AGRARIAN RESEARCH AND TRAINING INSTITUTE

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

PART 4 - ANURADHAPURA DISTRICT

July 1975

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

PART 4

ANURADHAPURA DISTRICT

Agrarian Research and Training Institute

colombo 1975

FOREWORD

This is the fourth 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 inter-disciplinary 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.

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The Setting	*R.D. Wanigaratne* *A.S. Ranatunga*
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Production and Disposal of Paddy	*A.S. Ranatunga* *W. Gooneratne*
Labour Utilisation and Income	*P. Wickremasekera*
Summary and Conclusions	*W. Gooneratne* *A.S. Ranatunga* *P. Wickremasekera*

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 not only helped the research staff in the preparation of statistical tables, diagrams and in the interpretation of the data but also edited the final draft of the report.

DIRECTOR
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July 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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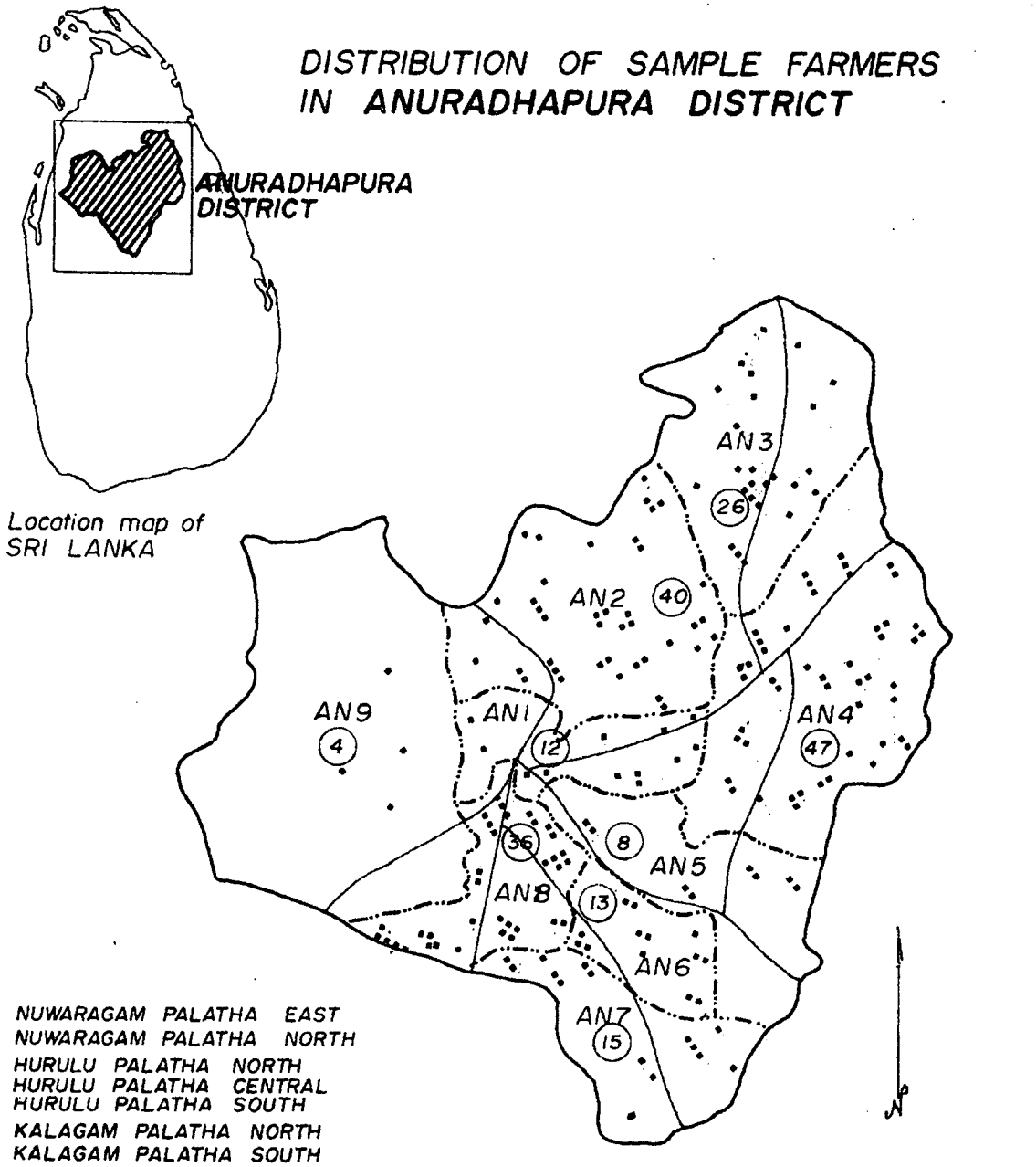
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Map 1

INTRODUCTION

Objectives and scope of the study

This study of the Agrarian Situation relating to paddy cultivation in the Anuradhapura District forms part of a larger study which includes the important paddy producing districts of Hambantota, Polonnaruwa, 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 Febaruay 1972, is still an infant institution struggling to build up its organisation and personnel. Nevertheless, the Institute decided that even with the limited resources available to it at present, it would be worthwhile to undertake a survey relating to paddy cultivation in some of the important paddy producing districts in the island. There were several reasons for taking this decision. 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 noteworthy surveys and research studies relating to various aspects of paddy cultivation in Sri Lanka; nevertheless there is a great deal of work that remains to be done on the socio-economic aspects of paddy cultivation in different parts of the island. This study inaugurated by the Institute should therefore be treated as an introductory inquiry intended to surface the major socio-economic and environmental factors affecting paddy cultivators in the selected districts. It is intended to be a forerunner to further studies which will clarify and sharpen the situation regarding paddy production in the country.

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 fertiliser 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 influences 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.

Method of study and Sample design

The survey was 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, land holding, source 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 adopted in paddy production in Yala 1972.
6. Paddy production expenses in Yala 1972.
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 Anuradhapura District was limited to 201 as this number was 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 rain-fed 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.

The Field Survey

The field work in Anuradhapura was conducted during the period 25 February to 11 March 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 201 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.

Rounding off of Figures

Figures reported have been rounded off to the nearest whole number except where it was considered important to retain decimal places. Slight discrepancies between the 'sum of components' and 'total' 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.

Definitions

Some of the terms used in this report may require definition

1. 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 the 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.

2. 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.

3. 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.

4. Size of Holding

Operated lowland holdings have been classified into 6 classes in terms of size:

Up to	2.00	acres	-	holdings	up	to	and	including	2.00	acres	
2.00 -	4.00	acres	-	"	over	2.00	acres	and up to	and including	4.00	acres
4.00 -	6.00	acres	-	"	"	4.00	"	"	"	6.00	acres
6.00 -	8.00	acres	-	"	"	6.00	"	"	"	8.00	acres
8.00 -	10.00	acres	-	"	"	8.00	"	"	"	10.00	acres
Over	10.00	acres	-	holdings	over	10.00	acres				

[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.

Irrigation Schemes

Major Irrigation Schemes are schemes that service extents of 200 acres or more, under the maintenance of the Department of Irrigation,

Minor Irrigation Schemes are schemes that service extents less than 200 acres, under the maintenance of the Village Cultivation Officers of the Department of Agrarian Services.

Rainfed lands are lands not serviced by Irrigation Schemes.

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.

Maha/Yala

The two main seasons during which paddy is grown are referred to as Maha and Yala. 'Maha' 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.

Value of Paddy Produced

For purposes of valuing the paddy produced, the Guaranteed Price of Rs.14.00 per bushel has been used, which was the prevailing price at the time of the study.

Attan - traditional term used for exchange labour.

Abbrevations - The abbrevations used in this report are:

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

Chapter 1

THE SETTING

1.1 General

The district of Anuradhapura located within the Dry Zone lowlands of the North Central part of Sri Lanka, covers an area of 2,753 sq. miles and is divided into eleven Revenue Divisions for administrative purposes.

Table 1-I **Land Area, Population and Population Densities of Anuradhapura District**

Revenue Division	Land Area (sq.mile)	Population	Population Density per sq. mile
Nuwaragam Palatha (West)	588	31,680	53.88
" " (South)	174	54,830	315.11
" " (East)	277	33,206	119.88
" " (North)	..	55,204	..
Hurulu Palatha (Central)	522	49,905	95.60
" " (North)	321	33,460	104.24
" " (South)	231	26,207	113.45
Kalagam Palatha (South)	155	31,787	205.08
" " (North)	137	33,990	248.10
Kadawath Korale and Kande Korale, Anuradhapura District	..	38,938	..
	2756	389,207	141,22

.. Not available

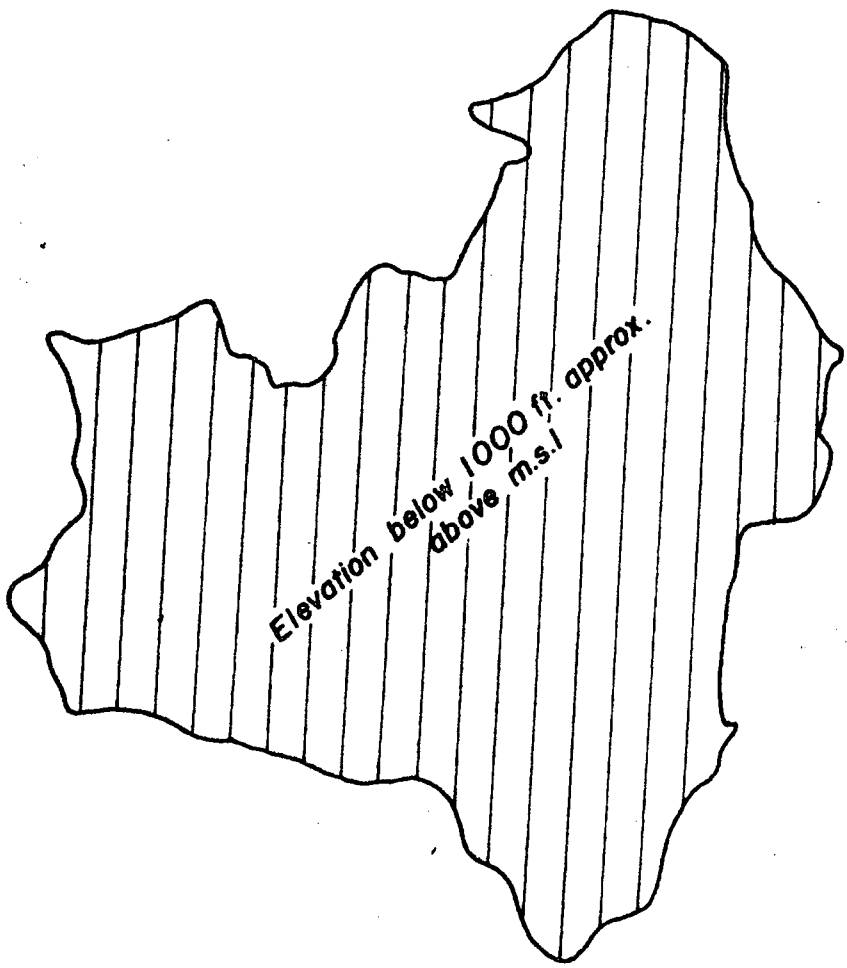
Source: Census of Population 1971

Agriculture is the main economic activity of the district. In 1962 about 11% of the land was in agricultural holdings of which 84% was cultivated. A substantial part of the land is under-utilised. Paddy cultivation is the principal occupation and around 64% of the agricultural lands (200,499 acres) is asweddumised.[1] Widespread chena or shifting cultivation is a striking feature. This is practised on the highlands during the North-East monsoons under rainfed conditions.

The population density is relatively low except in Nuwaragam Palatha and Kalagam Palatha. In Nuwaragam Palatha (South) the population

[1] Census of Agriculture 1962, Dept.of Census and Statistics

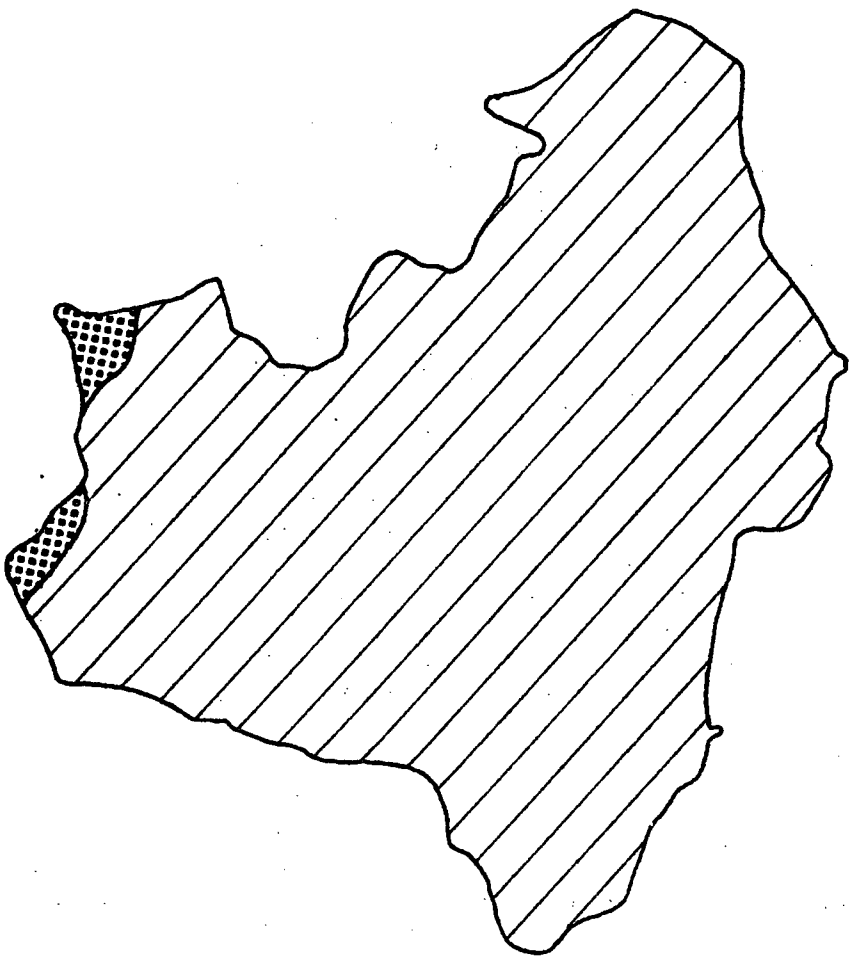
GENERALIZED RELIEF MAP OF ANURADHAPURA DISTRICT



SOURCE: ADAPTED FROM AGRO-ECOLOGICAL MAP OF CEYLON-1972

Map 2

GENERALIZED RAINFALL MAP OF ANURADHAPURA DISTRICT



Dry Lowland– Low rainfall (M.A.P.) approx. 50"–75"

Dry Lowland– " (with a pronounced dry season)

SOURCE : ADAPTED FROM AGRO–ECOLOGICAL MAP OF CEYLON 1972

Map 3

density per sq.mile is more than twice the district value, while the population pressure on land is nearly twice that of the district value.

Table 1-II Rainfall in the Anuradhapura District (in inches)

Station	Average annual rainfall 1961-1971	rainfall 1972	No.of rainy days
Maha Illupalama	59.87	45.57	124
Kala Wewa Tank (excluding 1965)	53.45	54.34	111
Medawachchiya (excluding 1962-63)	53.17	53.25	92
Maradankadawala (excluding 1962)	62.17	43.65	101
Padawiya (excluding 1967-68)	76.13	47.72	100
Habarana (excluding 1963-64)	60.98	62.47	79
Anuradhapura	56.70	46.82	121
Kebitigollewa (" 1963,65,66, 70)	58.39	53.57	82
Ihala Halmillawa(" 1966,67,68)	46.39	45.65	66

Source: Department of Meteorology

The annual rainfall based on the aforementioned stations for the period 1961-1971 averages 58.55 inches. Maximum precipitation occurs during the North East monsoon (the Maha season) from October to January. This is followed by a relatively dry period from February to March. During the rest of the year thermal convection and cyclonic activity determine the rainfall. From April to August (the Yala season) high evapo-transpiration rates are experienced associated with warm dusty winds. The dry season lasts 4-5 months, May to September with intermittent light showers. The total rainfall has been sometimes as low as 25 inches resulting in severe and prolonged droughts, which have been more frequent in recent years. Acute water shortage during Yala is an endemic problem.

There are 1,474 villages in the district. Most of these villages are served by a small tank, after which the village is often named. The paddy allotments or the *'vel yaya'* is below the tank. Clustered settlements are found in the *'gangoda'* or highland and the surrounding jungle is periodically cleared for chena cropping. The *'gangoda'* lies close to and almost immediately above the tank on which the villagers depend not only for paddy cultivation but also for their domestic water supply.

1.2 Chena Cultivation

Chena Cultivation is practised on an extensive scale during the Maha season and the cultivated extents vary from year to year depending on the weather conditions. The clearing and burning of jungle is done in July and August. Sowing commences after the first rains usually in the latter part of September. Mixed cropping with chillies, kurakkan, paddy, vegetables, mustard and maize is the general practice. During Yala season too, primarily gingelly is grown in chenas in certain parts of the district. The success of paddy depends largely on the monsoons and the water supply situation. Consequently shifting cultivation is practised more or less as an insurance against an unpredictable paddy harvest. The widespread chena cultivation results in massive encroachments on crown land by nearly all of the paddy cultivators in the district.

1.3 Paddy Cultivation

Paddy is the major crop cultivated on 182,000 acres of asweddumised land all of which is in the dry zone.

Table 1-III Asweddumised Paddy Acreage - Maha 1971/72

		Major-irrigation	Minor-irrigation	Rainfed	Total
Extent (acres)	..	63,267	107,787	10.92	181,975
%	..	34.77	59.23	6.00	100.00
As a percentage of Sri Lanka's Total	..	4.37	7.44	0.75	12.56

Source: Department of Census and Statistics, 1972.

Almost 94% of this extent is dependent on minor and major irrigation schemes. Paddy cultivation in the district depends on the vast network of small village tanks in the district and a few larger reservoirs restored during the last three decades or so. The method of surface storage devised in ancient times remains even to this day which is the backbone of the irrigation system for paddy. However, since the tanks and their catchments are essentially located in the precipitation-deficient zones, almost total dependence on rainfall for water supply is a characteristic feature.

Table 1-IV Major Irrigation Schemes of the Anuradhapura District

Irrigation Scheme	Paddy Acreage irrigated
Huruluwewa	6,447
Kiwulkadawewa	1,050
Aluthdivulwewa	765
Kalawewa and Battuluwewa	12,285
Dewahuwa	2,336
Nuwarawewa	2,399
Tisawewa	1,020
Basawakkulama	921
Nachchaduwa	5,889
Mahawilachchiya*	2,664
Padaviyawewa	14,351
Divulwewa	400
Maha Illupalamawewa	504
Kattiyawe	893
Horiwila	750
Maguruhitiyawe	250
Madawachchiyawewa	180
Sangilikanadarawa	745
Mahakanadarawe	6,017
Halpan Canal Project	300

*Special Projects
Source: Office of Director of Works, North Western Region, 1974

About 80% of the total acreage is cultivated in Maha and about 30% during Yala in a normal year. The very restricted cultivation in Yala is primarily due to an insufficiency of water.

Table 1-V Asweddumised Paddy Acreage according to Size of Holding

Size of Holding (acres)	No. of Holdings No.	%	Extent Acres	%
Less than 0.5 acre	850	*2.47*	300	*0.23*
0.5 to under 1.0 acres	2,440	*7.08*	1,790	*1.40*
1.0 to under 2.5 acres	8,940	*25.95*	15,040	*11.73*
2.5 to under 5.0 acres	13,900	*40.34*	50,370	*39.29*
5.0 to under 10.0 acres	7,090	*20.58*	43,490	*33.93*
10.0 to under 25.0 acres	1,172	*3.40*	14,912	*11.63*
25.0 acres and over	61	*0.18*	2,284	*1.78*
Total	34,453	*100.00*	128,186	*100.00*

Source: Census of Agriculture 1962, Vol.3 - Paddy Lands

As the asweddumised acreage had increased by about 23% since 1972 the above data needs up-dating. 73% of the extent asweddumised paddy land was in holdings of 2.5 acres to under 10 acres; 39% in holdings of 2.5 acres to under 5 acres, and 34% in holdings of 5-10 acres. Small uneconomic holdings are not a major problem in the district, only 9% of them being less than 1 acre and 35% less than 2.5 acres.

Table 1-VI Tennurial Status of Paddy Cultivators

DRO Division	Tenant Cultivators on *Thattumaru* land	Tenant Cultivators on Other land	Owner Cultivators	Land owners using hired labour
Nuwaragam Palatha (East)	36	1,721	4,495	166
" " (South)	52	3,129	8,723	134
Kadawath Korale	8	408	4,947	35
Rambawe	21	304	3,982	52
Hurulu Palatha (Central)	-	1,172	8,593	-
" " (South)	96	613	4,359	3
" " (North)	2	1,880	9,698	32
" " (West)	51	1,595	2,742	4
Palagala	-	-	1,316	-
Galenbindunuwewa	-	-	338	-
Horuluwewa	-	-	2,994	-
Kalagam Palatha	2	991	6,396	13
Total	268	11,813	58,582	439
%	*0.38*	*16.62*	*82.37*	*0.63*

Source: Department of Agrarian Services Records (1972)

Table 1-VII Cultivated Extent according to Tenurial Category (acres)

DRO Division		Tenant Cultivators on *Thattumaru* land	Tenant Cultivators on Other land	Owner Cultivators	Land owners using hired labour
Nuwaragam Palatha	(East)	238	3,450	9,699	649
" "	(South)	196	4,095	16,267	511
Kadawath Korale		4	963	12,659	94
Rambawe		71	629	9,959	261
Hurulu Palatha	(Central)	23	1,880	24,721	-
" "	(South)	42	942	7,937	13
" "	(North)	7	2,932	24,986	165
" "	(West)	33	2,606	5,961	5
Kalagam Palatha	(South)	30	1,480	9,013	-
Palagala		-	-	4,275	-
Galenbindunuwewa		-	-	1,012	-
Huruluwewa		-	-	11,013	-
Total		644	18,977	137,502	1698
%		0.41	11.95	86.58	1.07

Source: Department of Agrarian Services Records (1972)

A large proportion of paddy cultivators are owners; 87% of the cultivated extent had been operated by owner cultivators which shows the relative importance of this category of operators. It is of interest to note that an appreciable number of land owners using hired labour for paddy cultivation are found in Nuwaragam Palatha (South) where the population density per sq.mile is also the highest.

Table 1-VIII Availability of Tractors as at the end of 1972

	Number
Workable tractors	
Four wheel	607
Two "	328
Unusable tractors	
Four wheel	166
Two "	35
Tractors adopted in Agricultural work	
Four wheel	538
Two "	325
Tractors adopted chiefly for transport of goods	
Four wheel	69
Two "	3
Total availability of tractors within the district	
Four wheel	773
Two "	363

Source: Department of Agrarian Services Records (1972)

The total number of tractors available for agricultural work is grossly inadequate considering the paddy acreage in the district. Shortage of spares for tractors is a major problem particularly in the case of four wheel tractors. No accurate data is available on the number of buffaloes available for draught purposes.

1.4 The Sample

The sample consisted of 201 households, which contained 869 individuals aged 14 years and above. The average number of persons per household in this age group was 4.3.

Table 1-IX Distribution of Individuals within the Surveyed Households

DRO Divisions		No.of household	No. of persons age 14 and above	Number of persons (aged 14 and above) per household
Nuwaragam Palatha	(West)	3	14	4.7
" "	(South)	33	170	5.2
" "	(East)	12	49	4.1
" "	(North)	38	172	4.5
Hurulu Palatha	(Central)	49	208	4.2
" "	(North)	30	113	3.8
" "	(South)	9	37	4.1
Kalagam Palatha	(South)	16	68	4.3
" "	(North)	11	38	3.5
Total		201	869	4.3

Table 1-X Nature of Employment of Individuals within the Sample

DRO Divisions		Number of persons 14 years and over				
		Total	Working only on farm	Working on farm and outside	Working only outside farm	Others (disabled and unspecified persons)
Nuwaragam Palatha	(West)	14	10	4	-	-
" "	(South)	170	119	25	12	14
" "	(East)	49	37	8	2	2
" "	(North)	172	123	28	17	4
Hurulu Palatha	(Central)	208	132	48	18	10
" "	(North)	113	93	16	3	1
" "	(South)	37	24	9	3	1
Kalagam Palatha	(South)	68	45	12	4	7
" "	(North)	38	21	9	6	2
Total		869	604	159	65	41
%		*100*	*70*	*18*	*7*	*5*
Average per farm		4.3	3.0	0.8	0.3	0.2

70% of the 14 years and over age group were found to be working only on the farm, while only 7% worked entirely outside the farm.

1.5 Water Sources

Table 1-XI Water Sources for Household and Cultivation Purposes

DRO Division		Number of households dependent on					
		Wells	Tanks	Rivers	Major irrigation	Minor irrigation	Rainfall
		(for household needs)			(for paddy cultivation)		
Nawaragam Palatha	(West)	3	-	-	3	-	-
" "	(South)	26	-	-	21	5	-
" "	(East)	13	-	-	9	4	-
" "	(North)	33	4	-	13	22	2
Hurulu Palatha	(Central)	47	3	-	8	42	-
" "	(North)	26	2	2	14	16	-
" "	(South)	14	1	-	9	6	-
Kalagam Palatha	(South)	15	-	-	6	9	-
" "	(North)	12	-	-	8	4	-
Total		189	10	2	91	108	2
%		94.	5.	1.	45.	54.	1.

54% of the households depended on some form of minor irrigation (channels, anicuts and small tanks) for cultivation purposes. Major irrigation (channels, anicuts, tanks, maintained by the Department of Irrigation) works were utilised by 45% of the households for cultivation purposes. Irrigation works both major and minor provided the necessary water for cultivation needs to 99% of the total sample of 201 households.

Major irrigation works provided a high proportion of the water requirements for cultivation particularly in the DRO Divisions comprising Nuwaragam Palatha as well as Hurulu Palatha. In all other DRO Divisions minor irrigational works were more important.

1.6 Machinery and Equipment

Table 1-XII Availability of Cultivation Equipment

Equipment	No.of farmers owning equipment	No.of units owned
Tractors (Four wheel)	12	12
" (Two ")	4	4
Trailers	5	6
Sprayers	10	10
Dusters	2	2
Ploughs (a) Light iron	19	27
(b) Village	63	134

In a district where tractors are used on a wide scale for initial tillage of paddy lands, the small number of households (8%) owning machinery gives an indication of the heavy dependence of paddy operators on hired machines.

The data on the ownership of ploughs shows that village ploughs are used extensively where buffaloes are used for draught purposes. This points out both the need as well as the scope for introduction of more suitable animal drawn implements in place of the traditional village plough, as it does a very poor job in burying weeds as well as stubble. The availability of sprayers and dusters is considered inadequate due to the large lowland operational holding size and extensive use of agro-chemicals particularly for weed control.

1.7 Livestock

Table 1-XIII Livestock Population Reported by Farmers

Livestock Type	No.of farmers reporting	Total No.of livestock
Buffaloes (milk and working)	51	259
Buffaloes (calves)	29	79
Cattle (milk and working)	105	597
Cattle (calves)	82	292
Poultry	48	393

25% of the respondents reported the ownership and utilisation of buffaloes for draught purposes. The average number of animals per household was 5 (approx). The availability of draught power appears to be totally inadequate as 75% of the households did not possess any draught animals and only 8% owned tractors. 53% of the households had neat cattle for milk and sale for slaughter. Poultry rearing is of minor importance.

1.8 Land Use

Lowlands are used exclusively for irrigated paddy. On the highlands the majority of the farmers reported the cultivation of a few assorted fruit crops viz. jak, coconut, mango, plantains and lime. A mixture of vegetables and root crops has been grown in home gardens particularly during Maha season.

29% of the total land operated by the 201 respondents was under chena. 46% of the operators reported some form of chena cultivation. This system of shifting cultivation was more prevalent in Hurulu Palatha and Nuwaragam Palatha. The higher proportion of paddy cultivators engaged in chena work in Hurulu Palatha may partly be a reflection of the greater availability of land due to low population pressure and uncertainty of paddy harvests due to very poor water supply conditions in this division. The traditional crops of Anuradhapura chenas such as kurakkan and various types of vegetables appear to be giving way to chillies. Due to the very attractive prices fetched by this commodity chillies now occupy a dominant position in most of the chenas.

Table 1-XIV Crops (Other than Paddy) Reported by Farmers

Crop	Total No.of farmers reporting	Trees/Plants		Extent	
		No.of farmers reporting	No. of trees/ plants	No.of farmers reporting	acres
Plantation Crops					
Coconut	188	171	5,200	11	19.60
Permanent Crops					
Arecanut	2	2	11	-	-
Guava	8	8	76	-	-
Fruit trees					
Jak	125	125	604	-	-
Mango	147	147	589	-	-
Orange	47	47	203	-	-
Lime	120	120	469	-	-
Papaw	4	4	30	-	-
Plantains	112	103	4,720	9	7.25
Passion	15	15	178	-	-
Temporary Crops					
Tobacco	1	1	300	-	-
Chillies	99	22	12,930	77	36.45
Onions	24	6	1,350	18	3.31
Green gram	19	-	-	19	6.73
Ground nut	10	-	-	10	3.30
Maize	17	3	230	14	3.54
Vegetables	50	9	816	41	18.58
Types of yams	22	15	3,033	7	2.87
Other types of annual crops	21	-	-	21	18.98

An appreciable number of temporary crops, mainly chillies, green gram, maize, yams and vegetables are grown in chena.

Table 1-XV Distribution of Chena Cultivation

D.O. Division			Total No.of farmers reporting	No.of farmers reporting chena
Nuwaragam	Palatha	(West)	3	3
"	"	(South)	33	10
"	"	(East)	12	5
"	"	(North)	38	19
Hurulu	Palatha	(Central)	49	20
"	"	(North)	30	17
"	"	(South)	9	5
Kalagam	Palatha	(South)	16	9
"	"	(North)	11	5
Total			201	93
%			*100*	*46*

Chapter 2

LAND DISTRIBUTION AND TENURE

2.1 Land Distribution

The sample of 201 cultivators operated 1,952.69 acres, an average of approximately 9.71 acres per person (Table 2-I). 65.58% of the total extent operated was lowland.

Table 2-I Operated Land Classified according to Type and Tenure Status

Tenurial category	Lowland Acres	%	Highland Acres	%	Total Acres	%
Owned ..	863.80	*67*	339.95	*51*	1,203.75	*62*
Rented/Leased in	174.50	*14*	.50	..	175.00	*9*
Encroached/chena	242.31	*19*	331.63	*49*	573.94	*29*
Total ..	1,280.61	*100*	672.08	*100*	1,952.69	*100*

.. = less than 1%

62% of the total extent was operated by owners. They operated 67% of the lowland and 51% of the highland. *An almost equal extent of highland (49%) was worked by chena cultivators and encroachers.*

2.2 Landlessness

Ten of the 201 cultivators were totally landless (Table 2-II).

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

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

Tenurial Category	Lowland only: Operaters owning up to No land	00.5 acre	1.00 acre	2.00 acre	Highland only: Operators owning up to No land	00.5 acre	1.00 acre	2.00 acre	Highland & Lowland: Operators owning up to No land	00.5 acre	1.00 acre	2.00 acre
Owners ..	-	-	1	13	9	16	51	79	-	-	-	-
Tenants ..	9	9	9	9	3	5	7	9	3	5	7	9
Owner tenants	-	-	-	3	1	4	8	15	-	-	-	2
Tenant owners	-	1	4	9	-	4	6	10	-	-	1	3
Others ..	9	10	12	17	15	23	38	53	7	8	10	11
Total	18	20	26	51	28	52	110	166	10	13	18	25

Every owner had on the average a holding of over 2 acres of both lowland and highland. 88% of the 201 cultivators owned over 2 acres of lowland and highland. 18 operators did not own any lowland while 33 operators (16%) had 2 acres or less of lowland. A far greater proportion of operators (69%) owned small highland holdings.

2.3 Distribution of Lowland

Of the 1,280.61 acres of lowland, 41% was operated by 109 pure owners, while pure tenants operated only 5%. A further 19% was operated by farmers who cultivated their own land as well as land which they had tenanted, owner-tenants (13%) and tenant-owners (6%). 12% of the total extent operated was reported to be chena and 17% encroachments. 93 households (46%) of the sample had done some form of chena cultivation and over half of them (approximately 60%) were from the three Revenue Divisions of Nuwaragam Palatha (North), Hurulu Palatha (Central) and Hurulu Palatha (North).

Table 2-III Distribution of Operated Land among Tenurial Categories

Tenurial Categories	No. of operators	Lowland Acres	%	Highland Acres	%	Chena Acres	%	Encroachments (highland) Acres	%	Total Acres	%
Owners	109	530.11	*41*	220.39	*65*	123.75	*52*	42.50	*44*	916.75	*47*
Tenants	9	61.00	*5*	6.50	*2*	2.63	*1*	1.00	*1*	71.13	*4*
Owner-tenants	16	131.25	*10*	29.75	*9*	30.00	*13*	8.75	*9*	199.75	*10*
Tenant-owners	10	59.00	*5*	11.39	*3*	4.50	*2*	-	-	74.89	*4*
Others	57	499.25[1]	*39*	72.42	*21*	75.00	*32*	-	*45*	690.17	*35*
Total	201	1280.61	*100*	340.45	*100*	235.88	*100*	95.75	*100*	1952.69	*100*
%			*66*		*17*		*12*		*5*		*100*

The category 'others' in Table 2-III comprises of operators who cultivated on encroached land in addition to their owned and/or tenanted land and pure encroachers. Such encroachers were merely owners (37). There were 2 tenant encroachers, 8 owner-tenant encroachers, 3 tenant-owner encroachers and 7 pure encroachers.

The lowland was mostly in holding sizes that ranged from 2-6 acres. Approximately 60% worked lowland holdings of 2-6 acres (Table 2-IV). *Though only about 14% of the operators worked on lowland plots of 10 acres, this extent constituted 32% of the total lowland or a little more than twice as much (2.28) as one would expect if the land was proportionately distributed.*

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[1] 285.81 acres were in encroachments - 22% of total lowland.

Encroachers were found to be more prevalent in areas served by minor irrigation schemes as --

(a) paddy cultivation under these conditions is risky owing to an unstable water supply and the cultivation of additional land offers some added insurance;

(b) encroaching is probably the only means for the increasing population of the *purana* **village** to gain a livelihood, particularly as:

i. the village tank cannot possibly cope with the increase in the land cultivated, and
ii. no means of livelihood other than agriculture, is available in the locality.

Table 2-IV Distribution of Operated Land according to Size of Land Holdings

Size of Holding (acres)	Operators No.	%	Operated Lowland Acres	%	Operated Highland Acres	%	Total Extent operated Acres	%
Up to 2.00	17	*8*	31.00	*2*	34.00	*5*	65.00	*3*
2.00 - 4.00	67	*33*	208.75	*16*	195.17	*29*	403.92	*21*
4.00 - 6.00	54	*27*	283.05	*22*	182.33	*27*	465.38	*24*
6.00 - 8.00	23	*11*	167.31	*13*	75.63	*11*	242.94	*12*
8.00 - 10.00	11	*5*	102.75	*8*	48.65	*7*	151.40	*8*
Over 10.00	29	*14*	487.75	*38*	136.30	*20*	624.05	*32*
Total	201	*100*	1,280.61	*100*	672.08	*100*	1,952.69	*100*

2.4 Distribution of Highland

Approximately 65% (220.39 acres) of the highland area was operated by 109 owners (Table 2-III), while owner-tenants (9%) formed the relatively more important tenurial class operating highland areas, than pure tenants and tenant-owners.

'Others' next in importance only to owners, were a significant tenurial category and accounted for 21% of the operated highland, 32% of chena and 45% of encroached highland.

Of the chena land operated by the various tenurial categories 52.46% was by owner cultivators.

Much of the highland area (approximately 56%) was in holdings 2-6 acres (Table 2-IV), while holdings over 10 acres accounted for approximately one-fifth of the operated highland area. *The position of holding size categories in the lowland area was similar to that reported in the highland areas.*

2.5 Overall Size of Holding

The average operational size of holding in the sample was 9.72 acres but drops to 6.86 when chena and encroachments are excluded. The average size of holding in the district especially in the lowland category is among the largest in the island. The average size of

paddy holdings in the district was 3.72 acres in 1962 (Table 1-V).

2.6 Size Characteristics of Lowland Holdings

The average size of lowland holdings for all tenurial categories was 6.37 acres but individual holdings ranged from 1 to 50 acres. The standard deviation for the varied lowland holding sizes was 5.54. The median size of holding was 5 acres with an average holding smaller than the median being 3.15 acres, as compared with 9.56 acres for holdings larger than the median. *Thus the cultivators with holdings larger than the median were operating on an average of more than three times as much land as cultivators with holdings smaller than median.*

The average size of holdings varied among cultivators of different tenurial categories (Table 2-V). *The average size was largest among the 'others' category (8.76 acres) while owner tenants were a close second with 8.20 acres followed by owners with 4.86 acres.* The average size of holding among 'others' category was almost twice as large as that of owners.

Table 2-V Size Characteristics of Lowland Holdings

Tenurial Category	Average size 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
			Smaller than median	Larger than median				
Owners	4.86	4.00	2.67	7.01	3.30	3.00	5.50	1.00-20.00
Tenants	6.78	4.00	2.25	10.40	6.38	2.38	9.25	1.50-19.00
Owner-tenants	8.20	7.50	4.41	12.00	5.36	4.38	10.50	2.50-22.00
Tenant-owners	5.90	5.75	3.90	7.90	2.79	3.50	7.00	2.50-12.00
Others	8.76	6.00	4.28	13.08	7.91	4.00	10.63	1.00-50.00
Overall	6.37	5.00	3.15	9.56	5.54	3.00	7.00	1.00-50.00

There are a number of limitations, however, in using the 'average size of holding' criterion. Although this criterion is a convenient and a useful measurement of the central tendency, the actual size of holdings could vary considerably from the average. For example, in the respective tenurial categories 81% of the 'owners', 67% of 'tenants', 44% of 'owner-tenants', 61% of 'tenant-owners', and 54% of 'others', had holdings smaller than the average of 6.37 acres. *However, the owner-tenant category apparently had more people with holdings of more than the average size of 6.37 acres than in the other categories.*

There were also marked differences in the average size of holdings of the cultivators with holdings smaller and larger than the median size. For example, the average size of holdings was only 2.67 for owner cultivators with holding sizes less than the median compared with 7.01 acres for those with holdings larger than the median size. For all other tenurial categories it was more than three times. *The magnitude of difference in the average size of holdings smaller and larger than the median size was more apparent among tenants than among other tenurial categories.* This may be a result of the tendency of tenants to work on available lowland holdings of any size, even on very many small plots. The number of tenants involved (9) is, however too small to make any definite statement.

2.7 Proportion of Land Owned and Rented

The variation in the extents owned and rented by owner-tenants and tenant-owners is also useful in understanding the size characteristics of operated land. The difference between the average size of holdings of the above categories was 2.3 acres. The average extent owned by owner-tenants was 6.0 acres compared to the average 1.6 acres owned by tenant-owners -- a difference of 4.4 acres. The tenant-owners rented on an average 4.3 acres compared with 2.2 acres rented by owner-tenants. Further clear differences were observed in comparing the cultivators with holdings smaller and larger than the median size.

Table 2-VI Proportion of Operated Land Owned and Rented

Characteristics	Tenurial Category: Owner-tenants operational holdings						Tenant-owner operational holdings					
	Total		Smaller than median		Larger than median		Total		Smaller than median		Larger than median	
	Avg. size	%	Avg. size	%	Avg. size	%	Avg. size	%	Avg. size	%	Avg. Size	%
Owned	6.0	*73*	2.9	*71*	9.1	*76*	1.6	*27*	1.1	*28*	2.1	*27*
Rented in	2.2	*27*	1.5	*29*	2.9	*24*	4.3	*73*	2.8	*72*	5.8	*73*
Owned and Rented in	8.2	*100*	4.4	*100*	12.0	*100*	5.9	*100*	3.9	*100*	7.9	*100*

The proportion of operational holdings owned was over twice greater than holdings rented in among owner-tenants; the reverse held true for tenant-owner category.

2.8 Distribution of Land Among Different Size Holdings

The distribution of holdings among different tenurial categories by the size of holdings is shown in Table 2-VII.

A larger proportion (69%) of the owners operated lowland holdings between 2-6 acres in extent. Five of the nine tenants operated lands below 4 acres in extent, while most of the owner-tenants operated between 4-8 acres and the tenant-owners between 2-6 acres. Among 'others' (51%) operated between 2-6 acres.

Among the 'others' category a large proportion (46%) of the 'owner-encroachers cultivated lowland holdings above 6 acres.

2.9 Highland Operated by Paddy Cultivators

A great proportion of the land operated by owners was in the 2-6 acre category by tenants in the less than 2 acre and above 10 acre categories, by tenant-owners 2-8 acres and in the case of 'others' the land operated was in the 2-6 acres and in the 10 acre categories (Table 2-VIII).

2.10 Distribution of Land according to Water Supply Conditions

In the Anuradhapura District much of the paddy cultivated (60% of the area) is under minor irrigation systems (Table 2-IX). Of the lowlands cultivated by owners 56% fell under minor irrigation.

Under major irrigation schemes, a large proportion of the holdings were below 4 acres while in minor schemes the majority of the holdings ranged from 2-8 acres. One factor responsible for this difference may be that *much of the irrigation works in this district are also tied up with agro-settlement schemes where the size of operational holding per cultivator is well defined, whereas in the case of minor irrigation works associated with* purana *villages the size of holding is defined more through hereditary ownership and entrepeneurship factors.*

Table 2-VII Distribution of Lowland Holdings according to Tenurial Categories and Size of Holding

Size of Holding (acres)	Owners				Tenants				Owner-tenants				Tenant-owners				Others			
	Operators		Extent		Operators		Extent		Operators		Extent		Operators		Extent		Operators		Extent	
	No.	%	Ac.	%	No.		Ac.	%	No.		Ac.	%	No.		Ac.	%	No.	%	Ac.	%
Up to 2.00	13	12	24.50	5	2	...	3.50	6	-	-	-	-	-	-	-	-	2	4	3.00	1
2.00- 4.00	45	41	135.94	26	3	...	9.50	16	3	...	8.50	6	3	...	9.00	15	13	23	45.81	9
4.00- 6.00	30	28	154.30	29	1	...	6.00	10	4	...	19.75	15	3	...	16.50	28	16	28	89.00	18
6.00- 8.00	8	7	56.12	11	1	...	7.00	12	4	...	31.00	24	3	...	21.50	36	7	12	49.19	10
8.00- 10.00	6	6	56.25	11	-	-	-	-	1	...	9.00	7	-	-	-	-	4	7	37.50	8
Over 10.00	7	6	103.00	19	2	...	35.00	57	4	...	63.00	48	1	...	12.00	20	15	26	274.75	55
Total	109	100	530.11	100	9	...	61.00	100	16	...	131.25	100	10	...	59.00	100	57	100	499.25	100

... percentages not reported as they are based on very small numbers.

Table 2-VIII Distribution of Highlands among Operators by Tenurial Category and Size of Holding

Size of Holding (acres)	OWNERS					TENANTS					OWNER-TENANTS				
	No.of operators	Extent owned (acres)	Extent leased (acres)	Total Extent (acres)	Avg.per operator (acres)	No.of operators	Extent owned (acres)	Extent leased (acres)	Total Extent (acres)	Avg. per operator (acres)	No.of operators	Extent owned (acres)	Extent leased (acres)	Total Extent (acres)	Avg.per operator (acres)
Up to 2.00	13	17.75	-	17.75	1.4	2	2.50	-	2.50	1.2	-	-	-	-	-
2.00 - 4.00	45	64.25	0.50	64.75	1.4	3	0.50	-	0.50	0.2	3	2.50	-	2.50	0.8
4.00 - 6.00	30	67.94	-	67.94	2.3	1	1.00	-	1.00	1.0	4	5.50	-	5.50	1.4
6.00 - 8.00	8	19.50	-	19.50	2.4	1	-	-	-	-	4	4.75	-	4.75	1.1
8.00 - 10.00	6	24.65	-	24.65	3.1	-	-	-	-	-	1	1.00	-	1.00	1.0
Over 10.00	7	25.80	-	25.80	3.7	2	2.50	-	2.50	1.2	4	16.00	-	16.00	4.0
Total	109	219.89	0.50	220.39	2.0	9	6.50	-	6.50	0.7	16	29.75	-	29.75	1.9

Size of Holding (acres)	TENANT-OWNERS					OTHERS					TOTAL				
	No.of operators	Extent owned (acres)	Extent leased (acres)	Total Extent (acres)	Avg.per operator (acres)	No.of operators	Extent owned (acres)	Extent leased (acres)	Total Extent (acres)	Avg.per operator (acres)	No.of operators	Extent owned (acres)	Extent leased (acres)	Total Extent (acres)	Avg.per operator (acres)
Up to 2.00	-	-	-	-	-	2	-	-	-	-	17	20.25	-	20.25	1.2
2.00 4.00	3	3.25	-	3.25	1.8	13	10.67	-	10.67	0.8	67	81.17	0.50	81.67	1.2
4.00 6.00	3	2.64	-	2.64	.9	16	14.75	-	14.75	0.9	54	91.83	-	91.83	1.7
6.00 8.00	3	3.50	-	3.50	1.2	7	8.00	-	8.00	1.1	23	35.75	-	35.75	1.6
8.00 10.00	-	-	-	-	-	4	3.75	-	3.75	0.9	11	29.40	-	29.40	2.7
Over 10.00	1	2.00		2.00	1.0	15	35.25	-	35.25	2.4	29	81.55	-	81.55	2.8
Total	10	11.39	-	11.39	1.1	57	72.42	-	72.42	1.3	201	339.95	0.50	340.45	1.7

Table 2-IX Distribution of Operated Lowland by Tenurial Category According to Water Supply

Water Supply	OWNERS				TENANTS				OWNER-TENANTS				TENANT-OWNERS				OTHERS				TOTAL			
	Operators No.	%	Extent acres	%	Operators No.		Extent acres	%	Operators No.		Extent acres	%	Operators No.		Extent acres	%	Operators No.	%	Extent acres	%	Operators No.	%	Extent acres	%
Major Irrigation	58	*53*	234.25	*44*	8	...	58.00	*95*	6	...	58.75	*45*	6	...	44.50	*75*	16	*28*	125.31	*25*	94	*47*	520.81	*41*
Minor Irrigation	51	*47*	295.86	*56*	1	...	3.00	*5*	10	...	72.50	*55*	4	...	14.50	*25*	41	*72*	373.94	*75*	107	*53*	759.80	*59*
Total	109	*100*	530.11	*100*	9	...	61.00	*100*	16	...	131.25	*100*	10	...	59.00	*100*	57	*100*	499.25	*100*	201	*100*	1280.61	*100*

... percentages not reported as they are based on very small numbers.

Table 2-IX(a) Distribution of Operators by Tenurial Status, Source of Water Supply and Size of Lowland Operational Holdings - (201 Operators) - 1971/72 Maha

Tenurial Category	Source of Water Supply	Up to 2.00	2.00-4.00	4.00-6.00	6.00-8.00	8.00-10.00	Over 10.00	Total
Owners	Major	11	29	11	2	3	2	58
	Minor	2	16	19	6	3	5	51
	Total	13	45	30	8	6	7	109
Tenants	Major	2	2	1	1	-	2	8
	Minor	-	1	-	-	-	-	1
	Total	2	3	1	1	-	2	9
Owner-tenants	Major	-	1	2	1	-	2	6
	Minor	-	2	2	3	1	2	10
	Total	-	3	4	4	1	4	16
Tenant-owners	Major	-	-	2	3	-	1	6
	Minor	-	3	1	-	-	-	4
	Total	-	3	3	3	-	1	10
Others	Major	-	6	6	2	1	1	16
	Minor	2	7	10	5	3	14	41
	Total	2	13	16	7	4	15	57
All Tenurial Categories	Major	13	38	22	9	4	8	94
	Minor	4	29	32	14	7	21	107
	Total	17	67	54	23	11	29	201

2.11 Tenancy Conditions

Only about 14% of the total lowland extent cultivated by the sample of 201 cultivators was rented in land, worked essentially under the system of ande. *Although there were about 9 pure tenants, almost 24% of the operators cultivated some land on* ande. *In a district where pressure on land is not so high and where encroaching is widely practised the extent of tenancy as reported for the district is significant.*

The economic conditions of a tenant depend to a large extent on his power of negotiation which, among other things, is affected by -

a) the extent of land (lowland and highland) owned by the tenant;
b) the pressure for land in the area, especially for agriculturally productive land;
c) the extent offamily income from non farm sources.

It is also affected by the relationship of the tenant to his landlord and the nature of the landlord himself. The rent paid by the tenant or that demanded by the landlord and the collateral help offered by the latter are all in one way or another affected by this relationship.

In the discussion that follows the total number of tenants reported in the Tables does not tally with the number of tenants reported in the other sections of this report as the tenants have been multiple-counted once for each landlord. This was made necessary owing to the fact that certain tenants had obtained parcels of paddy land from more than one landlord and the arrangements with different landlords had varied considerably.

2.12 Occupation of Landlords

The 174 acres of tenanted paddy land in the sample were owned by landlords who pursued several occupations. As shown in Table 2-X *the majority of landlords (47%) were peasant landlords (farmers). Non-cultivating land owners (4%) were not important in this district.* Temple lands were also absent. However, *almost 30% of the landlords were public servants and traders, the public servants consisting of a larger proportion of the two.*

There was no excessive concentration of paddy lands in the hands of a particular category of landlords, (Table 2-XI). However, there was some inequality between the number of landlords and the amount of land they rented out. For instance, the salaried employees and unsalaried professional workers who constituted 18% of all landlords controlled 22% of all tenanted paddy land. But the 47% of peasant landlords controlled only 38%. These peasant landlords rented out an average of 2.5 acres, whereas the average rented out by the former category was 3.8 acres. It is clear that *sizable extents of village paddy land are being passed into the hands of government servants and traders who are mostly residents of other districts.*

Table 2-X Occupation of Landlords and their Relationship to Tenants

Relationship		Occupational Categories: Salaried Employees and Professional workers	Traders	Land Owners	Farmers	Pensioners	Others	Unspecified	Total *	
		No.	No.	No.	No.	No.	No.	No.	No.	%
1.Friend	No.	4	1	-	6	2	3	2	18	*32*
	%	*22*	*6*	-	*33*	*11*	*17*	*11*	*100*	
2.Neighbour	No.	-	-	-	2	-	-	-	2	*4*
	%	-	-	-	*100*	-	-	-	*100*	
3.Total of 1 & 2	No.	4	1	-	8	2	3	2	20	*35*
	%	*20*	*5*	-	*40*	*10*	*15*	*10*	*100*	
4.Relatives	No.	3	1	1	16	-	1	1	23	*40*
	%	*13*	*4*	*4*	*70*	-	*4*	*4*	*100*	
5.Outsiders	No.	3	4	1	3	-	2	1	14	*25*
	%	*21*	*29*	*7*	*21*	-	*14*	*7*	*100*	
Total	No.	10	6	2	27	2	6	4	57*	*100*
	%	*18*	*11*	*4*	*47*	*4*	*11*	*7*	*100*	

* 4 operators had 2 landlords each and 2 operators had 3 and 4 landlords respectively Information regarding relationship was not available in respect of one landlord

Table 2-XI Distribution of Tenanted Paddy Land according to Occupation of Landlord

			Salaried Employees & Prof.workers	Traders	Landowners	Farmers	Pensioners	Unspecified	Others	Total *
Landlords		No.	10	6	2	27	2	4	6	57
		%	*18*	*11*	*4*	*47*	*4*	*7*	*11*	*100*
Tenanted Paddy Holdings	Total Extent	Acres	37.50	18.75	7.00	66.50	8.50	14.50	21.00	173.75
		%	*22*	*11*	*4*	*38*	*5*	*8*	*12*	*100*
	Average Extent	Acres	3.8	3.1	3.5	2.5	4.3	3.6	3.5	

* 4 operators had 2 landlords each, 2 operators had 3 and 4 landlords respectively. Information regarding relationship to tenant of one operator was not available.

2.13 Residence of Landlords

Absentee landlordism is of considerable importance in the district. Only 43% of the landlords lived in the same village where the land given on *ande* was located. The rest were from outside the village. Some of those living in the same district were from neighbouring villages but more than half lived outside a radius of 10 miles. The above picture suggests that *absentee landlordism is an important feature in the tenurial structure of the district particularly when one considers the fact that 28% of the landlords lived outside the district. Most of such landlords were from distant places like Jaffna, Colombo and so on.* Almost all the tenants of such absentee landlords paid a fixed rent.

Table 2-XII Residence of Landlord

	All Landlords		Landlords Receiving half share as rent		Receiving a fixed rent	
	No.	%	No.	%	No.	%
Same village ..	25	*43*	19	*68*	6	*21*
Same district ..	16	*29*	3	*11*	13	*46*
Outside district	15	*28*	6	*21*	9	*32*
Total ..	56	*100*	28	*100*	28	*100*

* Excludes 2 landlords for whom the mode of payment of rent was not mentioned.

When the landlord is a resident of the village itself or is from a neighbouring village, he generally takes a direct interest in the land particularly by providing some collateral help to the tenant. *The majority of landlords living within the village also received half the share of the crop (Table 2-XII). Landlords who received a fixed rent were mostly absentees* who often lived outside the district and some in distant places.

2.14 Relationship of Landlords to Tenants

The landlord-tenant relationship has an important bearing on the tenant's situation particularly with regard to the rent paid, the collateral help received and the extent of security enjoyed by the tenant. Details of this relationship are presented in Table 2-X. *75% of the landlords were either friends, neighbours or relatives. Relatives constituted the most important category (40%) of landlords.*

Nearly 60% of the peasant landlords were family relatives including kinship ties in tenancy arrangements of the purana *village. Almost 67% of the trader landlords were reported to be outsiders and the salaried employees and unsalaried professionals who constituted the second most important landlord class were mostly mentioned as friends and relatives.* Only 30% of them were reported as outsiders.

2.15 Landlords' Contribution to Tenants

Only about 1/3 of the tenants received any collateral help (seed paddy, fertiliser, etc.) *from their landlords* (Table 2-XIII). Although a greater proportion of the category of tenants with encroachments benefited from such collateral help, only a few pure tenants had access to such help.

Table 2-XIII Landlords' Contribution to Tenants

	Tenant	Owner-tenant	Tenant-owner	T,OT and TO with encroachments	Total
Total No.of tenants	13	19	12	14	58
No.receiving collateral help ..	1	8	3	7	19
% receiving collateral help ..	*8*	*42*	*25*	*50*	*33*

There was a close relationship between the form of land rent paid and the extent of collateral help received by the tenants. Those who paid a fixed rent did not receive any such help. This was true of all tenants paying a fixed rent irrespective of their relationship to the landlord. However, almost 70% of the tenants paying half crop share received at least one input from their landlords, here again irrespective of the relationship to the landlords. The relatives however, contributed more inputs than others (Table 2-XV). The different input combinations provided by the landlords to their tenants paying half share of produce are shown in Table 2-XIV.

Table 2-XIV Landlords' Contribution to Tenants Paying Half Share of Produce as Rent

	Landlords who contributed No.
Total	19
Seed only	1
Fertiliser only	1
Seed + ploughing expenses	7
Fertiliser + tractor charges	1
Agro-chemicals + tractor charges	2
Seed + fertiliser + tractor charges	2
Seed + fertiliser + agro-chemicals	2
Seed + agro-chemicals + tractor charges.. ..	2
Seed + fertiliser + agro-chemicals + ploughing expenses	1

Table 2-XV Relationship to Landlords and Nature of Collateral Help Received by Tenants Paying Half Share

Relationship	Tenants who pay half the produce as rent: Total	Tenants who receive: One input	More than one input	No inputs
Friends ..	4	1	2	1
Neighbours ..	1	-	-	1
Relatives ..	15	-	11	4
Others ..	7	1	4	2
Total ..	27 *	2	17	8
%	*100*	*7*	*63*	*30*

* Information about the relationship of landlords was not available in respect of one operator.

Seed paddy and ploughing expenses (mostly cost of tractors) were the two most important inputs supplied by the majority (75%) of the landlords offering collateral help. Fertiliser and agro-chemicals were provided only by a small number. *Very few landlords provided more than 2 inputs.*

2.16 Land Rent Paid by Tenants

The predominant forms of land rent paid by tenants to their landlords were the fixed rent and the half share of produce. The two types of rents were paid by almost an equal proportion of tenants. Almost all the pure tenants paid a fixed rent, and a greater proportion of owner tenants and tenants with encroachments paid half share of produce to their landlords.

Among those who paid a fixed rent nearly 74% paid 6 bushels per acre. Only a few paid a fixed rent of 7-9 bushels per acre. 25% paid the rent in cash which amounted in many cases to between Rs.100/- to Rs.125/- per acre per season. The fixed rent in cash was more a 'lease' rent for land than a rent based on production on the *ande* system.

Among the tenants who paid half the produce the largest number of landlords (56%) were relatives from whom many tenants (73%) received more than one input as collateral help. Of the tenants who rented in land from friends, neighbours and even from outsiders paying half share, the majority (over 70%) got at least one input from their landlords as collateral help (Table 2-XV).

Table 2-XVI Land Rent Paid by Tenants

Tenurial Category		Fixed rent (cash or kind)	1/2 Produce	1/4 produce	1/5 produce	Total
Tenants	No.	11	1	-	1	13
	%	*85*	*8*	-	*8*	*100*
Owner-tenants	No.	6	13	-	-	19
	%	*32*	*68*	-	-	*100*
Tenant-owners	No.	7	5	-	-	12
	%	*58*	*42*	-	-	*100*
Tenants, Tenant-owners, Owner-tenants, with encroachments	No.	4	9	1	-	14
	%	*29*	*64*	*7*	-	*100*
Total	No.	28	28	1	1	58
	%	*48*	*48*	*2*	*2*	*100*

A noteworthy feature emerging from the pattern of rent payment prevalent in the district is the almost equal importance of fixed rent and half share. The fact that almost 50% of the tenants still continue to pay half share of the produce indicates that the rent regulation provisions of the Paddy Lands Act have been ineffective.

In Anuradhapura, land is not scarce as in the wet zone districts. Encroaching on crown land is relatively easy and it is in fact being widely practised by almost all cultivators; tenants as well as owners. The general conditions that make it imperative for cultivators in the wet zone district to pay half share of produce as rent are the high demand for land, close kinship and social obligations in tenant-landlord relationship and dependence of tenants on landlords for collateral help. On examination of the data, it is found that though there is some association between receipt of collateral help and payment of half share as rent, this alone cannot explain the reasons for payment of high rent. Kinship ties and social obligations seem to play no part in determining the rate of payment. 66% of the tenants in the minor schemes paid half share of produce as rent, while 33% paid this rent in the major schemes. *Though land per se is not scarce in this district there is definitely a dearth of productive land especially for paddy cultivation. The productivity of paddy lands is directly related to the availability of an assured supply of water. Lands with assured supply of water are very limited in the Purana villages served by small tanks and the demand for such land is also very high. The land rent therefore continues to be very high for such land. This explains the high prevalence of payment of half share of produce as land rent.*

17 Attitude of Tenants to Rents paid

Almost all the tenants in the sample paid either a fixed rent or half share of produce. In the case of the half share the burden of the rent on the tenant is closely tied up with the amount of collateral help provided by the landlord and the attitude of the tenant to this type of rent depends on several factors such as his relatipnship to the landlord, the landlord's economic situation, competition for land among tenants in the area and so on.

Surprisingly, *over 85% of the tenants paying half share of produce reported that the rent they pay is fair.* Even those who received less than one input, (the majority in this category had received no inputs) felt that the rent was not excessive. As mentioned earlier, productive land with assured water is in short supply in this district. This is why even a larger number of tenants with encroachments and some with owned land and encroachments paying half share of produce considered the rent as fair. *In an environment of uncertainty where agriculture is dependent essentially on the rains, a plot of land with assured water forms a secure source of income. The majority of tenants who paid half share of produce would have cultivated such productive paddy lands. However, if the rent regulation provisions of the Paddy Lands Act have been effective enough to protect the tenants it is doubtful whether even under such circumstances many tenants would have considered half share as reasonable and continued to pay it.*

Table 2-XVII Attitude to Rent of Tenants who Paid Half Share of Produce and Fixed Rent *

Attitude to Rent	Tenant	Owner-tenant	Tenant-owner	T, TO, OT with encroachments	Total
Fair	-	9	5	9	23
Excessive	1	3	-	-	4
Total	1	12+	5	9	27+

* Tenants who had more than one landlord have been multiple-counted once for each landlord

\+ One operator did not respond

Table 2-XVII (a) Attitude of Tenants to Rents Paid in Cash or in Kind

Attitude to rent	Total	
	Cash	Kind
Fair	2	10
Excessive	1	10
Total	3	20++

++ 10 operators did not respond.

Among those who paid a fixed rent in kind (mostly 6 bushels/acre) almost 50% said it is fair, while the remaining 50% considered it to be excessive. Although 6 bushels/acre appears to be a very reasonable rent, it is clear that where land is frequently subjected to crop failure, the tenant paying a fixed rent without the benefit of any collateral help is placed at a disadvantageous position than if he paid a share of produce. When the risk element is high the fixed rent *per se* is often a disadvantage to the tenants. They would certainly have been better placed if they could pay 6 bushels/acre or 1/4 of produce as stipulated in the Paddy Lands Act.

Table 2-XVIII Security of Tenure by Category of Tenant

Tenurial Category	No. who stated that their rights were:			No. not responded	Total
	Secure No.	Not Secure No.	Doubtful No.	No.	No.
Tenants	11	-	2	-	13
Owner-tenants ..	3	12	1	3	19
Tenant-owners ..	4	3	4	1	12
Tenants, Tenant-owners, Owner-tenants, with encroachments ..	7	4	2	1	14
Total ..	25	19	9	5	58
% ..	*43*	*33*	*16*	*9*	*100*

An attempt was made in this survey to collect detailed information on the question of security of tenure. However, a few comments may be made from the data available. *Less than half the number of tenants felt that their tenancy rights were secure. However, almost all of those who paid a fixed rent*[1] *of 6 bushels per acre were certain of their* ande *security.* It is difficult to say whether they considered their tenancy to be secure on the strength of the Paddy Lands Act or because their land was of low productivity that it was not in high demand and therefore the potential danger of eviction was low.

However, many of the owners of such lands were absentee landlords who do not exercise a direct control over the tenants. Hence *it is possible that reasons other than the strength of the Paddy Lands Act have been more important in giving the tenants paying a fixed rent an apparent security of their tenancy. This is more or less confirmed when one considers the attitude of the tenants who paid half share of the produce. Here less than 30% of the tenants even after paying half share of produce as rent and in spite of the fact that their landlords are mainly relatives felt that the tenancy rights were secure.* As mentioned above, *when the demand for productive land is high even where land* per se *is not a scarce factor, tenancy conditions tend to be dominated by insecurity and high rents and whatever legislative provisions that exist to protect the tenants from eviction and to reduce the rents become ineffective.*

Table XIX Security of Tenure by Rent Paid

Tenurial Category		Number who stated that their rights were:			No. not responded	Total
		Secure	Not Secure	Doubtful		
Paying half share of produce	No.	8	13	5	2	28
	%	*29*	*46*	*18*	*7*	*100*
Paying fixed rent	No.	16	6	3	3	28
	%	*57*	*21*	*11*	*11*	*100*
Total	No.	24	19	8	5	56
	%	*43*	*34*	*14*	*9*	*100*

[1]Those who paid a cash rent were really not tenants but lessees.

2.18 Need to Cultivate More Land on *Ande*

A little more than half the number of tenants indicated their desire to cultivate additional land on ande. There was however no direct relationship to the size of the operational holding which may be due to unequal productivity potential associated with different holdings in relation to water supply, location, etc.

Table 2-XX Tenants willing to Cultivate more Land on *Ande*

Size of Holding (acres)	Paying half share			Paying fixed rent		
	Total No.	Willing to cultivate more land No.	%	Total No.	Willing to cultivate more land No.	%
Up to 2.00	-	-	-	2	2	*100*
2.00 - 4.00	8	5	*63*	3	2	*67*
4.00 - 6.00	10	6	*60*	5	2	*40*
Over 6.00	10	7	*70*	18	6	*33*
All Size Classes	28	18	*64*	28	12	*43*

The reasons why even those who operated holdings over 6 acres desired to cultivate more land on ande *is the dearth of productive land in* purana *villages and the need to cultivate land with assured water to guarantee a good yield.*

This also shows that the pressure on land with assured water is quite acute in these areas.

Chapter 3

CO-OPERATIVES AND CREDIT

3.1 Membership in Co-operatives

93% of the respondents were members of co-operative societies at the time of interview. Among non-members the most important reason given for not being members was the lack of adequate information about co-operatives. Other important reasons are mismanagement of co-operatives, recent settlement of the respondents in the area and the possibility of deriving more benefits from private sources.

Table 3-I Reasons for Not Being Members of the Co-operative

Reasons	Non-members No.
No knowledge of the Co-operative Society ..	7
Mismanagement of Co-operative	4
Have settled in the village recently	2
Derive more benefits from private traders ..	1
Landlord is a member of Co-operative	1
It is impossible to buy consumer goods on loan basis	1
Have not yet received the deeds from the Co-operative	1
Total	17

3.2 Provision and Utilisation of Co-operative Services

Respondents were asked a general question as to whether they were aware of the types of services usually provided by the co-operatives and whether they actually made use of them. This has been examined with reference to their size of land holding and tenurial status. *The smallest operators seem to benefit less from certain services provided by the co-operatives.*

It appears from Table 3-II that *the smallest land size class, i.e. up to 2 acres made less use of cultivation loans and certified seed paddy supply.* The largest land size class above 10 acres also made less use of such services.

Table 3-II Number of Respondents giving information about the Services Provided by the Co-operatives and making use of them

(Classified by size of lowland holdings)

Type of Service		Up to 2.00 acres		2.00-4.00 acres		4.00-6.00 acres		6.00-8.00 acres		8.00-10.00 acres		Over 10 acres		All holdings	
		Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised
Cultivation loans	No.	16	9	62	39	44	28	17	12	9	8	24	12	172	108
	%	*56*		*63*		*64*		*71*		*89*		*50*		*63*	
Certified seed paddy	No.	11	4	48	23	35	13	11	3	8	3	15	5	128	51
	%	...		*48*		*37*		...		...		*33*		*40*	
Subsidised Fertiliser	No.	17	11	63	46	46	32	20	17	10	7	28	22	184	135
	%	*65*		*73*		*70*		*85*		...		*79*		*73*	
Agro-chemicals	No.	17	11	65	51	48	31	19	17	11	8	24	22	184	140
	%	*65*		*79*		*65*		*89*		...		*92*		*76*	
Marketing of paddy	No.	16	16	67	63	54	48	22	21	11	10	27	26	197	184
	%	*100*		*94*		*89*		*95*		*91*		*96*		*93*	
Other Facilities	No.	9	4	42	29	21	20	4	4	6	6	15	15	97	78
	%	...		*69*		*95*		...		...		*100*		*81*	

... percentages not reported as they are based on small numbers.

A slight difference is also seen in the case of the utilisation of subsidised fertiliser and of agro-chemicals by the smallest land size classes. In marketing of paddy to the co-operatives no differential behaviour is seen between the largest and the smallest land size classes.

The different tenurial categories also demonstrate a fairly important gap in the utilisation of cultivation loans. *Owners generally avail themselves more of co-operative services.* The difference between the owner and the tenant is also significant in the utilisation of certified seed paddy. The utilisation of certified seed paddy among the owners is comparatively greater than that among the tenants.

Table 3-III Number of Respondents giving Information about the services provided by the Co-operatives and making use of them

(Classified by Tenurial Categories)

Type of Service		Owners		Tenants		Owner-tenants		Tenant-Owners		Other arrangements		Total	
		Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised	Provided	Utilised
Cultivation loans	No.	94	64	9	3	13	8	8	3	48	30	172	108
	%	*68*		...		...		...		*62*		*63*	
Certified seed paddy	No.	71	29	6	1	10	3	5	3	36	15	128	51
	%	*41*		...		...		...		*42*		*40*	
Subsidised Fertiliser	No.	99	69	9	8	14	13	10	6	52	39	184	135
	%	*70*		...		...		...		*75*		*73*	
Agrochemicals	No.	100	76	8	5	15	13	10	5	51	41	184	140
	%	*76*		...		...		...		*80*		*76*	
Marketing of paddy	No.	108	100	8	8	16	16	10	8	55	52	197	184
	%	*93*		...		...		...		*95*		*93*	
Other Facilities	No.	51	39	4	2	8	8	4	2	30	27	97	78
	%	*76*		...		...		...		*90*		*81*	

... percentages not reported as they are based on small numbers.

3.3 Indebtedness

46% of the respondents had borrowed during Maha 1971/72 (Table 3-IV). *The proportion of borrowers was the smallest (38%) for owner operators.* Among other tenurial categories (except for the 9 tenants of whom 44% borrowed) the percentage of borrowers ranged from 50-60%.

There is heavy dependence on private sources for credit. The largest proportion of borrowers (58%) relied on such sources for their loans. However, 34% borrowed from institutional sources only. Only 21% borrowed entirely from the co-operative and another 7% from co-operatives and private sources. If all sources of institutional credit are taken together, then we see from Table 3-IV that more owners borrow from such sources than others. Tenants and tenant-owners borrow least. The owner-tenants and others (among whom the majority are owners with encroachments) also borrow more from insitituional sources than tenants and tenant-owners. *The tenants and tenant owners with little or no owned land seem to be handicapped by their lower socio-economic status to benefit fully from the institutional sources of credit.*

Table 3-IV Number of Sources from which Cultivators borrow according to Tenurial Category - Maha 1971/72

Tenurial Category	No.of Operators	All Sources		Co-op only		One Private source only		Co-op.& private source only		More than one private source		Co-op and Bank		Bank only		Bank* and Private source	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Owners	109	41	38	10	24	21	51	3	7	1[1]	2	1+	2	4+	10	1	2
Tenants	9	4	...	1	...	2	...	1	...	-	-	-	-	-	-	-	-
Owner-tenants	16	8	50	2	25	5	62	-	-	-	-	-	-	-	-	1	13
Tenant-owners	10	6	...	1	...	4	...	1	...		-	-	-	-	-	-	-
Others	57	33	58	5	15	20	61	1	3		-	-	-	7+	21	-	-
Total	201	92	46	19	21	52	57	6	7[f]	1	1	1+	1	11@	12	2	2

... percentage not reported as they are based on very small numbers.

* People's Bank and the Rural Bank

[1] One operator borrowed from 3 private sources

+ Includes one operator who borrowed from the Rural Bank

@ Includes two operators who borrowed from the Rural Bank

[f] The number of loans is 7

Table 3-V Amount of Loans according to Source of Loan and Tenurial Category of borrower - Maha 1971/72

Tenurial Category		Source of Loan				All Sources			
		Co-op and Bank	Money Lender	Landlord	Traders	Friends & Relatives	Total	No. of borrowers	Average per borrower
Owners	Rs.	12,742	1,700	110	2,410	7,060	24,022	41	586
	%	*53*	*7*	*1*	*10*	*29*	*100*		
Tenants	Rs.	634	-	-	5,500	300	6,434	4	1,608
	%	*10*	-	-	*85*	*5*	*100*		
Owner-tenants	Rs.	960	-	-	1,290	1,500	3,750	8	469
	%	*26*	-	-	*34*	*40*	*100*		
Tenant-owners	Rs.	1,500	1,600	-	1,000	642	4,742	6	790
	%	*32*	*34*	-	*21*	*13*	*100*		
Others	Rs.	4,495	725	-	1,375	8,690	15,285	33	463
	%	*30*	*5*	-	*9*	*56*	*100*		
Total	Rs.	20,331	4,025	110	11,575	18,192	54,233	92	589
	%	*37*	*7*	..	*21*	*33*	*100*		

.. Less than 1%

A few of the agricultural operators borrowed from more than one private source. The tenants have borrowed only from Co-operatives and private sources.

Out of a total of Rs.54,233/-, Rs.20,331/- or 37% was borrowed from the Co-operatives during 1971/72 Maha alone. This amount constitutes the highest proportion of loans obtained from various sources, though loans taken from all other sources taken together are almost twice as high as the total co-operative loans. Friends and relatives constituted 33% of all loan sources while traders and money lenders together provided 28% of all loans which is very substantial.

Taking all tenurial categories together, the average size of loan per borrower is Rs.589/-.

Loans from Co-operatives accounted for a larger proportion of borrowings for owners (53%) than for other groups, the corresponding percentage for other groups being 10% for tenants,26% for owner-tenants, 32% for tenant-owners and 30% for 'others'. Tenants and tenant owner groups have borrowed little from friends and relatives compared with other categories. Tenants were very heavily indebted to traders.

Table 3-V(a) shows a close relationship between the average amount of loans from all sources and the size of land holdings irrespective of different tenurial groups. *The average amount of loan increases with the increasing size of land holdings with the exception of over 10 acres land size class.* The highest amount of loan was borrowed by the 8-10 acre land size class, while the lowest average amount of loan was borrowed by the up to 2 acre land size class. *The extent of land operated seems to determine the amount of credit obtained.*

The average amount of co-operative loan borrowed during Maha 1971/72 per borrower increased with the increasing size of holding (Table 3-VI)[1]. The average amount of co-operative loans obtained per borrower of over 10 acre land size class was, however, Rs.275/- during this season (see Table 3-VI).

The Co-operative loans per borrower for the overall operational holding was Rs.495/- (both old and current loans). *Among all borrowers during Maha 1971/72 there were twenty-six who received an amount of Rs.10,561/- from co-operatives and there were ninety-nine operators who could not obtain co-operative loans during Maha but had outstanding loans amounting to Rs.51,307/- from the same source. A large percentage of borrowers (of current, old or both loans) were farmers with holdings of 2-4 acres or 4-6 acres in extent and those groups of borrowers were also those who obtained the bulk of the loans.*

The land size class 4-6 acres accounted for the largest proportion of current borrowings (Maha 1971/72) while the highest proportion of old loans was taken by the 2-4 acre size class.

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[1]Operators of 8-10 acre holdings did not borrow from the Co-operative during this season. They obtained loans only from the Bank.

Table 3-V(a) Amount of Loans according to Size of Holding and Source - Maha 1971/72

Size of holding (acres)		Source of Loan					All Sources		
		Co-op & Bank	Money Lender	Landlord	Traders	Friends and Relatives	Total	No. of borrowers	Average per borrower
Up to 2.00	Rs.	310	-	-	300	250	860	4	215
	%	*36*	-	-	*35*	*29*	*100*		
2.00 - 4.00	Rs.	5,266	1,100	-	950	3,082	10,398	30	347
	%	*50*	*11*	-	*9*	*29*	*100*		
4.00 - 6.00	Rs.	5,175	1,325	-	2,710	3,260	12,470	27	462
	%	*42*	*11*	-	*22*	*26*	*100*		
6.00 - 8.00	Rs	2,650	1,600	110	1,275	2,275	7,910	14	565
	%	*34*	*20*	*1*	*16*	*29*	*100*		
8.00 - 10.00	Rs.	5,000*	-	-	-	6,425	11,425	6	1,904
	%	*44*	-	-	-	*56*	*100*		
Over 10.00	Rs.	1,930	-	-	6,340	2,900	11,170	11	1,015
	%	*17*	-	-	*57*	*26*	*100*		
Total	Rs.	20,331	4,025	110	11,575	18,192	54,233	92	589
	%	*37*	*7*	..	*21*	*33*	*100*		

.. Less than 1%

*One operator obtained a loan of Rs.5,000 from the Peoples Bank

Table 3-VI Loans from Co-operatives Classified as Current or Old Loans and Size of Operational Lowland Holdings of Borrower

	Size of Lowland Holdings (acres)						
	Up to 2.00	2.00-4.00	4.00-6.00	6.00-8.00	8.00-10.00	Over 10.00	Total
Current Loans:							
No.of borrowers ..	2	10	9	3	-	2	26
Amount (Rs.) ..	310	3,566	4,185	1,950	-	550	10,561
Average per borrower	155	357	465	650	-	275	406
Old Loans:							
No.of borrowers ..	5	37	25	11	7	14	99*
Amount (Rs.) ..	1,884	14,455	12,612	6,260	8,350	7,746	51,307
Average per borrower	377	391	504	569	1,193	553	518
All Loans:							
No.of borrowers ..	7	47	34	14	7	16	125
Amount (Rs.) ..	2,194	18,021	16,797	8,210	8,350	8,296	61,868
Average per borrower	313	383	494	586	1,193	518	495

* One debtor who did not state the amount borrowed has been excluded.

3.4 Reasons for Not Borrowing from Co-operatives

Nearly 79% of the respondents did not borrow from Co-operatives during the 1971/72 Maha cultivation season. Of the various reasons given for not borrowing from Co-operatives, outstanding loans to Co-operatives was given as the most important reason.[1] *It accounted for 49% of all the reasons given by non-borrowing respondents.*

The second important reason (23%) was the lack of a need for loans. Other important reasons were, absence of any organisation for granting loans, difficulty of procedure, application not made in time, non-membership of the co-operatives, necessary expenses supplied by the landlord, dislike to be indebted and the surrender rice ration coupons if failed to repay in time.

3.5 Rates of Interest

The rate of interest charged by non-institutional sources ranged from 0% to 140% per annum (though the period of repayment in most cases was less than 1 year). *The average rate of interest was about 38% per annum.*

A large number of borrowings (45) were interest free obtained mostly from friends and relations. Such borrowings consisted of small amounts borrowed on several occasions during the cultivation season. Depending on the type of mutual relationship between the parties and the size of loan borrowed, a rate of interest is charged either in cash or in kind by friends and relatives. This varies from 0% to 120%. *Friends and relatives thus advanced loans without interest as well as with a high interest.* There were three borrowings from money lenders with a high interest rate of 120% and there were fourteen borrowings from the bank. The normal interest rate on loans from People's Bank and Co-operatives varied between 7½% and 9% per annum respectively.

Table 3-VI(a) Borrwers from Co-operatives according to Size of Operational Holdings

Size of holding (acres)	Total No. of Operators	Operators who received Co-op loans during Maha 1971/72		Operators who could not obtain Co-op loans during Maha but had outstanding Co-op loans		Total No. of borrowers	
	No.	No.	%	No.	%	No.	%
Up to 2.00	17	2	*12*	5	*29*	7	*41*
2.00 - 4.00	67	10	*15*	37	*55*	47	*70*
4.00 - 6.00	54	9	*17*	25	*46*	34	*63*
6.00 - 8.00	23	3	*13*	11	*48*	14	*61*
8.00 - 10.00	11	-	-	7	*64*	7	*64*
Over 10.00	29	2	*7*	14	*48*	16	*55*
Total	201	26	*13*	99*	*49*	125	*62*

* 8 operators who had outstanding loans did not mention this as a reason for not being able to borrow from the Co-op.

[1] Of the 92 operators who stated outstanding loans as the reason for not getting loans, 86 mentioned it as the most important reason.

Table 3-VII Repayment of Loans Borrowed during 1971/72 Maha (Loans Classified by Tenurial Category of Borrower, Source and Repayment of Loans)

Tenurial Category		Co-op & Bank		Money Lenders		Landlords		Traders		Friends & Relatives		Total	
		repayment	non repayment	repayment	non repayment	repayment	non repayment	repayment	non repayment	repayment	non repayment	repayment	non repayment
Owners	No.	13	8	1	2	2	-	4	2	13	4	32	16
	%	*62*	*38*	*33*	*67*	*100*	-	*67*	*33*	*66*	*34*	*67*	*33*
Tenants	No.	1	1	-	-	-	-	2	-	1	-	4	1
	%	*50*	*50*	-	-	-	-	*100*	-	*100*	-	*80*	*20*
Owner - tenants	No.	1	3	-	-	-	-	2	3	1	-	4	5
	%	*25*	*75*	-	-	-	-	*40*	*60*	*100*	-	*44*	*56*
Tenant-owners	No.	2	-	2	-	-	-	-	1	1	2	5	3
	%	*100*	-	*100*	-	-	-	-	*100*	*33*	*67*	*62*	*38*
Other arrangements	No.	5	8	2	1	-	-	2	2	11	4	20	15
	%	*38*	*62*	*67*	*33*	-	-	*50*	*50*	*64*	*36*	*57*	*43*
Total	No.	21	19	5	3	2	-	10	8	27	10	65	40
	%	*52*	*48*	*62*	*38*	*100*	-	*56*	*44*	*63*	*37*	*62*	*38*

3.6 Repayment of Loans

Of the total co-operative and bank loans (Rs.20,331/-) borrowed during Maha 1971/72 an amount of Rs.6,154/- or *30% of the total borrowings was not repaid at the time of interview (Table 3-VII). There were 19 borrowers (48%) who were in default of such loans. The amount not repaid as a percentage of total amount borrowed was 23% or Rs.12,660/- out of Rs.54,233/-.* The total number of loans obtained from all sources were 105 and 31 loans of this total were not repaid; thus 8 loans were repaid only partly.

A larger proportion (62%) of owners have repaid their co-operative and bank loans. For other groups non-repayment rate is much higher.

Private sources of credit show a greater recovery rate. 62% of the borrowers from money lenders, 56% from traders and 63% from friends and relatives have repaid their loans. *In the case of private loans, even if the loan is not repaid in full many have at least paid the interest due on them.*

The reasons given for non-repayment of Co-operative Loans obtained during Maha 1971/72 were: crop failure, no pressure for collection of loans by the Co-operatives or Government, and unavoidable family expenses, e.g. sickness, funerals, etc. Ten respondents mentioned crop failure as the most important reason. Three respondents gave unavoidable expenses such as sickness and funerals as the most important reason for non-repayment of Co-operative Loans.

The number of defaulters of Co-operative Loans is as high as 48% of the total number of borrowers. In the case of private loans only 29% defaulted. Although the majority of respondents stated crop failure as the most important reason for non-repayment of co-operative loans, the high rate of repayment of private loans tends to cast some doubt on the validity of this reason especially because none mentioned the fact that they had to settle other debts prior to settlement of co-operative loans. This highlights the necessity for further intensive investigation on the problem of non-repayment of co-operative loans.

APPENDIX I

Reasons for not obtaining loans from Co-operatives according to Tenurial Categories - Maha 1971/72

Reasons for not obtaining Co-operative loans	Owners		Tenants		Owner-tenants		Tenants owners		Other arrange-ments		All Tenurial categories	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.No organisations for loans ..	14	12	1	...	3	18	1	...	8	11	27	12
2.No knowledge about the credit scheme	-	-	-	-	1	6	-	-	1	1	2	1
3.Too difficult procedure ..	11	9	-	-	1	6	-	-	6	8	18	8
4.Not applied in time ..	4	3	-	-	-	-	1	...	5	7	10	4
5.Outstanding loans to Co-op ..	46	39	4	...	6	35	3	...	33	45	92*	41
6.Not interested in NHYVs, etc ..	-	-	-	-	-	-	-	-	1	1	1	..
7.Loans not needed	33	28	3	...	4	24	1	...	12	16	53	23
8.Not a member of co-operative..	1	1	1	...	-	-	-	-	3	4	5/	2
9.Cannot get loan in time ..	1	1	-	-	-	-	-	-	-	-	1	..
10.As they are encroachers ..	-	-	-	-	-	-	-	-	2	3	2	1
11.Necessary expenses supplied by the landlord ..	1	1	-	-	1	6	-	-	-	-	2	1
12.Has to surrender r.r. coupons if failed to repay in time	1	1	-	-	-	-	-	-	1	1	2	1
13.Do not like to be indebted ..	3	3	-	-	-	-	-	-			3	1
14.Other reasons	4	3	1	...	1	6	2	...	1	1	9	4
Total ..	119	100	10	...	17	100	8	...	73	100	227	100

... Percentages not reported as they are based on small numbers

.. Less than 1%

* Only 92 of the 100 farmers who had outstanding loans during 1971/72 Maha stated this reason.

/ Only 5 of the 16 non-members of Co-operatives stated this reason.

APPENDIX II

Reasons for Not Borrowing From Co-operatives during Maha 1971/72

Most important reason for not getting Co-op. loans in Maha 1971/72	Owners		Tenants		Owner-tenants		Tenant-owners		Other arrangements		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.No organisations for loans	11	*12*	1	...	2	...	1	...	3	*6*	18	*10*
2.No knowledge about credit scheme ..	-	-	-	-	-	-	-	-	-	-	-	-
3.Too difficult procedure ..	5	*5*	-	-	-	-	-	-	3	*4*	8	*4*
4.Not applied in time	1	*1*	-	-	-	-	1	...	2	*4*	4	*2*
5.Outstanding loans	44	*46*	3	...	6	...	3	...	30	*59*	86*	*49*
6.Not interested in NHYV, etc.	-	-	-	-	-	-	-	-	1	*2*	1	*1*
7.Loans not needed	27	*28*	1	...	4	...	1	...	6	*12*	39	*22*
8.Not a member of Co-op	1	*1*	1	...	-	-	-	-	3	*6*	5	*3*
9.Cannot get the loan in time ..	-	-	-	-	-	-	-	-	-	-	-	-
10.As they are encroachers ..	-	-	-	-	-	-	-	-	2	*4*	2	*1*
11.Necessary expenses supplied by landlord	1	*1*	-	-	-	-	1	...	-	-	2	*1*
12.Has to surrender coupons if failed to repay in time	1	*1*	-	-	-	-	-	-	1	*2*	2	*1*
13.Do not like to be indebted	2	*2*	-	-	-	-	-	-	-	-	2	*1*
14.Other reasons ..	2	*2*	1	...	2	...	1	...	-	-	6	*3*
Total	95	*100*	7	...	14	...	8	...	51	*100*	175	*100*

... percentages not reported as they are based on small numbers.

* 92 operators who stated outstanding loans as a reason for not getting loans, only 86 mentioned it as the most important reason.

APPENDIX III

Reasons for Non-Repayment of Loans

	No. of operators who had stated reasons for non-repayment					
	Owners	Tenants	Tenant owners	Owner-tenants	Other arrangements	Total
	No.	No.	No.	No.	No.	No.
Reasons for non-repayment of Co-op Loan:						
Crop failure ..	3	1	-	1	4	9
Government loan - debtors not pressed to pay ..	1	-	-	-	-	1
Desire to settle other debts first	-	-	-	-	-	-
Unavoidable expenses owing to sickness, funerals, etc.	1	-	-	-	-	1
Other reasons	2	-	-	-	-	2
Total ..	7	1	-	1	4	13
Most important reasons for non-repayment of Co-op Loans:						
Crop failure ..	3	1	-	1	4	9
Government loan - debtors not pressed to pay ..	-	-	-	-	-	-
Desire to settle other debts first	-	-	-	-	-	-
Unavoidable expenses owing to sickness, funerals, etc.	2	-	-	-	-	2
Other reasons ..	1	-	-	-	-	1
Total ..	6	1	-	1	4	12

Chapter 4

AGRICULTURAL EXTENSION AND COMMUNICATION

4.1 Extension Organisation and Activity

The District Agricultural Extension Officer heads the Extension Organisation with an office at Anuradhapura. He is assisted at district level by an additional District Extension Officer, four Agricultural Instructors and two *Krushikarma Viyapthi Sevakas*.

At divisional level the technical staff consists of Agricultural Instructors and at village level Krushikarma Viyapthi Sevakas deployed as set out below:

Extension Centre	Agricultural Instructors	Krushikarma Viyapthi Sevakas
Shravastipura	1	8
Anuradhapura	1	7
Seeppukulama	1	5
Kebithigollewa	1	8
Medawachchiya	1	8
Kahatagasdigiliya	1	8
Kekirawa	1	8
Nochchiyagama	1	7
Galenbindunuwewa	1	8
Horawupathana	1	5
Eppawela	1	5
Ipalogama	1	5
Thirappane	1	10
Rambewa	1	10

There are four special projects in the district, Rajangana, Padaviya, Dewahuwa and Kagama-Kettiyawa and each project is manned by a Project Manager and a staff consisting of Agricultural Instructors, Colonisation Officers and KVSs.

4.2 Sources and Agencies of Agricultural Information

Data indicates that *the information source that had made the greatest impact on the farmers had been the Agricultural Extension Service.* Among the different techniques used by the Extension Staff the most effective had been their visits to farmsteads. On such visits 81% of the operators had got general information on agriculture, while around 60% had obtained advice on fertiliser use and NHYVs.

Table 4-I Coverage of Different Sources and Agents of Agricultural Information

Source/Agent	General Agricultural Information		Adoption of NHYVs No. of farmers reporting		Fertiliser Recommendations for NHYVs No. of farmers Reporting	
	No.	%	No.	%	No.	%
	196	*100*	35	*100*	34	*100*
Extension personnel visiting farmer ..	158	*81*	21	*60*	20	*59*
Farmer visiting extension centre ..	58	*30*	9	*26*	2	*6*
Farm neighbours ..	87	*44*	14	*40*	2	*6*
Farmer training classes	33	*17*	5	*14*	3	*9*
Demonstration plots ..	54	*28*	8	*23*	-	-
Advisory leaflets ..	54	*28*	8	*23*	*4*	*12*
Radio programmes ..	33	*17*	7	*20*	-	-
Agricultural film shows	50	*26*	3	*9*	-	-
Newspaper articles ..	-	-	1	*3*	-	-
Visiting Department of Agriculture farms..	14	*7*	-	-	-	-
Other sources ..	12	*6*	1	*3*	3	*9*

No.of non-respondents = 5
Total No.of non-respondents = 1
Total No.of operators = 201
Total No.of operators who adopted NHYVs = 35

Next in order of coverage for general information had been the farm neighbours. Advisory leaflets, agricultural film shows and demonstration plots too had been effective in disseminating general information. In effecting the change *to new high yielding varieties, farm neighbours (40% as against extension personnel 60%) have emerged as the second most influential source. This tendency points to the possibility of using more of progressive farmers to supplement the extension effort in certain field programmes.* Use of 'Minikit' and 'Production kit' programmes of the Department of Agriculture on a wider scale could help to expose a greater proportion of farmers to new information on paddy in a relatively shorter period of time as these programmes are conducted in farmers fields. Even in the case of fertiliser recommendations for new high yielding varieties, personal visits of the extension staff had been the most effective. *In the dissemination of information of a technical nature like fertiliser recommendations, demonstration plots which are expected to play a major role had not been effective as not a single operator had been exposed to them.*

4.3 Extension Contact Score

An extension contact score was used to measure the number of contacts between farmers and extension services. The score, one to each source

refers to the number of sources with which a farmer had contact in Yala 1972.

Types of Contact

1. Visits to Extension Centres
2. Visits by Extension Personnel
3. Farmer Training Classes
4. Demonstration Plots
5. Advisory leaflets (farmers who reported reading leaflets were included)
6. Radio programmes (farmers listening to radio programmes were included)
7. Agricultural film shows

Table 4-II Extension Contact Score - Yala 1972

Contact level	Contact Score	Operators No.	Operators %
L o w	(0	7	*9*
	(1	9	*12*
	(2	12	*16*
	(3	11	*14*
Medium	4	10	*13*
High	(5	16	*21*
	(6	6	*8*
	(7	6	*8*
Total		77	*100*

Only 8% of the farmers had all seven types of contacts, while 9% of them had no contacts at all (Table 4-II). Farmers were classified into "Low', 'Medium' and 'High' groups according to the contact score. A score of 0-3 was classed as low and a score of 4 as medium and those over a score of 4 were classed in the high group.

51% of the farmers were in the 'Low' group. The overall contact score was 3.4.

Table 4-III Distribution of Respondents by Use of Contact Method - Yala 1972

No. of respondents = 77 *(100%)*

Method	Respondents who Used the Method of Contact No.	%
Personal Contact:		
Visited extension centre	38	*49*
Visited by extension personnel	42	*55*
Attended farmer training classes	19	*25*
Impersonal Contact:		
Had seen demonstration plots	42	*55*
Had read advisory leaflets	35	*45*
Listening to radio programmes	44	*57*
Had seen agricultural film shows	41	*53*

The distribution of farmers in terms of extension contacts during the season indicates that personal visits of extension staff had the highest frequency of use with 55% of the farmers reporting this type of contact. On the other hand 49% of the operators had visited extension centres. Radio programmes had been a very effective impersonal method of contact closely followed by demonstration plots and film shows. Generally around half the number of operators had been exposed to almost all the contact methods other than the farmer training classes. *The training classes had been relatively ineffective in this respect.*

4.4 Farmer Contacts with Extension Services

Table 4-IV Farmer Contact with the Extension Centre

Method	Operators No.	Operators %
	(77)	*(100)*
A. Awareness and visits made to Extension Centres:		
No.of farmers who knew the location of the Extension Centre	61	*79*
No.of farmers who visited it in 1972 Yala	38	*49*
B. Reasons for visiting Extension Centres:		
To buy seed paddy	14	*37*
To buy other inputs	9	*24*
For advice in general	10	*26*
Others	5	*13*
Total No.of farmers who gave reasons for visiting	38	*100*

It is gratifying to find that 79% of the operators had been aware of the location of the extension centres while 40% had actually visited them. *The principal reasons for such visits had been to purchase seed paddy and other inputs. Only 26% had visited the centres to obtain general advice on agricultural problems. Since the issue of certified seed paddy is almost exclusively handled through the extension services, the staff at these centres get many opportunities to establish a dialogue with farmers during these visits. Such opportunities could be effectively used by the extension personnel to pass on information on technical matters to farmers in addition to supplying them with inputs.*

Table 4-V Farmer Relationship with Extension Personnel

Method	Operators No.	Operators %
	(77)	*(100)*
Farmers visited by Extension personnel in Yala 1972	43	*55*
Visits made in Yala 1972 - total No.of visits	43	
Visits made in Yala 1972 - on request of farmer	9	
Visits made in Yala 1972 - on their own initiative	34	
Average No.of visits/farmers visited	1	
Farmers who preferred more visits	77	*100*
Farmers who knew how to contact KVS if needed	60	*78*
Farmers who knew him by name	28	*36*

During Yala 1972, 55% of the farmers had been visited by extension staff and 80% of such visits had been made on their own initiative. *Nearly every one of the operators in the sample had preferred more visits by extension personnel. This preference for more individual visits involve two difficulties: (a) the area or number of farm families that an extension worker has to cover; (b) the problem of transport particularly in rural areas. Considering the large number of farm families (700-1000) a village level extension worker has to service and relatively poor public transport facilities in rural areas it is not feasible for extension staff to increase visits to individual farmers in the present situation. The fact that 36% of the operators knew the KVS by name and 78% how to contact him gives rather an encouraging picture of the relationship between farmers and extension personnel in this district.*

Table 4-VI Farmer Training Classes - Yala 1972

Method	Operators No.	Operators %
Total number of farmers	77	100
Farmers who attended training classes	19	25
Farmers who attended training classes and indicated usefulness	16	21
Farmers who did not attend training classes.. ..	58	75
No.of farmers who gave reasons for not attending ..	54	70
Reasons for not attending:		
Did not know about them	46	60
Not convinced of their benefits	2	3
Place was too far	1	1
Too much work in the farm	6	8
Household problems	-	-

The proportion which attended training classes during the Yala season is relatively low (25%). However, a great majority of them had indicated the usefulness of these classes. *The poor response to these training programmes is not surprising as almost 60% of those who had not attended these classes had not known about them. Since these training classes are an important aspect of extension work it is desirable to give more publicity about them in future. If training classes are arranged at the village level rather than at farmer training centres more are likely to attend them.*

Of the 55% who had viewed demonstration plots all except 6% had indicated their usefulness. Among those who had read advisory leaflets 27% were able to mention the names of the documents they had read. Advisory leaflets on chillie appeared to be popular probably because it is a major crop in the peasant sector that gives a very high rate of return. Cultivation of this crop is now being undertaken on a very large scale on highlands due to the very attractive prices fetched in the open market.

Table 4-VII Demonstration Plots - Yala 1972

Method	Operators No.	%
No.of respondents	77	100
Farmers who had seen demonstration plots	42	55
Farmers who had seen and indicated usefulness ..	38	49
Advisory Leaflets:		
No.of respondents	77	100
Farmers who read advisory leaflets	35	45
Farmers who read advisory leaflets and indicated usefulness	32	42
Farmers who mentioned the name of a document they read:	21	27
(a) *Govikam Sangarawa* 4		
(b) Fertiliser 3		
(c) Chillies 10		
(d) Other crops 3		
(e) Others 1		

Table V-III Radio Programmes and Agricultural Film Shows - Yala 1972

Radio Programmes	Operators No.	%
No.of respondents	77	100
Farmers who listen to radio programmes	44	57
Farmers who listen to radio at home	33	43
Farmers who listen to radio at the Community Centre..	-	-
Farmers who listen to radio at the village boutique..	5	6
Farmers who listen to radio at neighbours houses ..	6	8
Farmers who indicate usefulness of these programmes..	44	57
Farmers who could give the name of a recent broadcast:	29	38
Tharuna Govi Samaja Tharangaya .. 11		
About other crops 16		
About New High Yielding Varieties .. 1		
Others 1		
Film Shows:		
No.of respondents	77	100
Farmers who had seen agricultural film shows during Yala 1972	41	53

53% of the farmers had seen agricultural film shows during Yala 1972.

57% of the farmers had listened to radio programmes and all of them indicated their usefulness. Of them 38% were able to indicate the names of a recent broadcast. Programmes on 'other field crops' and the Young Farmers' Club Radio Quiz (*Tharuna Govi Samaja Tharangaya*) appeared to be popular.

Chapter 5

MANAGEMENT PRACTICES

Anuradhapura with an asweddumised extent of approximately 180,000 acres[1] is a premier paddy producing district. This entire paddy acreage falls exclusively in the dry zone. Of this 34% is under major schemes and 59% under minor schemes. A striking feature of paddy cultivation is that much of it depends on a net work of small village tanks scattered throughout the district. These village tanks, as well as the major tanks including Padaviya, in turn rely almost exclusively on the onset of monsoon rains to obtain their water. The 107,000 acres described as coming under minor irrigation schemes are *de facto* dependent on rains. Successful paddy production in the district is largely governed both by the timely arrival and the distribution of monsoon rains. Another important feature is the favourable man/land ratio of paddy lands. 24% of the holdings are above 5 acres and cover an area of nearly 47% of the asweddumised extent. The percentage of holdings under 2½ acres is around 36% and this size group accounts for only 13% of the asweddumised area.[2] In this context, it is evident that the major constraint to paddy production in the district is really the uncertainty of water.

5.1 Duration of Sowing Operations

During Maha season of the 201 operators only 157 were able to indicate the exact month of sowing (Table 5-I).

Table 5-I Distribution of Operators according to Time of Sowing and Water Supply during Maha 1971/72*

Month of Sowing	Major Irrigation	Minor Irrigation	Total	
	No.	No.	No.	%
September	9	9	18	*11*
October	6	9	15	*10*
November	36	27	63	*40*
December	28	17	45	*29*
January	5	7	12	*8*
February	-	4	4	*3*
Total	84	73	157	*100*

* Information relates to only 157 of the 201 operators who cultivated in Maha 1971/72. Operators who reported crop failure and operators who had reported sowing at two different times have been excluded.

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[1] Department of Census and Statistics (1972)

[2] Census of Agriculture (1962)

As both minor and major schemes depend on monsoon rains, the duration of sowing under them appears to follow a similar pattern. The main sowing season extends from October to December, with a modal concentration in November. Since North-East monsoon rains generally commence in early October, completion of sowing by the end of November would help to make better use of rain water stored in tanks during Yala (dry season) when water becomes really scarce.

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

Table 5-II Paddy Cropping Intensity in Maha 1971/72 and in Yala 1972

Water Supply	No. of operators	Area available for cultivation during each season (acres)	Extent Cultivated (acres)			Cropping Intensity		
			Maha 1971/1972	Yala 1972	Year 1971/1972	Maha 1971/1972	Yala 1972	Cultivation Year 1971/72
Major Irrigation	94	587.95	479.06	241.06	720.12	81.5	41.0	122.5
Minor Irrigation	107	758.25	633.01	59.63	692.64	83.5	7.9	91.4
Total	201	1,346.20	1,112.07	300.69	1,412.76	82.6	22.3	104.9

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

Generally 60%-80% of the asweddumi ed paddy land in Maha and about 30% in Yala is cultivated. In the year 1971/72 due to unfavourable weather conditions experienced Yala cultivation in particular had suffered considerably. The very low cropping index of 91% under minor irrigation schemes is primarily due to the failure of South West monsoon rains in 1972. The susceptibility of paddy cultivation to the vagaries of the monsoons is amply highlighted by the low overall cropping index of 104%.

A very low cropping intensity generally implies that a high proportion of cultivable paddy lands remain idle during a greater part of the year. In such a context there is considerable scope for expansion of cultivation of other field crops particularly under major irrigation schemes during Yala. Diversification of cropping enterprises enables better utilisation of both water and land resources. There is a range of food crops, viz. sorghum, green gram, ground nut, cow pea and vegetables that needs considerably less water and are suitable for cultivation in paddy fields when water is a limiting factor as often happens in Yala. An extension of the acreage under other field crops during Yala in paddy fields would not only increase the cropping intensity but also provide subsidiary food stuffs and additional income to farm families. This would be an advance on the practice of allowing the fields to lie fallow or resorting to the customary paddy cultivation under uncertain water conditions.

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

Water Supply		No.of farmers reporting	Extents prepared for cultivation	Types of draught power used for land preparation: Mammoty only	Buffaloes only	2-wheel tractor only	4-Wheel tractor only	Mammoty & Buffaloes	Buffaloes & 2-Wheel tractor	Buffaloes & 4 Wheel tractor	Mammoty & 4 Wheel tractor	2-Wheel & 4-Wheel Buffaloes	2-Wheel & 4-Wheel Tractors and Buffaloes
	No.	94		3	15	4	34	5	6	22	1	2	2
	%	*(100)*		*3*	*16*	*4*	*36*	*5*	*6*	*23*	*1*	*2*	*2*
Major irrigation	Acres		480.9	6.5	55.3	25.0	169.3	12.5	34.8	94.0	2.5	32.0	49.0
	%		*(100)*	*1*	*11*	*5*	*35*	*3*	*7*	*20*	*1*	*7*	*10*
	No.	107		1	11	-	67	-	-	21	7	-	-
	%	*(100)*		*1*	*10*	-	*63*	-	-	*20*	*7*	-	-
Minor irrigation	Acres		654.1	4.0	33.2	-	430.0	-	-	140.1	46.8	-	-
	%		*(100)*	*1*	*5*	-	*66*	-	-	*21*	*7*	-	-
	No.	201		4	26	4	101	5	6	43	8	2	2
	%	*(100)*		*2*	*13*	*2*	*50*	*2*	*3*	*21*	*4*	*1*	*1*
Total	Acres		1,135.0	10.5	88.5	25.0	599.3	12.5	34.8	234.1	49.3	32.0	49.0
	%		*(100)*	*1*	*8*	*2*	*53*	*1*	*3*	*21*	*4*	*3*	*4*

5.2 Draught Power

The data pertaining to use of draught power for land preparation is given in Table 5-III.

The major source of draught power is 4-wheel tractors. Around 80% of the lowland cultivated has been prepared either exclusively with tractors or along with animal power. Use of buffaloes for tillage is of lesser importance as only a small proportion of operators depend entirely on animals. A number of reasons could be attributed to the widespread use of tractors for tillage. Firstly the average size of lowland operational holding is large (6.37 acres). Chena cultivation practised on a wide scale[1] during Maha also places a time constraint on land preparation in lowlands, as sowing of chena crops is normally completed before work commences on paddy fields. This time factor makes it necessary for farmers to rely heavily on mechanical power for speedy preparation of land.

In view of the relative importance of tractors for paddy cultivation, the main reasons indicated by farmers for their preference are summarised below.

Table 5-IV Principal Reasons for Using 4-Wheel Tractors

	No.	%
Operators who used 4-wheel tractors	156	*100*
Buffaloes were not available	67	*43*
4-Wheel tractors do a timely job than 2-Wheel tractors or buffaloes	55	*35*
Owned a tractor	10	*6*
Easily available	9	*6*
2-Wheel tractors were not available	3	*2*
As the holdings are large	3	*2*
Hard soil	6	*4*
More satisfactory work	2	*1*
Other reasons	1	*1*

It is of interest to point out that even among the operators who had used 4-wheel tractors the majority had done so mainly due to their inability to get buffaloes. Another important reason being the capability of 4-Wheel tractors to do speedier field operations. In a district where the average lowland holding size is large and the water supply is undependable speedy field preparation becomes very necessary particularly when paddy farmers also have to apportion their time for work in chenas during Maha season.

5.3 Availability of Draught Power

Records available with the Department of Agrarian Services indicate that the total number of 4-Wheel tractors in working condition in 1972 was only 607. Since around 125,000 acres are generally cultivated during a Maha season and the farmers are greatly dependent on mechanical power it is unnecessary to labour the point regarding the inadequacy of draught power availability. The data on tractor use shows that 94% had depended on hired machines for land preparation. As a large majority of 4-Wheel tractor owners are really non-cultivators, the owners prefer to hire out their machines for transport and threshing than for land preparation.

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[1] Of the 201 farmers interviewed, 94 (47%) had been engaged in chena cultivation during Maha 1971/72 season.

Thus it is thought a substantial proportion of operators often fail to obtain the required machinery at the appropriate time for field work.

In view of the high social opportunity cost of importing machinery, fuel and other ancilliary equipment, it is of utmost importance to make effective use of more animal power for draught purposes. Data on availability of buffaloes is lacking. However, thousands of stray buffaloes that roam in scrub jungles are really a potential source of power that needs to be harnessed for draught purposes. One major problem appears to be to get the farmers to shift back to animal power from relatively cheaper mechanical power to which the majority had got accustomed to during the last two decades. In order to exploit the full potential of available animal power, designing of implements particularly suitable for paddy field work also needs attention. Large extents of scrub jungle as well as paddy fields that remain fallow during Yala season could provide ample grazing grounds for draught animals.

5.4 Use of Improved Varieties

Operators classified on the basis of varieties cultivated during Maha 1971/72 and Yala 1972 are given in Table 5-V.

Table 5-V Distribution of Operators according to Varieties Cultivated - 1971/72

Season	Operators	NHYV only	OHYV only	TV only	NHYV and OHYV	NHYV and TV	OHYV and TV	NHYV OHYV and TV	Total
Maha 1971/72	No.	6	130	19	24	5	16	1	201
	%	*3*	*65*	*9*	*12*	*2*	*8*	..	*100*
Yala 1972	No.	12	5	56	-	3	4	-	80
		15	*6*	*70*	-	*4*	*5*	-	*100*

.. less than 1%

During Maha OHYVs and in Yala TVs are generally popular. The principal Maha variety is H-4 whilst the short aged (3 months) *Pachchaiperumal* is widely grown during Yala. Only a small proportion of operators had taken up to NHYVs that were released for general extension work only in 1971.

5.5 Use of Improved Varieties according to Size of Holding

Varietal distribution classified on the basis of holding size is presented in Table 5-VI and 5-VII.

The varietal spread examined on the basis of holding size also pinpoints to the importance of OHYVs and traditional varieties during Maha and Yala seasons respectively. The proportion of the area under these two varietal groups show relative uniformity in the majority of the holding size classes. During Maha in the largest size group (over 10 acres) the absolute acreage under NHYVs is relatively high. In the Yala season too, the proportion of the area under the new varieties in holdings of over 6 acres is higher. *Operators of larger holdings who are normally*

expected to possess a stronger economic base have taken to NHYVs very rapidly almost during the first year of their release. Traditional varieties occupy a very important position in all size groups during Yala even though new varieties have begun to make an impact particularly in the larger holdings of over 8 acres.

Table 5-VI Extent under Different Varieties according to Size of Holding - Maha 1971/72

Size of Holding (acres)	NHYV (acres)	OHYV (acres)	TV (acres)	Total (acres)
Up to 2.00	2.50	19.75	8.50	30.75
%	*8*	*64*	*28*	*100*
2.00 - 4.00	10.00	171.56	17.75	199.31
%	*5*	*86*	*9*	*100*
4.00 - 6.00	16.75	208.06	35.75	260.56
%	*6*	*80*	*14*	*100*
6.00 - 8.00	22.25	99.95	27.00	149.20
%	*15*	*67*	*18*	*100*
8.00 - 10.00	3.75	85.75	8.50	98.00
%	*4*	*88*	*9*	*100*
Over 10.00	61.50	270.75	42.00	374.25
%	*16*	*72*	*11*	*100*
Total	116.75	855.82	139.50	1,112.07
%	*10*	*77*	*13*	*100*

Table 5-VII Extent under Different Varieties according to Size of Holding - Yala 1972

Size of Holding (acres)	NHYV (acres)	OHYV (acres)	TV (acres)	Total (acres)
Up to 2.00	2.00	1.00	13.00	16.00
%	*12*	*6*	*81*	*100*
2.00 - 4.00	5.75	2.00	40.81	48.56
%	*12*	*4*	*84*	*100*
4.00 - 6.00	7.75	3.75	43.63	55.13
%	*14*	*7*	*79*	*100*
6.00 - 8.00	8.50	-	33.50	42.00
%	*20*	-	*80*	*100*
8.00 - 10.00	13.00	-	2.00	15.00
%	*85*	-	*13*	*100*
Over 10.00	31.50	17.00	75.50	124.00
%	*25*	*14*	*61*	*100*
Total	68.50	23.75	208.44	300.69
%	*23*	*8*	*69*	*100*

5.6 Use of Improved Seeds according to Supply of Water

Distribution of varieties according to water supply during Maha 1971/72 and Yala 1972 are given in Tables 5-VIII and 5-IX.

Table 5-VIII Extent Under Different Varieties according to Water Supply - Maha 1971/72

Water Supply	NHYV (acres)	OHYV (acres)	TV (acres)	Total (acres)
Major Irrigation	83.00	324.31	71.75	479.06
%	*17*	*68*	*15*	*100*
Minor Irrigation	33.75	531.51	67.75	633.01
%	*5*	*84*	*11*	*100*
Total	116.75	855.82	139.50	1,112.07
%	*10*	*77*	*13*	*100*

Table 5-IX Extent Under Different Varieties according to Water Supply - Yala 1972

Water Supply	NHYV (acres)	OHYV (acres)	TV (acres)	Total (acres)
Major Irrigation	66.50	14.00	160.56	241.06
%	*28*	*6*	*67*	*100*
Minor Irrigation	2.00	9.75	47.88	59.63
%	*3*	*16*	*80*	*100*
Total	68.50	23.75	208.44	300.69
%	*23*	*8*	*69*	*100*

Irrespective of the source of water supply, OHYVs in Maha and Traditional Varieties in Yala are extensively grown confirming the observations made earlier. In major schemes the more assured water supply conditions have had a marked influence on the spread of new varieties. Even in Yala with a lower acreage under cultivation (about 50% of the Maha cultivated acreage), an appreciable proportion of the cultivated area has been planted with NHYVs. On the other hand, under minor schemes farmers tend to rely more on the familiar Old High Yielding as well as Traditional Varieties.

5.7 Use of Improved Seed according to Tenurial Categories

Due to the very small number of tenants (8) compared to owners (97) a discussion on varietal use based on tenancy conditions is not attempted. Broadly the Maha data shows a high rate of adoption of improved varieties among all operator groups, irrespective of tenurial conditions, the overall average being 91%. Data for Yala shows that the rate of adoption of high yielding varieties among different tenurial groups is low, the average being 30%.

5.8 Non-cultivation of New Improved Varieties

83% had not cultivated any NHYVs during Maha 1971/72 season. The reasons indicated by them are set out in descending order of importance.

Table 5-X Reasons for Non-cultivation of New High Yielding Varieties - Maha 1971/72

Reasons reported by farmers	Farmers not cultivating NHYVs	
	No.	%
	165	*100*
Difficulty in getting seed paddy	54	*33*
Lack of knowledge about these varieties ..	43	*26*
Problems of water	43	*26*
High cost of cultivation	40	*24*
Following neighbours	29	*18*
Against change	18	*11*
Not convinced of benefits	18	*11*
Cultivation too difficult	12	*7*
Other reasons	8	*5*

As the NHYVs were released for the first time for extension work only in 1971, the main reasons given by farmers such as difficulties in obtaining seed and lack of conviction of benefits are very logical. As the Department of Agriculture has launched a programme to popularise 'minikits' as well as 'production kits' containing seed of new varieties, it should be possible to overcome gradually some of these problems. However, lack of an assured supply of water would continue to be a hindrance to the spread of new varieties which require higher investments to obtain optimum yields.

5.9 Methods of Planting

The traditional system of broadcast sowing was widely adopted during both seasons. 83% and 94% of the operators had resorted to this practice in Maha 1971/72 and Yala 1972 respectively.

5.10 Methods of Planting according to Water Supply

As ready availability of water is a crucial factor that influences decisions made by farmers with regard to adoption of improved cultural practices, data on planting methods arranged on the basis of source of water supply is given in Tables 5-XI and 5-XII.

Table 5-XI Extent Under Different Planting Methods according to Water Supply - Maha 1971/72

Water Supply		Trans-planting	Broad-casting	Total
Major Irrigation	Acres	57.00	422.06	479.06*
	%	12	88	100
Minor Irrigation	Acres	22.45	610.56	633.01†
	%	4	96	100
Total	Acres	79.45	1,032.62	1,112.07$
	%	7	93	100

*Includes 0.25 acres row sown forming less than 1% of the total area sown in the major scheme.

†Includes 5.50 acres row sown forming less than 1% of the total area sown in the minor scheme.

$Includes 5.75 acres row sown forming less than 1% of the total area sown during Maha 1971/72.

Table 5-XII Extent Under Different Planting Methods according to Water Supply - Yala 1972

Water Supply		Trans-planting	Row sowing	Broad-casting	Total
Major Irrigation	Acres	6.5	2.0	232.56	241.06*
	%	3	1	96	100
Minor Irrigation	Acres	-	0.5	59.13	59.63†
	%	-	1	99	100
Total	Acres	6.5	2.5	291.69	300.69$
	%	2	1	97	100

*Includes 2.0 acres row sown forming 0.8% of the total area sown in the major scheme.

†Includes 0.5 acre row sown forming 0.9% of the total area sown in the minor scheme.

$Includes 2.5 acres row sown forming 0.9% of the total area sown in Maha 1971/72.

Extent transplanted during both seasons is negligible. During Yala this practice is hardly adopted. *In major schemes even during Maha the extent transplanted is very limited. In these schemes paddy cultivation commences only after the irrigation tanks get filled from North East monsoon rains. Faced with such uncertain water supplies, farmers are naturally reluctant to incur extra expenditure required for this operation. In Yala, adoption of improved methods of planting is still less popular as problems connected with water supply are acute. With very limited water supply and long dry spells experienced during this season*

farmers invariably use short aged (3 months) drought tolerant traditional varieties which hardly respond to transplanting.[1]

The proportion of the area transplanted examined on the basis of holding size showed very little variation. During Maha, it was less than 10% for all size groups, other than the smallest (less than 2 acres). However, on an acreage basis the highest extent (28 acres) had been transplanted in the largest size group of over 10 acres, and in Yala (7 acres) in the 2.00-4.00 acre size group.

In view of the very small number of pure tenants (8) data on planting methods was not examined on the basis of tenancy conditions. Owners (109) who cultivated the largest extents (479 acres) in Maha had also transplanted the highest acreage (27 acres) among the four main tenurial groups.

5.11 Reasons for Not Transplanting

The two most important reasons given by the operators for continuing with the traditional method of broadcast sowing were the inability to incur extra expenses due to lack of funds (38%) and the uncertainty of water supply (28%). Shortage of labour and the tedium of transplanting are some of the other important reasons indicated.

Lack of funds and shortage of labour become crucial for adoption of improved cultural practices on a wider scale, in addition to a number of reasons, which were mentioned earlier. Uncertainty of water already discussed needs no further elaboration. The population density in the district is relatively low (141 per square mile) and in the sample the average number of persons working in the farms was found to be only 3.0. On the other hand the average size of lowland holding is large (6.3 acres). In addition 47% of the operators had also engaged in chena cultivation. Thus a relatively smaller labour force is called upon to work not only larger extents of paddy lands but also chenas as well. In such circumstances the resources available to operators, e.g. labour, draught power and cash are totally inadequate for adoption of improved cultural practices on a wider scale. Since chena cultivation precedes the sowing of Maha paddy crops the time at the disposal of farmers too is insufficient to adopt intensive cultivation practices in paddy fields even in relatively smaller paddy holdings.

5.12 Application of Fertiliser according to Seasons

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

Total No.of Respondents = 201

Type of Fertiliser	Farmers reporting use of fertiliser		Quantity per acre (cwts)
	No.	%	
Any type of fertiliser	100	50	1.7
Urea	74	37	1.1
$V_1/V_2/V_3$	40	20	1.0
TDM	5	2	0.8
Ammonium sulphate	23	11	0.9
Pellet fertiliser	6	3	1.0
Super phosphate	2	1	0.8
Muriate of potash	3	1	1.0

[1] The Department of Agriculture does not recommend transplanting of traditional (3 months) varieties.

Table 5-XIV Application of Fertiliser - Yala 1972

Total No.of Respondents = 79*

Type of fertiliser	Farmers reporting use of fertiliser		Quantity per acre (cwts)
	No.	%	
Any type of fertiliser	43	54	1.7
Urea	33	42	1.3
$V_1/V_2/V_3$	16	20	1.0
TDM	4	5	0.8
Ammonium sulphate	8	10	1.1
Pellet fertiliser	2	3	0.6
Super phosphate	1	1	1.0
Murate of Potash	-	-	-

*One operator who used but did not report the quantity used/acre has been excluded.

Around 50% of the farmers have reported use of fertiliser in both seasons at 1.7 cwt per acre. The pattern of fertiliser use during the two seasons has been similar both with regard to types as well as quantities. Urea has been the most widely used fertiliser with an average of 1.1 cwt per acre. Even the recently introduced basal mixture V_1 appears to gain acceptance as 20% of the operators have used it in the very first year of its release. Those who had used the basal mixture could have followed the official recommendations more closely. *However, in the case of nitrogenous fertilisers the quantities used could be considered excessive particularly during the Yala season. As nearly 70% of the extent had been under traditional varieties in Yala, an overall figure of 1.3 cwt of urea and 1.1 cwt of ammonium sulphate used per acre is far in excess of the official recommendations for such varieties.*[1] *Relatively higher dressings of urea and ammonium sulphate in an area where traditional and OHYVs predominate may also be a form of substitution of such fertilisers in place of the recommended basal mixture as only 20% had used any mixed fertiliser. However, it has to be pointed out that the use of higher doses of nitrogenous fertiliser particularly for short aged traditional varieties is unlikely to give commensurate returns to farmers.* Rational use of urea has become very vital in the present context as nitrogenous fertilisers have a very high social opportunity cost due to very sharp increases in the world market price of this commodity.[2] The reduction of the government subsidy on paddy fertiliser in 1974 is also likely to reduce the indiscriminate use of urea at farm level.[3]

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[1]Official recommendations for traditional varieties:

Age Class	Urea
3-3½ months	.70 cwt per acre
5 months	0.62 to 1 cwt per acre

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

[3]Due to this price escalation and reduction of the government subsidy, the price of Urea has risen from Rs.28.00 at the time of survey to Rs.94.00 per cwt by October 1974.

5.13 Application of Fertiliser according to Water Supply

Data on fertiliser use in relation to water supply is presented in Tables 5-XV and 5-XVI.

Table 5-XV Application of Fertiliser according to Water Supply - Maha 1971/72

	Major Irrigation	Minor Irrigation	Major Irrigation	Minor Irrigation
No. of farmers reporting	94	107		
Type of Fertiliser	% of farmers reporting		Quantity per acre (cwts)	
Any type of fertiliser	64	37	1.8	1.4
Urea	54	21	1.2	1.0
$V_1/V_2/V_3$	25	15	1.0	0.8
TDM	3	2	0.8	0.8
Ammonium sulphate	11	12	1.0	0.8
Pellet fertiliser	4	2	1.0	0.7
Super phosphate	1	1	0.8	1.0
Muriate of potash	2	1	0.9	1.0

Table 5-XVI Application of Fertiliser according to Water Supply - Yala 1972

	Major Irrigation	Minor Irrigation	Major Irrigation	Minor Irrigation
No. of farmers reporting	50	29*		
Type of fertiliser	% of farmers reporting		Quantity per acre (cwts)	
Any type of fertiliser	68	31	1.7	1.2
Urea	56	17	1.3	0.8
$V_1/V_2/V_3$	26	10	1.0	0.9
TDM	8	-	0.8	-
Ammonium sulphate	10	10	1.1	1.2
Pellet fertiliser	4	-	0.6	-
Super phosphate	2	-	1.0	-
Muriate of potash	-	-	-	-

* One operator who used fertiliser but had not furnished information on the type and quantity used has been excluded.

Under major schemes as opposed to minor schemes a considerably higher proportion of farmers had used fertiliser during both seasons. This difference is more marked during Yala when water supply is very acute. Fertiliser applied per acre is also higher in major schemes. Problems connected with water supply naturally restrict the fertiliser usage in minor schemes.

5.14 Timeliness of Fertiliser Application

As response to fertiliser is closely related to proper timing of applications, an attempt was made to obtain data pertaining to this aspect during Maha 1971/72. The following numbers had reported as having applied fertiliser at the appropriate time.

Table 5-XVII Fertiliser Application at Different Stages of Growth - Maha 1971/72

Total No. of Respondents = 201

No. of farmers who used fertiliser = 100

Stage of Growth	Farmers who reported use of fertiliser	
	No.	%
Basal application	47	47
1st top dressing (tillering)	91	91
2nd top dressing (panicle initiation)	59	59
Other stages	5	5

Since it is customary to apply basal fertiliser before sowing, it is assumed that the farmers who had used mixed fertiliser would have applied this mixture at the correct time. With regard to top dressings the data available on the time of application is inadequate to indicate the number who had adopted this practice at the correct time. As only 47% had applied basal mixture and 59% the second top dressing it is evident that almost half the number who had fertilised their paddy crops during this season had not adhered to the recommendations of the Department of Agriculture.

5.15 Application of Fertiliser according to Size of Holding

The pattern of fertiliser use during Maha 1971/72 season was also examined in relation to size of holding.

Table 5-XVIII Pattern of Fertiliser Application according to Size of Holding - Maha 1971/72

Size of Holdings (acres)	No. of applications: At least once				Three times	
	Farmers		Extent		Farmers	
	No.	%	Acres	%	No.	%
Up to 2.00	7	41	13.0	42	1	6
2.00 - 4.00	34	51	90.8	46	11	16
4.00 - 6.00	22	41	101.3	39	7	13
6.00 - 8.00	14	61	85.2	57	4	17
8.00 - 10.00	5	45	27.2	28	1	9
Over 10.00	18	62	160.5	43	3	10
Total	100	50	478.0	43	27	13

In the different holding size groups the number who used fertilisers at least once was not very high, the overall average being only 50%. Similarly the percentage extents fertilised in different size groups have been low and have not exceeded 50% of the area cultivated except in the 6.00-8.00 acre size group. *The number who had made three applications has been negligible indicating the need for more farmer education on this aspect*

In view of the disparity in the number of tenants (8) and owners (49) included in the sample any inferences drawn on the pattern of fertiliser use according to tenurial category would not be very helpful. However, the available data indicates that a higher proportion of tenants (89%) had fertilised 95% of the cultivated land compared to 45% of the owners who had fertilised 39% of their fields during Maha 1971/72 season.

5.16 Weed Control

Weed control as practised in this district is of special interest as chemicals are used widely. During Maha 1971/72 season 70% of the operators had used chemicals exclusively for weed control in 74% of the extent cultivated. Hand weeding had been adopted only in 11% of the extent cultivated indicating the minor role of this practice in paddy cultivation. On examining the information on weed control in relation to size of holding,it is evident that the farmers in all size groups have a marked preference for use of chemicals. *An important reason for widespread use of chemicals is the general scarcity of labour due to low population density. Chena cultivation also competes for the limited labour available making necessary the greater use of chemicals for weed control in paddy fields. Large lowland operational holdings (6.37 acres) is another possible reason.*

The weed control methods adopted do not show much variation when examined on the basis of water supply. Both in major as well as minor irrigation schemes, around 73% of the cultivated extent had depended only on chemicals. Hand weeding has been practised in a slightly larger area (11%) under major schemes compared to only 7% in minor schemes. Restricted water supply conditions also pose problems at the field level with regard to satisfactory hand weeding of paddy crops.

Chapter 6

PRODUCTION AND DISPOSAL OF PADDY

Unfavourable weather conditions and uneven distribution of rains that were experienced in the dry zone during the year 1971/72 have had a severe impact on yields particularly in Anuradhapura District. During Maha 1971/72 season though all the 201 operators had cultivated their fields, 36 in the sample had reported crop failure. Only 80 operators (40%) of those interviewed had cultivated during Yala 1972 due to shortage of water and of them 11 had reported crop failure. Principal sources of irrigation in the district, both major and minor schemes being essentially rainfed, show variation in their relative efficiency as they are very sensitive to rainfall conditions. Inadequate water supplies appear to be the most important limiting factor for successful paddy cultivation in the district. Shortage of water restricts the absolute acreage under cultivation in the district particularly during the Yala season (Section 5.1). Undependable water supply is also a major impediment for adoption of improved cultural practices on a wider scale as was observed in Section 5. This in turn has adverse effects on productivity of the lands cultivated.

The yields reported in respect of the two seasons showed very little variation. The overall yield reported by 165 operators during Maha was only 40.2 bushels per acre, whilst during Yala an acre yield of 38.3 bushels had been recorded in respect of 69 farms. These yields are considerably lower than the figures of estimated yield released by the Ministry of Agriculture and Lands.[1]

6.1 Land Tenure and Yields

In view of the small number of operators in the different tenurial groups except in the case of owners and 'others' it is difficult to make meaningful comparisons on the relationship between tenurial categories and yields. In the preceding discussions on management practices very little variation was observed with regard to cultural practices adopted by different tenurial categories. *However, adoption of important practices in transplanting and fertiliser use were more evident in major schemes where water supply conditions were relatively assured. This leads to the view that the adoption of better management practices that contribute to higher yields are dependent more on*

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[1] According to the Annual Implementation Programme 1968-1970 of the Ministry of Agriculture and Lands, the estimated paddy yields are: Maha 1971/72 52.9 bushels and Yala 1972 52.6 bushels.

the availability of water than on the tenurial conditions under which the land is worked, particularly in areas such as Anuradhapura where water is a major constraint to paddy production.

Table 6-I Paddy Yields according to Tenurial Category and Size of Holding - Maha 1971/72 (Bushels/Acre)*

Tenurial Category	Size of Holdings (Acres)					
	Up to 2.00	2.00-4.00	4.00-6.00	6.00-8.00	Over 8.00	Overall
Owners	45.7	43.2	41.9	33.9	41.9	41.9
Tenants	55.7	30.0	35.0	45.0	32.9	35.2
Owner-tenants ..	-	35.6	25.3	26.9	35.6	31.7
Tenant-owners ..	-	35.8	39.4	51.6	41.7	44.2
Owners with encroachments ..	42.7	40.6	41.6	31.2	34.1	35.9
Tenants with encroachments ..	-	60.9	38.3	-	30.8	37.1
Pure encroachers ..	60.0	34.8	-	38.3	45.9	42.1
Overall	46.3	42.8	41.2	35.6	40.3	40.2

* Information relates to only 165 of the 201 operators who cultivated in Maha 1971/72. 36 operators who reported crop failure have been excluded.

Table 6-II Paddy Yields according to Tenurial Category and Size of Holding - Yala 1972 (Bushels/Acre)*

Tenurial Category	Size of Holdings (Acres)					
	Up to 2.00	2.00-4.00	4.00-6.00	6.00-8.00	Over 8.00	Overall
Owners	40.3	35.2	54.5	34.5	48.3	44.1
Tenants	34.0	36.2	40.0	-	26.0	29.4
Owner-tenants ..	-	43.6	48.0	29.9	24.3	29.3
Tenant-owners ..	-	-	56.7	36.3	40.0	41.5
Owners with encroachments ..	20.0	53.7	44.3	40.0	26.0	42.6
Tenants with encroachments ..	-	83.0	47.2	-	12.5	37.3
Pure encroachers ..	-	34.3	-	-	-	34.3
Overall	38.3	40.3	49.9	34.6	33.5	38.3

* Information relates to only 69 of the 80 operators who cultivated in Yala 1972. 11 operators who reported crop failure have been excluded.

Data in Tables 6-I and 6-II indicate that two of the groups (viz: owners and tenant-owners) have obtained relatively higher yields. It is also of interest to point out that both these categories of operators have cultivated smaller extents. 80% of the owners and 60% of the tenant-owners had operated less than 6 acres of lowland. On the other hand a higher proportion of other tenurial groups except pure tenants had operated holdings of more than 6 acres.

Yield classified on the basis of holding size classes do not give a very clear picture. However, the data in respect of the two seasons indicate that the average yields reported in respect of both seasons tends to be lower particularly in the larger size holdings. The lowest yields have been reported in the largest holding size groups of over 6 acres during both seasons. In contrast the highest yields during Maha have been reported from the smallest size group of less than two acres and in Yala in the 4-6 acre group. *The overall yields reported from different size classes below 6 acres were higher during both seasons compared to those of larger holdings. The yield data of only two seasons is insufficient to generalise on the relationship between acre yields and holding size classes. As mentioned earlier the widespread chena cultivation in Anuradhapura District prejudices the general levels of management of paddy. Since chena cultivation is invariably done first, the time and other resources (labour, cash, and draught power etc.) at the farmer's disposal for Maha paddy are likely to be impaired. In such circumstances the productivity in the larger holdings is likely to be affected more.*

6.2 Yields in relation to Water Supply Conditions and Varieties Grown

As adequate supply of water is a prime requirement to obtain satisfactory yields, operators were broadly classified into four groups based on the acre yields harvested and the water supply conditions experienced by each group during sowing and flowering stages.

Table 6-III Distribution of Operators according to Yields and Water Conditions* that prevailed at different stages of cultivation - Maha 1971/72

Yield/Acre (Bushels)	Average Yield/Ac (Bushels)		Operators No.	%	Stages of Cultivation: Land Preparation and sowing — Water Conditions: Good	Fair	Poor	Flowering Stage — Water Conditions: Good	Fair	Poor
Up to 20.0	12.9	No.	15	*9*	2	10	3	2	1	12
		%	*100*	-	*13*	*67*	*20*	*13*	*7*	*80*
20.0 - 40.0	31.8	No.	74	*45*	17	45	12	15	36	23
		%	*100*	-	*23*	*61*	*16*	*20*	*49*	*31*
40.0 - 60.0	52.8	No.	51	*31*	17	26	8	12	30	9
		%	*100*	-	*33*	*51*	*16*	*24*	*59*	*18*
Over 60.0	70.5	No.	25	*15*	9	13	3	7	16	2
		%	*100*	-	*36*	*52*	*12*	*28*	*64*	*8*
Overall	40.2	No.	165	*100*	45	94	26	36	83	46
		%	*100*	-	*27*	*57*	*16*	*22*	*50*	*28*

* Excluding crop failure

The data presented shows a relatively close relationship between the quality of irrigation experienced particularly during the flowering stage of paddy and the acre yields harvested. 80% of the operators in the lowest yield group (less than 20 bushels) have had a poor water supply at flowering whilst only 8% of those who had reported yields of over 60 bushels per acre had experienced similar conditions. The water conditions experienced during this season show that in general, the quality of irrigation supply is poor. Given the uncertainty of rain, irrigation remains a critical factor in determining the acre yields.

The yields classified on the basis of source of irrigation water and varieties cultivated are given in Tables 6-IV and 6-V.

Table 6-IV Paddy Yields per acre according to Water Supply, Size of Holding, and Varieties of Paddy - Maha 1971/72

Water Supply	Size of holding (acres)	Old High Yielding varieties only		Traditional Varieties only	
		Yield* bushels/ acre	No. of farmers reporting	Yields ƒ bushels /acre	No.of farmers reporting
Major irrigation	Up to 2.00	47.4	8	43.3	3
	2.00 - 4.00	44.1	26	45.0	4
	4.00 - 6.00	51.4	10	34.4	3
	6.00 - 8.00	49.8	4	-	-
	8.00 - 10.00	50.4	3	23.5	1
	Over 10.00	46.9	1	-	-
	Overall	47.8	52	36.3	11
Minor irrigation	Up to 2.00	55.0	1	60.0	1
	2.00 - 4.00	39.5	16	31.2	1
	4.00 - 6.00	36.9	18	40.0	1
	6.00 - 8.00	30.9	5	45.0	1
	8.00 - 10.00	50.4	3	-	-
	Over 10.00	31.0	8	23.2	2
	Overall	36.4	51	29.6	6

* Excludes particulars relating to 4 operators in the major schemes and 23 in the minor schemes who reported failures.

ƒ Excludes particulars relating to 2 operators in the minor schemes who reported failures.

Table 6-V Paddy Yields per acre according to Water Supply, Size of Holding and Varieties of Paddy - Yala 1972

Water Supply	Size of holding (acres)	New High Yielding varieties only: Yield bushels/ acre	New High Yielding varieties only: No.of farmers reporting*	Traditional varieties only: Yield bushels/ acre	Traditional varieties only: No.of farmers reporting †
Major irrigation	Up to 2.00	85.0	1	32.5	7
	2.00 - 4.00	42.5	2	39.1	13
	4.00 - 6.00	56.5	2	51.0	7
	6.00 - 8.00	30.0	1	36.2	4
	8.00 - 10.00	80.0	1	-	-
	Over 10.00	40.0	1	22.4	3
	Overall	52.8	8	35.2	34
Minor irrigation	Up to 2.00	-	-	-	-
	2.00 - 4.00	-	-	34.3	2
	4.00 - 6.00	-	-	41.0	5
	6.00 - 8.00	-	-	34.7	3
	8.00 - 10.00	-	-	20.0	1
	Over 10.00	26.7	1	18.3	4
	Overall	26.7	1	30.9	15

* Excludes particulars relating to two operators in the major scheme, one in the minor scheme who reported crop failure

† Excludes particulars relating to one operator in the major scheme and six in the minor scheme who reported crop failure.

Understandably during both seasons, substantially higher yields had been recorded under major schemes due to the more assured water supply. In minor schemes the lower yields could be attributed both to erratic water supply conditions and poor levels of management as was observed in Section 5. In the absence of data on the percentage area irrigated in different holding size classes, productivity in relation to holding size and the effects of irrigation was not examined.

Marked yield differences are observed between the varieties cultivated under different water supply conditions. In general OHYVs had out-yielded traditional varieties during Maha. The yield differences based on varieties are more striking in Yala when the relative effeciency of irrigation provided (quantum, regularity and controllability of water supply) is very low. Superior performance of OHYVs during Maha (notably H-4) under water supply conditions of differing quality in major as well as minor schemes serves as a pointer to their wider adaptability. Higher dosages of fertiliser applied in major schemes (Section 5.12) too would undoubtedly have contributed to higher productivity in such areas.

During Yala NHYVs had given almost 50% higher yields than traditional varieties in major schemes. The possibility that new varieties have more favourable water conditions than the rest of the area planted under traiditional varieties may perhaps also account for their better performance. Such performances also point to the potential of new varieties, given other complementary inputs such as fertiliser (Table 6-V) and assured water supply. In general the satisfactory yields reported in respect of traditional varieties under minor schemes during Yala season also show their suitability for cultivation under restricted water supply conditions and lower levels of management.

6.3 Disposal of Paddy

Data on disposal of paddy from the Maha 1971/72 and Yala 1972 crops tabulated on the basis of holding size is presented in Tables 6-VI and 6-VII).

Table 6-VI Disposal of Paddy according to Size of Holding - Maha 1971/72*

Size of holding (acres)	No.of farms	Sales per acre sown (bushels)	Sales as a % of total production	Sales to Co-op as a % of total sales	Yield bushels/ acre
Up to 2.00	17	24.7	*53*	*83*	46.3
2.00 - 4.00	55	24.3	*56*	*84*	42.9
4.00 - 6.00	42	26.1	*64*	*86*	41.2
6.00 - 8.00	19	22.6	*64*	*66*	35.6
8.00 - 10.00	8	39.0	*74*	*71*	52.4
Over - 10.00	20	24.6	*64*	*82*	38.2
Overall	161	25.7	*63*	*80*	40.7

* Information relates to 161 of the 201 operators who cultivated in Maha 1971/72. 36 operators reported crop failure and 6 operators who were landlords have been excluded (of the 6 landlords 2 operators had crop failure).

Table 6-VII Disposal of Paddy according to Size of Holding - Yala 1972*

Size of holding (acres)	No.of farms	Sales per acre sown (bushels)	Sales as a % of total production	Sales to Co-op as a % of total sales	Yield bushels/ acre
Up to 2.00	9	16.6	*43*	*89*	38.3
2.00 4.00	20	24.8	*62*	*79*	40.3
4.00 6.00	16	29.0	*58*	*71*	49.9
6.00 8.00	8	12.9	*37*	*86*	34.6
8.00 10.00	3	67.9	*91*	*18*	74.3
Over 10.00	12	18.5	*66*	*47*	27.9
Overall	68	23.5	*61*	*59*	38.8

* Information relates to 68 of the 80 operators who cultivated in Yala 1972. 11 operators reported crop failure and 1 operator who was an owner cum landlord has been excluded.

The average quantity of paddy sold per acre is high when examined in relation to the low acre yields reported earlier [1]. Relatively higher quantities sold per acre may be explained on the basis of a number of factors mentioned previously. *Firstly, the average operational holding is large (6.37 acres). Very low incidence of tenancy and widespread chena cultivation are also bound to have an impact on the volume of paddy offered for sale. With a very small proportion of tenants (less than 10%) among the operators a large majority does not have to pay a share of the harvested crop as rent. Consequently even the smaller operators have a relatively larger surplus for disposal. Availability of a range of substitute foods viz: millets and pulses from chenas also make it possible for paddy farmers to dispose of a larger volume of paddy per acre.*

During both seasons the average sales had amounted to about 60% of total production. The percentage of sales per acre shows an increase with the increase in holding size particularly during the Maha season due to the higher volume of paddy harvested.

Co-operative societies constitute the main marketing channel for paddy as 80% of the sales in Maha and 61% in Yala had been effected through this institution. The pattern of sales to co-operative societies shows more uniformity in all size groups during Maha but in the Yala season the operators of smaller holdings appear to have sold a higher proportion of their surplus paddy under Guaranteed Price Scheme. *This tendency is contrary to the popular notion that small farmers withhold sales of paddy to co-operatives in order to avoid repayment of cultivation loans.*

During Yala season there is a general shortage of paddy in the district due to the very restricted acreage cultivated (30% of the asweddumised extent). In this situation operators on larger holdings appear to be disposing of substantial portions of their surplus paddy outside the co-operative network in order to take advantage of the apparently higher prices prevailing in the open market.

Data on disposal of paddy classified on the basis of water supply and tenancy conditions revealed that in the major schemes both the owners as well as tenants had sold a higher volume of paddy per acre. Greater productivity in major schemes had made it possible for both categories to sell over 70% of their total production during the two seasons.

In minor schemes during Maha the owner operators had sold 54% of their produce compared to only 17% by tenants. During Yala the sales effected by owner operators have been only 14% of production. *In absolute terms, owner operators in major schemes have sold 15 and 32 bushels more per acre compared to those in minor schemes during Maha and Yala seasons respectively. This pattern of sale also highlights the importance of water supply as a very critical factor in determining the success of paddy cultivation in this district.*

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[1] Data on the disposal of paddy is more realistic if production is computed on the basis of yields (50 bushels per acre) as reported by the Ministry of Agriculture and Lands.

Chapter 7

LABOUR UTILISATION AND INCOME

This chapter deals mainly with the situation relating to labour use, and family farm earnings of the household surveyed. Relevant background data on family size and family labour force is presented first. The total population in the sample amounts to 1,460 of whom 869 were 14 years and above.

7.1 Family Size

The average household size in the sample is 7.3. Nevertheless, 31% of households had 9 or more family members while 20% had below 4 persons.

No clear cut relationship can be observed between tenural groupings and family size. (Table 7-I).

7.2 Family Labour Force

Family labour force as defined here includes all family members of 14 years and above. However, this definition is an overestimate for several reasons:

i. The above population would include those too old to work, disabled people, etc.

ii. It ignores the 'participation' factor as well. Some may not be actively seeking work, i.e.some housewives may not be available for work in family enterprises.

On the other hand, it is quite possible for younger people (below 14 years) to help in farm work. However, we have excluded them from the labour force following standard practice.

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

No. of family Members	All Tenurial Categories — Size of Holdings (acres) Up to 2.00 No.	%	2.00–4.00 No.	%	4.00–6.00 No.	%	6.00–8.00 No.	%	8.00–10.00 No.	%	Over 10.00 No.	%	Total No.	%	All Tenurial Size Classes — Category Tenants No.	%	Owners No.	%	Tenant-owners No.	%	Owner-tenants No.	%	Others No.	%	Total No.	%
Up to 3	1	6	-	-	2	4	1	4	1	9	1	3	6	3 (3)	1	11	5	5	-	-	-	-	-	-	6	3
3 - 4	5	29	13	19	10	19	4	17	-	-	2	7	34	17 (20)	-	-	21	19	4	40	2	12	7	12	34	17
5 - 6	8	47	11	16	9	17	5	22	2	18	4	14	39	19 (39)	2	22	22	20	1	10	4	25	10	18	39	19
7 - 8	1	6	23	34	15	28	7	30	4	36	9	31	59	29 (68)	4	44	31	28	1	10	5	31	18	32	59	29
9 - 10	-	-	15	22	11	20	2	9	3	27	5	17	36	18 (86)	1	11	19	17	3	30	3	19	10	18	36	18
Above 10	2	12	5	7	7	13	4	17	1	9	8	28	27	13 (99)	1	11	11	10	1	10	2	12	12	21	27	13
Total	17	100	67	100	54	100	23	100	11	100	29	100	201	100	9	100	109	100	10	100	16	100	57	100	201	100

As Table 7-II shows, *50-62% of the population in different tenurial categories are in the potential labour force.*

Table 7-II Distribution of Work Force and Employment by Tenurial Categories Summary Indicators

	Owners	Tenants	Owner tenants	Tenant-Owners	Others	Total
Total Number of households	109	9	16	10	57	201
Total population ..	750	64	126	66	454	1460
Average size of household	6.9	7.1	7.0	6.6	8.0	7.3
Total No.above 14 years *	465	36	77	33	258	869
	(62.0)	(56.3)	(61.1)	(50.0)	(58.8)	(59.5)
Size of work force per farm	4.3	4.0	4.8	3.3	4.5	4.3
Size of work force per acre (all land)	0.51	0.51	0.39	0.45	0.37	0.44
Size of work force per acre (lowland)	0.88	0.59	0.59	0.56	0.52	0.67
Total No.employed **	396	31	67	27	205	726
	(85.2)	(86.1)	(87.0)	(81.8)	(79.5)	(83.5)
No. employed per farm	3.6	3.4	4.2	2.7	3.6	3.6
No. employed per acre (all land)	0.43	0.44	0.34	0.36	0.30	0.37
No. employed per acre (lowland)	0.75	0.56	0.59	0.56	0.41	0.57

* Figures in parentheses denote the percentage of work force to population

** Figures in parentheses denote the percentage of numbers employed to work force

The above participation rates represent uppermost limits. There does not seem to be much difference in the average work force size. The small numbers involved in pure tenant and tenant-owner categories make generalisation difficult. The size of work force per acre is a more meaningful indicator of the availability or sufficiency of labour. Owners have about 0.51 units of labour whereas the 'others' category has only 0.37. As highland cultivation also is important in the cropping pattern of the area, labour availability is measured against all land (lowland and highland). The lowland ratio also is given. The overall average is 0.44 units per acre.

The family labour force information could be further analysed according to the size distribution of holdings. (Table 7-III).

Table 7-III Distribution of Work Force and Employment by Size Class of Holding

	Size of Holding (acres)						
	Up to 2.00	2.00-4.00	4.00-6.00	6.00-8.00	8.00-10.00	Above 10.00	Total
Total Number of Farms	17	67	54	23	11	29	201
Total population ..	94	482	387	161	83	253	1,460
Average size of household	5.5	7.2	7.2	7.0	7.5	8.7	7.3
Total number above 14 years*	63	257	227	94	66	162	869
	(67.0)	(53.3)	(58.7)	(58.4)	(79.5)	(64.0)	(59.5)
Size of work force per farm ..	3.7	3.8	4.2	4.1	6.0	5.6	4.3
Size of work force per acre (all land) ..	0.97	0.64	0.49	0.39	0.44	0.26	0.44
Size of work force per acre (lowland) ..	2.0	1.23	0.8	0.56	0.64	0.33	0.68
Total Number employed**	54	214	199	74	49	136	726
	(85.7)	(83.3)	(87.7)	(78.7)	(74.2)	(83.9)	(83.5)
Number employed per farm	3.2	3.2	3.7	3.2	4.5	4.7	3.6
No.employed per acre (all land)	0.83	0.53	0.43	0.3	0.32	0.22	0.37
No.employed per acre (lowland)	1.74	1.02	0.7	0.44	0.48	0.28	0.57

* Figures in parentheses denote the percentage of work force to population in group.

** Figures in parentheses denote the percentage of numbers employed to work force in group.

63% of the total population (above 14 years) are in the 'below 6 acres' category. *The number of workers per farm shows an upward trend with holding sizes rising* from 3.7 to 5.6 in the highest size class. The number available per acre *shows a sharp decline* as one moves up the size scale. It falls from almost 1 unit of labour to 0.26 units in the highest size class. Hence the two ratios move in opposite directions.

7.3 Pattern of Labour Use

The average household in the sample had 7.3 members, of whom 4.3 were 14 years and above. However with an average holding of 6.4 acres, it is not possible to depend on family labour alone. Table 7-IV indicates the relative dependence on different types of labour for different field operations during Maha 1971/72. It should be kept in mind that this data does not reflect the intensity of labour use.

Table 7-IV Percentage distribution of Farms according to Pattern of Labour Use for different Field Operations - Maha 1971/72

Field Operations	Family labour only %	Hired labour only %	*Attan* labour only %	Contract only %	Family and hired %	Hired and *attan* %	Family and *attan* %	Family, hired & *attan* %	Total %	No
Land preparation	*38*	*6*	*1*	-	*44*	-	*6*	*5*	*100*	198
Transplanting	*19*	*16*	*16*	-	*35*	-	*10*	*3*	*100*	31
Weeding	*68*	*13*	*1*	-	*16*	-	*2*	-	*100*	166
Harvesting	*35*	*6*	*1*	*1*	*38*	-	*13*	*6*	*100*	193
Threshing	*24*	*8*	*2*	-	*47*	-	*15*	*5*	*100*	195

Exclusive reliance on family labour is rather high, ranging from 68% of farms (in weeding) to 19% of farms (transplanting). As expected, there is a relationship between relative dependence on different categories of labour and peak activity periods (land preparation, harvesting and threshing stages). Family labour is mostly used in the case of weeding which could be carried out during slack periods. Hired labour (exclusively and jointly with family labour) is mainly used during peak activity periods. Also, the pattern of labour use cannot be isolated from the fact of mechanisation. If both land preparation and harvesting/threshing are mechanised then the demand for family and outside labour would be greatly reduced. The percentages conceal the fact that only 15.4% of all farms had transplanted whereas other operations were done by the majority of farms. Hence the impact of a given operation on labour demand may differ, *Attan* labour is important only for transplanting. A word of caution may be necessary concerning figures on use of *attan* labour only as it is unusual for exchange *(attan)* labour to be used exclusively without the help of family labour.

The labour use patterns were also examined in relation to size of holding (Table 7-V). *Farms above 8 acres reveal a tendency for reduced family labour use and greater dependence on hired labour or hired labour in association with family labour.* Family and hired labour combination is still the most important source of labour supply among all categories.

7.4 Employment Situation

The survey was not designed to collect detailed information on employment aspects. Some general comments on the extent and nature of off-farm work are given below. *Out of a potential labour force of 869 persons, 83.5% (726 persons) were employed.*

The family work force (employed) is classified on the basis of work place into three categories:

A - Employed in own farm. Full time operators/farm workers.
B - Employed in own farm and outside. Part time farmers/farm workers.
C - Employed only outside or off-farm employment.

The respective proportions are pointers to the degree of diversification in the employment pattern of farm households. However, without quantitative information on labour inputs the above aspect cannot be analysed in any depth.

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

	Field Operation	Family labour only %	Hired labour only %	*Attan* labour only %	Contract only %	Family and hired %	Hired and *attan* %	Family and *attan* %	Family, hired & *attan* %	Total %	Total No.
Up to 2.00	Land Prep.	47	6	6	–	29	–	–	12	100	17
	Transplant.	–	–	–	–	...	–	...	–	...	3
	Weeding	69	19	–	–	13	–	–	–	100	16
	Harvesting	31	13	6	–	25	–	13	13	100	16
	Threshing	18	12	6	–	29	–	24	12	100	17
2.00-4.00	Land Prep.	44	3	–	–	38	–	11	5	100	64
	Transplant	...	...	...	–	...	–	...	–	...	9
	Weeding	75	8	–	–	15	–	2	–	100	53
	Harvesting	36	2	2	–	34	–	19	8	100	64
	Threshing	25	5	2	–	40	–	22	8	100	65
4.00-6.00	Land Prep.	43	2	2	–	43	–	4	7	100	54
	Transplant	...	–	...	–	...	–	–	...	...	7
	Weeding	75	3	3	–	15	–	5	–	100	40
	Harvesting	39	2	–	2	37	–	16	4	100	51
	Threshing	27	6	2	–	51	–	12	2	100	51
6.00-8.00	Land Prep.	35	4	–	–	52	–	4	4	100	23
	Transplant.	–	...	...	–	...	–	–	–	...	5
	Weeding	55	30	5	–	5	–	5	–	100	20
	Harvesting	39	13	–	–	39	–	4	4	100	23
	Threshing	26	4	4	–	43	–	13	9	100	23
8-00-10.00	Land Prep.	18	18	–	–	64	–	–	–	100	11
	Transplant.	–	–	–	–	...	–	–	–	...	1
	Weeding	64	18	–	–	18	–	–			11
	Harvesting	18	18	–	–	55	–	9	–	100	11
	Threshing	9	18	–	–	64	–	9	–	100	11
Over 10.00	Land Prep.	21	17	–	–	59	–	–	3	100	29
	Transplant.	...	...	...	–	–	–	...	–	...	6
	Weeding	54	19	–	–	27	–	–	–	100	26
	Harvesting	29	11	–	–	50	–	7	4	100	28
	Threshing	21	14	–	–	61	–	4	–	100	28

... percentages not reported for transplanting as they are based on extremely small numbers.

Table 7-VI reveals that *farming is the main employment outlet, 83.2% of the total employed being engaged only in farm work.* The second category amounts to 13.4 and only 2% fall into the non-agricultural employment group. This is understandable, given the fact that Anuradhapura is a predominantly agricultural district.

Table 7-VI Employment Situation - Family members over 14 years according to tenurial category

Tenurial Category	Employed in own farm only			Employed in own farm and outside								Employed outside only			
				Including Students				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	109	322	3.0	58	88	*53*	1.5	47	57	*43*	1.2	11	17	*10*	1.5
Tenants	9	25	2.8	6	8	*67*	1.3	3	4	*33*	1.3	2	2	*22*	1.0
Owner-tenants	16	56	3.5	8	11	*50*	1.4	7	9	*44*	1.3	2	2	*12*	-
Tenant-owners	10	22	2.2	4	7	*40*	1.8	3	5	*30*	1.7	-	-	-	-
Others	57	179	3.1	29	45	*51*	1.6	16	22	*28*	1.4	4	4	*?*	1.0
Total	201	604	3.0	105	159	*52*	1.5	76	97	*38*	1.3	19	25	*9*	1.3

Table 7-VII shows the main features of the farm work force defined as family members of 14 years and above who are available for farm work either on full time or part time basis (ca egories A and B). The average number of workers per farm is 3.9 ranging from 2.9 (tenant-owners) to 4.2 (owner-tenants). The average number per acre shows the highest ratio for the owner category.

Table 7-VII Farm Work Force

Tenurial Category	Average size of holding (acres)	Median size of holdings (acres)	Employed in own Farm only and own farm and outside		
			No.	Average per family	Average per (acre)
Owners	4.86	3.50	410	3.8	0.8
Tenants	6.78	4.00	33	3.7	0.5
Owner-tenants	8.20	7.50	67	4.2	0.5
Tenant-owners	5.90	5.75	29	2.9	0.5
Others	8.78	6.00	224	3.9	0.4

Analysis by tenurial categories and holding size shows little variation as regards labour units available and the distribution pattern in farm and off-farm jobs.

The nature of off-farm activities of family members (categories) was further analysed in terms of an occupational breakdown (Table 7-VIII) The total number with outside interests was 122 with 97 (79.6%) working on both own farm and outside. The outside employment structure could reflect two things.

Table 7-VIII Nature of Outside Employment

Employment	Tenurial Categories											
	Owners		Tenants		Owner tenants		Tenant owners		Others		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Salaried or white collar employment	20	*27*	2	*33*	3	*27*	-	-	5	*19*	30	*25*
Trade/Commerce	6	*8*	1	*17*	3	*27*	1	*20*	5	*19*	16	*13*
Skilled workers	10	*14*	1	*17*	1	*9*	-	-	6	*23*	18	*15*
Non-agricultural labourers	29	*39*	2	*33*	3	*27*	4	*80*	10	*39*	48	*39*
Others/Not specified	9	*12*	-	-	1	*9*	-	-	-	-	10	*8*
Total	74	*100*	6	*100*	11	*100*	5	*100*	26	*100*	122	*100*

(a) Some households may be able to diversify their family employment through education or training along vocational lines, etc.
(b) Family members may be driven to supplement their income through low productivity off-farm jobs especially during slack seasons.

Non-agricultural labour (unskilled) accounts for 39% of outside employment. This may well represent the second category (b) referred to above. The trade/commerce category may also denote a low productivity services sector. It is also interesting that none are employed as agricultural labourers.[1] The *salaried/white collar group represent 1/4 of the total. This group plus the skilled group amount to 43% of the total.*

7.5 Income Distribution among Farm Households

Data on incomes gathered in the course of the survey are not comprehensive enough for a meaningful discussion of income distribution. Gross receipts from (a) paddy production in Maha and Yala, (b) sale of highland and livestock produce, (c) off-farm employment, were enumerated. However, the following limitations of data should be borne in mind.

(a) Net farm family income cannot be worked out as expenditure; data was collected only in relation to paddy cultivation in Yala 1972. Expenses connected with the production of highland and livestock produce have not been deducted.

(b) Several forms of non-monetary income or income in kind have not been incorporated, i.e. rent-free housing, consumption of some home produced goods, etc.

(c) Hence the figures are only crudely indicative of the income position in the rural areas. The trends in gross receipts could be a poor indicator of the relative well being/poverty of different groups. It may be more useful as an indicator of the scale of operations.

7.6 Gross Farm Family Receipts

Farms were classified according to receipt groups (Table 7-IX). *59% earn below Rs.335/- per month.* The highest two groups comprising 41% of total income receivers receive 85.2% of total receipts. Average receipts range from 351 in the lowest to Rs.10,845/- in the highest group.

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[1] See explanation given in foot-note on p 119 in the Agrarian Situation relating to paddy cultivation - Hambantota District, February 1974.

Table 7-IX Total Family Receipts - Distribution of Farmers by Tenurial Status and Receipt Group

Receipt Groups (Rupees)	Owners		Tenants		Owner-tenants		Tenant-Owners		Others		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0 - 500	4	4	-	-	-	-	1	...	1	2	6	3
501 - 1000	10	9	-	-	3	19	-	-	3	5	16	8
1001 - 2000	21	19	-	-	2	13	1	...	14	25	38	19
2001 - 4000	33	30	2	...	4	25	4	-	14	25	57	29
4001 - 8000	25	23	3	...	4	25	-	-	14	25	46	23
Over 8000	16	15	4	...	3	19	3	...	11	19	37	18
Total	109	100	9	...	16	100	9	...	57	100	200	100

... percentages not reported as they are based on small numbers

Distribution of receipt groups by size of holding shows a clear tendency for higher size classes to be associated with higher receipt groups (Table 7-X). This is to be expected as agricultural land provides the main source of income.

Table 7-X Total Family Receipts - Distribution of Farmers by Size of Holding and Receipt Groups

Receipt Groups (Rupees)	Up to 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.	%
0 - 500	1	6	1	2	4	7	-	-	-	-	-	-	6	3
501 - 1000	-	-	4	6	9	16	2	8	-	-	1	4	16	8
1001 - 2000	6	35	17	27	8	14	2	8	1	9	4	14	38	19
2001 - 4000	6	35	24	38	14	25	7	29	2	18	4	14	57	28
4001 - 8000	3	18	12	19	14	25	8	33	3	27	6	21	46	23
Over 8000	1	6	6	9	7	12	5	21	5	45	13	46	37	18
Total	17	100	64	100	56	100	24	100	11	100	28	100	200	100

The variation among different tenurial groups is not significant.

7.7 Receipts from Sources other than Paddy

183 households reported earnings from sources other than paddy which points to some degree of diversification in income sources. Receipts from other sources formed 34.6% of gross income in 1971/72. 77% of households are in the below Rs.2,000 receipts group. Only 11% receive over Rs.4,000/-.

When receipts are analysed in relation to size of holding the proportion of farms with higher receipts is observed to increase with size.However, this is much less marked than in the distribution of paddy receipts with holding size. Hence, *it is paddy receipts which lead to the uneven distribution in family receipts in relation to size class.*

Table 7-XI Family Receipts from Sources other than Paddy produced by Operators - Distribution of Farmers by Size of Holdings and Receipt Groups

Receipt Groups (Rupees)	Up to 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.	%
0 - 500	6	*40*	19	*31*	24	*48*	8	*40*	1	*9*	11	*42*	69	*38*
501 - 1000	2	*13*	14	*23*	10	*20*	2	*10*	-	-	5	*19*	33	*18*
1001 - 2000	4	*27*	14	*23*	9	*18*	5	*25*	3	*27*	3	*12*	38	*21*
2001 - 4000	2	*13*	8	*13*	4	*8*	2	*10*	4	*36*	3	*12*	23	*13*
4001 8000	1	*7*	3	*5*	3	*6*	2	*10*	2	*18*	3	*12*	14	*8*
Over 8000	-	-	3	*5*	-	-	1	*5*	1	*9*	1	*4*	6	*3*
Total	15	*100*	61	*100*	50	*100*	20	*100*	11	*100*	26	*100*	183	*100*

Table 7-XII shows that owner tenants have the lowest amount of outside earnings while other categories earn more than Rs.1,500.00.

Table 7-XII Average Receipts from Sources other than Paddy produced by Operators

Tenurial Category	Total No.of farms	No.of farms reporting outside earnings		Average Receipts /farm	
		No.	%	Reporting farms only Rupees	All farms Rupees
Owners	109	99	*91*	1,675	1,521
Tenants	9	8	*89*	2,439	2,168
Owner-tenants	16	14	*88*	454	397
Tenant-owners	9	9	*100*	2,129	2,129
Others	57	53	*93*	1,740	1,618

7.8 Gross Value of Paddy Production

The gross value/income from paddy produced is estimated as the product of yield of paddy and the GPS price of paddy (Rs.14.00 at the time of the survey). Hence, the values directly reflect the productivity of paddy adjusted for the payment of land rent in some cases.

Table 7-XIII Average Income per Family from Paddy after Deduction of Land Rent for Tenanted Land - 1971/72 (Maha and Yala)

Water Supply	Income Rs
Major Irrigation	4,180
Minor Irrigation	2,237

Those under minor irrigation schemes earn only 53.5% of that under major schemes. Minor schemes can be roughly identified with the *purana* villages.

Table 7-XIV shows the gross value of paddy produced per farm and per acre.

Table 7-XIV Value of Paddy Produced under Different Tenurial Categories 1971/72 (Maha and Yala)

Tenurial Category	Average size of holding (acres)	Average income per farm (Gross) Rs	Income after deducting land rent *	
			Average per farm Rs.	Average per acre Rs.
Owners	4.86	2,756	2,756	567
Tenants	6.78	5,608	4,653	686
Owner-tenants	8.20	3,686	3,524	430
Tenant-owners	5.90	5,831	5,038	768
Others	8.76	3,302	3,229	369

* Income was computed by valuing the paddy produced at Rs.14.00 per bushel guaranteed price prevailing at the time of the survey.

The former indicates farm family incomes while the latter relates to land productivity. *Tenant-owners and tenants carry higher receipts on both counts.* Land rent does not disturb the relative rankings.

As tenants in the sample are few, it is not meaningful to compare the relative performance of owners and tenants under different water supply conditions. Data relating to owners (Table 7-XV) shows that value of paddy produced per farm as well as per acre is much higher under major irrigation.

Table 7-XV Value of Paddy obtained by Owners Served by Different Sources of Water Supply - 1971/72 (Maha and Yala)

Water Supply	Average size of holdings (acres)	Average income per farm Rs.	Average income per acre Rs.	Average income per head of members 14 years and above Rs.
Major Irrigation	4.03	3,423	848	727
Minor Irrigation	5.80	1,997	344	529

Average receipts per employed persons is more meaningful than receipts per family labour force defined as above. However, the latter index also shows that major irrigation schemes ensure higher receipts to labour,

Receipts by size class of holding shows a rising trend both per farm and per capita basis (as defined above). This is to be expected as paddy land is the main source of income (Table 7-XVI).

Table 7-XVI Average Family and Per Head Income from Paddy by Owners in different Size of Holding Categories

Size Class (acres)	Average Annual Income per farm Rs.	Income per head of members 14 years and above Rs.
Up to 2.00	1,756	457
2.00 - 4.00	1,796	447
4.00 - 6.00	2,969	670
6.00 - 8.00	2,581	666
8.00 - 10.00	8,447	1,267
Over 10.00	5,180	1,170

7.9 Production Expenses and Income from Paddy - Yala 1972

Since recall lapse on the part of farmers is bound to be high, data on operating expenses was collected only for the immediately preceding season, Yala 1972. Only 80 operators cultivated in Yala, but 11 of these reported crop failure. The following data pertain to the remaining 69 operators who cultivated a total of 257.31 acres. The average cash outlay per acre amounted to Rs.308/- (Table 7-XVII).

Table 7-XVII Summary of Cash Outlay for Paddy Cultivation - Yala 1972 - Average cash outlay per acre

Particulars of cash expenses	Amount Rs.	%
1.Draught power	103	*33*
2.(a) Hired labour	91	*30*
(b) Food bought for hired labour	37	*12*
3.Purchased inputs	43	*14*
4.Land rent, acreage tax and *ande*	28	*9*
5.Transport	6	*2*
Total	308	*100*

Cost of hired labour inclusive of the food supplied was Rs.128/- per acre, representing 42% of total expenses. The high size of lowland operational holdings and the low use of *attan* labour may have contributed to this as in Polonnaruwa. Draught power was the next important item in the cost structure. *Purchased inputs represent only 14% of cost.* Rent payments are low since the number of tenants is small.

Analysis by irrigation brings out some interesting Points (Table 7-XVIII).

Table 7-XVIII Cash Outlay per acre for Paddy Cultivation according to Source of Water Supply - Yala 1972

	Source of Water Supply			
	Major		Minor	
No. of farmers	48		21	
Extent cultivated (acres) ..	214.06		43.25	
	Expenses			
Items of Expenditure	Amount Rs.	%	Amount Rs.	%
1. Field Operations	253	*74*	123	*82*
i. Tractor including fuel costs	93	*27*	79	*53*
ii. Buffalo	13	*4*	11	*7*
iii. Hired labour				
(a) Wages	105	*31*	19	*13*
(b) Food	42	*12*	14	*9*
2. Inputs	49	*14*	17	*11*
3. Miscellaneous				
i. Land Acreage Tax & Land Rent	32	*9*	6	*4*
ii. Transport	6	*2*	3	*2*
Total	340	*100*	149	*100*

The average cash outlay in major schemes is more than double that for the minor irrigation category. The composition of total outlay also varies significantly. Labour cost is higher on major schemes while draught power represents the higher cost item for farms under minor works. A high risk factor resulting mainly from uncertain water supply has restricted cash expenses of farms under minor irrigation. Hence, the latter spent only Rs.17.00 per acre while the major irrigation group incurred Rs.49.00 as costs on purchased inputs.

Cash expenses were not examined in relation to tenancy conditions, because of small numbers involved.

7.10 Income from Paddy - Yala 1972

Net income from paddy is defined as the difference between gross income and cash operating expenses. On this basis, the average net income per farm is estimated to be Rs.228.00.

Y a l a 1972

Gross farm income per acre of paddy .. Rs.536.00
Cash operating expenses per acre .. Rs.308.00
Net farm operating income per acre.. Rs.228.00

Operators under minor irrigation schemes obtain a higher net income per acre compared to the major irrigation group.

Income and Expenditure per Acre - Yala 1972

	Major Irrigation Rs.	Minor Irrigation Rs.
Gross farm income	564	398
Cash operating expenses	340	149
Net farm operating income	224	249

The yield advantage of farms under major irrigation is more than offset by their higher operating expenses.

SUMMARY AND CONCLUSIONS

A Land and Land Use

A- 1 The asweddumised paddy acreage of the Anuradhapura District in Maha 1971/72 was 182,000 acres. 59% of the total acreage is under minor irrigation schemes, 35% under major schemes and 6% is purely rainfed. *Paddy cultivation depends on irrigation from water stored in reservoirs which in this district depend essentially on rainfall in the catchment for their water supply making even the larger tanks sensitive to drought. Small village tanks run dry even during short dry spells. This situation has rendered paddy cultivation an intensely risky venture. Chena cultivation is practised on an extensive scale especially in areas served by minor irrigation schemes as an insurance against an unpredictable paddy harvest.*

A- 2 *The land tenure structure in this district is of a complex nature.* Of the 201 operators in the sample, 54% were pure owner operators, 17% operated land on *ande* only or in addition to their owned land and 28% -(57) were encroachers with encroachments as part or whole of their holdings. Of the 57 encroachers, 37 were owners, 2 tenants, 11 part tenants and 7 pure encroachers. If the 50 cultivators who operated encroachments in addition to their owned and/or tenanted land are classified by the tenurial status of their legal holdings, then including these operators the sample consists of 73% owner operators, 18% part tenant operators, 6% pure tenants and 3% pure encroachers. *67% of the lowland was owned while 14% was rented in and operated under* ande. *Encroached land accounted for 19% of the operated land. While 50% of the highland was owned, the remaining 50% was encroached land. Encroaching is found to be more prevalent in areas served by minor irrigation schemes where paddy cultivation is a risky operation and hence cultivation of additional encroached land brings greater security to the cultivators. In addition, in the* purana *village where the capacity of the tank is very limited and where other means of livelihood are almost absent, encroaching is probably the only outlet available for the increasing population to gain a livelihood.*

A- 3 Absolute landlessness was negligible (59%) among the operators in the sample. 75% of the operators owned lowland of extents above 2.0 acres. In the case of highland 88% owned 2.0 acres or less. Considering the entire holding (both lowland and highland) 88% owned more than 2.0 acres.

A- 4 *The pure owner lowland operators (54% of all operators) cultivated 41% of all lowland,* 65% of highland (excluding encroachments) 52% of chena and 44% encroached highland. *The encroachers who formed 28% of the operators operated 39% of the lowland (including encroachments),* 21% of highland (excluding encroachments) 32% of

chena and 45% of the encroached highland. *The average operational holding for the district is (9.7 acres) large compared to other districts.* It comprises of 6.37 acres of lowland, 2.17 acres of highland and 1.17 acres chena. 1.21 acres of lowland and 0.47 acres of the highland were encroached land. *Thus chena and encroached land formed an important component of the total operational holdings.*

The average lowland holding was (6.37 acres) large compared to the national average. The median size was 5.0 acres. The holding size ranged from 1-50 acres showing considerable variation between holdings. The largest proportion of the holdings was in the range 2-6 acres. The average size of the operational holding was largest for the 'others' category (8.76 acres, including 4.25 acres of encroached land), and smallest for 'owners' (4.86 acres).

A- 5 A high proportion of the holdings in the major irrigation schemes were below 4 acres due mainly to the nature of the settlement. The bulk of the holdings in the minor schemes varied between 2-8 acres.

A- 6 *Only 14% of the land operated by the sample farmers was tenanted; 24% of the operators cultivating at least a part of their holdings on* ande. *Considering the favourable land/man ratio and the possibilities for encroaching, the extent of tenancy as reported for the district seems to be of considerable importance. Almost all the tenants pay either half share of the produce or a fixed rent. Nearly half the tenants paid a fixed rent as stipulated in the Paddy Lands Act, but none of them received any collateral help from their landlords. Of the other 50% who paid half share of produce the majority (74%) got some collateral help from their landlords who were mostly mentioned as family relatives. Seed paddy and ploughing expenses were the most important inputs received by them. However, only a few landlords receiving half share of produce provided more than one input.*

Land with assured water is limited, especially under minor irrigation schemes. The rent paid was high (half share of produce) in almost 50% of the tenanted land. Where the pressure on productive land is high and therefore competition for such land is also acute, problems of high rent could not be eliminated altogether by means of legislative provisions. This is why the provisions of the Paddy Lands Act have not been so effective in this district.

A- 7 47% of the landlords were farmers themselves, 11% were traders and 18% were salaried employees or professional workers. The latter groups controlled almost 33% of all tenanted land. These landlords were mostly outsiders. The fact that 28% of the landlords lived outside the district also shows the extent of absentee landlordism in the district.

A- 8 *Over 50% of the tenants indicated their desire to cultivate additional land on* ande *if available.* A large percentage of even those with holdings over 6 acres expressed this desire suggesting the need for cultivation of additional paddy land to ensure a steady income.

B Institutions

B- 1 A very high proportion of operators (93%) were members of co-operatives and a majority had made use of this institution to obtain necessary inputs. 73% had obtained fertiliser *through co-operatives which is the only source of subsidised fertiliser at village levels. 76% of the farmers had also obtained their requirements of agro-chemicals*

from the co-operative. As the Extension Service of the Department of Agriculture is primarily concerned with the seed paddy supply and also as very often farmers retain their own seed material dependence on co-operatives for seed paddy is low (only 40%). 93% of the operators irrespective of their holding size and tenurial conditions had made use of the Co-operatives for marketing their paddy.

B- 2 *63% of the operators had made use of the loan facilities provided by the co-operatives. Generally, more farmers in the larger holdings over 2 acres had relied on the co-operative for credit compared to those in the smallest size class (less than 2 acres). The smaller operators appear to be handicapped in making use of important services offered by the co-operatives.*

B- 3 *In Maha 1971/72, 71% of the operators had not borrowed at all from the co-operatives. The proportion of farmers who had not relied on institutional sources for even a part of their credit requirements was as high as 57%.* As the bulk of the holdings are relatively large (average being 6.37 acres) and as the use of hired tractors is a common feature, the demand for production credit needs no elaboration. *During Maha 1971/72, of the Rs.54,233/- borrowed only 37% had come from various institutional sources. Private sources had provided 63% of the credit of which a little less than half had been obtained from money lenders and traders. 33% of the operators had been indebted to friends and relatives. The co-operatives had thus not fulfilled an important function. Hence the heavy dependence on private sources for credit. The most important reason for not borrowing from co-operatives had been outstanding loans (49%). Over 20% indicated the lack of proper organisation for granting of loans or complained of procedural difficulties. 24% of non-borrowers reported that they were not in need of loans. A lesser proportion of operators of less than 2 acre size group had got their credit from the co-operatives indicating that smaller operators get relatively less benefit from institutional sources of credit.*

B- 4 *The rate of interest charged by non-institutional sources ranged from 0-140%. 45% of the loans from friends and relatives were interest free but in some cases they charged an interest as high as 120%.*

B- 5 *The average co-operative loan per borrower amounted to Rs.406/-. It ranged from Rs.155/- for the less than 2 acre size class up to Rs.650/- for the 6-8 acre size class. The owners had met a greater proportion of their credit needs from the co-operatives and banks than other tenurial groups.*

B- 6 *30% of the total loans borrowed from co-operatives and banks in Maha 1971/72 had not been repaid. 48% of the operators had defaulted. A high proportion of owners had repaid their loans. The rate of recovery of credit from private sources had been greater and in instances where loans had not been repaid in full, the majority had paid at least the interest due. Crop failure had been reported as the main reason for non-repayment of loans from co-operatives. Recurrent crop failure is certainly an important problem in this district, though it was not so during Maha 1971/72 season as weather conditions were favourable. Thus, the reported crop failure cannot be a plausible reason for non-payment of loans from co-operatives*

particularly as a high proportion of non-institutional credit has been repaid. The second most important reason given by defaulters was the lack of interest and enthusiasm by the co-operative to recover the loans. The absence of a sustained effort by the societies to recover loans appears to affect considerably the total recovery rate. As preference is given by all categories of operators to settle loans from private sources the question of non-repayment of co-operative loans is a problem that needs further investigation.

B- 7 Understandably the principal source of agricultural information is the Extension Service as 81% had relied on extension personnel visiting their farms for various types of technical information. *It is noteworthy that 44% had contacted farm neighbours for general information. This source also had influenced an appreciable proportion of operators (40%) to take to NHYVs which points to the possibility of using more of progressive farmers to supplement the efforts of extension staff over some of the field programmes.* Farmer training classes and radio programmes had been less effective as only 17% had obtained information from these two sources. Information on NHYVs (60%) and fertiliser recommendations (59%) had been provided by mostly extension personnel visiting farmers. Demonstration plots had been completely ineffective in disseminating technical information on fertiliser use as not a single operator had been exposed to them.

B- 8 Personal contact has had the highest frequency as 55% of the operators had been visited by extension staff. 80% of these visits had been made by the staff on their own initiative. Nearly every one of the operators in the sample had preferred more visits by extension personnel. Considering the large number of farm families (700-1,000) a village level extension worker has to service and the relatively poor public transport facilities in rural areas, it is not feasible for extension staff to increase visits to individual farmers in the present situation. Use of more of 'leader farmers' is a feasible proposition as mentioned earlier. Radio programmes (57%) had been the most effective impersonal method followed by film shows. *The farmer training programmes had been relatively ineffective in this respect.*

B- 9 79% of the farmers had been aware of the location of the extension centres while 49% had in fact visited them during Yala 1972. Of them 37% had made visits to purchase seed paddy and 24% to buy other inputs. *Only 26% had visited these centres to obtain technical advice. The staff at these centres get many opportunities to establish a dialogue with farmers when visits are made to purchase seed and other inputs. Such opportunities could be more effectively used by the staff to pass on information on technical matters in addition to selling of inputs.*

36% of the operators had known the KVS by name and 78% to contact the village level officer. These figures give a rather encouraging picture of the relationship between farmers and extension personnel in this district.

B-10 Farmer training classes had been attended by only 25% of the operators and a majority of them had indicated that the subject matter discussed was useful. *Of the balance 75% who had not attended training classes a very high proportion (over 80%) had not been*

aware of these programmes. The relatively poor response to these training classes is not surprising when a majority had been unaware of these programmes. If more classes are organised at the village level rather than at farmer training centres, more farmers are likely to attend them.

B-11 Although demonstration had been viewed by about 55% of the operators their impact on disseminating technical information (e.g. fertiliser use), had been negligible. The effectiveness of demonstration plots *per se* had been established. In this instance their ineffectiveness may perhaps have been due to a failure to make the fullest use of them.

B-12 Radio programmes had been listened to by 57% of the operators all of whom had commented favourably on them. 43% had listened to these programmes in their homes. The most popular radio programmes had been on 'Other Field Crops' and Young Farmers' Club Radio Quiz.

C Management Practices and Productivity

C-1 The main sowing season extends from October to December *with a modal concentration in November* in which month 40% of the operators had sown their Maha crops.

C-2 The very low index of cropping intensity of 104% was primarily due to failure of 1972 Yala rains. This low overall cropping index amply highlights the susceptibility of paddy cultivation to the vagaries of monsoon rains. Even under normal weather conditions only about 70% of the asweddumised paddy land in Maha and about 30% in Yala is cultivated. Consequently *there is considerable scope for expansion of cultivation of other field crops that need less water,* viz. sorghum, green gram, ground nut, cow pea and vegetables when water is a limiting factor for paddy particularly under major schemes during Yala.

C-3 *The major source of draught power is four wheel tractors.* Over 70% of fields in Maha had been prepared either exclusively with machinery or along with buffaloes. Popularity of tractors is due to a number of reasons. The average size of lowland operational holding is large (6.37 acres) and generally the water supply is undependable. Chena cultivation also places a time constraint on land preparation in paddy fields. In this situation *speedy preparation of paddy fields becomes important and farmers rely more on mechanical power. Above all there is an acute shortage of draught animals (buffaloes), as 43% of those who had used tractors had done so due to their inability to get buffaloes.*

C-4 In 1972, there were only 607 tractors (four wheel) in working condition. Since approximately 125,000 acres are cultivated normally during Maha and a majority of operators depend on tractors, *it is unnecessary to labour the point regarding inadequacy of draught power availability.* In view of the high social opportunity cost of importing machinery, fuel and other ancilliary equipment, *it is of utmost importance to make use of animal power more.* Large extents of scrub jungle as well as paddy fields that remain fallow could provide ample grazing grounds for draught animals. *Designing of implements suitable for paddy field work also needs attention.* A major problem appears to be to get farmers to shift back to animal power from tractors that had a high component of subsidy in the past.

C- 5 During Maha, 64% of the operators had grown OHYVs exclusively and in Yala 70% had planted traditional varieties. The distribution of OHYVs shows relative uniformity in many of the holding size classes but in the case of NHYVs operators of larger holdings of over 8 acres appear to have taken up to them more rapidly.

C- 6 OHYVs in Maha and traditional varieties in Yala are popular irrespective of the source of water supply. Assured water supply conditions appear to influence the spread of new varieties, as 28% of the cultivated extent in major schemes have been under NHYVs compared to only 3% in minor schemes, during the Yala season.

C- 7 33% of the operators had not grown NHYVs due to their inability to get seed paddy and 26% due to lack of conviction of benefits of new seed. This is not surprising as new varieties were released only in 1971. However, *lack of an assured supply of water referred to by 26% of the operators is a major constraint for the spread of new varieties.*

C- 8 *The traditional system of broadcast sowing is widely adopted* during both seasons as 83% and 94% of the operators in Maha and Yala respectively had resorted to this practice. In Maha even under major schemes the extent transplanted is very limited (12%). *Reasons given for continuing with the traditional method of broadcast sowing were the inability to incur extra expenses (38%), uncertainty of water supply (28%) and shortage of labour.* Uncertainty of water as mentioned earlier needs no further elaboration. In this district a relatively small labour force (3.6 working persons per farm) is called upon to work not only larger extents of paddy land (average 6.37 acres) but also chenas as well. In such circumstances the resources available to operators appear to be inadequate for adoption of improved cultural practices.

C- 9 Around 50% of the operators had reported use of fertiliser in both seasons at 1.7 cwt per acre. *Urea is the most popular kind used with an average of 1.1 cwt per acre. Only 20% had used the mixed fertiliser V_1.* Reported quantities of nitrogenous fertiliser (Urea and Sulphate of Ammonia) used appear to be excessive. During Yala when 70% of the extent had been planted with traditional varieties, an overall figure of 1.3 cwt of Urea and 1.1 cwt of Ammonium Sulphate used per acre is far in excess of the official recommendations for such varieties. *Use of higher doses of Nitrogenous fertiliser for short aged traditional varieties is unlikely to give commensurate returns to farmers.* Rational use of Urea has become very vital as chemical fertiliser imports have a very high social opportunity cost.

C-10 In major schemes around 64% of the operators had used some kind of fertiliser compared to only 37% and 31% in minor schemes during Maha and Yala seasons respectively. Problems connected with water supply naturally restrict the use of fertiliser in minor schemes.

C-11 During Maha as only 47% had applied basal mixture and 59% the second top dressing, *it is evident that almost half the number who had fertilised their crops during this season had not adhered to recommendations of the Department of Agriculture.* Only 13% of those who had used fertiliser had made 3 applications indicating the need for increased farmer education on this aspect of paddy cultivation.

C-12 *Chemicals are used widely for weed control. During Maha 70% of the operators had used chemicals exclusively for weed control in 74% of the extent cultivated.* Farmers in all size classes appear to have a marked preference for use of chemicals. Apart from the general scarcity of labour in the district, the widespread chena cultivation competes for even the limited labour available making it necessary for farmers to rely more on chemicals for weed control. Restricted water supply conditions also pose problems at the field level with regard to effective hand weeding of paddy crops.

C-13 *The yields reported were 40.2 bushels in Maha and 38.3 bushels per acre in Yala.* These yields are considerably lower than the yields estimated on the basis of crop cutting experiments conducted by the Department of Gensus and Statistics, e.g. 52.9 bushels in Maha and 52.6 bushels in Yala.

C-14 *Lowest acre yield (37 bushels) have been reported in the largest holdings size group of over 8 acres during both seasons.* The overall yields reported from different size classes below 6 acres were higher during both seasons compared to those of larger holdings. Chena cultivation prejudices the general level of management of paddy. *Since sowing of chenas invariably takes precedence over paddy field work in Maha the time and other resources at the farmers' disposal for Maha paddy appear to be impaired. Under such circumstances, the productivity in the larger holdings is likely to be affected more.* In the absence of data on the percentage area irrigated in different holding size classes, productivity in relation to holding size and the effects of irrigation water could not be examined.

C-15 A relatively close relationship was observed between the quality of irrigation experienced during the flowering stage of paddy and the acre yields harvested. *80% of the operators in the lowest yield group* (less than 20 bushels) *have had a poor water supply at flowering whilst only 8% of those who had reported yields of over 60 bushels per acre had experienced similar conditions.* Given the uncertainty of rains, irrigation remains a crucial factor in determining the yields harvested. During both seasons substantially higher yields had been reported under major schemes.

C-16 *Generally OHYVs had out-yielded traditional varieties during Maha.* Higher dosages of fertiliser applied in major schemes too possibly would have contributed to higher productivity in such areas. *The yield differences for all varieties are more striking in Yala when the relative efficiency of irrigation provided* (quantum, regularity and controllability of water supply) *is low.* During Yala NHYVs had given almost 50% higher yields than traditional varieties in major schemes. The possibility that new varieties have more favourable water conditions than the rest of the area planted under traditional varieties may perhaps also account for their superior performance.

D Expenses, Disposal and Income

D- 1 Data on cash operating expenses was collected only for Yala 1972. *The average cash outlay per acre was Rs.308/-* for the 69 operators enumerated.

D- 2 *The major component in operating expenses was hired labour* (42% of total outlay). The proportion spent on draught power and purchased inputs amounted to 33% and 14% respectively.

D- 3 *There was a substantial difference between the level and composition of average cash outlay per acre under major and minor irrigation,* Rs.340/- and Rs.149/- respectively. This could be traced to the unstable water supply conditions and consequent risk in minor schemes which make farmers spend less on purchased inputs and other operations.

D- 4 Disposal of 25 to 35 bushels per acre during Maha and Yala seasons is considered excessive in the light of low acre yields reported earlier (40 bushels). However, relatively *high quantities of paddy sold per acre may be explained on the basis of large lowland operational holdings* (Avg. 6.37 acres) *very low incidence of tenancy and widespread chena cultivation.* Large operational holdings mostly worked by owner operators (tenants being less than 10%) are likely to have large surpluses for disposal. *Availability of a range of substitute food viz. millets and pulses from chenas also facilates the paddy farmers to dispose of larger quantities of paddy per acre.*

D- 5 During both seasons the average sales had amounted to about 60% of the total production. Generally the percentage of sales per acre shows an increase with the increase in holding size particularly during the Maha season, one exception being the 8-10 acre size group.

D- 6 *Co-operative societies constitute the main marketing channel for paddy as 80% of the sales for Maha and 61% for Yala had been effected through this institution.* The pattern of sales to co-operatives shows more uniformity in all holding size groups during Maha but in the Yala season operators of smaller holdings had sold a higher proportion of their surplus paddy to the Government. This tendency is contrary to the popular notion that small farmers withhold sales of paddy to co-operatives in order to avoid repayment of cultivation loans. During Yala there is a general shortage of paddy in the district due to the very restricted acreage cultivated. In this situation operators of larger holdings appear to be disposing of a substantial portion of their surplus paddy outside the co-operative network, presumably to take advantage of the higher prices prevailing in the open market.

D- 7 Operators in major schemes (both owners as well as tenants) had been able to sell over 70% of total production during the two seasons. On the other hand in minor schemes during Maha the owner operators had been able to sell 54% of the produce whereas in all other instances the sales effected had amounted to less than 20% of the production. In absolute terms owner operators in major schemes had sold 15-31 bushels more per acre during Maha and Yala seasons respectively compared to those in minor schemes. *Larger quantities of paddy sold by operators of major schemes once again highlight the importance of water supply as a critical factor in determining the success of paddy cultivation in the district.*

D- 8 *The distribution of gross family receipts showed that about 58% earned less than Rs.335/- per month.* Only 18% had receipts higher than Rs.666/- per month. *Family receipts were positively related to holding size.*

D- 9 *Sources other than paddy formed about 1/3 of total receipts which points to some degree of diversification in paddy receipts.*

D-10 *The net operating income from paddy amounted to Rs.228/- per acre.* Operators under minor schemes obtained a higher net return than those under major schemes because of their lower expenses.

E Labour and Employment

E- 1 The 201 farm families surveyed had a population of 1,460 persons which gives an average household size of 7.3. There was a tendency for *larger holdings to be associated with larger families.*

E- 2 The potential family labour force (members 14 years and above) amounted to 869, that is, about 60% of the population. *The average labour force per farm was 4.3.*

E- 3 726 persons (83.5% of potential labour force) were employed - 604 persons employed only on the farm, 97 both on the farm and outside and 25 only outside. The farm work force represented by the first two categories averaged 3.5 per farm and 0.68 per acre.

E- 4 The pattern of labour use shows a high degree of dependence on family labour and hired labour. Exclusive reliance on family labour is high ranging from 68% of farms (in weeding) to 19% of farms (in transplanting). Family labour and hired labour was the most widely used combination. *As the use of* attan *labour was extremely low there was greater dependence on hired labour during peak activity periods.*

E- 5 *The size of holdings showed some relationship to labour use. Farms about 8 acres reveal a tendency for reduced family labour use and greater dependence on hired labour or hired labour in association with family labour.*

E- 6 *47% of households had some members employed outside their farms either on a part time or full time basis.* The main outside occupation was non-agricultural labour (39%) followed by salaried or white collar employment (25%).