ECONOMICS OF PADDY CULTIVATION IN SRI LANKA

WITH SPECIAL REFERENCE TO RESOURCE USE AND PROFITABILITY BASED ON 1987 / 88 MAHA SEASON

G . M . HENEGEDARA

Research Study No.106 **May 2000**

HECTOR KOBBEKADUWA
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FOREWORD

This study was conducted in 1988 with a view to investigate the socio economic situation of paddy farming sector in Sri Lanka. The study was aimed at assessing the impact of agricultural policies on cost of production and returns to paddy cultivation. Field work of this study was undertaken in Hambantota and Gampaha districts by taking into account the dry zone and wet zone conditions. The analysis was focussed on production process, especially in terms of cultivation methods such as broadcasting and transplanting. The study highlights the pattern of land utilization and tenurial system, use of production inputs, cost of production, yields and profitability.

This study revealed that profitability of paddy cultivation has decreased in the late 80s due to various factors such as increased cost of labour and draught power, removal of government subsidies, low yields and low marketable surplus. The total production cost in irrigated areas has increased significantly. Nevertheless, the decrease in net returns is more prominent in rainfed conditions than under irrigated conditions because of low yields. The study has suggested some remedial measures in order to overcome the problems.

Even though the field research was conducted for this study about 12 years ago, the Publication Committee decided to publish the report in view of historical value of data. I take this opportunity to thank Mr. G.M. Henegedara (Coordinator) and the supporting staff for completing the study.

Dr. S.G. Samarasinghe
Director

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G.M. Henegedara
Head, Statistics and Data Processing Division

ABSTRACT

This study was broadly designed to serve as an analysis of the cost of production of paddy in Sri Lanka. The main focus of the study however was to analyse the production process with special reference to inputs used, costs and the disposal of the produce. An attempt was also made to study the land utilization pattern and socio-economic characteristics of farm households in the Hambantota and Gampaha districts and how they had a bearing on paddy production.

The study revealed that the average production costs had increased substantially over the past few years, due mainly to increased labour charges and a heavy reliance on capital intensive inputs. In both districts the net income per acre was negative and insufficient to meet the production costs incurred per acre. The decrease of net returns was more evident in rainfed paddy farming areas than in irrigated areas. It was also seen that the use of production inputs had changed overtime with a heavy reliance at present on capital intensive inputs such as tractors and threshing machines. The use of agro chemicals had also increased substantially. Thus, it is clear that the increasing cost of paddy production is the result of a multiplicity of factors rather than on any one single factor. Any remedial measures therefore for making the operation viable should take into consideration all of these factors and circumstances that affect paddy cultivation.

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British to Metric Units

1 Acre	=	0.405 Hectares (ha)
1 Pound (lb)	=	0.454 Kilogramme (kg)
1 Bushel of Paddy	=	20.87 Kg of paddy
1 Mile	=	1.609 Kilometers (km)

Metric to British Units

1 Hectare	=	2.471 Acres
1 Kilogramme	=	2.205 Lb
1 Kilometre	=	0.621 Mile

Currency Units

1 US $	=	around 41.00 Rupees (1988)

CHAPTER ONE

INTRODUCTION

The economic and agricultural development policies introduced by the government shortly after1977, had a distinct impact on the paddy farming sector in Sri Lanka as evidenced in the upward movement of the prices of production inputs, the cultivation practices and output levels. Available data suggest that over the past few years prices of farm production inputs had shown a remarkable increase (Abeysekara, 1986). At the same time paddy production increased but at a slower pace. Although farm gate prices of paddy had increased substantially these increases were insufficient to cover the increased production costs. Thus farmers appear to have faced a gradual erosion of their net-farm returns in real terms (Abeysekara, 1986). The pattern of land utilization also shifted towards commercial farming and landlessness, the number of share-croppers and, the number of marginal farmers increased as a result (Gunaratne and Gunawardena, 1984). Faced with such situations, farmers in the recent past should have changed their production practices as well as the pattern of resource allocations.

In view of the changes that have taken place in the agrarian sector during the past few years, a detailed investigation of the prevailing production patterns and the socio-economic situation was considered both timely and relevant. It was hoped that such a study based on farm level data, would provide insights into the economics of paddy cultivation with special reference to inputs used, farm management practices, farm supporting services and disposal of outputs. Though some quantitative analyzes have been carried out, qualitative studies on these aspects have hardly been undertaken. Therefore, this study is intended provide an analysis of the current constraints facing paddy growers under dry zone and wet zone conditions in the two selected districts.

1.1 Objectives

The objectives of the study are;

i. To examine some aspects of paddy farming particularly in respect of the use of production inputs, cultural practices adopted and the disposal of produce.

ii. To assess the farm level paddy production process in terms of economic criteria with a view to establishing the relative costs, returns and profitability of paddy farming.

iii. To ascertain the extent to which the production process benefits from institutional support services and to evaluate their relative effectiveness.

1.2 Study Area

The study was conducted in two paddy growing districts, Hambantota and Gampaha

representing the agro-climatic conditions of both the dry zone and wet zone areas respectively in order to compare the two situations.

The Hambantota district reflects the paddy dominated, surplus producing and market-oriented production system characteristic of the Dry Zone. Irrigated paddy farming and different land tenure patterns in the district, indicate a variation of the use of production inputs, management practices and disposal of the produce. Further variations would reflect the potentiality of cultivated lands (see Appendix 1). In order to assess production potential in terms of agro-climatic conditions, three Agrarian Service Centre (ASC) areas, namely Yodakandiya, Lunama and Beliatta were selected to represent high, medium and low potential areas of the district.

The Gampaha district reflects the small-scale semi-subsistence production patterns which are common to the wet zone. Using the same criteria, three ASC areas namely Meerigama, Badalgama and Katana in the Gampaha district were selected to represent high, medium and low potential areas (Appendix 1). These areas would reflect semi-commercial production conditions, land tenure problems and their implications for paddy cultivation. Furthermore, the Gampaha district is situated closer to the capital city Colombo and would therefore reflect urban influences as well.

1.3 Methodology

The analysis was based on the findings of the sample survey conducted in the Hambantota and Gampaha districts.

A total of 318 farmers were selected from both districts on the basis of land suitability and agro-ecological conditions. Of the 318 farmers, 192 were selected from 3 areas of the Hambantota district representing cultivated lands of high, medium and low production potential. The sample of the Hambantota district was accordingly selected from Yodakandiya (64), Lunama (64) and Beliatta (64) Agrarian Service Centre areas. 126 farmers were selected from the Gampaha district on the same basis covering Meerigama (42), Badalgama (42) and Katana (42). The details of the sample are given in Appendix 1.

The stratified random sampling method was followed to select farmers. The sample size was determined to represent at least ten percent of the total farmers in each ASC division. The paddy land register was used as the sample frame.

The bulk of the study data was gathered through a survey. The field survey was conducted in June 1988 covering *Maha* 1987/88. The collection of data was done by a group of trained investigators under the direct supervision of the researcher. Tabulation was done manually using software facilities.

1.4 Concepts and Definitions

In itemizing the cost of production of paddy, a distinction should be made between inputs that could be valued in terms of money and inputs that do not have a market value. Such a distinction would be very useful because the majority of farmers live under semi-subsistence or 'semi-commercial' conditions. Therefore, the behaviour of farmers is an important factor in determining actual production costs.

Costs could be classified either in terms of all the operations related to paddy cultivation or the production inputs utilized in paddy farming. Whatever the classification used in estimating production costs, it is necessary to consider both inputed costs as well monetary costs. The analysis of this study presents both in terms of operational activities and major production inputs. An attempt has been made to distinguish between cash and non cash production costs too. The terms used in this study are classified as follows.

1. Production takes into account the most commonly used cultivation practices in the respective areas. Where more than one method was reported for the same operation (eg. ploughing either by tractors or buffaloes) the most widely practiced operation has been included.

2. Labour data are presented in 'mandays' which includes family, exchange and hired labour. The cost of hired labour was calculated on the basis of wage rates prevailing in the area together with the cost of food and drinks supplied. The cost of family labour was imputed considering labour charges prevailing in the area. Food and drink costs were not taken into account in this case on the assumption that family members would have to be maintained in any case. The cost of exchange labour was also inputed considering the opportunity cost of hired labour in the area.

3. The total number of mandays were calculated by converting the days worked by women and children using coefficients 0.8 for a woman worker, and 0.6 for child worker.

4. With regard to the use of materials such as seed paddy, fertilizer and chemicals etc., the purchase price was considered, excluding cost of transport and baggages.

5. In calculating the cost of draught power where the animals were owned by the farmer; the prevailing rates of hire were taken into account.

6. Returns and profits were calculated in terms of gross income, net income and cash income.

1.5 Limitations of the Study

Like many other cost of production studies the study faced some difficulties in the presentation of production data in terms of pricing and in interpreting costs and market values of some aspects of production. This is mainly due to the heavy reliance on owned resources such as family labour, draught power, and seed paddy. Thus, difficulties emerged in making a realistic assessment of these production inputs.

The paddy lands register was used as the sample frame. However, the paddy lands register has not been updated regularly on an annual basis. Therefore, the information on paddy cultivators did not include recent changes and consequently, the sample would not indicate any recent changes in paddy land ownership.

There were a number of units used in the measurement of paddy in the two districts. While in one locality *kuruni* is the unit, in another it is *laha* or *bera*. These measurements also were not uniform in the two districts.

In the case of accounting man-days worked by family labour or exchange labour (a form of mutual aid) there is a greater possibility of error. For instance, many cultivators gave only the number or man days rather than the number of man hours. This was very misleading because the number of man days stated did not give the actual number of man hours worked.

As in the case of many other social science research studies, answers given by farmers from memory are not very reliable. This is all the more so when the survey is done after four to eight weeks of the cultivation season.

1.6 Chapter Organization

The study consists of eight chapters. The first three chapters provide basic information on the setting, socio-economic characteristics and patterns of land distribution among the sample households. The fourth chapter analyses the use of production inputs, while the fifth chapter deals with farm support services such as credit, marketing and extension services. A descriptive analysis of the cost of production is presented in the sixth chapter while chapter seven examines the returns and profitability of paddy production. The final chapter presents the summary and conclusions of the study.

CHAPTER TWO

THE SETTING

In order to provide some background information, a brief description of the demographic, physical and socio economic characteristics of the two districts and the sample households is presented in this chapter. The total population, annual rainfall, soil, labour force, employment status and level of education are the main features considered in this regard.

2.1 General

The Hambantota district located in the south eastern part of Sri Lanka covers an area of 2593 sq. km. Administratively the district belongs to the southern provincial council and comprises eight A.G.A. divisions and 15 A.S.C. divisions (see Map 1 & 2). According to a survey on economic and social statistics of Sri Lanka done in 1986 the total population was 477,000 giving the Hambantota district a density of population of 185 per sq. km. Agriculture is the main occupation of the people and only a very few are engaged in non-farm activities (Central Bank of Ceylon 1989).

The Gampaha district located in the western province in Sri Lanka covers an area of 1399 sq. km. For administrative purposes the district is divided into 13 A.G.A. divisions and 26 A.S.C. divisions (Map 1 & 2). The economic and social statistics of Central Bank (1989) gives the total population as 1,452,000 with an average density of 1,189 persons per sq. km. The majority of the population of Gampaha is mainly employed in the service sector (trade, transport and industries); while a substantial proportion of the population is engaged in agriculture as full time or part time farmers.

The average annual rainfall recorded for the year of 1987 was 930 mm. and 2015 mm. in Hambantota and Gampaha respectively. The average number of rainy days was relatively higher in the Gampaha district indicating sufficient rainfall for agricultural purposes throughout the year.

Table 2.1 : Average Rainfall and Average Number of Rainy Days for 1987

District	Annual Rainfall (millimeters)	Average number of rainy days
Hambantota	930	57
Gamapaha	2015	106

Source: Economic & Social Statistics, Central Bank of Ceylon, (1987).

In Hambantota the heavy rainfall occures during the North-east monsoon (December to February), while the South-west monsoon (May to September) affects mostly the western part

of the district. The rainfall figures in Hambantota however, do not ensure an adequate supply of water for paddy cultivation. In the eastern part of the district water was scarce in the *Yala* season while farmers in the central part, the area fed by Walawe left and right bank channels, suffered from an excess of water at the harvesting time. The conditions in Maha are more a less the same for the entire district as the North-east monsoon rainfall is experienced throughout the district. Hence paddy cultivation in the district is done mainly under irrigation.

In Gampaha, the maximum rainfall occures during the South-west monsoon while most of the secondary precipitation occures during the North-east monsoon. The heavy South-west monsoonal rainfall experienced during the yala reduces the extent cultivated in much of the district as paddy lands are subject to long period of inundation and sometimes to floods.

According to Table 2.2, a large extent of the cultivated land in Hambantota is served by major irrigations while only 30 percent is rainfed or served by minor irrigation schemes (Table 2.2)[1] In Gampaha, however 97 percent of the total extent cultivated is rainfed or served by minor irrigation schemes. Major irrigation schemes were not mentioned in the sample areas in Gampaha.

Table 2.2 : Classification of Operated Paddy Parcels* by Source of Water

Source of Water Supply	Hambantota		Gampaha	
	No. of Parcels	Acres	No. of Parcels	Acres
Major Irrigation	169	418	-	-
Minor Irrigation	56	80	3	1
Rainfed	77	68	270	220
Minor Irrigated/Rainfed	34	69	8	6
Drainage	2	2	-	-
Total	338	637	281	227

* Some farmers have reported more than one parcel.

Vast areas of the Hambantota district consist of reddish brown earth while the coastal areas consist of sandy regosols or Recent Beach and Dune sands (Moorman and Panabokke, 1961). On the other hand, most of the Gampaha district consists of red-yellow podzolic and red-yellow podzolic with laterite soils. The paddy tracts are mostly located on clay alluvial soils associated with river or low lying areas. The soils in the low lying coastal areas where paddy is grown suffer from salinity (Moorman and Panabokke, 1961).

2.2 Socio-Economic Characteristics of Sample Households

As shown in Table 2.3 the average family size was 5.5 in Hambantota and 4.7 in Gampaha. About 70 percent of the sample population in both districts, are labourers. The dependency ratio is high in both districts, due to a high proportion of young adults and children in the sample population.

1 Walawe, Kirindi Oya, Urubokka Oya, and Murutha-wela schemes are important as major irrigation schemes in the district.

Table 2.3 : Labour Characteristics of Sample Households

Item	Hambantota	Gampaha
Average family size	5.5	4.7
Labour Force[1] (%)	70.0	70.0
Dependency Ratio[2]	42.3	42.7

1. Labour Force = Population within the age group 15-65 years

2. Dependency Ratio = $\frac{\text{Population within the age group less than 15 + 65 years \& above}}{\text{Population within the age group 15 - 65 years}} \times 100$

Table 2.4 reflects the percentage distribution of the sample population according to age groups. About 70 percent of the sample population belong to the age group of 15 – 65 years while in both districts about 30 percent are in the age groups below 15 years and above 65 years.

Table 2.4 : Distribution of Household Members by Age Groups

Age Group Years	Household Members (%)	
	Hambantota N = 1057	Gampaha N = 595
<14	20.2	15.5
15 – 65	70.3	70.1
Above 65	9.5	15.5
Total	100.0	100.0

The educational status of the sample population is given in Table 2.5. The level of education is relatively higher in Gampaha than in Hambantota due mostly to better educational facilities in Gampaha. However, the majority of the sample population in both districts had either a primary or a secondary education. In Hambantota about 11 percent of the sample population had not attended school while in Gampaha it was 5 percent. Only 25 and 33 percent of the sample population had qualified for secondary education in Hambantota and Gampaha respectively. Poverty is identified as one of the major seasons for the increase in the number of school drop-outs in both districts and consequently the majority of them work as labourers in agriculture and elsewhere.

The Table 2.6 indicates the employment status of the sample households. The majority of the population in both districts are engaged in agricultural activities while the number of government and private sector employees is relatively high in Gampaha. Students comprise about 25 percent of household members in both districts, while more than 30 percent of the population in Hambantota and about 23 percent of the population in Gampaha were unemployed.

Table 2.5 : Distribution of Household Members Classified by Level of Education

Level of Education	Hambantota		Gampaha	
	No.	%	No.	%
No schooling (including children less than five years)	117	11.1	28	4.7
Primary Grade (1-5)	321	30.4	126	21.2
Secondary education Grade (6-(O/L)	335	31.7	215	36.1
Passed O/L	190	18.0	149	25.0
Passed A/L	587	5.5	31	5.2
Undergraduates	08	0.8	03	0.5
Graduate/ Technical qualifications	07	0.7	13	2.2
Others	04	0.4	02	0.3
Not reported	17	1.6	28	4.7
Total	1057	100.0	595	100.0

Table 2.6 : Distribution of Household Members According to Status of Activity

Type of Activity	Household Members			
	Hambantota		Gampaha	
	No.	%	No.	%
Working in own farm	374	35.4	128	21.5
Agricultural labourers	07	0.7	12	2.0
Non-agricultural Labourers	10	0.9	14	2.4
Self employees	10	0.9	26	4.4
Government Employees	44	4.2	80	13.4
Private Sector Employees	08	0.8	26	4.4
Students (including children less than 5 years)	268	25.4	142	23.9
Unemployed	315	29.8	137	23.0
Others	04	0.4	02	0.3
Not reported	17	1.6	28	4.7
Total	1057	100.0	595	100.0

The socio-economic characteristics of the two districts appear to have a certain degree of resemblance in spite of the difference in their agro-climatic conditions.

CHAPTER THREE

LAND DISTRIBUTION AND TENURE

Land distribution and land tenure have some bearing on land utilization and cost of production of paddy. This chapter is divided into four sections. The first part examines the pattern of land distribution among sample households. The second reviews the cropping intensity for *Maha* 1986/87, while different land tenurial practices are described in the third section. Tenancy and tenancy conditions, land rent and security of tenure are delt with in the final section.

3.1 Land Distribution

The full extent of land (both highland and lowlands) cultivated by the sample household was 986 and 692 acres in the Hambantota and Gampaha districts respectively. Of the total extent cultivated in Hambantota, 67 percent was lowland, while only 32 percent of cultivated land was lowland in Gampaha. This indicates that lowland paddy cultivation is relatively higher in the Hambantota district than in Gampaha.

Due to the rapid urbanization in Gampaha a diminishing amount of land is used for paddy cultivation and many paddy lands have been converted into brick factories in Badalgama and Katana areas. But in Hambantota, most of the land is still used for the cultivation of paddy.

Table 3.1 shows the classification of cultivated land into highland and lowland. The extent of lowland cultivated lands was relatively higher in Hambantota than in Gampaha, while the extent of highland cultivated was relatively higher in Gampaha than in Hambantota.

Table 3.1 : Classification fo Cultivated Land

Type of Land	Hambantota		Gampaha	
	Extent (Acres)	%	Extent (Acres)	%
Lowland	659	67	220	32
Highland	327	33	472	68
Total	986	100	692	100

According to the survey about 63 percent of the sample farmers in the Hambantota owned more than 2 acres of land in contrast to 26 percent of farmers in Gampaha. On the otherhand, the majority (73 percent) of farmers in Gampaha owned land up to two acres while only 37 percent farmers in Hambantota belonged to this category (Table 3.2). The widespread micro paddy holdings in Gampaha reflects the heavy population pressure and land fragmentation. Hence, the tendency to move away from paddy cultivation to non-agricultural activities is greater in Gampaha.

Table 3.2 : Distribution of Paddy Land According to Size of Holding

Size Class (Acres)	Hambantota		Gampaha	
	No. of Farmers	Extent(Acres)	No. of farmers	Extent (Acres)
=< 0.50	13	5	23	10
0.51 - 1.00	19	17	32	29
1.01 - 2.00	39	71	37	60
2.01 - 4.00	75	233	24	72
4.01 - 6.00	31	158	6	28
6.01 - 8.00	8	55	1	6
8.01 - 10.00	1	10	1	10
> - 10.00	6	87	1	12
Not reported	-	-	1	12
Total	192	636	126	227

Table 3.3 presents the size of lowland holdings in relation to total extent of lowland and size of the main paddy parcel. Since the majority of farmers in the two districts own more than one paddy parcel, only the main parcel was taken into account in order to collect accurate costs incurred in cultivating an acre of paddy land. Thus, table 3.3 presents the average size of the main low land parcel.

Table 3.3 : Size of Lowland Holdings by Districts

Item	Mean	Median	SD	Mode	Range
Total Low land (Acres)					
Hambantota	3.36	3.30	2.75	3.40	0.25 - 22.00
Gampaha	1.81	1.30	1.69	1.70	0.13 - 12.10
Main Land Parcel (Acres)					
Hambantota	2.16	2.00	1.35	2.10	0.25 - 7.00
Gampaha	0.98	1.00	0.65	-	0.13 - 4.00

The average size of a lowland holding is 3.36 acres in Hambantota and 1.81 acres in Gampaha. These sizes range between 0.25 – 22.00 acres in Hambantota and 0.13 – 12.10 acres in Gampaha. Standard deviations for these holdings were 2.75 and 1.69 acres for Hambantota and Gampaha respectively indicating a significant variation in the holding sizes. This variation is higher in Hambantota than in Gampaha.

3.2 Cropping Intensity

According to Table 3.4 cropping intensity for *Maha* 1987/88 was high in both districts. About 87 and 82 percent of the cultivable land was sown in Hambantota and Gampaha respectively. This indicates that extents of uncultivated paddy lands were considerably low in both districts during the survey season.

Table 3.4 : Cropping Intensity

District	Cropping Intensity[1]
Hambantota	87
Gampaha	82

1. Cropping Intensity = $\frac{\text{Area sown with paddy}}{\text{Area asweddumized in Maha 1987/88 season}}$ X 100

3.3 System of Tenure

The study revealed eight categories of tenurial status in the two districts. These were: owners, tenants, owner tenants, tenant owners, lessees, mortgagees, encroachers, joint owners and others[1]. Farmers who cultivate their own land were classified as owners. Where the entire operating holding is rented in, leased in or taken as *Ande*[2] the operator is classified as a tenant. Where the operated holding is made up of both these categories of land, the operator has been classified as owner-tenant or tenant owner depending on whether 50 percent of the operated holding is owned or tenanted. Farmers who practice traditional tenurial methods such as *Kattimaru*[3] *Thattumaru*, were classified as joint owners while farmers who do not belong to these categories and farmers belonging to more than one category were classified as others. Table 3.5 shows the distribution of paddy land operators according to various tenurial statuses.

Table 3.5 : Distribution of Paddy Land Operators According to Tenurial Categories

Tenure Status	Hambantota		Gampaha	
	No. of Farmers	%	No. of Farmers	%
Owners	56	29.2	70	55.6
Owner Tenants	16	8.3	13	10.3
Tenant Owners	12	6.3	10	7.9
Tenants	59	30.7	24	19.0
Joint Owners	5	2.6	1	0.8
Leases/Mortgagees	9	4.7	2	1.6
Encroachers	3	1.6	-	-
Others	32	16.6	6	4.8
Total	192	100.0	126	100.0

1 The same definitions were used in the studies on Agrarian Situation Relating to Paddy Cultivation in five selected districts (1974) conducted by the ARTI.

2 *Ande* refers to the system of share cropping.

3 *Kattimaru* and *Thattumaru* are terms used to refer to an arrangement which rotates ownership and cultivation rights among the members of the family.

Table 3.5 shows that of the 192 farmers in Hambantota 29 percent were owners, 31 percent were tenants while the rest belonged to other categories. Of 126 farmers in Gampaha, 56 percent were owners, 19 percent were tenants and the rest (25 percent) belonged to tenants and tenants owners. Joint ownerships reported from Gampaha was less than one percent.

Lowland holdings classified by tenurial status are presented in Table 3.6. The statistics on various tenurial categories do not show any significant difference between the two districts. But the Standard Deviation of some categories is high in Hambantota due to land holdings being very small in the wetter part (Beliatta) of the district compared to land holdings in other parts of the district. The mean size of holdings of owners in Hambantota is slightly small when compared to other categories like tenants, owner tenants and tenant owners. But in Gampaha, mean size holdings of owners are relatively higher than other categories except in the case of farmers classified as others.

Table 3.6 : Average Size of Lowland Holdings According to Tenurial Status

Tenurial Status	Mean	Median	Std. Dev.	Range
Hambantota				
Owners	2.89	2.03	3.30	0.25 - 22.00
Owner tenants	3.76	4.00	1.77	0.50 - 06.88
Tenant Owners	4.22	5.00	1.84	0.75 - 06.00
Tenants	3.04	3.00	1.69	0.25 - 07.00
Joint Owners	1.80	2.00	0.83	1.00 - 03.00
Leased in Mortgage	2.31	2.50	1.06	0.81 - 04.00
Encroachers	2.00	2.5	0.86	1.00 - 22.50
Others	4.94	3.50	3.74	0.65 - 14.00
Gampaha				
Owners	1.81	1.25	1.71	0.13 - 10.00
Owner Tenants	1.67	1.63	1.01	0.26 - 03.50
Tenant Owners	1.92	1.85	0.77	1.00 - 03.00
Tenants	1.47	1.00	0.98	0.50 - 04.50
Joint Owners	0.58	0.58	-	0.58 - 00.58
Leased in Mortgage	1.75	1.75	1.06	1.00 - 02.50
Others	4.94	2.43	1.27	0.69 - 12.13

3.4 Tenancy Conditions

Ande is the term used to refer to the traditional system of renting out land on the basis of share cropping. This system is practiced throughout the country. According to the *Ande* system land is rented out for a certain period subject to certain conditions.

The tenancy conditions and negotiations which existed in the two districts under this *Ande* system could be summarized as follows:

(1) The landlord's share is determined by the landlord-tenant relationships and collateral supports provided by landlords. When landlords bear half of the total production cost,

he receives half of the total harvest as land rent. Otherwise, landlords receive either 25 percent of the harvested crop or a fixed rent usually 15 bushels/acre. The second arrangement is popular in Hambantota due to the prevalent absentee landlordism in the district.

(2) The level of family income, holding size and social status of tenants are important factors in determining tenancy conditions. Thus, landless poor farmers have less bargaining power than the well-off farmers.

(3) Length of time worked as a tenant is an important factor in negotiating tenancy conditions. It was found that more than 70 percent of farmers in both districts had been working as tenants for more than 20 years. Tenants are sometimes so powerful that landlords are unable to make any changes without negotiating with them. Many owners in Hambantota complained against their tenants for misuse of the land and defaulting of the share due to them.

(4) Friendship, neighbourly relationships, and kinship were important consideration when selecting tenants.

(5) *Gambare* is the term used to refer to a person who works for a landlord in the Hambantota District. The *Gambare* acts as an intermediary to contact fellow farmers and to collect rent from them. The *Gambare* system is being abandoned due to the direct connections between landlords and tenants.

With regard to the *Ande* system, absentee landlordism was widespread in Hambantota and many landlords were engaged in non-agricultural activities in urban centres resulting in their involvement in paddy cultivation being negligible. The survey revealed that some landlords who live in urban areas have never even seen their lands. Though half of the landlords in Gampaha live outside their villages, their involvement in paddy cultivation was considerably higher compared to the situation in Hambantota, because many of them were state employees who live in nearby cities. The majority of landlords (60 percent) in both districts were engaged in salaried jobs while the rest were priests, traders and lawyers. Table 3.7 shows the location of the land owners in the two districts.

Table 3.7 : Place of Residence of the Landlord

Place of Residence	Hambantota %	Gampaha %
Within the village	25	42
Outside the village	75	58
Total	100	100

3.5 Land Rent

Table 3.8 shows variations of land rents paid by tenants in the two districts. About half of the landlords in Gampaha receive 50 percent of the harvest as land rent, since they bear half of the total production costs. But the majority (97 percent) of landlords in Hambantota receive either 25 percent of the crop or 15 bushels per acre, as they do not provide any collateral sup-

ports. It was revealed that 40 percent of the tenant farmers in Hambantota did not even pay ¼ of the harvested crop as stipulated by the Agrarian Services act of 1978. The majority of tenants in Hambantota were willing to pay ¼ of the harvest when the yield was low and 12 bushels when the harvest was satisfactory.

Table 3.8 : Percentage Distribution of Tenants by Share of Harvest Paid

District	The Share of the Harvest Paid by Tenants						
	3/4	1/2	1/4	1/5	1/6	1/8	<1/8
Hambantota	1	3	55	7	14	17	3
Gampaha	-	53	45	-	2	-	-

It was found that more than 90 percent of landlords in both the districts collect the land rent themselves. About 10 and 6 percent of landlords in Hambantota and Gampaha respectively collect their rent through middlemen.

3.6 Security of Tenure

The tenants who work under different conditions and pay different types of rent did not found their tenancy status affected very much. More than 90 percent of the tenants in both districts reported that their tenancy had not hindered them in accessing farm support services such as agricultural credit, extension services and crop insurance etc. (See Appendix 3.1). The survey identified three factors which influenced the security of tenants.

The tenants who pays ¼ of produce or less felt that their rights were secured but tenants who pay ½ share of produce did not satisfy the conditions for security of tenure. As indicated in Table 3.8 majority of tenants in Gampaha stated that they pay ½ of the produce because of the possible threat of evictions. But tenants in Hambantota who pay only ¼ share of the produce do not feel insecure due to prevalent absentee landlordism. It was found that the security of tenure depends on political power, economic conditions and the social status of the tenants. In some instances, tenants were more powerful than landlords due to their political connections. It was found that some tenants in Hambantota had leased their rented lands to third parties for more benefits.

CHAPTER FOUR

PRODUCTION INPUTS

Production inputs are classified under six main heads, namely labour, draught power, fertilizer, agro-chemicals, seed paddy and other inputs. Since many farmers in both districts own more than one paddy land parcel, the analysis of cost of production is based on the main parcel, with a view to obtaining accurate information on cost and returns per acre. Labour utilization is analysed in the first section. The second section reviews the use of draught power with reference to animals, tractors and their rental values. Fertilizer application and use of agro-chemicals (weedicides and pesticides) are described in the third and fourth sections, while use of seed paddy is examined in the fifth section. Utilization of all other inputs is discussed briefly in the final section.

4.1 Labour

Labour is the single costliest item in paddy production. As shown in Table 4.1 more than 50 percent of the total expenditure in both districts is incurred as labour charges. Labour costs are relatively higher in Gampaha than in Hambantota.

Table 4.1 : Cost of Labour as a Percentage of Total Production Cost

District	Crop establishment technology	
	Broadcasting (%)	Transplanting (%)
Hambantota	49.6	54.5
Gampaha	56.0	60.7

The amount of labour used in paddy cultivation is measured by calculating the total number of working days for the entire operation. Labour days were worked out by converting the days worked by women and children into man equivalents using the coefficient 0.8 for a woman worker and 0.6 for a child worker[1]. Table 4.2 presents the total number of working days required to cultivate an acre of paddy land.

Some activities like the construction of bunds, broadcasting, transplanting, crop care and harvesting were more labour intensive in both districts (Table 4.2). However, with the introduction of threshing machines, labour utilization for threshing and winnowing has declined considerably. But since farmers' awareness on seeders, weeders and harvesters was low, transplanting, weeding and harvesting appeared to be more labour intensive. On the other hand in the two operations, ploughing and threshing tractors and threshing machines are used to a great extent.

1 Same coefficient was used by the Central Bank of Ceylon in the survey on cost of production of paddy in 1969.

Labour use differs greatly depending on the methods practiced in paddy cultivation.

1. As transplanting is more labour intensive, wide differences in the use of labour can be seen between transplanting and broadcast sowing.

2. Some physical constrains such as the location of the land and the size of the holding have made the use of tractors and other farm equipment impractical.

Table 4.2 : Operation-wise Labour Application in Paddy Cultivation

Activity	Mandays	
	Hambantota (Mandays/Ac.)	**Gampaha (Mandays/Ac.)**
Land preparation	5.52	6.20
Ploughing and harrowing	3.12	3.52
Puddling and levelling	5.47	4.50
Plastering bunds	9.37	6.07
Broadcasting	5.82	6.73
Transplanting	17.93	13.84
Fertilizer application	1.34	1.74
Weedicide application	1.00	0.57
Insecticide application	1.50	0.61
Crop protection	4.97	4.67
Harvesting	10.26	5.44
Threshing	3.00	3.30
Processing	3.39	4.92
Total : (Broadcasting)	54.76	48.27
(Transplanting)	66.87	55.38
Including crop care[1]		
(Broadcasting)	60.40	70.90
(Transplanting)	72.90	78.00

4.1.2 Type of Labour

Table 4.3 shows the type of labour used in planting. Family, hired and contract labour are the major sources of labour in both the districts. Commercialized paddy farming in Hambantota depends mainly on hired and contract labour, while semi-commercial farming in Gampaha is done mostly by hired and family labour.

1 Estimation of all crop care activities was done on the assumption that all farmers spend at least 2 hours per day to attend to crop care during the entire cultivation period. Since majority of farmers in the two districts cultivate 4 months old rice varieties, three months were taken into account, excluding a certain period of time for land preparation and post harvesting activities.

Table 4.3 : Labour Utilization Classified by Type of Labour

Type of labour	Broadcasting		Transplanting	
	Hambantota (%)	Gampaha (%)	Hambantota (%)	Gampaha (%)
Family labour	42	47	42	48
Hired labour	38	36	40	35
Contract labour	20	12	18	13
Exchange labour	-	5	-	4
Total	100	100	100	100

Of the total labour supply, the percentage of family labour is high in both districts (Table 4.3). Mostly family labour is used for broadcasting, while hired labour is used for transplanting. The higher percentage of hired labour used indicates the under utilization of potential family labour in both districts. Type of labour used classified according to operational – simple activities are given in Table 4.4.

According to Table 4.4, family labour is mainly used for clearing of channels, land preparation and application of fertilizer. Puddling, levelling, construction of bunds and sowng were done by both family labour and hired labour. Contract labour was engaged for activities like ploughing and threshing.

Table 4.5 : Utilization of Family Labour in Relation to its Availability

Item	Method of Crop Establishment			
	Broadcasting		Transplanting	
	Hambantota (Mandays)	Gampaha (Mandays)	Hambantota (Mandays)	Gampaha (Mandays)
Family labour available per farm	2.09	1.47	2.09	1.47
Family labour available per farm during the season[1]	251	176	251	176
Family labour utilization per farm[2] including crop care[3]	76.00	40.40	77.40	41.60
Family labour utilization per farm as a percentage of its potential availability	30.4	22.9	30.8	23.7
Excess family labour as a percentage of its availability	69.7	77.1	69.2	76.3

1. Based on 120 days per season and excludes family members living outside the farm.

2. Average farm size of the two districts is as follows :
   Hambantota 2.16 acres
   Gampaha 0.98 acres

3. Estimated 90 days for all crop care activities on the basis of short aged (3 – 3 ½) varieties.

Table 4.4 : Type of Labour Classified by Operational Activities

Operation	Type of labour as a percentage of total labour supply							
	Hambantota %				Gampaha %			
	Family Labour	Hired Labour	Contract Labour	Exchange Labour	Family Labour	Hired Labour	Contract Labour	Exchange Labour
Land preparation	70	30	-	-	57	40	3	-
Ploughing + Harvesting	6	5	89	-	22	24	52	2
Puddling and levelling	44	55	-	1	40	53	-	7
Construction of bunds	46	54	-	-	50	48	2	-
Broadcasting	42	51	-	7	42	41	-	17
Transplanting	45	48	7	-	50	33	12	5
Fertilizer application	80	20	-	-	76	23	1	-
Weedicide application	41	48	10	1	35	27	38	-
Insecticide application	38	49	12	1	40	29	31	-
Crop processing	79	14	7	-	90	10	-	-
Harvesting	27	52	21	-	32	32	27	9
Processing	12	30	58	-	49	36	8	7
Heaping	29	63	8	-	35	46	6	13
Total	43	40	16	1	47	35	13	5

The use of family labour and its potential is shown in Table 4.5. It is observed that more than 69 percent of the potential family labour was not utilized in both districts. This could be the result of the use of tractors and threshing machines for land preparation and threshing of paddy which finally led to the displacement of manual labour in paddy cultivation. Also, the movement of labour from rural to urban areas may be another reason for the under-utilization of family labour.

4.1.3 Labour Productivity

Labour productivity is measured in terms of output per labour day. Table 4.6 shows the difference in labour productivity in terms of broadcasting and transplanting. Theoretically, the productivity of labour should be higher in farms where transplanting is practised, due to higher yields expected with better management practices. But a paradoxical situation is seen in Hambantota where productivity is lower in the transplanted areas than of the broadcast. This indicates that the average number of mandays utilized for transplanting an acre of paddy land is not economically feasible in a situation where yields are low. Thus, the method of planting and the optimum use of inputs can be a determining factor in labour productivity.

Table 4.6 : Labour Productivity in Paddy Cultivation Classified by Method of Planting

District	Output Per Labour Day	
	Broadcasting (Bushels)	Transplanting(Bushels)
Hambantota	1.23	1.13
Gampaha	0.93	0.92

1. Labour Productivity = $\frac{\text{Average yield per acre in bushels}}{\text{Total labour days utilized to cultivate one acre of paddy land}}$

It was found that labour charges show a wide variation between the two districts as well as within the districts themselves. According to Table 4.7, wage rates in the Gampaha district are higher than those in Hambantota. The cash rates paid to women and children were worked out by converting the coefficient; 0.8 for a woman worker and 0.6 for a child worker. Labour may be scarce in one area, while it may be found in plenty in another. Therefore, labour charges for agricultural activities are determined mainly on the availability of labour. Other aspects such as technical skills or specialization of labour are of secondary importance. The reported labour charges in the two districts are given in Table 4.7.

Table 4.7 : Daily Wage Rates of Hired Labourers in Paddy Cultivation

District	Wages Per Day*		
	Man (Rs.)	Woman (Rs.)	Child (Rs.)
Hambantoa	35.00	28.00	20.00
Gampaha	40.00	32.00	25.00

* In addition to the labour charges, the provision of a mid-day meal and tea to hired labour is customary in both districts thereby increasing the real wage rate by Rs.15.00 per day.

Agricultural labour rates vary according to the activities performed. Higher wage rates are paid for the application of weedicides and insecticides due to the dangers involved, and labourers in both districts are paid Rs. 75.00 – Rs. 100.00 per day for such activities.

In Hambantota, labour charges increased during peak periods due to shortage of labour and movement of labour during these periods. But the wetter part of the district (Beliatta area) is not affected by labour shortages due to heavy population pressure when compared to other parts of the district.

4.2 Draught Power

The aim of this section is to identify the use of draught power, ownership patterns and sources of farm power and hiring rates in the two districts. Draught power accounts for about 20 percent of the total production cost which varies according to methods of planting.

The bulk of farm power requirements of the two districts are met by using tractors and animals and farmers hardly depend on human labour for tillage threshing.

Table 4.8 provides information on the percentage of farmers according to the type of power used by them. In Hambantota ninety three percent of farmers relied entirely on tractors, while the rest used both animals and tractors. But in Gampaha, only 30 percent of the farmers used tractors, while 70 percent used both tractors and animals. Only about 10 percent of the sample households relied entirely on animals. Reliance on traditional agricultural practices, availability of animal draught power and physical features of some lands were the main factors that made for the use of animals in the Gampaha district.

Table 4.8 : Use of Draught Power

Districts	Percentage farmers used			
	Tractors only (%)	Animals only (%)	Tractors & Animals (%)	Total
Hambantoata	93	-	7	100
Gampaha	30	10	60	100

As indicated in Appendix 4.1, about 15 percent of farmers own tractors in Hambantota. The use of two wheel tractors was more popular due to the low operational cost and because they are convenient to use in the paddy fields. In Gampaha, about 14 percent of farmers own tractors, and there was no great difference in the number of persons owning two-wheel and four-wheel tractors (Appendix 4.1). The use of buffalo draught power was popular in Gampaha because it was more convenient and economical to use on small holdings.

According to Table 4.9 the rent paid for draught power varies according to the type of draught power used ie. tractors, animals or threshing machines. Tractor charges for ploughing and threshing was Rs. 850 per acre in Hambantota and Rs. 1050/acre in Gampaha. Though there is no great difference between the hiring charges for tractors or animals, the majority of farmers in Gampaha preferred buffaloes as they were more suitable for work on small paddy holdings. The hiring of animals varies between Rs. 900 – Rs. 950 per acre. However, the costs

of hire depends based on factors like kinship, neighbourliness and friendship ties. The use of threshing machines is widespread in both districts due to their low operational costs.

Table 4.9 : Hiring Charges of Draught Power

OPERATION	Tractors		Animals[1]	Threshing Machines	
	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)	Gampaha (Rs/Ac)	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)
Ploughing and harvesting	500	750	700	-	-
Threshing and winnowing	350	300	250	300	250
Total	850	1050	950	300	250

The tractor charges are paid in cash or kind, or both. The payment in kind is determined on the per acre or *Amuna*[2] basis and is common in the Hambantota district. Three bags of paddy (about 125 kgs) is the charge for a two-wheel tractors and four bags of paddy (167 kgs) for a four-wheel tractor respectively, to plough an acre of paddy land. The threshing and winnowing cost payable in kind is two bags of paddy (82 kgs).

4.3 Fertilizer Application

Table 4.10 gives the cost of fertilizer application per acre and as a percentage of the total cost. Fertilizer accounts for 11 and 15 percent of the total production cost in the two districts respectively, while it varies according to method of planting whether broadcasting or transplanting. Though there is no big difference in total fertilizer cost in the two districts (see Table 4.10) in the Gampaha district the cost of fertilizer as a percentage of total production cost is considerably higher.

Table 4.10 : Cost of Fertilizer Application Per Acre as a Percentage of the Total Production Cost

District	Material Cost (Rs)	Labour Cost (Rs)	Total Cost (Rs)	As a % of total production Cost	
				Broadcasting	Transplanting
Hambantota	569	58	627	11.9	11.1
Gampaha	560	74	634	15.5	14.6

Fertilizer application and the cost incurred according to the size of holding is given in Table 4.11. The highest quantity as well as costs were reported from small holdings below 0.5 acres in Gampaha. According to Table 4.11 there was no appreciable difference in regard to the overall quantity of fertilizer used and prices, in the two districts. But in some instances the cost varied according to the size of holding.

1 No information was reported from Hambantota

2 *Amuna* = 7 bushels of paddy

Table 4.11 : Quantity Used and Cost of Fertilizer Classified by Size of Holding

Size of Holding	Quantity		Cost	
	Hambantota (Kg)	Gampaha (Kg)	Hambantota (Rs.)	Gampaha (Rs.)
< 0.50	198	209	508	607
0.50- 1.00	163	155	569	491
1.01-2.00	162	160	523	522
2.01-4.00	172	185	516	602
4.01-6.00	168	-	538	-
Overall	178	175	569	560

In both districts, there was no uniformity in the use of fertilizer. Though almost all the farmers used fertilizer, only a few of them applied the required dosage as recommended by the Department of Agriculture (Table 4.12). The majority of farmers in both districts applied less than the recommended dosage, while 40 percent applied more than the recommended amounts. A failure to use the correct quantity of fertilizer may be due to poor communication between the Extension Officers and the farmers, the unavailability of fertilizer or the lack of money at the required time.

Table 4.12 : Use of Fertilizer as Compared to Recommended Quantity by the Department of Agriculture

Usage	% of Farmers	
	Hambantota N = 192	Gampaha N = 126
Higher than the recommended dosage	42	40
Lower than the recommended dosage	49	58
Recommended dosage	09	02

It was revealed that majority of farmers in Hambantota applied fertilizer more than four times during the cultivation season. (See Appendix 4.2). The higher frequency of fertilizer application in Hambantota showed that farmers did not follow the advice of the Agriculture Instructors. This was perhaps because some farmers preferred their own methods or because the advice given by the extension officers was misunderstood.

4.4 Agro-Chemicals

Table 4.13 presents the cost of agro-chemicals, weedicides and pesticides in the two districts. The average expenditure incurred for chemicals per acre amounts to Rs. 641.00 and Rs. 388.00 in Hambantota and Gampaha respectively. There is also no great difference in the expenditure on agro-chemicals the cost being almost the same in the case of the broadcast or transplanting method.

Table 4.13 : Cost of Weedicides and Pesticides as a Percentage of Total Production Cost

Chemical	As a percentage of total cost			
	Broadcasting		Transplanting	
	Hambantota	Gampaha	Hambantota	Gampaha
Weedicides	7.1	3.2	6.0	2.0
Pesticides	7.4	2.3	6.9	2.1

The reliance on chemicals is higher in the Hambantota district (Table 4.14). More than 90 percent of farmers in Hambantota use both weedicides and pesticides in contrast to 77 percent in Gampaha. Meanwhile, hand weeding is practised by 23 percent of the farmers in Gampaha in contrast to 5 percent in Hambantota. The limited size of the land holdings and the exorbitant prices of chemicals were given as the main reasons why hand weeding was prepared.

Table 4.14 : Method of Weed Control and Pest Control

District	Farmers used weedicides (%)	Farmers used hand-weeding (%)	Farmers used Pesticides (%)
Hambantota	95	5	91
Gampaha	77	23	74

It was observed that very few farmers in both districts followed the traditional *kem system*[3] to combat pest attacks. Table 4.15 presents the breakdown of costs for weed and pest control.

Table 4.15 : Cost Composition of Weed Control and Pest Control

Cost Item	Weedicides		Pesticides	
	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)
Material	373*	130	390	93
Equipments	30	13	45	14
Labour	55	25	100	27
Total	458	168	535	134

* Although the total cost of weedicide application varies for transplanting and broadcast ing, this Table illustrates only the weedicide cost incurred under the broadcast method.

Materials constitute the main cost item. Many farmers in both districts use their own spray machines to keep costs down. The average expenditure on chemical application is considerably high in Hambantota as paddy cultivation is undertaken on a commercial basis.

[3] A term used to refer to a traditional religious system to combat pesticides.

4.5 Seed Paddy

The quantity of seed paddy used varies according to methods of planting. Thus, a relatively smaller quantity of seed paddy is required to transplant one acre of paddy land compared to the quantity required for broadcasting. But, due to the heavy labour involved the total cost of transplanting is higher than broadcasting. Table 4.16 shows the different methods of planting in the two districts and their relative costs.

Table 4.16 : Cost of Seed Paddy by Method of Planting

Method of Planting	Cost per acre (Rs)	
	Hambantota	Gampaha
Broadcasting	288	178
Transplanting	237	129

It was found that in Gampaha the material cost was relatively low in terms of both broadcasting and transplanting. This was mainly because many farmers used their own seed paddy. In Hambantota however farmers purchase seed paddy from private traders as well as government institutions.

Table 4.17 : Varieties of Seed Paddy

Variety	Hambantota		Gampaha	
	(Acres)	(%)	(Acres)	(%)
BG 94/1	189.01	34.5	16.05	8.6
BG 380/2	117.00	21.4	0.00	-
BG 11/11	0.75	0.1	28.57	15.4
BG 400/1	59.39	10.8	37.91	20.4
BG 379/2	44.88	8.2	0.00	-
BG 34/8	15.75	2.9	21.76	11.7
Mavee	-	-	40.55	21.8
Others	120.90	22.1	41.13	22.2
Total	547.68	100.0	185.97	100.0

According to Table 4.17, the majority of the farmers in Hambantota used new high yielding varieties which have 3 ½ - 4 ½ months life period. Only about 56 percent utilize these varieties in the Gampaha district. This could be due to the uncertain rainfall. Table 4.18 shows that about 30 percent of the sample population in Gampaha used old high yielding varieties and traditional varieties because they are more resistant to uncertainty of rainfall patterns.

Table 4.18 shows the overall seed paddy utilization in the two districts according to holding size. In Gampaha as the size of plot increases, there is a tendency for a reduction in the quantity of seed paddy required and the cost incurred. But, there is no clear relationship as such in Hambantota. Use of seed paddy is relatively low for holdings above 6 acres.

Table 4.18 : Use of Seed Paddy Classified by Size of Land Holding

Size of Land Holding	No. of Farmers		Quantity		Cost	
	H	G	H (Bu/Ac)	G (Bu/Ac)	H (Rs/Ac)	G (Rs/Ac)
< 0.50	18	27	2.67	2.22	293.24	238.55
0.51 – 1.00	23	39	2.64	1.78	263.88	196.02
1.01– 2.00	454	36	3.08	1.46	321.42	173.45
2.01– 4.00	73	17	3.11	1.22	312.33	147.89
4.01 – 6.00	22	7	3.08	0.97	324.70	106.79
6.01 – 8.00	6	-	1.48	-	143.08	-
8.01 – 10.00	+1	-	1.89	-	208.42	-
> 10.00	3	-	0.66	-	67.60	-
All size classes	191*	126	2.71	1.42	277.23	163.40

* One farmer has not responded. H – Hambantota G – Gampaha

4.6 Other Costs

Land tax, water and irrigation charges and crop insurance are the other inputs. The average expenditure incurred on other inputs was Rs. 6.00 per acre and it accounted for 0.15 and 0.14 percent of the total production cost in Hambantota and Gampaha respectively. Only land and irrigation taxes were taken into account in this study because very few farmers had contributed to the crop insurance scheme.

CHAPTER FIVE

FARM SUPPORTING SERVICES

In this chapter an attempt is made to examine farm support services such as credit, marketing and extension services. Firstly it examines the use of agricultural credit with reference to source of credit, interest rates and comparision of actual cash cost with approved credit ceilings. Marketing channels, marketing constrains and variation of paddy prices are discussed in the second section while farmer's access to extension services are discussed briefly in the third section.

5.1 Credit

Data given in Table 5.1 indicates the utilization of agricultural credit in the two districts. The survey revealed that the majority of farmers in Gampaha did not obtain credit either from institutional or from non-institutional sources. Therefore, the analysis focuses mainly on the credit situation in Hambantota. Of 126 farmers 70 percent depended on non-institutional sources of lending while the rest obtained credit from institutional sources. Traders, friends, and relatives were important as non-institutional sources of lending while the People's Bank and the Bank of Ceylon played an important role as institutional sources.

Table 5.1 : Source of Credit

District	Farmers who borrowed		Farmers who did not borrow (%)
	Institutional sources (%)	Non-Institutional sources (%)	
Hambantota	20	51	29
Gampaha	03	07	90

The rates of interest charged by non-institutional sources varies from 0-200% per annum. Borrowings from friends and relatives were mostly interest free. It was found that interest on borrowings to be paid in kind was higher than the interest when paid in cash because the value of the harvest changes according to the market price of paddy. The average loan per borrower and per acre is given in Table 5.2. It is seen that the size of the average loan per borrower as well as the credit per acre is comparatively high in Hambantota.

Arrangements have been made by the Central Bank of Ceylon and State Banks of the country for the disbursement of cultivation loans to paddy sector. These institutions grant credit to rural farmers through various channels such as co-operatives, branches of the banks and Agrarian Service Centres. The quantum of credit given to farmers is subject to a maximum limit on the basis of method of planting and the operational activities. The maximum credit recommended by the Central Bank of Ceylon is insufficient to meet the cash requirements of the paddy cultivators. As shown in table 5.3, there is a considerable difference between the actual

cash requirement and the approved credit ceiling in regard to land preparation, fertilizer and chemicals application, transplanting, harvesting and threshing. On the other hand, maximum level of credit granted for the preparation of a seed nursery appears to be in excess. This indicates that the approved credit ceilings are not realistic in terms of the actual credit needs of farmers. Consequently, non-institutional credit sources are still predominant in both districts. Lack of information on lending systems, the inconvenience associated with lending procedures and the difficulty of obtaining credit at the required time were disincentives in regard to obtaining credit from institutional sources.

Table 5.2 : Credit Obtained by Source of Credit

District	Credit Obtained			
	Per Borrower		Per Acre	
	Institutional Sources	Non-Institutional Sources	Institutional Sources	Non-Institutional Sources
Hambantota	4010	5080	1769	2032
Gampaha	3320	1643	1897	1095

5.2 Marketing

The average marketable output of paddy per acre was 38 and 08 bushels in Hambantota and Gampaha respectively. This accounted for 41 and 23 percent of the harvested crop in the respective districts irrespective of whether cultivation was done by transplanting or broadcasting. Of the total sample population, 60 in Hambantota and 20 percent in Gampaha generate a marketable surplus. This indicates that a large number of small farmers in Gampaha cultivate mainly to meet their consumption needs while the majority of the farmers in Hambantota produce a substantial marketable surplus.

Table 5.4 : Channels of Marketing

Channel of Marketing	% Farmers	
	Hambantota(%)	Gampaha(%)
Village traders	65	66
Outside traders	35	34

Table 5.4 shows the marketing channels in the two districts. Private traders appear to be very active in purchasing paddy from the farmers in both districts. Traders can be categorized into two groups: those who reside in the same village and those who reside outside. As shown in Table 5.4 about 65 and 35 percent of the saleable output is purchased by traders residing in the same village of the respective districts, while the balance is purchased by traders who come to the village from outside. Many farmers are compelled to sell their produce to private traders either because they are in debt to them or have to pay for hiring of draught power.

State marketing institutions like the Paddy Marketing Board (PMB), and co-operatives were not popular among the farmers due to the strict quality control and grading systems adopted. State purchasing institutions were not functioning in the sample areas as they were unable to compete with private traders. Private traders, therefore, dominated the purchasing of paddy in both districts.

Table 5.3 : Comparision of Actual Production Costs and Approved Credit Ceiling According to Field Operations

	Approved Credit Ceiling[1]				Cost of cultivation per Acre of paddy[2]				Difference			
	Rainfed Broad-casting	Irrigated Broad-casting	Rainfed Transp-lanting	Irrigated Transp-lanting	Rainfed Broad-casting	Irrigated Broad-casting	Rainfed Transp-lanting	Irrigated Transp-lanting	Rainfed Broad-casting	Irrigated Broad-casting	Rainfed Transp-lanting	Irrigated Transp-lanting
Land Preparation	635	750	625	750	1612	1556	1612	1556	-987	-806	-987	-806
Seed	200	200	200	200	178	288	129	237	122	-88	+71	-37
Nursery	-	-	200	200	-	-	76	67	-	-	+124	+133
Transplanting row	-	-	275	275	-	-	484	710	-	-	-209	-435
Fertilizer	450	500	450	500	634	627	634	629	-184	-127	-184	-127
Weed control	125	250	125	250	137	458	90	423	-12	-208	+35	-173
Pest and Disease	150	150	150	150	133	535	133	535	+17	-385	+17	-385
Harvesting/Threshing	325	400	325	400	591	944	591	944	-266	-544	-266	-544
Total	1875	2250	2350	2725	3285	4408	3743	5101	-1410	-2168	1393	-2376
Actual total cost					4093	5257	4355	5643				
Approved credit Ceiling as % of Actual total cost					45%	43%	54%	48%				

1. New comprehensive Rural Credit Scheme Operating Instructions Department of Rural Credit-Central Bank of Ceylon (1985).
2. The survey conducted by the ARTI on cost of production of

Table 5.5 : Variation of Market Prices of Paddy

District	Lowest Price (Rs/Bu)	Average Price (Rs/Bu)	Highest Price (Rs/Bu)
Hambantota	60	80	105
Gampaha	80	90	103

Table 5.5 shows the fluctuations in the market price of paddy in both districts. The paddy price in Hambantota varys from Rs. 60 – 105 per bushels and from Rs. 80.00 – 103.00 in Gampaha. It is seen that the lowest price offered by private traders was lower than the price offered by the guaranteed price scheme (GPS). This was mainly due to the situation of the farmer like indebtedness, tenancy conditions and personal relationships between the farmer and the trader. Generally paddy prices declined during the harvesting season while it gradually increased during the off-farm season.

5.3 Extension Services

Many farmers in both districts followed the advice given by the Extension Service of the Department of Agriculture. The majority of the farmers used fertilizer and agro-chemicals but some cultural practices such as transplanting were not followed by all farmers in both the districts. Although, there were a number of officers involved in extension services, the benefit of those services did not reach all the farmers due to a lack of co-ordination among the line-agencies. Cultivation Officer (CO) and *Krushikarma Viyapthi Sevaka* (KVS) play a dominant role in providing advice and facilities at the grass root level. However, a small proportion of farmers in both districts did not contact the relevant officers to get advice or the facilities available.

CHAPTER SIX

COST OF PRODUCTION

The discussion on the cost of production of paddy is divided into eight parts. The first analyses the operation cost wise while the second part examines the cost of inputs cost. The third part analyse the cost in terms of cash and non-cash basis while the fourth reviews total production costs including rental value of lands. The fifth examines per bushel/Kg cost. Input costs in terms of yield obtained per acre is discussed in the sixth part while variation of costs according to farm size is described in the seventh. And finally the variation of production costs according to sample areas is presented in the final part.

6.1 Operationwise Analysis of the Costs

Table 6.1 gives a break down of the operational costs according to field operations and methods of planting. The operational cost for cultivating an acre of paddy land is considerably higher for transplanting compared to broadcasting due to the greater amount of labour involved. The operational cost per acre is considerably higher in Hambantota when compared to costs incurred in Gampaha perhaps due to the commercial nature of paddy farming in the Hambantota district. Due to the heavy reliance on family labour for transplanting, crop protection and harvesting, the operational costs are low in Gampaha. Expenditure incurred in connection with ploughing, broadcasting and fertilizer application forms the major cost components of paddy cultivation.

Table 6.1 : Cost of Production of Paddy in Relation to Field Operations and Methods of Planting

Operation		Hambantota (Rs/Ac)	Gampaha (Rs/Ac)
Land Preparation		208	391
Ploughing + Harrowing		642	727
Puddling + Levelling		267	218
Plastering Bunds		439	276
Broadcasting		593	544
Transplanting		1014	716
Fertilizer Application		627	634
Weedicide Application	- Broadcasting	458	137
	Transplanting	423	227
Insecticide application		535	133
Crop Protection		198	184
Harvesting		458	234
Threshing		485	357
Processing		340	252
Others		6	6
Total	- Broadcasting	5257	4093
	Transplanting	5643	4355

Table 6.2 presents the various operational costs described in Table 6.1 expressed in percentage. It is clear that transplanting forms the largest cost item in transplanted areas while ploughing and harrowing form the major cost item in the broadcast areas.

Table 6.2 : Cost of Field Operations and Methods of Planting Expressed in Percentages

Operation	As a Percentage of Total Cost			
	Broadcasting		Transplanting	
	Hambantoa %	Gampaha %	Hambantota %	Gampaha %
Land Preparation	4.0	9.6	3.7	9.0
Ploughing & Harrowing	12.2	17.8	11.4	16.7
Puddling & Levelling	5.1	5.3	4.7	5.0
Construction of Bunds	8.4	6.7	7.8	6.3
Broadcasting	11.3	13.3	-	-
Transplanting	-	-	18.0	16.4
Fertilizer Application	11.9	15.5	11.1	14.6
Weedicide Application	8.7	3.4	7.5	5.2
Insecticide Application	10.2	3.2	9.5	3.1
Crop Protection	3.8	4.5	3.5	4.2
Harvesting	8.7	5.7	8.1	5.4
Threshing	9.2	8.7	8.6	8.2
Processing	6.5	6.2	6.0	5.8
Others	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0

The emphasis on and the importance of the different paddy farming operations vary in the two districts. An operation important in one area may be less important in the other. For instance, activities like clearing of canals, and irrigation activities were not given priority in Gampaha district where rainfed cultivation is widespread. Operational costs of agricultural activities vary according to the type of labour. Labour and draught power can be obtained through the hiring system or on a contract basis. Under the contract system, the per acre cost of certain operations is relatively lower compared to the hiring system. Therefore, in both districts ploughing, harrowing and harvesting operations are done mainly on a contract basis. Likewise costs for ploughing and harvesting vary according to the mode of draught power (see Table 4.9).

6.2 Inputwise Distribution of Costs

The breakdown of production costs is given in terms of inputs such as labour, draught power, fertilizer, chemicals and seed paddy also given in the cost of the various inputs and its variation according to the method of planting. Calculation of costs were based considering inputed values and money values (see Section 1.4). Table 6.3 presents costs incurred on each input and also as a percentage of the total cost.

According to Table 6.3, labour constitutes the single most important production input, accounting for more than 50 percent of the total cost. Draught power and fertilizer were the other major inputs and accounted for about 20 and 13 percent respectively of the total cost.

Table 6.3 : Cost of Production of Paddy by Production Inputs and Method of Planting

Input		Broadcasting		Transplanting	
		Hambantota	Gampaha	Hambantota	Gampaha
Labour	Rs	2606	2294	3078	2645
	%	49.6	56.0	54.6	60.7
Seed Paddy	Rs	288	178	237	129
	%	5.5	4.4	4.2	3.0
Draught Power	Rs	950	806	950	806
	%	18.1	19.7	16.8	18.5
Fertilizer	Rs	569	560	16.8	806
	%	10.8	13.7	10.1	12.9
Weedicides	Rs	373	130	338	90
	%	7.1	3.2	6.0	2.1
Pesticides	Rs	390	93	390	93
	%	7.4	2.3	6.9	2.1
Equipments	Rs	75	26	75	26
	%	1.4	0.6	1.3	0.6
Others	Rs	6	6	6	6
	%	0.1	0.1	0.1	0.1
Total	Rs	5257	4093	5643	4355
	%	100.0	100.0	100.0	100.0

Due to rapid inflation, the cost of inputs has increased remarkably during the past few years (Abeysekera, 1986). Agricultural labour charges have increased by more than 20 percent while draught power charges increased by more than 25 percent. Farmer's reliance on "imported items" such as tractors, threshing machines and chemicals has increased overtime while the use of animals and organic/fertilizer has declined. The devaluation of local currency in the international market has further contributed towards an increased cost of inputs.

6.3 Cash and Non-cash Operating Costs

The resources used in the paddy farming operations are divided into two categories, namely cash and non-cash items. The cash items include payments made in respect of production inputs, while the non-cash items covers resources like family labour, draught power and seed paddy belonging to the farmer. Such an analysis is necessary as several non-cash items are used in paddy farming. Therefore, an attempt is made to find out the opportunity cost of non-cash items by valuing all non-cash inputs at the market prices prevailing in the two districts. The precise identification of cash outlays are important because it would help to find out the actual cash requirements of paddy cultivators in order to formulate credit policies accordingly.

The opportunity costs of family labour have been worked out on the basis of daily wage rates of the respective districts (see Table 4.7). The value of food consumed by family labour was not taken into account. The cost of seed paddy was estimated based on market prices. The value of draught power owned by the farmer was estimated at the prevailing hiring rates. Corresponding values for draught power are given in Table 4.9.

Labour cost forms the major cash and non-cash cost component. It accounts for about 50 percent of the total cash cost and about 70 percent of the total non-cash cost (Table 6.4). Fertilizer, draught power and chemicals were the other important cash cost items while seed paddy and draught power were important as non-cash inputs.

There was no uniformity in the cash cost and non-cash cost in the two districts. Utilization of non-cash inputs was relatively higher in Gampaha while more cash inputs was used in Hambantota. This indicates in Gampaha a relatively higher use of family labour, draught power and seed paddy belonging to farmers.

Table 6.4 : Cost of Production of Paddy Classified by Cash and Non-cash Costs

Items		Broadcasting		Transplanting	
		Hambantota	Gampaha	Hambantota	Gampaha
Cash Inputs					
Labour	Rs	1801	1368	2285	1698
	%	42.9	45.6	49.5	52.4
Seed Paddy	Rs	119	87	88	38
	%	2.8	2.9	1.9	1.2
Draught Power	Rs	886	746	886	746
	%	21.1	24.9	19.2	23.0
Fertilizer	Rs	569	560	569	560
	%	13.6	18.7	12.3	17.3
Weedicides	Rs	373	130	338	90
	%	8.9	4.3	7.3	2.8
Pesticides	Rs	390	93	390	93
	%	9.3	3.1	8.4	2.9
Equipments	Rs	55	7	55	7
	%	1.3	0.2	1.2	0.2
Others	Rs	6	6	6	6
	%	0.1	0.2	0.1	0.2
Total	Rs	4199	2997	4617	3238
	%	100.0	100.0	100.0	100.0
As a percentage of total cost		79.9	73.2	81.8	74.4
Non-Cash Inputs					
Labour	Rs	805	926	793	947
	%	76.1	84.5	77.3	84.8
Seed Paddy	Rs	169	91	149	91
	%	16.0	8.3	14.5	8.1
Draught Power	Rs	64	60	64	60
	%	6.0	5.5	6.2	5.4
Equipments	Rs	20	19	20	19
	%	1.9	1.7	2.0	1.7
Total	Rs	1058	1096	1026	1117
	%	100.0	100.0	100.0	100.0
As a percentage of total cost		20.1	26.8	18.2	25.6

6.4 Total Production Cost Including Land Value

The report has already analysed the cost of production in terms of items which have variable costs. But in the context of estimating the total production cost, fixed costs which includes the opportunity cost of land should also be taken into account. However, the rental value of land cannot be precisely assessed due to the existence of different arrangements such as mortgaging, tenancy and leasing system as discussed in chapter three. For instance, in the areas where the tenancy system is prevalent, the land rent varies according to tenancy conditions and collatoral supports provided by landlords. Accordingly fixed rental value is considered irre-

spective of different tenurial systems. Table 6.5 indicates the existing rental values in the two districts.

Table 6.5 : Operational Production Cost Including Land Values

	Hambantota		Gampaha	
	Broadcasting Rs	Transplanting Rs	Broadcasting Rs	Transplanting Rs
Total operation cost	5257	5643	4093	4355
Rental value	1000	1000	800	800
Total Production cost	6257	6643	4893	5155

As shown above, the total production cost per acre increases by Rs. 1000 and Rs. 800 in Hambantota and Gampaha respectively. The rental value of lands is relatively high in the Hambantota district because the production potential is high in irrigated paddy lands in Hambantota. It was noticed that rental value varied according to potentiality of the sample areas. Thus, land value is higher in high potential production areas than in the medium or low potential areas (Table 6.9).

6.5 Per Bushel/Kilogram Cost

This cost analysis is important to both the policy makers and the farmer in order to understand the economics of paddy cultivation. The selling price is an indicative of the level of producer profits. But due to heavy fluctuations of market prices, it is difficult to workout the returns and profits at different price levels. Accordingly, the guaranteed price was used as the constant price level during the survey period.

Table 6.6 shows the production costs per bushel and per kilo-gram in the two districts. Imputed land costs have been excluded in this analysis to avoid distortions in calculations.

Table 6.6 : Production Cost Classified by Per Bushel and Per Kilogram

Item	Broadcasting		Transplanting	
	Hambantota Rs	Gampaha Rs	Hambantoa Rs	Gampaha Rs
The cost per bushel[1]	77	91	74	84
The cost per Kilo Gram[2]	3.70	4.36	3.56	4.01
Returns per bushel at GPS Rs. 70/=	-7	-21	-4	-14
Returns per Kilo Gram at GP Rs. 70/=	-0.35	-1.01	-0.21	-0.66

1. Cost per bushel = $\frac{\text{Total production costs per acre}}{\text{Average yield per acre in bushels}}$

2. Cost per Kilo = $\frac{\text{Total production costs per acre}}{\text{Average yield per acre in Kgs}}$

One bushel of paddy equivalent to 20.87 Kg.

The production cost per bushel of paddy was lower in Hambantota than in Gampaha. This indicates the cost per bushel in Hambantota remains at or near break-even point. But in Gampaha, per bushel cost is very high and consequently paddy cultivation did not seem to be economically profitable. The low returns in Gampaha district is not only the result of subsistance farming but also a result of the low application of fertilizer and agro-chemicals. Therefore, low returns have adversely increased the per unit cost in Gampaha (see Table 6.6).

6.6 Production Costs Classified in Terms of Real Value of Production Inputs*

This analysis highlights real costs incurred in cultivating an acre of paddy land in each of the two districts. Real costs were calculated on the basis of actual costs incurred on each input divided by guaranteed price of Rs. 70/= per bushel of paddy. As indicated in table 6.7 the total production cost in Hambantota varies between the range of 70-80 bushels of paddy in terms of broadcasting and transplanting while it varies between 58 to 62 bushels in Gampaha.

Table 6.7 : Production Costs Classified by Real Value of Production Inputs*

Input	Broadcasting		Transplanting	
	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)
Labour	37.23	32.77	43.97	37.79
Draught Power	13.57	11.51	13.57	11.51
Fertilizer	8.13	8.00	8.13	8.00
Weedicides	5.3	1.86	4.83	1.29
Pesticides	5.57	1.33	5.57	1.33
Seed Paddy	4.11	2.54	3.39	1.84
Equipment	1.07	0.37	1.07	0.37
Others	0.09	0.09	0.09	0.09
Total	75.01	58.47	80.62	62.22

As illustrated in Table 6.7 about 40% of the total cost of the harvested crop in the two districts were for labour charges, while about 20% was spent on fertilizer and agro-chemicals in Hambantota and about 10% in Gampaha. When we consider the disposal of paddy output per acre, marketable surplus was almost equalent to labour costs except in the broadcasted areas in Gampaha. Like wise landlords' share was almost equalent to cost incurred on fertilizer.

* Calculated by dividing the actual cost incurred on each input by the GPS price of Rs. 70/= per bushel of paddy.

6.7 Production Costs Per Farm

Per farm production cost was calculated on the basis of estimating the total production cost incurred to cultivate one parcel of land. Since many farmers in both districts own more than one plot of land, the focus of the analysis was on the main land parcel to avoiding distortions. The average farm size was 2.16 acres in Hambantota and 0.98 acres in Gampaha respectively. The Table 6.8 presents the average production costs per farm in terms of the method of planting.

Table 6.8 : Cost of Production of Paddy Per Farm Classified by Production Inputs and Method of Planting

Inputs		Broadcasting		Transplanting	
		Hambantota*	Gampaha*	Hambantota	Gampaha
Labour	Rs	5629	2248	6648	2592
	%	49.6	56.1	54.6	60.7
Seed Paddy	Rs	622	174	512	126
	%	5.5	4.3	4.2	3.0
Draught Power	Rs	2052	760	2052	790
	%	18.1	19.7	16.8	18.5
Fertilizer	Rs	1229	549	1229	549
	%	10.8	13.7	10.1	12.9
Weedicides	Rs	806	127	730	88
	%	7.1	3.2	6.0	2.1
Pesticide	Rs	842	91	842	91
	%	7.4	2.3	6.9	2.1
Equipment	Rs	162	25	162	25
	%	1.4	0.6	1.3	0.6
Others	Rs	13	6	13	6
	%	0.1	0.1	0.1	0.1
Total	Rs.	11355	4010	12188	4267
	%	100.0	100.0	100.0	100.0

* Average farm size - Hambantota 2.16 acres
Gampaha 0.98 acres

According to Table 6.8 labour forms the largest cost item followed by draught power and fertilizer respectively. The average production cost per farm varys with the type of land holdings, and per farm production cost is relatively high in the Hambantota districts.

6.8 Variation of Cost of Production According to Sample Areas

The total production cost per acre changes within a wide range depending on the productivity potential of the areas. This variation is clearly seen between the two districts and even within each district as well (Table 6.9). The highest production cost was reported from high potential areas while the lowest cost was reported from low and medium productivity potential areas. The operational costs of medium and low potential areas were below the average operational costs of the respective districts. In addition to land suitability and production potential,

adoption of improved management practices and farm mechanization have contributed to the changes in the cost of production.

Table 6.9 : Variation of Total Production Cost According to Production Potential of Sample Areas

District		High (Rs/Ac)	Medium (Rs/Ac)	Low (Rs/Ac)
Hambantota	Broadcasting	5583	5139	42116
	Transplanting	6189	5511	4547
	Rental value	1200	1000	800
Gampaha	Broadcasting	4389	4093	4377
	Transplanting	4559	4900	4222
	Rental value	900	800	700

Table 6.9 reflects the relationship between the average cost of production and production potential of the cultivated lands. The operational cost and rental value is high in the high potential areas indicating that land suitability and production potential are also important apart from material inputs used in determining the cost of paddy production.

Considering all the factors referred to in the chapter, production cost could be analysed as follows:

- The method of planting is a considerable factor in determining costs. About 70 percent of the total cost was for four major operations, ploughing , transplanting, fertilizing and harvesting.

- The greatest propotion of costs (about 50 percent) was for labour. Draught power and fertilizer accounted for about 30 percent of the total cost.

- Analysis on cash and non-cash costs showed that the utilization of family labour, seed paddy and draught power owned by the farmer have made a significant impact on increasing costs. Utilization of non-cash items is relatively high in the Gampaha district compared to Hambantota.

- A consideration of the actual cost of producing a bushel of paddy and the average returns per acre show that paddy cultivation is not economically profitable in either Hambantota or in Gampaha.

CHAPTER SEVEN

YIELDS AND PROFITABILITY

This chapter consists of five sections. The first deals with the average productivity per acre and per farm while the second reviews the disposal of output with reference to marketable surplus, consumption and various deductions. Profitability of paddy cultivation is discussed in the third section with special emphasis on gross income, net income and cash income per acre and per farm. The fourth section highlights the returns for paddy cultivation per bushel and the final section examines the variation of output levels, returns and profitability according to the production potential of the sample areas.

7.1 Output Levels

The average output levels of the two districts are shown in Table 7.1. Per acre and per farm output levels vary in the two districts and according to the method of planting. The per acre and per farm output levels are considerably higher in transplanted areas compared to that of the broadcast areas. Likewise the level of output is higher in Hambantota compared to Gampaha thus reflecting a significant difference between commercial and semi commercial paddy farming systems.

Table 7.1 : Yield Distribution by Method of Planting

	Broadcasting		Transplanting	
	Hambantota (Bu)	**Gampaha (Bu)**	**Hambantota (Bu)**	**Gampaha (Bu)**
Per Acre				
Average output	68	45	76	52
Lowest output	05	33	12	02
Highest output	140	106	210	112
Per Farm*				
Average output	146	44	164	51
Lowest output	10	32	26	02
Highest output	302	104	454	110

* Average size of main paddy land parcel - Hambantota 2.16 acres
- Gampaha 0.98 acres

According to Table 7.1 the highest per acre and per farm yields were reported from Hambantota while the lowest yields were reported from Gampaha. Despite similar climate conditions in some areas, the considerable difference in the yields between the two districts, is mainly due to different cultural practices adopted and the production potential of the cultivated lands. The average yield varies according to the size of land holdings (See Table 7.2).

Table 7.2 : Average Yield According to Size of Land Holdings

Size Category (Acres)	Broadcasting		Transplanting	
	Hambantota (Bu/Ac)	Gampaha (Bu/Ac)	Hambantota (Bu/Ac)	Gampaha (Bu/Ac)
=< 0.50	35	50	41	56
0.51 – 1.00	69	26	56	60
1.01 – 4.00	69	31	69	58
4.01 – 6.00	70	00	110	00
Overall	68	45	76	52

Table 7.2 shows a clear and positive relationship between the size of holding and the average yield per acre in Hambantota. In Hambantota average yield increases with the size of holdings but in Gampaha, there is no clear relationship between yield and the holding sizes. The smallest land parcels (less than 0.50 acres) recorded that highest yield compared to other categories (Table 7.2).

Table 7.3 : Modes of Disposal of Paddy and Method of Planting

Mode of disposal	Broadcasting		Transplanting	
	Hambantota (%)	Gampaha (%)	Hambantota (%)	Gampaha (%)
Marketable output	40.0	15.0	43.6	32.6
Home consumption	23.0	62.2	24.8	51.8
Share of share holders	3.0	1.0	0.4	0.1
Share of landlords	11.0	9.0	9.6	6.1
Payment for Hire Laboures	7.0	3.0	7.5	2.0
Repayments	14.0	1.0	12.3	0.5
Others	2.0	9.0	1.7	6.7
Total	100.0	100.0	100.0	100.0

7.2 Disposal of Output

As indicated in Table 7.3 more than 40 percent of the total output in Hambantota is disposed of in the form of marketable surplus in contrast to 15 and 32 percent from broadcast and transplanted fields respectively in Gampaha. On the other hand, home consumption is significantly high in Gampaha which is a common feature of the subsistence farming systems. There is a positive relationship between the mean yield and marketable surplus in Hambantota indicating relatively higher marketable surplus in transplanted areas. But hardly any of the farmers produce mainly for commercial purpose. According to the study, about 1/3 and 1/5 of the total output is deducted for various payments such as landlord's share, loan repayments and labour charges in Hambantota and Gampaha respectively. Indebtedness and various tenurial practices adopted by farmers have contributed to this situation, consequently decreasing the marketable output. About 10 and 8 percent of the total output was paid as landlord's share in Hambantota and Gampaha respectively. Higher proportion of the output was deducted as the landlord's share in Hambantota due to prevalence of tenant cultivators.

7.3 Returns and Profits

The discussion on returns and profits of paddy cultivation is based on two criteria namely per acre and per farm. This is reflected in Table 7.4 and Table 7.5.

The gross income, which is equivalent to the total output of paddy, is considerably higher in the transplanted areas in both districts. The lowest gross income was reported from broadcast areas in Gampaha while the highest gross income was reported from transplanted areas in Hambantota. Favourable weather conditions and improved management practices adopted in Hambantota may have led to a substantial improvement in the yield and gross income between the two districts.

The family income which indicates the value of paddy sold out and the quantity used for consumption is almost equal in both districts. Consumption and sales account for about 70 percent of the total production. The rest is deducted for other payments such as landlords share and the dues to share croppers. Due to these reasons the prevailing gap between family income and gross income is considerably high in both districts.

The cash income which indicates the value of sales is relatively high in Hambantota reflecting a higher proportion of saleable output. But in Gampaha where semi-commercial paddy farming is widespread, the cash income is marginal due to low marketable surplus (See table 7.2). This difference is striking in broadcast areas.

In order to avoid price fluctuation during the harvesting and off farm seasons the return from paddy is calculated at the guaranteed price of Rs. 70/= per bushel. When paddy fetches market prices of Rs. 80/= and Rs. 90/= per bushel, the profitability would be much greater in both districts (See Table 7.5).

The value of net income which is equivalent to gross income minus total cost including inputed values is negative in both districts. This is became production costs in paddy cultivation are high and the returns marginal.

Table 7.4 : Returns and Profits from Paddy Per Acre and Per Farm (Valued at Guaranteed Price of Rs. 70 Per Bushel)

Item[1]	Broadcasting		Transplanting	
	Hambantota	Gampaha	Hambantota	Gampaha
	(Rs)	(Rs)	(Rs)	(Rs)
Per Acre[2]				
(a) Returns				
Gross Income	4760	3150	5320	3640
Family Income	3010	2450	3640	3080
Cash Income	1890	490	2310	1190
(b) Profits				
Net Income	-497	-943	-323	-715
Farm Income	561	153	703	402
Net Cash Income	-2309	-2507	-2307	-2048
Gross Value added	3140	2189	3786	2768
Per Farm*[2]				
(a) Returns				
Gross Income	10282	3087	11491	3567
Family Income	6502	2401	7862	3018
Cash Income	4082	480	4990	1166
(b) Profits				
Net Income	-1074	-924	-698	-701
Farm Income	1212	150	1518	394
Net Cash Income	-4987	-2457	-4983	-2007
Gross Value added	6782	2145	8178	2713

* Average farm size of main paddy - Hambantota 2.16 acre
- Gampaha 0.98 acre

1 Definitions

Gross income = Value of total output :
Cash income = Value of cash sales :
Family income = Cash income plus value of paddy consumed on the farm :
Net income = Gross income minus total costs :
Farm income = Gross income minus payments in kind and cash
Net cash income = Cash income minus value of material inputs
Gross value added = Gross income minus value of material inputs

2 Paddy valued at the guaranteed price of Rs.70/= per bushel.

Table 7.5 : Returns and Profits from Paddy Per Acre and Farm (Valued at the Prevailing Market Prices of Rs. 80/= and Rs. 90/= Per Bushel)

Item[1]	Broadcasting		Transplanting	
	Hambantota (Rs)	Gampaha (Rs)	Hambantota (Rs)	Gampaha (Rs)
Per Acre[2]				
(a) Returns				
Gross Income	5440	4050	6080	4680
Family Income	3440	3150	4160	3960
Cash Income	2160	630	2640	1530
(b) Profits				
Net Income	183	-43	437	325
Farm Income	1241	1053	1463	1442
Net Cash Income	-2039	-2367	-1977	-1708
Gross Value Added	3820	3089	4546	3808
Per Farm*[2]				
(a) Gross Income	11750	3969	13133	4586
Family Income	7430	3087	8986	3881
Cash Income	4666	617	5702	1499
(b) Profits				
Net Income	395	-42	944	319
Farm Income	2681	1032	3160	1413
Net Cash Income	-4404	-2320	-4270	-1674
Gross Value added	8251	3027	9819	3732

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* Average farm size - Hambantota 2.16 acre
Gampaha 0.98 acre

1 Definitions

Gross income = Value of total output :
Cash income = Value of cash sales :
Family income = Cash income, plus value of paddy consumed on the farm:
Net income = Gross income minus total costs :
Farm income = Gross income minus payments in kind and cash :
Net cash income = Cash income minus payments in kind and cash :
Gross valued added = Gross income minus value of material inputs :

2 Paddy value at the market price of Rs. 80/= and Rs. 90/= per bushel in Hambantota and Gampaha respectively.

However, the difference between gross income and total cost is low in transplanted areas due to the better yields obtained.

The value of farm income which indicates the difference between gross income and value of payments in kind and cash is positive in both districts except for some broadcast areas in Gampaha. Though 26 percent of the total cost is on non-cash items, the value of farm income is negative in broadcast areas in Gampaha due to low returns experienced for 1986/87 *Maha* season. This would be the result of unfavourable weather conditions. In a situation where the cost of non-cash inputs is high farm income would be positive, but due to labour scarcity experienced during the peak periods, labour charges rise and consequently the proportion of cash costs increases.

Net cash income which is equivalent to cash income minus payments in kind and cash is negative in both districts. This is due to various deductions and subsequent low marketable output. Though per acre and per farm output is high in Hambantota, there was no evidence to prove that paddy cultivation was undertaken mainly for commercial purposes. On the other hand, the subsistence paddy farming in Gampaha was mainly for home consumption. Therefore, net cash income is negative in both districts due to home consumption and various other deductions.

Gross value added which is equivalent to gross income minus value of material inputs was positive in both districts. Only about 35 percent of the total production cost was spent on material inputs, the cost of the non-material inputs being crucial in determining the gross value.

Besides, indicating the levels of income and profits of the average paddy farmer, these measures provide useful evidence on indebtedness, use of credit and tenancy conditions. It was observed that indebtedness and various tenurial practices had a considerable effect on changing the farm income and profit margins of paddy cultivation. Thus, many farmers in both districts had to give more than 20 percent of their total output as loan repayments and landlord's share.

According to Table 7.4 profit making from paddy cultivation is feasible only in Hambantota, but the profit margin is low due to high production costs. In Gampaha, because of the limited size of the paddy lands and a lack of improved management practices, semi-commercial paddy farming did not seem profitable. This clearly indicates that the land size and adoption of improved management practices are vital in enhancing profits from paddy cultivation.

There was no appreciative difference in profitability between per acre and per farm (Table 7.4). The only difference was that returns and profits in Hambantota was higher than the Gampaha due to the bigger land holdings. And due to the limited size of the land parcels, profitability is even lesser in the transplanted areas in Gampaha.

7.4 Per Bushel Returns and Profits

Table 7.6 presents the average profit margin per bushel of paddy. This estimation was also based on the guaranteed price of Rs. 70/= per bushel. The returns and profitability per bushel is negative in both districts, indicating that the guaranteed price scheme is insufficient to meet the production cost per bushel. The gap between (GPS) and production cost is very high in rainfed areas compared to irrigated areas indicating that semi-commercial paddy farming in rainfed areas is far from profitable. When we consider the prevailing open market prices (See

Table 5.5) the average profit margin per bushel of paddy is favourable in both districts except in the broadcast areas in Gampaha.

Table 7.6 : Average Production Costs and Profit Margins Per Bushel of Paddy

Item	Broadcasting		Transplanting	
	Hambantota (Rs/Bu)	Gampaha (Rs/Bu)	Hambantota (Rs/Bu)	Gampaha (Rs/Bu)
Cash costs	61.75	66.60	60.75	62.27
Non-Cash costs	15.56	24.36	13.50	21.48
Total Production cost	77.31	90.96	74.25	83.75
Profit margin in relation to the guaranteed price of Rs. 70/= per bushel	-7.31	-20.96	-4.25	-13.75
Profit margin in relation to prevailing market prices of Rs. 80/= & Rs. 90/= per bushel	2.69	-0.96	5.75	6.25

Guaranteed Price Scheme (GPS) would not be a suitable indicator to measure the profit margin in terms of per acre as well as per bushel of paddy, due to wide price variations in both districts.

7.5 Variation of Outputs, Returns and Pofitability According to Sample Areas

The profitability of paddy cultivation varies according to the production potential of the sample areas. This variation is likely to be high even among farmers in the same area. The Table 7.7 shows variation of the average yield distribution according to the production potential of the sample areas. The difference between medium and high potential areas is considerable in transplanted areas, but even a larger difference exists in the broadcast areas. The highest yield was reported from the high potential areas while the lowest yield was reported from the low potential areas.

Table 7.7 : Mean Yield Distribution According to Production Potential of Sample Areas

Potential Area	Broadcasting		Transplanting	
	Hambantota (Bu/Ac)	Gampaha (Bu/Ac)	Hambantota (Bu/Ac)	Gampaha (Bu/Ac)
High	70	55	88	68
Medium	74	33	67	51
Low	40	31	45	29

Table 7.8 : Returns and Profits Per Acre According to Production Potentiality of Sample Area

Item[1]	Broadcasting		Transplanting	
	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)
High Potential Areas				
(a)Returns[1]				
Gross Income	4900	3850	6160	4760
Family Income	2870	3150	4270	3090
Cash Income	1820	980	3150	1750
(b)Profits[2]				
Net Income	-683	-539	-29	201
Farm Income	218	953	896	1645
Net Cash Income	-2862	-1917	-2114	-1365
Medium Potential Areas				
(a)Returns[1]				
Gross Income	5180	2310	4690	3570
Family Income	3290	1680	3570	3360
Cash Income	2310	420	1120	1050
(b)Profits[2]				
Net Income	41	-1783	-821	-1330
Farm Income	961	-858	0	-385
Net Cash Income	-1909	-2748	-3570	-2905
Low Potential Areas				
(a)Returns[1]				
Gross Income	2800	2170	3150	2030
Family Income	1855	1208	2380	1663
Cash Income	525	18	560	123
(b)Profits[2]				
Net Income	-1316	-2207	-1397	-2192
Farm Income	-293	-1152	-454	-1163
Net Cash Income	-2568	-3304	-3044	-3070

1 Definitions

Gross Income = Value of total output;
Cash Income = Value of cash sales;
Family Income = Cash income, plus value of paddy consumed on the farm;
Net Income = Gross Income minus total costs;
Farm Income = Gross income minus payments in kind and cash;
Net Cash Income = Cash income minus payments in kind and cash;

2 Paddy valued at the guaranteed price of Rs. 70/= per bushel.

Table 7.8 shows the variation in income levels and profits according to the production potentiality of samples areas. Suitable land and the availability of water are the major factors which determine production potentiality paddy of lands. It is seen that net income of paddy cultivation is positive only in high potential areas. But except in transplanted areas the net income is negative even in high potential areas in Gampaha. This shows that the adequate water is a crucial factor in improving the yield in high potential areas. Paddy lands in the sample areas showed a remarkable difference in terms of returns and profits even in the same district, indicating that paddy cultivation can be more profitable under better climatic and management conditions.

The analysis on average yields, disposal of produce, returns and profits reveal that paddy cultivation is not economically viable in both districts as a consequence of the higher cost of production and lower market prices.

CHAPTER EIGHT

SUMMARY AND CONCLUSION

Background Information

Considering the socio-economic characteristics of sample households in Hambantota and Gampaha there was no appreciate difference seen between the two districts. The level of education is low in both districts. About 11% of the sample population did not attend schools while 30 percent population had completed only primary education in the Hambantota district, while the corresponding figures for Gampaha were 5% and 21% respectively. About 30 percent of the population in Hambantota and 23 percent of the population in Gampaha were unemployed.

The average size of lowland holdings were 3.36 and 1.81 acres in the Hambantota and Gampaha districts respectively. Lowland holdings in Hambantota show a wide variation in sizes compared to Gampaha. The average sizes of the man power of paddy land were 2.16 acres in Hambantota and 0.98 acres in Gampaha.

The index of cropping intensity for 1987/88 *Maha* was 87 percent for Hambantota and 82 percent for Gampaha. The relatively low index for Gampaha was the result of inadequate rainfall during the respective seasons.

8.1 Land Utilization

Eight tenurial categories were identified in the two districts: owners, tenants, owner tenants, tenant owners, leasees/mortgagees, encroachers, joint owners and others. Though there is no significant difference in land holding size of these tenurial groups, owners and tenants dominated all other categories.

More than one third of the sample households in both districts had been working as tenants for 30 years or more. Tenancy conditions and negotiations were based on kinship, friendship and neighbourly relations. Due to the prevalent absentee landlordism in Hambantota, the role of the *Gambare* is important as an intermediary for both parties i.e., landlords and tenants.

Land rent is decided mainly on collateral support provided by landlords. More than 70 percent of the tenants in Hambantota paid either 25% of the harvested crop or a fixed rent, usually 15 bushels/acre as land rent. But the majority of the tenants in Gampaha paid 50% of the harvested crop because production inputs were provided by the landlords.

It was observed that tenancy has not hindered either the adoption of cultural practices or the access to farm supporting services. Hence, there is no significant difference between owner cultivators and tenant cultivators with regard to the bearing of cultivation risks.

8.2 Production Inputs

The use of tractors, threshing machines and other farm equipments is widespread in both districts. The reliance on animal draught power has declined and only a few farmers in rainfed areas use animals. Due to the increased use of chemical fertilizers and other chemicals, application of manure and the adoption of traditional management practices for pest and weed control has declined. The majority of the farmers (more than 80 percent) cultivated new high-yielding varieties while farmers' preference for old varieties was negligible. Likewise, the reliance on imported inputs (tractors, fertilizer and agro-chemicals) seems to be high.

With regard to type of labour, the majority of farmers used hired labour to supplement family labour. None of them relied purely on family labour nor hired labour. Contract labour is normally used for activities such as ploughing and threshing in both districts. The survey revealed that ¼ of the potential family labour was unused in both districts due to people leaving the village. As a consequence the use of hired and contract labour was high in both districts. Therefore, labour charges increase during the peak period of cultivation due to the shortage of labour.

The wages for agricultural labourers varied greatly depending on the nature of the work as well as the actual work done. Real wage rates are higher than nominal wage rates because it is customary to provide meals and tea for labourers. Likewise, the existing labour charges are relatively high in Gampaha due to the availability of alternative employment opportunities in the area.

The bulk of farm power requirements were met through tractors and animals, the farmers hardly depending entirely on human labour for tillage or threshing. The farmers in the irrigated areas in Hambantota relied heavily on tractors while those in rainfed areas in Gampaha used both animals and tractors. The expenditure incurred on draught power shows a wide variation according to the cultivated areas, type of draught power (animals or tractors) and operational activities. It also seems that draught power charges were relatively high in the Gampaha district, (See Table 4.9) due to the above reasons.

The survey found that there was no uniformity in the use of fertilizers. Though, almost all the farmers in both districts use fertilizers, the majority of them did not apply the required dosage as recommend by the Department of Agriculture (Table 4.12). Frequently, farmers use less than the recommended dosage due to lack of know how, unavailability of the recommended brands and financial difficulties. It was evident that many small farmers face financial difficulties at the time of fertilizer application. This situation is aggravated by the existing credit ceiling approved by the state banks which falls short of the actual cost of fertilizer.

The analysis of agro-chemicals shows that almost all the farmers in Hambantota apply weedicides and pesticides while in Gampaha, about 75 percent use agro-chemicals and the rest practice hand weeding. This indicates that the reliance on agro-chemicals is higher among commercial paddy farmers than those who cultivate on a semi-commercial basis.

The use of new varieties namely BG 94/1, BG 380/2 and BG 400/1 is popular in Hambantota while the use of BG 11/11, BG 400/1, and BG 34/8 is widespread in the Gampaha. Traditional varieties are used only by few farmers (22 percent) in Gampaha. This was mainly

due to the fact that these varieties are resistant to irregular rainfall patterns. Despite sufficient improvements in paddy production, the majority of farmers (more than 70 percent) in both districts still mainly follow the broadcast method. This was mainly due to labour scarcity and higher labour charges.

8.3 Farm Supporting Services

According to the information available, the majority of farmers in both districts appear to have had difficulties in accessing the farm support services provided by the government institutions. This suggests that credit, marketing and extension services did not reach the rural farmer as expected by the government. As a result private money lender plays a dominant role in rural credit markets while traders appeared to be very active in purchasing paddy from farmers.

More than 50 percent of the farmers in Hambantota obtained loans from private traders, friends and relatives. The interest rate of these non-institutional credit sources varied from Rs. 0-200 per annum while borrowings from friends and relatives were mostly interest free. Credit in kind is very popular in the Hambantota district and the rate of interest is high accordingly. The Bank of Ceylon and the People's Bank functioned as the state lending institutions in granting credit. About 30 percent of the total borrowings were granted by these two banks. Eventhough the interest rates of state lending institutions are comparatively low, borrowings were very low compared to that of the private traders. Insufficiency of the amounts granted, difficulty in obtaining loans at the required time and the inconveniences associated with the lending procedures were identified as main difficulties in this regard.

The paddy marketing prices fluctuate widely (Table 5.5). This is mainly due to indifferent intervention by the State Marketing Agencies. Some farmers in Hambantota are compelled to sell their produce at a low price, even lower than the GPS as a result of their indebtedness. The average open market paddy prices are relatively higher than the GPS. The study found that the majority of traders pay Rs. 80/= or more for a bushel of paddy in both districts (see Table 5.5).

8.4 Cost of Production

The analysis of cost of production of paddy shows a remarkable increase in the cost of items needed for cultivation. This increase is very clear when compared to the figures published by the Department of Agriculture in the past three years from *Maha* 1984/85 to *Maha* 1986/87.

The operationwise analysis of cost of production indicates that operational cost for cultivating an acre of paddy land is relatively higher for transplanting than for broadcast methods. Cost for ploughing, harvesting, transplanting and fertilizer accounts for 70 percent of the total operational cost mostly incurred in connection with hired labour and draught power.

The inputwise analysis of production cost indicates that cost of labour which accounts for about 50 percent of total cost is the largest cost item in paddy production. Draught power and fertilizer accounted for almost 30 percent of the total cost. Also, more than 40 percent of total production cost is incurred on tractors and chemicals. Labour migration, under utilization

of potential family labour, acute shortage of draught power during peak period and heavy reliance on chemical fertilizer were the most significant factors contributing to the size in production costs.

Rising wage rates during the last few years had a corresponding effect on labour charges. For instance, in Hambantota a daily wage rate of Rs. 46.00 per day in 1984/85 increased to Rs. 55.00 in 1987/88 while it increased from Rs. 40.00 to Rs. 60.00 during the same period in Gampaha.

The analysis of cash and non-cash production costs indicate that the utilization of family labour, and owned seed paddy and draught power was a significant factor in affecting the total cost of production. More than 20 percent of the total production cost is accounted for by non-cash inputs such as family labour, draught power and seed paddy belonging to the farmers. Relatively higher proportion of non-cash inputs (about 27 percent) is utilized in the Gampaha district as against 18 percent in Hambantota. This indicates that the use of their own resources is higher among the farmers in semi-commercial paddy growing areas than in commercial paddy growing areas. Family labour forms the largest non-cash item in both districts while seed paddy and draught power come second and third. As regards cash inputs, labour forms the largest cash cost item and accounts for 31 percent of the total cost.

Farm production costs vary according to the size of the land holdings. This indicates a direct relationship between the holding size and the individual farm production cost. Thus, individual farm production costs are relatively higher in Hambantota where there are bigger paddy holdings than in Gampaha where paddy holdings are generally smaller.

In regard to the average expenditure per bushel of paddy, the production cost is relatively low in Hambantota, when compared to Gampaha. This indicates the difference between commercial and semi-commercial paddy farming systems.

The new trends emerging in paddy production in Sri Lanka indicate that there is a movement towards a capital intensive production technology involving high costs. Semi-commercial paddy farming may not therefore be profitable under such circumstances. Likewise, farmers engaged in commercial and semi-commercial paddy farming systems endeavor to reduce production costs by improved management practices.

8.5 Changes in Returns and Profitability

The profits from paddy cultivation show a decling trend in both districts. This was mainly due to increases in cost of production inputs as well as low market prices. Due to rising inflation the cost of production of paddy has increased over time while the prevailing marketing prices have been insufficient to meet increasing costs.

The average yield per acre differs widely under irrigated and rainfed conditions. Thus, the average yield per acre in irrigated conditions (Hambantota district) was 71 bushels compared to 49 bushels in rainfed conditions (Gampaha district). The net income from paddy cultivation is negative in both districts reflecting a substantial gap between cost and returns in paddy cultivation.

Farmers in Hambantota produce a higher marketable surplus (40 percent) than farmers in the Gampaha district (23 percent). About 30 percent of total output in both districts was used for various payments like landlord's share, loan repayments, and payments for share cropping. Consequently the marketable surplus is insufficient even to meet the cost incurred in the paddy farming operation.

The selling price of paddy shows a wide variation between the two districts. The price per bushel varies from Rs. 60-105 in Hambantota and Rs. 80-103 in Gampaha. In some instances, the open market prices were lower than the GPS due to tenancy and various links between traders and paddy growers. Therefore, many farmers in Hambantota did not get the benefit of price variations due to indebtedness and tenancy conditions.

Under these circumstances, it is surprising that the majority of farmers are still engaged in paddy farming as their main occupation. Farmers are not very much concerned with the opportunity cost of family labour as paddy cultivation is done mainly for home consumption.

8.6 Recommendations

From the study, three factors emerged as major constraints with regard to paddy cultivation in Sri Lanka. They are high production costs, low yields, and low marketable surpluses. Though the effect of these factors would vary according to farming systems (commercial, semi-commercial and subsistence) and the area cultivated, they are nevertheless common to both irrigated and rainfed farming areas.

High production costs are not the result of a single factor but the outcome of a number of reasons closely related to each other. Heavy reliance on capital intensive inputs, labour and draught power shortage at the peak period and inflational effects were significant factors in this regard. Therefore, any remedial measures designed to reduce the cost of production should deal with all these matters. An integrated farming system is strongly recommended as a strategy for reducing production costs because the integration of two or more enterprises (i.e. crops and livestock) would be helpful to reduce costs and to make better use of scarce resources (Shanner, Philipp, Schmehi 1981). For instance, available family labour could be used more efficiently and more economically under an integrated farming system. In this way agriculture could be considered a coordinated and integrated activity.

As a consequence of agricultural innovations some traditional management practices like hand weeding, use of organic fertilizer and traditional pest controlling methods have been neglected while the use of agro-chemicals has increased. The study revealed that the cost incurred on agro-chemicals is relatively high in Hambantota as compared to Gampaha. This reflects cost differences in different farming systems i.e. commercial and semi-commercial conditions. Therefore, the study recommends that more experiments should be made to re-examine the use of organic fertilizer and traditional management practices with a view to reducing production costs.

The study found that the cost of animal draught power is considerably less than that of tractors (Table 4). Therefore, the cost could be reduced by using more animal draught power (Farrington, Abeyratne, Gill 1981).

Fertilizer costs could be reduced by encouraging farmers to use organic fertilizer such as compost, cowdung and straw. In fact, fertilizer supplemented straw application have given better results because of their high level of organic matter and is less expensive (Derrick Schokman 1987). Likewise, institutional changes should be made to ensure that fertilizer is readily available and at a fair price.

Farmers should be encouraged to form themselves into small groups to press for their needs.

The average yields per acre in the two districts were considerably lower than the national yield of the past three years[1]. This was not only due to unfavourable weather conditions or different cultural practices, but also due to low cropping intensity and the failure to adopt improved management practices. Therefore, attention should be paid to increase cropping intensity and expand the extent of cultivated land. This could be done by giving due consideration to better water management practices as well as adopting improved management practices in rainfed areas.

It was revealed that the marketable surplus product in both districts has declined significantly due to various reasons such as indebtedness, tenurial practices, share-cropping and general poverty. A fundamental change in the situation would be necessary to supply better farm support services to the rural farmer. In this context, priority should be given to identify target groups of the farming community. Secondly arrangements should be made to solve credit and marketing problems through a group farming approach. Such an organizational system would be helpful to bear the entire risk in repayment of loans given by lending institutions although the farmer is liable to face losses due to circumstances beyond his control.

It is essential that paddy cultivation be considered an industry. The concept of growing paddy for home consumption only should be changed by motivating farmers to consider farming as a business - agri business.

1 Cost of production surveys, Department of Agriculture

Figure 8.1 : The Agrarian Situation in the Districts of Hambantota and Gampaha with Special Reference to the Economics of Paddy Production

No.	The Problem	Causes of the Problem	Recommendations
1.	High Production Cost	High labour charges : Largely because of four major factors; migration, under-utilization of family labour, other employment opportunities and inflation. Higher reliance on capital intensive inputs : This is due to i. Scarcity of animal draught power at peak periods. ii. Devaluing of traditional cultural practices.	i. The introduction of integrated farming systems and strengthening of farmer organizations. ii. The greater use of appropriate technology and encouraging farmers and others to re-examine traditional management practices. iii. Promoting the use of organic fertilizer.
2.	Low Yields	Low cropping intensity, inadequate fertilizer application, lack of improved management practices and no proper arrangements to benefit from farm support services.	i. Increase the extent cultivated. ii. Encourage farmers to adopt improved management practices like transplanting.
3.	Low marketable surplus and various payments	The result of tenancy conditions, sharecropping, indebtedness and rural poverty.	iii. Commercialization of paddy cultivation. i. Institutional changes in respect of farm credit, group marketing and group farming.

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LAND SUITABILITY CLASSES AND SUBCLASSES

Lands are broadly classified into five categories for each Land Utilization Type, according to the degree of suitability. The classes are S1 (highly suitable), S2 (moderately suitable), S3 (marginally suitable), N1 (currently not suitable) and N2 (permanently not suitable). Land suitability subclasses are identified in terms of the dominent kinds of limitations that reduce the productivity of the land for a given purpose. Class S1 lands have no significant limitations and therefore have no subclasses. S2, S3 and N1 lands have subclasses where the factors that limit the quality of the land are identified. Therefore on the basis of land suitability S1 lands are considered high potential while S2 and S3 are considered medium and low potential lands respectively. The study sample is based on samples as indicated below.

Appendix 1.1 : Distribution of Sample

District	No. of farmers selected according to potentiality				
	Low	Medium	High	Total	%
Hambantota	(Beliatta) 64	(Lunawa) 64	(Yodakandiya) 64	192	60
Gampaha	(Katana) 42	(Badalgama) 42	(Meerigama) 42	126	40
Total	106	106	106	318	100

COSTING PROCEDURE

For the costing of various items, the following were taken into account.

1. Labour

(a) Family – Family labour was costed using the same wage rates paid to hired workers. However, the value of the food consumed by family labour was not taken into account on the assumption that the family members would have to be maintained in any case.

(b) Hired – The prevailing rates were paid for hired labour. The cost of food and drinks supplied to labourers was added by agreement.

(c) Contract – In the case of the contract system, payments were made on the basis of the entire job or for work completed over a period of time. Thus, ploughing/harrowing and harvesting charges were determined on the basis of tractor and labour charges.

(d) Attan – In the case of attan (exchange) labour, the prevailing labour rates in the respective areas were used in estimating costs. In this instance too, the value of food supplied to labourers was estimated and added to the costs.

2. Buffaloes

In the case of buffaloes hired, the actual payment made for hiring of buffaloes was used in computing the costs. Where farmers' used their own buffaloes, the local rate for hiring buffaloes was used in costing.

3. Tractors

In instances where tractors were hired, the actual payments made were used as costs. When farmers used their own tractors, the local hiring charges were taken as costs.

4. Materials

In regard to the use of materials such as seed paddy, fertilizer, chemicals and gunny bags, etc., the purchase price was used irrespective of whether they were provided by the farmer or the land owner.

5. Land Rent

In the case of tenant farmers, land rent was included as an item of cost depending on the pattern of share-cropping prevailing in the respective areas. Similarly where acreage taxes were paid, such expenditure was included as other costs. Likewise the rented value of the lands was determined on the basis of current leasing charges of the area.

6. Payments in Kind

When payments were made in kind to labourers, tractor owners, land owners, etc., cost was calculated on the basis of the guaranteed price of paddy at Rs. 70/= per bushel.

7. Other Costs

Water taxes, acreage taxes and crop insurance were included as other costs.

EXPLANATORY NOTE ON THE DETAILS OF CULTIVATION OPERATIONS

The field operations were classified into the following thirteen categories :

Land Preparation
Ploughing and Harrowing
Puddling and Levelling
Plastering of Bunds
Broadcasting
Transplanting
Fertilizer Application
Weedicide Application
Crop Protection
Harvesting
Threshing
Processing

The details of operations of each category are given below :

1. **Land Preparation**

   Land preparation work includes clearing channels, water ways, and bunds, application of organic manure, field preparation and clearing of lands.

2. **Ploughing and Harrowing**

   All the ploughing work (first, second and third) and harrowing came under this category. These two operations are generally practiced together by using tractors or animals.

3. **Puddling and Levelling**

   Puddle and level the paddy land.

4. **Plastering Bunds**

   Constructing, repairing and plastering bunds.

5. **Broadcast Method of Sowing**

   Broadcasting and filling vacancies.

6. **Transplanting**

   Nursery preparation and transplanting

7. **Fertilizer Application**

   Basal application, 1st top dressing and 2nd top dressing.

8. **Weedicide Application**

   Hand-weeding, rotary weeding and spraying of weedicides.

9. Insecticide Application

Traditional pest control methods and spraying of insecticides.

10. Crop Protection

All the crop care activities were included with special reference to bird scaring.

11. Harvesting

Reaping, spreading, bundling of sheaves, transport of sheaves, and stacking near threshing floors, etc.

12. Threshing

Threshing includes the following operations :
Cleaning and repairing of threshing floors, breaking of paddy stacks, spreading of sheaves, threshing, winnowing etc.

13. Processing

The following operations have been included under the item, i.e. drying, bagging and transporting from threshing floor to homestead or traders.

Appendix 3.1 : Attitudes of Tenants

Attitudes	Hambantota		Gampaha	
	No.	%	No.	%
Tenancy was a hinderance to access farm supporting services	06	6.2	05	10.6
Tenancy was not a hinderance to access farm supporting services	91	93.8	42	89.4
Total	97	100.0	47	100.0

Appendix 4.1 : Distribution of Farmers Owning Tractors and Buffaloes

District	Number of farmers owning		
	Tractors		Buffaloes
	2W	4W	
Hambantota	01	27	08
Gampaha	07	11	27

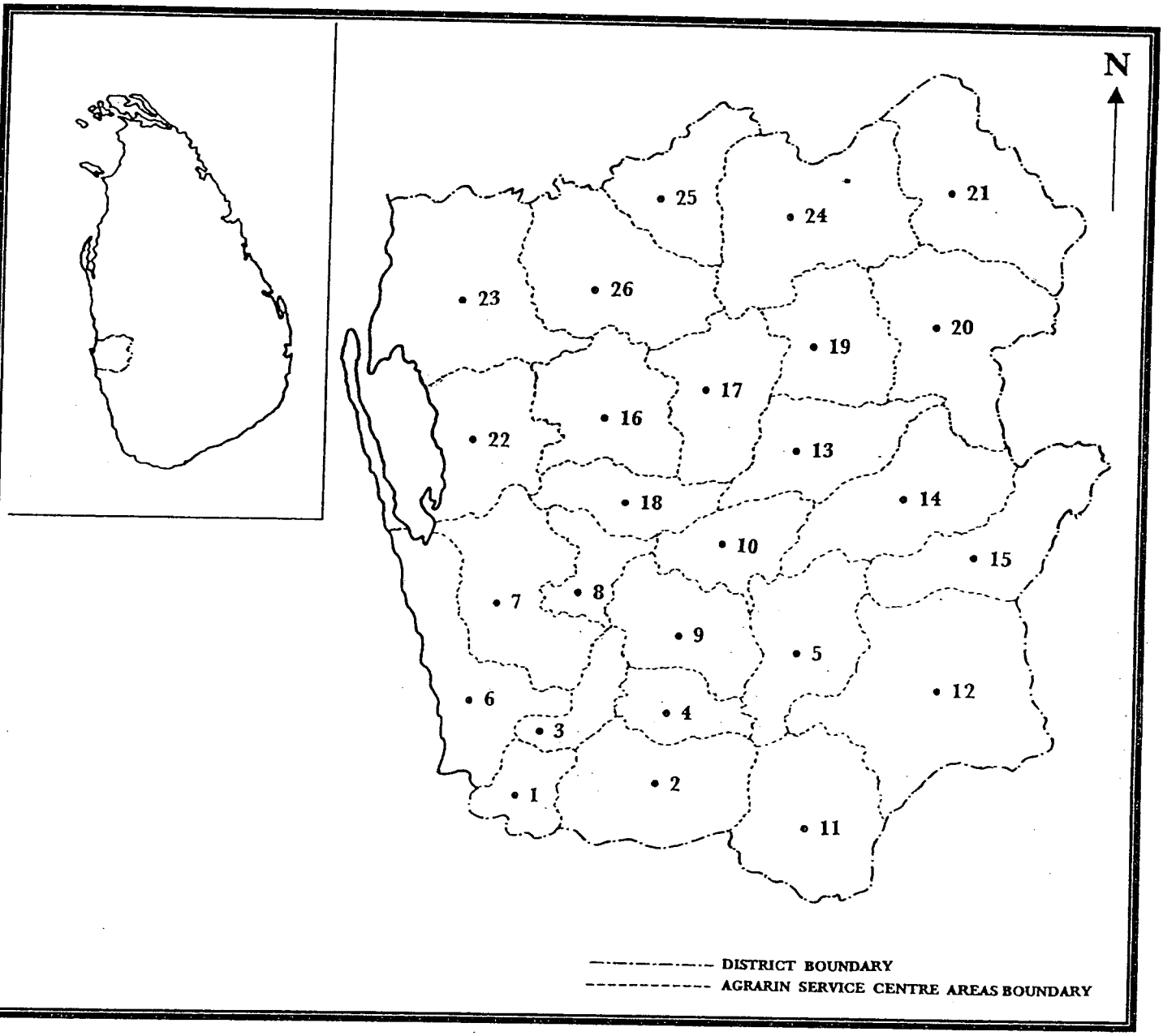
Appendix 4.2 : Frequency of Fertilizer Application

District	Frequency of application and the number of farmers					
	None	Once	Twice	Thrice	Four	Five
Hambantota (N=192)	1	1	8	83	91	8
Gampaha (N=126)	-	6	31	85	4	

Appendix 4.3 : Distribution of Weedicides and Pesticides Costs According to Size of Holdings

Size of holding	Weedicide		Pesticide	
	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)	Hambantota (Rs/Ac)	Gampaha (Rs/Ac)
0.01 – 0.50	194.85	105.26	294.11	140.70
0.51 – 1.00	259.45	89.04	188.05	83.44
1.01 – 2.00	310.74	316.49	155.26	90.29
2.01 – 4.00	382.84	152.32	115.95	47.03
4.01 – 8.00	475.24	-	177.76	-
Overall	375.00	100.00	168.00	84.00

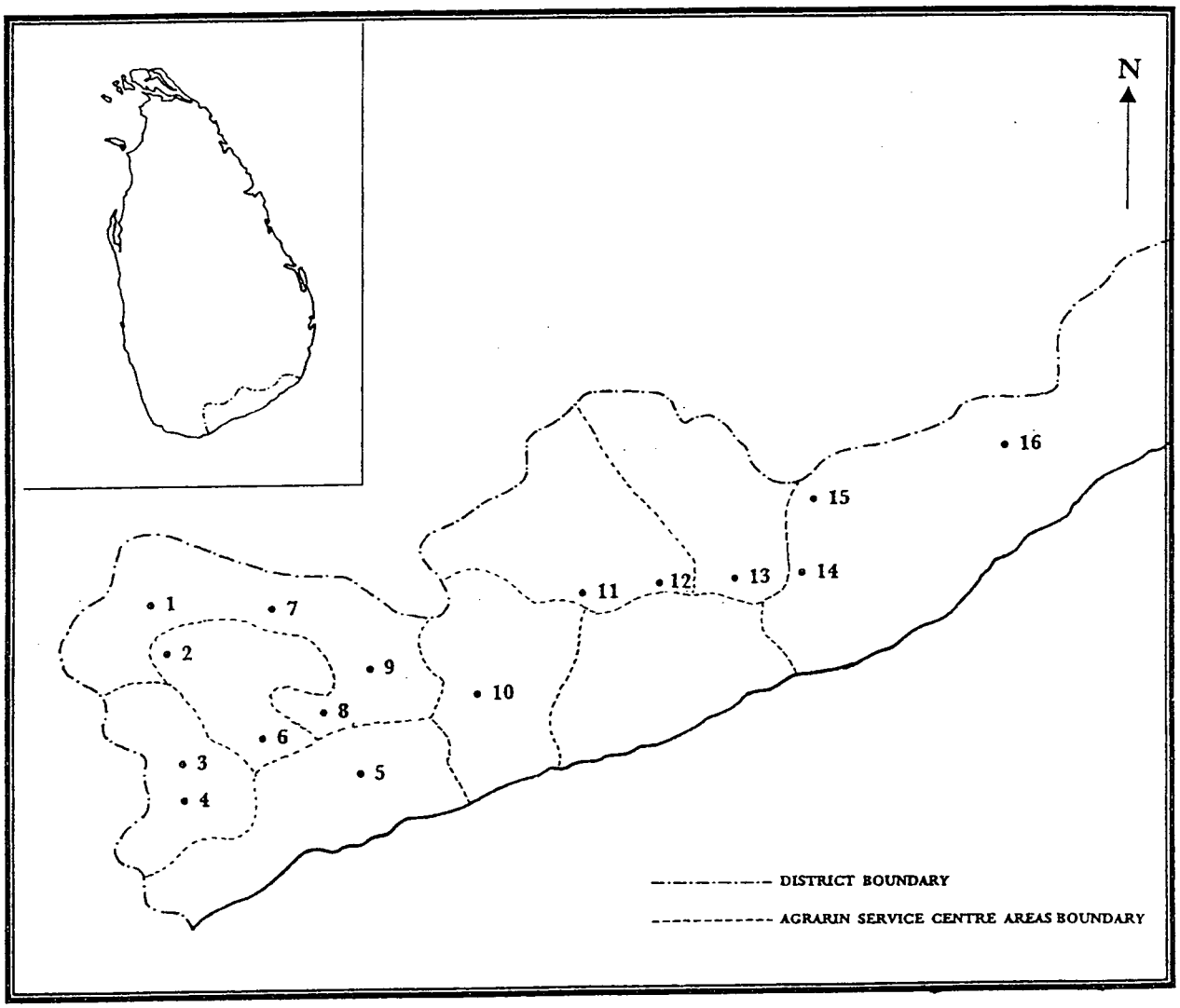
GOVIJANA KENDRAYA (AGRARIAN SERVICE CENTRE) AREAS
GAMPAHA DISTRICT



1. KELANIYA
2. BIYAGAMA
3. SOORIYAPALUWA
4. UDUPILA
5. MALWATHUHIRIPITIYA
6. PAMUNUGAMA
7. JA-ELA
8. GALAHITIYAWA
9. HENARATHGODA
10. YAKKALA
11. DEKATANA
12. WEKE
13. BEMMULLA
14. NITTAMBUWA
15. URAPOLA
16. MINUANGODA
17. MABODALA
18. UDUGAMPOLA
19. PASYALA
20. PALLEWELA
21. MIRIGAMA
22. ANDIAMBALAMA
23. KATANA
24. WALPITA
25. BADALGAMA
26. MARANDAGAHAMULA

Map : 2

GOVIJANA KENDRAYA (AGRARIAN SERVICE CENTRE) AREAS
HAMBANTOTA DISTRICT



1. KATUVANA
2. WALASMULLA
3. OKEWELA
4. BELIATTA
5. NETOLPITIYA
6. WEERAKETIYA
7. MEEGASARA
8. UDAYALA
9. AGUNAKOLAPALASSA
10. LUNAMA
11. AMBALANTOTA
12. MEEGAHACHADURA
13. BANDAGIRIYA
14. WEERAVILLA
15. BERALIHELA
16. YODAKANDIYA