakan(Winter)	Area During Punja(Summer)	Total Area under G.F	% of Total Area Under Paddy
Trivandrum	3363.00	3546.00	-	6909.00	33.02
Quilon	4014.00	4986.00	-	9000.00	28.96
Pathanamthitta	1690.00	2010.00	2449.00	6149.00	44.08
Alleppy	3587.00	4179.00	17806.50	25572.50	39.63
Kottayam	4613.60	3040.95	2517.60	10172.15	33.84
Idukki	935.00	571.27	-	1506.27	30.65
Eranakulam	4763.00	3778.00	9815.00	18356.00	26.30
Trichur	8560.00	11493.00	13030.70	33083.70	44.43
Palghat	13885.00	14963.00	-	28848.00	19.65
Malappuram	4495.00	6294.39	2040.00	12829.39	23.45
Calicut	1397.84	1895.46	182.75	5106.05	36.46
Wayanad	2696.00	-	1850.00	2714.50	12.91
Cannanore	5025.00	4694.00	-	9719.00	46.32
Kasargode	2200.00	1271.00	-	3471.00	21.40
TOTAL	61224.44	62722.07	51321.55	175267.98	30.04

Source: For the Kharif the data is obtained from Govt. of Kerala (1989,b).

The rest of the data is obtained from Agricultural Department of Government of Kerala

As mentioned earlier, systematic collection and processing of field data to assess the impact of group farming on paddy production in the state is yet to be done. Broadly it appears that the production and productivity of paddy has shown a significant increase and area under cultivation a marginal increase during 1989-90 from the previous year. This reversal in the declining trend is attributed to the Group Farming Programme. While officially it is claimed that area, production and productivity of paddy increased by about 1, 14, and 13 per cents respectively (Govt. of Kerala, 1990), these aggregate figures tend to conceal significant variations in the operation of this programme and some serious problems it faces. We have attempted to bring this out through a survey undertaken in one of the

regions under group farming, the findings of which we discuss in the following two chapters.

Notes

1. OECD stands for Organization for Economic Cooperation and Development.
2. It is possible that the exodus was the result of a differentiation process that had been taking place in the rural area and the introduction of group effort in farming was a mechanism to fight against the process by those who still held on.
3. This example tends to show that such a system of group farming would help to improve the highly fragmented structure of part-time agriculture in Kerala and facilitate the gradual departure of part-time farmers leaving the land to real farmers.
4. Encouraged by the favourable response, the idea of group management is also extended to coconut cultivation. Group irrigation, scientific manuring and plant health cover are the main activities under this programme (Govt. of Kerala, Economic Review, 1989)
5. Some of the other important programmes are, i) group management in coconut (see the previous end note), ii) Village level resource mapping and iii) Centre for Development of Imaging Technology.
6. Information on subsidy is collected from the Department of Agriculture.
7. Incentives in the form of subsidies and tax reliefs had been in vogue for the development of group farming. In Spain, France and Japan, where group farming reached significant level of development state assistance consisted mainly of tax reliefs, financial aid and regulations designed to adapt company law to the exigencies of farming.

In France tax reliefs were given to group farming groups under the principle known as "fiscal transparency". Accordingly for tax purposes the groups were considered as an aggregate of individual farms and not a single undertaking. Members therefore continued to enjoy the relief granted to farmers and were not subject to company taxation, which would be much heavier. Japan also had a similar system.

The financial aids available were those generally granted to farmers, but it was obvious that groups found it easier to meet the conditions imposed, viz., minimum size. Moreover, the terms of aid were more favourable in the case of groups: an increased subsidy proportionate to the number of hectares. Similarly, there were credit facilities - except for land purchase - particularly in France where groups obtain lower rates of interest. And

again, adjustments had been made to company law by which groups were exempted from registration duties. (OECD,1980).

CHAPTER 4

AN OVERVIEW OF THE SURVEY FINDINGS

Introduction

In this chapter we attempt to provide an overview of the main findings of the survey. Section one gives the methodology followed in the survey. A brief outline of the general characteristics of the survey area is given in section two and the socio-economic characteristics of the area is highlighted in section three. The major changes that group farming has brought about in the various operations involved in paddy cultivation is discussed in the fourth section. The final section deals with subsidies given to cultivators as part of the programme.

4.1 Survey Methodology

The methodology followed for the sample survey is as follows:

After a purposive selection of the Panchayat, the sample paddy cultivating households were selected in a random manner from the five Padasekharams in the area, in which Group Farming had been introduced. For this purpose, each household in the selected padasekharams was put on a listing schedule. The listing schedule contained information about the name of the head of each cultivating household and area of paddy land owned. The listing was done on an ascending order according to the size of paddy land owned. Since the population is not large, consisting of 242 households, we chose to include one-third of the total

households in the sample. The random interval worked out to Three. From the random table, a number was randomly selected to determine the start. Once the random number had been determined every 3rd household starting from the number was selected. This was done for all the Five Padasekharams separately, obtaining a combined total of 80 sample households. The five padasekharams in which Group Farming has been introduced will be referred to in the study as P1, P2, P3, P4 and P5.

Table.4.1
Padasekharam Wise Distribution of Sample Households

Padasekharam	No. of Households
" P1	20
" P2	10
" P3	15
" P4	18
" P5	17
TOTAL	80

An appropriate questionnaire (Annexure 1) to serve the objectives of the study was administered to the respondents.

4.2 General Characteristics of the Survey Area

The survey region is part of two villages in the Trivandrum rural block. It is situated contiguous to Trivandrum city, hence there is a significant amount of urban influence in the area. It has an area of 16.67 sq.kms. and the population according to the 1981 census is 38277. Coconut and paddy are the most important crops in dry and wet lands respectively. Virippu (July - October) and Mundakan (October - February) are the two seasons of paddy cultivation¹.

4.3 Socio-Economic Characteristics of the Survey Area

A distribution of the households by main occupation of the head of the household, in terms of the time spent, reveals that agriculture accounts for about 53 per cent. Over 40 per cent of the households reported non-agricultural activity as the main occupation, regular salaried employment accounting for 33.33 per cent of it. (Table 4.2). Among the agriculturists we observe a significant number of pensioners, whose agricultural activity is mostly confined to supervisory work. There are two (2.5 percent) female headed households who reported household work as the main occupation. If we exclude the Pensioners almost two thirds of the head of households are not agriculturists in the strict sense of the term.

Table 4.2
Distribution of Households by the Main
Occupation of the Head of Households

Occupation	Number	% share
Agriculture	43	53.75
(of which Pensioners	16	20.00)
Regular Salaried Employment	27	33.75
Business	6	7.50
Petty Business	2	2.50
Household work	2	2.50
TOTAL	80	100.00

source: Survey data

- Notes: 1) Those categorized as business include contractors, big shop owners and merchants of coconuts and building materials whose annual income exceeds Rs.10000.
2) Petty business are those whose income from business is less than Rs.10000 an year.
3) In the case of those who reported household work as the main occupation (female headed households) the farming work is done by their children.

When we examine the distribution of households by main source of income of the households, the significance of non-agricultural activities is brought out more sharply. Only one third of the households reported agriculture as the main source of income; salaried employment accounted for about 40 per cent and pensions for about 8 per cent (see Table 4.3). This particular pattern of activity may to some extent have been influenced by locational factors.

Table 4.3
Distribution of Households by the Main Source of Income

Occupation	Number	% share
Agriculture	27	33.75
Regular Salaried Employment	33	41.25
Business	9	11.25
Pension	6	7.50
Petty Business	2	2.50
Foreign Remittance	2	2.50
Rent, interest etc.	1	1.25
TOTAL	80	100.00

Source: Survey Data

When the occupational structure of the landholders (defined in terms of the major part of work time spent) is examined padasekharam-wise, it is observed that only in P1, P2 and P3 agriculturists (including Pensioners) have a dominant position, constituting more than half of the landholders (see Table 4.4). While in padasekharam P1, 70 per cent of the landholders are agriculturists, in P5 they form only 41 per cent. If we exclude the pensioners from the category of agriculturists, it is seen that only in padasekharams P1 and P3 agriculturists have a dominant position, while in the others regular salaried

employment dominates and for these respondents farming is only a secondary occupation.

Table 4.4
Distribution of Households by the Main Occupation of Head of Household
(Padasekharan-wise)

Occupation	P1	P2	P3	P4	P5	TOTAL
Agriculture	14 (70.00)	5 (50.00)	8 (53.33)	9 (57.18)	5 (41.17)	41 (53.75)
(of which Pensioners)	4 (20.00)	2 (20.00)	3 (20.00)	5 (27.77)	2 (11.76)	16 (20.00)
Salaried Regular Employment	4 (20.00)	4 (40.00)	4 (26.66)	7 (38.88)	8 (48.05)	27 (33.75)
Business	2 (10.00)	0 (00.00)	3 (20.00)	0 (00.00)	0 (00.00)	6 (7.50)
Petty Business	0 (00.00)	1 (10.00)	0 (00.00)	0 (00.00)	1 (5.88)	2 (2.50)
House Work	0 (00.00)	0 (00.00)	0 (00.00)	2 (11.11)	0 (00.00)	2 (2.50)
ALL OCCUPATIONS	20 (100.00)	10 (100.00)	15 (100.00)	18 (100.00)	17 (100.00)	80 (100.00)

Source: Survey Data.

Note: Figures in brackets indicate percentage share.

An analysis of the annual income distribution pattern of the households show the dominance of the income groups 10001-20000 and 20001-30000 (see Table 4.5). These two groups together form 66 per cent of the households. The average income of the households works out to Rs.30879.05 with a per capita income of Rs.4833, which is much higher than the state average of Rs.3835 in 1988-89 (estimates are at current prices).

Table 4.5
Distribution of Household by Income

Size-class	No. of Households	% of Households	Average Income
<10000	8	10.00	8750.00
10001-20000	30	37.50	15316.66
20001-30000	23	28.50	24652.17
30001-40000	9	11.25	30555.50
40001-50000	4	5.00	43500.00
50001 &>	6	7.50	62500.00
ALL SIZES	80	100.00	30879.06

Source: Survey Data.

When we consider the distribution of income in relation to size of holdings² (total land) we observe a near direct relationship, (except for the size class 0.50 - 0.99) (see Table 4.6). In the case of paddy land also we see a direct relation between size of holding and income of the households (see Table 4.7). However it is interesting to note that of the total number of households who own less than 2 acres of land, agriculture is the principal means of family income for only 24 per cent. On the other hand it is the main source of income for 45 per cent of the households who own more than two acres of land. This implies that non-agricultural incomes help to reduce inter size income disparities.

Table 4.6
Distribution of Income by Size of Land Holding
(Total Land)

Size-class (Acres)	No of Holdings	% of holdings	Average income
0.01-0.49	5	6.25	20300.00
0.50-0.99	25	31.25	18220.00
1.00-1.99	28	35.00	21303.57
2.00-3.99	17	21.25	35352.94
4.00 &>	5	6.25	47666.66
ALL SIZES	80	100.00	30879.06

Source: Survey Data

Table 4.7

Distribution of Income by Size of Holding
(Paddy Land)

Size-class (Acre)	NO. of Holdings	% of Holdings	Ratio of paddy land to Total land	Average Income
0.01-0.49	34	42.50	.58	19808.82
0.50-0.99	26	32.50	.56	20769.23
1.00-1.99	18	22.50	.51	37833.33
2.00 &>	2	2.50	.35	47500.00
ALL SIZES	80	100.00	.43	30879.06

Source: Survey Data.

An examination of the distribution of income by the main occupation of the head of the household reveals that those engaged in business earn the highest average income, followed by those with housework and pension (see table 4.8). Petty Businessmen occupy the lowest position preceded by agriculturists. Those who reported house work as the main occupation occupy a high position with regard to income because of the substantial income they derive from the earnings of other members of the household.

Table 4.8
Distribution of Income by the Occupation
of the Head of Households

Occupation	Number	% of total	Average income
Business	6	7.50	41666.66
House work	2	2.50	30000.00
Pension	16	20.00	29562.50
Salaried Regular Employment	27	33.75	26629.62
Agriculture	27	33.75	17333.30
Petty Business	2	2.50	14750.00

Source: Survey Data.

The data on the educational level of the head of households shows that all the respondents are literates (see Table 4.9). Among the agriculturists 11 per cent are literate without educational level and over 75 per cent have only school level education. About 85 per cent of those whose educational level is above school level are either salaried regular employed or pensioners. However it is interesting to note that one of those with educational level of graduation and above is occupied in agriculture and another in business. The educational level of two females who are heads of households is low: while one has primary education the other is literate with out any formal education.

Table 4.9
Educational Level of Head of Households by Occupation

Level of Ed'n Occupation	1	2	3	4	5	6	7	8	9	Total
Cultivation	-	3 (11.11)	4 (14.81)	11 (40.74)	7 (25.92)	-	-	1 (3.7)	1 (3.7)	27 (100)
Salaried Regular Employment	-	-	-	2 (7.4)	12 (44.44)	2 (7.4)	4 (14.81)	1 (3.7)	6 (22.22)	27 (100)
Business	-	-	-	3 (50.00)	2 (33.33)	-	-	-	1 (16.66)	6 (100)
Petty Business	-	-	-	1 (50.00)	1 (50.00)	-	-	-	-	2 (100)
Pension	-	-	-	2 (12.55)	7 (43.75)	1 (6.25)	-	1 (6.25)	5 (31.25)	16 (100)
Household Work	-	1 (50.00)	1 (50.00)	-	-	-	-	-	-	2 (100)
TOTAL	-	4 (5.00)	5 (6.25)	19 (23.75)	29 (36.25)	3 (3.75)	4 (5.00)	3 (3.75)	13 (16.25)	80 (100)

Source: Survey data

Note: The numbers 1 to 9 indicating educational level stands for: 1 = Illiteracy, 2 = Literate without formal education, 3 = Primary, 4 = Middle, 5 = Secondary, 6 = Pre-University, 7 = Non-technical Diploma, 8 = Technical Diploma and 9 = Graduates and above.

As seen in Table 4.10 we observe no strong relation between educational level and income of the landholders. However, it is seen that the group with the highest educational level (graduation and above) has reported the highest income also.

Table 4.10
Distribution of Income by the Education
of Head of Households

Educational level	Number	% of Total	Average Income
Literate without Educational level	4.0	5.00	21000.00
Primary	5.0	6.25	14714.85
Middle	19.0	23.75	17277.77
Secondary	29.0	36.25	24258.62
Pre-University	3.0	3.75	18666.66
Non-technical Diploma	4.0	5.00	31333.33
Technical Diploma	3.0	3.75	29333.33
Graduates &>	13.0	16.25	37585.72

Source: Survey Data.

Table 4.11 gives the average size and distribution of holdings of both wet and dry land together for the study area. It is seen that about 75 per cent of the holdings are of the size between half an acre and 1.99 acres. The average size of holding

Table 4.11
Distribution of Land Holdings (Total Land)

Size-class (Acres)	No of Holdings	% of holdings	Average Area
0.01-0.49	5	6.25	0.36
0.50-0.99	25	31.25	0.69
1.00-1.99	28	35.00	1.40
2.00-3.99	17	21.25	2.78
4.00-5.99	3	3.75	4.57
6.00-7.99	1	1.25	6.80
8.00 &>	1	1.30	8.45
ALL SIZES	80	100.00	1.68

Source: Survey Data

is 1.68 acres which is much above the average size of operational holding in Kerala (see Table 4.12), but below the average size of holding for India, which is 1.84 acres (NSS, 37th round).

Table 4.12
Percentage Distribution of Number and Area of Operational Holdings in Kerala over Five Broad Holding Classes for the Year 1985-86

Size Classes (In hectares)	House holds	Area owned
Marginal (less than 1.00)	91.53	46.10
Small (1.00-2.00)	5.76	21.55
Semi-medium (2.00-4.00)	2.12	15.28
Medium (4.00-10.00)	0.50	7.40
Large (10.00 &>Above)	0.08	9.67

Average size of holding: 0.36 ha. (ie., 0.89 acres)

Source: Govt. of Kerala, (1989)

However, the average size of operational paddy land is much lower (71 cents). The biggest area reported is 220 cents and the smallest unit is 14 cents which implies that all the holdings are marginal according to the NSS criterion, ie., below one hectare. Thus all these holding are below economic size, which would not give full employment to family labour nor be sufficient to maintain a pair of bullocks.

4.4 An Account of the Impact of Group Farming on Farming operations.

In this section we shall examine the extent and impact of the programme on various farming operations, as revealed from our survey.

It is reported that in all the padasekharams Group Farming Committees were formed during the early months of 1989. The initiative to this effect was taken by some cultivators, Krishi Bhavan and the Panchayat authorities. Each Committee had its convener, elected by the cultivators.

However the actual implementation shows varying levels of group action in the different padasekharams. We shall give below the changes that group farming has made in various aspects of cultivation in the different padasekharams.

4.4.1 Soil Preparation

The introduction of Group Farming brought about change in the soil preparation operations in padasekharams P1 and P3. While before group farming only draught animals were used for ploughing operations, under group farming ^{tiller} tiller was used in the place of animals. Tilling is done jointly now, with each cultivator paying according to the time taken to plough his field. In P3, however, only 65 percent of the cultivators used tiller. The others were either forced³ to use bullocks or preferred to use their own cattle, which otherwise would have

been left without work, though this was done against the Committee decision. The tiller which was used in both the padasekharams was hired from a Harijan Co-operative Society of the area. The use of tillers, as we shall see later, appears to have generated significant gains to the land holders.

In the other three padasekharams - P2, P4, and P5- cultivators continued to use draught animals for ploughing, with each individual cultivator operating it according to his convenience and availability of bullocks.

4.4.2 Seed

The seed used for cultivation is mostly owned by the land owners themselves; though some have reported purchasing it from Krishi Bhavan and private sources. Generally people prefer to prepare their own seeds rather than to buy it from Krishi Bhavans where seeds are not usually available on time, and when available, are found to be of poor quality. Both high yielding varieties (HYVs) - mainly Bharathi, Jyothi and Pavizham - and traditional varieties (TVs) -PTB 20 - are in use both before and under group farming⁴.

The use of HYVs has, however, witnessed a substantial increase under group farming, mainly due to its increased use in padasekharam P1, where the use of HYVs increased from 60 percent to 95 percent. The reason for this large scale change is the Committee's decision to cultivate only HYVs under group farming. But here also we have come across a land owner who did not co-

operate with the Committee and continued to cultivate the traditional variety.⁵

In the other padasekharams also the use of HYVs has shown an increase under group farming, but on a much lower scale. In P3 its use increased from 40 percent to 60 percent, in P2, 20 to 30; P4, 33 to 44; and in P5, 47 to 52 per cent respectively. For all the padasekharams together the use of HYVs increased from 42 percent before group farming to 60 percent under group farming. It is observed that these figures on the use of HYVs are much higher than the estimates for the state and the district, even in the pre group farming period. As Table 4.13 shows the spread of HYVs in Trivandrum district is only about 26 per cent, while in the study area it shows a much higher percentage.

Table 4.13
District-wise Distribution of Area under HYV of Paddy in Kerala, All Seasons Combined (Area in Hectares)

Districts	1989-90		
	Total Area	Area Under HYVs	%of Area under HYVs
Trivandrum	20921	5383	25.73
Quilon	31075	11414	36.73
Pathanamthitta	13949	6821	48.90
Alleppy	64534	33218	51.47
Kottayam	30063	25951	86.32
Idukki	4914	339	6.90
Eranakulam	69801	17755	25.44
Trichur	74451	17424	23.40
Palghat	146739	10805	7.36
Malappuram	54704	10125	18.51
Calicut	14004	2738	19.55
Wayanad	21032	2796	13.29
Cannanore	20982	7833	37.33
Kasargode	16220	2963	18.27
KERALA	583389	155625	26.68

source: Govt. of kerala, Economic Review, 1990

An analysis of the adoption rate of HYVs according to the main occupation of the head of households reveals that those whose occupation is household work (female headed households) reported 100 percent adoption under group farming (which was 50 percent before group farming) followed by agriculture, 70.3 (44.7), regular employment, 51.85 (37.07), business, 50 (33.33), petty business, 50 (50), and pension, 62.5 (50) per cent each (figures in brackets are the proportions before group farming) (see Table 4.14). There is 100 per cent HYV use among those whose main occupation is household work. However, since their number is very ^{small} few any firm conclusions cannot be made based on this. If we compare the two major occupational groups, agriculturists and those employed with regular salary, which together form 70 per cent of the sample, we see that those whose main occupation is agriculture tend to adopt HYVs more than those with regular salaried employment. This may be due to the fact that cultivators are more disposed to give the extra care and attention which the HYVs are known to require.

Table 4.14
Use of Seed Variety by the Main Occupation of Head of Household

Occupation	Under Group Farming		Before Group Farming	
	HYV	T V	HYV	T V
Agriculture	19 (70.31)	8 (29.62)	12 (44.74)	15 (55.25)
Salaried Regular Employment	14 (51.85)	13 (48.15)	10 (37.07)	17 (62.96)
Business	3 (50.00)	3 (50.00)	2 (33.33)	4 (66.66)
Petty Business	1 (50.00)	1 (50.00)	1 (50.00)	1 (50.00)
Pension	10 (62.50)	6 (37.50)	8 (50.00)	8 (50.00)
House Work	2 (100)	0 (0.00)	1 (50.00)	1 (50.00)
ALL OCCUPATIONS	48 (60.00)	32 (40.00)	34 (42.50)	46 (57.50)

Source: Survey Data

Note: Figures in brackets indicate the percentage share of each variety.

It is usually held that the use of HYVs is higher among bigger farms. We have not observed any such relation in our study area. Under group farming more of those in the lower and middle size groups (0.25 - 0.49 & 0.50 - 0.99) have shifted to HYVs (see table 4.15).

Table 4.15
Distribution of HYV Seed Use by the Size of Paddy Land Holding

Size class (in acres)	Under G. Farming		Before G. Farming	
	No.	%	No.	%
0.01-0.29	3	42.80	3	42.80
0.25-0.49	19	70.37	14	51.85
0.50-0.99	17	65.38	11	42.30
1.00-1.49	6	42.86	4	28.57
1.50-1.99	2	50.00	2	50.00
2.00 &>	1	33.33	0	00.00

Source: Survey Data

In the case of household income and HYV use also we fail to notice any relation. The only significant feature is

that both the lowest and highest groups appear to be less disposed to the use of HYVs (see Table 4.16).

Table 4.16
Distribution of HYV Seed Use by the Income of Households

Income class	Under g.farming		Before g. farming	
	No.	%	No.	%
<10000	2	25.00	2	25.00
10001-20000	23	76.66	16	53.33
20001-30000	13	56.52	9	39.13
30001-40000	6	66.66	4	44.44
40001-50000	2	50.00	2	50.00
>50000	2	33.33	1	16.66

Source: Survey Data.

Information gathered on the reasons for adopting the particular seed variety for cultivation brought out the following aspects: while higher productivity and Committee decision are mentioned for adopting HYVs, better taste, less care, better resistance to pests and diseases, ability to produce more straw etc. are mentioned as reasons for using traditional varieties.

4.4.3 Nursery Preparation

Community nursery, in place of the usual practice of each farmer organizing his own nursery, is one of the programmes visualized under Group Farming to bring down the cost of cultivation. In the study area, except in P1, where small groups of cultivators organized group nursery under group farming, in none of the other padasekharams was it undertaken. In these padasekharams the earlier practice of individual nursery continued. The main obstacle reported in organizing common nursery was the non-availability of land for community nursery and the fear of the cultivators that bringing up a common nursery

in their fields would reduce the fertility of their soil and delay cultivation.

4.4.4 Irrigation

Adequate irrigation and water control facilities is an essential component of paddy cultivation, especially for improved practices. In the group farming context, the ability of landholders to undertake timely cultivation, in all the fields together, requires assured water availability. Similarly, the use of weedicides for weed control, effective use of manure and fertilizers etc. need efficient water control facilities. It is seen that in the padasekharams of the present study, there exists no assured irrigation facilities. The main sources of irrigation are channels running from common ponds and rain water. Farmers had to block the channels running from the common ponds (which function as drainage channels) at different places to let water into the fields. As there are no field channels, field to field irrigation is practiced⁶. The silting of the ponds and consequently less water availability is reported. Though three of the padasekharam Committees have submitted project proposals to the Krishi Bhavan and Panchayat for rectifying these problems and developing their fields, in none of the padasekharams did we witness, land development, water control and infrastructure build up activities completed or underway. No change in the source or organization of irrigation has occurred in any of the padasekharams as part of the programme.

4.4.5 Manuring and Fertilizing

The organization and administration of manures and fertilizers also has not shown any noticeable change under group farming. The cultivators use both organic and inorganic manure for cultivation. The organic manure mainly consists of cattle-dung and oil cakes. About seventy per cent of the users reported having their own source of inorganic manure. An increasing tendency noticed in the case of application of organic manure is the substitution of cattle-dung with oil cakes, especially by those who do not possess their own source of cattle-dung. While before group farming 20 percent used oil cakes, their proportion increased to 25 percent under group farming. This is due to the disproportionate increase in the price of cattle-dung and its transport cost. The inorganic manure chiefly consists of phosphate, potash, urea and ammonia, with phosphate having a higher share. No arrangements to make fertilizers available at the field site with the help of producing companies, as envisaged under the Group Farming Programme, is reported from the Padasekharams; nor has any change taken place in the organization of manuring in the form of common purchase and application of manure. Some cultivators ~~have~~^{have}, especially those who have changed the seed variety to HYVs, mentioned increase in the quantity of fertilizers applied. This confirms the tendency of applying more manure to HYV seeds. The share of manure and fertilizers works out to around 15 percent of the total cost of cultivation.

4.4.6 Plant Protection

Plant protection is an area where significant gains, in the form of reduced costs and less pest attacks can be obtained if undertaken in common. In Padasekharam P1 a good number of land owners (62 per cent) have resorted to, at least once, group pesticide application during the group farming period. This was not done by all the land owners together, but only in small groups. In the other padasekharams, plant protection continued to be done individually, as practised before group farming. However, reduction in cost of plant protection is reported not only in P1 but, to a smaller extent, from other padasekharams also during that season. This suggests that, besides the factors like group application of pesticides and planting the same seed variety, some climatic factors have also reduced pestilence in that particular season.

The commonly used equipment for plant protection is Knapsack Spray which is usually hired. Only 8 per cent of the cultivators reported owning their own plant protection equipments.

The introduction of Agro-clinics for post planting crop care is a major institutional innovation envisaged under Group Farming. Accordingly, Krishi Bhavans should conduct weekly clinics on specific days close to each padasekharam, and advise farmers regarding pests and diseases, weed control and the general improvements in cultivation. Our survey shows that only in P1 an Agro-clinic is operating with certain amount of regularity; in the others though cultivators have expressed the

desire to avail themselves of its service, Agro-clinics are yet to start functioning. Discussions with the farmers of P1 revealed that, even there, the initial enthusiasm and regularity, shown by the Krishi Bhavan in operating agro-clinics is dying down.

4.4.7 Transport and Storage

As regards the transport cost, though it forms only about five percent of the non-material cost involved in paddy cultivation, group action in this area of activity is sure to bring gains to cultivators. Usually items are transported individually, the main items being seed, manure and farm outputs. These are transported mostly by hired workers by head load. The introduction of group farming has not changed this mode of transport in any of the padasekharams. Nor is any change introduced in storage facilities. Cultivators store the farm products using the available facilities at their disposal. However, the fact that 18 cultivators (22 per cent) reported that lack of storing facilities forced them to sell their produce (either paddy or straw) immediately after harvest, brings to focus the scope of group action in respect of storing. The sale of products immediately after harvest would fetch them only low prices, since usually during that period the prices are low.

4.4.8 Credit and Finance

In the present study we have tried to find out whether group farming has made any impact on the credit facilities available to the landholders. This plays an important role since

availability of adequate finance is a necessary factor for undertaking timely cultivation and care of crops. Most of the landowners finance the cultivation from their own savings. However the survey has reported seven cases of making use of credit for cultivation, though none of them exclusively for paddy cultivation. Of these, four took the credit from banking institutions and others from non-institutional sources. It is interesting to note that out of those seven borrowers only four actually used it for cultivation, the rest have used it for other purposes like house construction, building compound walls and for family use. It is the credits from banks that have been diverted like this which indicates a tendency of mis-using agricultural credit for other non-productive purposes. However we cannot generalize on the extent of this tendency since our sample covers only one panchayat.

Four landholders reported that they felt financial constraint in undertaking timely cultivation, but did not avail of credit from banks. This was because of the feeling that they do not stand to gain in cultivating paddy by taking credit at 8 to 10 percent interest. Group Farming has not made any change in the credit and other financial facilities available to landholders in any of the padasekhrams.

4.4.9 Marketing

It is seen that much of the farm produce is used for self consumption, the marketed portion of paddy for all the padasekhrams together being only 17.27 per cent before group

farming and 19.2 per cent under group farming (see Table 4.15). In the case of straw the marketed portion has a higher share; the shares being 45.65 per cent before group farming and 46.60 per cent under group farming.

However, we notice considerable variations between the padasekhrams in respect of the portion of paddy that is marketed. While in P1 the share was 29.81 per cent before group farming and 33.03 percent under group farming, in P3 it was only 5.41 and 6.38 per cent respectively. This variation may be explained by the existence of relatively larger farms in P1 than in P3. While in P1, 30 per cent of the farms are above one acre size, with an average size of 1.6 acres, in P3, it is only 20

Table 4.17
Marketed Share of Farm Produce (Padasekhram wise)

<u>Padasekhram</u>	<u>Paddy (paras)</u>		<u>Straw(bundles)</u>	
	UGF	BGF	UGF	BGF
P1	850 (33.03)	635 (29.81)	228 (62.60)	253 (61.25)
P2	110 (20.48)	110 (22.45)	59 (46.83)	59 (45.04)
P3	90 (6.38)	70 (5.41)	93 (32.98)	86 (29.97)
P4	335 17.40)	295 (17.00)	159 (41.41)	159 (40.76)
P5	125 (8.62)	100 (7.37)	147 (46.51)	146 (45.77)
TOTAL	1510 (19.12)	1210 (17.27)	686 (46.60)	703 (45.65)

Source: Survey Data

Notes: 1. Figures in brackets indicate percentage share of the marketed to the total production.

2. The figures for the period under group farming include those which are already sold and which are set apart for sale.

3. UGF : Under group farming BGF : Before group farming

per cent with an average size of 1.26 acres. Another aspect

noticed in relation to marketed share is that the portion that is sold increased much faster than the increase in production. For instance, Paddy production under group farming increased only 10.72 percent for all padasekharams together, but the portion that is sold increased by 24.80 per cent. This aspect becomes more obvious if we take the case of P1 alone, where paddy production increased by 20 per cent and portion sold increased by 34 per cent.

It is seen that about 35 per cent of those who sold their products, did so immediately after harvest, mainly due to lack of storing facilities, want of money and desire to avoid storing expenses. The others sold their products in the off-season, when prices are comparatively high or when the buyers approach them for the products. There are mainly three marketing channels reported: beaten-rice merchants, other households and mills. The average price received is about 28 Rupees per Para (a Para measures about 9 Kgs. of paddy). However, those who have sold to the beaten-rice merchants have usually received a higher price, i.e., 29 to 30 Rupees per Para. No change in the organization and pattern of marketing is reported since group farming.

4.5 Subsidies

Though so many subsidy schemes have been offered, as we have seen in the earlier chapter, our survey shows that its percolation to landholders is minimal. The subsidy offered under scheme (1) i.e., 40 paise per cent (Rs. 40 per acre) of land under

cultivation, are distributed among the cultivators. But the distribution has been partial. While in P1 90 per cent of the cultivators reported receiving this subsidy, in P5 only 17 percent received it. P2, P3 and P4 reported 80, 75 and 22 per cent respectively. In the case of subsidy item (2), ie; community nursery subsidy, though Krishi Bhavan sources reported distribution of Rs.800 each for one acre of community nursery to four padasekharams, none of the landholders, even those who undertook common nursery in small groups in P1, have reported receiving such a subsidy. All these suggests large scale leakage in the distribution of subsidies which are paid in cash.

None of the padasekharams have made use of the subsidies offered for land development in the form of soil amelioration, development of irrigation and water control facilities since no such activities were under taken anywhere, though as mentioned earlier project proposals for such activities are submitted by some padasekharams.

Conclusion

From the above account it is quite clear that in the five padasekharams of the study area, the functioning of Group Farming is very uneven both across padasekharams and activities. While in padasekharams P1 and P3 group farming has gained ground, in the other three padasekharams no headway has been made in group action. Even in those two padasekharams where some progress has been made in group farming, much differences exist in the scale of group operations undertaken. While in P3 group action to some

extent is reported only in selection of the same variety of seed and in soil preparation activities, in P1 group action in a measurable degree is seen in the case of nursery preparation, selection of seed variety, soil preparation and plant protection.

Different reasons exist for the variation in the scale of group farming in the different padasekharams. The leadership and organizing ability of the Convener is found to be one of the most important factors determining the success of the programme. This is very much evident in padasekharam P1, where cultivators openly acknowledged the significant role the Convener has played in undertaking group activities.

The socio-economic character of the landowners of the padasekharam is another major factor which has a bearing on the functioning of the Programme. Those paddy land holders who have salaried employment and other non-agricultural main sources of income have not shown equal interest nor given adequate support to group efforts. We notice some relation between the proportion of agriculturists in the padasekharams and the intensity (in terms of the number of operations done in group) of group farming in the area. We had seen in Table 4.4 that agriculturists (including pensioners) form more than half of the landowners only in padasekharams P1 (70 per cent), P3 (53.33 per cent) and P4 (57.18 per cent). And it is relevant to note that it is in two of these padasekharams that group farming has made headway, more significantly in padasekharam P1.

The lack of initiative and guidance on the part of the

Krishi Bhavan has been mentioned by some cultivators as one of the reasons for the poor functioning of the programme. It is reported that the officers have failed to educate, organize and initiate the cultivators to the Programme.

We noted that the proximity of the padasekharam to the Krishi Bhavan also has an influence on the functioning of the Programme. In the study area, the padasekharams which have made progress in group farming are those which are located near to the Krishi Bhavan. It may be that due to proximity to the Krishi Bhavan the officers of the Krishi Bhavan are able to give better attention to the running of the programme; the way the officer organizes and co-ordinates the work - plays important role in the success of the Programme.

The differences in the availability of irrigation facilities is another reason for the varying levels of success. Availability of adequate water in all the parts of the padasekharam is necessary for undertaking timely cultivation together. It is noticed that P1 has comparatively better water facilities than the others.

Added to all these is the political colour and undertones given to the Programme by interested circles. For instance certain political groups consider the Group Farming Programme as a means to spread the patronage and influence of the ruling parties among the cultivators. Such responses tend to divide the farming community and acts as a counter force to any innovative programmes introduced in the field.

Though such factors have influenced the success and failure of the Programme, landholders of P1 and P3, where group farming has made some impact, have reported measurable benefits due to the introduction of the Programme. Some of the important gains noticed are in terms of, a) lower cost, b) increase in output, c) better infrastructural support, d) uniform cropping pattern and e) technological diffusion. In the following chapter, we analyze the benefits that have accrued to the landholders and the change in costs incurred under the group farming programme.

Notes

1. In 1988-89, there were 21487 hectares of paddy land in Trivandrum district which was about 12 per cent of the gross cropped area of the district and 4 per cent of the total paddy land in the state.
2. Since there is hardly any leasing in\out of land, no distinction is made between operational and ownership holding.
3. 'Forced' in the sense that ploughers ploughed the fields without getting the consent of the owner of the land and collected the money.
4. It is seen that HYVs were introduced quite late in the area. The earliest use reported is in 1976. Many of those reported the use of HYVs used it intermittently, depending on climatic and plant disease factors.
5. This cultivator is a rich businessman, whose cultivation is looked after by a 'Karyastan' (care-taker). According to the agreement the Karyastan takes the straw (the by-product of paddy) in return for his service. TVs of paddy are known to produce more straw, so the Karyastan is interested in cultivating TVs. Besides, the owner is more interested in growing rice with a better taste - which TVs give.
6. Experiments conducted at Kerala Engineering Research Institute at Peechi have shown that the practice of field to field irrigation results in a loss of 30 per cent of water when compared to channel irrigation (Chackacherry and Jayakumar, 1990). Besides the lack of field channels with proper control structures, inadequate drainage facilities resulting in water stagnation and flooding, lack of uniformity in the system of cultivation (this aspect has improved very much under group farming in those padasekharams where it is practiced) and lack of sense of economic use of irrigation water are some of the commonly found and reported problems regarding irrigation.

CHAPTER 5

IMPACT OF GROUP FARMING ON COST AND RETURNS

5.1. Introduction

The difficulties faced in calculating the cost of production in agriculture are well known, particularly in handling owned inputs like family labour and land. Also, though we did come across some cultivators who kept regular accounts of their income and expenditure, in general this was not so. Imputing a market wage to family labour - especially for the managerial functions - need not be accurate in many ways. Similarly, whether we should include ground rent of land to cost of cultivation is debatable¹. Though conscious of these limitations we have followed the conventional methodology adopted by the Department of Economics and Statistics of the Government of Kerala in estimating cost of cultivation.

The main cash and kind expenses which are identified for the calculation of cost consist of:

- 1) Human Labour²
- 2) Animal Labour
- 3) Machine Labour
- 4) Seed and Seedlings
- 5) Organic Manure
- 6) Chemical Fertilizers
- 7) Plant Protection Chemicals and Weedicides
- 8) Transport and other Expenses.

Some of the owned inputs to which values are imputed are:

- i) Family Labour: Values are imputed to family labour on the basis of average wage rate per workday of hired labour.
- ii) Owned Seed: This is estimated at the prices prevalent in the Panchayat at the time of sowing.
- iii) Owned Manure: Price of owned manure is estimated at the current prices of manure in the area.
- iv) Payments in kind: Payment in kind, like paddy share given for harvesting and threshing is estimated at the average price of paddy prevalent in the area and this is taken as the cost of labour for harvesting and threshing.

The concept of cost used here include all the paid out expenses in cash and kind as also the imputed costs of owned inputs, including family labour. This differs from the cost Concept 'A' of the Department of Economics and Statistics which excludes cost of family labour³.

In the survey area paddy is cultivated in two seasons, Virippu (Autumn) and Mundakan (Winter). The data collected for the present study is of Virippu season of 1989 (before group farming) and the same season for 1990 (under group farming).

5.2 Group Farming and Cost of Cultivation of Paddy

In this section we will examine the impact group farming has made on the cost involved in paddy cultivation for the different padasekharams and the various size-classes. On the average, a general decrease in the cost of cultivation is observed in all the padasekharams and the different size-class of

holdings (see Table 5.1; see also Appendix 5.1). However the reduction in cost is seen to be statistically significant (at 5 per cent level of significance) only in padasekharam P1. What impresses one from the Table is the uneven impact of group farming, to capture which we need to undertake a disaggregated analysis.

The cost of cultivation of paddy can be broadly classified into labour cost and material cost, which in turn can be further disaggregated into their various components. We will first examine the impact group farming has made on labour cost by different operations for the different padasekharams.

5.2.1 Labour Cost

The cost of labour on an average account for around 70 per cent of total cost of cultivation. We get a picture of the labour cost involved in the various operations before and under group farming in the different padasekharams from Table 5.2 (also see Appendix 5.2). A padasekharam-wise analysis is given below.

5.2.1.a Padasekharam P1

In padasekharam P1 significant reduction in the labour cost is seen under group farming (see Table 5.2). Among the different operations a statistically significant decrease is observed in the cost of nursery, soil preparation, weeding and plant protection. It may be noted that it is in these operations in which measurable group action is reported. It may also be pointed out that excluding nursery and plant protection the

Table 5.1
Cost of Cultivation (Total) under and before Group Farming (Rs. Per Acre)
(PADASEKHARAM & SIZE OF HOLDING-WISE)

Padase kharams	0.01-0.24			0.25-0.49			0.50-0.99			1.00-1.49			1.50-1.99			2.00 & >			All sizes		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
P1	-	-		5584.66	5063.71	-9.33	4900.97	4579.39	-6.56	4847.33	4422.89	-8.76	4567.66	4232.66	-7.33	4594.25	4128.34	-10.14	4898.97	4485.40	-8.44*
P2	5348.20	5342.51	-0.11	4683.32	4645.96	-0.80	-	-		4322.81	4303.28	-0.45	-	-		-	-		4785.47	4756.86	-0.60
P3	5321.43	5321.43	0.00	5350.60	5277.00	-1.38	5015.52	4717.31	-5.95	4511.03	4191.30	-7.09	-	-		-	-		5049.65	4876.76	-3.42
P4	5255.00	5265.00	0.19	4998.03	5009.76	0.23	5138.09	5112.92	-0.50	4570.64	4568.38	-0.05	4404.54	4399.33	-0.12	4110.78	4087.39	-0.57	4746.18	4740.47	-0.12
P5	5707.72	5707.72	0.00	5254.41	5224.19	-0.58	4468.55	4478.75	0.23	4659.44	4599.46	-1.29	4877.49	4794.74	-1.70	-	-		4993.53	4960.98	-0.65
Average	5408.09	5409.17	0.02	5174.20	5044.12	-2.51	4670.78	4512.09	-3.40	4665.58	4500.40	-3.54	4616.56	4475.58	-3.05	4352.52	4107.87	-5.62	4894.76	4764.09	-2.71

Source: Survey data

* significant at 5 per cent level

Table 5.2
Labour Cost of Cultivation (Rs. Per Acre)
(PADASEKHARAM AND OPERATIONS-WISE)

Operations	Padasekharams			P1			P2			P3			P4			P5		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change			
Nursery	238.48	212.21	-11.01*	282.07	283.03	0.34	285.69	285.69	0.00	251.08	251.08	0.00	274.19	274.19	0.00			
Land Preparation	1042.67	699.68	-32.90*	1034.33	1034.33	0.00	1045.29	851.26	-18.56*	1016.04	1016.04	0.00	1043.01	1043.01	0.00			
Sowing/Transplanting	458.03	455.38	-0.58	466.13	466.13	0.00	443.17	441.20	-0.45	476.47	476.47	0.00	506.46	506.46	0.00			
Manuring & Fertilizing	95.54	95.54	0.00	116.39	116.39	0.00	108.87	108.87	0.00	91.08	92.80	1.88	95.74	95.74	0.00			
Weeding	322.59	219.98	-31.81*	300.06	282.59	-5.82	294.33	287.28	-2.40	284.31	274.80	-3.35	326.65	286.71	-12.23*			
Plant Protection	85.45	66.88	-21.73*	90.37	90.37	0.00	95.19	94.17	-1.07	102.28	98.95	-3.26	77.97	77.97	0.00			
Irrigation & Supervision	464.70	467.47	0.60	411.91	411.91	0.00	510.61	528.96	3.59	364.72	364.72	0.00	374.99	374.99	0.00			
Transport	84.15	80.36	-4.50	92.67	99.18	7.03*	121.94	124.23	1.87	67.97	69.73	2.60	77.70	78.49	1.02			
Harvesting & Threshing	930.52	930.52	0.00	859.90	859.90	0.00	994.20	994.20	0.00	1033.25	1033.25	0.00	1063.56	1063.56	0.00			
Drying & Storing	188.31	185.95	-1.25	219.29	219.29	0.00	202.81	202.81	0.00	201.94	201.94	0.00	222.43	222.43	0.00			
TOTAL	3910.44	3414.00	-12.70*	3873.13	3863.13	-0.26	4102.10	3918.66	-4.47	3889.15	3879.78	-0.24	4062.70	4022.68	-0.99			

Source: Survey Data

* Significant at 5 per cent level.

significant reduction in cost under the other operations was greatly assisted by the introduction of technological and biological inputs in the form of mechanization of tilling⁴ and the increased use of weedicides⁵ under group farming. The implications of this in terms of labour displacement would be significant. The labour cost involved in other operations has either shown only marginal changes or has remained stagnant. These are also the operations in which no group activity has been reported. A peculiar characteristic of this region should be noted which perhaps explains the stagnancy in costs under harvesting and threshing. While in most places of Kerala, wage payments for harvesting and threshing are made on a crop-sharing basis, in the region under study it is made on the basis of the area harvested. In this system while the labourers are assured of a fixed share, whether the harvest turns out to be poor or good, it has the disadvantage of denying the labourers an increased share in case of a better harvest⁶.

5.2.1.b Padasekharam P3

The labour cost data for padasekharam P3 shows significant decrease under group farming in the cost of soil preparation and a marginal decline in cost of weeding and plant protection. The reduction in the cost of soil preparation is the result of mechanization and common tilling introduced under group farming. However we notice that the percentage reduction in the cost of soil preparation in P3, is lower than in P1 since the rate of participation in common tilling in P3 is much lower.

While in Padasekharam P1, 95 per cent of the cultivators participated in mechanized collective tilling, in P3 only 65 per cent joined in it. The rest for various reasons (mentioned in the previous chapter) kept away and continued to use bullock for soil preparation. No group action is reported in the other operations, hence the marginal reduction in cost seen in the case of weeding and plant protection is to be attributed to favourable climatic factors. In fact cultivators have mentioned variations in the growth of weeds and attacks by pests between years and even seasons.

5.2.1.c Padasekharams P2, P4 and P5

In the remaining three padasekharams only in ^{the} case of labour cost for transport in P2 and weeding in P5 do we notice any significant change. With respect to other operations either there have been only insignificant changes or none at all. Since no group action is reported from these padasekharams, though they have been enlisted under the Group Farming Programme, the change in transport cost could be attributed to incidental⁷ factors and in weeding to favorable climatic factors.

5.2.1.1 Impact of Group Farming on Various size Holdings with Regard to Labour Cost

Since cost of labour has registered some decline under group farming, it would be interesting to see its impact in relation to size of holdings to ascertain the benefits (if any) accruing to smaller farms through group action (see Table 5.3).

Table 5.3
Labour Cost (Total) of Cultivation by Size of Holding (Padasekharam-wise)

Size Class (in acres)	P1			P2			P3			P4			P5		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01-0.24	-	-		4317.91	4317.90	-0.00	4314.29	4314.29	0.00	4420.00	4420.00	0.00	4663.83	4663.83	0.00
0.25-0.49	4612.34	4107.89	-10.94	3824.13	3809.77	-0.38	4355.90	4256.52	-2.28	4076.53	4083.76	0.18	4287.34	4248.89	-0.90
0.50-0.99	3987.50	3453.19	-13.40	-	-		4028.99	3713.03	-7.84	4269.65	4224.19	-1.06	3670.78	3644.36	-0.72
1.00-1.49	3735.00	3296.75	-11.73	3477.35	3461.72	-0.45	3709.21	3390.79	-8.58	3659.61	3662.94	0.09	3807.79	3750.06	-1.52
1.50-1.99	3565.00	3188.33	-10.57	-	-		-	-		3525.00	3519.79	-0.15	3883.74	3806.24	-2.00
2.00 &)	3652.38	3023.82	-17.21	-	-		-	-		3384.09	3367.98	-0.48			
Average	3910.44	3414.00*	-12.70	3873.13	3863.13	-0.26	4102.10	3918.66	-4.47	3889.15	3879.78	-0.24	4062.70	4022.68	-0.99
S.D	378.23	374.15	-1.08	1791.85	1784.54	0.20	450.22	584.62	29.85	601.80	591.60	-1.69	549.62	544.73	-0.89

Source: Survey Data

* significant at 5 per cent level

The data reveal an inverse relationship between the size of holding and labour cost per acre with substantial variation between the groups. Given the fact that smaller farms tend to use a higher degree of labour per unit of land in particular family labour, and we are imputing a cost to family labour, this result is not surprising.

As far as the impact of group farming is concerned, the inverse relationship mentioned above is maintained. However, data for Padasekharam P1 shows significant decrease in labour cost in all size-class of holdings, but the variation in cost between the size-classes, as measured by the standard deviation, has registered only a small decline due to the disparate behavior, operation-wise.

An operation-wise analysis shows that in the case of nursery preparation, though there has been a substantial decrease in cost under group farming, the deviation between the size-groups has increased (see Appendix 5.5). This is because, only the size-groups 0.50-0.99, 1.00-1.49 and 1.50-1.99 have significantly gained from the group nursery undertaken in padasekharam P1 under group farming. On the other hand as a result of common tilling the variation in the cost involved in soil preparation across all size classes has been remarkably reduced under group farming. Similarly the variation between the groups with regard to weeding and plant protection too has considerably reduced. Due to this differential behavior the variation in the total labour cost between size-classes has registered only a small decline.

In padasekharam P2 the inverse relation between the size-classes with regard to labour cost has not shown any marked change under group farming period (see Table 5.3). The operation-wise analysis also gives a similar picture (see Appendix 5.6).

However the data for padasekharam P3 shows that the variation between the size-classes has increased under group farming (see Table 5.3). This is because the reduction in labour cost registered in P3 was not equally felt in the different size-classes. For instance while the size-class 1.00-1.49 showed an 8.58 per cent decrease in labour cost under group farming, in the 0.01-0.24 class there has been no change and in the size-class 0.25-0.49 the decrease was only 2.28 per cent. The operation-wise analysis (see Appendix 5.7) shows that the cultivators belonging to the lowest size-class kept away from the mechanized, common soil preparation, which denied them the benefits of cost reduction; hence the increase in the variation of labour cost between size-classes.

In padasekharams P4 and P5 the changes in labour cost have been marginal in all the size-classes and do not show any pattern (see Table 5.3). Interestingly these changes have reduced the variation between the size-classes marginally even without the operation of group action. Operation-wise data shows a notable reduction in variation in the labour cost of weeding in both P4 and P5 (see Appendices 5.8 and 5.9). In other operations no significant change in variation has occurred.

5.2.2 Material Cost

The cost of materials is the other important component of cost accounting for about 30 per cent of the total cost. What has been the impact of group farming on material costs in the different Padasekhrams and on different size of holdings?

In padasekharam P1 the total material cost of cultivation has increased under group farming (Table 5.4). This is due to the imposing increase in the cost of weedicides, and the significant rise in the cost of inorganic manure. The cost incurred on weedicides has shown a five fold increase owing to its large scale use under group farming. The functioning of Agro-clinics and the comparatively better water control facilities available in P1 have contributed ^{to} (in) the spread of the use of weedicides. The increase in the use of organic manure and inorganic manure is associated with the increase in the use of HYVs. No group action in the purchase or use of these materials is reported under group farming. On the other hand, the cost of seed and plant protection chemicals has reduced significantly in the latter period. The reduction is contributed by the common nursery and group application of pesticides and insecticides reported by a good number of cultivators in padasekharam P1. This focuses our attention on the potential gains from economies of size which could be exploited through group action.

In the other padasekharams no statistically significant change is observed in the cost of materials (see Table 5.4). In the case of organic manure and inorganic manure there is a marginal increase in cost in the last three padasekharams. This is attributed to the increased application of manure due to the

Table 5.4
Material Cost of Cultivation (Rs. Per Acre)
(PADASEKHARAM and MATERIAL-WISE)

Padase-kharans	Seed			Organic Manure			Inorganic Manure			P.P Chemicals			Weedicides			TOTAL		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
P1	144.66	130.01	-10.12*	324.88	337.82	3.98	402.14	456.79	13.59*	108.02	89.59	-17.06*	8.82	57.19	548.22*	988.53	1071.40	8.38*
P2	154.64	153.68	-0.62	285.05	282.17	-0.34	369.66	367.16	-0.67	102.30	97.77	-4.43	-	-	-	912.34	893.73	-2.04
P3	170.95	169.99	-0.56	319.03	327.21	2.56	347.56	353.31	1.65	110.01	107.60	-2.19	-	-	-	947.55	958.10	1.11
P4	157.46	157.46	0.00	266.85	270.39	1.33	335.46	336.52	0.32	97.27	96.32	-0.97	-	-	-	857.03	860.69	0.43
P5	158.75	158.75	0.00	343.49	344.69	0.44	332.78	340.55	2.48	95.80	94.30	-1.61	-	-	-	930.83	938.30	0.93
Average	157.29	153.98	-2.11	307.86	312.46	1.49	357.52	370.87	3.73	102.68	97.11	-5.42	1.76	11.44	548.22	927.26	944.44	1.85

Source: Survey Data

* Significant at 5 per cent level

increase in use of HYV seeds under the group farming. The use of plant protection chemicals has also shown a general decrease in the different padasekharams, though there is considerable variation between them. As mentioned in the earlier section, this reduction is due to climatic factors.

5.2.2.1 The Impact of Group Farming on Material Costs in the Different Size of Holdings

We now examine Table 5.5 in order to analyze the impact of group farming with regard to material cost incurred by size of holdings. We had noticed an inverse relation in the case of labour cost and size of holdings, but with regard to material cost no clear pattern is seen. However when considered item-wise, in the case of fertilizers a near direct relationship is observed, while with respect to other materials the relationship is generally inverse, with considerable variations between the groups (see Appendix 5.10).

In padasekharam P1 due to a marginal decrease in the cost incurred by the first size group and different rates of increase registered in other groups, the variation between the groups shows a 5.25 per cent decrease under group farming. When the decrease is considered material-wise it is observed that the variation in the cost of seed, fertilizers and plant protection chemicals has considerably reduced under group farming, while it has increased in the case of organic manure and weedicides owing to the varying rate of increase in their cost registered in the

Table 5.5
Material Cost (Total) of Cultivation by Size of Holding (Padasekharam-wise)
 (Rs. per acre)

Size Class (in acres)	P1			P2			P3			P4			P5		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01-0.24	-	-		1030.29	1024.61	-0.55	1007.14	1007.14	0.00	835.00	845.00	1.20	1043.89	1043.89	0.00
0.25-0.49	972.32	955.82	-1.70	859.19	836.19	-2.68	994.70	1020.48	2.59	921.50	926.00	0.49	967.07	975.30	0.85
0.50-0.99	913.47	1126.20	23.29	-	-		986.53	1004.28	1.80	868.44	888.73	2.34	797.77	834.39	4.59
1.00-1.49	1112.33	1126.14	1.24	845.46	841.56	-0.46	801.82	800.51	-0.16	911.03	905.44	-0.61	851.65	849.40	-0.26
1.50-1.99	1002.66	1044.32	4.15	-	-		-	-		879.54	879.54	0.00	993.75	988.50	-0.53
2.00 & >	941.87	1104.52	17.27	-	-		-	-		726.69	719.41	-1.00	-	-	
Average	988.53	1071.40	8.38*	912.34	893.73	-2.04	947.55	958.10	1.11	857.03	860.69	0.43	930.83	938.30	0.93
S.D	68.70	65.10	-5.25	84.08	87.58	4.17	84.46	91.19	7.98	64.79	67.84	4.72	91.68	82.14	1.89

Source: Survey Data

* Significant at 5 per cent level.

various groups (see Appendix 5.11). The fact that group nursery and common plant protection has considerably reduced the variation between the groups brings out the efficacy of group activity in reducing the cost differences between the size of holdings.

In the other padasekharams marginal changes are seen in the material cost. (see Table 5.5 and Appendices 5.12, 5.13, 5.14 and 5.15). However, these changes are not reflected evenly in the various size-classes. Hence they have, in most case, resulted in increasing cost variation between the groups.

The above analysis on cost of cultivation may be summarized as follows:

i) There is a general decrease in the in the labour cost involved in paddy production under group farming. However it is not statistically significant for all padasekharams. In padasekharam P1, where significant reduction in labour cost is seen in the case of nursery, soil preparation, weeding and plant protection, the role of group action is evident. Similarly, in padasekharam P3, group action in soil preparation is reflected in the decrease in labour cost involved in that operation. In the other padasekharams the marginal decrease in the cost of labour is contributed mainly by the decrease in weeding and plant protection cost which is due to favorable climatic factors rather than the result of any group activity. The experience of padasekharam P1, however, highlights the efficacy of group farming in reducing labour cost of paddy cultivation, which as we

observed earlier was assisted by the adoption of mechanical/biological inputs.

ii) An inverse relation is observed between farm size and the labour cost involved in paddy cultivation both before and under group farming. However there is a small reduction in variation between size groups in P1 contributed largely by the reduction in weeding, soil preparation and plant protection costs, in which group action is reported. This highlights the positive impact of group farming in reducing variation between size-groups. In padasekharam P3, however, there was an increase in the variation mainly due to the differential participation rates of the cultivators of different size-classes in the common tilling.

iii) The effect of group farming on material cost on average has been insignificant. Only in padasekharam P1 has there been a significant change under group farming, in the form of decrease in the cost of seeds and plant protection chemicals and increase in the cost of fertilizers and weedicides. In the other Padasekharams, the non-functioning of group farming is reflected in the cost structure of materials also, which shows no major change under the group farming, compared to the earlier situation.

iv) On examining the material cost according to the size of holding, in the case of cost of seed, organic manure and plant protection chemicals, the relationship is more or less inverse but in the case of inorganic manure the relation is direct, the

cost increasing with increase in land size. The variation in material cost between the different size of holdings has shown a decrease in padasekharam P1 under group farming, while it has marginally increased in other Padasekharams during the group farming period.

Hence it is only in P1 and to some extent in P3 that group action across a fairly wide range of operations was undertaken by almost all size-class of cultivators. The decrease in cost was most significant on account of reduction in labour cost and very little benefit has been derived in reducing cost of materials through group functioning.

5.3 Group Farming and its Impact on Paddy Production

The returns from paddy is constituted of the value of paddy, the main output, and straw its by product. The current price of paddy is around 28 rupees per para (Rs.3 per Kg.) and the average price of straw is Rs.60 per bundle or about Rs.1.50 per kg. Over the years, while the price of paddy has shown only marginal increases, the demand and hence the price of straw has been consistently increasing. We shall assess below the impact of group farming on paddy production in the various padasekharams.

The average per acre output of paddy during the two periods for the different padasekharams are given in Table 5.6. We observe a general increase in paddy yield under group farming by about 10.5 per cent, but a decrease in straw output, with

considerable variations between the padasekharams. Not surprisingly the changes have been most significant in padasekharam P1 followed by P3.

Table 5.6
Production of Paddy in the different Padasekhrams (Per Acre)

padasekharams	Paddy (in Paras)			Straw(in bundles)			Total Value (in Rs.)		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
P1	138.93	166.22	20.33*	26.07	23.32	-10.55*	5454.24	6053.36	10.98*
P2	102.26	110.45	7.91*	27.22	26.65	-1.93	4496.77	4691.49	4.26
P3	117.07	129.62	10.72*	28.48	27.05	-5.03*	4986.54	5251.99	5.32*
P4	132.61	143.56	8.25*	27.37	26.96	-1.50	5355.87	5637.39	5.25*
P5	127.69	133.51	4.71	28.27	28.15	-0.42	5271.87	5427.58	3.01
Average	123.71	136.67	10.48	27.48	26.43	-3.89	5113.06	5412.36	5.74

Source: Survey Data

* significant at 5 per cent level

The fact that production has increased in all padasekharams, even those where no group action was reported suggests that the increase/decrease in the production of paddy and straw appears to be related not only to the extent of group farming but also the change to high yielding variety of paddy reported from the different padasekharams. As we had pointed out earlier, there was a general increase in the use of HYVs under group farming. Altogether 17 per cent of the cultivators (15 per cent of area) changed from TVs to HYVs; in padasekharam P1 it was 35 per cent of cultivators (area, 30 percent); padasekharam P2, 10 percent (area, 7 percent); padasekharam P3, 20 per cent (area, 12.34 percent); padasekharam P4, 9 per cent (area, 11 per cent) and padasekharam P5, 5 per cent (area, 4.9 per cent). The HYVs are known to be more productive than T.Vs, but tend to give less straw.

In order to obtain an idea of the impact of this shift to HYVs an estimate of the production in each padasekharam, eliminating those cases which have reported change in seed variety has been made and the results are given in table 5.7. It is seen that, on an average, there is now an increase of 5 per cent in the output of paddy and an insignificant (.57 per cent) decrease in the production of straw. This could be taken as a proximate estimate of the increase in output due to group farming and favourable climatic factors. On the other hand the difference in growth of paddy output as indicated by Tables 5.6 and 5.7 can be attributed to the impact of change in seed variety. Further, the data in Table 5.7 suggest that the effect of group farming on production is even lower than it appears. This is evident from the fact that the differences in the percentage change in paddy output between padasekharam P1, where group farming has made its highest impact and padasekharam P2, where no group farming is reported, is only 1.82 per cent. The impact of HYVs on output in P1 appears to have been overwhelmingly high, the exclusion of which reduced the percentage increase in output to 6.52 per cent while the increase in P2 was 4.70 per cent.

Table 5.7
Production of Paddy Excluding those Households which
have Changed in to HYVs under Group Farming (Per Acre)

padasekharams	Paddy (in Paras)			Straw(in bundles)			Total Value (in Rs.)		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
P1	153.47	163.48	6.52	24.16	24.16	0.00	5746.76	6027.04	4.88
P2	102.56	107.38	4.70	26.94	26.16	-2.90	4488.08	4576.24	1.96
P3	120.06	126.05	4.99	26.13	26.15	0.08	4929.48	5098.40	3.43
P4	134.17	140.25	4.53	27.28	27.28	0.00	5293.56	5463.80	3.22
P5	128.39	132.67	3.33	27.09	27.09	0.00	5220.32	5340.16	2.30
Average	127.73	133.97	4.89	26.32	26.17	-0.57	5135.64	5301.13	3.22

Source: Survey Data

Thus we see that the significant increase in paddy output obtained under group farming is the cumulative effect of increased use of HYVs, favorable seasonal factors and the advantages⁸ derived from group cultivation.

5.3.1 Impact of Group Farming on Returns in Different Size of Holdings

In order to assess the impact of group farming on the paddy production by size of holding, a size class-wise estimate of the output from paddy cultivation in the different padasekharams is presented in Table 5.8. The Farm Management Survey (FMS) had observed an inverse relation between productivity and farm size (Bharadwaj, 1974). The results of the present survey, however, do not show any clear pattern as Bharadwaj's own analysis, crop wise, had indicated. It is seen that only in padasekharam P1, where group farming made its highest impact, has the variation between the groups decreased

Table 5.8
Returns (Total) from Paddy Cultivation by Size of Holding
(PADASEKHARAM-WISE)

Size class (in acres)	P1			P2			P3			P4			P5			All Padasekharams		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
0.01-0.24	-	-		4693.08	4919.04	4.81	5114.24	5434.00	6.25	5305.60	5576.08	5.10	5366.00	5366.00	0.00	5119.73	5323.78	4.04
0.25-0.49	5085.24	5969.88	17.40	4711.84	4960.56	5.28	4903.16	5224.60	6.56	5234.56	5803.76	10.87	6156.88	6316.20	2.59	5218.34	5655.00	8.54
0.50-0.99	5147.16	6225.12	20.94	-	-		5176.20	5487.88	6.02	4978.08	5224.08	4.94	4962.20	5260.24	6.01	5065.91	5549.33	9.48
1.00-1.49	6040.92	6270.04	3.79	4085.40	4194.88	2.68	4752.56	4861.48	2.29	5073.04	5229.28	3.08	5066.28	5299.80	4.61	5003.64	5161.74	3.06
1.50-1.99	5426.68	5706.68	5.16	-	-		-	-		6059.68	6252.32	3.18	4808.00	4895.64	1.82	5431.45	5618.21	3.39
2.00&>	5571.20	6095.08	9.40	-	-		-	-		5484.28	5738.80	4.64	-	-		5527.74	5916.94	7.02
Average	5454.08	6053.36	10.98*	4496.77	4691.49	4.26	4986.54	5251.99	5.32*	5355.87	5637.39	5.25*	5271.87	5427.58	3.01	5113.03	5412.36	5.92*
S.D	343.25	202.66	-40.96	290.99	351.57	20.82	168.80	245.98	45.72	353.98	355.26	0.36	478.63	473.44	-1.08	149.47	188.97	26.42

Source: Survey Data

* Significant at 5 per cent level

significantly. In the other padasekharams it has either increased or has shown only marginal changes.

When we examine the figures for paddy and straw output separately we find that in padasekharam P1 the variation in paddy output between the size-classes has been reduced under group farming (see Appendix 5.16). Production figures of the lower size - classes have registered a higher increase of 30 per cent and are now on par with other groups.

Among the other padasekharams, in P5 the variation in paddy output has shown a marginal decrease and in the rest there has been a general increase in the variation between the size groups under group farming, implying that the increase in production under group farming in these padasekharams was not equally felt in the different size of holdings (see Appendices 5.17, 5.18, 5.19 and 5.20).

The results of the above analysis of paddy production under the two periods may be summarized as follows:

i) There has been a general increase in the production of paddy under group farming. The highest increase is noticed in padasekharam P1 which has reported considerable group effort. However this is not entirely due to extent of group farming adopted but is also related to the change in seed variety and favorable climatic factors. The production of straw which has shown a marginal decrease in all the padasekharams is on account of the shift in seed variety.

ii) An estimate of the relation between production and size of holding reveals no neat pattern both before and under group farming. In padasekharam P1, where substantial group farming is seen, the variation in production between size holdings has been reduced under group farming as a result of the larger production increase registered in the lower size-groups. In the other padasekharams no major changes in the size-class variation has occurred under group farming.

5.4 Profitability of Paddy Cultivation : A Comparative Analysis

In this part our attempt is to make a comparative analysis of the profit/loss from paddy cultivation, in the two periods of study. Table 5.9 provides a summary of the cost, returns and profit/loss from Paddy in the different Padasekharams.

Table 5.9
Profit/loss From Paddy Cultivation

Padase kharams	BGF			UGF		
	Cost	Returns	Profit/loss	Cost	Returns	profit/loss
P1	4898.97	5454.08	555.11	4485.40	6053.36	1567.96
P2	4785.47	4496.77	-288.70	4756.86	4691.49	-65.37
P3	5049.65	4986.54	-63.11	4876.76	5251.99	375.23
P4	4746.18	5355.87	609.69	4740.47	5637.39	896.92
P5	4993.53	5271.87	278.34	4960.98	5427.58	466.60
Average	4894.76	5113.03	218.27	4764.09	5412.36	648.27

Source: Survey Data.

The data show different profit/loss pictures for the padasekharams. In the case of padasekharam P1 it is found that

under group farming the profit increased by Rs.1012.85 (from 555.11 to 1567.96) in which the share of decrease in cost is Rs.413.57 and increase in returns is 599.28 rupees. Padasekharam P2 experienced loss both before and under group farming, however, the amount of loss has been considerably reduced in the latter period. Here the increase was Rs.223.33 in which the share of cost reduction is Rs.28.61 and of output increase Rs.194.71. In P3, the loss of Rs.63.11 incurred before group farming has been converted to a profit of Rs.375.23 under group farming, the increase being Rs.438.34. Of this increase Rs.172.89 is due to decrease in cost and the rest (Rs.265.45) is derived from increased output. In P4 the profit increased by Rs.287.23 (from 609.69 to 896.92 rupees) in which Rs.5.71 is contributed by decrease in cost and Rs.281.52 due to increase in returns. An increase in profit of Rs.188.25 is seen in P4 (from Rs.278.34 to Rs.466.60) in which the share of reduced cost is Rs.32.55 and that of increased returns is Rs.155.71.

The following findings emerge out of the above analysis.

i) The increase in profits seen in padasekharam P1 and to a lesser extent in padasekharam P3 is remarkably higher than that of other padasekharams; and

ii) The increase in profits observed in padasekharams P4 and P5 and reduction in loss in P2 is contributed mostly by increase in output with the decrease in cost playing an insignificant role. But in the case of padasekharams P1 and P3 reduced costs have made a major contribution in the profit increases registered under group farming.

These two aspects highlight the fact that only in padasekharam P1 and to a lesser extent in P3 has group farming made some impact ensuring gains to cultivators in the form of reduced costs. In the other padasekharams the increase in profit is mainly derived from increase in output which, as we saw earlier, is contributed largely by factors other than group farming.

5.4.1 Estimate of Profit/Loss According to Various Cost Concepts.

In the above estimate of profit/loss we have not taken in to account interest on working capital and fixed capital (owned or otherwise) which we now include to estimate all operational costs. Interest on working capital has been taken as 10 per cent of all paid out expenditure.

Table 5.10 gives the estimate of profit/loss from paddy cultivation under different concepts of cost, which could be more inclusive or exclusive than the concept we have used. The data relates to the average figures for the five padasekharams. It is seen that when the interest on working capital is added to the cost, the profit from Paddy diminishes from what it was before (see the average profit given in Table 5.9 and item 5 of Table 5.10). However, if we deduct the cost of family labour from total cost, the average profit of cultivators increase by about Rs.500 (see item 6). But the situation changes altogether, when the interest on fixed capital is added to the total cost (see item 8).

Now we see the cultivators incurring loss of Rs.1915.67 before group farming and Rs.1481.02 under group farming.

Table 5.10
Profit/Loss of Paddy cultivation According to Different
Concepts of Costs (Per Acre)
(in Rs.)

	BGF	UGF
1.Gross Returns (Paddy and Straw)	: 5113.03	5412.36
2.Cost of Cultivation(Labour ^{\$} & Material):	4894.76	4764.09
3.Interest on Working Capital*	: 113.82	109.17
4 Cost of Production (2 + 3)	: 5008.58	4873.26
5.Profit/Loss (1 - 4)	: 104.45	539.10
6.Profit/Loss if Family Labour cost is excluded @	: 613.16	1056.76
7.Interest on Fixed capital#	: 2020.12	2020.12
8.Net Profit/Loss (5 - 7)	: -1915.67	-1481.02

Source:Survey Data.

Notes: \$ This includes imputed cost of family labour.

* The interest on working capital is calculated at the rate of 10 per cent for 4 months after deducting the cost of family labour (since this does not come under paid out cost) and the cost of harvesting and threshing (as this cost is incurred in kind only)

@ Since family labour cost is not paid out, farmers usually exclude it from cost estimates and gets included as profit.

Interest on the value of fixed assets such as farm land (estimated at the current market rate which is about 60,000 rupees per acre), draught animals and implements (no farm building etc. are reported) at the rate of 10 per cent per annum, for 4 months.

The results of a similar exercise done for the padasekharams separately are given in Table 5.11. It shows that despite the inclusion of interest on working capital, almost all the padasekharams are making a profit under group farming, except one which was already incurring a loss.

Table.5.11
Profit/Loss (per acre) Under Different Cost Concepts
(Padasekharam-wise)

Padasekh- khrams	Profit/loss as defined in item 5 of table 9 ^a		Profit/loss as defined in item 6 of table 9 ^b		Profit/loss as defined in item 8 table 9 ^c	
	BGF (2)	UGF (3)	BGF (4)	UGF (5)	BGF (6)	UGF (7)
P1	442.69	1469.52	1038.49	2071.03	-1640.64	-613.81
P2	-399.57	-175.01	199.57	632.64	-2419.76	-2195.13
P3	-180.45	264.81	372.91	835.02	-2200.57	-1755.31
P4	493.74	785.58	876.85	1152.63	-1618.40	-1326.56
P5	162.07	350.43	603.89	762.64	-1992.29	-1803.93

source : Survey Data.

- Notes : a. Profit/loss if interest on fixed capital is excluded.
b. Profit/loss if interest on fixed capital and imputed cost of family labour is excluded.
c. Profit/loss if all costs are included.

When cost of family labour is excluded from the cost of cultivation, we find that cultivators in all the padasekharams derive a profit, which has increased under group farming, though at different rates (see column 4 and 5). However, when the net profit/loss is estimated (by adding interest on fixed capital to the cost) we notice that cultivators in all the Padasekharams including P1 incur losses (see column 6 and 7). But the loss has been reduced under group farming, especially in respect of padasekharam P1. The conclusion we can draw from the above is that when the cost of production is calculated in its broadest sense, group farming has only helped in reducing the loss from Paddy cultivation.

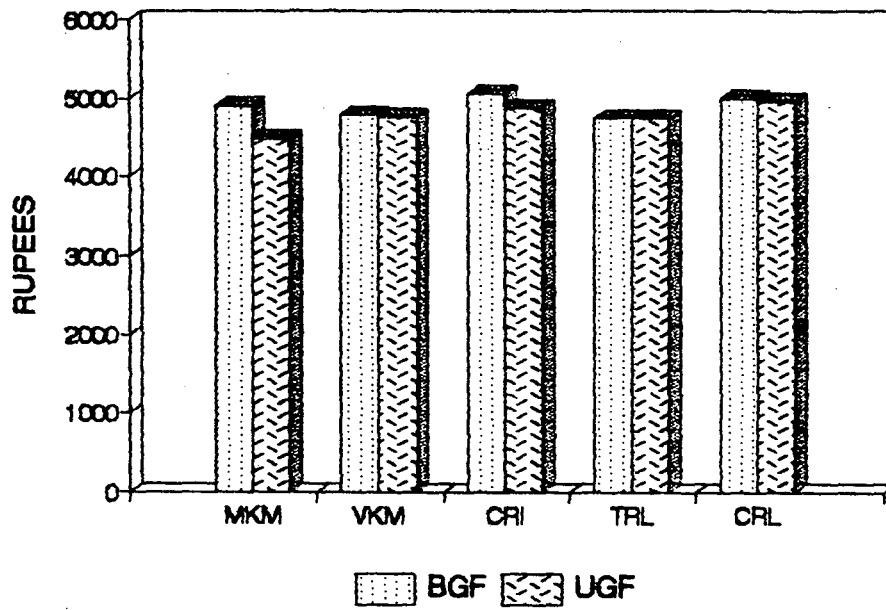
Conclusions

It is quite evident from the preceding analysis that the performance of group farming has certainly made positive impact in reducing cost of cultivation and to some extent in augmenting output. This impact has been assisted by the bio-technological changes introduced under group farming. Thus mechanized tilling and chemical weedicides are primarily responsible for the reduction in labour cost seen in those operations. While from the point of view of individual cultivators this is a saving in cost, it has to be weighed against the 'social' cost in terms of labour displacement.

The analysis of the impact of group farming on the different size of holdings reveals that in the padasekharams where group farming has made measurable impact, the changes in cost and output are reflected in all the size-groups. This has brought about a reduction in the variation between the size-classes at least in one padasekharam. The reduction in the case of some operations is in fact quite high. And in those padasekharams where group farming has made little progress the variation has increased or has shown no clear pattern. This points to the positive effect of group farming in reducing variation between size-groups. What impact group farming, with its technological innovation, has made on the agricultural labourers is analyzed in the next chapter.

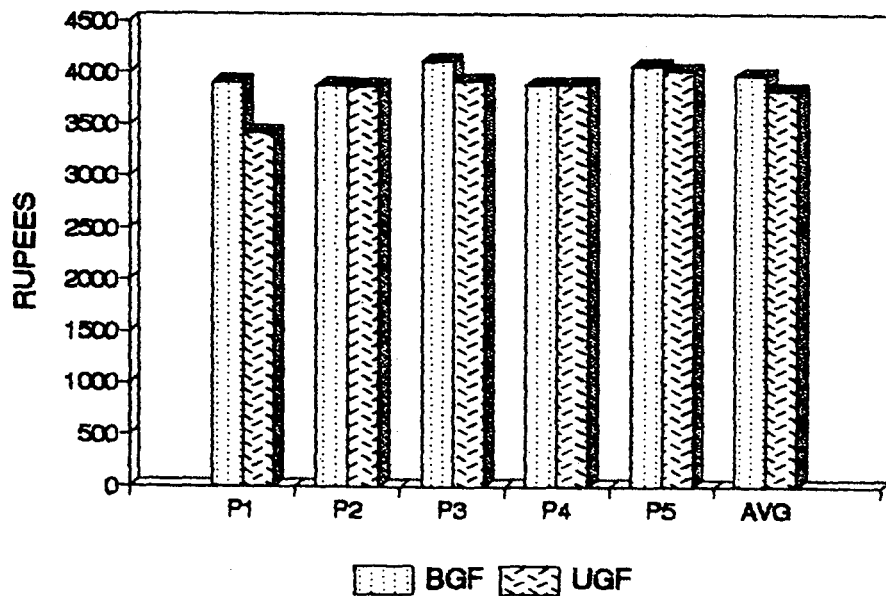
Appendix 5.1

**TOTAL COST OF CULTIVATION (Per Acre)
BEFORE AND UNDER GROUP FARMING**



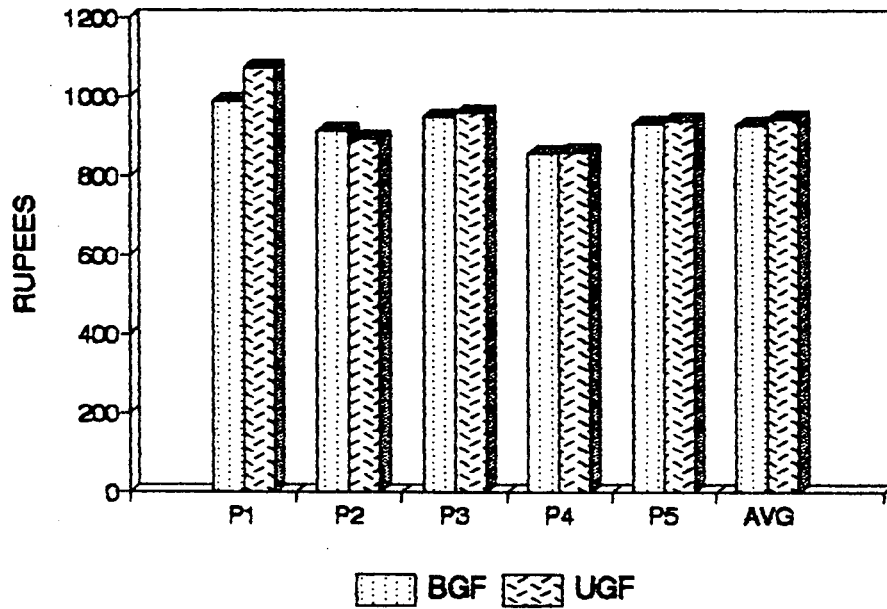
Appendix 5.2

**LABOUR COST OF CULTIVATION (Per Acre)
BEFORE AND UNDER GROUP FARMING**



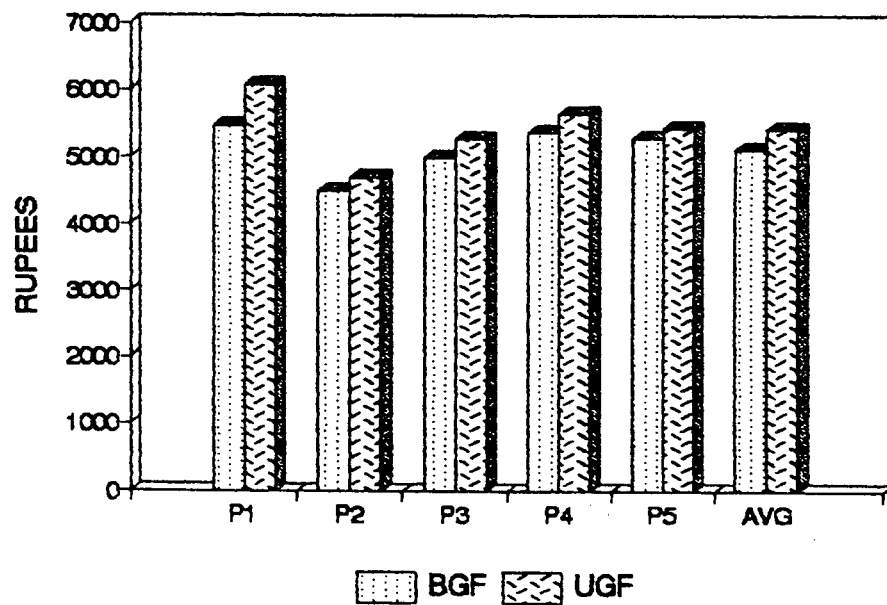
Appendix 5.3

MATERIAL COST OF CULTIVATION (Per Acre)
BEFORE AND UNDER GROUP FARMING



Appendix 5.4

RETURNS FROM PADDY CULTIVATION (/Acre)
BEFORE AND UNDER GROUP FARMING



Appendix 5.5
Labour Cost of Cultivation by Size of Holding
(PADASERHARAM P1)

Size Class (in acres)	Nursery			Land Preparation			Sowing/Transplanting			Manuring&Fertilizing			Weeding			Plant Protection		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01-0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.25-0.49	309.82	307.57	-0.73	1156.15	752.37	-34.92	492.11	492.11	0.00	113.56	113.56	0.00	309.78	263.41	-14.97	93.06	72.56	-22.03
0.50-0.99	264.71	219.36	-17.13	1040.44	683.82	-34.28	430.15	430.15	0.00	90.69	90.69	0.00	305.39	197.55	-35.31	80.88	56.37	-30.30
1.00-1.49	208.82	161.76	-22.54	977.94	669.12	-31.58	476.47	463.24	-2.78	79.41	79.41	0.00	255.88	179.41	-29.89	66.18	58.82	-11.12
1.50-1.99	206.67	170.00	-17.74	965.00	771.67	-20.03	420.00	420.00	0.00	108.33	108.33	0.00	380.00	250.00	-34.21	96.67	80.00	-17.24
2.00 &)	202.38	202.38	0.00	1073.81	621.43	-42.13	471.43	471.43	0.00	85.71	85.71	0.00	361.90	209.53	-42.10	90.48	66.67	-26.32
Average	238.48	212.21	-11.01	1042.67	699.68	-32.90	458.03	455.38	-0.58	95.54	95.54	0.00	322.59	219.98	-31.81	85.45	66.88	-21.73
S.D	42.36	52.09	22.98	69.39	55.26	-20.37	27.95	26.67	-4.56	13.18	13.18	0.00	44.16	31.77	-28.07	10.97	8.71	-20.53

Appendix 5.5 contd.

Size Class (in acres)	Irrigation & Supervision			Transport			Harvesting&Threshing			Drying & Storing			TOTAL		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01-0.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.25-0.49	849.84	837.22	-1.48	91.48	72.56	-20.69	980.44	980.44	0.00	216.09	216.09	0.00	4612.34	4107.89	-10.94
0.50-0.99	523.28	523.28	0.00	90.69	90.69	0.00	967.65	967.65	0.00	193.63	193.63	0.00	3987.50	3453.19	-13.40
1.00-1.49	438.24	464.71	6.04	83.82	83.82	0.00	951.18	951.18	0.00	197.06	185.29	-5.97	3735.00	3296.75	-11.73
1.50-1.99	255.00	255.00	0.00	83.33	83.33	0.00	886.67	886.67	0.00	163.33	163.33	0.00	3565.00	3188.33	-10.57
2.00 &)	257.14	257.14	0.00	71.43	71.43	0.00	866.67	866.67	0.00	171.43	171.43	0.00	3652.38	3023.82	-17.21
Average	464.70	467.47	0.60	84.15	80.36	-4.50	930.52	930.52	0.00	188.31	185.95	-1.25	3910.44	3414.00	-12.70
S.D	218.87	214.11	-2.17	7.20	7.32	1.74	45.38	45.38	0.0	18.90	18.39	-2.70	378.23	374.15	-1.08

Source: Survey Data

Appendix 5.6

**Labour Cost of Cultivation by Size of Holding
(PADASEKHARAM P2)**

Size Class (in acres)	Nursery			Land Preparation			Sowing/Transplanting			Manuring&Fertilizing			Weeding			Plant Protection		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.00-0.24	301.49	301.49	0.00	1089.55	1089.55	0.00	537.31	537.31	0.00	179.10	179.10	0.00	313.43	313.43	0.00	119.40	119.40	0.00
0.25-0.49	310.34	313.22	0.93	1011.49	1011.49	0.00	462.64	462.64	0.00	91.95	91.95	0.00	258.62	241.38	-6.67	83.33	83.33	0.00
0.50-0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.00-1.49	234.38	234.38	0.00	1001.95	1001.95	0.00	398.44	398.44	0.00	78.13	78.13	0.00	328.13	292.97	-10.71	68.36	68.36	0.00
1.50-1.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.00 &)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average	282.07	283.03	0.34	1034.33	1034.33	0.00	466.13	466.13	0.00	116.39	116.39	0.00	300.06	282.59	-5.82	90.37	90.36	0.00
S.D	135.57	39.42	0.37	4.77	4.77	0.00	32.10	32.10	0.00	6.91	6.91	0.00	34.75	25.79	4.45	7.49	7.49	0.00

Appendix 5.6 contd.

Size Class (in acres)	Irrigation & Supervision			Transport			Harvesting&Threshing			Drying & Storing			TOTAL		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.00-0.24	505.97	505.97	0.00	108.96	108.96	0.00	901.49	901.49	0.00	261.19	261.19	0.00	4317.91	4317.90	-0.00
0.25-0.49	466.09	466.09	0.00	94.83	94.83	0.00	855.17	855.17	0.00	189.66	189.66	0.00	3824.13	3809.77	-0.38
0.50-0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.00-1.49	263.67	263.67	0.00	74.22	93.75	26.32	823.05	823.05	0.00	207.03	207.03	0.00	3477.35	3461.72	-0.45
1.50-1.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.00 &)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average	411.91	411.91	0.00	92.67	99.18	7.03	859.90	859.90	0.00	219.29	219.29	0.00	3873.13	3863.13	-0.26
S.D	101.21	101.21	0.00	10.30	0.54	10.53	16.06	16.06	0.00	8.69	8.69	0.00	1791.85	1784.54	0.20

Source: Survey Data

Appendix 5.7
Labour Cost of Cultivation by Size of Holding
(PADASEKHARAM P3)

Size Class (in acres)	Nursery			Land Preparation			Sowing/Transplanting			Manuring&&Fertilizing			Weeding			Plant Protection		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01_0.24	321.43	321.43	0.00	1107.14	1107.14	0.00	428.57	428.57	0.00	142.86	142.86	0.00	214.29	214.29	0.00	142.86	142.86	0.00
0.25-0.49	313.66	313.66	0.00	1049.69	906.83	-13.61	428.57	428.57	0.00	102.48	102.48	0.00	298.14	279.50	-6.25	77.64	77.64	0.00
0.50-0.99	265.56	265.56	0.00	1046.69	708.17	-32.34	448.44	448.44	0.00	91.44	91.44	0.00	317.51	323.74	1.96	86.58	82.49	-4.72
1.00-1.49	242.11	242.11	0.00	977.63	682.89	-30.15	467.11	459.21	-1.69	98.68	98.68	0.00	347.37	331.58	-4.55	73.68	73.68	0.00
1.50-1.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.00 &)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average	285.69	285.69	0.00	1045.29	851.26	-18.56	443.17	441.20	-0.45	108.87	108.87	0.00	294.33	287.28	-2.40	95.19	94.17	-1.07
S.D	33.03	33.03	0.00	45.89	171.31	273.27	16.02	13.19	-17.69	20.02	20.02	0.00	49.43	46.58	-5.75	27.91	28.28	1.32

Appendix 5.7 contd.

Size Class (in acres)	Irrigation & Supervision			Transport			Harvesting&Threshing			Drying & Storing			TOTAL		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01_0.24	642.86	642.86	0.00	157.14	157.14	0.00	1014.29	1014.29	0.00	142.86	142.86	0.00	4314.29	4314.29	0.00
0.25-0.49	670.81	726.71	8.33	147.83	154.04	4.20	1018.63	1018.63	0.00	248.45	248.45	0.00	4355.90	4256.52	-2.28
0.50-0.99	444.55	462.06	3.94	97.28	100.19	3.00	985.99	985.99	0.00	244.94	244.94	0.00	4028.99	3713.03	-7.84
1.00-1.49	284.21	284.21	0.00	85.53	85.53	0.00	957.89	957.89	0.00	175.00	175.00	0.00	3709.21	3390.79	-8.58
1.50-1.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.00 &)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average	510.61	528.96	3.59	121.94	124.23	1.87	994.20	994.20	0.00	202.81	202.81	0.00	4102.10	3918.66	-4.47
S.D	157.14	170.63	8.58	31.00	31.81	2.62	24.42	24.42	0.00	45.35	45.35	0.00	450.22	584.62	29.85

Source: Survey Data.

Appendix 5.8
Labour Cost of Cultivation by Size of Holding
(PADASEKHARAM P4)

Size Class (in acres)	Nursery			Land Preparation			Sowing/Transplanting			Manuring&&Fertilizing			Weeding			Plant Protection		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01_0.24	300.00	300.00	0.00	1275.00	1275.00	0.00	350.00	350.00	0.00	150.00	150.00	0.00	300.00	300.00	0.00	150.00	150.00	0.00
0.25-0.49	288.14	288.14	0.00	1050.85	1050.85	0.00	567.80	567.80	0.00	96.05	106.34	10.72	247.46	247.46	0.00	146.56	132.90	-9.32
0.50-0.99	259.57	259.57	0.00	1069.38	1069.38	0.00	515.55	515.55	0.00	105.26	105.26	0.00	364.11	318.65	-12.49	87.98	87.98	0.00
1.00-1.49	239.81	239.81	0.00	1033.57	1033.57	0.00	453.24	453.24	0.00	62.35	62.35	0.00	275.30	285.00	3.52	94.32	87.95	-6.75
1.50-1.99	216.67	216.67	0.00	833.33	833.33	0.00	522.22	522.22	0.00	55.56	55.56	0.00	264.44	259.23	-1.97	66.67	66.67	0.00
2.00 &)	202.27	202.27	0.00	834.09	834.09	0.00	450.00	450.00	0.00	77.27	77.27	0.00	254.55	238.43	-6.33	68.18	68.18	0.00
Average	251.08	251.08	0.00	1016.04	1016.04	0.00	476.47	476.47	0.00	91.08	92.80	1.88	284.31	274.80	-3.35	102.28	98.95	-3.26
S.D	35.43	35.43	0.00	151.61	151.61	0.00	69.76	69.76	0.00	31.56	32.06	1.58	39.44	28.79	-27.00	34.00	31.59	-7.08

Appendix 5.8 contd.

Size Class (in acres)	Irrigation & Supervision			Transport			Harvesting&Threshing			Drying&storing			TOTAL		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01_0.24	450.00	450.00	0.00	75.00	75.00	0.00	1120.00	1120.00	0.00	250.00	250.00	0.00	4420.00	4420.00	0.00
0.25-0.49	432.85	432.85	0.00	96.05	106.64	11.03	917.51	917.51	0.00	233.28	233.28	0.00	4076.53	4083.76	0.18
0.50-0.99	516.60	516.60	0.00	98.09	98.09	0.00	1051.67	1051.67	0.00	201.44	201.44	0.00	4269.65	4224.19	-1.06
1.00-1.49	334.35	334.35	0.00	51.56	51.56	0.00	970.74	970.74	0.00	144.36	144.36	0.00	3659.61	3662.94	0.09
1.50-1.99	250.00	250.00	0.00	41.67	41.67	0.01	1057.78	1057.78	0.00	216.67	216.67	0.00	3525.00	3519.79	-0.15
2.00 &)	204.55	204.55	0.00	45.45	45.45	0.00	1081.82	1081.82	0.00	165.91	165.91	0.00	3384.09	3367.98	-0.48
Average	364.72	364.72	0.00	67.97	69.73	2.60	1033.25	1033.25	0.00	201.94	201.94	0.00	3889.15	3879.78	-0.24
S.D	111.60	111.60	0.00	23.14	25.50	10.19	68.47	68.47	0.00	36.79	36.79	0.00	601.80	591.60	-1.69

Source: Survey Data

Appendix 5.9
Labour Cost of Cultivation by Size of Holding
(PADASEKHARAM P5)

Size Class (in acres)	Nursery			Land Preparation			Sowing/Transplanting			Manuring&&Fertilizing			Weeding			Plant Protection		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01_0.24	329.27	329.27	0.00	1292.68	1292.68	0.00	634.15	634.15	0.00	85.78	85.78	0.00	341.46	341.46	0.00	97.56	97.56	0.00
0.25-0.49	310.13	310.13	0.00	1094.94	1094.94	0.00	544.30	544.30	0.00	107.59	107.59	0.00	286.08	247.63	-13.44	69.62	69.62	0.00
0.50-0.99	232.60	232.60	0.00	927.44	927.44	0.00	441.35	441.35	0.00	110.34	110.34	0.00	246.52	216.13	-12.33	70.58	70.58	0.00
1.00-1.49	277.08	277.08	0.00	931.25	931.25	0.00	443.75	443.75	0.00	100.00	100.00	0.00	369.17	315.83	-14.45	70.83	66.43	-6.22
1.50-1.99	221.88	221.88	0.00	968.75	968.75	0.00	468.75	468.75	0.00	75.00	75.00	0.00	390.00	312.50	-19.87	81.25	81.25	0.00
2.00 &)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average	274.19	274.19	0.00	1043.01	1043.01	0.00	506.46	506.46	0.00	95.74	95.74	0.00	326.65	286.71	-12.23	77.97	77.09	0.00
S.D	41.95	41.95	0.00	138.85	138.85	0.00	73.93	73.93	0.00	13.42	13.42	0.00	53.12	46.95	-11.62	10.68	11.39	6.65

Appendix 5.9 contd.

Size Class (in acres)	Irrigation & Supervision			Transport			Harvesting&Threshing			Drying & Storing			TOTAL		
	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change	BGF	UGF	%change
0.01_0.24	414.63	414.63	0.00	97.56	97.56	0.00	1126.83	1126.83	0.00	243.90	243.90	0.00	4663.83	4663.83	0.00
0.25-0.49	481.01	481.01	0.00	82.28	82.28	0.00	1008.86	1008.86	0.00	302.53	302.53	0.00	4287.34	4248.89	-0.90
0.50-0.99	366.80	366.80	0.00	90.46	94.43	4.40	973.76	973.76	0.00	210.93	210.93	0.00	3670.78	3644.36	-0.72
1.00-1.49	318.75	318.75	0.00	76.96	76.96	0.00	1018.33	1018.33	0.00	201.67	201.67	0.00	3807.79	3750.06	-1.52
1.50-1.99	293.75	293.75	0.00	41.24	41.24	0.00	1190.00	1190.00	0.00	153.13	153.13	0.00	3883.74	3806.24	-2.00
2.00 &)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average	374.99	374.99	0.00	77.70	78.49	1.02	1063.56	1063.56	0.00	222.43	222.43	0.00	4062.70	4022.68	-0.99
S.D	67.29	67.29	0.00	19.53	20.11	2.95	81.35	81.35	0.00	49.48	49.48	0.00	549.62	544.73	-0.89

Source: Survey Data

Appendix 5.10

**Material Cost of Cultivation by Size of Holding (Rs. Per Acre)
(ALL PADASEKHARAMS)**

Size Clas (in acres)	Seed			Organic Manure			Inorganic Manure			P.P Chemicals			Weedicides			TOTAL		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	%change	BGF	UGF	% change	BGF	UGF	%change
0.01-0.24	197.13	197.13	0.00	341.36	341.36	0.00	324.98	324.98	0.00	115.62	116.70	1.32	-	-		979.08	980.16	0.16
0.25-0.49	165.61	162.51	-1.94	318.61	320.30	0.38	342.71	354.25	3.17	116.03	105.69	-7.86	-	-		942.96	942.76	-0.09
0.50-0.99	139.67	132.58	-4.98	311.10	327.40	5.12	336.96	390.88	16.03	103.83	95.69	-7.70	-	67.40		891.55	963.40	8.00
1.00-1.49	148.71	142.83	-3.57	299.75	299.75	0.00	358.84	362.78	0.90	88.34	84.55	-4.27	44.11	73.53	66.70	904.46	904.61	-0.05
1.50-1.99	143.18	140.96	-1.67	282.22	284.44	0.73	442.74	442.74	0.00	90.51	85.98	-4.43	-	50.00		958.65	970.79	1.21
2.00 &>	130.61	130.61	0.00	262.98	280.84	5.56	351.45	371.86	4.55	89.25	81.17	-9.23	-	95.00		834.28	911.97	8.13
S.D	21.96	23.03	4.91	25.24	22.34	-11.50	38.68	36.36	-6.00	11.94	12.70	6.38		36.17		48.13	28.77	-40.23
Average	154.15	151.10	-1.98	302.67	309.01	2.10	359.61	374.58	4.16	100.59	94.96	-5.60		47.66		927.56	944.44	1.85

Source: Survey Data

Appendix 5.11

**Material Cost of Cultivation by Size of Holding (Rs. Per Acre)
(PADASEKHARAM P1)**

Size Class (in acres)	Seed			Organic Manure			Inorganic Manure			P.P Chemicals			Weedicides			TOTAL		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	%change	BGF	UGF	% change	BGF	UGF	%change
0.01-0.24	-	-		-	-		-	-		-	-		-	-		-	-	
0.25-0.49	164.03	151.42	-7.69	304.73	288.32	-5.39	363.09	411.67	13.38	140.47	104.41	-25.67	-	-		972.32	955.82	-1.70
0.50-0.99	142.16	117.65	-17.24	324.75	363.48	11.93	341.66	498.50	45.91	104.90	79.17	-24.53	-	67.40		913.47	1126.20	23.29
1.00-1.49	164.71	135.29	-17.86	368.52	368.52	0.00	436.17	455.86	4.51	98.82	92.94	-5.95	44.11	73.53	66.70	1112.33	1126.14	1.24
1.50-1.99	133.33	126.66	-5.00	305.00	311.66	2.18	456.00	456.00	0.00	108.33	100.00	-7.69	-	50.00		1002.66	1044.32	4.15
2.00 &>	119.05	119.05	0.00	321.42	357.14	11.11	413.80	461.90	11.62	87.60	71.43	-18.46	-	95.00		941.87	1104.52	17.27
Average	144.66	130.01	-10.12	324.88	337.82	3.98	402.14	456.79	13.59	108.02	89.59	-17.06	8.82	57.19	548.22	988.53	1071.40	8.38
S.D	17.71	12.41	-29.90	23.31	31.96	37.11	43.31	27.58	-36.32	17.69	12.47	-29.50		32.01		68.70	65.10	-5.25

Source :Survey Data

Appendix 5.12
Material Cost of Cultivation by Size of Holding (Rs. Per Acre)
(PADASEKHARAM P2)

Size Clas (in acres)	Seed			Organic Manure			Inorganic Manure			P.P Chemicals			Weedicides			TOTAL		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	%change	BGF	UGF	% change	BGF	UGF	%change
0.01-0.24	179.10	179.10	0.00	325.37	325.37	0.00	376.12	376.12	0.00	149.70	144.02	-3.79	-	-		1030.29	1024.61	-0.55
0.25-0.49	144.83	141.95	-1.99	275.86	267.24	-3.12	347.70	340.22	-2.15	90.80	86.78	-4.43	-	-		859.19	836.19	-2.68
0.50-0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
1.00-1.49	140.00	140.00	0.00	253.91	253.91	0.00	385.15	385.15	0.00	66.40	62.50	-5.87	-	-		845.46	841.56	-0.46
1.50-1.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
2.00 & >	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
Average	154.64	153.68	-0.62	285.05	282.17	-0.34	369.66	367.16	-0.67	102.30	97.77	-4.43	-	-		912.34	893.73	-2.04
S.D	68.64	67.99	-2.79	29.89	31.03	3.81	15.96	16.41	6.61	34.97	34.18	-2.26	-	-		84.08	87.58	4.17

Source: Survey Data

Appendix 5.13
Material Cost of Cultivation by Size of Holding (Rs. Per Acre)
(PADASEKHARAM P3)

Size Clas (in acres)	Seed			Organic Manure			Inorganic Manure			P.P Chemicals			Weedicides			TOTAL		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	%change	BGF	UGF	% change	BGF	UGF	%change
0.01-0.24	214.28	214.28	0.00	357.14	357.14	0.00	350.00	350.00	0.00	85.72	85.72	0.00	-	-		1007.14	1007.14	0.00
0.25-0.49	186.33	186.33	0.00	310.56	333.54	7.40	354.96	363.35	2.36	142.85	137.26	-3.91	-	-		994.70	1020.48	2.59
0.50-0.99	142.41	138.57	-2.70	332.10	341.82	2.93	383.46	398.05	3.80	128.56	125.84	-2.12	-	-		986.53	1004.28	1.80
1.00-1.49	140.79	140.79	0.00	276.32	276.32	0.00	301.82	301.82	0.00	82.89	81.58	-1.58	-	-		801.82	800.51	-0.16
1.50-1.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
2.00 & >	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
Average	170.95	169.99	-0.56	319.03	327.21	2.56	347.56	353.31	1.65	110.01	107.60	-2.19	-	-		947.55	958.10	1.11
S.D	30.98	31.89	2.96	29.66	30.57	3.08	29.33	31.51	7.66	26.21	24.33	-7.17	-	-		84.46	91.19	7.98

Source: Survey Data

Appendix 5.14
Material Cost of Cultivation by Size of Holding (Rs. Per Acre)
(PADASEKHARAM P4)

Size Clas (in acres)	Seed			Organic Manure			Inorganic Manure			P.P Chemicals			Weedicides			TOTAL		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
0.01-0.24	200.00	200.00	0.00	300.00	300.00	0.00	225.00	225.00	0.00	110.00	120.00	9.09	-	-		835.00	845.00	1.20
0.25-0.49	179.71	179.71	0.00	347.45	357.95	3.02	281.35	281.35	0.00	112.99	106.99	-5.31	-	-		921.50	926.00	0.49
0.50-0.99	132.77	132.77	0.00	315.79	326.55	3.41	321.53	335.16	4.24	98.35	94.25	-4.17	-	-		868.44	888.73	2.34
1.00-1.49	143.90	143.90	0.00	266.66	266.66	0.00	398.56	398.56	0.00	101.91	96.32	-5.49	-	-		911.03	905.44	-0.61
1.50-1.99	146.22	146.22	0.00	166.66	166.66	0.00	497.22	497.22	0.00	69.44	69.44	0.00	-	-		879.54	879.54	0.00
2.00 &)	142.16	142.16	0.00	204.54	204.54	0.00	289.09	281.81	-2.52	90.90	90.90	0.00	-	-		726.69	719.41	-1.00
Average	157.46	157.46	0.00	266.85	270.39	1.33	335.46	336.52	0.32	97.27	96.32	-0.97				857.03	860.69	0.43
S.D	24.01	24.01	0.00	63.13	66.84	5.88	89.09	89.58	0.55	14.42	15.44	7.12				64.78	67.84	4.72

Appendix 5.15
Material Cost of Cultivation by Size of Holding (Rs. Per Acre)
(PADASEKHARAM P5)

Size Clas	Seed			Organic Manure			Inorganic Manure			P.P Chemicals			Weedicides			TOTAL		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
0.01-0.24	195.12	195.12	0.00	382.92	382.92	0.00	348.78	348.78	0.00	117.07	117.07	0.00	-	-		1043.89	1043.89	0.00
0.25-0.49	153.16	153.16	0.00	354.43	354.43	0.00	366.45	374.68	2.25	93.03	93.03	0.00	-	-		967.07	975.30	0.85
0.50-0.99	141.33	141.33	0.00	271.76	277.76	2.21	301.19	331.81	10.17	83.49	83.49	0.00	-	-		797.77	834.39	4.59
1.00-1.49	154.16	154.16	0.00	333.33	333.33	0.00	272.50	272.50	0.00	91.66	89.41	-2.45	-	-		851.65	849.40	-0.26
1.50-1.99	150.00	150.00	0.00	375.00	375.00	0.00	375.00	375.00	0.00	93.75	88.50	-5.60	-	-		993.75	988.50	-0.53
2.00 &)	-	-		-	-		-	-		-	-		-	-		-	-	
Average	158.75	158.75	0.00	343.49	344.69	0.44	332.78	340.55	2.48	95.80	94.30	-1.61				930.83	938.30	0.93
S.D	18.74	18.74	0.00	39.79	37.64	0.88	39.51	37.75	3.94	11.25	11.79	2.21				91.68	82.14	1.89

Appendix 5.16
Returns from Paddy Cultivation by Size of Holding (Per Acre)
(PADASEKHARAM P1)

Size class (in acres)	Paddy (in Paras)			Straw(in bundles)			Total Value (in Rs.)		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
0.01-0.24	-	-	-	-	-	-	-	-	-
0.25-0.49	126.18	166.56	32.00	25.87	21.77	-15.85	5085.24	5969.88	17.40
0.50-0.99	128.67	177.69	38.10	25.74	20.83	-19.08	5147.16	6225.12	20.94
1.00-1.49	160.29	173.53	8.26	25.88	23.52	-9.12	6040.92	6270.04	3.79
1.50-1.99	136.66	146.66	7.32	26.67	26.67	0.00	5426.68	5706.68	5.16
2.00&>	142.85	166.66	16.67	26.19	23.81	-9.09	5571.20	6095.08	9.40
Average	138.93	164.14	20.33	26.07	23.32	-10.55	5454.24	6053.36	10.98
S.D	12.20	10.66	-12.67	0.33	2.01		343.25	202.66	-40.96

Source: Survey Data

Appendix 5.17
Returns from Paddy Cultivation by Size of Holding (Per Acre)
(PADASEKHARAM P2)

Size class (in Acres)	Paddy (in Paras)			Straw(in bundles)			Total Value (in Rs.)		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
0.01-0.24	106.86	114.93	7.55	28.35	28.35	0.00	4693.08	4919.04	4.81
0.25-0.49	104.23	116.82	12.08	29.89	28.16	-5.79	4711.84	4960.56	5.28
0.50-0.99	-	-	-	-	-	-	-	-	-
1.00-1.49	95.70	99.61	4.09	23.43	23.43	0.00	4085.40	4194.88	2.68
1.50-1.99	-	-	-	-	-	-	-	-	-
2.00&>	-	-	-	-	-	-	-	-	-
Average	102.26	110.45	7.91	27.22	26.65	-1.93	4496.77	4691.49	4.26
S.D	6.76	7.71	10.77	2.75	2.28		290.99	311.57	5.82

Source: Survey Data

Appendix 5.18
Returns from Paddy Cultivation by Size of Holding (Per Acre)
(PADASEKHARAM P3)

Size class (in Acres)	Paddy (in Paras)			Straw(in bundles)			Total Value (in Rs.)		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
0.01-0.24	121.43	132.85	9.40	28.57	28.57	0.00	5114.24	5434.00	6.25
0.25-0.49	105.92	126.70	19.62	32.29	27.95	-13.44	4903.16	5224.60	6.56
0.50-0.99	126.45	140.56	11.16	27.26	25.87	-5.10	5176.20	5487.88	6.02
1.00-1.49	114.47	118.36	3.40	25.79	25.79	0.00	4752.56	4861.48	2.29
1.50-1.99	-	-	-	-	-	-	-	-	-
2.00&>	-	-	-	-	-	-	-	-	-
Average	117.07	129.62	10.72	28.48	27.05	-5.03	4986.54	5251.99	5.32
S.D	7.71	8.15	5.59	2.41	1.23		168.80	205.98	15.72

Source: Survey Data

Appendix 5.19
Returns from Paddy Cultivation by Size of Holding (Per Acre)
(PADASEKHARAM P4)

Size class (in acres)	Paddy (in Paras)			Straw(in bundles)			Total Value (in Rs.)		
	BGF	UGF	% change	BGF	UGF	% change	BGF	UGF	% change
0.01-0.24	127.00	136.66	7.61	29.16	29.16	0.00	5305.60	5576.08	5.10
0.25-0.49	130.87	154.07	17.73	26.17	24.83	-5.12	5234.56	5803.76	10.87
0.50-0.99	115.26	126.51	9.76	29.18	28.03	-3.94	4978.08	5224.08	4.94
1.00-1.49	119.53	125.11	4.67	28.77	28.77	0.00	5073.04	5229.28	3.08
1.50-1.99	166.66	173.54	4.13	23.22	23.22	0.00	6059.68	6252.32	3.18
2.00&>	136.36	145.45	6.67	27.77	27.77	0.00	5484.28	5738.80	4.64
Average	132.61	143.56	9.94	28.38	26.96	-2.27	5355.87	5637.39	5.26
S.D	16.73	16.79	0.34	2.13	2.18		353.98	355.26	0.36

Source: Survey Data

Appendix 5.20
Returns from Paddy Cultivation by Size of Holdings (Per Acre)
(PADASEKHARAM P5)

Size class (in acres)	Paddy (in Paras)			Straw(in bundles)			Total Value (in Rs.)		
	BGF	UGF	% change	BGF	UGF	% change	UGF	BGF	% change
0.01-0.24	134.15	134.15	0.00	26.83	26.83	0.00	5366.00	5366.00	0.00
0.25-0.49	158.86	164.55	3.58	28.48	28.48	0.00	6156.88	6316.20	2.59
0.50-0.99	116.30	128.23	10.26	28.43	27.83	-2.11	4962.20	5260.24	6.01
1.00-1.49	122.91	131.25	6.79	27.08	27.08	0.00	5066.28	5299.80	4.61
1.50-1.99	106.25	109.38	2.95	30.55	30.55	0.00	4808.00	4895.64	1.82
2.00&	-	-	-	-	-	-	-	-	-
Average	127.69	133.51	4.71	28.27	28.15	-0.42	5271.87	5427.58	3.01
S.D	18.03	17.77	-1.44	1.32	1.33		478.63	473.44	-1.08

Source: Survey Data

Notes

1. For a detailed discussion on the conceptual issues involved in the treatment of land value in the estimates of cost of cultivation of crops in Kerala see P.S.George (1988).
2. Labour is defined in terms of workers or standardized days of eight hours of work. In the case of Irrigation and Supervision, for instance, the estimate is made by dividing the total time spent by the standard eight hour day.
3. The 'Report on Cost of Cultivation of Important Crops in Kerala' (Department of Economics and Statistics,1987) includes the imputed value of household labour under the cost Concept of 'C'. Since there exist no Irrigation Cess in the study area we have not included this cost in our estimate. The estimates including interest on working capital and interest on fixed capital (Cost 'B') is done separately in a later section of this chapter.
4. It is seen that mechanization and common tilling could bring in a saving of 30 to 40 per cent of the cost involved in soil preparation. In money terms it comes to around 350 rupees per acre. This is a substantial gain in the context of the decreasing profitability of paddy cultivation.
5. It is to be noted here that Rs. 103 saved in labour cost due to the use of weedicides cannot be considered net savings, since Rs.48 per acre was incurred for the purchase of weedicides. Yet there is still an average saving of Rs.55 per acre due to the use of weedicides in padasekharam P1 though some cultivators have not used it.
6. However it is possible that if the increase in production is sustained over the years the workers would succeed in getting a higher share as wages.
7. For instance the significant decrease in the transport cost seen in P2 is contributed by the substitution of cowdung with oil cake by a few cultivators as organic manure for paddy on which much less expenses was incurred by way of transportation.
8. Cultivators of padasekharam P1 had reported less pest and insect attacks during the group farming season due to the use of same seed variety, uniformity in the time of cultivation and combined pest management.

CHAPTER 6

GROUP FARMING AND LABOUR

6.1 Introduction

In the previous chapter we have seen that under group farming labour cost has been reduced significantly due to group action and technical innovations introduced as part of the Programme. This points to the displacement of labour under Group Farming. In this chapter we shall try to assess the impact it has made on labour. The analysis is done according to padasekharam, gender of the worker and source of labour.

6.1 Labour Displacement: Padasekharam-wise

The per acre labour use under the two periods of study is illustrated in Table 6.1. It is seen that in padasekharam P1 (see columns 2, 3 & 4) the per acre labour use in terms of labour days, reduced by 12.74 per cent, which amounts to 10.48 labour days. This reduction is contributed mainly by the decrease in the labour used in soil preparation, weeding, plant protection and transport. In the other padasekharams only in the case of soil preparation in padasekharam P3 we see a substantial decrease in labour use (see columns 5 to 16 of Table 6.1). Here due to the mechanization of tilling, introduced under group farming, the average labour use per acre decreased by 5.10 labour days. The labour days involved in weeding and plant protection has also decreased in these padasekharams, though at a much lesser scale.

Table 6.1
Average Labour Use by Operations (Per Acre)
(unit in days)

Operations	P1			P2			P3			P4			P5			Avg.		
	BGF	UGF	P.C	BGF	UGF	P.C	BGF	UGF	P.C	BGF	UGF	P.C	BGF	UGF	P.C	BGF	UGF	P.C
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
I. Soil preparation																		
1. Machine labour	0	0.7	0	0	0	0	0	0.53	0	0	0	0	0	0	0	0	0.3	0
2. Animal labour	8.65	1.99	-76.9	7.94	7.94	0	8.65	3.55	-58.9	8.07	8.14	0.87	7.66	7.66	0	8.27	5.48	-33.7
3. Human labour	8	7.37	-7.87	10.09	10.09	0	9.44	9.44	0	8.38	8.38	0	9.3	9.3	0	9.04	8.92	-1.33
II. Sowing&trnsplnt.	14.79	14.73	-0.41	14.88	14.88	0	14.16	14.16	0	14.99	14.99	0	16.26	16.26	0	15.02	15	-0.13
III. Manure& frtlzr.	2.42	2.42	0	2.91	2.91	0	2.71	2.71	0	2.46	2.5	1.63	2.53	2.53	0	2.61	2.62	0.38
IV. Weeding	10.94	7.6	-30.5	10	9.42	-5.8	10.03	9.55	-4.79	9.58	9.33	-2.61	11.04	9.98	-9.6	10.32	9.18	-11.0
V. Plant protectn.	1.8	1.43	-20.5	1.72	1.72	0	3	2.99	-0.33	2.1	2.03	-3.33	1.48	1.46	-1.35	2.02	1.93	-4.46
VI. Irrgn& srpvsn.	10.38	10.45	0.67	12.71	12.71	0	11.26	11.42	1.42	8.47	8.1	-4.37	9	9	0	10.36	10.34	-0.19
VII. Transport	2.03	1.9	-6.4	2.03	2.16	6.4	2.96	3	1.35	1.46	1.51	3.42	1.87	1.95	4.28	2.07	2.1	1.45
VIII. Hrvst&thrshng.	17.24	17.24	0	19.11	19.11	0	19.17	19.17	0	16.71	16.71	0	19.42	19.42	0	18.33	18.33	0
IX. Drying&storing	6.03	5.95	-1	9.48	9.48	0	6.79	6.79	0	8.63	6.83	0	8.27	8.27	0	7.48	7.46	-0.27
TOTAL	82.28	71.8	-12.7	90.87	90.42	-0.5	88.17	83.31	-5.51	79.05	78.52	-0.67	86.83	85.83	-1.15	85.52	81.66	-4.51

Source: survey data.

Note: Bgf: Before Group Farming, Ugf: Under Group Farming; P.C: % change.

6.2. Labour Displacement Under Group Farming : Gender-wise Analysis

A gender-wise analysis of the labour displaced under group farming, shows that both male and female labourers have suffered loss in employment under group farming (see Table 6.2). Relatively however, male labourers have lost more days on average. However, significant reduction in labour use of male labour is seen only in padasekharam P1 (6.79 labour days) and P2 (4.15 labour days); in the others it has either remained stationary or has shown only a marginal change. In the case of female labour in all the Padasekharams there has been a reduction in labour use, however only in padasekharam P1 has it been significant.

Table.6.2

Change in Labour Use by Gender (Per Acre)						
Padase kharams	Male Labour			Female Labour		
	BGF	UGF	Labour Days Lost/Gained.	BGF	UGF	Labour Days Lost/gained
P1	34.50	27.71	-6.79	47.78	44.09	-3.69
P2	36.87	36.96	0.09	54.00	53.46	-0.54
P3	34.66	30.51	-4.15	53.51	52.80	-0.71
P4	32.11	31.60	-0.51	46.94	46.92	-0.02
P5	31.26	31.26	0.00	54.57	55.77	-1.20
Average	33.81	31.30	-2.51	51.71	50.17	-2.98

Source: Survey Data.

6.3. Labour Displacement Under Group Farming: Source-wise Analysis

The analysis of the labour use according to the source

of labour shows that it is mainly hired labour that has been affected rather than family labour (see Table 6.3). Significant reduction in hired labour days is seen in padasekharam P1 (10.22 days) and P3 (4.47 days) from where group action is reported. In the case of family labour no marked change in labour use is seen which indicates that group action and the technological innovations have substituted mainly hired labour.

Table.6.3
Change in Labour Use by Source of Labour (Per Acre)

Padase kharams	Family Labour			Hired Labour		
	BGF	UGF	Labour days Lost/Gained	BGF	UGF	Labour Days Lost/Gained
P1	14.24	13.98	-0.28	68.04	57.82	-10.22
P2	16.05	16.55	0.50	74.82	73.87	-0.95
P3	14.16	13.40	-0.76	74.01	69.54	-4.47
P4	9.88	9.74	-0.14	69.17	68.64	-0.43
P5	11.20	11.20	0.00	75.63	74.63	-1.00
Average	13.11	12.97	-0.14	72.33	68.90	-3.43

Source: Survey Data.

Thus our analysis shows that, in those Padasekharams, where group farming has made some headway, there has been displacement of labour, its proportion being related to the extent of modernization (like mechanization of tilling and use of weedicides) and group action undertaken. However it is important to note that in the surveyed area, it is not joint operations of activities as such but the modernization of operations introduced as part of group farming Programme, which has displaced much of the labour. Hence in those places where such practices are already in existence the impact of group farming on labour would be much less. The loss of labour days under group farming is an aspect which should be taken note of, especially in the context of the increasing unemployment situation of Kerala.

6.4. Impact on Labour: Response from Labourers

In order to assess the impact of group farming on agricultural labourers we conducted a sample survey of thirty labourers from the catchment area of the five Padasekharams. The survey, besides providing us with an idea of the impact of group farming on the work pattern also throws some light on the structural aspects of the agricultural labour force.

The respondents consisted of eleven female and nineteen male labourers. A caste-wise classification of them shows that 93 per cent belong to Scheduled Castes (Pulayas), the rest are Ezhavas. The average age of these workers is 51 years (male:54 and female:49.5), the lowest being thirty five and the highest sixty eight.

Regarding the work pattern of the workers surveyed, it is observed that only 30 per cent of them are exclusively engaged in agricultural work. An almost equal proportion took up non-agricultural works like construction, loading and quarrying also though the major part of the work was in agriculture. This was because they found it difficult to survive with agricultural work alone due to its seasonal nature. The above two categories accounted for almost 63 per cent of the workers interviewed. For others, though they worked in the fields, on-farm employment accounted for only a minor proportion of their total workdays.

Table.6.4
Employment Pattern of the Workers (in Percentage)

Employment Pattern	% of workers
1. Exclusively engaged in agricultural work	30
2. Major portion of work in agriculture(including 1)	63
3. Major portion of work in non-agricultural sector	37

Source: Survey Data

An analysis of the occupational structure of those interviewed and their household members reveals some interesting facts. Among the working population 57 per cent are occupied in non-agricultural work among whom the regular salaried employees form only about 10 per cent. It is seen that about 95 per cent of those who are occupied as agricultural labourers are more than 35 years old (the lowest age to be reported being thirty one) (see Table 6.5). On the other hand 74 per cent of those occupied as non-agricultural labourers are below thirty five years. Another interesting fact is regarding the education of those in the lower age groups. It is seen that, though about 93 per cent of the households are Harijans and economically poor, 81 per cent of those in the age group of 5-14 and 34 per cent in the age group of 15-24 are reported as students.

Table 6.5
Occupational Structure of the labourers and
their Household Members by Age Group

Main Occupation:	Agri'l Labour	Non-agri. labour		Non-workers		
		Non-agri' Labour	Regular Employ't	Student	Household work	No work
Age Group						
5 - 14		4 (10.25)		35 (72.92)		4 (26.66)
15 - 24		11 (28.20)	5 (41.66)	13 (27.08)	1 (7.14)	8 (53.33)
25 - 34	2 (5.00)	14 (35.40)	5 (41.66)		3 (21.43)	3 (20.00)
35 - 54	23 (57.50)	7 (17.94)	2 (16.66)		2 (14.29)	
55 & >	15 (37.50)	3 (7.69)			8 (57.14)	
Total	40 (100)	39 (100)	12 (100)	48 (100)	14 (100)	15 (100)

source: Survey Data

Notes: 1. Percentages are given in brackets.

2. Those in the age group of 0 - 5 are not considered.

All the respondents articulated their allegiance to one or other of the political parties, however only 33.33 per cent reported belonging to some labour unions. And of those who reported membership to labour unions 60 per cent belonged to Kerala State Karshaka Thozhilali Union (KSKTU) affiliated or sponsored¹ by the Communist Party of India (Marxist) [CPI(M)] and the rest were members of the Deseeya Karshaka Thozhilali Union (DKTU), affiliated or sponsored by the Indian National Congress (I).

All those surveyed reported owning their houses. The land owned by them (including the house site) varied from 6 cents to 35 cents. An enquiry into the source of their land (and house) showed that five of them (16 per cent) got their house and

the plot through the "One Lakh House" scheme², four (13.37 per cent) households owe their land to the Land Reforms (through invalidation of tenancy), six of them (20 per cent) to distribution of Purampokku land (Government land) and others either got it through inheritance or bought it from others.

The respondents were rather vague in specifying and quantifying the impact of group farming on their work. Thirteen (viz.43.30 per cent) of those surveyed mentioned that their work in the paddy sector had been reduced due to group farming (see Table.6.6). It was mainly the labourers who were working in padasekharams P1 and P3 who reported loss of work. The severity seems to have been highest among ploughers, who reported to have lost 10 to 60 per cent of their work due to mechanization of tilling introduced under group farming. However the impact of the displacement of labour has not been felt much since the reduction in paddy field work was largely made-up by off-paddy field work³. For those female workers who lost workdays in the paddy sector, varying from 6 per cent to 30 percent, due to mobility constraints and unwillingness to take up unfamiliar work, most of them were not able to obtain alternative employment.

Table 6.6
Response of Labourers Regarding Impact of Group Farming

	Affected by Group Farming	Not affected by by Group Farming	Total
Male Labourers	8 (42.10)	11 (57.89)	19 (100)
Female Labourers	5 (45.45)	6 (54.55)	11 (100)
Total	13	17	

Source: Survey Data

Note : Percentages are given in brackets.

Discussion with the workers revealed that though they were aware of the loss of work opportunities due to the introduction of group farming, they were not keen on any organized move against the Programme (some ploughers in padasekharam P3 have showed their resentment to mechanization of tilling in the form of forced ploughing of land with bullocks, but this was very sporadic in nature). Various factors could have contributed to such a response. First of all, since implementation of the Programme was uneven in the different padasekharams its impact on labour was not wide spread. Moreover, the agricultural workers seem to be very much aware that paddy cultivation has turned out to be an unremunerative avocation, hence any organized move on their part against the loss of work may force the cultivators to leave their land fallow or shift to labour saving crops; an outcome in which they stand to lose even more. Hence it is in their interest also to sustain paddy cultivation.

Some other factors also seem to have restrained the workers from organizing any protest against group farming. The workers are given representation in the Panchayat Krishi Vikasana Samithy which is assigned an important role in the running of group farming. Since workers have been thus taken into confidence on the various aspects of the programme the chances of organized opposition was minimized. The Group Farming Programme was initiated by the Left Democratic Front (LDF) Government and most of the Conveners of the Padasekharam Committees are found to be members or sympathizers of the ruling political parties. These

two factors may have acted as a restraint on the workers loyal to the ruling parties, who form the great majority of the study area, from putting up any organized resistance. Due to these reasons, which of course need not be the case everywhere and at all times, it is unlikely that a strong movement against Group Farming may emerge from the labourers.

6.5. Shortage of Labourers!

On the other hand, a major problem with regard to labour mentioned by cultivators during the survey, is the shortage of workers during the critical periods of paddy operations, especially for soil preparation, replanting and weeding. This often prevents the cultivators from undertaking timely cultivation. The severity of the problem, it is observed, has increased overtime. This phenomenon is apparently paradoxical in nature in the context of the high unemployment situation in Kerala, and hence warrants an explanation.

Social and economic factors appear to have contributed to such a development. Paddy field work, being relatively tedious, has been done mostly by workers considered as low caste, chiefly Harijans, and hence has been treated as of low status. Only people considered as low caste acquired skills in this work.

Since Independence, especially in the last two decades, various employment opportunities were opened up to people considered as low castes. It also became clear that education could uplift them from their poor social and economic

status. So Harijan parents began to educate their children rather than initiate them into traditional work. (Our data on the occupational structure of the household members of the paddy field labourers given in Table 6.4 also supports this. It was seen that 80 per cent of those in the age group of 5-15 were students, and we did not see any one in this age group occupied as an agricultural labourer). This process resulted in the young generation of the so called low caste agricultural labourers failing to become skillful in the traditional work of their parents nor willing to work in the fields, since it was socially of low status and would push them back into the old position. Hence only those of the older generation, who have traditionally been doing such work are available for paddy field work now with barely any new additions to this pool. The fact that the lowest age reported by any of the workers surveyed by us or those belonging to their households engaged in agricultural labour is over 30 supports this argument.

Another factor which has contributed to the decline in the availability of agricultural labourers in the paddy field is the occupational shift that is taking place among workers, particularly towards 'construction'. Earlier construction work was done mostly by traditional artisans. But the situation changed in the context of increasing migration of the traditional artisans to West Asian countries and urban centers for work, where they could get better rewards (see T.N Krishnan, 1991). Also the construction boom which began in Kerala, from the mid seventies created a big demand for labourers in the construction sector. The unskilled labour requirement for this was met by

labourers from agriculture, especially the younger workers who were looking for new avenues and saw in this occupation better status and payment. While in agriculture work a male worker would get Rs.34 and female labourer Rs.20, in the construction work they would get Rs.40 and Rs.35 respectively (Economic Review, 1989; Kannan, 1990). This would have affected the availability of labour in the agricultural sector in the form of less labour and shrinkage in the flow of new recruits. Of course, we may not be in a position to generalise on the basis of our study which could be biased on account of the peri-urban character of the area surveyed. However it is worth mentioning that similar tendencies have been noted in a primarily rice growing area in central Kerala (I owe this information to Shaji Francis who conducted a survey in the area referred). Interestingly, even while this declining supply of agricultural labourers is felt in the case of paddy cultivation, the cultivators themselves appear to be showing a tendency for lower self participation, creating a situation of increased dependence on hired labour.

Our discussions with the cultivators revealed that most of them were not hopeful about their next generation continuing in Paddy farming. Interestingly, neither did the cultivators themselves wish their children to remain in agriculture field, unless they were forced to do so. The net result of such a process would be the emergence of a generation of 'cultivators' who would neither participate in farming nor would be interested in their occupation. Unless a change in such an attitude and process takes place the future of agriculture, especially of

paddy, will be a bleak one.

6.6. Conclusion

The analysis of labour use before and under group farming shows that there is significant labour displacement under group farming, mainly on account of the mechanization of soil preparation and the use of chemical weedcides. A survey among the workers to find out the impact of group farming has made on their work structure revealed that about 45 per cent of those surveyed found their work in the paddy sector reduced due to group farming. However the workers interviewed were rather vague in quantifying the impact. The severity seems to have been felt mostly among ploughers, some of whom reported to have lost about 60 per cent of their ploughing work. The gender-wise and source-wise analysis of the labour displacement showed that both male and female labourers suffered labour loss and it was hired labour which was the most affected. Most of the male workers made up the reduction in paddy field work by off-farm field work or by going into new areas. (Some changes that have been noted in the rural labour market in terms of availability of alternative employment opportunities and a 'shortage' of labour for agricultural work may have helped in this adjustment). But such adjustments were not possible for female labourers in the short run due to mobility constraints and unwillingness to take up unfamiliar works, hence they seem to have suffered more. However, it is to be pointed out that since the spread of the group farming has not been as wide as was envisaged (which our study reveals) its impact on labour has not been widespread.

Notes

1. The relation between the party and labour union is referred thus. See T.K. Oommen (1985), P.144, chart.2.
2. The "One Lakh House" Scheme was launched by the Government of Kerala in 1972. It was one of the pioneering housing schemes in India. According to the Scheme, each beneficiary were to be given a house plot, the area of which was fixed at 200 sq. yards, and a fully constructed semi-pucca dwelling. The Scheme was to cover 96,000 houses (100 houses in each of the 960 Panchayats), but by the end of 1976 only about 60,000 houses could be constructed. The Scheme was discontinued in 1975-76, by the government, with a view to evolve new Schemes to benefit more members of the poor households.

The various physical, social and economic impact of the Scheme was evaluated by the Expert Committee appointed by the Government of Kerala in 1978. The Survey of the beneficiaries conducted by the Committee revealed that 63.8 per cent of the families were dissatisfied with the semi-detached arrangement as they preferred to stay in detached houses, the traditional preferences of the people of Kerala. The old houses of the Scheme was found poor with regard to space and quality of materials used. (Agusty, 1989).
3. In order to make up the work lost in their customary paddy fields, some ploughers have taken up work in new areas where mechanization has not been introduced. Though this mobility factor has helped some to cope up with the new situation, some others were on the look out to dispose of the bullocks they own.

Chapter 7

CONCLUSIONS

Paddy production in Kerala has been declining from the mid-seventies, mainly due to the large scale shift in area under paddy. Various factors have contributed towards this trend, in particular the decreasing profitability of paddy cultivation. Over the years official programmes like, Intensive Paddy Development Programme, Intensive Area Development Programme, Paddy Boosting Programme etc. have been introduced to improve the production of paddy. But they have not produced the desired results. The petty and fragmented paddy fields have been a major constraint in introducing any major cost reducing innovations in cultivation of paddy and boosting its production. It was in this context and as part of the policy of reorganization and revitalization of the agricultural sector by the then existing Government that Group Farming in paddy cultivation was introduced in Kerala in 1989.

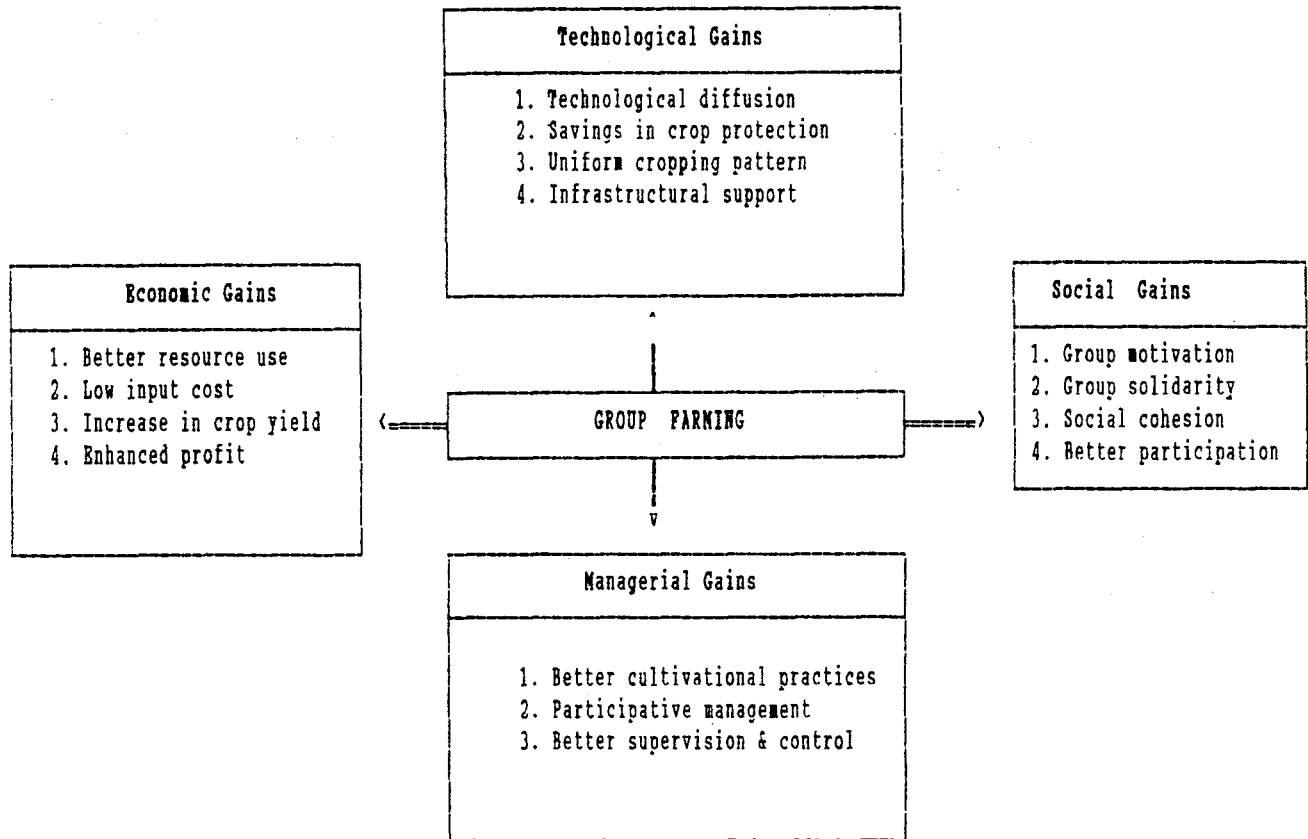
Group farming, which is distinct and different from co-operative and collective farming, has the following objectives; a) to reduce cost of production through collective management and sharing of common benefits, b) to facilitate effective management of the resources by pooling the individual resources for managing purposes only, c) to promote individual incentives and enterprise by retaining individual ownership of land/capital, and d) to strengthen the linkages between production, technology transfer, input supply and marketing. As a method of farming such a system had been in vogue in various parts of the world. And some of the

earlier micro-level experiments in Kerala itself had shown to be beneficial.

In 1989-90 about 30 percent of the total area under paddy was brought under group farming, spreading over all the districts of Kerala. Though the Programme has existed for only a short duration, official circles have claimed its achievements to be substantial. In this study we have made an attempt to analyze the impact the group farming has made on the paddy cultivation by a farm level survey in a selected panchayat in Trivandrum district. A study at this stage was important since it would enable us to assess its performance and throw some light on the drawbacks, if any. The main findings of the study and their policy implications are discussed below.

Among the five padasekharams of the panchayat in which group farming has been introduced we observed different levels of implementation. Only in two, ie., padasekharam P1 and P3, has the Programme made significant impact on paddy cultivation. Here the cultivators have reported notable gains under group farming. The important ones are, a) reduction in cost of cultivation, b) increase in output, c) introduction of new technologies in the form of mechanized tilling and chemical weed control, d) uniform cultivational practices, e) better infrastructural support, and f) group solidarity. These gains are presented in a stylized form in the schematic chart below.

chart 7.1:Gains From Group Farming



The analysis of data collected from the padasekharams showed that in the two padasekharams where group farming has progressed there has been significant reduction in the cost of cultivation. The decrease was much higher in padasekharams P1 than in P3 and in the others no significant change in cost is observed. It was in the cost of labour that the reduction mainly registered. In padasekharam P1 it decreased by 12 per cent. This reduction was greatly assisted by technological innovations like mechanized tilling and chemical weed control introduced under group farming. In the case of the cost of materials, though there has been a significant reduction in the cost of seed and plant protection chemicals, due to a larger increase in the

cost of fertilizer, organic manure and weedicides the total material cost has increased under group farming. This was mainly due to the increase in the use of HYV seeds to which more manure is applied. The paddy output increased in all padasekharams, but at a higher rate in padasekharams P1 and P3. Our analysis showed that the increase in the use of HYV seed and favorable climatic factors played the major role in the increase of output registered under group farming.

The reduction in the cost of cultivation was visible in all size groups of land holdings. However, it was stronger in the smaller classes. We have noticed an inverse relation between size of holding and cost of cultivation, with considerable variation between the groups. Under group farming the variation has reduced. The increase in paddy output is also reflected in all sizes of holdings. Though there was no clear pattern in these changes, the variation between the size classes has come down under group farming. And in those padasekharam where group farming has not progressed no significant change in variation is observed. These results are indicative of the benefits that could accrue from grouping of operations, especially for small sized holdings.

An important aspect of the Group Farming Programme brought out in the study is the considerable unevenness in the implementation of group farming among the different padasekharams. The officers of the local Krishi Bhavan reported implementation of group farming in five padasekharams. However our study showed that in three of them group farming has failed

to take-off from the initial stage of forming Padasekharam Committees. Even in the other two in which the Programme has gained ground, there was considerable differences in the number of farm operations undertaken in group.

We have identified various factors for the better performance of the Programme in some padasekharams; i) initiative and interest shown by the Krishi Bhavan, ii) proximity of the padasekharam to Krishi bhavan, iii) leadership and organizational abilities of the Convener of the Padasekharam Committee, iv) availability of irrigation facilities and v) socio-economic background of the landholders, ie., the proportion of cultivators exclusively occupied in agriculture being higher. These factors are to be improved for the better functioning of the programme. We suggest the following measures.

i) In the case of the first two factors, apart from the administrative measures already taken by the government in starting a Krishi Bhavan in every panchayat, there is need for a group of dedicated and motivated officers in each Krishi Bhavan. They should be given adequate training before introducing innovative programmes like group farming. Occasional evaluation and incentives for better performance are also in order.

ii) The third factor highlights the importance of the Conveners in the Programme. It calls for keeping political or other sectarian considerations apart in the selection of Conveners. A truly democratic and fair process of selection should be followed.

iii) The problem related to irrigation demands a) discriminatory investment in irrigation in areas with lesser facilities, b) measures to prevent silting and levelling of available irrigation sources, c) co operate action of cultivators to obtain maximum benefit to maximum number from the available sources, without dissension and d) better co-ordination between Irrigation and Agricultural Departments.

The last factor for the poorer performance is related to the lack of interest being shown by those land holders who are not primarily agriculturists - i.e., who have other major employments - in agricultural programmes and activities. Since this category forms a substantial portion of the land holders in Kerala, policy changes are called for. In the given conditions, one way of overcoming this problem would be to make an arrangement, recognized and guaranteed by the government, whereby the land holders who are other-wise employed be allowed/asked to entrust their land to fulltime agriculturists for cultivation. Provision may be made to enable the owner to retrieve the land for self cultivation when situation demands. Such an arrangement should contribute much to the progress of agricultural sector in general and paddy cultivation in particular which needs more care and attention.

It is observed that operations like marketing, transport and purchase of inputs are not brought under group farming in any of the padasekharams. These are areas of cultivation where significant gains could be made if done in

common. For instance, in the survey area marketing of the products is done individually and the small holders usually sell their products immediately after harvest to the local merchants who appropriate large margins. Such eventualities could be remedied to a large extent if group effort is made in the marketing of products. Government intervention in the form of Regulated Markets etc. also could help in the cultivators getting a remunerative price for their products.

Our analysis has shown that group farming has a 'social cost' in the form of reduction in deployment of labourers. However this has neither been large nor widespread. Both male and female labourers have been affected. The impact has been more on female labourers since they could not make up the work lost by undertaking non-paddy farm work or by moving to new areas as the male labourers did. With regard to the type of labour affected, it was observed that it was mainly hired which has been affected.

No organized resistance has occurred against the programme. This could be due to the fact that, a) the impact on labour has not been widespread, b) the workers have been taken into confidence on the various aspects of the programme by the Karshika Vikasana Samithi in which labourers have representation. and c) it is in the interest of workers also to sustain paddy cultivation since it gives them comparatively more employment than cultivation of other crops. These factors could have restrained the labourers from putting up any organized resistance against the Group Farming Programme.

In short, it can be said that group farming programme is a much more viable farming system, which offers potential for enhancing production and profitability of paddy. There is no gain saying the fact that this programme has induced farmers to innovate and experiment. Some of its draw backs could be attributed to the weakness of the existing organizational and institutional arrangements, in spite of some earnest efforts from the Government. Hence it is suggested that with suitable and further modifications and revamping in its functional styles, the group farming model be of much benefit to paddy cultivation and could be emulated by other sectors of cultivation also.

Annexure 1

A STUDY ON GROUP FARMING IN KERALA
Questionnaire for Field Survey
(Paddy Cultivators)

DISTRICT	PANCHAYAT	PASASEKHARAM
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I. Identification of the Sample House Hold:

1. Name of the Head:
2. House Address:

II. Details of Members of the family:

1. No.	Name	Relation to the Head	Sex	Age	Occupation	Education
1						
2						
3						
4						
5						

Codes: i) Sex : 1. Male 2. Female

ii) Occupation : 1. Farmer 2. Agricultural labour 3. Non-Agricultural wage labour 4. Regular Employment 5. Self Employed 6. Business 7. Household work 8. Student 9. Others

iii) Education: 1. Illiterate 2. Literate without educational level 3. Primary 4. Middle 5. Secondary 6. Pre-University 7. Non-technical diploma certificate not equal to degree 7. Technical diploma not equal to degree 9. Graduate and above

III. Annual Income of the Family:

Source	Amount
1. Agriculture	
2. Salary	
3. Business	
4. Pension	
5. Foreign Remittance	
6. Rent, interest etc.	

IV. FARM AND FARMING DETAILS

1. Area Owned and nature of Land:

WET LAND				DRY LAND				TOTAL
Cult- vated	Uncultivated		sub- total	Cult- vated	Uncultivated		sub- total	
	Fallow	Never Culti'd			Fallow	Never culti'd		

2. Details of Wetland Cultivation:

GROUP FARM					NON GROUP FARM				
Irrigated		Unirrigated		Sub- total	Irrigated		Unirrigated		Sub- total
HYV	TV	HYV	TV		HYV	TV	HYV	TV	

Codes: HYV = I.R.8, I.R.20, I.R.5 (Pankaj), Jyothi, Bharathi, Jaya, Pavizham etc.
 TV = P.T.B.20 to 29, O.T.P., Vella, Vellari, Vellakori.

3. Details of Dryland Cultivation:

Crop	Area
Coconut	
Tapioca	
Benana	
Rubber	
Others	

V. SPECIFIC INFORMATION

1. When did group farming start in your Padasekharam?

1. 1989, Virippu, 2. 1989, Mundakan, 3. 1989, Punja
 4. 1990, Virippu, 5. 1990, Mundakan.

UGF

BGF

2. Whether soil testing done before
 cultivation.

1. Yes 2. No

1. Yes 2. No

3. Whether Agro-Clinics operating.

1. Yes 2. No

1. Yes 2. No

4. If yes, how frequently?

1. Weekly 2. Fortnightly 3. Monthly

4. Few times in an year.

5. Whether manuring and plant protection

done on the basis of soil testing. 1. Yes 2. No 1. Yes 2. No

Note: UGF = Under Group Farming

BGF = Before Group Farming

V. SOIL PREPARATION:

1. How was land tilled: U G F B G F
 1. Country ploughing 2. Digging
 3. tractor ploughing 4. tiller ploughing
2. How was tilling organized: U G F B G F
 1. collectively 2. Individually
3. Ownership of equipment : UGF BGF
 1. Own 2. Other private persons
 3. co-operative society 4. Krishi Bhavan
4. When did you start using tractor/tiller:

VI. SEED

1. Source of seed: U G F B G F
 1. Own 2. Purchased from others 3. Krishi Bhavan
2. What is the variety of the seed: UGF BGF.....
3. If HYV, since when:
4. Why was it preferred? (1) HYV (2) T.V
 1. supplied by Krishi Bhavan 2. More productive
 3. less affected by pests and diseases
 4. due to water problem (lack of water/water logging)
5. How was sowing / nursery organized: UGF BGF
 1. collectively 2. Individually

VII. IRRIGATION:

1. What are the main sources of irrigation:
 1. canal 2. tube well 3. ponds 4. rain water 5. Tank 6. stream
2. Whether any existing irrigation facilities lying unutilized:
 1. Yes 2. No
3. If yes, why?
4. Any improvements made in irrigation/water control facilities since G.F?
 - (1) Yes (2) No
5. How was irrigation organized: UGF BGF
 1. collectively 2. individually
6. Do you have water control problem?
 1. Yes 2. No

VIII. MANURING:

1. Source of manure:

- a) in organic manure: UGF..... BGF.....
- b) organic manure : UGF..... BGF.....
 - 1. own source 2. bought from market
 - 3. Krishi Bhavan 4. others

2. How was manure applied?

- a) in organic : UGF BGF
- b) organic : UGF BGF
- 1. collectively 2. individually

3. Whether the quantity and intensity of manuring more/ less under group farming:

- 1. Yes 2. No 3. No difference

4. If yes, why?

- 1. advise of Krishi Bhavan 2. due to collectivisation
- 3. due to change in seed variety 4. any other

IX. PLANT PROTECTION:

1. How was plant protection organized: UGF BGF

- 1. collectively 2. individually

2. What was the equipment used: UGF..... BGF

- 1. knaspsack spray 2. power spray

3. Ownership of equipment: UGF BGF

- 1. own 2. other pvt. persons 3. co-op.soty 4. Krishi Bhavan

4. Whether the quantity and intensity of application of pesticides/insecticides more/less under G. farming?

.....

5. If yes, why?

- 1. Advise of Krishi Bhavan 2. due to collectivisation
- 3. due to change of variety of seed

X. TRANSPORT AND STORAGE:

1. Whether anything transported collectively: 1. Yes 2. No

- 2. If yes, what? 1.Seed 2.Manure 3.fertilizer 4.Paddy 5.Hay

3. Quantity and manner of transport

ITEM	FAMILY LABOUR		HIRED LABOUR		MACHINE	
	Amount	Cost	Amount	Cost	Amount	Cost
Seed						
UGF						
BGF						
O.Manure						
UGF						
BGF						
Fertilizer						
UGF						
BGF						
Paddy						
UGF						
BGF						
Hay						
UGF						
BGF						

4. Whether anything stored in common? 1. Yes 2. No
5. If yes, what 1.seed 2.manure 3.fertilizer 4.paddy 5.Hay
6. Whether lack of storing facilities force you to sell the produce immediately: 1. Yes 2. No

XI. CREDIT:

1. Do you avail credit facilities for paddy cultivation
 1. Yes
 2. No
2. If yes, what was the source
 1. primary co-op.banks
 2. comm. banks
 3. pvt.individuals
3. What was the credit for:
 1. agricultural purposes
 2. development purposes
 3. any other
4. How as the credit availed:
 1. through the committee
 2. individually
5. Whether non availability of credit facility a real problem for taking up timely agricultural operations
 1. Yes
 2. No

XII. MARKETING

1. How much of the produce was marketed:

	UGF	BGF
a) Paddy
b) Hay

2. When were the produce sold:

UGF ...

BGF ...

1. immediately after harvest 2. New month later

3. How was marketing done? UGF ... BGF ...

1. collectively 2. individually

XIII. LABOUR

1. How was labour mobilised: UGF ... BGF

1. collectively 2. individually

2. Whether any labour problems: UGF ... BGF

1. Yes 2. No

3. If yes, when do they occur

1. at the time of land preparation 2. time of harvesting
3. any other

4. How were they resolved?

1. arbitration council 2. mutual arbitration 3. court

5. Whether labour availability is a problem for carrying out
timely operations

1. Yes 2. No

6. If yes, reasons:

1. lack of sufficient labourers 2. incapability of farmer
to pay the pay the labour charge 3. agricultural labourer opt for
other works during the period 4. any other reasons.

7. As regards to labour problems, are you in an advantageous
position under group farming?

1. Yes 2. No 3. No difference

XIV. OTHER ACTIVITIES WHICH ARE COLLECTIVELY ORGANIZED

Specify:

XV. EXTRA ELEMENT OF SUBSIDY UNDER GROUP FARMING

(above what already exists)

ITEM	KIND	CASH
1		
2		
3		
4		
5		

XVI. COST OF CULTIVATION

a) Labour cost (costs when it comes to paise has been rounded off to the nearest rupee value)

I T E M		FAMILY LABOUR						HIRED LABOUR						ANIMAL LABOUR			MACHINE LABOUR			TOTAL	
		Hours		Rate		Cost		Hours		Rate		Cost		Hours	Rate	Cost	Hours	Rate	Cost	Cost	
		M	F.M	M	F.M	M	FM	M	FM	M	FM	M	FM								
Preparatory tillage	UGF																				
	BGF																				
Sowing/transplanting	UGF																				
	BGF																				
Manuring / fertilizing	UGF																				
	BGF																				
Weeding	UGF																				
	BGF																				
Plant protection	UGF																				
	BGF																				
Drying / storing	UGF																				
	BGF																				
Irrigation	UGF																				
	BGF																				
Miscellaneous (transport etc)	UGF																				
	BGF																				
Total	UGF																				
	BGF																				
Harvesting / threshing	UGF																				
	BGF																				

b) Material Cost:

	Type		Rate		Quantity		Value	
	UGF	BGF	UGF	BGF	UGF	BGF	UGF	BGF
Seed								
Organic Manure								
Urea								
Inorganic Manure								
Phophaste								
Potash								
Plant protection								
Irrigation								
Miscellaneous (weedicides)								

XVII. INCOME FROM CULTIVATION

	UGF	BGF
a) Paddy : Quantity (Para)
Value (Rs.)
b) Hay : Quantity (Bundle)
: Value (Rs)

Total value

XVIII. ADVANTAGES OF GROUP FORMING:

1. more profitable due to less labour cost
2. less pest attacks
3. easier to get loans
3. less labour problems
5. increase in area under cultivation
6. increase in productivity
7. increase in production
8. increase in irrigation/water control facilities

XIX: PROBLEMS FACED UNDER GROUP FARMING

1. inputs like seeks, manure etc. are not delivered on time
2. non availability of machines and equipments on time
3. subsidies are not given
4. non co-operation of some farmers
5. any other?

XX. ADDITIONAL INFORMATION:

Investigator:

Date:

Annexure - 2

A STUDY ON GROUP FARMING IN KERALA

Questionnaire for Field Survey (agri.labour)

1. Name and address of the worker:
2. Caste:
3. Household and occupational details of the worker:

Sl.No	Rel. to head of household	Sex	Age	Main occupation/s	Occupation rel. to paddy cultivation	Annual work days	
						Agri. BGF UGF	Non-agri. BGF UGF
1							
2							
3							

4. Has group farming made any impact on your work? YES/NO
5. If yes, give details.
6. What is your opinion about group farming?
7. Labour shortage is reported for operations like replantation and harvesting. What, according to you are the reasons for this?
8. How did you come to own your house and land?
8. Did you receive any benefit from Land Reforms/Government Projects?
9. Are you a member of any labour union/political party?
If yes, details:
10. Do you receive 'agricultural labour' pension?
If yes, details:
11. Additional information:

Investigator:

Date:

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