AGRARIAN RESEARCH AND TRAINING INSTITUTE

THE AGRARIAN SITUATION RELATING TO PADDY CULTIVATION IN FIVE SELECTED DISTRICTS OF SRI LANKA

PART 3- POLONNARUWA DISTRICT

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February 1975

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PART 3

POLONNARUWA DISTRICT

CORRECTION

1. Paragraphs 1, 2 and 3 on page 62 should be read after the final paragraph on page 65.

2. Page 14: "Professional" should read "proportional" in the second line of the paragraph below Table 1-XII.

Agrarian Research and Training Institute

colombo 1975

PREFACE

This is the third of a series of reports based on a comprehensive survey relating to paddy cultivation carried out in five of the important paddy producing Districts in the island. The report which is being issued in six parts will contain information pertaining to all aspects of the agrarian situation in the five Districts.

The interdisciplinary nature of the study was maintained from the time it was instituted and several of the Research and Training Staff and the FAO Advisors have worked as a team to prepare this report. In view of the several disciplines involved in the study the report is being published under the name of the Institute. It is, however, important to place on record the names of those officers who have contributed to this work.

Introduction	*A.S. Ranatunga* *Hiran D. Dias* *Miss T. Sanmugam*
Summary and Conclusions	*W. Gooneratne*
The Setting	*Hiran D. Dias*
Land Settlement and Tenure	*Hiran D. Dias*
Co-operatives and Credit	*A.A. Khan (FAO)* *Miss T. Sanmugam*
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Management Practices	*A.S. Ranatunga*
Productivity	*A.S. Ranatunga* *Miss T. Sanmugam*
Labour Utilisation and Incomes	*P. Senanayake* *A.S. Ranatunga* *W. Gooneratne*

Special mention must be made of the efforts made by Mr. A.S. Ranatunga who co-ordinated the work relating to this study and Miss T. Sanmugam who helped the research staff in the prepatation of statistical tables, diagrams and in the interpretation of data.

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February 1975.

ACKNOWLEDGEMENTS

With the limited resources of the Institute an exercise of this dimension would not have been possible without the unstinted co-operation of the officers in the district. Our thanks are due particularly to the Extension Staff of the Department of Agriculture who arranged for meetings with the farmers and the DAEO who made available his vehicles for this work on a number of occasions.

Finally we would like to express our appreciation of the manner in which the farmers and their families responded to our request for information.

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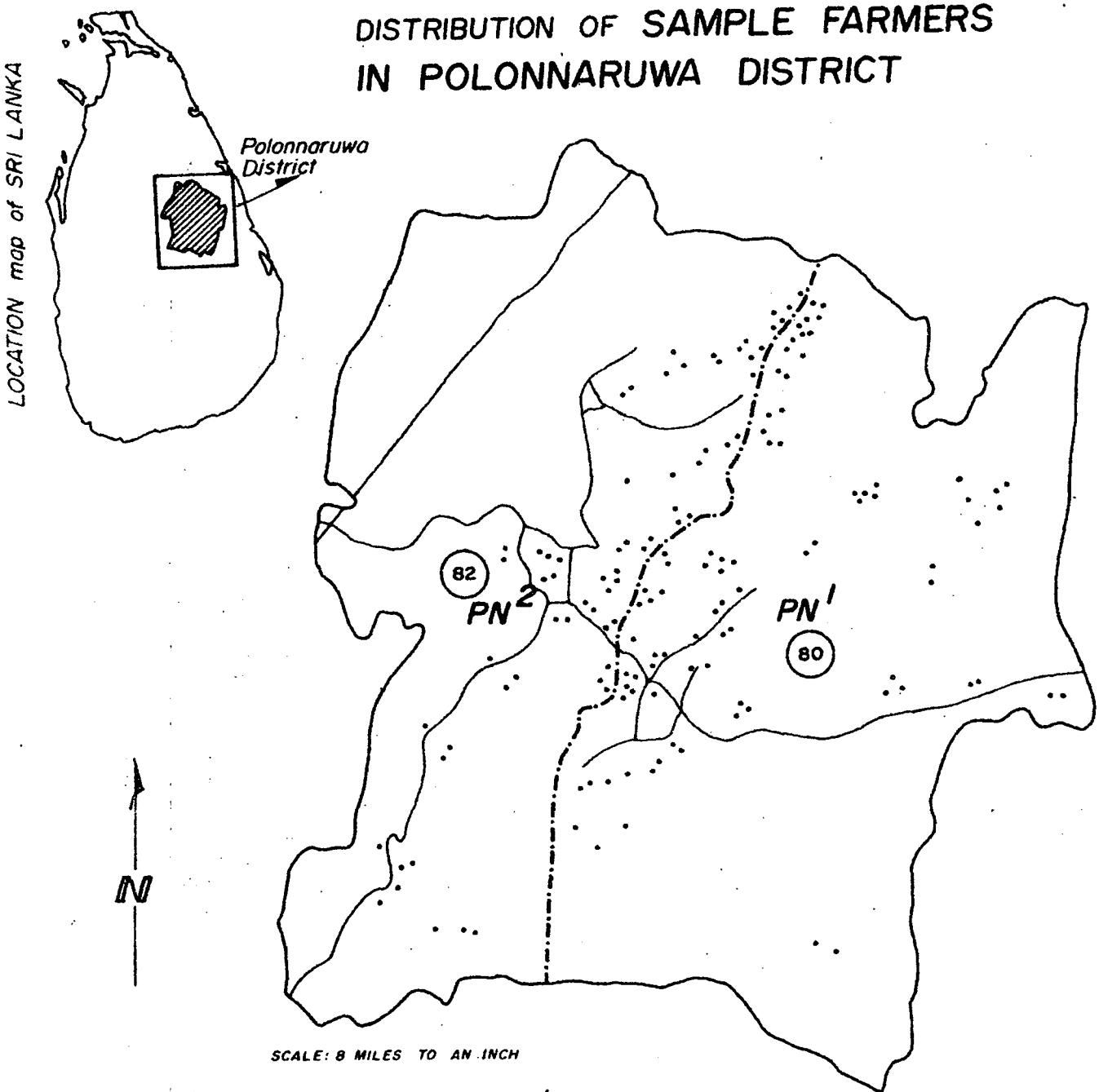

Map 1

INTRODUCTION

1 Objectives and scope of the study

This study of the Agrarian Situation relating to paddy cultivation in the Polonnaruwa District forms part of a larger study which includes the important paddy producing districts of Hambantota, Anuradhapura, Kandy and Colombo. While the study relating to each district can be examined in its own right, it would be necessary to keep the larger design of the work constantly in view. This is relevant because the conclusions and suggestions emerging in each individual case and in their totality are of value in determining the strategies of the development programme for paddy production in the future.

The Agrarian Research and Training Institute which was officially inaugurated in February 1972, considered it worthwhile to undertake a survey relating to paddy cultivation in some of the important paddy producing districts in the island for several reasons. The Institute has been established for the purpose of studying and evaluating the agrarian situation in Sri Lanka where the cultivation of paddy by small-holders is a dominant feature of the agrarian situation. In recent years there have been several research studies relating to various aspects of paddy cultivation in Sri Lanka. A great deal of work however remains to be done on the socio-economic aspects of paddy cultivation in different parts of the island. This study has been undertaken with this object in mind in order to identify the major socio-economic and environmental factors affecting paddy cultivators in the selected districts.

During the last few years there have been a number of noteworthy technical achievements in the area of rice cultivation in Sri Lanka. Among them are the development of new high yielding varieties of paddy, the availability of fertilizer mixtures suitable for different agro-climatic regions and specific recommendations for the control of major pests and diseases. Yet information available on the human and institutional factors involved is still very inadequate.

The declared national goal of attaining self-sufficiency in rice has to be achieved by matching the scientific and technical basis of the paddy production programme with the human and institutional factors. It is hoped that this survey will focus greater attention on the socio-economic and environmental factors conditioning paddy production programme in Sri Lanka. In particular, this study will examine :

1. The influence of certain socio-economic, environmental and attitudinal factors on the adoption of different cultural practices, and the impact of such practices on the productivity of land.

2. Attitudes of farmers towards various tenurial arrangements.

3. Utilisation of family and hired labour in paddy cultivation.

4. The effectiveness of different extension communication media as agents of change in cultural practices.

The study has been confined to 833 farmers in the five districts mentioned below :

	District	No of farmers interviewed
Dry Zone	Anuradhapura	201
	Hambantota	160
	Polonnaruwa	162
Wet Zone	Colombo	152
	Kandy	158
	Total	833

The number of farmers to be interviewed in each district was determined mainly by the Institute's available resources.

1.2 Method of Study and Sample Design

The Survey based on a formal questionnaire where the emphasis was on production aspects. The questionnaire was set out in seven main sections :

1. General information about the farmer, viz. family size, the land operated, sources of water, machinery and equipment, livestock, other crops cultivated, etc.

2. Tenurial arrangements and the farmer's attitude towards them.

3. Co-operatives, Credit and Indebtedness.

4. Cultural practices adopted in paddy production in Maha 1971/72.

5. Cultural practices in paddy production in Yala 1972.

6. Paddy production expenses in Yala 1972; and

7. Agricultural information and the farmer.

The questionnaire was pre-tested by Research and Training Officers of the Institute in three different areas in the Colombo district, revised and uniformly administered in all five districts.

The sample of operators selected for the survey was taken from the sample of parcels of paddy land chosen by the Department of Census and Statistics for the crop cutting survey in Maha 1970/71, which was based on a stratified multi-stage random sampling design, the parcels of paddy within each stratum being chosen with probability proportional to the extent cultivated during the previous corresponding season.

The sample for the Polonnaruwa district was limited to about 150, considered adequate to provide representative data on the agrarian situation in the district. This sample was proportionately divided between the strata 'major irrigation, minor irrigation and rainfed conditions' on the basis of the area cultivated under each in Maha 1971/72. The farmers to be interviewed were taken in sequence from the list of parcels chosen for the crop cutting survey omitting the parcels where crop cutting experiments had not been carried out and the parcels cultivated by a farmer already selected. Where the parcels were insufficient selection continued from a reserve list until the required number was obtained. The farmers cultivating the parcels so selected formed the sample for the survey.

As the size of the sample was felt to be inadequate to give reliable estimates due to the wide variability within the sample units, the appropriate estimation procedure was not followed. Instead the data was analysed as a simple random sample of operators from a population of operators.

The sample of parcels for the crop cutting survey was chosen with probability proportional to the extent under cultivation during the previous Maha season. As the sample of parcels and

consequently clusters of parcels with corresponding operators were chosen with probability proportional to an auxiliary variate associated with size of holdings, the estimate obtained by treating the sample as a simple random sample could be biased. Estimates of characteristics positively associated with size of holding would tend to be over-estimated and those negatively associated are likely to be under-estimated on the assumption that size of holding is linearly correlated positively with the auxiliary variable - extent sown during Maha 1970/71. The extent of bias depends on the nature of the distribution of the auxiliary variable in the population.

The selection of the sample was based on an objective randomisation procedure the units being chosen with unequal probability. Although not the sampling design best suited to some aspects of the study, this sampling procedure was adopted to enable a comparison of reported yield with yield data obtained through crop cutting experiments especially since agrarian aspects connected with production and productivity were the main concern of the survey. The data analysis does, however, introduce an element of bias on estimates and conclusions in respect of characteristics related to the size of holdings. The reader's attention has, however, been drawn to the parts of the report where such biases appeared to be significant.

1.3 The Field Survey

The field work in the Polonnaruwa was conducted during the period 26th March to 3rd April 1973. Three investigators from the Institute assisted by seven final year Geography and Sociology students from the University of Sri Lanka interviewed the farmers. Although they had had previous experience of similar field work, the investigators were given additional instructions on the survey objectives and the information to be collected.

The farmers in the sample were contacted with the assistance of the Government Agent and Agricultural Extension staff. The field work was supervised on the spot by four Research and Training Officers of the Institute who also scrutinised the completed questionnaires at the end of each day and in consultation with the investigators rectified any discrepancies on incomplete recording. The response of the 162 farmers interviewed was very good and the analysis was based on this data, except for some sections where responses were not available from all of them.

Figures reported have been rounded off to the nearest whole number except where it was material to retain decimal places.

Slight discrepancies between the 'sum of components' and 'totals' seen in some tables are due to rounding off of figures. Non-additivity of components due to reasons other than rounding off of figures have been specifically indicated.

1.4 Definitions

Some of the terms used in this report may require definition.

a. Lowland/Highland/Chena

'Lowland' refers to asweddumised wetlands normally used for paddy cultivation although other crops may sometimes be grown in Yala perhaps due to the lack of water. Some of these are terraced fields which are on hill slopes and are fed from streams by means of anicuts and channels. 'Highland' refers to dry lands, unirrigable by gravity methods which are used on a permanent basis. While 'Chena' refers to dry lands used on the basis of shifting cultivation.

b. Household/Family/Farm

Information was collected on the basis of households. A 'Household' being defined to include all members of a family living together. This unit is sometimes referred to as 'Family' in the text. The 'farm' represents the collective farming activities of the members of the household.

c. Tenurial Status

This refers to the operator's tenure relationship to the lowland cultivated. Where the entire cultivated holding is owned by members of the household, the operator has been classified as 'Owner'. Where the entire operated holding is rented in, leased in or taken on ande[1], the operator has been classified as 'Tenant'. Where the operated holding comprises both these categories, the operator has been classified as 'Owner-tenant' or 'Tenant-owner' depending on whether more than 50% of the operated holding is owned or tenanted respectively.

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[1] 'Ande' refers to the traditional system of renting out land on the basis of share-cropping. The arrangements under which such lands are cultivated vary considerably. Conditions prevailing in this district are discussed in Chapter 2.

d. Size of Holding

Operated lowland holdings have been classified into 7 classes in terms of size :

Upto 2.00 acres	-	holdings upto and including 2.00 acres
2.00 - 4.00 acres	-	holdings over 2.00 acres and upto and including 4.00 acres
4.00 - 6.00 acres	-	holdings over 4.00 acres and upto and including 6.00 acres
6.00 - 8.00 acres	-	holdings over 6.00 acres and upto and including 8.00 acres
8.00 - 10.00 acres	-	holdings over 8.00 acres and upto and including 10.00 acres
Over 10.00 acres	-	holdings over 10.00 acres

e. Paddy Varieties

Varieties cultivated have been classified as Old High Yielding Varieties, New High Yielding Varieties, and Traditional Varieties as follows :

Old High Yielding Varieties	- H-4, H-7, H-8, H-501
New High Yielding Varieties	- BG 11-11, BG 34-6, BG 34-8, LD 66, MI 273, IR 264, Taichung
Traditional Varieties	- All unselected local varieties, as well as older pure line varieties like Pachchaiperumal.

f. Maha/Yala

The two main seasons during which paddy is grown, 'Maha' the more important season normally extends from about September-October to February -March and coincides with the North-East Monsoon which brings rain to the dry zone where the major paddy growing areas are. This is the more important season, where 4-4½ months and longer age varieties of paddy are mainly grown. 'Yala' normally extends from about April to August and coincides with the South-West Monsoon during which time the dry zone gets little or no rain. Shorter age varieties of 3-3½ months are grown mainly during this season especially in the dry zone.

g. Value of Paddy Produced

For purposes of valuing the paddy produced, the Guaranteed Price of Rs.14/- per bushel has been used, which was the prevailing price at the time of the study.

h. Attan - traditional term used for exchange labour.

i. Abbreviations

The abbreviations used in this report are :

AI	-	Agricultural Instructor
DRO	-	Divisional Revenue Officer
HYVs	-	High Yielding Varieties
KVS	-	Krushikarma Vistharthi Sevaka (Village Level Extension worker)
NHYVs	-	New High Yielding Varieties
TDM	-	Top Dressing Mixture (fertilizer)
TVs	-	Traditional Varieties
V_1/V_2	-	Basal Dressing Mixture (fertilizer)

Chapter 1

THE SETTING

1.1 General

The district of Polonnaruwa which is in the North Central Province is situated in the Dry Zone of the country. 1,314 square miles in area, the district is divided into two revenue divisions for administrative purposes.

1. Medapattu and Egodapattu, and
2. Sinhalapattu

With a population of 163,858 in 1971[1] *and a density of 124 persons per square mile, Polonnaruwa is one of the more sparsely populated areas of the country.* The population is very unevenly distributed and is concentrated mostly in the areas under major irrigation.

The main economic activity of the district is agriculture.[2] *In* 1962 *about* 11 *per cent of the land was under agricultural holdings of which 79 per cent was under crops. Of the 75,292 acres under crops 68 per cent was asweddumised making paddy cultivation the premier agricultural activity in the district.* The remaining 23,753 acres were reported to be under subsidiary food crops, plantation crops and grassland.

The land is suitable for agriculture though most of it remains uncultivated owing to climatic conditions. Much of the area consists of gently undulating lowland varying for the most part between 50-500 feet above sea level. (Map 2). Towards the South Western and Western margins of the district the elevation exceeds 500 feet where low ridges from the central highlands tending north-northeastwards extend into this district.

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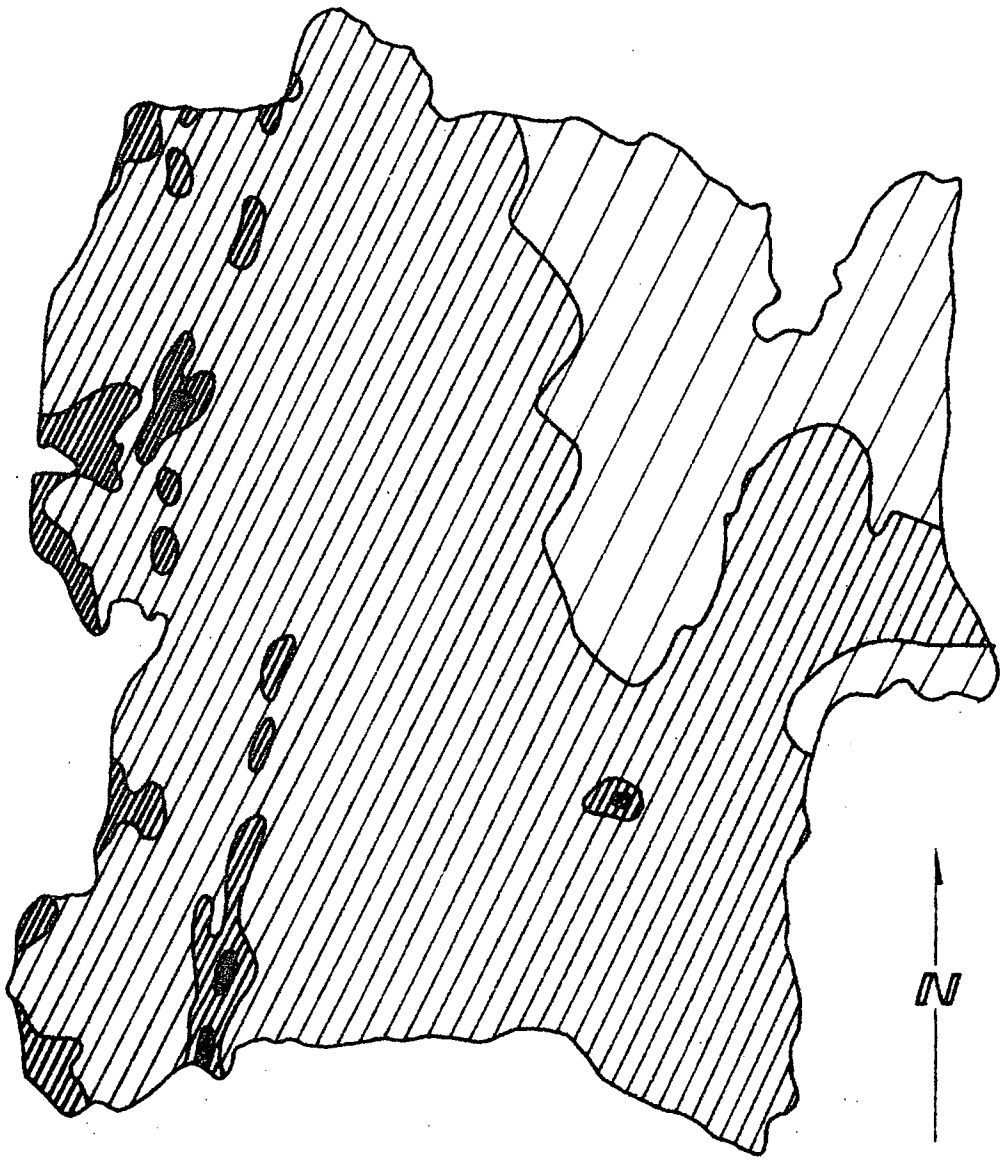
[1] Statistical Abstract of Ceylon, 1970-71, Dept. of Census and Statistics, 1974.

[2] Census of Agriculture, 1962, Department of Census and and Statistics, 1966.

Generalized RELIEF Map of POLONNARUWA



ELEVATION

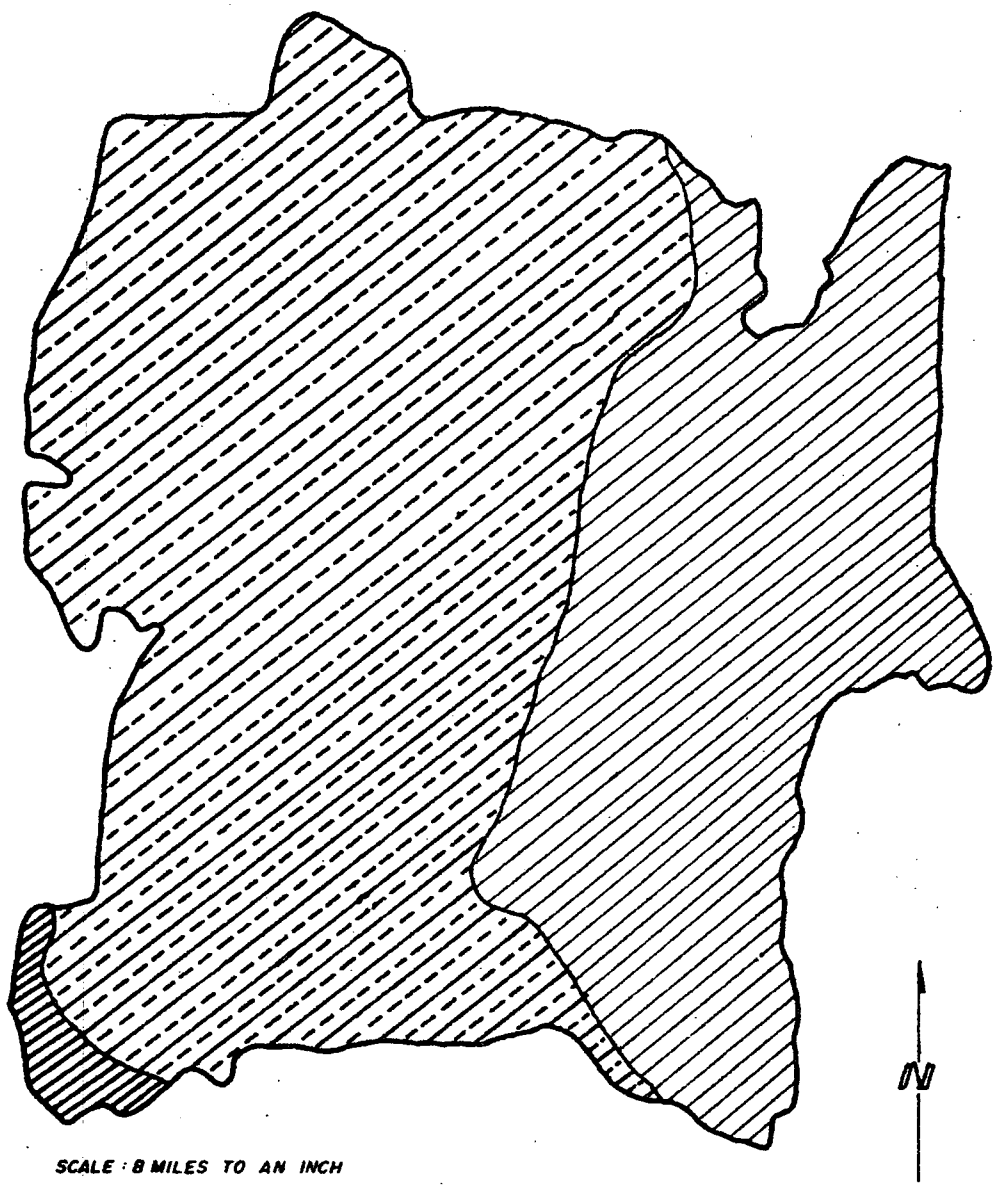
- 1000 ft. and above
- 500 – 1000 ft.
- 100 – 500 ft.
- 100 ft. m.s.l.

SCALE : 8 MILES TO AN INCH

Source : Map of Ceylon – Physical

Map 2

Generalized **RAINFALL Map of POLONNARUWA DISTRICT**



SCALE : 8 MILES TO AN INCH

DRY LOWLAND - (Latosol region)- LOW RAINFALL M.A.P. Approx. 50"–75"

DRY LOWLAND - (Reddish Brown Earth region) — do —

DRY LOWLAND - (SEMI DRY) Moderately low to low rainfall with rain shadow effect.

Source - Adapted from the Agro-Ecological map of Ceylon

Map 3

Much of the district is drained by the Mahaveli Ganga and its tributaries which flow in broad, gently sloping valleys separated by low ridges. The lowland appearance of this area is broken here and there by an isolated monadnock rising 200-300 feet above the surrounding lowland.

The temperature is warm enough for year round cultivation, but the rainfall is seasonal. The dry zone (Map 3) receives 50-75 inches of rainfall annually but 40-50 per cent of this falls between November and January which is the period of the north-east monsoon. The intermonsoonal periods which immediately precede and follow it account for most of the remaining rainfall. The dry season extends for 4-5 months, May or June to September, when the monthly rainfall varies from about 0.5 inches to about 3.0 inches. The high temperatures and the moistureless dessicating winds which blow during this period from the South West across the central highlands increase the evapo-transpiration to very high levels. This is a season when only plants adapted to the prolonged drought conditions can survive. *If inadequate rainfall affects land use in this area, its uncertainty is equally a problem.* A delayed monsoon or its partial or total failure, excessive rain or its untimely occurrence are characteristics of the dry zone where the average rainfall figures conceal the vagaries of the weather.[1]

Table 1-I gives the average rainfall as well as the rainfall for the period September 1971 - August 1972 for several stations in the district.

The rainfall in 1971-72 was much less than the average. Topawewa had almost 50 per cent less. Apart from Angamedilla and Polonnaruwa the other stations received between 20-38 per cent less than the average rainfall during this period. The number of rainy days was also less. *This meant a longer period of drought which seriously affected cultivation in several areas.* After the Maha, the water left in the tanks was insufficient to meet the cultivation needs in Yala. The rains were not only delayed but were also excessively heavy in December and very unevenly spread through the year. *All the stations recorded a rainfall for December which amounted to almost 50 per cent of the total rainfall received for the year.*

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[1] Refer B.H. Farmer - Pioneer Peasant Colonisation in Ceylon, pp 22-31 for a more detailed discussion of the climatic conditions affecting agriculture in this area (Oxford Univ. Press. 1957).

Table 1-I : Rainfall in Polonnaruwa District

Station	Average Rainfall* Inches	No. of rainy days	1971-72 Rainfall Inches	No. of rainy days
Angamedilla	68.42	91(1940-60)	63.57	69
Giritale	66.56	97(1954-60)	47.71	69
Hingurakgoda	61.85	105(1940-60)	49.08	87
Hingurakdamana	67.92	88(1941-60)	47.02	68
Kaudulla	63.99	91(1954-60)	41.03	61
Manampitiya	70.90	75(1953-60)	43.88	50
Minneriya	62.89	94(1931-60)	47.38	76
Polonnaruwa	68.90	99(1940-60)	59.20	49
Topawewa	66.93	100(1931-60)	33.30	64

*The period of years for which the average has been calculated is specified against each station

Source : Meteorological Department

Drought conditions set in from January, February and March were almost completely dry. The drought conditions, however, were partially relieved by a rainfall of 4-8 inches in May although the average for that month is only 2-5 inches.

Farmers accordingly face the difficulty of obtaining water from rain for their cultivation. Only in Maha is cultivation possible without irrigation but even during that season irrigation is a necessary safeguard against the uncertainties of the weather. Historically irrigation in this area has depended on the storage of water in 'tanks' (reservoirs) of varying sizes. The supply from the smaller village tanks often referred to as main irrigation wells is sufficient only for Maha even in years of good rainfall; at all other times even this is inadequate even for Maha. These are often referred to as minor irrigation works. The larger tanks which form the major irrigation works are generally fed by perennial sources like the Mahaveli Ganga and its tributaries and augmented by the rain water in their catchment areas. The distribution of tank water is through gravity flow and the irrigated areas are the broad valleys below the tanks. On the higher slopes which cannot be so irrigated cultivation depends on rainfall or underground water. Where the water-table is high enough throughout the year, permanent crops like coconuts and other deep-rooted tree crops can be cultivated, but these

are very limited in extent. In other areas cultivation takes place only in the Maha season and very often takes the form of shifting cultivation which is dependent entirely on the timely occurrence of the Maha rains. A delay in the monsoon, excessive rain or drought in January - February would spell ruin for the crops. *Environmental conditions largely determine the fortunes of the farmers in this district. With sufficient water cultivation can be done in both seasons.*

1.2 Paddy Cultivation

Paddy cultivation in this district has been developed in recent decades with the restoration of the ancient irrigation works. Most of the paddy cultivation is under a few major irrigation schemes (Table 1-II).

Table 1-II Paddy Cultivation under Major Irrigation

Irrigation Scheme	Extent cultivated (Acres)
Parakrama Samudra	20,000
Minneriya	13,100
Giritale	6,200
Gal Amuna	3,500
Elahera	6,000
All schemes	48,800

Source : Director of Works, TCEO, Polonnaruwa

These five schemes account for nearly all the land cultivated in paddy under major irrigation (Table 1-III). *According to the paddy statistics for Maha 1971/72, 80 per cent of the extent cultivated in paddy was under major irrigation.* There was more land cultivated under minor irrigation than under rainfed conditions;

In 1971/72 there was an increase of 10,829 acres of aswedduMised paddy land as compared with the figure for 1962 (Table 1-IV).

Table 1-III Gross Extent Sown in Paddy
Maha 1971/72

	Major Irrigation	Minor Irrigation	Rainfed	Total
Extent (acres)	49,816	7,599	4,963	62,368
Per cent	80	12	8	100

Source : Department of Census & Statistics

In 1962 most of the holdings fell into the categories 2.5-5.0 and 5.0-10.0 acres (Table 1-IV) and accounted for 72 per cent of the holdings and 81 per cent of the land extent. This may be explained as the result of the land policy under which these areas were developed. In the early stages of colonisation, settlers were entitled to an allotment of land consisting of both lowland and highland,[1] which varied in extent from 5 to 10 acres. During this period an attempt was made to attract middle class settlers also to these areas by giving them allotments of 25 acres. In later years the expansion in irrigated extent could not keep pace with the rapidly increasing population and the increasing demand by the landless peasantry for land in the Dry Zone. As a consequence of this the size of the allotment was reduced in later years and there were no attempts to attract middle class settlers. The average size of a paddy holding according to these figures is 4.0 acres.

Table 1-IV Asweddumised Paddy Land according to
Size of Operational Holding - 1962

Size of Holding (Acres)	Holdings No.	Holdings %	Extent Acres	Extent %
Less than 0.50	430	3	210	*
0.50 to under 1.00	420	3	280	*
1.00 to under 2.50	2,430	19	3,600	7
2.50 to under 5.00	4,620	36	15,810	31
5.00 to under 10.00	4,640	36	25,500	50
10.00 to under 25.00	240	2	4,180	8
25.00 to under 50.00	11	*	300	*
50.00 and over	5	*	1,659	3
Total	12,796	100	51,539	100

* Less than 1%

[1] Lowland refers to asweddumised paddy land, while highland refers to unirrigable highland.

Only 2 per cent of land under paddy cultivation was recorded as cultivated by tenants who formed 4 per cent of the cultivators in this district. (Table 1.V). The lands alloted to settlers under the major irrigation schemes are referred to generally as "LDO (Land Development Ordinance) lands". In our analysis we have treated these as owner cultivated because these cultivators do not face the same problems as ande cultivators. Tenancy under traditional forms of ande cultivation is negligible in this district.

Table 1-V Cultivators and Cultivated Extent according to Tenurial Categories (1971/72)

Size of Holding (Acres)	Tenant Cultivators On Thattumaru and Kattimaru land			Tenant Cultivators On other tenanted land			Owner Cultivators			Land Owners using hired labour		Total		
	No	%	Acres	No	%	Acres	No	%	Acres	No	Acres	No	%	Acres
Less than 0.50	*	*	*	38	7	*	212	1	*	-	-	250	1	*
0.50- 1.00	*	*	*	110	20	*	855	6	*	-	-	965	6	*
1.00- 2.00	*	*	*	175	32	*	1,565	11	*	-	-	1,740	12	*
2.00- 5.00	*	*	*	134	25	*	8,371	59	*	-	-	8,505	59	*
5.00-10.00	*	*	*	89	16	*	3,266	23	*	-	-	3,355	23	*
Over 10.00	*	*	*	2	+	*	108	+	*	-	-	110	+	*
Total	3	8		548	100	1,274	14,377	100	53,156	-	-	14,925		54,438

Source : Department of Agrarian Services

*Not available; - Nil; + Less than 1%

Although comparable macro-level data on the distribution of land according to size of holding is not available for the period of the survey, we could use the data in Table 1-V to get some idea of the position in 1972. Most of the cultivators (59%) had holdings of 2.0 - 5.0 acres; a further 23 per cent had holdings of 5.0 - 10.0 acres. On the assumption that each cultivator had only one holding, this would imply that 82 per cent of the holdings were 2.0 - 10.0 acres in size. This assumption may not be completely valid but as the settlers who received land under major irrigation schemes were entitled only to one holding, it may be justified in a district such as this where major irrigation accounts for 80 per cent of the cultivated extent. Compared to this, the holdings of 2.5 - 10.0 acres formed 72 per

cent of all the holdings in 1962. Part of the difference is probably due to the exclusion of the holdings of 2.0 - 2.5 acres from these figures. No major variation appears to have taken place in the category as a whole but within it, the holdings of 5.0 - 10.0 acres which formed 36 per cent of the holdings in 1962 formed only 23 per cent in 1971/72. There appears to have been a more than corresponding increase in the smaller holdings in this category. While the holdings of 2.5 - 5.0 acres accounted for 36 per cent in 1962, in 1972 the category of holdings 2.0 - 5.0 acres formed 59 per cent. The increase is due only partly to the inclusion of holdings of 2.0 - 2.5 in the latter figure; it must also be due to a relative increase in smaller sized holdings. Holdings of over 10.0 acres also seem to have decreased during this period; while there were 256 in that category in 1962. There were only 110 in 1971/72. The total cultivated extent for Maha 1971/72 reported by the Department of Census and Statistics (Table 1-III) was almost 7,000 acres more than the extent reported for 1971/72 by the Department of Agrarian Services (Table 1-V). A discrepancy of this magnitude points to the need for careful attention to our methods of data collection.

1.3 The Sample Population

There were 1152 persons in the sample of 154 households covered by this study. 691 persons among them were 14 years of age and over: they have been categorised separately to estimate the availability of family labour for work on the farm. The distribution of the sample households and population (of 14 years and over) among the DRO divisions is shown in Table 1-VI.

Table 1-VI Distribution of Sample Population

DRO Division	No of families	No of persons aged 14 years and over	Average no per family 14 years and over
Meda and Egoda Pattus	76	343	4.5
Sinhala Pattu	78	348	4.5
Total	154	691	4.5

The average number of persons in a household was 7.48, while 4.5 per household were available for work.

67 per cent of the 691 persons of 14 years of age and over reported that they worked only on their farms, an average of 3.0 per household doing farm work exclusively.

Table 1-VII Nature of Employment*

DRO Division	No of persons 14 years of age and over	Working only in own farm	Working in own farm & outside	Working only outside the farm	Students		Othe (Disabl too ol work e
					Engaged in farm work	Not engaged in farm work	
Meda and Egoda Pattus	343	222	48	10	8	40	15
Sinhala Pattu	348	243	43	1	11	37	13
Total No.	691	465	91	11	19	77	28
%	100	67	13	1	3	11	4
Average per farm	4.5	3.0	0.6	0.1	0.1	0.5	0.2

*figures also include students aged 14 and above

1.4 Source of Water

91 per cent of the households obtained their domestic requirements of water from wells which were sometimes shared. The rest depended on tanks (4%) while pipe borne water served (5%).

(86%) of the households obtained water for cultivation from major irrigation schemes reflecting the importance of major irrigation as a source of water for paddy cultivation in this district, and the rest (14%) depended on minor irrigation. Two of the operators reported that minor irrigation was a supplementary source of water for cultivation. Of the 843 acres lowland operated, 83 per cent were irrigated in Maha and 57 per cent in Yala (Table 1-IX). As all the holdings were under either major or minor irrigation, these figures indicate that a fair proportion of the land dependent on irrigation water did not get irrigation water. *For a district in which 86 per cent of the households receive water for*

Table 1-VIII Source of Water for Household and Cultivation Purposes

DRO Division	For Household Purposes No of households dependent on			For Cultivation Purposes No of households dependent on	
	Wells	Tanks	Pipe-borne water	Major Irrigation	Minor Irrigation
Meda and Egoda Pattu	68	4	4	59	17
Sinhala Pattu	72	2	4	74	4
All DRO Divisions	140	6	8	133	21
%	91	4	5	86	14

cultivation from major irrigation schemes, the proportion of land receiving irrigation water in Yala was very low. This probably was due to the failure of the rains during that year.

Table 1-IX Distribution of Irrigated Lowland*

DRO Division	Maha Season	Yala Season
Meda and Egoda Pattus	339.50	248.00
Sinhala Pattu	363.00	232.33
All DRO Divisions	702.50	480.33
% operated lowland	83	57

*All holdings were in Minor and Major Irrigation Schemes

4 holdings that reported source of water supply as minor and rainfed were classified as minor schemes.

1.5 Machinery and Equipment

78 per cent of the households (120) owned a total of 300 ploughs 89 per cent of which were light iron ploughs. *25 households (16%) owned 30 tractors indicating both the demand for tractors by farmers with larger holdings and the level of affluence of the cultivators, (67%) were hand tractors.*

150 households owned 559 mammoties. Only 9 households owned less than 2 mammoties- 70 households owned 4 or more mammoties per household. The ownership of ploughs and mammoties is surprisingly high for a district where operational holdings are large and several cultivators themselves own tractors. This is probably due to the cultural practices that the settlers in this district have imported from their home areas. A large number of settlers as well as migrant labour mostly for hire are from the Kandyan areas where the use of ploughs and mammoties is common.[1] Although tractors are used for field preparations, cultivators depend on buffaloes and also for an operation involving so large an extent of paddy.

Table 1-X Availability of Machinery and Equipment

Equipment and Machinery	No of farms that own equipment	No of equipment owned
Tractors (4 wheel)	7	9
Tractors (2 wheel)	18	21
Trailers	6	7
Sprayers	18	20
Dusters	5	5
Ploughs		
(a) light iron	109	267
(b) village plough	11	33

18 households owned 20 sprayers and 5 households 5 dusters. *This works out approximately at 40 acres per sprayer, an unsatisfactory situation as most of the spraying has to be done at certain critical periods.*

1.6 Livestock

The sampling population owned several head of buffalo as well as neat cattle. Ninety one households (59%) owned 519 buffaloes for draught purposes - 5.7 per each reporting household and 3.3 per sample household. *There was a pair of buffaloes for approximately 3.0 acres of lowland operated.* Several households (80) kept neat cattle for milk or draught purposes - altogether 319 head of cattle were reported which amounted to almost 4.0 head per each reporting household. *The 1086 head of buffalo and cattle reported by the 154 sample households averages 7.0 head per household representing a sizeable livestock population.*

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[1] See Agrarian Situation Study - Part II Kandy District, ARTI Research Study Series No. 7, 1974.

Table 1-XI Livestock Population reported by Sample Farms

	No of farmers reporting	Total no of livestock
Buffaloes (working)	91	519
Buffaloes (calves)	39	113
Cattle (milk and working)	80	319
Cattle (calves)	55	135
Poultry	42	461

Very few households kept large herds of either buffalo or cattle. In the case of buffaloes several households (47) kept 4 to 6 buffaloes. Most of the others had less than 4 per household, while 10 households kept 10 or more buffaloes. Most of the neat cattle were kept for milk but several households had cattle for draught purposes also, Households keeping 2 or 3 head of cattle were most common. About 10 households had 10 or more head of cattle. 42 households kept 461 poultry of which only 17 had 10 or more birds.

1.7 Land Use

The lowland was used mainly for paddy in Maha, but in Yala vegetables, subsidiary food crops, and sometimes tobacco were grown on asweddumised land where there was insufficient water for paddy. The highland area about one third of the operated land was utilised for a variety of crops (Table 1-XII).

The discussion here relates to crops other than paddy reported by the farmers. Among these chillies occupied an important position with 98 households having over 40,000 plants and a further 16 households reporting 34.5 acres.. Coconuts, vegetables and onions were also cultivated. Mango, jak, citrus and plantains were grown by many cultivators on their highland homesteads. Chillies, onions, tobacco, vegetables and plantains are grown primarily as cash crops although a fair proportion of vegetables and plantains are used for domestic consumption. Other crops are grown mainly for domestic consumption and the excess if any, is sold.

Only 5 households reported that they were engaged in chena cultivation, the extent reported being 13.5 acres. This appears unexpectedly low for a dry zone area where chena cultivation is fairly widespread. The reason why so few

Table 1-XII Crops other than paddy reported by the Farmers

Type of Crop	No. of farmers reporting	Trees/plants		Extent	
		No. of farmers	Trees/ plants	No. of farmers	Acres
Coconut	139	132	4,330	7	15.75
Rubber	1	-	-	1	1.00
Jak	102	102	583	-	-
Mango	128	128	673	-	-
Orange	34	34	137	-	-
Lime	93	93	236	-	-
Gauva	3	3	21	-	-
Pomegranate	5	5	28	-	-
Cadjunuts	7	7	15	-	-
Butterfruits	7	7	9	-	-
Other types of permanent crops	10	9	412	1	4.0
Papaw	1	1	20	-	-
Passion fruit	8	7	30	1	.50
Plantains	93	91	3,889	2	2.50
Tobacco	10	-	-	10	8.00
Gingelly	1	-	-	1	1.00
Chillies	114	98	40,545	16	34.48
Onions	33	-	-	33	11.11
Green gram	23	-	-	23	8.60
Ground nut	7	-	-	7	3.00
Maize	7	-	-	7	2.49
Vegetables	55	1	30	54	27.74
Types of Yams	25	20	4,450	5	7.25
Other types of annual crops	12	4	41	8	7.12

farmers reported chena cultivation may be due to the nature of the sample. The numbers were professional to the extent cultivated under various types of water supply. Only 21 were cultivators under minor irrigation in the sample where 86 per cent cultivated under major irrigation. The areas of major irrigation were very extensive tracts under major schemes such as Parakrama Samudra, Minneriya and Elahera where the access to land suitable for chena cultivation is limited except in the peripheral areas. In the areas under minor irrigation which are small tracts surrounded by forest, not only is the access to suitable land better but the risk involved in paddy cultivation is greater and cultivators tend to insure against this by engaging in chena cultivation also. The probability of finding chena cultivators among the latter is greater than among the former. Surprisingly, however, all the

5 cultivators who reported chena cultivation in the sample were cultivators under major irrigation. If the sample is taken as representative of this district or similar areas, it appears as though only cultivators under major irrigation schemes engage in chena cultivation and those under minor irrigation schemes do not do so. It would be difficult to maintain that position from the present knowledge of conditions in the dry zone, and it is more likely that the sample has not brought out adequately the position of chena cultivation among paddy cultivators in this district.

Chapter 2

LAND DISTRIBUTION AND TENURE

2.1 Land Distribution

The distribution of land and tenurial status of the cultivators reflect the somewhat special character of this district. 80 per cent of the asweddumised lowland is under major irrigation. Both lowland and highland under these major irrigation schemes were distributed by government to settlers in allotments of varying size, from 5.0 acres lowland and 3.0 acres highland initially to 3.0 acres paddy and 2.0 acres of highland in more recent times. In middle class schemes 10.00 acres in paddy and 15.5 acres of highland were alloted and the allottees were required to cultivate the land themselves. Although legally only lessees to all intents and purposes the allottees function as owner cultivators and have been so classified in this study. Further, the allottees are not permitted to rent, lease out or subdivide their allotments. Hence the cultivators interviewed being legally registered allottees might not have divulged information relating to any de facto subdivision of the allotment, ande cultivation, renting or leasing of the land. It is not possible to assess how widespread these conditions are but in considering the information presented here it should be assumed that these situations exist.

Of the 1,236.75 acres worked by the 154 operators an average of 8.03 acres per operator, 68 per cent was lowland used almost entirely for paddy cultivation. On the basis of 1152 persons in the 154 households the density works out at almost 1 person per acre for both lowland and highland and 1.36 persons per acre for the lowland. The distribution of this land according to the type of tenure is shown in Table 2-I.

82 per cent of the land operated was either owned or allotted, divided near equally between highland and lowland, the proportion being slightly higher for highland. 10 per cent of the operated land was encroached lowland and chena constituting 129.25 acres of which almost 60 per cent was lowland. This shows that 9 per cent of the operated lowland is made up of encroachments. Only 2 per cent of the highland was reported as rented or leased in while 14 per cent was reported as encroached or chena. *105 of the sample cultivators (68%) operated purely as owner cultivators, 16 as owner tenants and 5*

Table 2-I Classification of Operated Land by Tenure Status and Type of Land

Tenure Status	Lowland Acres	%	Highland Acres	%	Total Acres	%
Owned/allotted	685.25	81	333.75	85	1,019.00	82
Rented/leased in	83.50	10	8.00	2	91.50	7
Encroached/ chena	74.50	9	54.75	13	129.25	10
Total	843.25	100	396.50	100	1,239.75	100
%	68		32		100	

as tenant owners. Among the remaining 28 (18%) were 2 tenants, 14 owner cultivators, 7 owner tenants and 1 tenant owner who also operated encroached land.[1] Thus 77 per cent of the cultivators were basically owner cultivators.

2.2 Landlessness

The sample survey revealed that there was hardly any landlessness for the reasons already mentioned. The nature of the sample may also be responsible for conveying that impression.[2] 86 per cent of the sample cultivators came from major irrigation schemes where tenancy, if it existed, was likely to have been concealed. There are a number of tenants whose names do not appear in the Paddy Lands Register. As the sample was drawn from among the names appearing in the register a number of tenants may have been omitted. The survey might thus reveal less landlessness than actually exists.

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[1] The remaining 4 operators were purely encroachers.

[2] The sample frame used was the list of parcels of land cultivated with paddy enumerated in the P.1 form. The basic information for this is collected from the Paddy Lands Registers maintained by the Cultivation Committees. Cultivators who are encroachers tended to get left out from these registers. Sometimes tenants also were not registered when the owners or allottees found it advantageous to prevent them from being registered and could do so. The condition under which land was alienated in the dry zone colonisation schemes extremely prohibited tenancy and there is much undocumented evidence to indicate that concealed tenancy exists. Although in the preparation of P.1 form an effort is made to check and correct information collected from the Paddy Lands Registers it is doubtful whether in 1970/71 the P.1 form could have shown an accurate picture of the conditions existing in the field. The sample itself would reflect these deficiences.

Among the 154 operators in the sample for whom data has been analysed there were only 6 (4%) who did not have any lowland of their own. Two of them were tenants who also operated encroached land and the remaining 4 were purely encroachers (Table 2-II). Four cultivators who were purely tenants, however, were excluded from the analysis because they constituted too small a group to be considered separately. Even if we include them proportion of cultivators without any lowland would be 6 per cent.

Table 2-II Number of Cultivators Owning Little or No Land

Tenurial Category	Lowland only Operators owning				Highland only Operators owning				Highland and Lowland Operators owning			
	No land	Up to ½ ac.	Up to 1 ac.	Up to 2 ac.	No land	Up to ½ ac.	Up to 1 ac.	Up to 2 ac.	No land	Up to ½ ac.	Up to 1 ac.	Up to 2 ac
Owners	-	-	3	9	1	13	33	57	-	-	-	3
Owner-tenants	-	-	-	1	-	-	4	11	-	-	-	-
Tenant-owners	-	-	-	1	-	-	1	3	-	-	-	-
Others	6	8	8	9	5	6	12	17	5	5	6	7
Total	6	8	11	20	6	19	50	88	5	5	6	10

Only 10 operators (6%) had 2.0 acres or less when their total landholding of lowland and highland was taken into consideration. With regard to the lowland, only 20 operators (12%) had 2.0 acres or less; about half this number had 1.0 acre or less. Larger numbers had small highland holdings. As many as 57 per cent of the operators had highland holdings of 2.0 acres or less; almost two-thirds of them had 1.0 acre or less.

These figures indicate that very few of the cultivators were completely landless or owned holdings which could be considered as too small to be economically viable. Most of them operate lowland holdings of over 2.0 acres. In addition to this, most of the operators had some highland also, and two-thirds of them have more than 1.0 acres. Table 1-XII, however, suggests that the use made of highland is very limited.

2.3 Distribution of Lowland

685.25 acres amounting to 81 per cent of the lowland extent of 843.25 acres were owned by the cultivators who operated them. Of this total extent of lowland, 487.25 acres (71%) were operated by 105 owner cultivators (68%) who did not operate any other land, while 143.00 acres (12%) were operated by owner-tenants and tenant-owners, and the remaining 114.00 acres (17%) were operated by 28 other cultivators (18%). Of the 83.50 acres rented/leased in 59.00 acres (71%) were operated by owner-tenants and tenant-owners and the remainder by mainly tenants included among other cultivators. All 74.50 acres reported as encroachments were operated by cultivators classified as 'other', 22 of whom owned 114.00 acres. Except among tenants and tenant-owners who formed a small number, most of the land operated was owned by the operators. The distribution of different types of land operated by the tenurial categories is shown in Table 2-III. *Except in the cases of chena and encroachments the figures suggest a fairly equitable distribution of land among the tenurial categories.*

Table 2-III Distribution of Operated Land among Tenurial Categories

Tenurial Category	Operators		Lowland		Highland		Chena		Encroachments Lowland		Encroachments Highland		Total	
	No	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Owners	105	68	487.25	63	237.50	69	9.00	67	-		20.50	50	754.25	
Owner-Tenants	16	10	104.00	14	32.00	9	2.50	19	-		4.50	11	143.00	
Tenant-Owners	5	3	39.00	5	16.00	5	-	-	-		1.50	4	56.50	
Others	28	18	138.50	18	56.25	16	2.00	15	74.50	100	14.75	36	286.00	
Total	154	100	768.75	100	341.75	100	13.50	100	74.50	100	41.25	100	1,239.75	

Operators with holdings of 2.0 - 4.0 and 4.0 - 6.0 acres were the most important groups - 31 per cent and 36 per cent respectively. (Table 2-IV). 34 per cent of the lowland extent (285 acres) was held in holdings of 4.0 - 6.0 acres. 46 per cent of the lowland was operated as holdings of over 6.0 acres by 39 operators who constituted only 25 per cent of the sample. The disparity was in holdings of 8.0 - 10.0 acres and over 10.0 acres; while 14 cultivators (9%) who had holdings of 8.0 - 10.0 acres operated 132 acres (16%), 7 cultivators (4%)

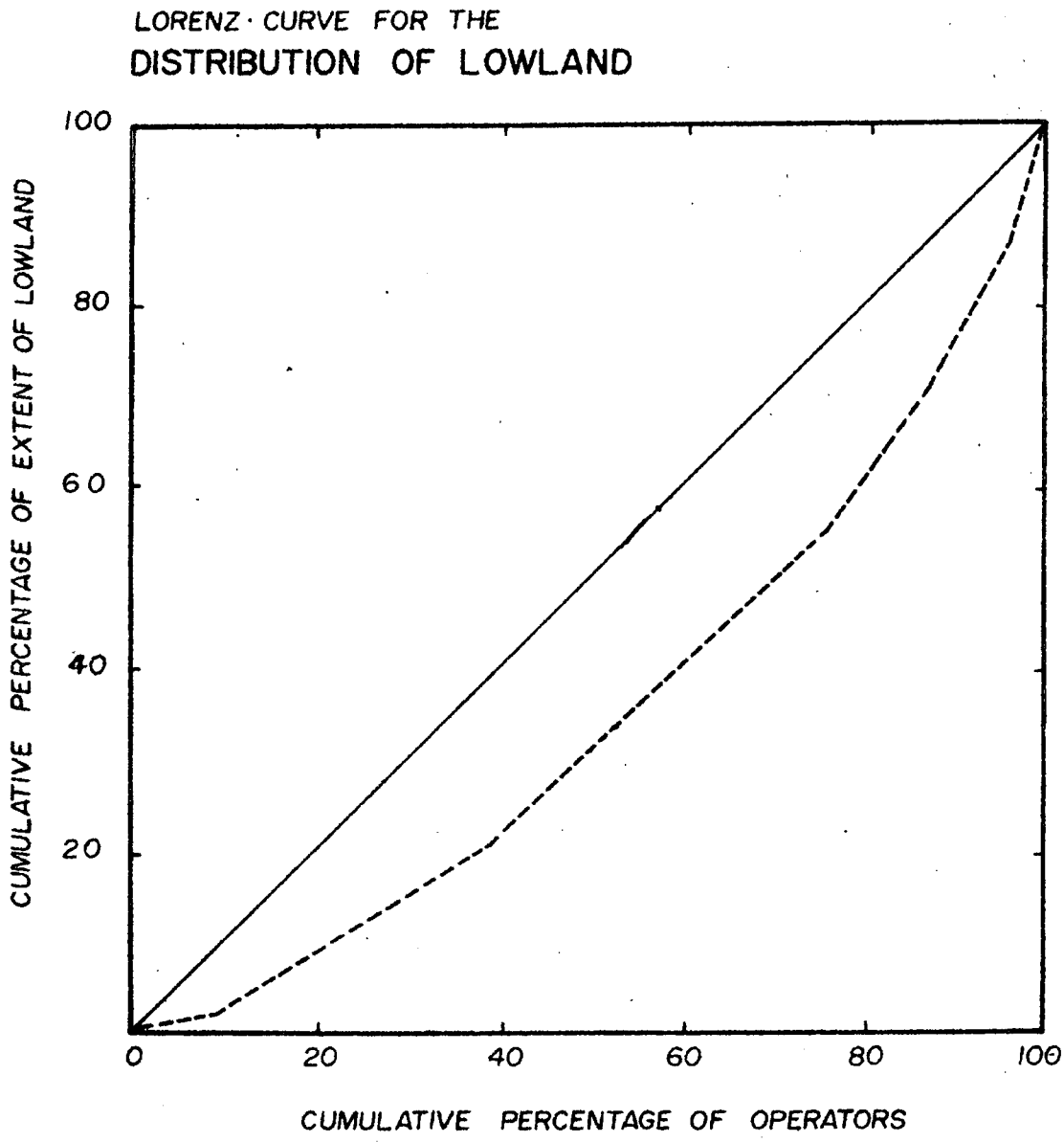
LORENZ · CURVE FOR THE
DISTRIBUTION OF LOWLAND
CUMULATIVE PERCENTAGE OF EXTENT OF LOWLAND
100
80
60
40
20
0
20
40
60
80
100
CUMULATIVE PERCENTAGE OF OPERATORS

Fig. 1

with holdings of over 10.0 acres operated 115 acres (14%); compared to the proportion of cultivators the former operated almost twice as much land and the latter more than three times as much. At the other extreme 12 cultivators (8%) with holdings of 2.0 acres or less operated only 21 acres (2%), and 48 cultivators (31%) with holdings of 2.0 - 4.0 acres operated 160 acres (19%).

Although these figures indicate inequalities in the distribution of lowland they are not of a very high order (Fig. 1). At the extremeties where the inequalities are greatest, the number of cultivators affected was relatively small (12%). The importance of the size groups 2.0 - 4.0 and 4.0 - 6.0 acres is because most of the holdings were 3.0 acres or 5.0 acres - the lowland allotment given to settlers under major irrigation schemes.

Table 2-IV Distribution of Operated Land according to size of lowland holding

Size of Lowland Holding (Acres)	Operators		Operated Lowland		Operated Highland*		Total extent operated	
	No.	%	Acres	%	Acres	%	Acres	%
Upto 2.00	12	8	20.75	2	21.25	5	42.00	3
2.00 - 4.00	48	31	159.75	19	105.75	27	265.50	21
4.00 - 6.00	55	36	284.75	34	154.50	39	439.25	35
6.00 - 8.00	18	12	131.25	16	40.50	10	171.75	14
8.00 - 10.00	14	9	131.50	16	44.25	11	175.75	14
Over 10.00	7	4	115.25	14	30.25	8	142.50	12
Total	154	100	843.25	100	396.50	100	1,239.75	100

*Extent of highland operated includes highland encroachments too.

2.4 Distribution of Highland[1]

The highland is more equitably distributed among the tenurial categories as well as among different classes of holding sizes. 69 per cent of the highland was operated by the owner cultivators who formed 68 per cent of the sample of cultivators. Cultivators classified as 'others' forming 18 per cent of the

[1]For purposes of this discussion the classification of operators according to their lowland holding has been retained.

PERCENTAGE DISTRIBUTION OF OPERATORS AND OPERATED LAND ACCORDING TO SIZE OF LOWLAND HOLDING

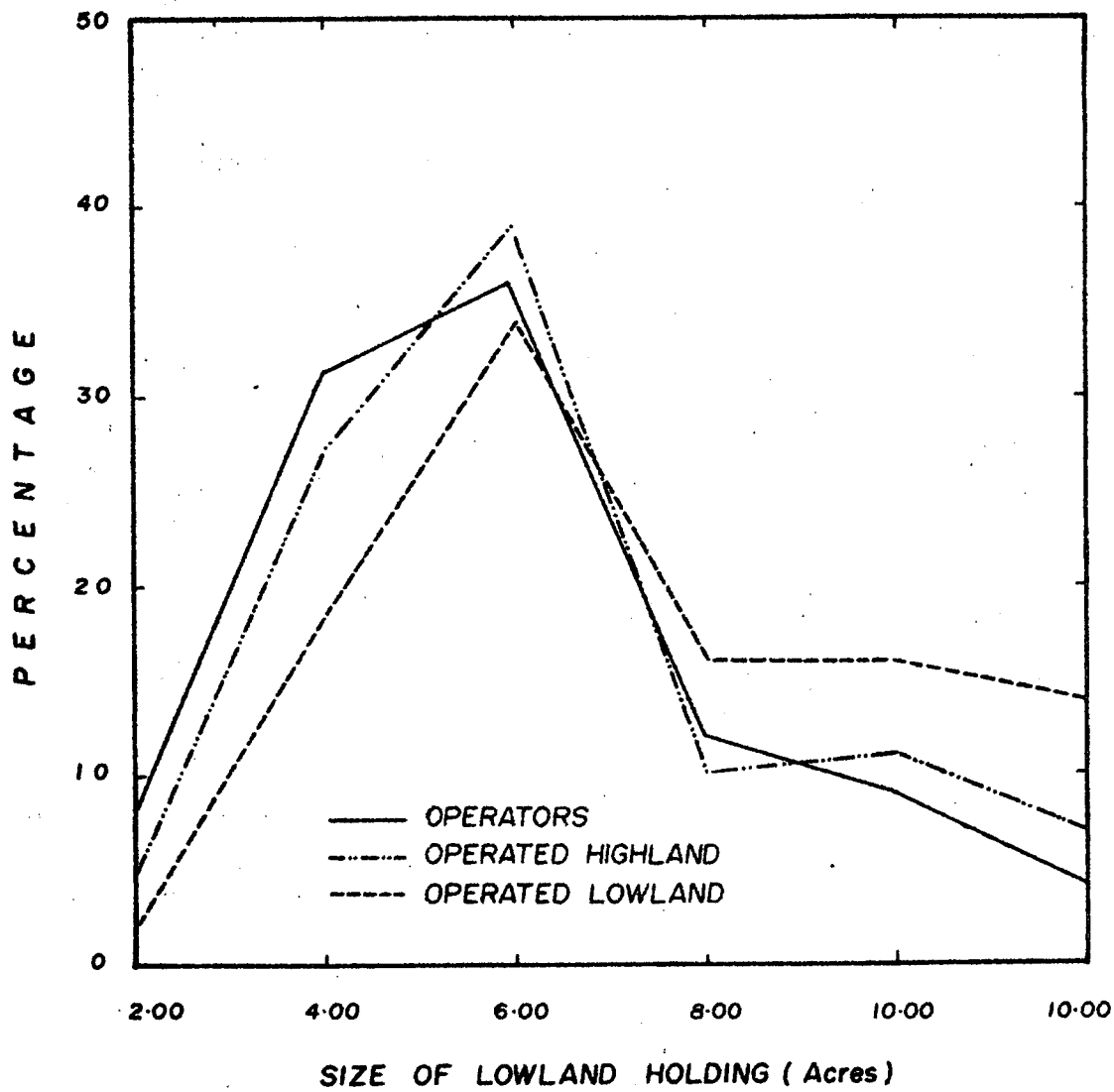

Fig. 2

RATIO OF PERCENTAGE OF LAND OPERATED TO PERCENTAGE OF OPERATORS BY SIZE OF LOWLAND HOLDING

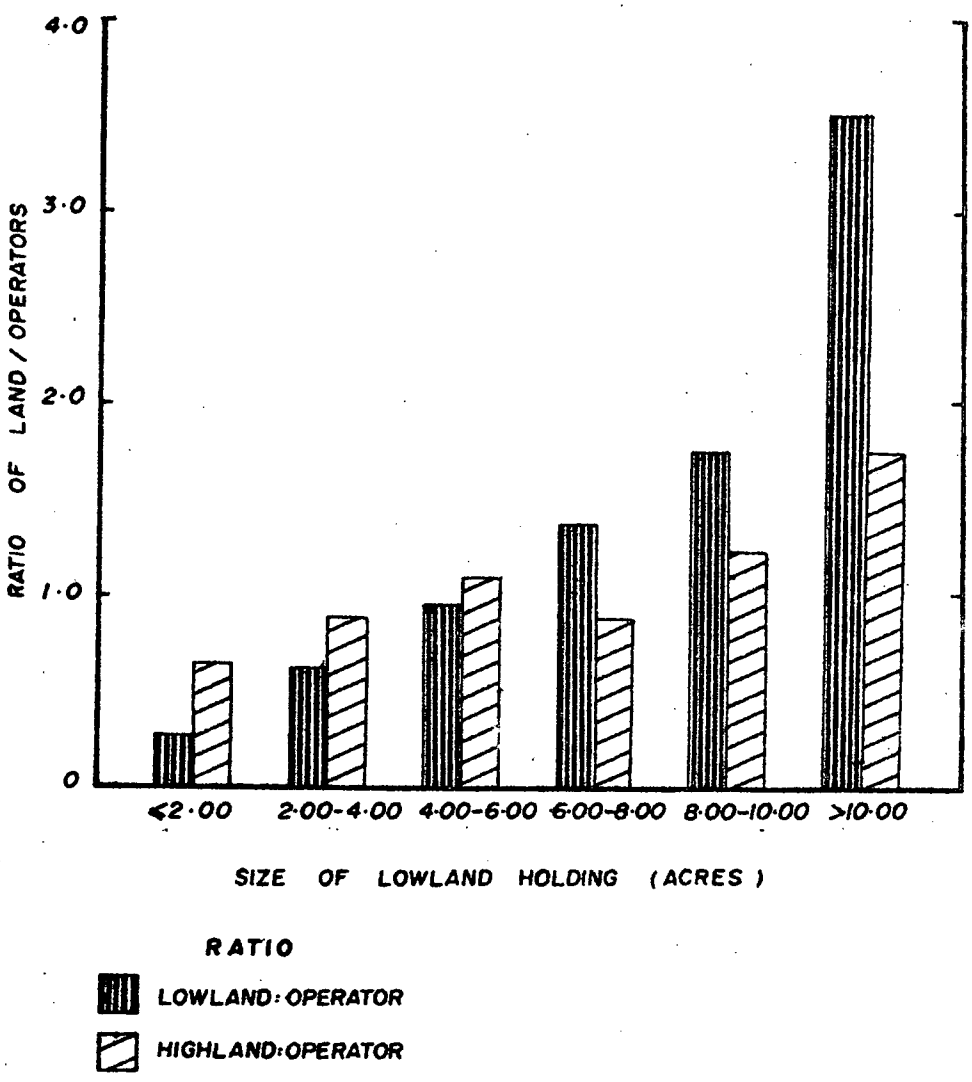

Fig. 3

sample operated 16 per cent of the highland area. This group, however, operated 36 per cent of the highland reported as encroached. Only 13.50 acres were reported as chena of which 67 per cent was reported by the owner cultivators.

The cultivators with lowland holdings of 4.0 - 6.0 acres operated the largest proportion of highland - 39 per cent of the highland was operated by the 55 cultivators who fell into this category who formed 36 per cent of the sample. The 12 smallest operators (with 2.0 acres or less) were at a slight disadvantage - the highland extent operated by them was 21.25 acres (5%) although they formed 8 per cent of the sample. On the other hand the 7 largest operators (over 10.00 acres) had a slight advantage as they (4%) operated 7 per cent of the extent (30.25 acres).

Taking both lowland and highland together, the 55 cultivators (36%) with holdings of 4.0 - 6.0 acres operated 35 per cent of the total extent operated. Those with holdings smaller than that operated proportionately less land - 39 per cent of the cultivators operated only 24 per cent of the land. The proportion of land they operated was less with respect to both lowland and highland; it was more so with regard to lowland than highland. Cultivators with holdings larger than 6.00 acres operated proportionately more, with the proportion increasing with size of holding. The two largest size classes operated proportionately more of both lowland and highland but the proportion was more with respect to lowland than highland. The cultivators with holdings of 6.0 - 8.0 acres operated proportionately more of lowland but less of highland (Figs. II and III). *The distribution of land appears to be fairly equitable among the medium size groups while the smallest cultivators operate proportionately less and largest farmers proportionately more than they should operate. This is more true of the lowland which forms the most important component of the landholdings in the district.*

2.5 Overall Size of Holding

As the sample selected was on probability proportional to size of holding, the figures are likely to be biased by the characteristics of the larger farmers. Most of the cultivators in this sample have been drawn from areas with major irrigation as the sample has been stratified on the basis of water supply. This factor would also have influenced the information relating to the size and tenure characteristics of landholdings in this district as most of the holdings came within major irrigation schemes. The size of holdings and conditions of tenure in them were determined by government

policies of land distribution which were in force at various periods of land development in this area.

The average extent operated by the cultivators in this sample was 8.05 acres which was made up of 4.99 acres lowland and 2.22 acres highland which was owned, allotted or leased/rented in and 0.84 acres of lowland and highland which was either encroachment or chena. More than half the encroached land was lowland. Much of the land operated by the cultivators was made up of allotments of lowland and highland given to settlers under major irrigation schemes; most of these were between 5.0 and 8.0 acres. There were, however, allotments of over 8.0 acres also which were given in the early period of land development in this area when land was relatively plentiful and it was difficult to attract settlers.

These figures, however, may be somewhat misleading. In several of major irrigation schemes there has been a natural growth of population. With the growth in size of families and the emergence of the second generation, it has become necessary for many settlers to support several families on the original allotment. This may have led to the subdivision of some allotments but because of the conditions under which land is allotted this would tend to be concealed. There is also a certain amount of tenancy or sub-letting which again tends to be concealed. Additional to these factors which affect size of holding on the land allotted, there has been encroachment. Several of these encroachers may not be registered in the Paddy Lands Registers and would not, therefore, get selected into the sample. These encroachers rarely operate such large holdings as the allottees. *If all this information was available the size of holding operated in reality would be smaller. It would be incorrect, however, to exaggerate the magnitude of its importance.* The average size of holding in this district is considerably larger than the national average and very much larger than the average size in wet zone areas.[1] The average size of the lowland holding revealed by these figures is larger than the average for the district as shown by Tables 1-IV and 1-V. This discrepancy may be due partly to the nature of the sample selected for this survey and partly to the differences in the basis on which the data was collected on the different occasions.

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[1] According to the Census of Agriculture, the average size of holding for all agricultural land use was approximately 4.0 acres and for asweddumised paddy land it was approximately 2.0 acres. Refer also other parts of this Survey.

2.6 Size Characteristics of Lowland Holdings

The average size of lowland holdings was 5.48 acres of which 4.99 acres were lowland which was owned, allotted and rented/leased in and the remainder was lowland which had been encroached upon. The actual extents of these holdings ranged from 1.0 acre to 23.25 acres. A standard deviation of 3.31 acres and a coefficient of variation of 60 per cent indicated a considerable variation in the size of holdings. *The median size was 5.0 acres which showed that more than half the holdings were smaller than the average size. The average size for holdings smaller than the median size was 3.42 acres compared to 7.54 acres for holdings larger than the median.* As the lower quartile was 3.0 acres, 75 per cent of the holdings were larger than that, half the lowland holdings were between 3.0 and 6.5 acres. *This indicates that the cultivators in this district operated on an average, an extent larger than what cultivators in most parts of the country operate.*

Owner cultivators constituted the largest tenurial category but the extent operated by them was on an average smaller than what was operated by other groups. The average size of lowland holding for them was 4.65 acres because some of the cultivators operated very small extents - the smallest extent was 1.0 acre. *50 per cent of the owner cultivators, however, operated extents of 5.0 acres and over.* The average holding was largest for tenant owners who operated 7.8 acres but there were only 5 cultivators in that category. The cultivators who fell into the category 'others' operated encroached land in addition to what they were allotted, owned or had taken on rent/lease. The average extent operated by them was 7.61 acres; the largest holding of 23.25 acres was operated by a cultivator in this category (Table 2-V).

It is possible to estimate the earnings from these holdings by applying the cost function derived by Izumi and Ranatunga.[1] The estimated cost per bushel at a yield of 60 bushels per acre was Rs.11.56 providing a profit of Rs.6.44 per bushel, and Rs. 386.40 per acre at the guaranteed price of Rs.18.00 prevailing at the time. On that basis the owners with their average holding of 4.65 acres could earn Rs.1,797.00 for a season. Both the owner-tenants and tenant-owners had larger holdings part of which was rented in. On the basis that they

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[1] Cost of Production of Paddy - Maha 1972/73, K.Izumi and A.S.Ranatunga - ARTI Research Study Series No. 12, April 1974, Colombo.

Table 2-V Size Characteristics of Lowland Holdings

Tenurial Category	Average size of holding	Median size of holding	Average size of holding		Standard deviation of size of holding	Lower Quartiles of size of holding	Upper Quartiles of size of holding	Range of size of holding
			Less than median	More than median				
Owners	4.65	5.00	3.11	6.17	2.24	3.00	5.00	1.00-15.00
Owner-tenants	6.50	6.25	4.72	8.28	2.18	4.75	8.00	2.75-10.00
Tenant-owners	7.80	8.00	6.80	8.80	1.30	6.75	9.00	6.00- 9.00
Others	7.61	6.00	3.88	11.34	5.53	4.00	8.75	2.00-23.25
All tenurial categories	5.48	5.00	3.42	7.54	3.31	3.00	6.50	1.00-23.25

pay half share[1] of the crop on the tenanted land which is approximately the highest amount paid as land rent, the owner-tenants and tenant-owners could earn on their average holdings Rs.2,077.00 and Rs.2,125.00 respectively per season. It is not possible to estimate the average earning capacity for the category 'others' because the cultivators included in this category are quite varied. The majority of them, however, were owner cultivators with encroachments; their earnings on the average holding of 7.61 acres could be estimated at Rs.2,941.00 for a season. If we consider that this income from one season must suffice for a family for half the year, the monthly incomes among the tenurial categories would be :

Owners	Rs. 299.00
Owner-tenants	Rs. 346.00
Tenant-owners	Rs. 354.00
Others (owners only)	Rs. 490.00

The larger holdings and the unimportance of tenancy account for the relatively high level of earnings shown by these figures. These average figures, however, can be misleading for several reasons. *Although most of the lowland comes under major irrigation, the overall index of cropping intensity was only 157 per cent: a fair proportion of this land was not*

[1] Land rent varied considerably. More than half the cultivators paid a fixed rent that varied among them. Among the others payment of half crop share was most common.

cultivated in Yala that year because of the shortage of water. Where the land cannot be cultivated in Yala the cultivators must depend primarily on the income from one season. Further, due to the variations in the size of holding the average size is not a good indicator of the holdings in this district. 51 per cent of the cultivators had holdings smaller than the average size. Among owners who constituted 68 per cent of the sample, the proportion with holdings smaller than the average for that tenurial category was 47 per cent. Among owner-tenants, tenant-owners and others, it was 56 per cent, 40 per cent and 64 per cent respectively. The variations in size, however, were not as great as in some of the other districts and the average figures, therefore, have some significance. The overall coefficient of variation was 60 per cent.[1] It was, however, only 48 per cent among the owner cultivators who constituted 68 per cent of the sample; it was even less for owner-tenants and tenant-owners - 34 per cent and 17 per cent respectively. The variation was greatest for the group of cultivators classified as 'others' among whom it was 73 per cent. Some idea of the variation in the size of holding could be gained from the difference between the average size of holding for holdings smaller and larger than the median size (Table 2-V). For the overall sample the average size was 3.42 and 7.54 acres respectively - that is, the larger holdings were on an average 2.2 times larger than the smaller ones. The magnitude of difference for the tenurial categories was 2.0 for the owners, 1.8 for owner-tenants, 1.3 for tenant-owners and 2.9 for others.

A further discrepancy arises from the difference in estimated yield and the yields obtained. The yield used as the basis for this estimate was 60 bushels per acre. This approximated to the average yield of 6212 bushels per acre obtained in Maha, although there were considerable variations in the yields obtained by the tenurial categories. When we adjust the estimates accordingly the monthly incomes for six months for Maha work out as follows :

Owners	Rs. 497.00
Owner-tenants	Rs. 507.00
Tenant-owners	Rs. 289.00
Others	Rs. 262.00

[1] The coefficient of variation is smaller than in Hambantota and Kandy districts which are representative of several other districts with similar characteristics.

The higher yields obtained by the owner-tenants and owners account for their higher level of income despite the smaller extent operated by them. These monthly incomes could not be expected in Yala because the average yield was only 50.4 bushels per acre and the extent cultivated was very much smaller.

2.7 Proportion of Land owned/rented

Owner-tenants and tenant-owners formed a small proportion of the sample accounting for only 13 per cent of the 154 cultivators. *65 per cent of the average holding among owner-tenants was owned by the cultivator.* There was little variation in the proportion owned between cultivators whose holdings were smaller and larger than the median size for that tenurial category - 60 per cent and 69 per cent respectively. *Among the tenant-owners only 41 per cent of the average holding was owned by the cultivator.* Here again there was little difference in the proportion owned by cultivators whose holdings were smaller and larger than the median size; the proportions were 38 per cent and 43 per cent respectively.

The difference between the extent owned by the owner-tenants and tenant owners was small - 4.25 acres as against 3.20 acres. The larger holdings among tenant-owners was made up mainly by the larger area rented in; they rented in almost twice as much land (4.60 acres) as the owner-tenants (2.25 acres)

2.8 Distribution of Land according to Size of Holding and Water Supply Conditions

As most of the cultivators (77%) operate purely as owner cultivators (105) or as owner cultivators with encroached land (14), the discussion under Section 2.3 describes adequately the distribution of land according to size of holding: apart from owner cultivators, owner-tenants (16) formed a group of reasonable size. While most of the owner cultivators had holdings of 2.0 - 4.0 acres and 4.0 - 6.0 acres, most of the owner-tenants had holdings of 4.0 - 6.0 acres and 6.0 - 8.0 acres. This is reflected in the larger average size of holdings operated by owner-tenants. Cultivators who were classified as 'others' were fairly evenly distributed among the different size classes.

Table 2-VI Proportion of Operated Land Owned/Rented

	Tenurial Category											
	Owner-Tenants Holdings						Tenant-Owners Holdings					
	All holdings		Smaller than median size		Larger than median size		All holdings		Smaller than median size		Larger than median size	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Average extent of owned land	4.25	65	2.81	60	5.69	69	3.20	41	2.60	38	3.80	43
Average extent of land rented in	2.25	35	1.91	40	2.59	31	4.60	59	4.20	62	5.00	57
Average extent of total holdings	6.50	100	4.72	100	8.28	100	7.80	100	6.80	100	8.80	100

There were no noteworthy variations in the supply of water to the holdings according to the tenurial status of the cultivator or the size of holding (Table 2.VII). 90 per cent of the operators who were owner cultivators were under major irrigation schemes. The proportion was lowest (75%) among 'others.' As the total number of cultivators in this category was so much smaller it is difficult to place much weight on this difference which in any case is not large. Similarly the proportion of holdings receiving water from major irrigation varied between 85 per cent and 100 per cent for different size classes excepting the size class 6.0 - 8.0 acres: in that class the proportion was only 60 per cent. All the holdings of over 10.0 acres received water from major irrigation; the number of holdings in that category was only 7. *Of the 154 cultivators in the sample only 21 reported that they received water from minor irrigation.* Most of them were owners or 'others' and had holdings of 2.0 - 4.0 acres or 6.0 - 8.0 acres: except in the case of 6.0 - 8.0 acre holdings the number of cultivators dependent on minor irrigation approximates the expected distribution.

2.9 Tenancy

Figures reveal very little overt tenancy. Of 158 sample cultivators classified originally according to their tenurial status, only 4 reported that they were purely tenants. As this group was too small to form a separate class for analysis they have been excluded from consideration. *There were, however, 31 other cultivators who operated some land under tenancy which they had rented/leased in from 36 landlords. While 28 of them were in areas under major irrigation the remainder were in areas under minor irrigation.* The 31 cultivators were made up of 23 owner-tenants, 6 tenant-owners and 2 tenants. The 2 tenants and some of the owner-tenants and tenant-owners operated encroachments in addition to their other land. 9 operators reported that they had rented out a part of their land.

Landlords whom the tenants reported as 'friends' constituted the largest group among the landlords. They accounted for 39 per cent of the landlords. While neighbours accounted for 17 per cent of landlords. These groups together accounted for 56 percent of all landlords. A conspicuously small number (11%) of the landlords were reported to be relatives. This is perhaps due to the nature of settlement in this district. Most of the cultivators have come here in the past

Table 2-VII Distribution of Operators by Tenurial Status, Source of Water Supply and Size of Holdings

Season	No. of Operators
Maha	154
Yala	140

Tenurial Category	Source of water supply	Size Of Holding: Upto 2.00	2.00-4.00	4.00-6.00	6.00-8.00	8.00-10.00	Over 10.00	All size classes
Owners	Major	8	33*	42	5	5*	2	95+
	Minor	1	6	1	2	-	-	10
	All sources	9	39*	43	7	5*	2	105+
Owner-Tenants	Major	-	3	4	4	2	-	13
	Minor	-	-	1	1	1	-	3
	All sources	-	3	5	5	3	-	16
Tenant-owners	Major	-	-	1	1	2	-	4
	Minor	-	-	-	-	-	-	1
	All sourses	-	-	1	2	2	-	5
'Others' X	Major	3	5	3	1	4	5	21
	Minor	-	1	3	3	-	-	7
	All sources	3	6	6	4	4	5	28
All tenurial categories	Major	11	41*	50	11	13*	7	133+
	Minor	1	7	5	7	1	-	21
	All sources	12	48*	55	18	14*	7	154+

* One of these operators did not cultivate in Maha 1971/72

+ Two operators did not cultivate in Maha 1971/72

X 'Others" Operator of owned and/or tenanted land along with encroachments, or operators of only encroachments. There were 14 owners, 2 tenants, 7 owner-tenants and 1 tenant-owner with encroachment and 4 operators of encroachments only.

two or three decades from various parts of the country and do not have a pattern of kinship relations as in the rural communities rooted more deeply in history. 33 per cent of the landlords were described as 'outsiders' which is also indicative of the same position. Table 2-VIII shows both the occupation of the landlords and their relationships to their tenants.

Table 2-VIII Occupation of Landlord and His Relationship to Tenant

Relationship		Occupational Category														Total*	
		Public servants		Traders		Land-owners		Labourers		Farmers		Unspecified					
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			No.	%
Friend	No	2	100	1	50	-	-	1	100	7	28	3	75			14	39
	%	14		7		-		7		50		21				100	
Neighbour	No	-	-	-	-	2	100	-	-	3	12	1	25			6	17
	%	-	-	-	-	33		-		50		17				100	
Total of 1 & 2	No	2	100	1	50	2	100	1	100	10	40	4	100			20	56
	%	10		5		10		5		50		20				100	
Relatives	No	-	-	-	-	-	-	-	-	4	16	-	-			4	11
	%	-		-		-		-		100		-				100	
Outsiders	No	-	-	1	50	-	-	-	-	11	44	-	-			12	33
	%	-		8		-		-		92		-				100	
Total	No	2	100	2	100	2	100	1	100	25	100	4	100			36	100
	%	6		6		6		3		69		11				100	

*5 operators had 2 landlords each

Farmers constituted the majority (69%) of landlords. Of the 82.50 acres operated under tenancy 70 per cent was rented from these farmer landlords, 44 per cent of whom were described as 'outsiders'. The farmer landlords were renting out an average 2.32 acres which might indicate that several cultivators cannot effectively operate the full extent of their allotments,

and rent out a part of their land. *The low incidence of cultivators who operate purely as tenants suggests that this land is rented in by cultivators who own land. It was stated earlier that the information reported to us might not have revealed the true position of tenancy in this district, particularly in the areas under major irrigation. The practice described above may be more widespread than the figures stated here indicate.* If it were so, it suggests that the size of the operational holding has undergone a change. It was not the intention of policy makers when allotments of a particular size were given to settlers that the size of the operational holdings should vary among settlers. Various conditions have been imposed on the allottees to ensure that such variations do not take place. *If, however, despite the intentions of the policy-makers and the elaborate legal precautions, a process of adjustment in the size of operational holding has been taking place, it would be useful to know the reasons for this as it may reveal valuable information for policy making. This is particularly important at a time when large extents of land would become available for distribution under Land Reform and the Mahaveli Development Scheme.*

The figures quoted as well as the figure relating to the residence of the landlords indicate that tenancy is most often a transaction between small farmers living within the same area. *78 per cent of the landlords live in the same village as their tenants.* Only 1 out of the 36 landlords was reported to live outside the district.

Table 2-IX Residence of Landlords

Residence	No.	%
Same village	28	78
Same district	7	19
Outside district	1	3
Total	36	100

54 per cent of the tenants paid a fixed amount as land rent while 34 per cent paid half crop share. The remainder paid either one third or one fourth share of the crop (Table 2-X).

Table 2-X Land Rent Paid by Tenants*

Tenurial Status		Operators: Fixed Rent (Cash or kind)	1/2 the produce	1/3 the produce	1/4 the produce	Total
Owner-tenants	No	9	7	-	-	16+
	%	56	44	-	-	100
Tenant-owners	No	2	2	2	1	7
	%	29	29	29	14	100
Tenants, Tenant-owners & Owner-tenants with encroachments	No	8	3	1	-	12
	%	67	25	8	-	100
All Tenants	No	19	12	3	1	35+
	%	54	34	9	3	100

* Tenants who had more than one landlord have been multiply counted once for each landlord.

\+ The mode of payment to a landlord by an operator was not mentioned.

Only 33 per cent of the tenants received any collateral help in the form of seed paddy, fertilizer or other inputs. Almost all the tenants (11 out of 12) who received such assistance paid half-share of the crop as land rent. 6 of them (54%) received seed paddy and fertilizer; most of the others received only seed paddy.

There were 18 (58%) tenants who expressed a desire to cultivate more land on ande if an opportunity was available (Table 2-XI). The proportion was similar for tenants who paid half-share of crop as for those who paid a fixed rent. The proportion was considerably lower among owner-tenants (43%) than among tenant-owners and others (73%) although the average size of holding was larger for the latter. The latter group, however, had lower yields and consequently their estimated incomes were seen to be lower. The desire to cultivate more perhaps reflects their need to increase their income. Although the size groups are not large enough to

make a definite statement, there appears to be a decline in the number desiring to cultivate more as the average size of holding gets larger (Table 2-XI).

Table 2-XI Willingness of Tenants to Cultivate more Land on Ande according to Size of Holding

Size of Holding (acres)	No of operators (1)	No of operators willing (2)	(2) as a % of (1)
Upto 2.00	-	-	-
2.00 - 4.00	3	2	67
4.00 - 6.00	8	5	63
6.00 - 8.00	8	5	63
8.00 - 10.00	11	6	54
Over 10.00	1	0	0
	31	18	58

As most of the tenants discussed here own some land and the land they cultivate on ande is most often owned by other cultivators like themselves, the question about the possibility of their owning that land had little relevance. Only 4 out of the 31 tenants responded to this question and only 1 of them felt that there was no possibility of becoming an owner.

5 operators who cultivated land on ande did not respond to the question about the fairness of the land rent charged from them. *Among those who responded, 73 per cent felt that it was fair.* The proportion of those who felt that the land rent was fair was greater among those who paid half-share of the crop (81%) than among those who paid a fixed rent (67%). This may be due partly to the fixed rent being too high. It may also be due to share-cropping being a fairer method for payment of land rent where the yield fluctuates substantially from season to season or is low due to environmental conditions beyond the control of the cultivators.

10 tenants did not respond to the question about security of tenure. *Of those who responded only 15 per cent felt that their tenure was secure. This indicates a general feeling of insecurity which is due to the nature of settlement in this area which has already been discussed.* Where due to legal requirements it is not possible to register tenants, tenancy becomes an informal agreement which has no legal status. In areas of recent settlement such as these where settlers are not bound by traditional social ties and obligations, informal agreements of this nature may not even have the weight of social conventions to support them. Under such circumstances it is not surprising that a large majority of the tenants feel insecure about their tenancy.

The position with regard to the distribution and tenure of land in this district could be considered as more favourable for the cultivators than in most other districts. The average size of holding is larger than in many other districts and most cultivators get water from major irrigation at least in Maha. There is little landlessness among cultivators and only a small proportion of land is cultivated under tenancy. Even though the information reported to us may understate the problem of landlessness and tenancy among cultivators in this district there is no reason to assume that the problem is of much greater magnitude. This, however, is an area that should be investigated further.

Chapter 3

COOPERATIVES AND CREDIT

3.1 Membership in Cooperatives

Of a total of 154 respondents 151 were members of the Cooperatives. The pattern of settlement together with the need to make the fullest use of the services provided by the Cooperatives may have accounted for the high membership. Mismanagement of the Cooperative Society, difficulty of money for membership and a lack of understanding about the Cooperative Society were the main reasons given by the three persons for non-membership.

3.2 Provision and Utilisation of Cooperative Services

Lack of information regarding agricultural services provided by the Cooperative Society and the difficulty of obtaining these services, placed the small farmers at a disadvantage. Respondents were asked whether they were aware of the types of agricultural services usually provided by the Cooperatives and whether they really made use of them. This question was examined with reference to their tenurial status and size of land holdings. It appears from Table 3-I that almost all respondents mentioned provision of the various services. The smallest land size class, i.e. upto 2 acres made less use of the Cooperatives for cultivation loans, the purchase of seed paddy, subsidised fertiliser and agro-chemicals, when compared to the larger land size classes.

The different tenurial categories too show difference in the utilisation of cultivation loans, seed paddy and agro-chemicals. Owner-tenants and the 'others' (mostly encroachers) made less use of the services than other tenurial groups. (See Table 3-II).

Table 3-I

Provision and Utilisation of Cooperative Services according to Size of Lowland Holding

Type of Services	Operators	Size of Holding (acres) Upto 2.00 Provided	Upto 2.00 Utilised	2.00 - 4.00 Provided	2.00 - 4.00 Utilised	4.00 - 6.00 Provided	4.00 - 6.00 Utilised	6.00 - 8.00 Provided	6.00 - 8.00 Utilised	8.00 - 10.00 Provided	8.00 - 10.00 Utilised	Over 10.00 Provided	Over 10.00 Utilised	Total Provided	Total Utilised
Cultivation Loans	No	12	6	45	42	53	46	17	12	13	12	7	7	147	125
	%		*50*		*93*		*87*		*71*		*92*		*100*		*85*
Certified Paddy	No	11	4	45	29	53	35	16	12	13	10	6	5	144	95
	%		*36*		*64*		*66*		*75*		*77*		*83*		*66*
Subsidised Fertilizer	No	12	6	45	38	52	50	16	14	14	12	7	6	146	126
	%		*50*		*84*		*96*		*88*		*86*		*86*		*86*
Agro-chemicals	No	11	5	44	35	52	47	14	11	13	10	7	6	141	114
	%		*46*		*80*		*90*		*79*		*77*		*86*		*81*
Marketing of Paddy	No	12	12	48	48	55	54	18	18	14	14	7	7	154	153
	%		*100*		*100*		*98*		*100*		*100*		*100*		*99*
Other Facilities	No	5	4	31	29	31	30	9	8	8	8	6	4	90	83
	%		*80*		*94*		*97*		*89*		*100*		*67*		*92*

Marketing of paddy to the Cooperatives irrespective of size of land holding or tenurial category is common among the respondents. The relationship between various tenurial categories and the utilisation of services provided by the Cooperatives may not, however, be of much importance.

Table 3-II

Provision and Utilisation of Cooperative Services according to Tenurial Category

Type of Service	Operators	Owners		Owner Tenants		Tenant Owners		Others		Total	
		Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised
Cultivation Loans	No	102	90	16	12	5	5	24	18	147	125
	%		*88*		*75*		*100*		*75*		*85*
Certified Seed Paddy	No	101	68	15	8	5	5	23	14	144	95
	%		*67*		*53*		*100*		*61*		*66*
Subsidised Fertilizer	No	103	88	15	13	5	5	23	20	146	126
	%		*85*		*87*		*100*		*87*		*86*
Agro-Chemicals	No	98	81	15	11	5	5	23	17	141	114
	%		*83*		*73*		*100*		*74*		*81*
Marketing of Paddy	No	105	105	16	16	5	5	28	27	154	153
	%		*100*		*100*		*100*		*96*		*99*
Other Facilities	No	62	59	10	9	4	4	14	11	90	83
	%		*95*		*90*		*100*		*79*		*92*

3.3 Indebtedness

66 per cent of the respondents were in debt during 1971-72 Maha. Although the number of owner-tenants, tenant-owners and 'others' (encroachers) compared to owner groups is too small to make any useful comparison, the percentage of indebtedness recorded among owner-tenants was 81, the highest for any group. It is followed by tenant-owners with 80 per percent. The owners and the 'others' with 66 per cent and 57 per cent in debt respectively, ranked the lowest. The percentage of owner borrowers contacting Cooperatives for loans is higher than that of (though the total number in the other groups is small) other groups of borrowers. The Cooperatives by and large seem to be the most popular among the various sources of borrowings (see Table 3-III).

Table 3-III Borrowers according to Tenurial Category and Source of Loan

Category	No of Operators	All Sources		Sources: Coop. only		Private source only		Coop and one private source		Coop and Bank		Bank only
		No.	%	No	%	No	%	No	%	No	%	No
Owners	103[1]	68	66	46	68	15	22	5	8	1	1	1
Owner tenants	16	13	81	6	46	5	38	1	8	1	8	-
Tenant Owners	5	4	80	2	50	1	25	1	25	-	-	-
Others	28	16	57	5	31	6	37	2	13	1	6	2
All Tenurial Categories	152	101	66	59	58	27	27	9	9	3	3	3

[1]Excludes two operators who did not cultivate in Maha 1971/72

Out of Rs.97,640 an amount of Rs.64,120 or 66 per cent was borrowed from the Cooperatives during 1971/72 Maha alone. This amount thus constitutes the highest proportion of loans obtained from all sources. Other significant sources of loans next to Cooperatives were friends and relatives (21% of all loans). Money lenders and traders together accounted only for 14 per cent.

The average loan per borrower from both institutional and non-institutional sources for all types of farmers works out to Rs.967. It varies from Rs.333 to Rs.2,352 as the size of land holding increased. The average amount of loan per borrower increases with the increasing size of land holding with the only exception of over 10 acres land size class for which the average amount borrowed is a little less (Rs.2,033) than that (Rs.2,352) for 8.00 to 10.00 acres size class (See Tables 3-IV and 3-V). The extent of land operated and the amount of credit obtained seem to be associated with each other; the larger the holding the greater the amount of credit obtained.

Table 3-IV Loans obtained during Maha 1971/72 from different sources according to tenurial category of borrowers

Tenurial Category	Amount	Source of Loans				All Sources		
		Coopera-tive [1]	Money Lenders	Traders	Friends and Relatives	Total	No of Borrow-ers	Average per Borrower
Owners	Rs.	43,576	1,370	3,100	13,300	61,346	68	902
	%	*71*	*2*	*5*	*22*	*100*		
Owner Tenants	Rs.	9,813	1,100	2,500	1,050	14,463	13	1,113
	%	*68*	*8*	*17*	*7*	*100*		
Tenant Owners	Rs.	2,665	2,500		3,000	8,165	4	2,041
	%	*33*	*31*	-	*37*	*100*		
Others	Rs.	8,066	1,600	1,150	2,850	13,666	16	854
	%	*59*	*12*	*8*	*21*	*100*		
Total	Rs.	64,120	6,570	6,750	20,200	97,640	101	967
	%	*66*	*7*	*7*	*21*	*100*		

[1] One operator obtained a loan from the Rural Bank and the other five operators obtained loans from the People's Bank totalling an amount of Rs.3,650.

Likewise in the case of loans from Cooperative. Cooperative loans during 1971/72 Maha increased with the size of land holding ranging per borrower from Rs.142 to Rs.1,367. The average Cooperative loan per borrower irrespective of holding size was Rs.852 (See Table 3-VI). Four persons were given loans from the Cooperatives amounting to Rs.3,385 although Rs.3,500 was in past due. Also there were 42 borrowers who had a sum of

Rs.29,824 as unpaid loans taken before Maha 1971/72. The average overdue loan per month amounted to Rs.710 including a single case of Rs.1,400 from the over 10 acres land size class. The defaulters are mostly among operators in the 2.00 - 4.00 and 4.00 - 6.00 acres land size classes.

Table 3- V Size of loans from various sources in relation to different lowland holdings - Maha 1971/72

Size of Holding (Acres)	Amount	Source of Loan						All Sources	
		Cooperative	Bank[1]	Money Lender	Trader	Friends & Relatives	Total	No of Borrowers	Average per Borrowe
Upto 2.00	Rs.	283	-	-	-	1,050	1,333	4	333
	%	*21*	-	-	-	*79*	*100*		
2.00 - 4.00	Rs.	15,121	350	1,070	1,650	2,900	21,091	33	639
	%	*72*	*2*	*5*	*8*	*14*	*100*		
4.00 - 6.00	Rs.	22,959	300	1,600	3,100	2,800	30,759	36	854
	%	*75*	*1*	*5*	*10*	*9*	*100*		
6.00 - 8.00	Rs.	7,135	1,800	600	-	2,950	12,485	14	892
	%	*57*	*14*	*5*	-	*24*	*100*		
8.00 - 10.00	Rs.	10,872	700	3,300	2,000	9,000	25,872	11	2,352
	%	*42*	*3*	*13*	*8*	*35*	*100*		
Over 10.00	Rs.	4,100	500	-	-	1,500	6,100	3	2,033
	%	*67*	*8*	-	-	*25*	*100*		
Total	Rs.	60,470	3,650	6,570	6,750	20,200	97,640	101	967
	%	*62*	*4*	*7*	*7*	*21*	*100*		

[1]One operator obtained a loan from the Rural Bank. The others obtained their loans from the People's Bank.

3.4 Reasons for not borrowing from Cooperatives

Nearly 42 per cent of the respondents did not borrow from Cooperatives during the 1971/72 Maha cultivation season. Of the various reasons given for not obtaining credit from Cooperatives outstanding loans to Cooperatives formed the most significant reason. It accounted for 41 per cent of all the reasons given by non-borrowing respondents. The second most important reason (25%) was the lack of a need for loans (vide Appendix II).

Table 3-VI Loans from Cooperatives classified as Current or Old Loans and Size of Holdings of Borrower

	Size of Holding (Acres)						
	Upto 2.00	2.00 - 4.00	4.00 - 6.00	6.00 - 8.00	8.00 - 10.00	Over 10.00	Total
Current loans only							
No of borrowers	2	20	27	7	8	3	67
Amount (Rs.)	283	14,611	20,084	7,135	10,872	4,100	57,085
Average per borrower	142	731	744	1,019	1,359	1,367	852
Old Loans only							
No of borrowers	3	16	18	4	-	1	42*
Amount (Rs.)	2,020	10,192	14,137	2,075	-	1,400	29,824
Average per borrower	673	673	785	519	-	1,400	710
Current and Old Loans							
No of borrowers	-	1	3	-	-	-	4
(a) Current							
Amount (Rs.)	-	510	2,875	-	-	-	3,385
Average amount per borrower	-	510	958	-	-	-	846
(b) Old							
Amount (Rs.)	-	100	3,400	-	-	-	3,500
Average amount per borrower	-	100	1,133	-	-	-	875
All Loans : Current							
No of Borrowers	2	21	30	7	8	3	71
Amount (Rs.)	283	15,121	22,959	7,135	10,872	4,100	60,470
Average amount per borrower	142	720	765	1,019	1,359	1,367	852
All Loans : Old							
No of borrowers	3	17	21	4	-	1	46
Amount (Rs.)	2,020	10,292	17,537	2,075	-	1,400	33,324
Average amount per borrower	673	605	835	519	-	1,400	724

*3 operators who stated that they had repaid their outstanding loans during Maha 1971/72 but had not specified the amount have been excluded..

3.5 Rates of Interest

The rates of interest charged by non-institutional sources varied from 0 to 240 per cent per annum (the period of repayment in most cases was, however, less than one year). A fairly large number of borrowings (19 out of 42 borrowings from private sources) were interest free and obtained mostly from friends and relations. Money lenders and traders advanced some interest free loans and also charged the highest rate of interest, i.e. 240 per cent. There was no relationship between the size of loans and the rates of interest, as the large loans were obtained at high rates of interest and also without any interest. So the mutual contact and understanding seem to be the only factor determining the rates of interest on private loans. The interest rates on loans from institutional sources (People's Bank and Cooperatives) ranged from 7½ per cent to 9 per cent.

3.6 Repayment of Loans

Of the total cooperative loans (Rs.60,470) borrowed during Maha 1971/72 an amount of Rs.10,110 or 17 per cent of total borrowings was not repaid till the time of interview. There were 14 (20%) borrowers who defaulted the repayment of such loans. Besides this, there was an amount of Rs.33,324 obtained from Cooperatives before Maha 1971/72 which was not yet repaid by 46 operators. Thus the overdue loans accumulated to nearly 46 per cent of the total amounts borrowed. The People's Bank which works in collaboration with cooperatives could recover only 36 per cent (Rs.1,300) of its total loans (Rs.3,650) advanced to 6 respondents during Maha 1971/72. Among the private sources friends, relatives, money lenders and traders had satisfactory records of repayment, the recovery rates being 96 per cent, 95 per cent, 91 per cent and 90 per cent respectively. It has been observed that in the case of loans obtained from private sources, even if the loans were not repaid in full (only one borrower obtained Rs.600 from a trader but not repaid in full) the interest due on the loans were paid.

The reasons given for the non-repayment of Cooperative loans obtained during Maha 1971/72 were crop failure, unavoidable family expenses like sickness, funerals, etc., low income and no pressure for collection of loans by the Cooperative. The respondents gave crop failure as the most important reason for non-repayment of Cooperative loans. But the defaulters of private loans, the number of whom is in any way too small, mentioned unavaoidable family expenses as the major reason for non-repayment.

Table 3-VII Repayment of Loans borrowed during Maha 1971/72 according to Tenurial Category, Source and Repayment of Loans

Tenurial Category		Cooperatives and People's Bank		Friends and Relatives		Money Lenders		Traders		All Sources	
		Repay-ment	Non-Repay-ment	Repay-ment	Non-Repay-ment	Repay-ment	Non-Repay-ment	Repay-ment	Non-Repay-ment	Repay-ment	Non-Repay-ment
Owner	No	41	13	12	2	3	-	2	1	58	16
	%	*76*	*24*	*86*	*14*	*100*	-	*67*	*33*	*78*	*22*
Owner Tenants	No	9	-	3	-	-	1	2	-	14	-
	%	*100*	-	*100*	-	-	*100*	*100*	-	*93*	*7*
Tenant Owners	No	1	2	-	1	1	-	-	-	2	3
	%	*33*	*67*	-	*100*	*100*	-	-	-	*40*	*60*
Others	No	8	3	4	-	2	-	2	-	16	3
	%	*73*	*27*	*100*	-	*100*	-	*100*	-	*84*	*16*
Total	No	59	18	19	3	6	1	6	1	90	23
	%	*77*	*23*	*86*	*14*	*86*	*14*	*86*	*14*	*80*	*20*

Whether crop failure accompanied by low income is really the only genuine reason for non-repayment of a number of other factors such as institutional, motivational etc., play no less important roles, needs further investigation.

APPENDIX I

Borrowers from Co-operative classified by Size of Operational Holding

Size Category of operator	Total No. of operators		Operators who received co-op. loans during 71/72 Maha	Operators who could not obtain co-op. loans during 71/72 Maha but had outstanding loans	Operators who received co-op. loans during 71/72 Maha but had outstanding loans	All operators who had received co-op. loans (inclusive of outstanding loans)
Upto 2.00	12	No	2	3	-	5
		%	*40*	*60*	-	*100*
2.00 - 4.00	47[1]	No	20	16	1	37
		%	*54*	*43*	*3*	*100*
4.00 - 6.00	55	No	27	18	3	48
		%	*56*	*37*	*6*	*100*
6.00 - 8.00	18	No	7	4	-	11
		%	*64*	*36*	-	*100*
8.00 - 10.00	13[1]	No	8	-	-	8
		%	*100*	-	-	*100*
Over 10.00	7	No	3	1	-	4
		%	*75*	*25*	-	*100*
All Size Category	152	No	67	42	4	113
		%	*59*	*37*	*4*	*100*

[1]Excludes one operator who did not cultivate in Maha 1971/72

APPENDIX II

Operators who did not obtain Co-operative Loans during Maha 1971/72 classified by Tenurial Category and reasons for not obtaining Co-operative Loans

Tenurial Category	Operator	Obtained loans	Not obtained loans	Reasons for not obtaining Cooperative Loans: No organisation for loans	No knowledge about the credit scheme	Too difficult procedure	Outstanding loan to Co-op.	Loan not needed	Not a member of Co-op.	Other reasons
Owners	No	52	51	4	1	4	30	16	1	7
	%	*50*	*50*	*6*	*2*	*6*	*48*	*25*	*2*	*11*
Owner Tenants	No	8	8	-	2	1	2	1	-	3
	%	*50*	*50*	-	*22*	*11*	*22*	*11*	-	*33*
Tenant Owners	No	3	2	-	-	-	1	-	-	1
	%	*60*	*40*	-	-	-	*50*	-	-	*50*
Others	No	8	20	2	-	4	7	7	2	2
	%	*29*	*71*	*8*	-	*17*	*29*	*29*	*8*	*8*
Total	No	71	81	6	3	9	40	24	3	13
	%	*47*	*53*	*6*	*3*	*9*	*41*	*25*	*3*	*13*

Other reasons for not obtaining Co-op. loans during Maha 1971/72

1.	Not applied in time	1
2.	Not interested in HYVs etc.	1
3.	Inability to repay loans	1
4.	Cannot get in time	1
5.	Private trader is better	1
6.	As they are encroachers	2
7.	Does not like to get loans	1
8.	Does not like to get Co-op. loans	2
9.	Own cheap labour	1
10.	Rural Bank facilities	1
11.	As cultivating Crown Land he was doubtful of ownership	1

Chapter 4

AGRICULTURAL INFORMATION AND COMMUNICATION

4.1 Extension Organisation and Activity in the District

The extension organisation in the district is headed by the Agricultural Extension Officer with an office in Polonnaruwa. The Head Office staff consists of 3 Agricultural Instructors and 3 Krushikarma Viyapti Sevakas, village level extension workers.

At the Divisional level the technical staff consists of 9 Agricultural Instructors and 46 Krushikarma Viyapti Sevakas, deployed as set out below.

Table 4-I Agricultural Extension Staff stationed at Divisional Level

Extension Centre	Agricultural Instructors	Krushikarma Viyapti Sevakas
Kaduruwela	1	7
Pulastigama	1	8
Medirigiriya	1	9
Karuduhuwewa Project	1	-
Kalinga Ela	1	6
Giritale	1	6
Pulugasdamana	1	5
Manampitiya	1	5
Pimburettawa	1	-

There are two special projects in the district, Minneriya and Elahera. The Minneriya special project is headed by a Project Manager assisted by 4 Agricultural Instructors and 17 Krushikarma Viyapti Sevakas. The Manager of the Elahera special project has a staff of 6 Agricultural Instructors and 11 Krushikarma Viyapti Sevakas.

4.2 Sources and Agencies of Agricultural Information

In the matter of diffusing farm information individual methods of communication were found to be most effective. 75 per cent of the respondents had their agricultural information from extension personnel visiting their farms; 39 per cent from farm neighbours, and next came farmer visits to extension centres and Government farms.

Table 4-II Coverage of Different Sources and Agencies of Agricultural Information

Source/Agent	General Agricultural Information		Information that influenced adoption of NHYV		Fertilizer recommendation for NHYV	
	Respondents					
	No	%	No	%	No	%
	153	100	87	100	78	100
Extension personnel visiting farms	115	75	51	59	44	56
Farmer visiting extension centre	57	37	16	18	9	12
Farm neighbours	59	39	22	25	9	12
Farmer training classes	41	26	22	25	18	23
Demonstration plots	53	35	18	21	-	-
Advisory leaflets	54	35	17	20	17	22
Radio programmes	38	25	11	13	-	-
Agricultural film shows	38	25	5	6	-	-
Newspaper articles	-	-	5	6	-	-
Visiting agricultural farms	16	11	-	-	-	-
Other sources	17	11	6	7	10	13
	No of non-respondents = 1		No of non-respondents = 2		No of non-respondents = 11	
	Total no of Operators = 154		Total no of Operators who adopted NHYV = 89		Total no of Operators who adopted NHYV = 89	

Of the mass media, demonstration plots and advisory leaflets were mentioned by 35 per cent, while radio programmes and agricultural film shows by 25 per cent. The information carried in advisory leaflets was of a technical nature and more specific than the information broadcast over radio or presented in agricultural film shows due to the inherent nature of the media.

The sources that influenced the adoption of NHYV showed a similar pattern-extension personnel visiting farmers, farmer neighbours and training classes. All these involved interpersonal communication between the extension agent and the farmer. In descending order of scale were demonstration plots, advisory leaflets, visits to extension centres, radio programmes, agricultural film shows and newspaper articles. In the process of adopting a new practice it is common to identify five stages : awareness, interest, trial, evaluation and adoption. The effectiveness of information sources varies with the particular stage in the adoption process. The effectiveness of impersonal methods is most felt at the awareness stage but declines through the subsequent stages of interest and evaluation. On the other hand personal methods increase in effectiveness as the process develops from the awareness to the adoption stages. The information in the present study is insufficient to draw conclusions in this regard. However, the influence of farmer neighbours and farmer training classes is clearly evident indicating that personal sources are more effective in making change to new practices.

56 per cent of the farmers mentioned visits of extension personnel as their source of information on fertiliser use for new high yielding varieties, while 23 per cent and 22 per cent mentioned farmer training classes and advisory leaflets indicating that all of these are useful sources in diffusing technical information. The present practice of using farmer training classes and advisory leaflets to deal with technical subjects like the use of agro-chemicals, the identification of pests and diseases, and so on, is a sound one. More farmers had their information by attending training classes than from the extension centre, perhaps because these classes were more convenient to attend than to call at the extension centre.

Farm neighbours were not a very effective source of disseminating information on fertiliser recommendations. However, they did influence their neighbours in changing over to the new varieties. A variety of paddy successfully grown by a farmer has a useful demonstration effect.

4.3 Extension Contact Score

An Extension Contact Score was used to measure the number of contacts between the farmer and the extension service. The score, one to each source, refers to the number of sources with which a farmer had contact in the 1972 Yala season.

Types of Contact

1. Visits to Extension Centre
2. Visits by Extension personnel
3. Farmer training classes
4. Demonstration Plots
5. Advisory leaflets (farmers who reported reading advisory leaflets were included)
6. Radio programmes (farmers listening to radio programmes were included)
7. Agricultural film shows

11 per cent of the farmers had had all 7 types of contacts while 9 per cent had no contact at all with the extension services.

Table 4-III Extension Contact Score - Yala 1972

Level of Contact	Contact Score	Operators No	Operators %
Low	0	12	9
	1	13	9
	2	20	14
	3	19	14
Medium	4	28	20
High	5	15	11
	6	18	13
	7	15	11

Farmers were classified into 3 groups, those with a contact score of 0-3 were described as low, 4 as medium, and 5-7 as high. 64 farmers, 46 per cent of the respondents were in the low contact category with an average contact score of 1.7; 28 (20%) with a score of 4 were in the medium group and 48 farmers, 35 per cent were in the high contact category with a score of 6. A little less than 50 per cent of the respondents were in the low contact category having 1-2 contacts. The average contact was between 3 and 4 (Table 4-III).

Table 4-IV Distribution of Respondents by Use of Contact Methods - Yala 1972

No of Respondents = 140

Method	Respondents who used method		
	No	%	
Personal contact			
Visited extension centre	70	50	
Visited by Extension Personnel	91	65	
Attended farmer training classes	47	34	Average 50
Impersonal contact			
Had seen demonstration plots	91	65	
Had read advisory leaflets	77	55	
Listening to radio programmes	81	58	
Had seen agricultural film shows	56	40	Average 54

Table 4-IV shows the frequency of contact with extension in the 1972 Yala season. Of the personal methods, visits of extension personnel to farmers had the highest frequency, while 50 per cent of the farmers had visited the extension centres and 34 per cent attended training. The fact that half of the farmers in the sample visited extension centres in Yala 1972 and 1/3 attended training classes is encouraging. Among impersonal contacts, demonstration (65%) had the highest frequency of use, followed by radio programmes (58%) and advisory leaflets (55%). The location of farmers in this recently colonised area and the good network of roads would have contributed to this. The fact that there are two special projects in the Polonnaruwa district could be another reason for high personal contact with the extension personnel. Further, in a district like Polonnaruwa where paddy farming is commercialised and where high yields per acre are achieved, information on specific farm problems rather than general information is needed.

Table 4-V Relationship between Extension Contact and Adoption of New High Yielding Varieties - Yala 1972

Contact Score	No of Operators	No of Adopters	Percentage Adoption
0	12	3	25
1	13	8	62
2	20	9	45
3	19	11	58
4	28	20	71
5	15	10	67
6	18	15	83
7	15	9	60
	140	85*	61

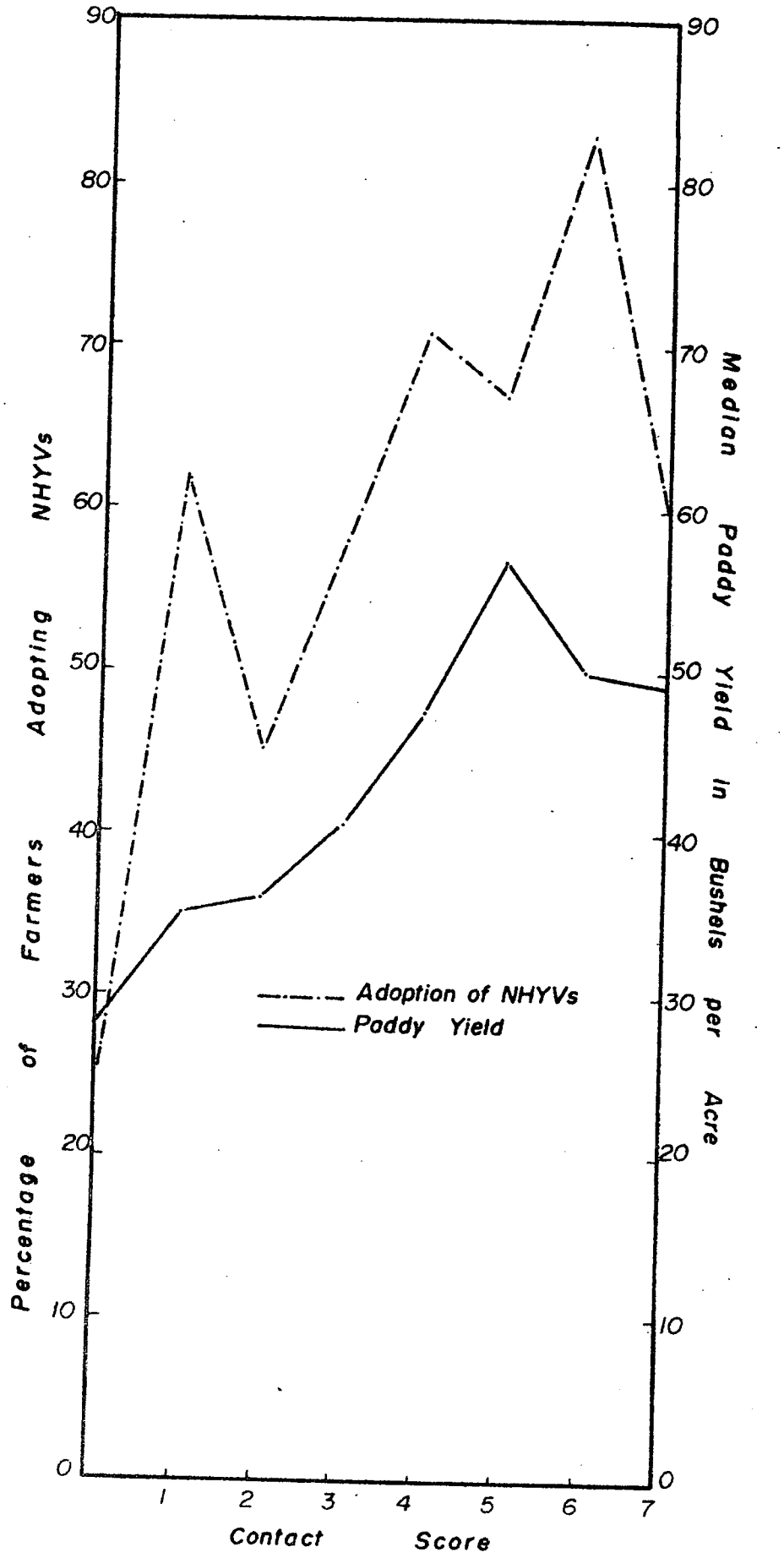
*only 85 operators had cultivated Yala

Table 4-VI Relationship between Extension Contact Score and Paddy Yields - Yala 1972

Contact Score	No of Operators	Median Yield Bushel / Acre
0	12	28.3
1	14	35.0
2	20	36.3
3	19	40.6
4	28	47.5
5	15	56.7
6	17	50.0
7	15	49.2

The extension contact score was next examined in relation to the adoption of new high yielding varieties as well as paddy yields in the 1972 Yala season, Table 4-V and 4-VI. A direct relationship between the extension contact score and the adoption of NHYV is evident but this is less so as regards yields. Yield is the result of a number of factors of which extension is one. A greater contact with extension personnel helps farmers to increase their yields and farmers with higher yields are likely to be motivated to have more contacts with the extension services. It is difficult then to distinguish between dependent and independent variables. At the levels of contact other than zero, the adoption rate was higher and was close to or above 50 per cent. Over the entire sample the adoption rate was 61 per cent. Yields on the other hand showed

RELATIONSHIP BETWEEN **EXTENSION CONTACT AND ADOPTION OF NHYVs AND PADDY YIELDS**



a progressive rise from 28.3 bushels per acre in the case of those with no contacts, to 49.2 bushels per acre in the case of those with 7 contacts.

4.4 Farmer Contacts with Extension Services

Table 4-VII Farmer Contact with the Extension Centre Yala 1972

	No	%
(a) Farmers who responded Awareness of and visits made to Extension Centres	140	100
No of armers who knew the location of extension centre	114	81
No of farmers who visited it in Yala 1972	70	50
(b) Reasons for visiting Extension Centres		
To buy seed paddy	31	44
For advice in general	27	39
To buy other inputs	9	13
Other	3	4
Total No of farmers who gave reasons for visiting	70	100

Table 4-VIII Farmers' Relationships with Extension Personnel - Yala 1972

	Farmers No	Farmers %	No of Visits
Farmers who responded	140	100	
Farmers visited by Extension personnel	91	65	
Visits made - Total no of visits			91
On request of farmer			28
On their own initiative			63
Average No. of visits/farmers visited			1
Farmers who preferred more visits	139	99	
Farmers who knew how to contact KVS in need	116	83	
Farmers who knew him by name	46	33	

Visits made to extension centres and their purpose are set out in Table 4-VII. 81 per cent of the farmers knew the location of the Extension Centre and 50 per cent visited it in 1972 Yala. The main reason for visiting the centres was to buy inputs, of which seed paddy was the most important. 57 per cent visited the centres for their purchases as against 39 per cent (24 per cent of the farmers in the sample) for getting advice.

65 per cent of the farmers were visited by extension personnel in the 1972 Yala season. 91 farmers had been visited once each. 83 per cent of the farmers knew how to contact village level extension workers but only 33 per cent knew him by name. Almost all of the farmers wished to be visited more often. This raises the range a village level extension worker has to work and the availability of transport. Group approach seems to be the possible solution. As discussed below the response to farmer training classes has been encouraging in the district and it should be possible to arrange group discussions, demonstrations etc.

Table 4-IX Farmer Attendance at Training Classes Yala 1972

	No	%
Respondents	140	100
Farmers who attended Farmer Training classes	47	34
Farmers who attended training classes and indicated usefulness	45	32
Farmers who did not attend training classes	93	66
No. of farmers who gave reasons for not attending	77	55
Reasons for not attending*		
Did not know about them	73	89.0
Not convinced of its benefits	1	1.2
Too much work in the farm	3	3.7
Household problems	5	6.1

*Operators who stated more than one reason for not attending classes have been shown against each reason stated.

Attendance at farmer training classes is given in Table 4-IX. Training classes were attended by 34 per cent of the farmers during the season. All of them except two indicated that these classes were useful. Of the 77 farmers who had given reasons for not attending these classes only 9 (13%) knew about them. This means that the majority of farmers who knew about the classes attended them. The response shown by farmers to training classes thus seems to be encouraging, of the 89 per cent who did not attend (66%) did not know about the training classes.

Table 4-X Demonstration Plots - Yala 1972

	No	%
Respondents	140	100
Farmers who had seen demonstration plots	91	65
Farmers who had seen and indicated usefulness	77	55
Advisory Leaflets		
Farmers who read advisory leaflets	77	55
Farmers who read advisory leaflets and indicated usefulness	70	50
Farmers who mentioned the name of a document they read	48	34
1. Govikam Sangarawa	20	
2. Fertiliser recommendations	1	
3. Growing of chillies	16	
4. Other crops	5	
5. Others	6	

65 per cent of the farmers had seen demonstration plots and 55 per cent indicated their usefulness. 50 per cent had read advisory leaflets. 48 farmers (34% of the sample and 62 per cent of those who had read advisory leaflets) were able to mention the name of a document they had read. 20 farmers mentioned the "Govikam Sangarava" the journal of the Department of Agriculture and 16 mentioned the name of the leaflet on chillies. The fact that 1/7 of the sample farmers referred to the "Govikam Sangarava" indicates the popularity of the journal. Leaflets on paddy were not popular among Polonnaruwa farmers as perhaps the Polonnaruwa farmer is sufficiently knowledgeable on the subject. Chillies were becoming

popular as an irrigated crop at the time of the survey and this could be the reason for the relatively high popularity of advisory leaflets on the subject.

58 per cent of the farmers had listened to radio programmes and the majority of them (50 per cent listened to programmes at home) indicating that more than 50 per cent of the farmers had radio sets. Places other than their homes were not popular as listening points. Almost all the farmers indicated the usefulness of radio programmes and more than 1/3 of them were able to give the name of a recent agricultural broadcast. The most important topic was new high yielding varieties of paddy. The introduction of the new varieties just previous to the study and the fact that 62 per cent had grown new varieties might account for the popularity of these programmes. 'Tharuna Govi Samajaya' and programmes on subsidiary food crops were the others mentioned.

40 per cent of the farmers had seen agricultural film shows during the season.

Table 4-XI Radio Programmes and Agricultural Film Shows

	No	%
Radio Programmes		
Farmers who listen to radio programmes	81	58
Farmers who listen to radio at home	70	50
Farmers who listen to radio at the Community Centre	1	1
Farmers who listen to radio at the village boutique	4	3
Farmers who listen to radio at the neighbours houses	6	4
Farmers who indicated usefulness of these programmes	79	56
Farmers who could give a name of a recent broadcast	29	21
Radio Broadcasts mentioned		
1. About subsidiary foodcrops	3	
2. Tharuna Govisamajaya	5	
3. About NHYV	11	
4. Others	10	
Film shows	140	100
Farmers who had seen agricultural film shows	56	40

Chapter 5

MANAGEMENT PRACTICES

The district of Polonnaruwa is unique in respect of both the ownership of land and the supply of water and these two factors have had a distinct bearing on the levels of management. Of the 62,368 acres of asweddumised paddy land, 49,816 acres (80 per cent) have a reliable supply of water from five major irrigation schemes restored during the last three decades. A large number of new settlements under these irrigation schemes have been established since 1942 mostly with landless labour from the densely populated wet zone districts. Paddy allotments in these settlements are relatively uniform in size and the allottees are 'de facto' owners of their operational holdings. The favourable man/land ratio of paddy lands is another important feature in this district. The proportion of operational holdings under 2½ acres is 12 per cent and covers an area of only 3 per cent of the extent asweddumised. 70 per cent of the operational holdings range from 2½ to 10 acres, 76 per cent of the asweddumised area.[1] Thus most of the social and environmental constraints to paddy production prevailing in other paddy producing districts are not present in Polonnaruwa to any appreciable degree.

5.1 Duration of Sowing Operations

In contrast to some of the other major rice growing areas in the dry zone, sowing operations in the district, particularly in Maha, are completed in a relatively shorter period primarily because of the presence of an efficient irrigation water distribution network in the district. In order to ascertain the 'timeliness' of cultivation, data on the time of the 1971/72 Maha paddy sowing was examined. Of the 152 farmers in the sample 139 were able to indicate the exact months of sowing (Table 5-I).

The main sowing generally extends from October to December, with a modal concentration in November during which month 53 per cent of those in the sample had completed their sowing.

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[1] Census of Agriculture 1962 : Vol. II - Land Use. Department of Census and Statistics, 1966.

Table 5-I Distribution of Farmers according to Time of Sowing, Water Supply - Maha 1971/72 *

Month	Farmers			
	Major No.	Minor No.	Total No.	Total %
August	-	1	1	1
September	2	1	3	2
October	26	3	29	21
November	70	3	73	53
December	25	3	28	20
January	3	-	3	2
April	-	2	2	1
Total	126	13	139	100

* Information relates to only 139 of the 152 operators who cultivated in Maha 1971/72. 8 operators who reported crop failures, 4 who furnished unreliable information regarding yield, and one who had reported sowing at two different times have been excluded.

Since time of sowing is a crucial factor in paddy cultivation particularly from the point of view of productivity, yields reported by farmers in major schemes were examined in relation to the month of sowing.

Table 5-II Distribution of Farmers under Major Schemes according to Time of Sowing and Varieties Sown during Maha 1971/72 Season *

Month of Sowing	Yield per acre (Bushel)	No of farmers who cultivated	No of farmers who cultivated						
			NHYVs only	OHYVs only	TV only	NHYVs and OHYVs	OHYVs and TVs	NHYVs and TVs	NHYVs OHYVs and TVs
September	90.3	2	1	1	-	-	-	-	-
October	67.1	26	6	15	-	3	1	1	-
November	69.5	70	24	26	2	14	1	3	-
December	21.9	25	7	11	1	4	1	1	-
January	36.7	3	1	1	-	-	-	-	1

* Information relates to only 126 of the 131 operators who cultivated under Major Schemes in Maha 1971/72. 3 operators who reported crop failure and 2 who furnished unreliable information regarding yields have been excluded.

58 farmers (39%) had used four-wheel tractors solely or in combination with buffaloes for field preparation. Since only five of the farmers in the sample owned tractors, a substantial proportion of those who had relied on tractors would naturally have had to depend on hired machines. 35 per cent had preferred tractors in order to complete land preparation 'in time' and 22 per cent had to fall back on machines as buffaloes were not available. All the 18 farmers who had used two-wheel tractors owned the machines.

'Timely cultivation' discussed in Section 5.1 is possible if adequate draught power is available in time and specific cultivation programmes are observed. There were only 350 serviceable tractors in the district.[1] Also the majority of the tractor owners are really non-cultivators, who prefer to hire out the machines for transport and threshing rather than for ploughing. Consequently, the tractors actually available for field preparation in peak sowing periods is considerably less than the figure indicated earlier. Since 92 per cent of those who have used four-wheel tractors depended on hired machines a great majority of them possibly could not have obtained the necessary machines at the required time, particularly as there is a general shortage of tractors in the district. The difficulties experienced by those who depend exclusively on hired machines could well be imagined, particularly in relation to the limited time available for field preparation. From the first issue of water to time of sowing under major irrigation schemes is usually about 40 days and there is a very heavy demand for tractors during a peak period of about 30 days. Those who hire machines are just not in a position to get their draught power at the required time.

Since the use of buffaloes is already popular in the district and as there is adequate grazing facilities for animals farmers should be encouraged to rear their own animals for paddy field work, rather than look to hired tractors.

Crops sown in the peak period of October-November gave considerably higher yields than those sown later in the season. Nearly 22 per cent who had sown in December-January harvested very low yields, indicating the effect of time of sowing on yields, *ceteris paribus*. In order to ascertain whether the yields were influenced by the time of sowing, chi-square (X^2) tests were done first to test the association between methods of planting, varieties and the month of sowing. The tests indicated that there were no significant correlation betwen either methods of planting or varieties and the month of sowing.

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[1] Information based on records available at the Polonnaruwa Kachcheri.

Therefore, 't' tests were done using all the observations on yields relating to each of the months of sowing to determine whether there were significant differences between average yields of crops sown during different months. It was found that the average yields of those who had sown or planted their crops in October and November were significantly greater than the yields harvested from crops sown in December at 5 per cent level. There was no significant difference between yields harvested from crops sown in October and November.

Since North East monsoon rains generally commence in the last week of September, as many farmers as possible should be encouraged to complete sowing operations by the end of November. Completion of Maha sowing by end of November would be possible only if initial tillage operations commence with the onset of monsoon rains, at least in the first week of October. Apart from the influence on yields 'timely' sowing of Maha crop would enable the Maha rain water stored in tanks to be conserved for use in Yala when irrigation water becomes usually scarce and is badly needed. Since the monsoon generally commences in the beginning of October, almost two calendar months are available for field preparations. Consequently sowing could be completed by the end of November particularly if sufficient draught power is available. Late cultivation in the Maha season prevents the best use being made of the highly productive paddy lands under major irrigation schemes.

The data pertaining to cropping intensity of paddy lands during the year 1971/72 is given in Table 5-III.

Table 5-III Cropping Intensity

Water Supply	No of operators	Area available for cultivation during each season (acres)	Extent cultivated			Cropping Intensity*		
			Maha 1971/72	Yala 1972	Year 1971/72	Maha 1971/72	Yala 1972	Cultivation year 1971/72
Major Irrigation	133	730	658	426*	1084	90	58	148
Minor Irrigation	21	113	83	39	122	73	34	107
Total	154	843	741	465	1206	88	55	143

$$\text{Cropping intensity} = \frac{\text{Extent cultivated}}{\text{Extent available for cultivation}} \times 100$$

Extent available for cultivation during the year is twice the extent available during a season.

*Includes the (1.0) acre of land rented out by the operator and cultivated by a tenant during Yala. This land was cultivated by the operator during Maha.

In normal weather conditions almost all of the asweddumised paddy land is cultivated in Maha and about 75 per cent in Yala. In 1972 Yala season, however, very unfavourable weather conditions were experienced in many parts of the dry zone, and Yala paddy cultivation in this district too suffered much. Consequently in 1971/72 the intensity of paddy cropping in lands located under major irrigation schemes was very low, the relevant figure being only 148 per cent. Hence no inferences are drawn with regard to the intensity of paddy land use based on above data. The low cropping intensity does not necessarily imply that all lands not cultivated with paddy remained idle during the Yala season. Due to the efforts of the Extension Services to diversify cropping patterns and attractive prices fetched in the open market for 'other field crops' (e.g. chillies, green gram, groundnut), many farmers began to try new crops in paddy fields particularly when the supply of irrigation water was restricted in Yala. Cigarette tobacco is also an important cash crop grown extensively in well drained paddy fields in Yala particularly in and around Hingurakgoda.

5.2 Draught Power

Table 5-IV provides an indication of the trend with regard to the pattern of draught power used for land preparation.

Table 5-IV Pattern of Draught Power Used
Maha 1971/72

Water Supply		Type of draught power used for land preparation							Total
		Buffa-loes only	Two wheel tractor only	Four wheel tractor only	Mammo-tty & Buf-faloes	Buff-aloes & two wheel tractor	Buff-aloes & four wheel tractor	Other Opts.	Exts.
Major Irrigation	No	56	11	20	-	5	37	2	131
	%	*43*	*8*	*15*	-	*4*	*28*	*2*	*100*
	Acres	252.25	49.0	107.25	-	22.0	213.0	14.0	657.50
	%	*38*	*7*	*16*	-	*3*	*32*	*2*	*100*
Minor Irrigation	No	17	-	1	2	-	-	1	21
	%	*81*	-	*5*	*10*	-	-	*5*	*100*
	Acres	75.75	-	3.0	3.75	-	-	0.5	- 83.00
	%	*91*	-	*4*	*4*	-	-	*1*	- *100*
Total	No	73	11	21	2	5	37	3	152
	%	*48*	*7*	*14*	*1*	*3*	*25*	*2*	*100*
	Acres	328.0	49.0	110.25	3.75	22.0	213.0	14.5	-740.50
	%	*44*	*7*	*15*	..	*3*	*29*	*2*	- *100*

.. less than 1 per cent.

The importance of the buffalo in land preparation is evident from the data on draught use. 48 per cent of the farmers in the sample depended exclusively on animal power for tillage in 44 per cent of the extent cultivated. In contrast 14 per cent relied only on four-wheel tractors to prepare 15 per cent of the land. Two-wheel tractors are of very little importance as a source of draught power. An appreciable proportion of farmers (25%) were dependent both on buffaloes as well as four-wheel tractors for field work. It is a common feature for farmers in the district to hire tractors for the first ploughing, and use their own buffaloes for subsequent field operations.

The widespread use of buffaloes for field preparation despite the relatively larger operational holding size (5.48 acres) is a noteworthy feature. The widespread use of animal power for tillage is partly due to ready availability of buffaloes in the district. Of the 154 farmers 60 per cent owned buffaloes, 31 per cent of them owning at least two pairs. The maintenance of draught animals is comparatively easy in Polonnaruwa since grazing is possible during most parts of the year in scrub jungles and on the uncultivated highlands. The main reasons given by 118 farmers who used buffaloes for draught purposes are summarised in Table 5-V.

Table 5-V Principal Reasons for Using Buffaloes

	No.	%
No of farmers using buffaloes	118	100
Reasons		
Owned buffaloes	52	44
Cheaper to use	9	8
Easily available	8	7
More satisfactory work	8	7
Boggy soil	7	6
4 wheel and 2 wheel tractors were not available	6	5

44 per cent of those who had used animal power had their own animals. Among the more important reasons given for the use of animal power were that it was more economical, readily available, and capable of doing a better job.

Draught power, particularly four wheel tractors available in the district, is totally inadequate to do the field preparation and ensure that the Maha sowing is completed by the end of November.

5.3 Use of Improved Varieties

Distribution of operators according to varieties cultivated during Maha 1971/72 and Yala 1972 are given in Table 5-VI.

Table 5-VI Distribution of Operators according to Varieties Cultivated during Maha 1971/72 and Yala 1972

Season	Opera-tors	NHYV only	OHYV only	TV only	NHYV and OHYV	NHYV & TV	OHYV & TV	NHYV OHYV & TV	Total
Maha 1971/72	No	41	70	4	26	5	5	1	152
	%	*27*	*46*	*3*	*17*	*3*	*3*	*1*	*100*
Yala 1972	No	52	5	61	-	19	3	-	140
	%	*37*	*4*	*44*	-	*14*	*2*	-	*100*

27 per cent of the farmers grew NHYV exclusively in Maha and 37 per cent in Yala, the most popular variety being BG 11 - 11. OHYV like H-4 continue to be important particularly in the Maha season as 46 per cent of the farmers grew only these varieties. During Yala, however, the traditional varieties are more popular, the predominant variety being the 3 month Pachchaiperumal. This variety was released in 1928 and is widely cultivated in the dry zone during Yala due to its good performance under conditions of restricted water supply. However, the numbers cultivating traditional varieties are gradually declining as 37 per cent of the respondents have already adopted recently bred short aged varieties as BG 34-8 and BG 34-6 in the second season after their release to farmers. These new varieties not only get very high yields, but are resistant to lodging, hence their ready acceptance among a high proportion of the farmers.

5.4 Use of Improved Seed according to Size of Holding

The pattern of varietal distribution during the two seasons according to size of holding is presented in Table 5-VII and 5-VIII.

Table 5-VII Extents under Different Varieties according to Size of Holding - Maha 1971/72

Size of Holding (Acres)		NHYV	OHYV	TV	Total
Upto 2.00	Acres	2.50	16.25	1.50	20.25
	%	*12*	*80*	*8*	*100*
2.00 - 4.00	Acres	53.50	89.00	5.75	148.25
	%	*36*	*60*	*4*	*100*
4.00 - 6.00	Acres	107.25	142.25	17.50	267.00
	%	*40*	*53*	*7*	*100*
6.00 - 8.00	Acres	44.75	61.00	5.50	111.25
	%	*40*	*55*	*5*	*100*
8.00 - 10.00	Acres	49.50	51.50	5.00	106.00
	%	*47*	*49*	*5*	*100*
Over 10.00	Acres	40.50	47.25	-	87.75
	%	*46*	*54*	-	*100*
Total	Acres	298.00	407.25	35.25	740.50
	%	*40*	*55*	*5*	*100*

During Maha season the proportion of the area cultivated with NHYV shows a uniform pattern in all size groups above 4 acres. Even with regard to OHYV a similar trend is observed. In the smallest holding size class of less than 2 acres, OHYV predominate. On the average, 40 per cent of the extent in all size groups has been under NHYV, 55 per cent under OHYV and only 5 per cent under traditional varieties. In all size classes the proportion of land cultivated in Maha with OHYVs is larger than that cultivated with NHYVs.

A striking feature in the pattern of varietal distribution during Yala is the dominant position occupied by the traditional varieties like Pachchaiperumal where almost half the extent cultivated by farmers has been under these varieties irrespective of holding sizes. The pattern of varietal distribution of NHYV is relatively uniform except in the holding size class below 2 acres. The recently introduced shorter-aged varieties e.g. BG 34-8 and BG 34-6 have spread rapidly into all size groups and this would be reflected in the acreage under

Table 5-VIII Extents under Different Varieties according to Size of Holding - Yala 1972

Size of Holding (Acres)		NHYV	OHYV	TV	Total
Upto 2.00	Acres	5.50	1.00	8.50	15.00
	%	*37*	*7*	*57*	*100*
2.00 - 4.00	Acres	48.00	9.25	35.75	93.00
	%	*52*	*10*	*38*	*100*
4.00 - 6.00	Acres	75.00	-	89.00	164.00
	%	*46*	-	*54*	*100*
6.00 - 8.00	Acres	21.50	-	29.50	51.00
	%	*42*	-	*58*	*100*
8.00 - 10.00	Acres	43.75	-	34.25	78.00
	%	*56*	-	*44*	*100*
Over 10.00	Acres	27.33	4.00	31.25	62.58
	%	*44*	*6*	*50*	*100*
Total	Acres	221.08	14.25	228.25	463.58
	%	*48*	*3*	*49*	*100*

traditional varieties in the future. The extent under OHYV in Yala is very insignificant, presumably as promising 'intermediate varieties' of the H-Series (of 3-3½ month age class) were not available to farmers until the advent of new varieties of BG series. Widespread cultivation of traditional varieties such as Pachchaiperumal during Yala season could be partly attributed to this reason.

5.5 Use of Improved Seed according to Supply of Water

The pattern of varietal distribution according to water supply during Maha 1971/72 and Yala 1972 are given in Tables 5-IX and 5-X.

Farmers under major schemes have changed to NHYV very readily primarily due to the assured water supply. On the other hand those under minor schemes have relied more on the older hybrids and the same familiar varieties. In minor schemes the risk to cultivate is higher, farmers were reluctant even in Maha to try out new varieties requiring more purchased inputs.

Table 5-IX Extents under Different Varieties according to Water Supply-Maha 1971/72

Water Supply		NHYV	OHYV	TV	Total
Major Irrigation	Acres	291.00	349.50	17.00	657.50
	%	*44*	*53*	*3*	*100*
Minor Irrigation	Acres	7.00	57.75	18.25	83.00
	%	*8*	*70*	*22*	*100*
Total	Acres	298.00	407.25	35.25	740.50
	%	*40*	*55*	*5*	*100*

Table 5-X Extents under Different Varieties according to Water Supply-Yala 1972

Water Supply		NHYV	OHYV	TV	Total
Major Irrigation	Acres	213.08	9.00	203.00	425.08
	%	*50*	*2*	*48*	*100*
Minor Irrigation	Acres	8.00	5.25	25.25	38.50
	%	*21*	*14*	*66*	*100*
Total	Acres	221.08	14.25	228.25	463.58
	%	*48*	*3*	*49*	*100*

In Yala the area under NHYV showed an increase over Maha. However, traditional varieties such as Pachchaiperumal occupy a predominant position irrespective of the water supply conditions. Even in major schemes 48 per cent of the extent had been under traditional varieties. 52 per cent of the extent cultivated during the dry season were under either traditional or old high yielding varieties, highlighting the relative importance of the older varieties even in a district that has reasonably good water supply conditions during Yala. This may be due partly to lack of success in the past in evolving high yielding short aged varieties of 3-3½ months class. However, with the release of the new shorter aged varieties of the BG-Series, this position is likely to change rather rapidly.

5.6 Use of Improved Seed according to Tenurial Category

Since the number of tenants and tenant-owners included in the sample was very small, the pattern of varietal distribution is not examined in relation to tenancy conditions. Data collected reveals that 95 per cent of those in the sample (148) have grown old as well as NHYV in 95 per cent of the extent cultivated by them during Maha 1971/72 season indicating the popularity of improved varieties during Maha season.

5.7 Non-Cultivation of Improved Seed

Of the 152 farmers in the sample 79 (52%) had not cultivated any NHYV during Maha 1971/72 season. The reasons are set out in descending order of importance.

Table 5-XI Reasons for Non-Cultivation of New High Yielding Varieties - Maha 1971/72

	No	%
Farmers who did not cultivate new high yielding varieties in Maha 1971/72	79	100
Reasons for not cultivating :		
Difficulty of getting seed paddy	47	60
Lack of knowledge about these varieties	24	30
Resistence to change	8	10
Problems of water	7	9
High cost of cultivation	7	9
Not convinced of benefits	7	9
Following neighbours	4	5
Other reasons	14	18

60 per cent of the respondents had not grown new varieties due to difficulties obtaining seed and 30 per cent for a lack of knowledge about them. Other important reasons were the high cost of inputs, a lack of conviction of benefits, and the problem of water. Hence the popularity of traditional varieties particularly under minor schemes. However, it is noteworthy that almost 50 per cent of the respondents had adopted new varieties in a matter of two seasons after their release.

5.8 Method of Planting

Distribution of farmers on the basis of planting methods adopted during Maha 1971/72 and Yala 1972 seasons are presented in Table 5-XII.

Table 5-XII Distribution of Farmers according to Planting Methods Cultivation Year 1971/72

Season		Transplanting	Broadcasting	Combinations	Total
Maha 1971/72	No	59	60	32	152[1]
	%	*39*	*40*	*21*	*100*
Yala 1972	No	11	116	12	140[2]
	%	*8*	*83*	*9*	*100*

[1] Includes one operator who had row sown in Maha 1971/72

[2] Includes one operator who had row sown in Yala 1972

Information on planting methods was available only in respect of 152 farmers in Maha and 140 in Yala. 60% and 17% of the farmers in Maha and Yala respectively had adopted transplanting at least in a portion of their fields. The number transplanting the full extent of their holdings is relatively smaller, 39 per cent in Maha and 8 per cent in Yala. Popularity of transplanting during Maha is primarily due to the ready availability of irrigation water, which facilitates the cultivation of 4-4½ month varieties that respond well to transplanting, unlike the short aged varieties of 3 months that predominate during the Yala season.

5.9 Methods of Planting according to Size of Holding

Data pertaining to planting methods classified on the basis of size of holding in the two seasons are given in Tables 5-XIII and 5-XIV.

Table 5-XIII Extent under Different Planting Methods according to Size of Holding-Maha 1971/72

Size of Holding (Acres)		Transplanting	Broadcasting	Total
Upto 2.00	Acres	8.50	11.75	20.25
	%	*42*	*58*	*100*
2.00 - 4.00	Acres	79.25	66.00	148.25*
	%	*53*	*44*	*100*
4.00 - 6.00	Acres	140.00	125.00	265.00
	%	*53*	*47*	*100*
6.00 - 8.00	Acres	51.75	59.50	111.25
	%	*46*	*54*	*100*
8.00 - 10.00	Acres	65.50	40.50	106.00
	%	*62*	*38*	*100*
Over 10.00	Acres	25.50	62.25	87.75
	%	*29*	*71*	*100*
Total	Acres	370.50	365.00	738.50*
	%	*50*	*49*	*100*

*Includes 3.0 acres row sown by one operator. This area is 0.4 per cent of the total extent.

The acreage transplanted in Maha does not show a regular relationship to size of holding. The average extent transplanted during Maha amounts to 50 per cent of the area cultivated; in the larger size holdings of 8-10 acres located mostly in Minneriya Stages I and II, the extent transplanted is greater (62%) while in the largest size holdings over 10 acres, the transplanted extent is 29 per cent showing a marked down-turn.

In Yala due to restricted water supply and the widespread cultivation of three month varieties, broadcast sowing is the standard practice, 83 per cent of the extent cultivated was sown broadcast. However, contrary to expectation, the data presented in Table 5-XIV reveals that a relatively higher proportion of the area in the largest size holdings of over 10 acres had been transplanted during Yala. In this size class, 30 per cent of the extent has been transplanted as against 8 per cent in the predominant size group of 4-6 acres.

Table 5-XIV Extent under Different Planting Methods according to Size of Holding-Yala 1972

Size of Holding (Acres)		Transplanting	Broadcasting	Total
Upto 2.00	Acres	1.00	14.00	15.00
	%	7	93	100
2.00 - 4.00	Acres	17.25	75.75	93.00
	%	18	82	100
4.00 - 6.00	Acres	14.00	145.00	164.00*
	%	8	88	100
6.00 - 8.00	Acres	3.00	48.00	51.00
	%	6	94	100
8.00 - 10.00	Acres	18.00	60.00	78.00
	%	23	77	100
Over 10.00	Acres	19.00	43.58	62.58
	%	30	70	100
Total	Acres	72.25	386.33	463.58*
	%	16	83	100

*Includes 5.0 acres row sown by one operator. This extent is 1.1 per cent of the total extent and 3.1 per cent of the extent in holding of size group 4.00-6.00 acres.

This tendency may partly be due to historical factors. A majority of the operators of larger size holdings are in fact "middle-class allottees", whose allotments are often located close to major tanks, Minneriya, Stages I and II. A sizeable number of pioneer settlers in Minneriya Stages I and II were not really landless peasants but persons with a middle-class social background who ventured into these areas with a limited amount of capital. Many of the persons have been successful in obtaining jungle lands for asweddumisation in proximity to irrigation tanks that were being restored at the time. Consequently, a fair proportion of operators in Minneriya Stages I and II possess holdings of over 10 acres. Thus, this category of affluent operators enjoy an assured water supply even in Yala primarily because their holdings are located in close proximity to the main reservoirs. Further, they are also in a position to hire labour at relatively low wage rates in Yala due to limited employment opportunities for labour in the dry season. Assured water supply and ready availability of cheap labour in Yala apparently have motivated the more affluent operators to undertake transplanting on a wider scale.

In contrast despite the availability of water in Maha, operators of larger holdings find it difficult to transplant on a wider scale, because of the difficulty of hiring labour at the required time. Despite the fact that there is a large influx of migrant labour into this district during Maha, the total labour supply falls far short of the peak season demand. And as transplanting has to be completed within a very limited time in Maha shortage of casual labour impedes transplanting on a wider scale particularly in the larger holdings. Data pertaining to planting methods was not examined separately in relation to water supply and tenurial conditions as over 80 per cent of the operators are in fact owner-cultivators whose allotments are under major irrigation schemes.

5.10 Reasons for not Transplanting

Of the 60 operators in the sample who have adopted broadcast sowing, 40 per cent indicated that lack of funds required for transplanting was the main reason for continuing with the traditional method of sowing, while another 23 per cent attributed it to an undependable water supply. In spite of the larger average holding size and the low population density the relatively larger extent transplanted in Maha (50%) reflects the comparatively high standard of management in this district.

5.11 Application of Fertilizer according to Seasons

Information on fertiliser use was available in the case of 151 farmers in Maha and 134 in Yala. Data pertaining to the respective seasons is given in Tables 5-XV and 5-XVI.

Table 5-XV Application of Fertiliser - Maha 1971/72

No of farmers reporting 151

Type of fertilizer	Farmers reporting use of fertilizer		Quantity per acre (cwts)
	No	%	
Any type of fertilizer	117	78	2.4
Urea	112	74	1.3
$V_1/V_2/V_3$	84	56	1.3
TDM	4	3	1.4
Ammonium Sulphate	6	4	1.2
Pellet Fertilizer	2	1	0.7
Super Phosphate	2	1	1.5
Muriate of Potash	1	1	0.3

Table 5-XVI Application of Fertilizer-Yala 1972

No of farmers reporting 134

Type of fertilizer	Farmers reporting use of fertilizer		Quantity per acre
	No	%	(cwts)
Any type of fertilizer	97	72	2.3
Urea	95	71	1.3
$V_1/V_2/V_3$	66	49	1.3
TDM	4	3	1.2
Ammonium Sulphate	2	2	1.1
Pellet fertilizer	-	-	-
Super Phosphate	1	1	1.0
Muriate of Potash	-	-	-

Over 70 per cent of the farmers had used some kind of fertilizer in both seasons at 2.3 cwts. per acre. The general pattern of fertilizer use during both seasons is similar both as regards types as well as quantities used. Urea was the most popular fertilizer, over 70 per cent having applied it, the average being 1.3 cwt. per acre in both seasons. Basal mixture V_1 made available for the first time in the 1971/72 season gained a wider acceptance among farmers in a relatively short period as around 50 per cent of the respondents had used it applying on an average 1.3 cwt. per acre. Those who used basal mixture tended to follow the official recommendations more closely. However, with regard to Urea the existing trend appears to be the application of somewhat higher dosages, particularly during the Yala season. As mentioned in Section 5.3 since 48 per cent have grown either OHYV or traditional varieties exclusively during the two seasons, an overall figure of 1.3 cwt. of Urea used per acre is considered excessive.[1] The practice of using higher quantities of Urea particularly in the Yala when traditional and OHYV predominate, may partly be a form of substitution of Urea in place of the recommended basal mixture as nearly 50 per cent in the sample have not used any mixed fertilizer. Use of higher quantities

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[1] Official recommendations for OHYV and traditional varieties:

Age class	Urea
3-3½ months	0.62 to 1 cwt. per acre
4 months	0.75 to 1 cwt. per acre

of only nitrogenous fertilizer particularly for short aged traditional varieties is unlikely to give farmers a commensurate return. Rational use of Urea has become very vital in the present context as this input has a very high social opportunity cost, due to very sharp increase in the world market price.[1] The existing pattern of fertilizer use in the field calls for a closer scrutiny to ascertain whether optimum economic returns are being got.

Fertilizer use in relation to water supply was also examined, and the relevant data is presented in Table 5-XVII and 5-XVIII.

Table 5-XVII Application of Fertilizer according to Supply of Water - Maha 1971/72

	Major Irrigation	Minor Irrigation	Rain-fed	Major Irrigation	Minor Irrigation
No of farmers reporting	130	21			
Type of Fertilizer	Percentage of farmers reporting			Quantity per acre (cwts.)	
Any type of fertilizer	84	38		2.4	2.3
Urea	80	38		1.3	1.7
$V_1/V_2/V_3$	62	14		1.3	1.2
TDM	2	5		1.5	1.3
Ammonium Sulphate	5	-		1.2	-
Pellet Fertilizer	2	-		0.7	-
Super Phosphate	2	-		1.5	-
Muriate of Potash	1	-		0.3	-

- Indicates no respondents

However, in view of the small number of farmers in minor schemes, a comparison of pattern of fertilizer use based on water supply is not attempted. Fertilizer is very popular under major schemes where in Maha 84 per cent use fertilizer

[1] Price of a cwt. of Urea has risen from Rs.53.26 to Rs.134.25 in July 1974.

Table 5-XVIII Application of Fertilizer according to Supply of Water - Yala 1972

	Major Irrigation	Minor Irrigation	Major Irrigation	Minor Irrigation
No of farmers reporting	121	13		
Type of fertilizer	Percentage of farmers reporting		Quantity per acre (cwts.)	
Any type of fertilizer	76	38	2.3	1.2
Urea	74	38	1.3	1.1
$V_1/V_2/V_3$	54	8	1.3	1.0
TDM	2	8	1.2	1.0
Ammonium Sulphate	2	-	1.1	-
Pellet Fertilizer	-	-	-	-
Super Phosphate	1	-	1.0	-
Muriate of Potash	-	-	-	-

- Indicates no respondents

compared to 76 per cent in Yala. The quantities of different kinds of fertilizer applied per acre in major schemes in the two seasons show hardly any variation. In minor schemes the amount applied per acre in Yala is substantially less mainly due to problems connected with water supply, but in Maha farmers appear to use almost the same quantities of fertilizer irrespective of the source of water supply.

5.12 Timeliness of fertilizer application

Since satisfactory response to fertilizer is dependent among other things on the time of application, the relevant data was examined. Of the 117 farmers in the sample those who applied various fertilizers at the appropriate time during Maha 1971/72 are indicated below.

	No	%
Basal application	84	72
First top dressing	114	97
Second top dressing	104	89
Other stages	17	14

It is assumed that the farmers who used basal fertilizer would have applied it at the correct time before sowing. However, the data available on the use of top dressing of different kinds of fertilizer is inadequate to indicate the proportion of farmers who would have top dressed their crops at the correct time.

5.13 Application of Fertilizer according to Size of Holding

The pattern of fertilizer use during Maha 1971/72 according to the size of holding is given in Table 5-XIX.

Table 5-XIX Pattern of Fertilizer Application according to Size of Holding - Maha 1971/72

Size of Holding (Acres)	Number of Applications					
	At least once				Three times	
	Farmers		Extent		Farmers	
	No	%	(Acres)	%	No	%
Upto 2.00	5	42	6.50	32	1	8
2.00 - 4.00	34	74	113.25	78	21	46
4.00 - 6.00	47	86	221.25	83	34	62
6.00 - 8.00	14	78	86.75	78	9	50
8.00 - 10.00	11	85	84.50	80	7	54
Over 10.00	6	86	79.75	91	5	71
Total	117	78	592.00	80	77	51

The number of farmers who fertilized their crops at least once was relatively uniform in the holding above 2 acres. Similarly in regard to the extents fertilized. A higher proportion of operators in the larger holdings of over 10 acres as well as those with 4-6 acres predominate the holding size in this district made 3 applications of fertilizer. Operators in holdings of over 4 acres appear to adhere more closely to the technical recommendations of split applications of fertilizer. However, about 50 per cent of the farmers had applied 3 doses of fertilizer as recommended.

5.14 Weed Control

65 per cent of the extent included in the sample was treated with some form of weed control measures in Maha 1971/72. Nearly 50 per cent of the farmers practiced only hand weeding while 37 per cent used chemicals during the season. The total extent of paddy land weeded by the different methods however

was almost the same (42%). Hand weeding is practised over a wider area (45% - 50%), in the medium size holdings of less than 8 acres, while chemical weed control is more popular in 74 per cent of the extent in the larger holdings.

The pattern of weed control measures adopted according to sources of water supply also shows that a slightly higher proportion of farmers (47%) hand weeded compared to 40 per cent who have used chemicals, but the area weeded by these two methods shows hardly any variation, Both hand weeding and chemicals are important management procedures in this district. In minor schemes the performance for hand weeding is indicated by the fact that 62 per cent of the operators used this method over 53 per cent of the cultivated land as against 19 per cent who used chemicals over 24 per cent of the extent cultivated.

Chapter 6

PRODUCTION AND DISPOSAL OF PADDY

The reference period 1971/72 was not very favourable for paddy cultivation in many of the dry zone districts including Polonnaruwa (Table 1-I). In 1971/72 the rainfall was considerably less than the average. The rains came late and were excessively heavy in December. Unfavourable weather conditions and the uneven distribution of rain through the year had an impact on yields particularly during the 1972 Yala season.

The overall yields of the 140 farmers in Maha was 62.9 bushels per acre. 124 farmers were able to provide yield data for Yala. Their overall yield was 50.4 bushels per acre. The Yala yield was 81 per cent of the Maha yields.

The average yield in major schemes was 64.7 bushels in Maha and 51.0 bushels per acre in Yala. The extents sown in major schemes were 657.5 acres and 425.08 acres in Maha and Yala respectively. No significant relationship was observed between yields and extents sown for each variety in major schemes.

6.1 Yields in relation to varieties grown and methods of planting

Since 80 per cent of the paddy acreage in the district is under major irrigation, the yield data of these farmers was examined in relation to varieties as well as methods of planting. During Maha 1971/72, 54 per cent of the cultivated extent had been transplanted. As mentioned in Section 5.9, 44 per cent of the cultivation was with NHYV and 53 per cent with OHYV in the same season. 102 farmers had adopted either transplanting or broadcast sowing in their entire operational holdings, and the yield data of 97 of these farmers according to methods of planting is given in Table 6-I.

Table 6-I Comparison of Yields of Different Planting Methods under Major Schemes- Maha 1971/72

Planting Methods	No. of farmers who reported the planting methods	Average yield per acre for all varieties
Transplanting only	58	80.0
Broadcasting only	39	50.0

Note: Of 131 operators who cultivated in Maha 1971/72 under major schemes only 102 adopted either transplanting or broadcast their entire operational holdings. Of them 2 had reported crop failure and 3 had furnished unreliable information. Accordingly 5 of the respondents have been excluded.

A comparison of acre yields for all varieties shows that those who transplanted their paddy crops obtained almost 30 bushels more per acre. The large differences in yields could not be attributed solely to transplanting, as yield depends on a number of factors of production, varieties, transplanting, fertiliser use, weed, pest control measures, and so on. The yields of these two groups of farmers were examined only in relation to varieties grown and methods of planting and not in relation to fertiliser use or weed control measures as the relevant data for such was not available.

Yields reported by 131 farmers in major schemes during Maha 1971/72 were grouped according to planting methods and varieties cultivated. 83 farmers had adopted either transplanting or broadcast sowing in their entire holdings and had used OHYVs or NHYVs exclusively during this season. In the case of operators who had used different varietal combinations as well as methods of planting in their holdings, yield data could not be grouped separately on the basis of varieties and methods of planting. Consequently, the discussion that follows is based on an analysis of data of 78 farmers as 5 had reported crop failure. Their yields on the basis of method of planting and the varieties grown are classified in Table 6-II.

Table 6-II No. of farmers and average yields
(No. of farmers in parenthesis)

Varieties	Method of Planting		
	Transplanting	Broadcast	Total
NHYV	90.82 (26)	61.85 (7)	84.68 (33)
OHYV	68.92 (18)	48.21 (27)	56.49 (45)
Total	81.85 (44)	51.02 (34)	68.42 (78)

The X^2 test was done to ascertain the connection between planting methods and the varieties grown. The value of X^2 was found to be highly significant ($P/ 0.001$) indicating that a great proportion of those who use NHYV transplant their crops, while OHYV are more popular with those who broadcast paddy.

't' tests with the yield data gave the following results :

i. the average yield of NHYV (84.68 bu/ac) was significantly greater than the average yield; of OHYV (56.49 bu/ac), at the 0.001 per cent level of significance.

ii. transplanting gave significantly greater yields (81.86 bu/ac) than broadcasting (51.02 bu/ac) ($P/ 0.001$).

iii. that for each variety, the transplanted crops significantly out-yielded the broadcast crops, the difference in yield being 28.97 bu/ac for NHYV and 20.70 bu/ac for the OHYV. The differences were significant at 0.001 per cent levels.

During Yala as was observed in Section 5.3, traditional varieties are more popular, the predominant variety being Pachchaiperumal which being a three month crop is always sown broadcast. NHYV and traditional varieties occupied 50 per cent and 48 per cent of the total extents cultivated. During this particular Yala season the area under OHYV was negligible. 83 per cent of the extent cultivated during Yala

was found to be broadcast sown and only 16 per cent transplanted (Section 5.9). A comparison of yields of 101 farmers who have either broadcast or transplanted their entire holdings is given in Table 6-III, clearly showing the advantages of transplanting in Yala.

Table 6-III Comparison of Yields of Different Planting Methods under Major Schemes- Yala 1972

Planting Methods	No. of farmers who reported planting methods	Average yield per acre for all varieties
Transplanting only	10	70.9
Broadcasting only	91	46.3

*Of 126 operators who cultivated in Yala 1972, 114 either transplanted or broadcast their entire operational holdings. 13 of these operators who reported crop failures have been excluded.

The data on methods of planting, varieties grown and the yields in Yala season, revealed that 84 farmers had either broadcast sown or transplanted their entire cultivated extents and have also used either NHYV or traditional varieties. Distribution of these farmers and their average yields are given in Table 6-IV.

Table 6-IV No of farmers and average yields - Yala 1972 (No. of farmers in parenthesis)

Varieties	Method of Planting		
	Transplanting	Broadcast	Total
NHYV	66.92 (9)	53.16 (31)	56.25 (40)
Traditional Varieties	-	42.97 (44)	42.97 (44)
Total	66.92 (9)	57.18 (75)	49.30 (84)

The results of 't' tests done on the average yields in Yala are summarised below:

i. NHYV gave significantly higher yields (56.25 bu/ac) than traditional varieties (42.97 bu/ac) the level of significance being 0.01 per cent.

ii. A comparison of the broadcast crops too, shows similar indications, the difference of 10.18 bu/ac in favour of NHYV being significant at 0.05 per cent level of significance.

iii. NHYV when transplanted gave significantly higher yields than when sown broadcast, the yield difference of 13.76 bu/ac being significant at 0.01 per cent level.

However the extents transplanted during Yala season is normally smaller (16% in 1972). Traditional varieties are widely grown during this season and are invariably sown broadcast, as these varieties are of shorter duration (three months) and do not respond to transplanting (cf. Management Practices). Even in the case of NHYVV, broadcast sowing is more popular in Yala due to water supply difficulties.

On an overview of the situation in Polonnaruwa, a number of noteworthy features were evident. The triple factors of economically viable holding size and the almost complete absence of tenurial problems, assured water supply, and efficient levels of management have resulted in higher levels of production. The use of NHYV coupled with transplanting has largely contributed to this situation. In the 4-6 acre group predominant in this district, the average yield of transplanted NHYV was 87 bushels per acre during the Maha season.

In the country's present foreign exchange situation, the import of agro-chemicals and fertilizer have a very high social opportunity cost. The reduction in fertilizer use due to an unprecedented price increase seems to be almost inevitable. In a district like Polonnaruwa where water is assured in Maha, production levels could be sustained even with a possible reduction in fertiliser use if labour intensive techniques like transplanting, hand weeding etc., are more widely practiced.

6.2 Disposal of Paddy

The quantity of surplus paddy at the farm level is relatively high. The average size of operational holding is relatively large. The assured water supply has enabled a great majority of paddy farmers to get high yields. Larger holdings and the high yields obtained have resulted in higher levels of production. As a very high proportion of operators are colonists in settlement projects the question of paying a portion of the crop as land rent does not arise. Surplus paddy at the farm level is appreciable and operators in major schemes have substantial quantities for disposal. The disposal of paddy in Maha 1971/72 and Yala 1972 classified according to holding size is presented in Tables 6-V and 6-VI.

Table 6-V Disposal of paddy - Maha 1971/72 classified according to size of holding

Size of Holding (Acres)	No. of farms	Sales per acre sown (Bushels)	Sales as % of total production	Sales to co-op. as a % of total sales	Yield per acre (Bushels)
Upto 2.00	10	26.3	65	100	40.6
2.00 - 4.00	40	49.5	73	100	68.1
4.00 - 6.00	49	51.5	73	100	70.7
6.00 - 8.00	16	43.9	74	100	59.2
8.00 - 10.00	12	41.8	78	100	53.5
Over 10.00	7	43.1	87	84	49.6
Total	134	46.8	75	98	62.4

During Maha on an average 75 per cent of the paddy produced is the sales per acre amounting to 47 bushels for all size groups. Sales classified according to holding size shows little variation except in the holdings of over 10.0 acres. Understandably, in the smallest holdings of less than 2.0 acres both the proportion as well as the quantity sold per acre has been low, being 26 bushels per acre. The largest quantity of paddy sold (51 bushels per acre) is in the predominant size group of 4-6 acres where the yields recorded have also been highest (70.7 bushels per acre). In Yala the average number of bushels as well as the proportion of total production sold per acre is lower than in Maha primarily due to lower yields. Generally sales as a percentage of total production shows an increasing trend with the increase in holding size and yields.

Table 6-VI Disposal of Paddy - Yala 1972 classified according to size of holding

Size of Holding (Acres)	No. of farms	Sales per acre sown (Bushels)	Sales as % total production	Sales to Co-op. as a % of total sales	Yield per acre (Bushels)
Upto 2.00	4	25.0	56	100	44.9
2.00 - 4.00	32	41.7	69	100	60.4
4.00 - 6.00	49	30.3	65	100	46.7
6.00 - 8.00	13	34.3	72	95	48.9
8.00 - 10.00	12	39.8	76	93	52.5
Over 10.00	6	43.7	81	100	53.9
Total	116	36.2	70	98	51.3

The co-operative societies have been the premier paddy purchasing agency in this district. In all holdings of less than 10.0 acres, the entire quantity of surplus paddy in Maha has been marketed through the co-operatives. In the larger holdings of over 10.0 acres a somewhat lower proportion of paddy (84%) has been channelled through the co-operative societies. In fact in both seasons the co-operatives have had almost a monopoly in the purchase of paddy even before the introduction of the monopoly purchase scheme in 1974.

On the average, operators in major schemes have disposed of 74 per cent of their total production in Maha and 66 per cent in Yala. In absolute terms sales have amounted to 61 and 33 bushels per acre during the Maha and Yala seasons respectively.

Chapter 7

LABOUR UTILISATION AND INCOME

In this chapter are discussed principally the situation relating to labour use, off farm work and family farm earnings of the households surveyed. Some data on family size and size of labour force is also given as background information. 154 families classified[1] into four major tenurial categories were considered, making a total of 1145 persons. 691 of them were 14 years of age and above.[2]

7.1 Family Size

The average size of family of the total sample was 7.5 members. Owners had relatively smaller families (7.3) compared with tenant owners whose family size was 8.4 members. Those classified as owner tenants and others had a family of 7.7 persons (Table 7-I).

Against the sample as a whole the size of families surveyed was big. Of the total sample of households, 34% had families of 9 persons or more while 1% had families of 4 members and less. In the majority of farms (53%) families varied from 5 to 8 members.

Table 7-I shows the relationship between family size and size of holding. It is seen that 33% of the small farms, i.e. those with land holdings of 2 acres and less had 4 members or less while 33% with holdings of 6 acres and over have 7 - 8 family members. Of the larger families with 9 or more members, 37% had holdings of 6 acres and above. The larger families were clearly concentrated more in the larger holding size classes.

The position of households with 5 and more members and 7 and more members in respect of different size classes for all tenurial categories is given in the following table, and here too the tendency is for larger families to be concentrated in larger holdings.

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[1] The detail information regarding this classification is given in the Introduction.

[2] The family members of 14 years and above are considered to be available for family farm work either fulltime or part time.

Table 7-I Distribution of Family Size by Size of Holding

Size of Holding (Acres)	5/ %	7/ %
Upto 2.00	67	42
2.00-4.00	88	69
4.00-6.00	89	56
Over 6.00	90	82

The tenurewise distribution of family size is shown in Table 7-II. Almost 60% of the households in the tenant owner category had families of 9 persons or more, while among the other three tenurial categories the percentage of such families was between 30% and 40%; the owners recording the lowest. All tenant owners had no families with less than 4 members whereas owner and owner tenant households had 10% and 12% respectively of families with less than 4 members. The category 'others' recorded the largest percentage (25) of smaller families.

7.2 Family Labour Force

In measuring the size of the available family labour force it is assumed that family members of 14 years and above are available for agricultural work either on full time or part time. The relevant data is presented in Table 7-III.

Table 7-III Distribution of Households by Size of Family Labour Force and Tenurial Category of Lowland Operators

Tenurial Category		Number of Family Members Aged 14 Years and Above								Average size of labour force
		1	2	3	4	5	6	7 and above	Total	
Owners	No.	1	13	22	16	24	15	14	105	3.8
	%	1	12	21	15	23	14	13	100	
Owner Tenants	No.	-	3	3	3	3	1	3	16	3.9
	%	-	19	19	19	19	6	19	100	
Tenant Owners	No.	-	-	1	2	1	-	1	5	3.0
	%	-	-	20	40	20	-	20	100	
Others	No.	-	6	6	3	3	5	5	28	3.7
	%	-	21	21	11	11	18	18	100	
Total	No.	1	22	32	24	31	21	23	154	3.7
	%	1	14	21	16	20	14	15	100	

Table 7-II Distribution of Households by Size of Family, Tenurial Category and Size of Holding

No. of Family Members	Tenurial Category										Size of Holding (Acres)											
	Owners		Owner-Tenants		Tenant-Owners		Others		Total		Upto 2.00		2.00-4.00		4.00-6.00		6.00-8.00		8.00-10.00		Over 10.00		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 3	1	1	-	-	-	-	1	4	2	1	-	-	1	2	1	2	-	-	-	-	-	-	2	1
3 - 4	9	9	2	12	-	-	6	21	17	11	4	33	5	10	5	9	2	11	1	7	1	14	18	12
5 - 6	30	29	2	12	-	-	1	4	33	21	3	25	9	19	18	33	2	11	1	7	-	-	33	21
7 - 8	32	30	6	38	2	40	9	32	49	32	3	25	18	38	14	25	5	28	6	43	2	29	48	31
9 - 10	23	22	5	31	3	60	6	21	37	24	2	17	9	19	12	22	7	39	5	36	2	29	37	24
More than 10	10	10	1	6	-	-	5	18	16	10	-	-	6	12	5	9	2	11	1	7	2	29	16	10
Total	105	100	16	100	5	100	28	100	154	100	12	100	48	100	55	100	18	100	14	100	7	100	154	100

The average size of family labour force for all tenurial categories was 3.7 persons, the smallest being for the tenant owners and the highest for the owner tenants. 49% of the total number of farms of all tenurial categories had 5 or more family members of 14 years and above, the owners and the category 'others' having a larger percentage share of such families than the tenant owners and owner tenants. The table also shows that for all tenurial categories taken together 65% of the families had a family labour force of 4 or more and only 15% of the families have a labour force of 2 persons or less.

Table 7-IV Distribution of Households by Size of Family Labour Force and Size of Lowland Operational Holdings

Size of Holding (Acres		Family Members Aged 14 Years and Above							
		1	2	3	4	5	6	7 and above	Total
Upto 2.00	No.	-	5	3	1	1	2	-	12
	%	-	42	25	8	8	17	-	100
2.00- 4.00	No.	1	6	11	8	10	4	8	48
	%	2	12	23	17	21	8	17	100
4.00- 6.00	No.	-	4	14	8	13	9	7	55
	%	-	7	26	14	24	16	13	100
6.00- 8.00	No.	-	4	2	2	5	2	3	18
	%	-	22	11	11	28	11	17	100
8.00-10.00	No.	-	1	2	4	-	4	3	14
	%	-	7	14	29	-	29	21	100
Over 10.00	No.	-	2	-	1	2	-	2	7
	%	-	29	-	14	29	-	29	100
Total	No.	1	22	32	24	31	21	23	154
	%	1	14	21	16	20	14	15	100

The above table shows the relationship between the farm labour force and size of lowland operational holding.

It is interesting to note that both the family labour force size groups of 2 persons and 7 persons or more have 2.00 - 4.00 acres as their model size group of operational holding while the other families falling in between these two groups have 4.00 - 6.00 acres as their model size group. This would mean that although the families grew larger there was no corresponding increase in the size of the lowland holding thus creating increasing pressure on the land in the second generation.

Table 7-V Size of Family Labour Force according to Model Size Group of Lowland Operational Holding

Size of Family Labour Force	Model Size group of lowland operational holding (acres)
2	2.00 - 4.00
3	4.00 - 6.00
4	2.00 - 6.00
5	4.00 - 6.00
6	4.00 - 6.00
7/	2.00 - 4.00

7.3 Pattern of Labour Use

The percentage distribution of farms according to pattern of labour use for different field operations during Maha 1971/72 is given in Table 7-VI.

Table 7-VI Percentage Distribution of Farms according to Pattern of Labour Use for Different Field Operations - Maha 1971/72

Field Operations	Percentage of Farmers Using Various Types of Labour								
	Family labour only	Hired labour only	Attan labour only	Con-tract only	Family and hired	Hired and attan	Family and attan	Family hired and attan	Total*
Land preparation	13	5	1	-	78	1	1	-	100 (152)
Transplanting	8	14	2	3	71	-	1	-	100 (91)
Weeding	45	17	1	-	23	-	12	2	100 (111)
Harvesting	9	11	-	7	65	-	4	3	100 (149)
Threshing	11	7	-	-	74	-	3	5	100 (149)

*Figures in parenthesis denote the number of farmers.

A very high proportion of farmers, almost over 70% depended both on family as well as on hired labour for major field operations, land preparation, transplanting and threshing. Weeding is done monthly by family labour. Since the average size of lowland holding in the sample is large (5.8 acres) and with a relatively

small family labour force (4.5 persons) available for farm work, it is natural that a large proportion of operators depend rather heavily on hired labour for field operations. The number of farmers using 'attan' (exchange) labour is negligible.

The pattern of labour use for different field operations is also examined in relation to holding size and the relevant data is presented in Table 7-VII.

In the smallest holdings of less than 2 acres no operator has relied exclusively on hired labour, the major field operations being performed mostly with family labour or in combination with hired labour. Conversely in the larger holdings over 8 acres, field operations other than weeding have been undertaken mostly with hired labour or with hired labour in association with family labour. In the predominant size class of 4.00 - 6.00 acres, use of both family and hired labour in near equal proportions is common. In all size groups family labour is used mostly for hand weeding which is normally done during slack times in the season. As the size of holdings increases to over 4.00 acres, the percentage of holdings using hired labour particularly for transplanting, harvesting and threshing also shows an increasing trend. Family labour possibly cannot cope with the demand for labour required to complete these operations in the larger holdings. Use of 'attan' labour is almost non-existent in all size groups.

Since hired labour was a major component of the total labour used in paddy cultivation, the average number of man days of hired labour used for various field operations under major schemes is indicated below.

Land preparation	8.7
Sowing or transplanting	4.1
After care, weeding, top dressing and irrigation	1.7
Harvesting and threshing	12.1
All operations	26.5

The operators in the sample have used on an average 26 man days of hired labour per acre. In major schemes ready availability of irrigation water particularly in Maha season reduces the risk factor considerably, which induces farmers to employ a relatively higher proportion of hired labour. Also, 78% of the total number of man days of hired labour employed had been utilised for two specific operations, land preparation and harvesting, both of which need to be completed within a very limited time due to the seasonal nature of paddy cultivation.

Table 7-VII Pattern of Labour Use for Different Field Operations according to Size of Holding - Maha 1971/72

	Percentage of Holdings Using								
	Family labour only	Hired labour only	Attan labour only	Con-tract only	Family and hired	Hired and attan	Family and attan	Family hired and attan	Total
Upto 2.00									
Land Prep.	42	-	-	-	58	-	-	-	12
Transplanting	33	-	-	-	67	-	-	-	6
Weeding	50	-	-	-	50	-	-	-	6
Harvesting	21	-	-	-	43	-	21	14	14
Threshing	8	-	-	-	75	-	17	-	12
2.00- 4.00									
Land Prep.	19	4	-	-	77	-	-	-	48
Transplanting	10	7	7	-	72	-	4	-	29
Weeding	50	17	3	-	15	-	12	3	34
Harvesting	15	7	-	6	66	-	2	4	47
Threshing	15	9	-	-	68	-	2	6	47
4.00- 6.00									
Land Prep.	9	7	2	-	76	2	4	-	54
Transplanting	3	17	-	6	74	-	-	-	35
Weeding	46	10	-	-	32	-	10	2	41
Harvesting	6	12	-	6	71	-	4	2	51
Threshing	15	7	-	-	66	-	4	8	53
6.00- 8.00									
Land Prep.	6	-	-	-	94	-	-	-	18
Transplanting	11	11	-	-	78	-	-	-	9
Weeding	57	-	-	-	14	-	29	-	14
Harvesting	6	12	-	6	76	-	-	-	17
Threshing	-	6	-	-	94	-	-	-	17
8.00-10.00									
Land Prep.	-	-	-	-	100	-	-	-	13
Transplanting	-	30	-	10	60	-	-	-	10
Weeding	20	60	-	-	10	-	10	-	10
Harvesting	-	31	-	15	54	-	-	-	13
Threshing	-	8	-	-	92	-	-	-	13
Over 10.00									
Land Prep.	-	29	14	-	57	-	-	-	7
Transplanting	-	50	-	-	50	-	-	-	2
Weeding	17	50	-	-	33	-	-	-	6
Harvesting	-	29	-	14	57	-	-	-	7
Threshing	-	14	-	-	86	-	-	-	7

In minor schemes there was much less use of hired labour, 12 man days per acre.

7.4 Employment Situation

In the absence of detailed information, the discussion is confined to the general employment situation relating to the extent and nature of off farm work.

Table 7-VIII Farm Labour Force according to Tenurial Category

Tenurial Category	Average size of holding	Employed in own farm only and in own farm and outside		
		No.	Average per family	No. per acre (on average holding)
Owners	*4.6*	394	*3.8*	*0.8*
Owner tenants	*6.5*	63	*3.9*	*0.6*
Tenant owners	*7.6*	15	*3.0*	*0.4*
Others	*7.6*	103	*3.7*	*0.5*

Irrespective of tenurial categories an average household consists of 4.5 persons of 14 years and over, of whom 3 persons are engaged exclusively in family farm work. Owner tenants have the largest number of persons (3.2) and tenant owners the least (2.0). Both owners and 'others' have almost an equal number of persons working only on their own farms. (Table 7-IX).

When the total work force (including students) employed both on their own farms and outside is considered, there is hardly any difference between the different tenurial categories. If, however, the school-going children are excluded, one could note a significant difference between owner and tenant families in the number of persons engaged both in family farm work and outside, owners accounting for as much as twice the number compared with tenants. The average number of persons engaged exclusively in off farm work amounted to 1.4 for the entire sample. Tenant owners had no family members employed exclusively in off farm work.

The number of persons per acre engaged in family farm work is not very high for all tenurial categories. The highest reported was 0.8 for owners, while in the case of tenant owners it is only 0.4. Since all major field operations are done by manual labour especially transplanting, harvesting and threshing, family labour available may not be adequate to complete such operations in time. Hence the need for farmers to depend on hired labourers (cf. 7.3).

Table 7-IX Employment Situation among Family Members Aged 14 Years and Above according to Tenurial Category

Tenurial Category	Employed in own farm only			Employed in own farm and outside (Including students)				Employed in own farm and outside (Excluding students)				Employed only outside (Excluding students)			
	No. of farms	Total No. of persons	Avg. per farm	No. of farms	Total No. of persons	4 as a % of 1	Avg. per farm	No. of farms	Total No. of persons	8 as a % of 1	Avg. per farm	No. of farms	Total No. of persons	12 as a % of 1	Avg. per farm
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Owners	105	317	*3.0*	48	77	*46*	*1.6*	30	65	*62*	*2.2*	3	4	*3*	*1.3*
Owner tenants	16	51	*3.2*	8	12	*50*	*1.5*	6	6	*38*	*1.0*	1	1	*6*	*1.0*
Tenant owners	5	10	*2.0*	3	5	*60*	*1.7*	3	4	*80*	*1.3*	-	-	-	-
Others	28	87	*3.1*	10	16	*36*	*1.6*	8	16	*57*	*2.0*	4	6	*14*	*1.5*
Total	154	465	*3.0*	69	110	*45*	*1.4*	47	91	*59*	*1.9*	8	11	*5*	*1.4*

Farms where some members work entirely outside the farm are not very many. Farmers categorised as 'others' had a larger percentage of households with some members engaged in employment and this percentage is lowest for the owners.

The overall situation regarding off farm work is given in Table 7-IX.

Table 7-X Nature of Outside Employment

Employment	Tenurial Category								Total	
	Owners		Tenants		Owner-Tenants		Tenant-Owners			
	No.	%	No.	%	No.	%	No.	%	No.	%
Salaried or white collar workers[1]	27	39	2	29	-	-	4	18	33	32
Non-salaried employment[2]	5	7	-	-	-	-	-	-	5	5
Trade and commerce[3]	4	6	1	14	-	-	8	36	13	13
Skilled workers[4]	6	9	9	-	1	25	-	-	7	7
Agricultural labourers[5]	1	1	2	29	2	50	3	14	8	8
Non-agricultural labourers[6]	15	22	-	-	1	25	1	5	17	17
Others/Not specified	11	16	2	29	-	-	6	27	19	18
Total	69	100	7	100	4	100	22	100	102	100

Notes:
1. Employees of Government, State Corporations, or non-Government institutions working for monthly payments: teachers, clerks, Grama Sevakas, Co-operative Managers, etc.
2. Mostly self-employed not drawing fixed salaries: Proctors, ayurvedic physicians (native doctors)
3. Those engaged in buying and selling goods.
4. Those who possess a mechanical or manual skill in the work they perform: mechanics, carpenters, drivers, etc.
5. Those who work exclusively in outside farms.
6. Refers mostly to unskilled labour outside agriculture.

The largest single group doing off farm work belongs to salaried employment (32%) which is also the most important source of off farm work in all tenurial groups except in the category of tenant owners. Apart from non-specified category (18%) the next most important source of off farm work is non-agricultural labour which in most cases is casual labour. Being essentially a paddy growing area with almost no industrial or active commercial activity casual labour may amount to slack season work. Agricultural labour is relatively less important (8%) and so is skilled work. However, trade and commerce remains an important source of employment for the 13% engaged in this activity which takes the form of running boutiques or small trading operations.

Off farm employment examined tenurewise shows that about 80% of the 33 persons engaged in white collar jobs belong to the owners category and the rest to owner tenants and 'other' categories. None of the family members of the tenant owner group had a salaried job. Further, almost all those engaged in the professions like proctors, Ayurvedic Physicians etc., are also from owners group, while the highest number of persons engaged in trade and commerce belong to the 'others' category. 75% of the tenant owners family members with off farm employment work as labourers either agricultural or non-agricultural.

Table 7-X clearly indicates two important characteristics in the pattern of off farm employment in the district.

a) The households in the owner operators group have more stable and socially accepted off farm employment than the households which belong to the remaining categories.

b) The largest number of persons in the 'others' category being engaged in trade and commerce shows that such families are in the process of foreclosing land in the area either by encroaching on Crown land or by leasing, mortgaging or some other internal arrangements. The transfer of any type of colonists land is prohibited under the LDO.

No relationship could be observed among different tenurial categories and the size of holding regarding the pattern of outside employment in this district. The different tenurial categories and the size of holding bare no relationship to the pattern of outside employment. This is because of the particular land-holding structure in the district. There is little landlessness and the holding is relatively large. Many of those working outside the farm (except with permanent employment) did so to supplement their farm incomes from an additional source, especially during slack seasons.

Table 7-XI Pattern of Outside Employment according to Tenurial Category and Size of Holding

Tenurial Category	Size of Holding (Acres)	Total No.of farms report-ing	Employed in own farm and outside No.	per farm	Employed only outside No.	per farm
Owners	Upto 2.00	9	6	*0.7*	-	-
	2.00- 4.00	39	26	*0.7*	2	*0.1*
	4.00- 6.00	43	21	*0.5*	2	*0.1*
	6.00- 8.00	7	4	*0.6*	-	-
	8.00-10.00	5	7	*1.4*	-	-
	Over 10.00	2	1	*0.5*	-	-
	Total	105	65	*0.6*	4	*.04*
Owner-tenants	Upto 2.00	-	-	-	-	-
	2.00- 4.00	3	1	*0.3*	-	-
	4.00- 6.00	5	2	*0.4*	1	*0.2*
	6.00- 8.00	5	2	*0.4*	-	-
	8.00-10.00	3	1	*0.3*	-	-
	Over 10.00	-	-	-	-	-
	Total	16	6	*0.4*	1	*0.1*
Tenant-owners	Upto 2.00	-	-	-	-	-
	2.00- 4.00	-	-	-	-	-
	4.00- 6.00	1	1	*1.0*	-	-
	6.00- 8.00	2	1	*0.5*	-	-
	8.00-10.00	2	2	*1.0*	-	-
	Over 10.00	-	-	-	-	-
	Total	5	4	*0.8*	-	-
Others	Upto 2.00	3	1	*0.3*	2	*0.7*
	2.00- 4.00	6	1	*0.2*	1	*0.2*
	4.00- 6.00	6	6	*1.0*	-	-
	6.00- 8.00	4	1	*0.3*	-	-
	8.00-10.00	4	5	*1.3*	2	*0.5*
	Over 10.00	5	2	*0.4*	1	*0.2*
	Total	28	16	*0.6*	6	*0.2*

7.5 Income Distribution according to Tenurial Status

Net farm family incomes are not computed from the data as the expenditure data collected was only in relation to paddy cultivation in Yala 1972. We have, however, figures for gross receipts for farm families based on gross value of the amount of paddy produced in Maha and Yala, cash proceeds from the sale of highland and livestock produce and earnings from off farm employment. In considering these figures it must be borne in mind,

1. that the figures are only crudely indicative of the income position in the rural areas;

2. that in comparing rural incomes with urban incomes, persons in rural areas enjoy benefits like rent-free housing, home produce or cheap agricultural products cultivated locally, negligible cost of travel to work, etc., and

3. that expenses connected with the production of paddy highland, and livestock produce have not been deducted.

7.6 Gross Farm Family Receipts

A large percentage of families (75%) in this district received over Rs.8,000 as gross receipts per family during the reference period which works out to a monthly gross receipt of Rs.667 per household (Table 7-XII). Thus only 25% of the families obtained less than Rs.4,000 per family giving a monthly gross receipt of less than Rs.335. The percentage number of families obtaining less than Rs.1,000 per year or Rs.90 per month accounted for 6% of the total number of households.

When family receipts are examined in terms of holding size, the percentage of families obtaining over Rs.4,000 increases as the size of paddy holding gets larger, whereas the percentage of those earning below Rs.2,000 decreases with the increasing size of holding indicating that the bulk of households depend essentially on paddy lands for their family receipts.

Gross Family Receipts	Size of Holding (Acres)			
	Upto 2.00	2.00-4.00	4.00-6.00	More than 6.00
	(% number of farms)			
More than Rs.4,000	*25*	*71*	*82*	*85*
Less than Rs.2,000	*33*	*18*	*9*	*8*

The variations in gross receipts among the different tenurial categories are not large. In over 75% of the families in the 3 tenurial groups, except category 'others' the gross receipts accounted for over Rs.4,000. Although a strict comparison between owners and tenant categories is not possible owing to the small number involved in the latter categories it is still interesting to note that there are no families in the tenant groups with less than Rs.1,000 as gross receipts. The category 'others' appears to be the relatively less favoured group and here about 11% receive less than Rs.1,000 as gross receipts and the percentage number of families receiving over Rs.4,000 is only 64%. However, the significant point is that over 75% of the families obtain receipts over Rs.4,000 per family.

7.7 Receipts from Sources other than Paddy

Earnings from sources other than paddy form a substantial proportion of the total receipts of the families (Tables 7-XII and 7-XIII). The percentage of families of all tenurial categories whose receipts from these sources are Rs.500 or less is 27% while the percentage of families with receipts of Rs.1,000 or less is 45%.

38% of those households with outside earnings get over Rs.2,000 from sources other than paddy, while 19% of them receive Rs. 4,000 or more.

The following figures summarise the data presented in Table 7-XIII showing more clearly the relationship between such receipts and the size of holding.

Receipt Group (Rupees)	Size of Holding (Acres)				
	Upto 2.00	2.00-4.00	4.00-6.00	6.00-8.00	Over 8.00
	%	%	%	%	%
More than Rs.1,000	*54*	*52*	*46*	*38*	*26*
Less than Rs.2,000	*27*	*31*	*36*	*46*	*53*

The interesting feature emerging from the above data is that the farmers in the larger holdings earn more from sources other than paddy thus increasing the income disparity between the smaller and larger farmers.

Table 7-XIV Average Receipts from Sources other than Paddy Produced by the Operators*

Tenurial Category	Total No.of farms	Farmers reporting outside earnings		Average farms reporting outside earnings	Receipts all farms
		No.	%	Rs.	Rs.
Owners	105	88	*84*	2,296	1,924
Owner tenants	16	14	*88*	2,729	2,388
Tenant owners	5	5	*100*	1,826	1,826
Others	28	22	*79*	2,473	1,943

*Paddy received by landlords from tenants has been considered as land rent and included in the receipts from other sources.

Table 7-XII Distribution of Farm Families according to Total Family Receipts for 1971/72

Receipts (Rupees)	Distribution according to Size of Holding (Acres)														Distribution according to Tenurial Category									
	Upto 2.00		2.00-4.00		4.00-6.00		6.00-8.00		8.00-10.00		Over 10.00		Total		Owners		Owner tenants		Tenant owners		Others		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0- 500	1	8	1	2	2*	4	-	-	-	-	-	-	4	3	1	1	-	-	-	-	2*	7	3*	2
501-1,000	-	-	3	6	-	-	1	6	-	-	-	-	4	3	3	3	-	-	-	-	1	4	4	3
1,001-2,000	3	25	5	10	3	5	1	6	-	-	1	14	13	8	7	7	2	12	1	20	3	11	13	8
2,001-4,000	5	42	5	10	5	9	2	11	1	7	-	-	18	12	12	11	2	12	-	-	4	14	18	12
4,001-8,000	3	25	23	48	21	38	5	28	2	14	-	-	54*	35	43	41	3	19	3	60	6	21	55	36
More than 8,000	-	-	11	23	24	44	9	50	11	79	6	86	61	40	39	37	9	56	1	20	12	43	61	40
Total	12	100	48	100	55*	100	18	100	14	100	7	100	154*	100	105	100	16	100	5	100	28	100	154*	100

*Includes one operator who had no receipt as he had crop failure in Maha 1971/72, did not cultivate in Yala 1972 and was not in receipt of income from any other source.

Table 7-XIII Distribution of Farm Families according to Receipts from Sources other than Paddy Produced by Operators for 1971/72

Receipts (Rupees)	Distribution according to Size of Holding (Acres)														Distribution according to Tenurial Category									
	Upto 2.00		2.00-4.00		4.00-6.00		6.00-8.00		8.00-10.00		Over 10.00		Total		Owners		Owner tenants		Tenant owners		Others		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0- 500	3	27	11	26	14	32	3	23	4	29	-	-	35	27	25	28	2	14	1	20	7	32	35	27
501-1,000	3	27	11	26	6	14	2	15	1	7	-	-	23	18	17	19	3	21	2	40	1	4	23	18
1,001-2,000	2	18	7	17	8	18	2	15	4	29	-	-	23	18	14	16	3	21	1	20	5	23	23	18
2,001-4,000	1	9	7	17	9	20	3	23	2	14	2	40	24	19	16	18	2	14	-	-	6	27	24	19
4,001-8,000	2	18	4	9	6	14	3	23	2	14	1	20	18	14	13	15	3	21	1	20	1	4	18	14
More than 8,000	-	-	2	5	1	2	-	-	1	7	2	40	6	5	3	3	1	7	-	-	2	9	6	5
Total	11	100	42	100	44	100	13	100	14	100	5	100	129	100	88	100	14	100	5	100	22	100	129	100

The tenant owner group does not have much outside earnings when compared with the farmers who belong to the owner tenant and 'others' categories. 60% of the tenant owner farmers who reported outside earnings obtain less than Rs.1,000 from sources other than paddy while about 40% of the farmers of the other two categories obtain receipts over Rs.2,000. In this respect the owner operators form an intermediary group, 47% of them receiving Rs.1,000 or less while 36% receive Rs.2,000 and more.

Tenant owners, then, are relatively worse off in respect of earnings from sources other than paddy.

7.8 Value of Paddy Production

It is clear that paddy yields bear a close relationship to the source of water, major irrigation schemes accounting for relatively higher yields. The estimated value of the total production of paddy for the year 1971/72 illustrates this difference better in money terms. (Table 7-XV). The per farm value of paddy produced in major irrigation schemes (Rs.6,391) is three times higher than in minor irrigation schemes (Rs.2,261).

Table 7-XV Average Receipts per Family from Paddy after deduction of Land Rent for Tenanted Land - 1971/72

Water Supply	Income in Rupees
Major Irrigation	6,391
Minor Irrigation	2,261

Table 7-XVI clearly indicates that the per acre gross value of paddy produced by owners is highest among all groups (Rs.1,217) both before and after deduction of land rent in respect of owner tenant and tenant owner categories. Once the land rent is deducted the tenant owners value of paddy is low as 1/2 that of owners. Although tenancy is not widespread in this district those who are tenants work in rented lands under disincentive ridden conditions.

As tenants in our sample are few it would not be very useful to compare the value of paddy produced by owners and tenants under different water supply conditions. However, the Table 7-XVII shows that the average value of paddy per acre as well as per head of members aged 14 years and above is much higher under major irrigation schemes than under minor irrigation schemes. The difference in income under these two sources of water supply is almost 300%.

Table 7-XVI Value of Paddy produced by Farmers of Different Tenurial Categories - 1971/72*

Tenurial Category	Average size of holding (Acres)	Average of gross value		Income after deducting land rent	
		Per family	Per acre	Average per farm	Average per acre
Owner	4.65	5,647	1,217	5,647	1,217
Owner tenants	6.50	7,123	1,096	6,831	1,051
Tenant owners	7.80	5,219	669	5,140	659
Others	7.61	6,505	855	6,056	796

*Income was computed by valuing the paddy produced at Rs.14 per bushel guaranteed price prevalent at the time of the survey.

Table 7-XVII Value of Paddy obtained by Owners served by different Sources of Water Supply - 1971/72

Water Supply	Average size of holding (Acres)	Average income per farm	Average income per acre	Average income per head of members 14 years and above
Major Irrigation	4.7	6,076	1,292	1,330
Minor Irrigation	4.1	1,568	387	490

The average family and per head value of paddy for owners in the different sizes of holdings are given in Table 7-XVIII. There is a general tendency for the value to increase with the size of holding although not in direct proportion.

Table 7-XVIII Average Family and Per Head Income from Paddy by Owners in the Different Size of Holding Categories

Size of Holding (Acres)	Average income per farm	Income per head of members 14 years and above
Upto 2.00	1,268	408
2.00- 4.00	3,826	927
4.00- 6.00	7,049	1,479
6.00- 8.00	6,626	1,406
8.00-10.00	10,629	2,311
Over 10.00	14,840	1,855

7.9 Production Expenses and Income from Paddy - Yala 1972

The weather conditions experienced in Yala 1972 were unfavourable for paddy. Of the 140 paddy operators 17 reported crop failure. Information on cash operating expenses of the balance 123 farmers during this particular season is given in Table 7-XIX.

Table 7-XIX Cash Outlay per Acre for Paddy Cultivation - Yala 1972

No. of farmers 123*
Area cultivated (Acres) 431.08

	Tractor hire and operating expenses Rs.	Buffalo hire Rs.	Labour hire Rs.	Total Rs.
I. Operational Costs				
1.Land preparation	32	19	35	86
2.Planting and sowing			61	61
3.Weeding			5	5
4.Irrigation and top dressing			3	3
5.Harvesting			40	40
6.Threshing	19	2	15	36
Sub total	51	21	159	231
7.Fuel (for tractor)	4			4
8.Food for hired labourers			83	83
Sub total	55	21	242	318
II. Material Inputs				
1.Seed				11
2.Fertilizer				40
3.Agro-chemicals				13
Sub total				64
III. Transport (paddy)				8
IV. Land Rent				
1.Land rent				1
2.Ande cultivation				2
3.Acreage tax				3
Sub total				6
Total expenditure				396

*Information related to 123 of the 140 operators who cultivated in Yala 1972. 17 operators who reported crop failure and another who furnished insufficient information regarding expenses have been excluded. Seed paddy given in kind were converted to rupees at the rate of Rs.18 per bushel.

The average cash outlay per acre amounted to Rs.396 of which hired labour was the major component. Cost of hired labour, inclusive of the food supplied, amounted to Rs.242 per acre, 61% of the total cash expenses. The high proportion of cash expenses incurred on hired labour was primarily due to two reasons: the average size of lowland operational holdings in the sample was large, 5.48 acres, and the traditional practice of using 'attan' (exchange) labour in paddy cultivation was almost non-existent in this district. Consequently, farmers relied more on hired labour.

Hiring of draught power was the second highest item in the total cash outlay accounting for Rs.76 (19%). Of this amount Rs.55 had been spent on tractor charges. Rs.64 was shown as expenses on purchased inputs, 16% of the total cash outlay. Fertilizer is the most important purchased input followed by agro chemicals. The subsidised fertilizer had cost Rs.40 per acre. Fertilizer amounted to 62% and agro chemicals 10% of the outlay on inputs purchased.

The payment of rents was negligible as operators in major colonisation schemes were mostly owner cultivators. Payments like the acreage tax due from settlers to Cultivation Committees and annual payments to the Land Commissioner's Department are invariably in default.

Cash expenses incurred by the 113 respondents in major schemes during Yala 1972 is presented in Table 7-XX.

Table 7-XX . Cash Outlay per Acre for Paddy Cultivation in Major Schemes - Yala 1972

No. of farmers	113	
Extent cultivated (Acres)	401.08	
Items of Expenditure	Expenses	
	Amount	%
1. Field Operations	325	*80*
i.Tractor including fuel costs	59	*14*
ii.Buffalo	17	*4*
iii.Hired labour (a) Wages	163	*40*
(b) Food	86	*21*
2. Inputs	68	*17*
3. Miscellaneous		
i.Ande, acreage tax and land rent	7	*2*
ii.Transport	8	*2*
Total	408	*100*

As the number of operators in the sample in minor irrigation schemes was only 10 of whom 4 were encroachers, their cash expenses are not present. Data relating to major schemes indicates that the proportion of the cash expenses incurred on hired labour and draught power were 61% and 18% respectively of the total cash outlay. With regard to draught power, hiring of tractors is the major item of expense. In minor schemes cash expenses have been considerably less per acre, Rs.243, mainly due to the unstable water supply during Yala and the high risks involved. Consequently less cash is spent by these farmers on field preparation as well as on purchased inputs than by those in major schemes.

Cash expenses incurred were not examined separately in relation to tenancy conditions as the majority of respondents were owner cultivators.

.10 Income from Paddy - Yala 1972

Income from paddy includes both the gross value of paddy sold and retained on the farm for consumption. The average yield of the 123 farmers providing this information was 50.4 bushels per acre. The weather conditions in Yala 1972 were not very good and the yields and expenses for paddy cannot be considered satisfactory for a premier paddy producing district like Polonnaruwa.

The average income and cash expenses per acre of paddy is given below.

Gross income per acre of paddy[1]	Rs.706
Cash operating expenses per acre[2]	Rs.396
Net farm operating income per acre[3]	Rs.310

[1]Equals cash farm incomes from sales and value of home retained paddy valued at Rs.14 per bushel.

[2]Cash operating expenses include food provided for hired labour.

[3]Equals gross value of paddy minus cash operating expenses.

SUMMARY AND CONCLUSION

A. Land and Land Use

A-1 The 154 sample farmers operated 1,236.75 acres of which 68 per cent was lowland used exclusively for paddy and the rest highland. Almost 86 per cent of the lowland was under major irrigation, 14 per cent under minor irrigation, and no rainfed lowlands in the sample.

A-2 68 per cent of the 154 operators were owner cultivators being allottees under the LDO while 13 per cent of the owners rented in a portion of their holdings. 18 per cent of the operators described as 'Others' were mostly encroachers. There were 4 tenants without any lowland. 82 per cent of the land operated was owned or allotted in near equal proportion under lowland and highland. The rented/leased in lands amounted to only 10 per cent of the lowland while the proportion of rented highland was almost insignificant (2%). 10 per cent of the operated land was encroachment and accounted for 9 per cent of the lowland and 13 per cent of the highland. Tenancy is not apparently widespread but might well be concealed.

A-3 There were no large disparities either in the tenurial status of operators or in the size of their holdings. Owner-cultivators operated 81 per cent of the lowland and 85 per cent of the highland. Owners renting land operated only 10 per cent and 2 per cent of lowland and highland respectively. Encroached land, however, amounted to 9 per cent and 13 per cent of the two land categories. The average extent of land per operator was 8.03 acres of which 4.99 acres of lowland and 2.22 acres of highland were owned, while 0.82 acres of both lowland and highland was encroachment or chena.

The lowland holdings ranged from 1.0 to 23.25 acres. A standard deviation of 3.31 acres and a co-efficient of variation of 60 per cent indicated considerable variation in the size of holdings. Although the average size of lowland holding was 5.48 acres, the median size was 5.0 acres, showing that half the holdings were smaller than the average size. The average size of holdings smaller than the median size were 3.42 acres compared with 7.54 acres for holdings larger than the median. Thus the larger 50 per cent of the holdings were on an average twice as large as the smaller 50 per cent. However, the overall situation is that cultivators in this district on an average operate a larger extent than in many parts of the country, and there is little disparity in the size of holdings.

A-4 Only 6 (4%) of the sample had no lowland while only 5 operators did not own any land whatsoever. All of them however had encroached land. The number of operators whose entire holdings was less than 2 acres was only 10 (6%). Thus very few cultivators were completely landless or owned holdings which could be considered too small. While nearly 90 per cent of the operators had 2 acres or more of lowland, about 2/3 operate 1 acre or more of highland. The distribution of lowland among different tenurial categories was more or less equal. Most of the lowland was owned by the cultivators themselves; 66 per cent of the lowland being operated by 57 per cent of the cultivators. The highland was also evenly distributed among different tenurial categories and holding size classes. In the case of both lowland and highland, it is among the median size groups that a more equitable land distribution is seen, because the smallest and the largest cultivators operated proportionately less and more land than they should actually handle. The ownership and operation of lowland as well as highland seems to be fairly equitable. Landlessness is insignificant. Most of the land is owner operated and the holding size is very much larger than the national average. Although the highland is neglected the use of the lowland could be considered very satisfactory since much of it is under major irrigation. However, the description given may not reveal the actual situation in respect of landlessness, fragmentation, tenancy, encroachments and so on, firstly due to the nature of our sample and because of the conditions under which land is allotted under major colonisation schemes. Growth of population over the years particularly in the absence of off farm employment, would naturally have resulted in a number of problems, though they may not be appreciable at the present moment.

A-5 Holdings of different tenurial categories or size classes do not show noteworthy difference in respect of water supply conditions. Over 85 per cent of all operators had their land under major irrigation. Further, nearly 90 per cent of the operators who were owner-cultivators were located in such areas. In other tenurial categories, proportion of cultivators, located in major irrigation schemes also did not vary much. Further no significant variations were also found among different holding size classes in the proportion of their land receiving water from major irrigation schemes. 15 per cent of the sample farmers who were located in areas served by minor irrigation belong mostly to the 2 categories: 'Owners' or 'Others' were not confined to any particular size class.

A-6 28 of the 31 cultivators who operated some land on tenancy came mostly from areas served by major irrigation. 56 per cent of the landlords were either friends or relatives while 33 per cent were described as outsiders. Only 11 per cent of the

landlords were mentioned as relatives. There was an absence of close kinship ties between families owing to the nature of settlement in the area. This situation has resulted in greater insecurity for tenants, particularly as the Paddy Lands Act[1] could not guarantee their security. 85 per cent of the tenants felt their tenure insecure. 54 per cent of the tenants paid a fixed rent while 34 per cent paid 1/2 crop share. The remaining 12 per cent paid 1/3 or 1/4 of the crop. Only 33 per cent of the tenants received any collateral help from their landlords in the form of seed-fertilizer, etc., and almost all of them paid 1/2 crop share as land rent. Those paying less than the traditional 1/2 share received no collateral help whatsoever. 73 per cent of the respondents felt that the rent they paid was fair; the proportion was higher for those who paid 1/2 crop share (81%) and lower for those who paid fixed rent (67%). The latter situation may be attributed to the fixed rent being too high on the one hand and to disadvantages of fixed rent under uncertain environmental conditions on the other.

A-7 Tenancy transactions were mostly between farmers of the same area, and (69%) of the landlords were farmers who rented out a portion of their lowland they could not cultivate. Considering the fact that the average owned extent of owner-tenants is 4.25 acres and that of tenant-owners 3.20 acres compared with 4.65 acres for owner-operators, it appears that those who rent in land are not the landless and that those who rent out a part of their holdings are owners with a holding slightly above the average and are not really large paddy land owners. 78 per cent of the landlords live in the same village as their tenants.

A-8 58 per cent of the tenants expressed the desire to cultivate more land on ande in order to increase their income. The group which required this land most was the tenant-owner category (73%) who had relatively lower income than the other tenant group.

B Institutions

B-1 Almost all the farmers (99%) surveyed were members of a co-operative.

B-2 Almost 92 per cent of the members utilised the various services offered by the co-operatives. The 99 per cent of the farmers for marketing their paddy, 86 per cent and 81 per cent respectively for chemical fertilizer and agro-chemicals. 85 per cent of the farmers depended on the co-operatives for their loan requirements and 66 per cent for their seed paddy.

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[1] Now replaced by the Agricultural Lands Law, 1973.

B-3 Although the smallest land size class, i.e. below 2 acres and the owner and 'Others' groups made less use of the co-operative services, there does not appear to be a distinct relationship between tenure, size of holding and the utilisation of co-operative services.

B-4 The co-operative was the most popular source of borrowings; and furnished 66 per cent of the total borrowings for Maha 1971/72. 42 per cent of the respondents did not borrow owing to outstanding loans, while 25 per cent did not require any loans. Co-operatives meet the loan requirements of the majority of farmers. The next important source of loans was friends and relatives (21 per cent of all loans). Money lenders and traders were the least important sources of credit (14 per cent of total loans).

B-5 83 per cent of the loans from the co-operatives in Maha 1971/72 were repaid. The remaining 17 per cent amounting to Rs.10,110/- was in default by 20 per cent of the borrowers. The sum of Rs.33,324/- obtained from co-operatives prior to Maha 1971/72 was outstanding. The accumulated outstanding loans amounted to 46 per cent of total borrowings. The major proportion of loan defaulters were from those with less than 6 acres. The People's Bank could recover 36 per cent of the loans taken by 6 borrowers. Loans obtained from private sources however were almost fully repaid.

B-6 Out of the gross amount of Rs.97,640/- borrowed during Maha 1971/72 almost 66 per cent was from the co-operatives, the average co-operative loan working out to Rs.852/- per operator. However, the average borrowings increased with the increasing size of holding, i.e. from Rs.142/- in the less than 2 acre size class to Rs.1,367/- in the over 10 acre size class. The owners met a greater proportion of their credit requirements from the co-operative than the other groups. The rates of interest varied from 7½ per cent to 9 per cent per annum for loans from institutional sources to 0 to 240 per cent for loans from private sources. Many landlords and traders while advancing some interest-free loans also charged the highest rate of interest, i.e. 240 per cent. Most loans from friends and relatives were described as interest-free.

B-7 Almost all the surplus paddy was sold through the Co-operatives, which accounted for 98 per cent of total sales in both Maha and Yala. In Maha, except the farmers in the above 10 acre group who sold 84 per cent, the others sold 100 per cent of their paddy to co-operatives. In Yala, 6-8 and 8-10 acre groups sold less. The smaller farmers appeared to have hardly any dealings with private sources for the sale of their paddy.

B-8 The extension service was the premier source of information. Most farmers had contact with several types of extension media (cf. 4.2) 75 per cent obtained general agricultural information from extension personnel visiting their farms; 37 per cent from visiting the Extension Centre themselves and 39 per cent from neighbouring farmers. Demonstration plots and advisory leaflets were also rated important. Farmer training classes, radio programmes, and agricultural film shows assumed a minor role. Information on NHYVs (59%) and fertiliser recommendations (56%) came mostly from extension personnel visiting farmers, while neighbours and farmers training classes had a greater influence on the adoption of NHYVs (25%) in both cases, farmer training classes and advisory leaflets had a greater impact on fertilizer recommendations for NHYVs indicating their usefulness for specific and technical farm information, where farming is relatively more commercialised. Interpersonal methods of communication were the most important sources of information for farmers. Mass media seems to play a relatively less important role. Farmer training classes had limited impact and of those who did not attend any training classes (56% of the sample) almost 90 per cent were unaware of them.

B-9 65 per cent of the farmers were visited by extension personnel in Yala 1972 largely on the initiative of the extension personnel themselves. However, almost all farmers requested more of the visits. While almost 81 per cent of the farmers knew the location of the Extension Centre, 50 per cent had visited it in Yala. This again reflects the nature of settlement, better accessibility, commercial character of farming, etc. The main reason for visiting the Extension Centre was to purchase inputs mostly paddy (57%) and 39 per cent for getting advice. More farmers would visit these centres if the supply of inputs is centrally better organised and these visits could be made use of for providing agricultural information too. Among methods of impersonnel contact 65 per cent of the farmers had seen demonstration plots and over 1/2 the farmers had access to radio programmes and advisory leaflets.

B-10 The average contact score for the sample was between 3 and 4. 46 per cent of the respondents were in the low contact category with an average contact of 1-2, while 35 per cent were in the high contact category with an average score of 6. 20 per cent of the respondents had an average contact score of 4. With contact frequency the adoption of NHYVs tended to increase. For instance, the rate of adoption was only 25 per cent among farmers with a contact score of 0.6; and 70 per cent among farmers with a score of 5.7. A similar tendency was seen in respect of yields although the relationship is not linear. While the farmers with a contact score of 0 obtained only 28 bushels per acre those with a score of 5.17 obtained over 50 bushels per acre.

C Labour and Employment

C-1 There were 1,145 persons in the 154 families surveyd, and the average number of persons per household was 7.5. 34 per cent of the families had 9 or more members and only 1 per cent less than 4 members. The tenant-owners had larger families than the other groups. The larger families appeared to be concentrated more in the larger holdings.

C-2 691 persons in the sample were 14 years of age of over. If they were available for farm work the average family work force would have been 3.7 persons. As 65 per cent of the families had 4 or more such persons, 49 per cent of all of the farmers would have had 5 or more available for work.

C-3 557 persons were employed - 465 employed only on the farm, 110 both on the farm and off, and 11 outside the farm (excluding students). The first two categories represented about 3.7 persons per household available for cultivation work. This, however, works out to 0.68 persons per acre on the average holding and 0.74 on the median holding showing that for certain operations requiring a high labour component family labour alone is inadequate to complete them during a certain period of time. This problem is faced more by the larger operators..

C-4 There was a heavy dependence on hired labour for the major operations. 45 per cent of the operators depended mainly on family labour for hand weeding, but the number using only family labour for all the other operations was less than 13 per cent. For land preparation, transplanting, harvesting and threshing the majority of operators used the family and hired labour combination, the respective proportions being 78, 71, 65 and 74 per cent. Hired labour was exclusively used by operators for transplanting (14%), weeding (17%) and harvesting (11%). The dependence on hired labour is because of the relatively smaller number of farm workers available per acre and to the limited timee available to complete field operations. Attan labour is almost non-existent, compelling farmers to depend on hired labour during peak periods.

C-5 Labour use showed some relationship to the size of holding. As the holding size increased to over 4 acres the percentage of operators using hired labour tended to increase. In the larger holdings of over 8 acres field operations other than weeding were done mostly with hired labour or with hired and family labour.

C-6 Use of hired labour is more evident in major schemes than in minor schemes. In the former, 26 man-days of hired labour per acre were used on an average; in the latter 12. Under major irrigation schemes more man-days of hired labour are required as the holding sizes here are much larger and also the need to complete some operations within a given time greater. Land preparation and harvesting alone accounted for nearly 78 per cent of the total number of hired man-days.

C-7 35 per cent of the households had some family members employed in full time or part time work outside their farms. Altogether 102 persons were so employed, the average per household was a little less than 2. 11 persons were in full time off farm employment. While only 5 per cent of the households had at least one person so employed the highest proportion of these persons was in the category "Others". The main source of off farm work is in white collar employment (32%), 80 per cent of such workers coming from the owners group, Non-agricultural unskilled labour and agricultural work was the second most important source of off farm work and was mostly confined to members of the tenant group. Trade and commerce are also important especially among the "Others" category, who in fact, are encroachers on Crown land or have foreclosed colonists lands in other ways.

D Management Practices and Productivity

D-1 The Index of Cropping intensity for the district was only 148 per cent, surprisingly low for an area where over 80 per cent of the operations are under major irrigation. This was largely due to unfavourable weather conditions in 1971/72 especially in Yala. However, much of the land not cultivated with paddy during Yala would not have remained entirely fallow as other field crops, chillies, green gram, groundnut, etc., and in some areas even tobacco are being increasingly cultivated by many farmers in this season.

D-2 53 per cent of the farmers cultivated their Maha 1971/72 crop in November while 23 per cent had sown in December or later. Crops sown during the peak period of October/November have given relatively higher yields than those sown later. This was confirmed by 't' tests done relating yields to the month of sowing (cf. 5.5). As water is assured to over 80 per cent of the paddy area under major irrigation timely sowing will not pose any problems if sufficient draught power is available. Timely sowing of these highly productive paddy lands should be encouraged and stricter adherance to cultivation calendars enforced as late sowing leads not only to loss of production but also prevents the best use during Maha of the monsoon rains which could be conserved in the tanks for use during Yala when water is scarce.

D-3 The most common method of field preparation was with buffalo (48 per cent of the farmers) or with buffalo plus 4-wheel tractors. Only 14 per cent exclusively used 4-wheel tractors. In spite of the larger average holding in the district, the widespread use of buffalo for preparatory work is a very significant feature especially in the context of the present tractor and fuel problems.

D-4 Nearly 60 per cent of the farmers have their own buffaloes and among them 31 per cent have at least two pairs indicating the availability of satisfactory grazing opportunities. 39 per cent of operators who used 4-wheel tractors solely or in combination with buffaloes had to hire the machines. 35 per cent did so in order to complete land preparation in time and 22 per cent owing to their inability to secure buffaloes. Since the majority of tractor owners are non-cultivators (only 5 operators own tractors) with a preference for hiring out machines for transport and threshing rather than for ploughing, the availability of tractors for preparatory work during peak sowing periods is limited and this prevents many cultivators from sowing in time. This is more so in the major schemes where the interval between the first issue of water and the time of sowing is about 40 days. Since the use of buffaloes is already popular in the district and adequate grazing facilities are available efforts should be made to encourage farmers to keep their own buffaloes by initiating a suitable programme. This will help to minimise dependence on tractors, reduce production costs and thereby augument farm incomes, and help to ease even in a small way the pressing tractor and fuel problems.

D-5 27 per cent of the farmers in Maha and 37 per cent in Yala had grown NHYVs exclusively at the time of sowing. The preference for OHYVs especially in Maha was still high with 46 per cent of the farmers having grown these varieties. Very few farmers cultivated traditional varieties in Maha although in Yala the members cultivating these varieties formed the largest group (44%). This was due to the restricted water supply during Yala and to the absence of high yielding short term varieties. The recent bred short term NHYVs are, however, becoming increasingly popular and may supercede the traditional varieties.

D-6 There was no significant difference in the adoption of NHYVs among operators of different holding sizes although for both Maha and Yala the size class up to 2 acres had the lowest extents under them (12 per cent and 37 per cent for Maha and Yala respectively). This may be due to the inability of the small farmer to afford the investment required by the NHYVs and also to his aversion to take risks in trying out new varieties. In this size class OHYVs predominate in Maha and traditional varieties in Yala. The pattern of adoption of NHYVs is more or less uniform in other size classes above 2 acres.

D-7 The area cultivated with NHYVs was proportionately much higher under major irrigation than under minor schemes, 44 per cent against 8 per cent in Maha and 50 per cent against 21 per cent in Yala.

D-8 60 per cent of the farmers did not grow NHYVs because they could not get seed paddy and 30 per cent had no knowledge about them. NHYVs were introduced as recently as in Maha 1970/71. High cost of cultivation, water problems, etc., were, however, not cited as very important reasons for not adopting NHYVs. The following points should, however be taken into consideration in this connection: (1) In Yala when water supply is not quite assured almost 50 per cent of the cultivated land is under traditional varieties. The proportion of the area planted with such varieties under minor irrigation schemes is as much as 66 per cent. (2) In Maha under minor schemes only 8 per cent of the area is planted with NHYVs. This obviously points to the fact that uncertain water conditions act as an important constraint to the adoption of NHYVs although this factor has not been revealed by the farmers.

D-9 The number of farmers who had adopted transplanting in the full extent of their holdings was higher for Maha (39 per cent) than in Yala (8 per cent). A further 60 per cent in Maha and 17 per cent in Yala transplanted at least a part of their holdings. Popularity of transplanting during Maha is essentially due to the ready availability of irrigation water. During Yala on the contrary uncertainty of water supply conditions and the need to cultivate short term varieties, which seem to respond less to transplanting, explain the low acreage transplanted.

D-10 During Maha when transplanting is more widely practiced than in Yala the extent transplanted did not vary much in the holdings of different sizes although in the above 10 acres class the percentage extent transplanted was the lowest (29 per cent). In Yala, however, a proportionately larger area is transplanted in holdings over 10 acres. This difference may be due to (1) In Maha when a large number of farmers transplant, recruiting sufficient labour is a problem. (2) In Yala the extent transplanted is generally less owing to water problems. Hence more labour is available to the larger operators whose holdings are located close to the main reservoirs where a supply of water is assured.

D-11 Over 70 per cent of the operators used fertilizer in both Maha and Yala, the average being 2.3 cwt. per acre. Although the official recommendations vary with the varieties grown and the expected yield, the amount applied by the sample farmers does not seem to be very low seeing that much of the area is still under OHYVs and traditional varieties. The amount.

however, falls short of the recommendation for NHYVs. While many farmers did not adhere to the recommended dosages of the different fertiliser types, certain types especially Urea were used in excess, which may not give commensurate returns especially to those cultivating OHYVs and traditional varieties (cf. 5.12) under present high costs. Many farmers use the basal mixture (62 per cent in Maha and 64 per cent in Yala), and they had done so at the correct time before sowing, but many more had applied Urea (84 per cent in Maha and 74 per cent in Yala).

D-12 Fertiliser use is not only more popular in major schemes but the quantities applied are also somewhat larger per acre especially during Yala when, in the case of minor schemes water problems discourage the use of fertilizer.

D-13 Only 50 per cent of the farmers applied three doses of fertiliser as recommended, mostly operators with holdings over 4 acres. The pattern of those using fertiliser at least once appears to be somewhat uniform for all classes above 2 acres.

D-14 Some form of weed control was practiced in 65 per cent of the extent cultivated in Maha. 50 per cent of the farmers practiced only hand weeding, which is more popular in medium holdings and also in minor irrigation schemes. 47 per cent of the operators who practiced chemical weeding were generally larger operators and this practice was not widely adopted in minor irrigation schemes.

D-15 The yield reported was 62.9 bushels per acre in Maha and 50.4 bushels per acre in Yala.

D-16 There was no clear indication that yields varied with the size of holding in this district, although in the 4.6 acre size class, which is the dominant holding group, average yield of transplanted NHYVs amounted to 87 bushels per acre in Maha. Yields in relation to tenure and water supply were not examined, since the bulk of the operators were located in major irrigation schemes and were also mostly owners.

D-17 Yields per acre of all varieties transplanted were higher by almost 30 bushels. 't' tests done on yield data indicated that both for Maha and Yala the average yield of NHYVs was higher than that of the OHYVs; that transplanting for all varieties gave greater yields than broadcasting. These results were arrived at by taking fertiliser application, weed and pest control as constants, especially as data in relation to varieties and methods of planting was not available. Generally,

while those who cultivate OHYVs practice broadcasting, farmers cultivating NHYVs transplant their crops indicating thereby that progressive farmers generally adopt a number of interrelated improved practices and thus obtain a higher yield. Viable holding size, absence of tenurial problems and an assured water supply have certainly induced farmers to adopt efficient management practices. Given these conditions, it appears that cultivation of high yielding varieties coupled with more labour intensive techniques in themselves can give higher yield even under rather relatively lower levels of purchased input application like that of fertilizer.

E Sales and Incomes

E-1 Information on cash operating expenses was available only in respect of 123 farmers for Yala 1972 which was a season of unfavourable weather conditions. The average cash outlay for paddy production was Rs.396/- per acre which amounted to approximately Rs.7.80 per bushel.

E-2 The proportion of cash outlay spent on hired labour was appreciable. 61 per cent of the total, owing to the larger average operational holding (5.48 acres) and to the absence of the attan labour practice.

E-3 Expenses on hired draught power amounted for Rs.76/- per acre of 19 per cent of the total cash outlay, of which almost 72 per cent was spent on hiring tractors the result of larger holdings and the lack of buffaloes. The expenditure on cash inputs was disproportionately low. Of Rs.396/- spent per acre, Rs.64/- were spent on cash inputs, 40/- on fertilizer and Rs.13/- on agro-chemicals, mostly pesticides. It is not possible to conclude whether the high expenditure incurred on hired labour and draught power have in fact reduced the farmers to bear the cost of applying recommended amounts of fertiliser. It should however be noted that even with a low expenditure on fertilizer, many farmers by adopting certain improved management practices under assured water supply conditions have obtained much higher yields than in other districts. Hence, when water supply conditions are favourable, use of NHYVs under certain improved practices such as transplanting, weeding etc., could give somewhat higher yields inspite of reduced purchased inputs like fertiliser.

E-4 Rent payment accounted only for a very small proportion of the total cash outlay as a majority of the farmers were owners and the bulk of the extent was owner operated.

E-5 There were considerable differences in the cash outlay per acre under major and minor irrigation, Rs.408/- and Rs.243/- respectively. The unstable water supply conditions during the Yala and the inherent risk under such conditions make the farmers in minor schemes spend less on purchased inputs and on other operations.

The Yala season of this particular year was characterised by unusual weather conditions in the district. Further, yields and expenses reported seem to be also rather unsatisfactory to make any valid assessment of the net farm operating income. On the basis of the average Yala yield reported; 50.4 bushels per acre, the net farm operating income was Rs.310/- per acre somewhat low for the district. However, on the average holding this was almost Rs.2,000/- per farm which in comparison to the other districts is quite satisfactory.

E-6 The farmers in the district had a considerable large surplus of paddy for sale. This is because the holdings are larger and the yields higher under major irrigation. 75 per cent of the paddy harvested in Maha and 70 per cent in Yala were sold. In absolute terms the quantities sold amounted to 61 and 33 bushels per acre in Maha and Yala respectively. Thus, in Yala the surplus sold was as low as half that of Maha, a result of lower yields and the lower acreage brought under cultivation. Almost all the surplus paddy had been sold to the co-operatives.

E-7 The amount sold was higher for larger holdings of above 2 acres. Holdings below 2 acres, sold a much lesser quantity and a smaller proportion of the production. The highest quantity of paddy was sold by farmers in the predominent size group, i.e. 4-6 acres which also recorded the highest yields. Operators in major schemes sold more paddy; 74 per cent of their total production in Maha and 66 per cent in Yala.

E-8 Gross family receipts of the district show a satisfactory income situation. Almost 75 per cent of the families earned gross receipts of over Rs.8,000/- in 1971/72 which gave an average gross monthly receipt of Rs.667/- per household. The remaining 25 per cent of families obtained less than Rs.4,000/- per year, but only 6 per cent of the total number of households had receipts of less than Rs.1,000/- per year or Rs.90/- per month. The bulk of the households depend essentially on paddy land for their family receipts. As a result, gross receipts were higher among operators with larger paddy holdings. The variation in gross receipts among different tenurial categories was not large.

Earnings from sources other than paddy formed a substantial proportion of the total receipts of the households. These came mainly from the highland averaging 2.2 acres in extent and from off-farm work even on a part-time basis (35 per cent of families). 56 per cent of the families had receipts of over Rs.1,000/- per year and 38 per cent obtained Rs.2,000/- or more. Operators with larger paddy holdings obtained bigger receipts from these sources, clearly illustrating the progressive income disparities between the smaller and larger farms.

E-10 There were no wide disparities in receipts from sources other than paddy among the different tenurial categories, although the tenant-owner group had much less earnings from these sources than the others. 60 per cent of them obtained less than Rs.1,000/- from these sources.

E-11 The per acre gross value of paddy produced by owners is highest (Rs.1,217/-) among all groups both before and after deduction of land rent for owner-tenants and tenant-owners. Once the land rent is deducted the tenant-owners' value of paddy amounted to only as much as half that of the owners, a consequence of high land rent. The value of paddy under major irrigation is almost 300 per cent higher than that under minor irrigation.