PRODUCTION AND MARKETING OF OTHER FIELD CROPS IN THE KIRINDI OYA PROJECT AREA

HARTI

RESEARCH STUDY NO. 91
MARCH 1995

PRODUCTION AND MARKETING OF OTHER FIELD CROPS IN THE KIRINDI OYA PROJECT AREA

L.P. Rupasena
W. A. Jayaratne

Research Study No. 91

March, 1995

Hector Kobbekaduwa
Agrarian Research and Training Institute
P.O. Box 1522,
114, Wijerama Mawatha
Colombo 7
Sri Lanka.

ISBN 955 - 612 - 009 - 2

FOREWORD

Cultivation of Other Field Crops - OFCs on paddy fields under major irrigation during the Yala season has been given higher priority since 1980s, in order to save scarce water resources and to increase farm income through commercialized farming. Growing paddy does not give higher returns to the farmers and thus farmers were encouraged to grow Other Field Crops during the Yala season. This has been vitally important for the Kirindi Oya Irrigation and Settlement Project (KOISP) because of the low water availability in the reservoir.

Diversification of paddy lands however has not been successful as expected not only in KOISP but in the other irrigation projects as well. Farmers take decisions on which crop or crops to be grown on their lands. Therefore identification of the problems and constraints for the development of OFC cultivation should commence from the farm level.

This study concludes that there are possibilities to develop the OFC s cultivation in the KOISP and a comprehensive production programme oriented towards the market is suggested in this study. The report provides guidelines on how to prepare such a programme. I am hopeful that this study will become a useful reference work for policy makers in the preparation of production programmes for OFCs not only in KOISP, but also in other areas in the country.

This study was coordinated by Mr. L.P. Rupasena, Head of the Marketing and Food Policy Division. Mr. W.A. Jayaratne has written the Chapter Four of the report.

I wish to thank the Asian Development Bank and the Ministry of Irrigation for sponsoring this study.

Dr. S.G. Samarasinghe
Director/HARTI.

ACKNOWLEDGEMENT

We wish to place on record our deep appreciation to all those who were instrumental in completing this study.

Mr. D.G.P. Seneviratne, former Director, HARTI gave his whole hearted support to the study and on many occasions provided us with necessary guidance and encouragement.

Helpful comments of Dr. E. Suraweera, Additional Deputy Director, Department of Agriculture on the first draft are also gratefully acknowledged. Mr. Ananda Wanasinghe, former Marketing Consultant to the KOISP, also made valuable suggestions for the survey.

A number of other officials in the KOISP also helped us in numerous ways in organising field data collection. Among them, Mr Liyanage, Project Manager and his staff deserve special mention in this regard.

Mr. Malinda Seneviratne edited the survey report. Mr. M.L. Nandasiri, Mr. R.L.N. Jayatissa, Mr. H.P.K.K. Udayasiri, Mr. K. Mahanama and Mr. B.W. Jayaratne were the support staff for data collection and statistical analysis.

Finally we thank Mrs. Anula Pathirana who typed the first and the final draft of the report neatly and efficiently.

L.P. Rupasena
W.A. Jayaratne

CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

Introduction

The Agrarian Research and Training Institute (ARTI)* was commissioned by the Asian Development Bank to undertake a study on the "Production and Marketing of Other Field Crops (OFCs) in the Kirindi Oya Irrigation and Settlement Project (KOISP) Area." Although a series of studies have been conducted, adequate attention has not been given to production and marketing, which are paramount in achieving project objectives. The rationale in initiating this study was to identify the problems and constraints associated with the production and marketing of OFCs, in order to implement productive remedies. In this sense, the study could be considered to be 'Situation Analysis'.

1.1 The Project

The KOISP, inaugurated in 1979, is a major development scheme in the South-East quadrant of Sri Lanka. The project is sited at Lunugamvehera in the Hambantota district, which is 260 kms away from Colombo. The physicial area of the project covers 12,900 ha of land and the entire area is divided into two parts;

1. The Old Developed Area (ODA) which consists of 4300 ha of land irrigated from five ancient tanks; Tissa, Yodawewa, Weerawila, Debarawewa and Badagiriya.

2. The New Developed Area (NDA) which amounts to the balance 8600 ha of new land (Figure 1).

The project was implemented in two stages. Phase one included the

* Name of the Institute was changed as Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) from February 1995.

construction of the reservoir and canal system, settlement of 4300 farm families in the NDA and improvement of the ODA. These activities have since been completed. Phase two, which includes the development of the rest of the area and settlement of farm families, commenced in 1987. Some 800 families have already been settled and nearly 760 ha of land has been developed for cultivation.

The NDA consists of 12 tracts: 7 are on the right bank covering 5000 ha and the rest are on the left bank covering 3600 ha. Each tract is sub-divided into hamlets.

A tropical monsoonal climate prevails in the area with monthly temperature ranging from 26 C to 28 C. The mean annual rainfall is about 1,000 mm; of which 75 percent is during the Maha season, between September and March.

The soil in the NDA has been broadly classified into three categories;

a. Upland - well drained Reddish Brown Earth (RBE) soil which covers about 40 percent of the area

b. Intermediate - a mixture of RBE soil and Low Humic Gley (LHG) soil which covers about 10 percent of the area.

c. Lowland - Poorly drained LHG soil which covers about 50 percent of the area.

The first two soil categories are very well suited for OFC cultivation during both seasons and the third category is suitable for OFC cultivation during Yala (Action Plan for Cultivation of OFCs in Maha 90/91, September 1990).

1.2 The Problem

Among the large irrigated projects a greater emphasis has been given to the KOISP for the cultivation of OFCs because of low water availability. The cultivation of OFCs in the project area has also been identified as important in terms of enhancing incomes and increasing employment opportunities, which

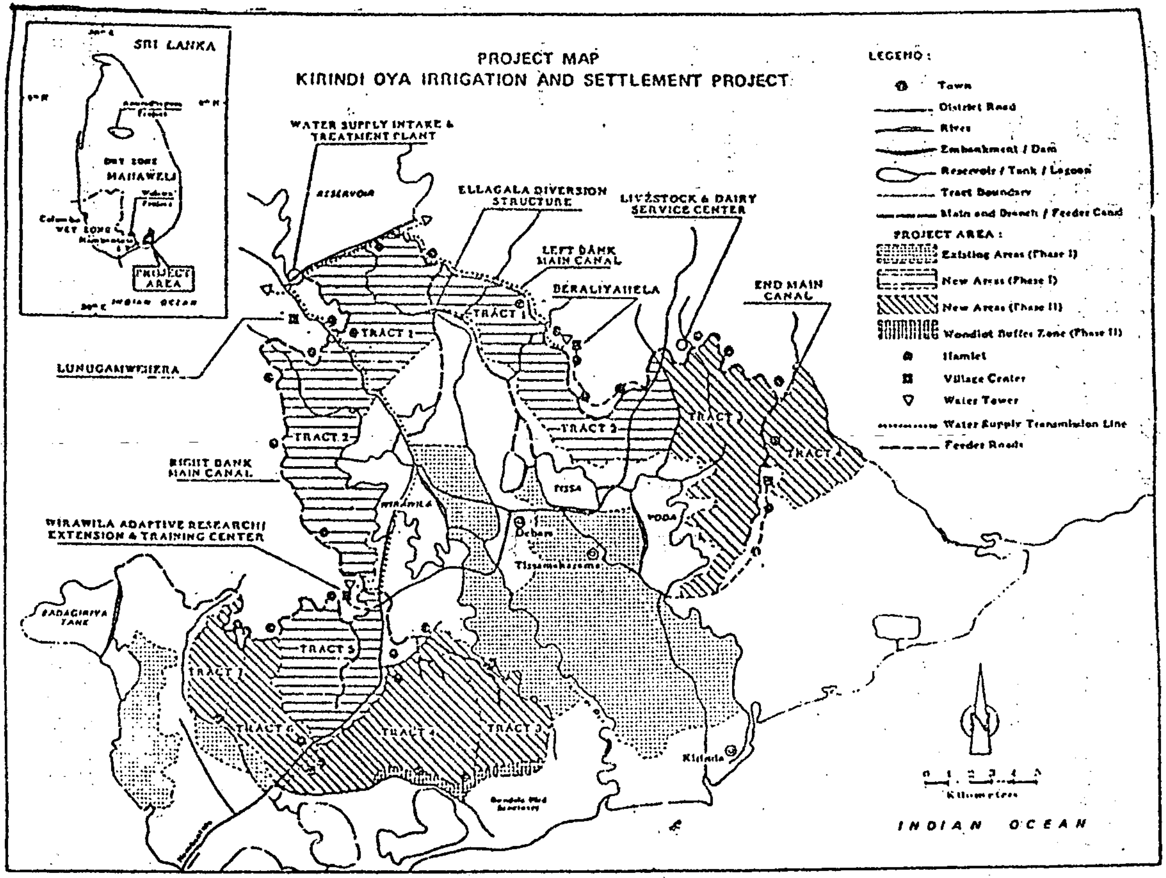

PROJECT MAP
KIRINDI OYA IRRIGATION AND SETTLEMENT PROJECT
SRI LANKA
DRY ZONE
MAHAWELI
WET ZONE
Colombo
PROJECT AREA
INDIAN OCEAN
WATER SUPPLY INTAKE & TREATMENT PLANT
RESERVOIR
ELLAGALA DIVERSION STRUCTURE
LIVESTOCK & DAIRY SERVICE CENTER
LEFT BANK MAIN CANAL
BERALIYAHELA
END MAIN CANAL
LUNUGAMWEHERA
RIGHT BANK MAIN CANAL
WIRAWILA ADAPTIVE RESEARCH EXTENSION & TRAINING CENTER
WIRAWILA
TISSA
YODA
Debara
Tissamaharama
Kirinda
BADAGIRIYA TANK
TRACT 1
TRACT 2
TRACT 3
TRACT 4
TRACT 5
TRACT 6
TRACT 7
LEGEND:
Town
District Road
River
Embankment / Dam
Reservoir / Tank / Lagoon
Tract Boundary
Main and Branch / Feeder Canal
PROJECT AREA:
Existing Areas (Phase I)
New Areas (Phase I)
New Areas (Phase II)
Woodlot Buffer Zone (Phase II)
Hamlet
Village Center
Water Tower
Water Supply Transmission Line
Feeder Roads
0 1 2 3 4 5
Kilometres
INDIAN OCEAN

Figure 1

are two principal objectives of the project (ARTI, 1988). Having identified the importance of OFC cultivaiton, attempts have been made to cultivate OFCs in the NDA, especially in the Yala season. Nevertheless, the cultivation of OFCs has not been as successful as expected. Cultivation in 1990 Yala was limited to 232 ha, which is only 12 percent of the targetted extent of 2000 ha. Similarly, in 1991 Yala, the area under OFCs was about 250 ha reflecting 25 percent of the targetted extent of 1000 ha. Therefore a big gap between target and achievement can be observed.

Targets have been estimated taking into account the availability of resources such as water and soil. Therefore, lack of resources cannot be considered a major constraint. If so, it might be due to some weakness in the implementing and monitoring system. In fact the success of any production programme depends entirely on farmers' ability to cultivate efficiently and to market at a reasonable price. In other words production failure indicates either the farmer's inability to cultivate efficiently or a difficulty in selling his produce at reasonable prices or both. This study attempts to answer the question of why OFC cultivation has not been satisfactory in the KOISP.

1.3 Study Objectives

The overall objective of the study is to examine the existing system of production and marketing of OFCs in the project area, with a view to identifying the problems and constraints hindering the development of OFC production. The specific objectives are;

1. to examine the factors affecting the choice of crop
2. to work out the cost of production and profitability;
3. to estimate the marketable surplus;
4. to ascertain the marketing channels at farm level and their impact on producer price;
5. to explore the policy implications of the findings.

1.4 Research Methodology

This study is mainly based on primary data obtained from a sample survey. The target population of the study is the OFC farmers in the NDA of

the KOISP. The sample population consisted of farmers who cultivated OFCs in tract two, five and six in 1991 Yala.

1.4.1 Study locations

More than 95 percent of OFC farmers in 1991 Yala were in tracts two, five and six and therefore these three tracts were selected for the study (Figure 1). All hamlets in the above three tracts were included in the sample.

1.4.2 Sampling frame and design

The list of OFC farmers who had cultivated in the 1991 Yala season was obtained from the project office and it was used as the sampling frame. This was the only list available and it was prepared by the project officials on information received from field assistants. The frame was stratified according to the crops and the cultivated land extent. Land extent was not taken into account since there was no significant variation in this respect. The final selection was done cropwise, randomly.

1.4.3 Sample Size

The number of farmers who grew OFCs in 1991 Yala in tract two, five and six was 566, of which, 155 farmers were selected. This represents 27 percent of the total. Selection was based on crops grown by farmers. All OFC farmers were divided into crop categories and 20 percent were taken from each category where the total farmers exceeded 15. When the total was less than 15, all were included in the sample.

1.4.4 Data Collection

Most of the information required for the study was collected from the following four sources:

a. Back ground data was obtained from official records maintained by the project office and a further set of secondary data, used to support the arguments which appear in the text, was gathered from a number of research studies;

b. a series of unstructured interviews held with officials, farmers and traders in order to obtain a better understanding of the situation;

c. a field survey conducted with the help of a structured questionnaire; and

d. observation techniques applied to examine the trading activities of the Pannegamuwa pola which was the major marketing outlet in the study area.

1.4.5 Accuracy of data

Every attempt was made to ensure high accuracy of data. Before selecting a sample, the population was studied in depth with a view to identifying major characteristics associated with the study objectives. Having identified the characteristics, a more representative sample was obtained. Also, the sample was a large one. This procedure helped in reducing sampling errors.

Whatever non sampling errors found in the study, can be attributed to interviewer bias and response errors. The research team consisted of two researchers and five research assistants. The entire team was in the field during the data collection period. The research assistants were well trained in the office and the field with special emphasis on how to secure the co-operation of respondents and on how questions should be formulated and put to them. These steps have helped in minimizing non-sampling errors. However, factors such as recall lapses might have affected the responses on such items like quantity sold and crop production. Even this type of error was minimized by the fact that the field survey was carried out soon after the harvest. The data was gathered in December 1991.

1.5 Organization of the study

This study is presented in five chapters. Chapter One is the introductory chapter and provides background information on the study area, the research problem, objectives of the study and research methodology. Demographic and socio-economic characteristics of the OFC farmers which influence decisions on production and marketing are discussed in Chapter Two. Chapter Three deals with the analysis of cultivation and production practices which prevailed in the study area. In Chapter Four, the marketing of OFCs is discussed. The final chapter gives the conclusions of the study, along with recommendations.

CHAPTER TWO

DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS

Demographic and socio-economic factors influence decisions on production and marketing. For example, the use of family labour, as well as marketable surplus, is determined partly by the family size and age distribution. The level of education is also highly corelated with production practices. Hence, this chapter deals with an analysis of the present demographic and socio-economic characteristics of OFC farmers, based on the information gathered from a sample of 155 farm families who cultivated OFCs in 1991 Yala. The discussion focus mainly on the following aspects:

1. Previous status of the farmers,
2. Composition of farm households (age structure, literacy and educational attainments), and
3. Labour force and employment

2.1 Previous Status of the Farmers

All the settlers are from either the Hambantota District or the adjoining districts. Some 61 percent of the sample farmers are from outside the Hambantota district (Table 2.1), the majority being from Matara.

Some 50 percent of the farmers mentioned that landlessness was the major reason for applying for land in the project area, while 20 percent were primarily motivated by the idea of cultivating paddy (Table 2.2).

Table 2.1
Origin of the Farmers

Origin	No. of Farmers	%
Within the project area	25	16.12
Near the project area	5	3.23
Within the district	31	20.00
Out of the district	94	60.65
Total	155	100.00

Source : ARTI Survey Data

Table 2.2
Reasons for Applying for New Lands

Reason	No.	%
Landlessness	73	47.10
Inadequacy of existing land	7	4.51
Desire to cultivate	26	16.77
Proximity to residence	1	0.65
Need for paddy land	31	20.00
Other	17	10.97
Total	155	100.00

Source : ARTI Survey data

Paddy is needed not only for consumption, but for the consumption of the relatives of farmers as well. Farmers in the Kirindi Oya project area have had to visit their original villages frequently to get essential commodities like coconut and, due to severe financial problems, to borrow money. As a result, the settlers have close connections with their relatives, especially parents and feel obliged to give paddy/rice to them. This seems to be a major constraint for crop diversification.

Table 2.3
Response on Previous Occupation

Response	No. of farmers	%
Yes	144	92.90
No	11	7.10
Total	155	100.00

Source : ARTI Survey data

Before the inauguration of the project, more than 90 percent of the study population had some kind of occupation (Table 2.3).

Nevertheless, only 23 percent had experience in OFC cultivation (Table 2.4) and even they were not knowledgeable on OFC cultivation under irrigation. As such, this situation underlines the importance of agricultural extension for successful OFC cultivation.

2.2 Demographic Characteristics

The total population in the sample is 766 persons, comprising of 373 males and 393 females, and a total of 155 farm families (Table 2.5). The average size of a household is 4.94, a little lower than the national average of 5.2. It was observed that the majority of the parents were young with small kids. Thus the availability of family labour seems to be an accute problem in farming.

Some 37 percent of the total population were under 14 years of age and only 2 percent belong to the age category of 65 years and over. Accordingly the work force is 61 percent of the population, the majority being between 15 and 44 years old.

Table 2.4
Nature of Occupation Before Arrival to the Project Area

Activity	No	%
Paddy cultivation	62	32.63
OFC cultivation	43	22.63
Agricultural Labour	9	4.74
Non Agricultural Labour	13	6.84
Self employment	32	16.84
Government employment	16	8.42
Private sector employment	12	6.32
Others	3	1.58
Total	190*	100.00

* Total exceeds sample size due to multiple responses
Source : ARTI Survey Data

Table 2.5
Age and Sex Distribution of the Sample Population

	Male		Female		Total	
Age group	No	%	No	%	No	%
0 - 14	150	40.21	131	33.33	281	36.68
15 - 24	60	16.09	73	18.58	133	17.36
25 - 34	70	18.77	60	15.27	130	16.97
35 - 44	59	15.82	86	21.88	145	18.93
45 - 54	11	2.95	25	6.36	36	4.70
55 - 64	12	3.22	11	2.80	23	3.01
65 and over	11	2.95	7	1.78	18	2.35
Total	373	100.00	393	100.0	766	100.0

Source : ARTI Survey Data

2.3 Literacy and Education

Educational attainment of the OFC families seems to be satisfactory (Table 2.6). The literacy rate of the study population was 98 percent, which is very high compared to the national literacy rate of 86.5 percent. Some 77 percent of the population have had primary and secondary education- upto G.C.E. (O/L), while 13 percent have passed the G.C.E. (O/L). Against this background, it is clear that scienctific farming can be developed with positive results.

Table 2.6
Educational Status of the Sample Population
(by sex - 5 years and over)

Level of education	Male		Female		Total	
	No	%	No	%	No	%
No schooling but can read	1	0.28	0	0.00	1	0.15
No schooling and cannot read	5	1.42	7	2.19	12	1.79
Primary grades (0-5)	112	31.82	103	32.29	215	32.04
Grade 6 to GCE(O/L)	161	45.74	143	44.83	304	45.31
Passed GCE (O/L)	45	12.78	39	12.23	84	12.52
Passed GCE (A/L)	19	5.40	11	3.45	30	4.47
Undergraduate	2	0.57	2	0.63	4	0.60
Graduate	3	0.85	4	1.25	7	1.04
Others	4	1.14	10	3.13	14	2.09
Total	352	100.00	319	100.00	671	100.00

Source : ARTI Survey data

2.4 Employment

The total work force in the sample is 467, reflecting 61 percent of the population. The number of employed amounted to 349 or 75 percent of the

work force. Table 2.7 presents the occupational pattern of the working group. As expected the majority of the employed population (93%) worked as agricultural operators and this is considered a major occupation. Out of 349, only 92 respondents reported having a secondary job. Among them, 40 percent worked as agricultural labourers.

Table 2.7
Occupation Pattern of Sample Population

Occupation	Main		Secondary	
	No	%	No	%
Agriculture operators	323.00	92.55	24.00	26.09
Agricultural labour	1.00	0.29	37.00	40.22
Non agricultural labour	3.00	0.86	2.00	2.17
Self employment	4.00	1.15	25.00	27.17
Government employment	8.00	2.29	1.00	1.09
Private sector employment	7.00	2.01	1.00	1.09
Others	3.00	0.80	2.00	2.17
Total	349.00	100.00	92.00	100.00

Source: ARTI Survey Data

CHAPTER THREE

PRODUCTION OF OTHER FIELD CROPS

In the 1991 **Yala** season, the principal crops grown in the new irrigated area of the project were chilli, red onion, ground nut, cowpea, green gram and big onion. This chapter examines the major production characteristics of these crops.

3.1 Farm Size

The average size of farms specializing in OFCs during the 1991 **Yala** was small because most of the farmers had cultivated more than one crop on their plot. The average farm size varied from 0.23 acre for big onion to 1.27 acres for green gram (Table 3.1). The farm size associated with onion was relatively low, because this crop was new to the area.

Table 3.1
Farm size

Crop	No. of farmers	Extent (Ac)	Average farm size (Ac)
Chilli	108	77.96	0.72
Ground nut	37	29.50	0.80
Big onion	13	3.04	0.23
Red onion	56	14.68	0.26
Green gram	14	17.83	1.27
Cowpea	20	13.49	0.67

Source : ARTI Survey Data

Table 3.2 shows the distribution of the sample farmers by land size. It further reveals that the majority of farmers have cultivated less than one acre for

a crop except for green gram. Ten farmers out of 14 who cultivated green gram, had a farm size of more than one acre. Green gram is generally associated with a large farm size because cultivation is easier. Sowing is the planting technique adopted by almost all the farmers throughout the country.

Table 3.2
No. of Farmers by Land Size

Land size(ac)	Chillie	Ground nut	Big onion	Red onion	Green gram	Cowpea
< 0.25	5	5	10	27	-	-
0.26 - 0.50	19	7	1	23	3	8
0.51 - 0.75	37	10	2	6	1	5
0.76 - 1.00	8	1	-	-	-	-
1 >	39	14	-	-	10	7
Total	108	37	13	56	14	20

Source : ARTI Survey data

3.2 Crop Selection

Project officials decide the total extent to be cultivated under OFCs and the specific areas to grow based on the water availability in the reservoir. Accordingly tract two, five and six were identified for OFC cultivation in Yala 1991. Farmers in the project area had the freedom to select the crop. Table 3.3 shows the distribution of sample farmers with the reason given for the selection of the particular crop. As shown in the table, chilli, red onion and big onion have been chosen mainly due to their high value. The major reason for the cultivation of green gram, ground nut and cowpea was that they were easy to grow. None of the farmers reported 'own consumption' as the principal reason for the selection of crops except in the case of cowpea. It can be argued that farmers' decision on crop selection was mainly determined by market forces, i.e., price. Although red onion is a new crop to the Kirindi Oya area, quite a large number of farmers (56 out of 155 farmers) grew it due to its positive market potential. The number would have increased further if seed onion had been made available in the area itself.

Table 3.3
Crop Selection by Farmers

Reason	Chillie	Ground nut	Big onion	Red onion	Green gram	Cowpe	Total
Higher price	40	3	3	14	2	-	62
Higher profit	50	6	4	21	-	2	83
Easy to cultivate	-	19	-	5	7	10	41
Non availability of other seeds	-	-	-	-	2	1	03
Model cultivation	8	-	-	-	-	-	08
Trial	-	2	5	8	1	3	19
Experience	4	4	-	2	2	1	13
Own consumption	-	-	-	-	-	3	03
Advice by officers	5	2	1	3	-	-	11
Suitability of soil	1	1	-	3	-	-	05
Total	108	37	13	56	14	20	248

Source : ARTI Survey Data

3.3 Crop Establishment

The extension staff educates farmers on crop planting. The recommended time period for OFC cultivation in the project area is between April and May (Table 3.4). Nevertheless actual planting of OFCs depends on the time water is issued by the project officials.

The majority of farmers had cultivated chilli, ground nut, big onion and red onion in June and July 1991, while the cultivation of green gram and cowpea commenced in June (Table 3.5). This indicates that OFC cultivation did not take place on time due to delays in water issue.

Table 3.4
Recommended time of Planting by the Dept. of Agriculture, Under irrigation

Crop	Time period
Chillie (MI2)	April - May
Ground nut	Mid April - Early May
Big onion	April - May
Red onion	April - May
Green gram	April - Early May
Cowpea	April - May

Source : Office of the Agriculture Officer, Weerawila

Table 3.5
Time of Actual Planting with Number of Farmers

Crop	Chillie	Ground nut	Big onion	Red onion	Green gram	Cowpea
April	12	-	-	-	-	1
May	19	6	3	4	-	1
June	46	19	7	27	11	10
July	26	9	3	20	2	6
August	4	2	-	4	1	2
September	1	1	-	1	-	-
Total	108	37	13	56	14	20

Source : ARTI Survey data

The transplanting method was used in the cultivation of chilli and big onion, while raw seeding was practiced in the case of ground nut, red onion and cowpea (Table 3.6). Green gram was established by broadcast seeding.

Table 3.6
Method of Planting with Number of Farmers

Method	Chilli	Ground nut	Big onion	Red onion	Green gram	Cowpea
Broadcasting	-	-	-	-	10	-
Transplanting	108	-	12	-	-	-
Row seeding	-	36	1	50	2	18
Others	-	1	-	6	2	2
Total	108	37	13	56	14	20

Source: ARTI Survey Data

The main source for the purchase of seed for chilli and big onion were government agencies: Agrarian Service Centre (ASC) and Agriculture Research Centre (ARC) (Table 3.7). The number of farmers who purchased chilli seed from the ASC was 45 out of 108, while ten farmers purchased from the ARC. The situation was different for other crops. Private dealers were the leading source of seed except for cowpea. The majority of cowpea farmers used their own seed.

Generally, the use of own planting material is high in Sri Lanka especially for crops like green gram and ground nut (Hafi and Erickson : 1989). Kularatne (1988) found that nearly 70 percent of green gram farmers in Kurunegala and Puttalam, where green gram is mainly grown, used their own seed. However, using own seed except for cowpea is not a common practice in the KOISP because of irregular cultivation practices. It was the first time that such a large number (some 86 percent of the sample farmers) had cultivated OFCs since they had been settled.

Table 3.7
Seed Supply with Number of Farmers

Source	Chillie	Ground nut	Big onion	Red onion	Green gram	Cowpea	Total
Own	7	8	-	1	5	10	31
Purchased from traders	43	19	1	53	7	5	128
Purchased from ASC	45	2	11	2	2	2	64
Purchased from farmers	3	8	-	-	-	3	14
Purchased from ARC	10	-	1	-	-	-	11
Total	108	37	13	56	14	20	248

Source : ARTI Survey data

The survey farmers did not complain about the quality of the seed, except in the case of big onion. The inferior quality of big onion seed was a national problem in 1991. In addition farmers complained of the scarcity of red onion seed.

3.3.1 Fertilizer Use

More than 90 percent of the farmers had applied fertilizer for chilli and big onion, while nearly 80 percent had used fertilizer for red onion (Table 3.8). However, the number of farmers who had applied fertilizer for ground nut and cowpea was very small. None of the farmers had used fertilizer for green gram cultivation. This is a common practice. Fertilizer application is higher for market oriented crops compared to other crops.

None of the sample farmers used organic fertilizer. There has been no tradition of applying organic fertilizer in OFC cultivation.

Table 3.8
Fertilizer Use

Crops	No. of farmers	Total of farmers	Percentage
Chilli	104	108	96.30
Ground nut	6	37	16.22
Big onion	12	13	92.31
Red onion	44	56	78.57
Green gram	0	14	0.00
Cowpea	2	20	10.00

Source : ARTI Survey data

3.3.2 Use of Agrochemicals

The level of agrochemicals used varied with the crop (Table 3.9). All those who cultivated big onion and green gram applied agrochemicals. The percentage of farmers using agrochemicals for all other crops exceeded 80 percent, except in the case of ground nut. This high level of agrochemical usage was due to diseases. Farmers have reported that all the crops were affected by diseases due to late planting. From the farmers' point of view, the proper time of planting was during the months of April and May, a view which coincided with the recommendations.

3.3.3 Agricultural credit

The number of farmers who obtained agricultural loans is indicated in Table 3.10. The highest percentage (83%) was reported for chillie, while the lowest (41%) was for ground nut. One can argue that the number of borrowers should be higher than the observed figure because Kirindi Oya farmers are relatively poor. The reason why farmers were reluctant to borrow money can be attributed to the risk factor in production, particularly the possibility of animal damage.

Table 3.9
Use of Agrochemicals

Crops	No. of farmers	Total of farmers	Percentage
Chilli	105	108	97.22
Ground nut	10	37	27.03
Big onion	13	13	100.00
Red onion	45	56	80.00
Green gram	14	14	100.00
Cowpea	17	20	85.00

Source : ARTI Survey data

Table 3.10
Agricultural Credit

Crops	No. of farmers	Total of farmers	Percentage
Chilli	90	108	83.33
Ground nut	15	37	40.54
Big onion	7	13	53.85
Red onion	38	56	67.86
Green gram	8	14	57.14
Cowpea	9	20	45.00

Source : ARTI Survey data

Farmers have borrowed money mainly from banks, friends/ relatives and money lenders (Table 3.11). Traders do not play an important role in lending as is common in many other areas of the country. The reason was the rather distant relationship between the parties, i.e. the farmers and traders, resulting in the absence of continued cultivation.

Table 3.11
Source of Credit with Number of Farmers

Source	Chilli	Ground nut	Big onion	Red onion	Green gram	Cowpea	Total
Commercial banks	50	6	4	20	2	1	83
Money lenders	9	3	-	3	3	6	24
Friends/Relatives	27	5	2	11	3	2	50
Traders	2	1	-	1	-	-	3
Others	2	-	1	3	-	-	06
Total	90	15	7	38	8	9	166

Source : ARTI Survey data

The repayment situation was found to be very poor. The rate of repayment was less than 50 percent for all the crops except for green gram, where it was exactly 50 percent (Table 3.12). A majority of the farmers have reported that they could not settle loans due to crop failure. There were farmers who repaid their loans by earning money through hired labour because of the belief that no credit would be provided by banks for subsequent cultivation if repayments are not made.

Table 3.12
Loan Settlement

Crops	No. of farmers	Total No of borrowers	Percentage
Chilli	38	90	42.22
Ground nut	2	15	13.38
Big onion	2	7	28.57
Red onion	13	38	34.21
Green gram	4	8	50.00
Cowpea	4	9	44.44

Source : ARTI Survey data

3.3.4 Labour use

The amount of labour required depends on the crop and the technology used in cultivation. Some crops, such as onion and chilli are labour intensive, requiring more labour than crops like green gram, cowpea and ground nut (Table 3.13). The highest labour usage was for red onion, which required 311 person days/acre, followed by big onion with 250 and chilli with 202. Green gram is the crop which used the minimum amount of labour amounting to 53 man days/acre. In this analysis the time spent for crop protection from animals was not taken into account. Almost all the farmers mentioned that they took care of crops throughout the cultivation cycle day and night.

Table 3.13
Labour Use (person days/acre)

Activity	Chilli	Ground nut	Big onion	Red onion	Green gram	Cowpea
Land preparation	39.55	16.46	80.51	61.08	05.95	19.91
Seeding	17.01	11.32	49.58	41.30	02.25	13.90
Fertilizing	22.93	0.43	18.05	22.40	00.00	0.17
Pest control	9.27	0.34	03.95	02.00	01.19	02.12
Weeding	56.80	11.17	51.58	58.30	02.89	13.71
Maintenance	17.83	7.43	28.84	44.49	09.88	21.97
Harvesting	30.86	10.57	12.47	44.15	24.94	17.62
Processing	8.03	5.69	4.66	37.33	06.29	7.08
Total person days	202.28	63.41	249.64	311.05	53.39	96.48
Family person days	143.99	34.68	184.07	229.66	25.36	68.82
% of family labour	71	55	74	74	48	71

Source : ARTI Survey data

More than 70 percent of the labour used in the production of OFCs, except in the case of green gram and ground nut, was supplied by family members. They were able to manage because of the small farm size. In most cases both the husband and wife work on the field, and in some, close relatives from the original village come and work without payment.

The daily wage for hired labour was in the range of Rs. 80-100 for a male, Rs. 50-60 for a female and Rs. 40-45 for a child. At the time of investigation, there was no problem of obtaining hired labour. It was easy to find workers among the settlers who did not cultivate during the season. There were some who even went to distant places like Ambalanthota to seek hired work.

3.4 Average Yield

Average yield was worked out by dividing the extent harvested by production. Table 3.14 shows the average yield for selected crops.

Table 3.14
Production of OFCs

Crop	Extent Harvested (Acre)	Total production (Kg)	Average yield (Kg/acre)
Chilli (green)	105.80	58173	549.84
Ground nut	19.37	9592	495.20
Big onion	1.56	538	344.87
Red onion	11.47	20378	1776.63
Green gram	16.25	2079	127.94
Cowpea	10.84	3319	306.18

Source : ARTI Survey data

An attempt was made to compare the average yield in the study area with the potential yield in the project area, the district average, the Mahaweli average and the national average (Table 3.15). The average yield in the

Mahaweli area was taken in order to make comparisons with irrigated agriculture since this happened to be the most relevant. The national and district averages include both irrigated and rainfed conditions. Average yields of all the crops except for ground nut was below the average of national, district and Mahaweli levels. The average yield of ground nut was more than 20 percent higher than the Mahaweli level. The average yield of big onions was around 95 percent below the averages of others. Similarly, average yield of green gram has remained less than 40 percent below the other averages.

Table 3.15
Comparison of Yield in 1991 Yala (Kg/Acre)

Crop	Potential *	K'Oya **	Hambantota ***	Mahaweli ***	Sri Lanka ***
Green chilli	NA	549.84	728.45	2136.79	1618.78
Ground nut	1300	495.20	291.38	404.69	250.91
Big onion	6000	344.87	4318.09	4662.08	3986.24
Red onion	5500	1776.63	2169.16	2691.22	2618.37
Green gram	550	127.94	420.88	441.12	315.66
Cowepa	650	306.18	441.12	489.68	339.94

Source : * AO Office, Weerawila
** ARTI Survey data
*** Data Bank (ARTI)

The majority of the farmers were not satisfied with the yields they obtained (Table 3.16). None of the surveyed farmers were happy with the yield of dried chillie and big onion. Productivity constraints which were reported by farmers are given in Table 3.17. Crop damaged by animals was the principal reason cited for the poor yield of all the crops, except for onions. Poor seed quality was attributed to crop failure of big onion, while inadequacy of water was the leading factor for the low yield of red onion. Insect attack was also an important factor for low yields of chilli and green gram.

Table 3.16
Farmer's Response on Increased Productivity

Crop	Response	No. of farmers	Percent
Green chilli	Yes	98	98.99
	No	1	1.01
Dried chilli	Yes	42	100.00
	No	0	0.00
Ground nut	Yes	28	90.32
	No	3	9.68
Big onion	Yes	11	100.00
	No	0	0.00
Red onion	Yes	42	77.78
	No	12	22.22
Green gram	Yes	11	91.67
	No	1	8.33
Cowpea	Yes	13	86.67
	No	2	13.33

Source : ARTI Survey data

3.5 Cost of Production

The total cost of production was worked out taking into account the variable cost. The cost of family inputs was estimated on the basis of the market rate for labour and other inputs. Except for family labour, the availability of all other inputs, such as seeds, tractors and spares was limited (less than 5 percent of the sample farmers).

Table 3.17
Constraints to Productivity

Type of constraints	No. of farmers						
	Chilli	Ground nut	Big onion	Red onion	Green gram	Cowpea	Total
Lack of water	14	3	-	25	-	-	42
Insect attack	37	-	-	-	5	2	44
Lack of quality seed	5	-	9	-	-	-	14
Damage by animals	72	23	1	8	6	11	121
Unsuitability of soil	12	2	1	10	-	-	25
Total	140	28	11	42	11	13	246

Source : ARTI Survey data

Variable inputs were divided into two categories: labour inputs and material inputs. The cost of production of selected OFCs is presented in Table 3.18. Big onion, red onion and chilli had the highest variable cost, amounting to Rs. 30,680, Rs. 30,300 and Rs. 23,970 per acre respectively. Ground nut and green gram had an average cost of less than Rs. 8000/ac. Labour cost has accounted for more than 75 percent for all the crops except for cowpea (68%).

Table 3.18
Cost of Production of OFCs Per Acre (Rs)

Activity	Chilli	Ground nut	Big onion	Red onion	Green gram	Cowpea
Labour inputs						
Land prepa-ration	3686.26	1570.06	7110.76	5714.75	523.14	1834.09
Seeding	1530.97	1001.90	4516.46	3465.45	215.61	1273.70
Fertilizing	2198.61	41.11	1724.47	1902.88	0	17.56
Pest control	921.11	33.85	356.20	195.88	107.48	211.72
Weeding	5504.62	1056.84	4345.49	5186.57	291.42	1205.75
Maintenance	1646.66	695.06	2596.71	3855.56	964.57	2148.87
Harvesting	2648.29	1006.77	1238.73	4073.54	2185.42	1606.74
Processing	720.01	487.07	429.45	2924.96	499.37	619.03
Sub total	18856.53	5892.66	27318.27	27319.59	4787.01	8917.44
Material inputs						
Tractor	889	931	1115	973	817	1022
Fertilizer	2009	313	1405	1477	0	2268
Pest control						
a. pesticide	1800	54	528	367	271	730
b. spray	415	13	316	161	40	122
Sub total	5113	1311	3364	2978	1128	4142
Grand total	23969.53	7203.66	30682.27	30297.59	5915.01	13059.44

Source : ARTI Survey data

3.6 Economics of OFC Production

This section deals with the economic aspects of OFC production. It analysis the cost and returns. All the calculations were based on the survey data. Gross return was obtained by the multiplication of yield and producer price. Net return is gross return less cost. This gives a sense of profitability. Net return including family labour reflects the return to land and management

while net return excluding the value of family labour represents the return to resources other than capital, land, family labour and management. Net return per unit of cash input with a positive sign gives returns to every rupee spent. Table 3.19 gives the results of the analysis. The major findings are:

1. Gross return varied from Rs. 44,650 for red onion to Rs. 3300 for green gram.

2. Ground nut, red onion, green gram and big onion were profitable crops. Nevertheless, green gram and big onion are not profitable when taking into account the cost of family labour.

3. Red onion gave the highest return to the cash input. The farmer got Rs. 5.10 for every one rupee spent.

Table 3.19
Analysis of Cost and Return

Description	Chilli	Ground nut	Big onion	Red onion	Green gram	Cowpea
Yield (Kg/Ac)	549.84	495.20	344.87	1776.63	127.94	306.18
Avg. farm price (Rs/Kg)	15.14	17.08	22.38	25.13	25.79	14.38
Cost (Rs/Ac)						
Inc. farm labour	23969.53	7203.66	30682.27	30297.59	5915.01	13059.44
Excl. farm labour	8884.31	2548.46	6915.38	7322.33	2564.10	5657.96
Cost (Rs/Kg)						
Incl. farm labour	43.59	14.55	88.97	17.05	46.23	42.65
Excl. farm labour	16.16	5.15	20.05	4.12	20.04	18.48
Cross return (Rs/Ac)	8324.58	8458.02	7718.19	44646.71	3299.57	4402.87
Net return (Rs/Ac)						
Incl. farm labour	-15644.95	1254.36	-22964.08	14349.12	-2615.44	-8656.57
Excl. farm labour	-559.73	5909.56	802.81	37324.38	735.47	-1255.09
Net return to cash input/unit	-0.06	2.32	0.12	5.10	0.29	-0.22

Source : ARTI survey data

CHAPTER FOUR

MARKETING OF OTHER FIELD CROPS

4.1 Marketing Structure of OFCs

4.1.1 Physical Set Up

The total project area belongs to a rural marketing environment which contains a number of small townships and rural markets. According to a survey published in 1991 (ARTI - Research Study No. 86),there are seven small towns and two rural fairs (pola) available to the farmers, consumers as well as for the trading community. Several essential services such as telecommunications, health, education, transport, banking and consumer markets are centred in Tissa town which is the closest sub-city to the KOISP.

The private sector has dominated all the trading activities of OFCs which is the most important crop sector cultivated in the Yala season. However, a number of OFCs have been cultivated according to the Chena system by farmers in the area before the project was implemented. One of the objectives of the project was to encourage a more systematic cultivation of OFCs in secure conditions both in production and marketing.

At the initial stage, Government organizations, namely the Paddy Marketing Board, the Department of Marketing Development and MARKFED, purchased certain OFCs from the farmers, but their role was gradually taken over by private intermediaries. At present, the Co-operative Wholesale Establishment is actively involved in purchasing certain OFCs such as green gram and dried chilli but the quantities are insignificant compared to what is purchased by private traders. Therefore, field level collectors, trucker buyers and traders who come from outside the project area, form the leading business community for OFC production in both the Maha and Yala seasons.

Economically, the total project area has been divided into two sections; the old irrigated area and the new irrigated area. The old irrigated area which is the southern part of the project is richer than the new settlement areas in terms of economic and commercial factors. Since the entire project had to be constructed according to a pre-planned structure, all the hamlets have been covered by a good road network. Farm families have been settled within a distance of one kilometer from their farmlands. Small scale grocery shops have sprung up throughout the project area and these shops supply day to day home-needs.

Farm families have been settled in hamlets. It was planned to settle 3,600 families under Phase One, while in Phase Two the settler number was to be 1,500 farm families and a total population of 2,500. The basic infrastructural requirements, including health, education and commercial activities were provided for each hamlet. However, commercial establishments have been developed more on economic factors rather than on the project plan. Most of the retail shops and small scale agricultural processing industries have cropped up at road intersections and beside the main roads. Therefore, pre-project townships such as Tissamaharama have developed faster than the new township sites introduced by the project.

4.1.2 Marketing Set up

According to a survey conducted by the ARTI in 1991, there were 527 established business enterprises and these enterprises have been divided into three categories namely large, medium and small-scale and the numbers belonging to each category were 45, 196, and 286 respectively. The most significant feature was that grocery shops contribute a larger share of the prevailing business enterprises in the project. These constitute over 50 percent of the total business establishments in each township area. Selling consumer necessities and buying the agricultural products within the area are the major activities of these enterprises. Even among the manufacturing and processing groups, about 47% of the entrepreneurs are engaged in the food processing sector. However, the processing of OFC products was not widespread in the project area.

Two major trading groups; traders who come from outside (trucker buyers) and traders who have commercial establishments within the hamlets (field level collectors); can be identified in the project area. The trucker buyers mainly operate during the harvesting season.

(a) The principle reason for this is that most of the markatable surplus of OFCs reaches the market soon after the harvest and the farmers as well as field level collectors do not store the produce. There was no large scale production for most of the crops.

(b) Traditionally, the weekly rural market places (pola) have been the major sales outlets for the agricultural produce in the remote areas. Wholesale traders within the project and outside wholesalers come to the Pannegamuwa Pola to purchase agricultural produce. Most of the field level collectors at the rural level also take their stuff to Pannegamuwa in order to obtain a better price. However, the major criticism of the farmers regarding this traditional outlet was that the large scale wholesale traders have organized themselves to keep the producer price (the purchasing price of the wholesaler) low.

(c) The marketable surplus of the individual farmer was small and it is not economically viable to take a lorry to the farmgate.

The marketable surplus of OFCs is limited due to low production and this creates a less competitive marketing environment in the entire project area. It is not viable for a large number of traders to enter the market because no such marketable surplus exists even during the harvesting period. Therefore, it seems to be a trader dominated market. The individual farmers have a very small marketable surplus and they are price takers for their production in most cases. An economically limited marketed surplus would be a major barrier to new traders attempting to enter OFC marketing.

This type of marketing set up contributed strongly to the low bargaining power of the small producers and the inefficient marketing linkages between farmers and intermediaries. The attraction for outside traders is also insignificant due to low production. OFC farmers have limited alternatives for marketing their produce.

Since most of the farmers have small stocks to sell, the weekly rural market is the major selling outlet available at present. Most of the farmers are used to taking their OFC produce to the Pannegamuwa pola which is held twice a week. Traders who come from Tissa town and other semi-urban cities such as Hakmana, Tangalle, Hambantota and Tanamalwila purchase the stuff from the

farmers. All the wholesalers belong to the 'cash wholesale' category because they pay immediate cash and the legal ownership of the produce also changes accordingly. Almost the entire stock of marketed OFC production is transfered from the project area wihout being subjected to processing.

4.2 Marketing Activities

The study found that seven OFCs were widely cultivated in the project area. According to Table 4.1, chilli and red onion are the leading crops among them, contributing to about 80% of the total production.

Table 4.1
Total Production of OFC (1991-Yala)

Crop	Production (Kg)	%
Chilli	58173	61.84
Ground nut	9592	10.13
Big onion	538	0.58
Red onion	20378	21.66
Green gram	2079	2.24
Cowpea	3319	3.55
Total	94079	100.00

Source: ARTI Survey Data

The cultivation of pulses and grain was insignificant among the sample farming groups during the reference period.

Big onion is a new crop to the project area and only a few farmers have cultivated this on a trial basis. During certain seasons in the past, ground nut and green gram were very popular among OFC farmers but a shift has occured to other crops mainly on account of the profit margin. Chilli and onion are the dominant crops even in other major irrigation schemes, especially in the Mahaweli systems. Cultivation of green gram and cowpea has declined remarkably in major irrigated schemes in recent years.

The cultivated acreage of OFCs was relatively small during the reference Yala season but the marketed surplus of production has shown a higher rate.

Farmers keep a very small stock for their own consumption and for payment in kind. For chilli, ground nut and green gram, the marketed surplus was more than 90 percent. These are considered to be commercial crops by the farmers. The main aim of the cultivator was selling and obtaining an additional income so that he can keep the paddy harvest for consumption during the Maha season.

However, farmers keep a greater percentage for their own consumption and for seed purposes (29 percent from big onions and 18 percent from red onion production). The fact that the production of big onion was very small may be the reason why the farmer tends to keep more for home consumption. Some farmers responded that they needed to keep red onions as seed for the next cultivation season because scarcity of seed was a severe problem in the project area. Both big-onions and red-onions are new labour intensive crops in the project area. In the case of big-onions, most of the farmers did not know how to cultivate the crop and the required seed chemicals were not readily available at the time of the survey. All the OFCs are considered cash crops by the farmers who sell most of the produce for money. Farmers reported that the OFCs are the major income sources for them and that they are not in a position to keep stocks for consumption. However, certain cultivators have kept reasonable stocks of cowpea for consumption.

In the reference Yala season, farmers cultivated six other field crops, their main purpose being making money by selling the stocks. Therefore the period in which stocks are sold is related to profit maximization. According to farmers' response, they do not sell their markatable surplus of dried chilli and red onion soon after the harvest (Table 4.2).

As for dried chilli, only 4 percent of the market surplus had been sold soon after the harvest because the profit margin is higher if stocks are held until the off season. Farmers keep well dried chilli in gunny bags in their homes. Only good quality chilli stocks are stored to obtain a higher price. They sell these stocks whenever cash is necessary. Farmers keep well matured red onion without removing the leaves by hanging them on wooden bars in bundles of 5 to

10 in their homes. This is a traditional storage method. Red onion can also generate big profit margins if good quality stocks are kept for two or three months. A significant factor was that most of the farmers who kept stocks for better price were people who were better off economically and therefore able to bear the risk of storing. Certain farmers had obtained day to day necessities on credit from the traders, choosing to hold their stocks of dried chillies and onions. However, farmers sell the stocks of ground nuts, cowpea and green gram soon

Table 4.2
Reason for Selling Soon After the Harvest

Reason	No. of farmers	Percentage
To settle credit obtained from traders	13	7.34
To settle bank loans	9	5.08
Immediate cash needs	56	31.64
No storage facilities	79	44.63
Insect attack	2	1.13
Prevailing high price at the market	7	3.95
Other	11	6.21
Total	177	100.00

Source : ARTI Survey data - 1990/91

after the harvest since it is not economically viable to store these crops, compared to chilli and onion, when considering price fluctuations of OFCs. Compared to the open market price of other OFCs, the open market price of onion and chilli show a sharply increasing trend during the off season and this reflects a high farmgate price as well. Another factor is that traders also compete with each other to buy dried chilli and onions in the off season compared to other crops. The demand for dried chilli and onion is stable throughout the year, even though the supply is seasonal in the country.

Lack of sufficient storage facilities and immediate cash needs were cited as the most important factors which influenced selling the produce soon after the harvest according to the survey findings. As highlighted earlier, ground nut,

cowpea and green gram stocks are sold soon after the harvest in the project area. One reason is that these crops are mainly cultivated by small scale farmers and it is not often economically viable for farmers to keep stocks to obtain better prices later. The other reason is that these farmers have very small houses and therefore limited storage space. Certain producers responded that the above mentioned crops do not generate bigger profit margins by storing and also that farmers are compelled to sell the stocks to fulfill their immediate cash needs.

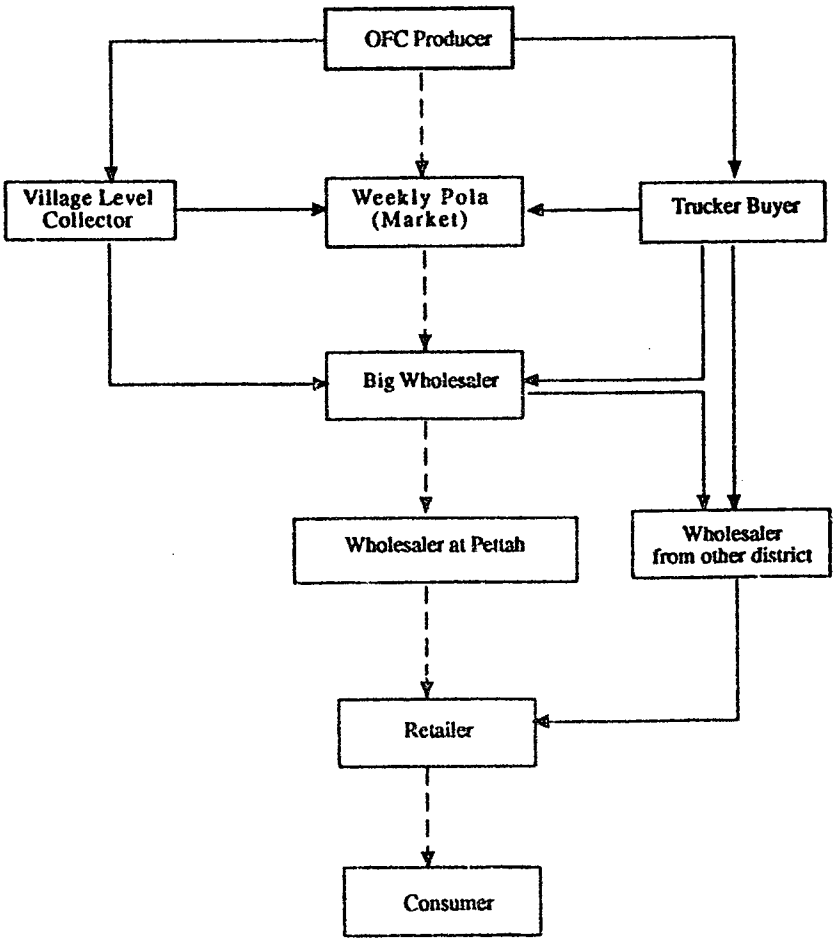
All the OFCs are considered commercial crops because in general the marketed surplus is over 80 percent of the total production among the sample farmers. A number of selling outlets are available for the farmers in the project area (Figure 2). Therefore, farmers use various selling outlets to dispose their stocks. For example, dried chilli and red onion are sold at the farm gate rather than at the rural Pola. As referred to earlier, these two crops were not sold soon after the harvest and traders often travel to the farmgate on a regular basis in the off season. Normally most of the farmers do not sell the entire stock at once and traders have continuous links with the farmers who have stocks in hand. Traders also gather price information from various markets. According to the opinion of the farmers the rural market is the major outlet for green chilli, cowpea and big onion. Green gram and ground nut have a number of outlets, including village level traders as well as traders who are operating from adjoining towns. A significant factor was that a very limited role is being played by CWE, co-operatives and the purchasing centres that were established by the Government in the project area to purchase OFCs from the farmers. There is no rationale for the selection of selling outlets for crops. According to growers, the high farm gate price and convenience with respect to disposal are the major reasons for the selection of selling outlets.

Certain farmers complained that there was no competition among traders when they sell the stocks. Traders who come to the villages as truck buyers also purchase at rural markets.

When they cannot purchase sufficient stocks from the market, they go to the farm gate. In the case of green gram, farmers use various selling outlets. Even the grocery traders at the village level were willing to purchase green gram and stock it to obtain a better price later. Traders in the nearby towns purchase about 25 percent of the marketed surplus of green gram. Ground nut also demonstrates a similar selling pattern in the project area.

In general the Pannegamua **pola** was functioning as the major selling outlet in the area. However, its importance has been reduced after farmers began storing the produce for better price. Certain experienced farmers have pointed out that crops like dried chilli and red onion are also sold in rural markets.

Figure 2
Marketing Channel for the Other Field Crops (OFC) Production in the Project Area



CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

The Kirindi Oya Irrigation and Settlement Project (KOISP), inaugrated in 1979, is a major development scheme in the South-East quadrant of Sri Lanka. The objective of the project is to enhance farm incomes and increase employment opportunities. Achievement of the project objectives entirely depends on the success of production linked with effective marketing.

Agricultural policies in the past concentrated mainly on the development of the paddy sector. Now, more attention has been given to the development of other field crops. Hence, crop diversification has been the major theme of the agricultural development programmes after 1980. Against this background farmers in the major irrigation schemes are encouraged to grow crops other than paddy during the Yala season. This has been more important for the KOISP than for other irrigated projects because of low water availability in the reservoir. Nevertheless, the cultivation of OFCs has not been as successful as expected. Achievements were far below the targets. Therefore it is necessary to identify the problems and constraints hindering the development of OFC cultivation in order to facilitate future planning. Such was the intent of the study.

The average household size is smaller than the national average of 5.3 indicating that the availability of family labour for farming is limited. However, the study found that more than 70 percent of the total labour used in the cultivation of OFC in 1991 Yala consisted of family labour. This was due to the small farm size. Family labour does not seem to be adequate for large scale farming.

Educational attainment of the farmers seem to be satisfactory. The

literacy rate remains above the national average and the majority of the farmers had achieved primary and secondary education upto the GCE (O/L). There is quite a large number of farmers who have passed the GCE (O/L). Also, the majority of the farmers are young adults (below 45 years old). Against this background scientific farming can be developed with positive results.

As expected, the major occupation is farming. The number of farmers involved in secondary jobs is very limited. The majority of those who were involved in secondary jobs, work as agricultural labourers. Therefore, the development of off-farm activities such as agro-based industries seems to be important in improving family income.

Farmers were willing to grow high value crops such as chilli and onion in favour of traditional crops such as green gram and cowpea. Own consumption is not an important factor in selecting crops. Hence, the introduction of new crops to farmers in the KOISP is not likely to be a problem. For instance, quite a large number of farmers have cultivated red onion on a trial basis in 1991 Yala.

Red onion and ground nut were the only profitable crops grown in the 1991 Yala season. Red onion gave the highest return. Since more crops have given negative returns to farmers, the study confirmed that OFC cultivation in 1991 Yala season was unsatisfactory. The majority of the farmers who cultivated OFCs in 1991 Yala seem to be worse off than those who did not cultivate OFCs.

Development of marketing activities was rather poor in the project area mainly due to the fact that only a small quantity of OFCs was moving even during the harvesting period. Direct marketing links with major wholesale markets such as Colombo and other consuming areas was not evident. A limited number of traders was operating in the rural pola (Pannegamuwa) and as trucker buyers at the field level. Therefore it seemed to be a trader dominated market rather than a competitive one. Only cash wholesalers were operating at the time of the study. Rural Pola traders who operate in the towns and as trucker buyers (for dried chilli and red onion) function as the major sales outlet channels in the project area, while the marketing activities of co-operatives, CWE and

purchasing centers established by the government played an insignificant role for OFC marketing. Farmer ----> Weekly market--->Big wholesaler---> Wholesaler at Pettah ----> Retailer is the most important marketing channel for OFC production among the systems of marketing in the present commercial environment.

The marketed surplus of OFCs has remained at a high rate for all the crops in general and therefore, these crops are cultivated mainly as cash crops.

Farmers generally store dried chilli and red onion for better price, while the other crops are sold soon after the harvest. Insufficient storage facilities and immediate cash needs are the two major reasons for this situation.

Traders have a greater power to determine the producer price for all the crops except dried chilli. Therefore, farmers are the price takers in this present marketing process.

A number of malpractices were observed at the rural market in Pannegamuwa, which contributed to low farmgate prices and underweight products.

The majority of farmers seemed to be unhappy with the existing farmer organization. They categorically blamed the structure of the organization pointing that the officials have more power than farmers. They also blamed their representatives for lacking leadership qualities. From their point of view, it is difficult to find capable leaders because almost all the farmers are financially handicaped. If such farmers become leaders, they would tend to concentrate on solving their own problems at the initial stage.

Recommendations

It was found that there is room for improving OFC production in the KOISP. The following guideliness are suggested:

(01) It is necessary that farmers who are willing to cultivate OFCs during the Yala season be identified. According to our observations settler farmers in the project area can be grouped into 4 categories;

i. Farmers who do not like to cultivate OFCs at all because they are not permanent residents in the area.

ii. Farmers who prefer to cultivate paddy as they do not own paddy fields in their villages, but have only limited extents of high land. They have come with the intention of cultivating paddy in both seasons. However, they could be persuaded to cultivate OFCs in the **Yala** provided that they grow paddy during **Maha** and obtain an adequate stock for consumption.

iii. Farmers who are reluctant to cultivate OFCs because they feel that crop management is not as easy as paddy.

iv. Farmers who prefer OFCs. They know that OFCs are more profitable than paddy. Some of them are willing to cultivate OFCs even during **Maha.** Most of the farmers who cultivated OFCs in 1991 **Yala** fall into this category.

All the farmers except those who come under the first category can be encouraged to engage in OFC cultivation during the **Yala** season. Nevertheless, priority should be given to the last category. A programme on the cultivation of OFCs is necessary and this should commence for farmers who are under the last category and expanded to include the others gradually.

(02) Cultivation of small plots under different areas is not practicable because of the probability of crop damage by animals, especially cattle, is very high. As in the case of paddy it is easier to protect crops which are on large blocks from animal damage. It also helps save irrigated water.

(03) Systems of sharing land with one another (**Bethma** system) was criticised by many farmers. They argued that it creates a lot of problems related to water distribution, crop protection and land clearance after harvest. Therefore giving an entire plot to one farmer, preferably to the owner, if he likes, seems to be more productive than the current system.

(04) Farmers complained about water distribution. Water was not issued during the time fixed by the project office during 1991 **Yala** and cultivation was delayed. Timely cultivation is a pre-condition for better production. Assurance of timely water issue seems to be an important factor for successful OFC cultivation in the project area. Therefore the project office should take into account this matter very seriously.

(05) Measures should be taken to prevent crop damage from animals, especially cattle and elephants. Damage by animals is more serious for OFCs than paddy. Hence most farmers are wary of going into OFC cultivation.

(06) Production support services, including transfer of improved technology and appropriate use of inputs, particularly improved seed, needs attention.

(07) An effort should be made to increase production in the project area. Then sufficient trade forces will be active during the harvesting period as well as during the off season.

(08) Since several malpractices have occured at the rural market in Pannegamuwa, two major steps must be taken to eradicate this problem:

i. Encourage alternative selling outlets such as trucker buyers, field level collectors etc.

ii. Take necessary steps to eliminate brokers and underweighing practices.

(09) The bargaining power of the farmers who store dried chilli and red onion was high and it is recommended that the practice of storing be encouraged among farmers. Insufficient storage facilities is the most important factor among certain farmers and a solution must be found for this problem.

(10) A collective effort is necessary to eliminate the trader dominated marketing environment.

(11) The role of the secondary sector (CWE, Co-operative, Government Purchasing Centres) should be strengthened to enhance competition with the private traders. This factor is essential because a number of financially strong traders control the marketing environment in the area.

(12) Trade links with distant wholesale markets such as Colombo have to be developed.

(13) Farmer organizations need to be re-organized in such a way that farmers have more power for decision making. Intervention of project officials should be at a minimum. Assistance from an independent organization would be required at the initial stage.

(14) The proposed marketing programme (providing credit support to farmer organizations) was highly acceptable to almost all the farmers. However, setting up a separate farmer organization for marketing is not advisable. There should be a farmer organization which could deal with production (including inputs) and marketing (including processing) since production and marketing activities are inter-related.

(15) Finally an action research programme on OFC production and marketing is suggested in order to demonstrate to the farmers successful OFC production. This is essential because OFC cultivation has not been successful so far. An action research programme would also facilitate continued monitoring of the production programme and better co- ordination, both of which are lacking today.

REFERENCES

Agroskills Ltd (1983), *Subsidiary Food Crops Marketing Study, Vol. I.*

ARTI (1993), *The South-East Dry Zone of Sri Lanka.*

ARTI (1991), *The Primary Phase of Urban Growth in the Kirindi Oya Irrigated Settlement Area.*

ARTI (1989), *Kirindi Oya Irrigation and Settlement Project Phase II : Monitoring and Evaluation Programme.*

ARTI (1984), *Kirindi Oya Irrigation and Settlement Project; Pre Project Socio-economic Conditions.*

ARTI (1982), *Prospects for Expansion in the Production of Coarse Grains and Grain Legumes.*

Asian Development Bank (1977), *Appraisal of the Kirindi Oya Irrigation and Settlement Project in Sri Lanka.*

Dimantha, D (1987), *"Irrigation Management for Crop Diversification in Sri Lanka"* in Irrigation Management for Diversified Cropping, International Irrigation Management Institute.

Hafi, A.A.B. and R.B. Erickson (1989), *Baseline Survey of Subsidiary Food Crop Cultivation in Sri Lanka,* USAID.

Khols, Lichard L and Johesp N Uhl (1985), *Marketing of Agricultural Products.*

Kularatne, W.H.D. (1988), *Production and Marketing of Green gram, North Western Province, Sri Lanka.*

Ministry of Lands, Irrigation and Mahaweli Development (1990), Kirindi Oya Irrigation and Settlement Project, Sri Lanka: *Action Plan for Cultivation of Other Field Crops in Maha 90/91.*

Ministry of Finance and Planning (1984), *Rice Self-sufficiency and Beyond: Export Prospects.*

Sirisena, N.L. (1986), "An Evaluation of Agricultural Policy on the Paddy Sector in Sri Lanka 1950-1985", *Sri Lanka Economic Journal 1 (1)* 66-97).