AGRARIAN RESEARCH AND TRAINING INSTITUTE

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

PART 6 - COMPARATIVE ANALYSIS

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COMPARATIVE ANALYSIS

Agrarian Research and Training Institute

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F O R E W O R D

This is the final part 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. Though district reports relating to the five districts viz. Hambantota, Polonnaruwa, Anuradhapura, K a n d y and Colombo have been issued separately, it was considered relevant to analyse the conclusions and suggestions emerging in each individual case in their totality as well in order to assist in the development of suitable programmes for paddy production in the future. This volume therefore, p r e s e n t s a comparative analysis of the important aspects highlighted in the individual district studies.

A comparative study, it was felt, would be relevant and helpful to students and researchers on agrarian problems in understanding the macro frame-work relating to some of the socio-economic and environmental factors affecting paddy cultivation in this county. It was also our view t h a t a study of this nature would bring into focus the salient features relevant and helpful for policy formulation in the future. We do hope that those who have not had the opportunity or the time to read through all the district reports will find this comparative analysis useful.

The preparation of a document based on an inter-disciplinary exercise is no doubt an exacting task. The following members of the Institute's staff have contributed in no small measure to bring out this publication: Dr. Wilbert Guneratne; Dr. Samir Asmar; Miss T. Sanmugam; Mr. A.S. Ranatunga and Dr. P. Wickramasekara. Dr. Wickramasekara coordinated the work relating to this study. Prof. Hiran Dias who was closely associated w i t h the preparation of the district reports was also associated with this publication. It is with pleasure that we record the contribution made by all of them in preparing this publication.

The Institute is also happy to announce that a further document highlighting the policy implications is being prepared in a more condensed form for restricted circulation.

C. Narayanasamy

Director,

Agrarian Research and Training Institute.

December, 1975.

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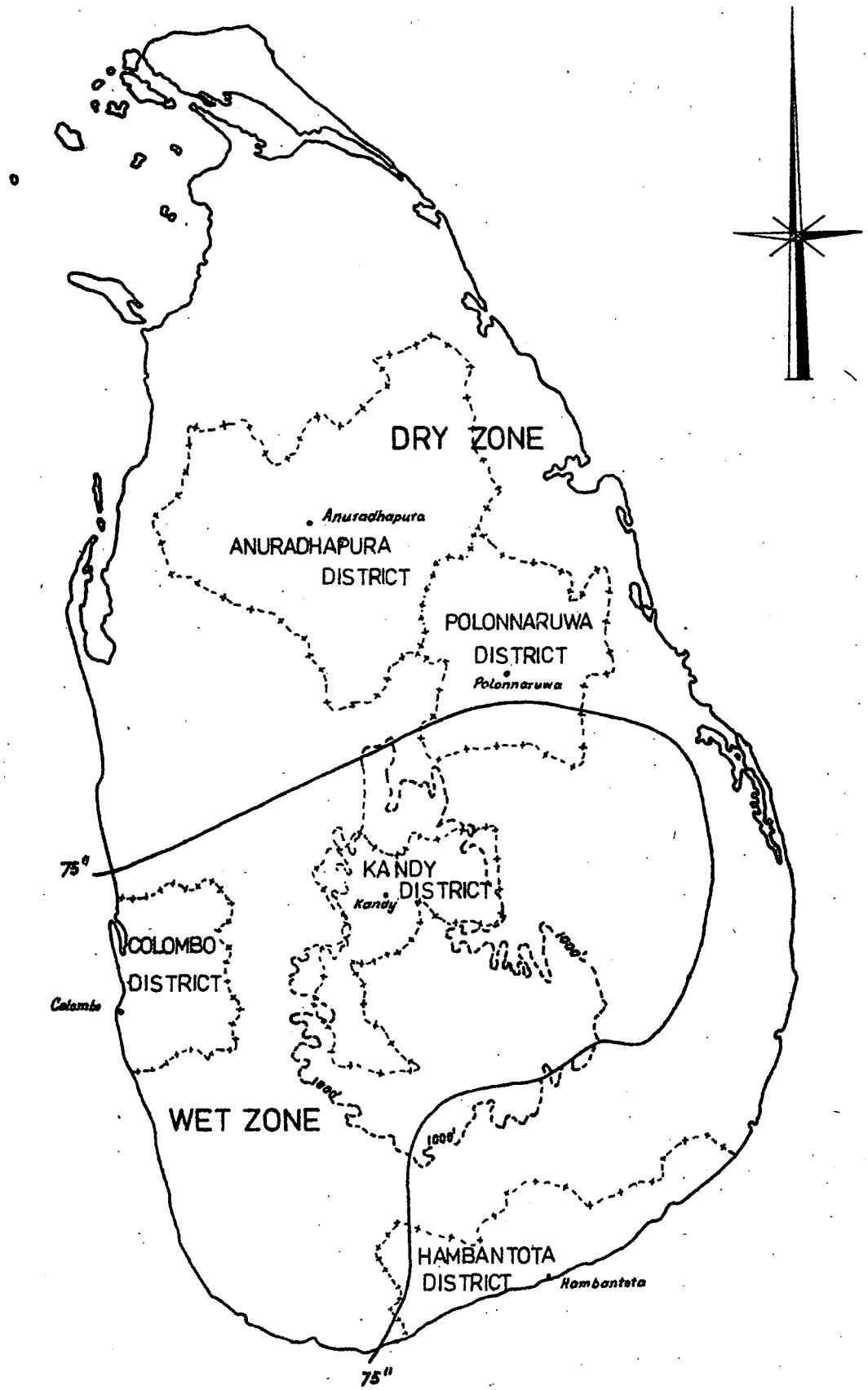

Chapter 1

INTRODUCTION

1. Objectives and Scope of the Study

Surveys were conducted in five important paddy producing districts - Hambantota, Polonnaruwa, Anuradhapura, Kandy and Colombo to study the agrarian situation relating to paddy cultivation. The studies were designed to focus attention on identifying the major socio-economic and environmental factors conditioning paddy production in Sri Lanka. In particular the studies examined :

1. The influence of certain environmental, socio-economic, institutional and attitudinal factors on the adoption of 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; and
4. The effectiveness of different extension communication media as agents of change in cultural practices.

Each of the five district studies had been described and analysed in its own right and the conclusions and suggestions emerging from each study were presented in the first five volumes of the report. This study which forms the final part of the series presents a description and a comparative analysis of the agrarian situation in all the five districts surveyed.

1.1 The District Study

i. Method of Study

The survey in each district was based on the collection of information from paddy land operators through field investigations with the use of a structured questionnaire. The emphasis in the collection of data was on production aspects. The questionnaire was set out in seven main sections.

(1) General information about the farmers, viz. family size, the land operated, 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 71/72;

(5) Cultural practices adopted in Yala 1972;

(6) Paddy production expenses in Yala 1972; and

(7) Agricultural information and the farmer.

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

ii. Sample Design

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. This was based on a stratified multi-stage random sampling design, the parcels of paddy land within each stratum being chosen with probability proportional to the extent cultivated during the previous Maha season.

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

iii. Size of the Sample

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

A total of 833 farmers were interviewed in the five districts distributed as follows:

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

iv. Operation of the Survey

The field surveys were conducted between November 1972 and April 1973.

Hambantota	21.11.1972	-	29.11.1972
Kandy	15.12.1972	-	21.12.1972
Colombo	23.01.1973	-	02.02.1973
Anuradhapura	25.02.1973	-	11.03.1973
Polonnaruwa	26.03.1973	-	11.04.1973

Three Investigators from the Institute assisted by seven final year Geography and Sociology students from the University of Sri Lanka interviewed the farmers. All Investigators had previous experience of similar field work but they were given additional instructions on the survey objectives and the information to be collected.

The response of the farmers interviewed was very good in all the districts.

v. Analysis

It would have been desirable to analyse the data according to the procedure adopted in the sample design but due to the wide variability within the sample units this was not possible. Instead the data was analysed as a simple random sample of operators from a population of operators. This method of analysis would have introduced biases in estimates of characteristics associated with size of holding because the sample of parcels for the crop cutting survey was chosen with probability proportional to the extent under cultivation during the previous Maha season.

1.2 The Inter-district Comparative Study

i. Objectives

The objective of this study is to integrate the findings of the individual district studies with a view to understanding the different agrarian situations and provide guidelines for policy formulation.[1]

ii. Method of Analysis

1. The agrarian situations of the five districts have been compared and contrasted highlighting the geographic and socio-economic similarities and dissimilarities between areas thus providing a picture of the different types of situation and conditions for paddy cultivation prevalent in Sri Lanka.

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1. The policy implications are dealt with in a separate document to be issued shortly.

2. A comparative analysis has been made of the findings of the individual studies. Meaningful relationships between characteristics within each district or between sub-areas within a district have been examined and consistent inter-area similarities or differences in relationships have been identified. The general validity or specificity to a situation of these relationships between the variables have been evaluated.

iii. Limitations of the Study

1. The problems of landless agricultural labourers have not been examined in the individual studies. This is a limiting factor in studying the agrarian situation as a whole.

2. The analysis is based on information on productivity and other variables in respect of two cultivation seasons Maha 71/72 and Yala 72. The yields (productivity) reported by the farmers in these seasons differ from the crop cutting survey estimates of the districts.

3. Due to the smallness of the size of the sample for each district, the stratification of the selected sample by the major characteristics, tenurial conditions and size of holdings resulted in very small numbers of observations in some groups or combinatorial groups of these factors. This limitation made it difficult to study in detail the direct or interaction effects of the different factors on management practices, productivity and incomes.

Chapter 2

THE SETTING

2.1 Introduction

The cultivation of paddy is done in a particular ecological and socio-economic context. To understand farmers' problems and to seek solutions to them we must see them in the context of the setting in which the cultivators operate their farms and make their decisions. Very often it is assumed that the setting is given and that it is uniform. Closer examination of the five districts selected for this study reveals that such an assumption is not justified. The conditions that affect the cultivation of paddy vary even within the districts. These have been described in the reports of the individual districts.

The three dry zone districts are important paddy producing areas of the island. In Anuradhapura and Polonnaruwa 54% and 64% of the cultivated land is under paddy while in Hambantota the proportion is 28%. In the two wet Zone districts the proportion of land under paddy is smaller. In the wet zone areas and in parts of Hambantota the bulk of the land is devoted for highland crop production often under large plantations. The relative position of the districts in terms of total production of paddy and population employed in rice production, as shown in Table 2-1 indicates the importance of the dry zone districts in national paddy production and the importance of paddy cultivation in the economy of the districts studied.

Table 2-I Land, Labour and Production in the Paddy Sector in Selected Districts

	H'tota	P'naruwa	A'pura	Kandy	Colombo
(1) Total asweddumized area, Maha 1971/72[a] acres	49,397	62,368	181,975	48,425	67,945
(2) Asweddumized paddy area as % of total agricultural area[b]	28	54	64	12	15
(3) Employed persons engaged in rice production as percentage of the total[c]	28.3	67.5	70.5	14.3	4.5
(4) Total paddy production 000* bushels.[a]	3,917	6,641	6,729	4,806	3,585

Sources: a - Department of Census and Statistics.

b - Census of Agriculture, 1962

c - Relates to population 10 years and above - Population Census 1971.

2.2 Physical Background

Hambantota, Polonnaruwa and Anuradhapura are in the dry zone lowland plain. The land is generally undulating in these districts with broad, gently sloping valleys where most of the paddy cultivation is located. The annual rainfall varies from 31 - 76 inches with little difference between the districts. Most of the rain falls during the North-East monsoon, the reliability of which is low. Delays in the onset of the monsoon rains and uncertainties in their occurrence add to the problems created by the insufficiency of rainfall. Although some rain is brought to these areas by convectional activity during the inter-monsoonal periods, this is an uncertain supply. In some years drought conditions extend from February to October. Cyclonic activity sometimes brings much rain in October-November and during the period of the North-East monsoon which follows. In certain other years the rainfall is so low that the monsoon is considered to have failed. In 1972 several stations in these districts recorded as little as half the average.

The uncertainties and inadequacy of rainfall make irrigation a necessity in these districts for successful cultivation of paddy. There is very little asweddumised paddy land that is entirely dependent on rainfall.[1]

Table 2-II Percentage distribution of aswedumised paddy land according to source of water - Maha 71/72

Dry Zone Districts	Rainfed	Irrigated		Total
		Major	Minor	
Hambantota	11	68	21	100
Polonnaruwa	08	80	12	100
Anuradhapura	06	35	59	100

In Polonnaruwa the supply of water to the major schemes is more assured than in the other districts. In Hambantota the irrigated areas around Ambalantota which are dependent on the lower WalaweGanga have an assured supply of water while the irrigated areas around Tissamaharama dependent on the Kirindi Oya have a less assured supply. A fair proportion of the paddy land is under minor irrigation. The position is worst in Anuradhapura where most of the paddy land is under minor

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1 Paddy cultivation in chenas and in some encroached land is essentially rainfed. (Chenas are a form of shifting cultivation).

irrigation. The paddy land is scattered over many parts of the district under many small and medium size tanks. During years of poor rainfall these tanks have little water and land remains uncultivated or crops fail due to insufficiency of water. Under such circumstances cultivators must face many risks and would tend to be discouraged from taking much interest in the cultivation. Only about a third of the paddy land in this district has major irrigation but most of these schemes do not have a reliable supply of water. Major irrigation, therefore, does not provide the cultivators in Anuradhapura with an assured supply of water as it does in the other two districts, especially Polonnaruwa. The conditions in Anuradhapura are more representative of the general conditions prevailing in the dry zone, Amparai and a major portion of Hambantota and Polonnaruwa being the exceptions.

Kandy and Colombo fall largely within the wet zone. Parts of Kandy that lie in the North-East of the district form a part of the dry zone. Although broadly within the wetter part of the country, these two districts are distinct from each other in several ways. Kandy forms a part of the central highlands, but due to the traverse of Mahaveli Ganga through the district, there is a wide variation in topography and elevation. Almost a third of the area, mainly in the South has an elevation of over 3,000 ft above sea level. Most of the rest of the district lies between 1,000 to 3,000 ft but a small area in the North-East is less than 1,000 ft in elevation. The slopes are steep in many areas and paddy cultivation is confined to narrow valley bottoms and some of the gentler slopes which have been terraced except in the area around Minipe where there are large, gently sloping tracts of paddy. Climatically too Kandy presents contrasts. Some areas receive their rainfall mainly from the South-West monsoon and convectional activity during the inter-monsoonal periods. These areas are very wet with an annual rainfall of over 80 inches distributed over much of the year. While some other areas receive a well distributed rainfall from both monsoons, a few areas receive only about 60-80 inches rainfall a year mainly during the North-East monsoon. In these drier areas, irrigation is essential for successful cultivation of paddy. The area under major irrigation constituting 17% of the paddy land is made almost entirely by the Minipe Scheme. The minor schemes take a different form here from the small tanks found in the dry zone lowland. They consist mainly of stream diversions. The topography and natural drainage lend themselves well to such irrigation works. These schemes are mainly in the semi-dry areas where during some periods in the year, water is available only in streams. Although the streams were perennial in the past according to the memories of the cultivators in these areas, many of them were said to run dry now in the dry season due to clearing of forests on the higher slopes of the catchment areas. Thus, in spite of the minor irrigation works, there are no facilities to store the water for use in dry periods. In the wetter parts of the district paddy lands situated in valley bottoms have a better water supply through small stream diversions and through seepage water.

By contrast Colombo has a fairly uniform rainfall of 80 -120 inches per annum, most of it in the South-West monsoon season. There is only a short dry period in January and February. The rainfall is higher towards the interior where the elevation of the land rises towards the foot hills of the central highlands. 83% of the paddy land is rainfed

in the district. Irrigation works in this district consist more of regulating water and drainage schemes than the storage or provision of water. More damage is done to paddy cultivation in this district by flooding and water-logging than by the lack of water. This is partly the result of the abundant rain and the water brought down from the central highlands by the many rivers that flow across this area. Much of the coastal area is below 50 - 100 ft in elevation. Broad flood plains which have become silted up slow down drainage to such an extent that several low-lying areas take the form of marshes. Other low-lying areas with a higher elevation are better drained and form fairly large tracts of paddy between broad, gently sloping water sheds. Further inland the foot hills of the central highlands extend towards the coastal lowland plain forming gently sloping, low hills and ridges. In addition to innundations and poor drainage conditions, late arrival or early departure of the monsoon rains often result in increasing the risk of crop failure.

2.3 Socio-Economic Background

Three of the districts Hambantota, Polonnaruwa and Anuradhapura are areas of comparatively recent settlement, the settlers being drawn mostly from the more congested areas in the wet zone during the past four or five decades. Up to the turn of the 19th century these districts had remained de-populated except for the *Purana* villages which managed to survive the decline and decay of the once thriving dry zone civilization. Even at the beginning of the century the population of the more densely settled part Nuwarakalawiya was less than 30 per sq. mile. Development and settlement increased these low densities by 1971 to 124 (Polonnaruwa), 141 (Anuradhapura) and 337 (Hambantota). As large parts of these districts are still thinly populated, the actual densities in the small areas which have been developed is very much greater. Paddy holdings are relatively large here and problems of joint ownership, tenancy etc., are not very important except in Hambantota where, paddy land concentration in the hands of absentee landlords has resulted in a high degree of tenancy.

By contrast, the two wet zone districts (Colombo and Kandy) are very thickly populated; the population density per sq. mile being 1,299 (Kandy) and 3,374 (Colombo). Although the population is more widely distributed in these districts, due to the large areas occupied by tea, rubber and coconut plantations the pressure of population on land used for domestic agriculture (paddy and home garden cultivation) is very heavy. This has caused extensive fragmentation of the land which in turn has brought landlessness, micro-holdings, joint ownership, tenancy, etc., all of which are important problems of the paddy economy of the wet zone districts.

There are differences in the economy of these districts. Polonnaruwa and Hambantota depend primarily on paddy cultivation. Although in both these districts chena cultivation is practised, farmers are by and large, full time paddy cultivators. On the other hand, the uncertainties of paddy cultivation under major irrigation in Anuradhapura have made chena cultivation an important part of the economy of that district.

Paddy cultivation forms a small part of the economy of the Kandy District except in areas such as Minipe. Highland holdings play a significant role in this district and cultivators obtain a fair proportion of their income from home garden cultivation. Even commercial crops such as spices and tea are cultivated on this scale. Work on tea, rubber and cacao estates also provides some alternative employment for cultivators in some parts of the district. The position is similar in Colombo District where again highland cultivation and alternative employment are important sources of income. Highland forms a more significant portion of the cultivators' holdings in Kandy and Colombo than in the other districts (Table 2-III)

Table 2-III

Percentage Distribution of operational holdings of paddy cultivators by type of land

District	Paddy land	Highland	Total
Hambantota	65	35	100
Polonnaruwa	68	32	100
Anuradhapura	66	34	100
Kandy	46	54	100
Colombo	36	64	100

The potential of highland is also greater in the wet zone due to the climatic conditions. In the dry zone highland is often unutilised or underutilised due both to environmental and technical problems.

Transport and other service facilities have developed to different extents in these districts. With the emphasis on the development of the plantation industry and the export-import economy, the transport network has developed mainly in the wet zone. Colombo and Kandy have a very dense network of roads and transport facilities. However, villages in the drier and hilly areas are less well served. In the dry zone, due to the uneven development many areas are poorly served by roads and transport facilities. Within these districts urban service centres have emerged in a few areas where irrigation is well developed e.g. around Polonnaruwa, Anuradhapura, Ambalantota and Tissamaharama. Inadequate road and transport facilities affect extension work, distribution of inputs and even supervision of infrastructural facilities.

There are important sociological differences also among the districts studied which affect the milieu in which paddy cultivation takes place. Although this survey did not specifically study these aspects they cannot be ignored in considering the setting for paddy cultivation as they affect especially the institutional framework within which paddy cultivators operate. The hierarchical structure of society is prevalent in the areas with a long history of settlement such as Kandy and Colombo districts and the *Purana* villages of the dry zone districts. All the complexities of caste and class distinctions and relationships exist in these areas. They are most developed in the Kandyan villages

and the *Purana* villages. But in these there is greater social cohesion and forms of communal organisation of labour such as *attan* still exist. Such features have been weakened or been replaced by new relations in urbanised areas of the districts under the impact of emerging social and economic changes such as growth of education, expansion of industry and trade, increased social mobility etc. On the other hand, in the recent developed areas of the dry zone where colonists from many parts of the country have very often been settled in homes which are distant from each other, there is little social cohesion. The attitude is much more individualistic, except in the nuclear family. Forms of traditional co-operation are therefore absent. Traders and money lenders have taken control of the social and power structure of these areas. They dominate in the institutions set up to serve the farmer. The *Gambarayas* of Hambantota are an illustration of this. Under conditions of this nature, institutions are not likely to work successfully. The problem of water distribution and management is a case in point. Although many of these areas have an adequate supply of water in the reservoirs which serve them, poor maintenance of distribution channels, illicit diversion of water and conflicts of interests at water meetings lead to waste of water and poor supply.

The successful diffusion of improved agricultural practices is influenced by certain human factors as well. The migrants from Kandy-Kegalle districts who have been used to labour intensive methods of cultivation in their home areas have often transferred these to the areas where they have settled. The standards of cultivation in Polonnaruwa have benefitted from the transfer of this technology.

In areas such as Matara, from where migrants went to Hambantota, conditions are different. In the former district levels of management are low. Consequently they are less conditioned to adopt intensive methods of cultivation. The larger holdings and difficulties of getting labour have also probably contributed to the lower standard of cultivation in Hambantota. Anuradhapura with its wide variety of ecological conditions and having both a large indigenous population as well as settlers from especially Kurunegala presents a more complex situation.

2.4 Conclusion

The eco-socio-economic conditions in the five districts are distinct from one another. Variations in the agrarian situation exist even within a district. The five districts may not be representative of every part of the country but they do typify conditions in many parts of the South-West coastal lowland, central highlands and much of the dry zone.

Therefore, from a long-term point of view it is important to consider whether the present administrative districts are adequate for efficient agricultural planning and policy making. Policies for the development of the paddy sector should take into account the variations that exist between 'regions' or 'situations' defined in terms of ecological and socio-economic criteria.

Chapter 3

WATER, LAND AND LABOUR

The purpose of this chapter is to discuss the position relating to the availability and utilisation of the basic resources of water, land and labour, as they affect paddy cultivation. It is against this background that the productivity situation and management practices are examined in the next chapter.

3.1 Water

The source of water supply is normally classified under (i) major irrigation; (ii) minor irrigation; and (iii) rainfed. This classification does not adequately reflect the quality of water supply in terms of quantum, regularity and controllability of supply. For instance, the rainfed areas of Kandy provide a more certain water supply than in the areas under major irrigation in Anuradhapura during most years.

An assured water supply permits a higher cropping intensity. In the major schemes of Polonnaruwa and Hambantota the cropping index is around 150 and in rainfed areas in Kandy and Colombo it is as high as 170. In contrast, in Anuradhapura where minor schemes and rainfall constitute the major sources of water, this index has been only 91%. Large extents are left fallow due to uncertain supply of water in areas served by minor schemes in the dry zone. In rainfed areas of the wet zone full utilization of the land is hampered by poor water regulation. Assuredness of water supply facilitates the observance of cultivation schedules and effective use of available resources like draught power. It also reduces risks inherent in farming and allows farmers to achieve higher levels of crop management.

3.2 Land

So far as productivity of paddy lands and income of farmers are concerned, the two basic aspects of land tenure that have to be considered are the size of holding, and the tenurial conditions under which it is operated.

3.2.1 Size of operational holdings

Table 3-I shows that the size of operational holding is generally larger in the dry zone districts. This may be the result of the lower pressure of population and differences in settlement patterns. Under land settlement schemes in Anuradhapura and Polonnaruwa, colonists were given allotments under the Land Development Ordinance with specific limitations on leasing, mortgaging, sale and fragmentation. The size of the allotments varied from 5.00 acres paddy land and 3.00 acres highland initially to 3.00 acres paddy land and 2.00 acres highland later. In Hambantota land grants were made to landlords who in turn rented it out in blocks to *ande* cultivators. Even in these districts, holdings are much smaller in areas that have been settled for long periods, e.g. *Purana* villages of the Anuradhapura District and Giruwa Pattu North and South in Hambantota. However, in the *Purana* villages of the dry zone possibilities available for encroachment have acted as

Percentage Distribution of Operators and extent operated according to size of Lowland Holding (acres)

Table 3-I

District	Percentage Distribution of Operators								Percentage Distribution of extent operated							
	Up to 0.5	0.5-1.0	1.0-2.0	Sub Total Up to 2.0	2.0-4.0	4.0-6.0	More than 6.0	Total	Up to 0.5	0.5-1.0	1.0-2.0	Sub Total Up to 2.0	2.0-4.0	4.0-6.0	More than 6.0	Total
Hambantota				18	33	32	17	100				6	21	35	38	100
Anuradhapura				8	33	27	30	100				2	16	22	59	100
Polonnaruwa				8	31	36	25	100				2	19	34	46	100
Kandy	15	23	32	70	16	8	6	100	3	9	24	36	22	18	24	100
Colombo	17	31	25	73	20	4	3	100	3	15	22	40	32	9	19	100

a buffer against reducing the operational holdings to extremely small units. In dry zone areas served by minor schemes with uncertain water supply, the extent actually cultivated by an operator is much smaller than his operational holding.

In effect a sizeable proportion of paddy operators in such areas operate very small holdings. The reliance on chena cultivation by a large number of farmers in the dry zone is partly influenced by the need for insurance against an uncertain paddy crop. However, the majority of farmers in the dry zone districts operate holdings which could be considered adequate to yield a minimum acceptable level of income.

The wet zone districts are dominated by operators of small holdings. In Colombo and Kandy for instance, over 70% of the operators work on holdings less than 2 acres in extent. 38% and 48% of operators in Kandy and Colombo respectively worked on holdings less than 1 acre in extent and only 14% and 7% operated holdings of over 4 acres.

The inequality in the distribution of operated land is also more marked in the wet zone areas, where over 70% of the operators with less than 2 acre holdings cultivated only 35% of all operated land. The bulk of the operators therefore suffer from 'size-disabilities'.[1]

Thus the large proportion of very small operators is a major problem associated with the developemnt of the paddy sector in the wet zone in addition to the presence of a large extent under tenancy.

3.2.2 Systems of Tenure

Paddy holdings are operated under various forms of tenure in the districts surveyed, ranging from full ownership to full tenant-operation (Table 3-II).

This categorisation of 'the level of tenancy' is based on the proportion of leased-in area to total operational holding.[2] Most owner-operators in Polonnaruwa are allottees under the Land Development Ordinance. The categories of joint owners and encroachers are important only in Colombo and Anuradhapura respectively. The districts with a high level of pure tenancy are Hambantota, Kandy and Colombo. The high incidence of part-tenancy in these districts indicates a tendency for leasing-in by owners to make their holdings viable.

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1 See A.M. Khusro, Economics of Land Reform and Farm Size in India, Macmillan, Bombay, 1973.

2 As defined here, owner-tenants own more than 50% of the extent of holdings operated by them.

Table 3-II System of Tenure

		Owners	Tenants	Owner-Tenants	Tenant-Owners	Others	Total
Polonnaruwa	No	105	-	16	5	28*	154
	%	68.2	-	10.4	3.2	18.2	100
Hambantota	No	32	77	16	22	9	156
	%	20.5	49.4	10.3	14.1	5.8	100
Anuradhapura	No	109	9	16	10	57*	201
	%	54.2	4.5	8.0	5.0	28.4	100
Kandy	No	60	48	15	35	-	158
	%	38.0	30.4	9.5	22.2	-	100
Colombo	No	63	39	-	18	24**	144
	%	43.7	27.1	-	12.5	16.7	100

* mainly encroachers

** joint-owners

The most common form of tenancy is share-cropping. The data available on the lease market is not comprehensive enough to analyse the system in depth. The reasons for the emergence of a high level of tenancy in Hambantota are different from those of the two wet zone districts. In the case of the former, this is due to the almost unique nature of land development and settlement in that district. Paddy land was owned in large tracts, sometimes as much as 200 acres or more by absentee landlords[1] who had purchased it at the time when this area was still undeveloped. Re-settlement in this district had been almost completed by the time major development began in the rest of the dry zone where the Land Development Ordinance of 1935 laid down the pattern of tenure. The large paddy land owners in Hambantota are absentee landlords living mostly in urban centres of the coastal South-West. The land is managed through an agent on the spot, an intermediary called '*Gambaraya*'.[2]

In the wet zone districts the high incidence of tenancy is associated with pressure of population on land resulting in fragmentation and

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1 The Land Reform Law of 1972 will have resulted in a breakdown of the largest tracts.

2 See H. Dias and B.W.E. Wickremanayake, The *Gambara* System in the Hambantota District -paper presented at the conference 'Agriculture in the Economic Development of Sri Lanka'. Ceylon Studies Seminar, Peradeniya Campus, 1974.

increasing landlessness.[1]

The extent to which tenancy can be a dis-incentive (or exploitative) depends mainly on who leases from whom. This affects the terms and conditions that accompany the leases.[2] The percentage of landowners among landlords in Hambantota and the two wet zone districts does not show marked differences.[3] The bulk of the landlords are non-cultivating owners.[4] In Kandy the percentage of cultivator owners (22%) is higher than the proportion of the salaried class and the position is reversed in the other districts.

Occupation of landlords
Percentage to total number

	White collar or professional	Traders	Land owners	Priests	Farmers	Others	Total No. of landlords
Hambantota	26	11	22	13	13	15	127
Kandy	11	8	21	14	22	24	72
Colombo	26	11	19	4	12	28	84

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1 N.K. Sarkar and S.J. Tambiah, The Disintegrating Village, University of Ceylon Press, 1957

2 V.M. Rao, Village Lease Markets for Agricultural Land : Some Approaches for Analysis, Economic and Political Weekly, Vol. IX (26), June 29, 1974, A-55 to A-62.

3 In the case of Hambantota, some tenants may have reported the occupation of the intermediaries rather than that of the actual owners. This may explain why the proportion of land owners is more or less similar to the two wet zone areas.

4 This may not strictly hold as the landlords have been classified by their main occupation. It is possible that there are part-time farmers among these.

In the wet zone areas the landlords who have salaried employment or are in trade are mostly people from the same area and not absentees. The proportion of landlords living in the same village as their tenants is around 50% for Kandy and Colombo whereas it is only 24% for Hambantota. The majority of tenants in all districts had obtained their land from either a friend or a relative. The terms and conditions under which land is made available determine the benefits derived by tenants from the diffusion of control over land through the lease market. The level of the share rent is therefore relevant. The data shows a clear-cut difference between Hambantota and the wet zone districts in regard to this.

Land Rent Paid By Tenants

	Fixed* rent A	1/4 share* of crop B	Whichever is * less of A & B C	½ share of crop D	Others E	Total
Hambantota	12	69	3	3	13	100
Kandy	11	5	-	83	1	100
Colombo	4	14	-	74	8	100

* under the Paddy Lands Act

In Hambantota, most tenants ((82%) were able to pay the rent at least partially in accordance with the Paddy Lands Act (1/4 share or the fixed rate). In both the wet zone districts over 75% of tenants still pay ½ share of the produce. The different level of share rent in Hambantota and the latter districts is partly explained in terms of differences in collateral help from the landlord. About 50% and 70% of the tenants in Kandy and Colombo respectively receive collateral help while only 9% of tenants in Hambantota receive such help. Considering the repayment conditions and other services performed by tenants for the landlord the effective rent would be still higher.[1] Some landlords provide collateral help in order to prevent tenants from paying the legal rent or to prevent them from getting registered in the Paddy Lands Register.

Another important aspect of the tenancy problem is the security of tenancy rights. This is found to be a major problem in the wet zone. In both districts about 35% of the tenants felt that their cultivation rights were insecure.

The tenancy situation may be aggravated by other factors such as smallness of holding. Tenants in Hambantota have larger holdings than

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1 No data is available on rent extracted by the landlord through other forms such as labour services, gifts, '*madaran*', etc. - See N.K Sarkar and S.J. Tambiah, op.cit.

the owner category but in the wet zone tenants are associated with small holdings. Therefore tenants in the wet zone suffer from both tenure and size disabilities. This interaction has to be taken into account in discussing the effects of tenurial arrangements.

3.3 Labour Supply

The data collected on labour and employment is not adequate for a detailed analysis. Labour supply may be put into the following categories:

a) family lanour

b) hired labour

c) exchange (attan) labour

3.3.1 Family Labour

The major determinants of family labour supply are -

a) family size
b) Age-sex composition of family members.

There is hardly any variation in the size of family across districts. It is consistently high ranging from 6.2 - 7.6. The population of 14 years and above represents those of effective working age and is above 60% of the total population in all districts, although not all members of this group are actually available for farm work.

This available supply has to be analysed in relation to average holding size which brings out the greater availability of labour in the wet zone districts.

Data on farm work force (excluding those employed only off-farm) shows a high degree of labour availability in the wet zone. This is partly offset by the higher proportion of workers employed outside agriculture. In Kandy and Colombo 25% and 39% of family members are involved in outside activity as well. Given this factor, the average work force per farm varies between 3 - 3.5 labour units.[1] If we assume that two units are full-time, the number of man-days available to a paddy operator would be about 625 for the year.[2] This amounts to about 300 man-days per season. Given the wet zone and dry zone average holding sizes, labour availability per acre of paddy may range between

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1 The data does not enable us to arrive at an estimate of full-time male-adult equivalents.

2 This is on the basis of 250 work-days per year.

60-- 150 man-days.[1] This implies that family labour supply should not be a major constraint for paddy cultivation. However, this is based on the assumption that farm operations can be carried out evenly whereas in paddy cultivation labour demand has seasonal peaks. It also takes no account of the willingness of family members to engage in agricultural work. There is no strong association between holding size and availability of family labour. It has to be pointed out that the above assumption took only the lowland into consideration. The cultivation of the highland also would make a demand on available labour. This is more so in the case of the wet zone.

3.3.2 Hired Labour

It is found that the use of hired labour is quite common even when the holdings are small. While this survey did not collect data on total labour input, the cost of production study for Maha 1972/73 shows the following ratios of hired labour to total labour inputs.[2]

Polonnaruwa	78%
Hambantota	86%
Kandy	59%
Colombo	56%

Again the dependence on hired labour is less in wet zone districts. Given that family labour may not be fully employed and that family earnings can be increased by employing less hired labour, the high reliance may be due to some other factors:

i. highly seasonal nature of the demand for labour. Certain operations may have to be completed within a short time, i.e. harvesting, transplanting;

ii. differences in cultural practices involving labour use;

iii. certain field operations, e.g. land preparation, are done mainly by male labour;

iv. larger holdings have a high land/labour ratio. Hence, the dependence on hired labour could increase with holding size. The relationships within each district do not show any consistent trend to support the above hypothesis. Hired labour is used mainly during peak activity periods, by both small and big farms.

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1 The following average holding sizes are assumed:
wet zone - 2.0 acres
dry zone - 5.0 acres

2 These figures (based on a small sample) may not be representative of the overall district situation.

3.3.3 Exchange Labour (*Attan*)

In the wet zone districts, popularity of exchange labour reduces the dependence on hired labour to some extent. The widely used pattern of labour in the wet zone is family labour combined with *attan* , while in the dry zone the combination of family and hired labour occupies the most important place. However, traditional practices such as *attan* are now being increasingly replaced by more commercialised forms.[1]

3.3.4 Intensity of Labour Use in Paddy Cultivation

A case has been made for more labour intensive technology in paddy cultivation.[2] It is maintained that more labour could be absorbed by substitution of labour for machinery in land preparation and threshing and for chemical in weeding. Transplanting itself would generate more demand for labour. Some degree of mechanization (selective mechanization) is however felt to be necessary in view of the limited buffalo population and the need to ensure timely cultivation in certain areas.[3] The picture emerging from the comparison of districts is that the whole question is closely tied up with environmental factors. In Anuradhapura with adverse water supply conditions and relatively large holding sizes, farmers rely more on tractors and chemical weedicides. Further, with double-cropping adherence to tight cultivation schedules becomes imperative.[4] In contrast in areas like Polonnaruwa and Kandy highly labour intensive operations such as transplanting, hand-weeding, and buffalo use are prevalent. The dependence of different practices on water supply conditions has been discussed in the next chapter.

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1 Gunasinghe, N - 'Social Change and Disintegration of a Traditional system of Exchange Labour in Kandyan Sri Lanka,' - paper presented to Ceylon Studies Seminar, 1975 Series, No.6, Peradeniya Campus.

2 ILO, Matching Employment Opportunities with Expectations. A Programme of Action for Ceylon, Report, ILO, Geneva, 1971.

3 Draft Agricultural Development Plan, Annual Crops.

4 See K. Izumi and A.S. Ranatunga, Utilisation of Labour under High Yielding Varieties of Paddy in Sri Lanka, Conference Paper, IDS (Sussex)/ARTI Seminar, April-May 1973.
I. Ahmed, Green Revolution with or without Tractors. The Case of Sri Lanka, Marga - Vol.2 (3) 1974.

Chapter 4

PRODUCTIVITY AND MANAGEMENT PRACTICES

4.1 General

In the study area the important factors that influence the productivity and management practices in paddy cultivation are:-

a) Environmental factors - variations in the water supply conditions,

b) Socio-economic factors - (i) Holding size
(ii) Tenancy conditions.

Basic data on water supply, holding size and tenancy conditions pertaining to the districts is summarised in Table 4-1. The size, distribution characteristics, tenurial status of operators and water supply conditions show marked differences, This indicates the potential offered for paddy production in the various districts. It is against this complex background that an attempt is made to see if any broad associations exist between management practices, productivity and the above factors.

Broadly production can be increased in two ways:-

i. Extending the area under cultivation;

ii. Increasing productivity.

The emphasis in this section is on the latter. Productivity here refers to land productivity as measured by yield per acre. Productivity variations can be assumed to be related to management practices which are influenced by more fundamental factors such as environmental and socio-economic factors.

Major changes in environmental and social conditions cannot be brought about by the efforts of individual farmers. Within the existing framework of physical and social constraints however, it is possible to increase productivity and incomes by improved management practices. Emphasis in the ensuing discussion would be focussed first on understanding the present management levels under the existing physical and social constraints. As some of the social and physical factors mentioned earlier have a direct influence on the incomes realised from paddy cultivation it is necessary to ascertain how these factors influence management practices. The initial discussion is restricted to the relationship between size of holding and productivity.

Table 4-I Environmental, social and economic conditions prevalent in the paddy area

District	Water supply conditions and drainage	Tenurial status			Size characteristics	
		Owner operated Extent %	Rented or leased %	Land-less operators %	Dominant size group (acres)	Avg. size of paddy holding (acres)
Polonnaruwa	Very stable. In 80% of the extent assured water supply from major schemes	81	10	4	4-6	5.4
Hambantota	Stable in 60% of extent. Major schemes main source of water	28	70	44	Over 6.00	4.5
Anuradhapura	Moderate in major schemes (34% of extent). Poor in 66% (under minor)	67	14	8	10 and above	6.37
Kandy	Stable in major schemes and rainfed areas covering 85% of extent	54	44	30	1.00-2.00	2.12
Colombo	Adequate rainfall but unsatisfactory in 90% of extent due to poor drainage and soil conditions	63	37	28	2.00-4.00	1.8

4.2 Productivity in relation to size of holding and water supply

4.2.1 Size of holding and productivity

It is generally held that small family farms are more productive.[1] This has been the subject of some controversy in the Indian context.[2] It is of interest to study the observed relation between yield per acre and size of holdings in various districts.

The average yields in respect of districts on the basis of yields reported by farmers are lower than the yield estimates of the Department of Census and Statistics given in Table 4-II Average acre yields in the dry zone except in Anuradhapura are higher compared to those of the wet zone.

Table 4-II Average yields per acre in relation to size of holding (bushels)

M a h a 1971/72

	Upto 2.00	2.00-4.00	4.00-6.00	6.00-8.00	8.00-10.00	Over 10.00	Average (Present-Survey)	per acre (Crop-cutting Surveys)*
Polonnaruwa	49	69	71	59	50	50	62	83
Hambantota**	37	40	35	29[a]			34	63
Anuradhapura	46	43	41	36	49	37	40	53
Kandy	49	43	59	55[a]			51	62
Colombo	36	35	42	35[a]			36	38

(Table 4-II continued next page)

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1 ILO, Matching Employment Opportunities with Expectations. The Report maintains that 'output per acre is known to be highest on small holdings of 1.5 to 2 acres in India, perhaps even smaller in Ceylon ....' p.93

2 See C.H. Hanumantha Rao, 'Alternative explanations of the Inverse Relationship between farm size and output per acre in India', The Indian Economic Review, Vol. 1 (2), October 1966, pp. 1-12.

	Y a l a 1972							
Polonnaruwa	41	58	47	49	49	54	50	56
Hambantota**	29	32	21	19[a]			24	56
Anuradhapura	38	40	50	35	74	27	38	53
Kandy	43	40	40	44[a]			42	62
Colombo	31	25	26	16[a]			26	38

* Source : Department of Census and Statistics

** A high proportion of farmers in Hambantota have reported the climatic conditions here unfavourable during this particular year.

a 6 acres and over.

Analysis of data shows the following relationships. The maximum acre yields have been obtained during Maha 1971/72 in the 4.0 - 6.0 acre size group in Polonnaruwa, Kandy and Colombo. In Polonnaruwa most holdings are located in settlement schemes and these enjoy assured water supply conditions and are relatively free from tenancy problems. This applies to Minipe in the Kandy District. On the other hand, in Hambantota the highest yieldshas been recorded in the smaller size group of 2.0 - 4.0 acres. In this district and Anuradhapura not only is water supply relatively less stable but also there are problems of draught power. However, during Yala highest yields have generally been recorded in smaller holdings of 2.0 - 4.0 acres in the dry zone except in Anuradhapura, and in the smallest holdings of less than 2.0 acres in the wet zone. These results do not indicate a clear and consistent trend in the relationship between size of holding per se or in the behaviour within different situations.

Yala yields are generally lower than Maha yields in all districts and no consistent pattern has been observed to exist between seasonal differences and size of holding.

4.2.2 Water supply and Productivity

The yields recorded in respect of Maha and Yala seasons classified on the basis of water supply conditions are summarised in Table 4-III.

Table 4-III Average yield per acre according to water supply (Maha 1971/72 and Yala 1972)
(Bushels)

	Major		Minor		Rainfed	
	MaMa	Yala	Maha	Yala	Maha	Yala
Polonnaruwa	64.7	51.0	35.0	41.9	-	-
Hambantota	39.8	33.5	29.6	7.3	23.0	23.9
Anuradhapura	43.6	40.3	33.6	28.4	-	-
Kandy	65.1	49.7	45.6	37.1	45.2	36.8
Colombo	-	-	33.6	19.8	37.9	28.7

Marked differences in yields are observed between different water supply conditions. The effect of qualitative differences in water supply is evident from the fact that yields in major schemes are higher than those in both minor schemes and rainfed land.

4.2.3 Relationship between size of holding, water supply and management practices

Some of the important management practices adopted are examined in relation to holding size and water supply with a view to explaining the observed productivity differences with size. For this purpose three cultural practices in respect of which data is available are considered: use of NHYV, adoption of transplanting and fertilizer use. The indicators of the extent of these practices discussed are:-

(a) percentage extent under NHYV;

(b) number of fertilizer dressings;

(c) percentage extent transplanted.

No attempt has been made to relate a package of farm practices (or new technology) to different situations as the NHYVs had been released only the previous year.

a) Use of NHYVs

The pattern of spread of new high yielding varieties may not indicate a clear trend because of the short time during which these were available to farmers. In Hambantota and Kandy a higher proportion of operators of medium size groups (4-6 acres) have introduced NHYVs in Maha compared to the other size groups. During Yala, the operators of larger holdings have planted a substantial proportion of their land with new varieties. Farmers with access to stable water supplies have readily taken up to new varieties. 44% of the extent under major schemes had been planted with NHYVs compared to less than 20% in minor schemes in all districts other than Anuradhapura.

The NHYVs have outyielded OHYVs in major schemes of both Polonnaruwa and

Hambantota. In Polonnaruwa, the average yield of NHYVs (84 bushels) was significantly greater than those of OHYVs (56 bushels). In minor schemes, the differences are not very marked. In Hambantota the older varieties such as H-4 have generally given a similar or better performance than NHYV during Yala indicating the capability of OHYVs to perform reasonably well under adverse weather conditions and lower levels of management.

b) Use of Fertilizer

A clear relationship between fertilizer use and different holding sizes is seen only in Polonnaruwa and Kandy. The proportion of operators who had used 3 dressings of fertilizer was highest in 4.0 - 6.0 acre size classes[1]. Except in Anuradhapura, over 50% of the operators have used at least one application of fertilizer and around 35% have applied 3 dressings in holdings of over 2 acres. In all districts irrespective of the water supply situation the practice of top dressing with urea is popular. Only about 50% have used basal fertilizer in most districts even under major schemes. In minor and rainfed areas excepting Kandy the proportion using basal fertilizer has been less than 20%. Pellet fertilizer is used very extensively in the Colombo District.

It may be concluded from the foregoing that in high potential areas a high proportion of farmers have used some kind of fertilizer and also adhered more closely to the recommendations of the Department of Agriculture in using basal fertilizers. Since over a large proportion of farmers in the sample have used fertilizer though quantity and quality vary widely it is not possible to examine closely the yield differences between users and non-users.

c) Transplanting

As transplanting is a costly operation it is normally adopted under assured water supply conditions. Over 50% of the operators in Polonnaruwa and Kandy have adopted transplanting. In these areas even large operational holdings have been extensively transplanted. The availability of an assured water supply together with the fact that farmers in these areas were traditionally used to transplanting may have contributed to this. In Polonnaruwa under major schemes transplanted crops have significantly out-yielded the broadcast crops, the difference in yield being 28 bushels for NHYVs and 20 bushels for OHYVs per acre. The very small proportion of the area transplanted under minor schemes

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1 The comparisons between groups exclude the large size groups with insufficient number of operators.

in the dry zone and in rainfed areas in Colombo shows the reluctance of the farmers to adopt techniques that are associated with high expenses under less favourable environmental conditions.

4.2.4 Land Preparation and Sowing

The influence of different water supply situations is readily seen in the dry zone areas on aspects such as draught power use, as only around 40 days are available for land preparation and sowing during Maha. These areas do not have the benefit of South Western monsoon rains and the soils also tend to remain hard until the advent of the North East monsoon and under such circumstances farmers find tractors more helpful than buffaloes for speedy field preparation. This tendency is most evident in areas with unsatisfactory supplies of water such as Anuradhapura where 65% of the cultivated extent has been tilled exclusively with tractors in Maha. In contrast in the adjoining district of Polonnaruwa as well as in Minipe where holdings are equally large and similar climatic conditions obtain, only 22% of the extent has been prepared exclusively with machinery in Maha due to the presence of an assured water supply. Of the tractor users 35% have indicated the need for speedy preparation of land as the main reason for their preference for machinery both in Anuradhapura and Hambantota. On the other hand, in Polonnaruwa the speed of field operations does not appear to be as important due to ready availability of water. Consequently buffaloes continue to be the more important source of draught power in this district, as generally found in the wet zone.

The patterns of ownership of machinery also appear to have adverse effects on field preparation and sowing. In both Anuradhapura and Hambantota where tractor is the main source of draught power, over 90% of the tractor users hire their machines mostly from non-cultivators, viz. merchants, millers, *Gambarayas* and landlords. In view of the general shortage of machinery in the country and the tractor users being heavily dependent on hired machines farmers often fail to complete sowing according to stipulated time schedules. Repercussions of this problem are clearly seen in different forms in the dry zone varying with the water supply situation. Under Walawe in Hambantota where water is readily available farmers have begun to stagger[1] their sowing operations as a strategy to overcome at least partially the shortage of draught power for land preparation. During Maha 1972/73 sowing operations have continued for almost seven months showing a complete disregard for sowing dates fixed under the Irrigation Ordinance. In this area the cultivation calendars appear to be observed more in the breach

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1 Main reasons of staggered sowing are:-
(a) ready availability of water,
(b) shortage of draught power and
(c) cultivation of 4-4½ month varieties during Yala.

and as a result there is considerable overlapping of seasons. When Maha and Yala seasons overlap each other in this manner, it is difficult to ascribe any fixed period for any one season and even cultivation seasons are missed once in every three to four years as a result. The time of sowing is a crucial factor from the point of view of productivity. Crops sown in the peak period in November have given higher acre yields both in Hambantota and Polonnaruwa than those sown later in the Maha season, indicating the influence of time of sowing on yields. In Polonnaruwa particularly the average yields of those who had sown their crops in October and November were significantly greater than the yields of December-sown crops.

On the other hand, in Anuradhapura where the water supply is unstable even in Maha, farmers do not have the same freedom to manipulate their sowing operations as in Walawe. Under such environmental conditions the general shortage of tractors has resulted in problems. As the availability of tractors is far short of the demand, a sizeable proportion of asweddumised land is being left fallow even during Maha.

4.3 Productivity in relation to Tenancy

Only the three districts of Hambantota, Kandy and Colombo provide sufficient information for analysis with regard to tenancy.

Table 4-IV Yields in relation to Tenurial conditions

	Average size of lowland holding		Average yield per acre			
			Maha		Yala	
	Owners Acres	Tenants Acres	Owners Bu.	Tenants Bu.	Owners Bu.	Tenants Bu.
Hambantota	2.99	4.76	44.5	34.7	43.4	22.0
Kandy	2.23	1.47	46.4	50.0	36.9	44.3
Colombo	1.95	1.36	36.9	33.7	27.5	25.4

The information presented in Table 4-IV shows that average yields of the two tenurial groups (owners and 'pure' tenants) do not show a consistent trend across districts while owners in Hambantota reported higher yields than tenants but this position is reversed in Kandy. However, considering the yields by different size groups, owners always obtain higher yields than the tenants in size groups ranging up to 2 acres. As the bulk of the operators are found in this group there is no strong reason to assume that tenants are more productive. Similarly in Hambantota, the relative performance of owners and tenants is not clearcut when yields are disaggregated on the basis of water supply and holding size.

In Colombo tenants produce less per acre than owners but the difference is not marked. If it is accepted that tenants are at

least as productive as owners in the wet zone districts, how does one explain the position in Hambantota? The situations may be broadly classified as follows:

(a) high tenancy - low rent - large holding situation represented by Hambantota;

(b) high tenancy - high rent - small holding situation represented by Kandy and Colombo.

The general trend of thinking is to regard the second as a situation leading to low productivity as this seems to combine both 'size and tenure disabilities'. But this is not reflected in productivity levels. Hence there must be other factors which affect this situation. A few tentative hypotheses can be suggested.

i) In the wet zone, especially in Kandy the landlord performs decision-making functions to some extent. As the landlord provides inputs which can directly be associated with higher productivity (mainly seed and fertilizer) the adverse effects of tenancy may not operate to the same extent. This is shown by the fact that there is hardly any difference in management practices between the two groups. This also assumes that tenant groups do not generally have assured access to input markets.

ii) Given a situation of small holdings and high rents, tenants have to intensify cultivation to produce enough for their family needs and rent obligations.[1]

iii) Insecurity experienced by tenants regarding the lease may lead them to produce more, i.e. a good rent may favour continuation of the lease.

Too much emphasis cannot be placed on the implications of a cross-sectional comparison of yields between tenurial groups. Such comparisons are static in nature and are based only on the productivity of a single input, land.[2] Hence the relative efficiency of owners versus tenants should be regarded as an issue requiring further research.

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1 H.D. Dias, A Land Reform Policy in the Context of HYVs - unpublished paper.

2 See Krishna Bharadwaj, Production Conditions in Indian Agriculture, Cambridge University Press, London, 1974.

4.4 Conclusion

On examining the overall productivity situation in the study area, environmental and socio-economic factors mentioned show a varying degree of impact on management levels and productivity. The water supply and tenancy conditions interact with the size of operational holdings and as a result the relationship between these variables and the management levels is not so clear. However, all the available data points to the fact that of the three variables examined supply of water is the most important factor that influenced management levels and productivity.

Chapter 5

I N C O M E

In planning for maximum paddy production, the objective of raising the living standards of all the paddy cultivator households should not be lost sight of. There is no guarantee that increased productivity by itself would fulfil the equity objective. This chapter analyses the income position of cultivators against the complex of factors discussed earlier.

In discussing income data, the concept of a minimum acceptable level of income becomes relevant. This would depend on family size, average consumption standards and nutritional norms, among other things.

The average family size in the districts studied was about seven. In the absence of detailed data to work out a minimum level of income, it is assumed here that a net income of Rs.3,000 per annum would be sufficient to meet family needs.[1] On a gross basis this figure may be placed at about Rs.4,000.[2] The size of the paddy holding which can generate this level of income varies across regions depending mainly on variations in productivity and cropping intensity. But the proportion of paddy operator households relying solely on paddy for their income varies from 4% in Colombo to 32% in Hambantota. The proportion of part-time farmers is generally higher in the wet zone districts, reflecting greater availability of alternative employment. The minimum holding has to be appraised in the light of these other sources of income.

Table 5-I Gross Income per Family (Annual) Rupees

	Income from all sources	% of operators earning More than Rs.4000	Paddy Income Rs.	% of total	Other sources Rs.
Polonnaruwa	7,915	75	5,943	75.1	1,972
Hambantota	3,565	31	3,041	85.3	524
Anuradhapura	4,768	41	3,260	68.4	1,508
Kandy	4,083	35	2,287	56.0	1,796
Colombo	4,895	33	1,335	27.3	3,560

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1 See T. Jogaratnam, The small Farmer in Sri Lanka. Conference on Agriculture in the Economic Development of Sri Lanka, Ceylon Studies Seminar, Peradeniya Campus, 1974.

2 It may be argued that the net/gross income ratio assumed here is rather optimistic. But these operators do not depend only on paddy.

Gross family receipts (annual) vary from Rs.7,915 in Polonnaruwa to Rs.3,565 in Hambantota. The minimum stipulated income is attained except in Hambantota District in which the Yala season yielded a very poor crop. Polonnaruwa has a high income reflecting high productivity under the favourable conditions mentioned in the previous chapters. The distribution pattern shows that the majority of operators (60%-70%) earn less than Rs.4000 in all districts other than Polonnaruwa.

The share of paddy income in total family income brings out the dry zone-wet zone differences. In the case of Colombo less than 1/3 of income is from paddy. The proportion of paddy income is higher in the dry zone areas.[1] Allowing for possible under-reporting of incomes, the position in the dry zone districts shows that a gross income of Rs.4,000 could be attained from paddy alone.[2]

Information on net incomes from paddy is available only for Yala 1972 and the minimum level of Rs.1,500 per season is attained in the case of Anuradhapura and Polonnaruwa.[3]

These variations in incomes are related to differences in holding size, tenure and water supply which affect productivity. As expected, farm family receipts are correlated with holding size and this places the dry zone districts in an advantageous position.

a. High land rent reduces farm family earnings significantly. Land rent forms 27%, 46% and 37% of the cash operating expenses of pure tenants in Hambantota, Kandy and Colombo respectively.

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1 In Colonisation Schemes, the dependence on paddy is normally high. A recent survey of six major Colonisation Schemes found that paddy accounted for 70-90% of gross family income. T. Jogaratnam, Irrigated Farming in Dry Zone of Sri Lanka. An Economic Survey of Six Major Colonisation Schemes 1973, Agricultural Economics Research Unit, Faculty of Agriculture, Peradeniya Campus, May 1974

2 Paddy has been valued at the rate of Rs.14 per bushel. At the current price of Rs.33 income would be much higher but the trend in net income depends on changes in costs of production. Data from the farm records maintained (Yala 1974) show that cost per acre has increased by 90% and 66% in Hambantota and Colombo respectively, whereas Polonnaruwa and Kandy recorded smaller increases. These may not be representative of the district situation.

3 These figures have to be treated with caution as they relate to a single season.

b. Receipts from other sources are low for the tenant group. The structure of outside employment of tenants shows that they are mostly employed as unskilled workers and labourers while the owner-group has a higher proportion of family members in white-collar/salaried employment.

Different situations relating to water supply also give rise to income disparities. Operators under assured water supply schemes are in a better position to adopt a package of improved farm practices as argued in chapter 4. Polonnaruwa and Minipe are cases in point.

From a productivity point of view, it may be argued that concentration of efforts should be on high potential areas. But this may cause wider disparities between high and low productive areas. The small holder in paddy is mainly in the wet zone. Selectivity in extension activity and input supplies may discriminate against these small holders. This group cannot benefit much from favourable producer price policies as they have hardly any surplus to sell and their creditworthiness also is low. Different policies will have to be evolved to deal with this group. Rent regulation, group production, provision of alternative employment outlets and measures for increasing the productivity of off-farm employment are avenues that have to be explored.

Chapter 6

RURAL INSTITUTIONS

Rural Institutions are only a means for achieving specific objectives. Their organisation, functional relationships and method of operation should take into consideration the various physical, as well as human variations that exist in a particular area of operation. A stereotype rural institution serving a clientele with differing resources and types of production will invariably fail to meet the needs of clients.

The variations which exist in the five districts in terms of availability of water, size of holdings, tenurial status etc., which have been highlighted in earlier sections call for the organisation of institutions cognisant of such variations if more efficient utilisation of resources and increased productivity are to be achieved.

Information was obtained on the agricultural extension service and the services provided by co-operative institutions.

6.1 Extension

The available data does not show any noteworthy variation between districts or broad zones in regard to extension aspects. The principal source of agricultural information was the extension service of the Department of Agriculture. A high proportion of farmers also viewed agricultural extension centres as a source of various production and material inputs. This is brought out clearly in the reasons given by farmers for visiting agricultural extension centres. About 60-65% of the visits were made to purchase seed paddy and other inputs. Even in a high potential area like Polonnaruwa only 40% of the farmers who visited extension centres sought technical advice.

The extension service was very successful in the dissemination of new high yielding varieties. It was noted that a high proportion of farmers used fertilizer, but only a smaller number closely followed the recommendations. According to farmers, visits by extension personnel to farms were more effective in influencing adoption of new high yielding varieties and recommended amounts of fertilizers than their own visits to the extension centres. A majority of farmers (60-80%) were aware of the location of the extension centre in all districts other than in Kandy. But the number who actually visited the centre varied between 40-50%. Most farmers also knew how to contact extension staff but on the average less than 1/3 of them actually made efforts to contact them in the season under reference. In most instances KVSs themselves have had to make the initial effort to meet farmers in their farms.

Farmers' exposure to extension services (measured in terms of a contact score)[1] was more or less similar between districts. There was generally a positive relationship between contact scores and adoption levels of NHYVs.

When extension activities in the five districts are examined on the basis of size of holding, and water supply it is found that farmers operating large holdings and those in major irrigation areas had greater exposure to extension methods. Extension activities (measured by extent of exposure to various extension methods) for farmers operating one acre or less had a very low score.

In all districts, neighbour farmers were found to be an important source of information, especially in the adoption of new high yielding varieties. However, with regard to information of a more technical nature such as fertilizer recommendations, farmer neighbours were less effective. Considering the importance of neighbour farmers more reliance on 'leader' or progressive farmers for diffusion of information seems desirable.

6.1.1 Farmer Training

Increase in paddy production can be achieved only when farmers have acquired the necessary information, knowledge and skills on the efficient and economic utilisation of their resources. Farmer training classes is one of the methods used for this purpose in all districts. But the proportion attending training classes was generally low, ranging from 15% (Kandy) to 34% (Polonnaruwa). A majority of farmers in all districts indicated that they were not aware of farmer training classes. Hence it would be desirable to conduct training classes more frequently with advance publicity.

In general a high rate of adoption of improved practices has been achieved specially in the major paddy producing areas. This shows that already the extension service has created an awareness among farmers on these practices. However, there appears to be a need for upgrading of farmer knowledge. Hence the extension strategy in these areas should be one of improving the existing knowledge qualitatively. The best way of achieving this appears to be by intensive farmer training classes.

6.2 Co-operatives

Membership in co-operatives was high in all districts, ranging from 75% in Colombo to 98% in Polonnaruwa. The co-operative is a source

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1 See individual district studies for definition of 'contact score'.

of production inputs and credit and a channel for marketing of paddy. The most important input supplied is fertilizer. The reliance on the co-operative for cultivation loans and seed paddy was less in the two wet zone districts. Co-operative services were more utilised by the operators of larger holdings relatively to small holders. On the average tenants do not seem to be discriminated in the provision of the above inputs.

The data on borrowings indicate that the farmer's dependence on the co-operative varied from district to district. Colombo represents one extreme with 90% of operators borrowing from private sources and only 7% from co-operatives. Anuradhapura and Hambantota also show greater dependence on non-institutional sources of credit. On the other hand, Polonnaruwa has the highest proportion of borrowers from the co-operative (58% exclusively from the co-operative). It may point to the successful functioning of this institution in a settlement scheme with high production potential.

Recovery of loans seems less of a problem in high potential areas. However, the repayment rate is generally higher for loans from private sources than from institutional sources. In Hambantota, the overall rate of repayment was 67% whereas the corresponding rate for loans from institutional sources was only 35%. Farmers often reported crop failure as the main reason for the non-repayment of loans, but information on production conditions collected in the course of the survey did not always support this explanation.

The bulk of surplus paddy was sold to the co-operative. No consistent trends in sales by operators according to size of holding or tenurial groups are observed.

Chapter 7

SUMMARY AND CONCLUSIONS

1. Labour

Data on family labour availability per unit of land show that the wet zone is in a more advantageous position than the dry zone. All categories of farmers use hired labour. This is tied up with the seasonal pattern of paddy cultivation and differences in cultural practices adopted.

2. Land Tenure

a) While there is diversity in systems of tenure a high level of tenancy mainly in the form of share-cropping is found in Hambantota and the two wet zone districts. Smallness of holding size combined with operation under tenancy is highly prevalent in the wet zone districts.

b) An analysis of the landlord-tenant relationship shows that landlords are mostly non-cultivating owners.

c) The terms and conditions of share-cropping arrangements differed between Hambantota and the wet zone districts. In the latter, the crop share was generally 50%, partly because of cost-sharing by the landlord. In all districts the Paddy Lands Act was only partially effective.

d) The effect of different tenurial arrangements on productivity is not clear-cut as it depends on such factors as holding size, provision of inputs by the landlord as well.

3. Productivity and Management Practices

a) The main factor affecting management levels and thereby productivity is found to be the condition of water supply.

b) No consistent relationship between yield per acre and size of holding was found.

c) Shortage of draught power results in low cropping intensity and staggered sowing in the districts of Anuradhapura and Hambantota respectively. Hence, some form of selective mechanisation would be necessary.

4. Income

a) The proportion of farmers mainly depending on paddy for their income is higher in the dry zone. The holding sizes in this zone are also sufficient to generate a minimum acceptable level of income at present levels of productivity.

b) Low income groups in the paddy sector can roughly be identified with tenant-cultivators and owner-operators of very small holdings who mainly depend on farming. These categories do not benefit much from extension, price and subsidy policies of the Government.

5. Rural Institutions

a) A high rate of adoption of improved practices has been achieved mainly under assured water supply conditions. In areas where a high rate of adpption has been achieved there appears to be a need for upgrading of the available knowledge. The best way of achieving this appears to be by intensive farmer training classes.

b) The services of co-operatives in regard to input supply, credit and marketing were utilised more by farmers operating large holdings (6 acres and more).

c) There was a high degree of dependence on private sources for credit except in Polonnaruwa.

Conclusions

The study reiterates the need for policy formulation which takes cognizance of regional variations in environmental and socio-economic factors. In order to obtain a comprehensive picture of paddy farming in relation to other agricultural and non-agricultural activities, in-depth studies on the following aspects could be suggested:

a) Classification of regions in terms of potential under different ecological and socio-economic conditions;

b) Socio-economic position of landless agricultural labourers;

c) Structure of tenurial relationships at the village level;

d) Allocation of available labour between paddy farming, other agriculture and non-agricultural acitivities.