MID PROJECT SOCIO-ECONOMIC EVALUATION OF THE SEVENAGALA SUGAR DEVELOPMENT PROJECT

ARTI

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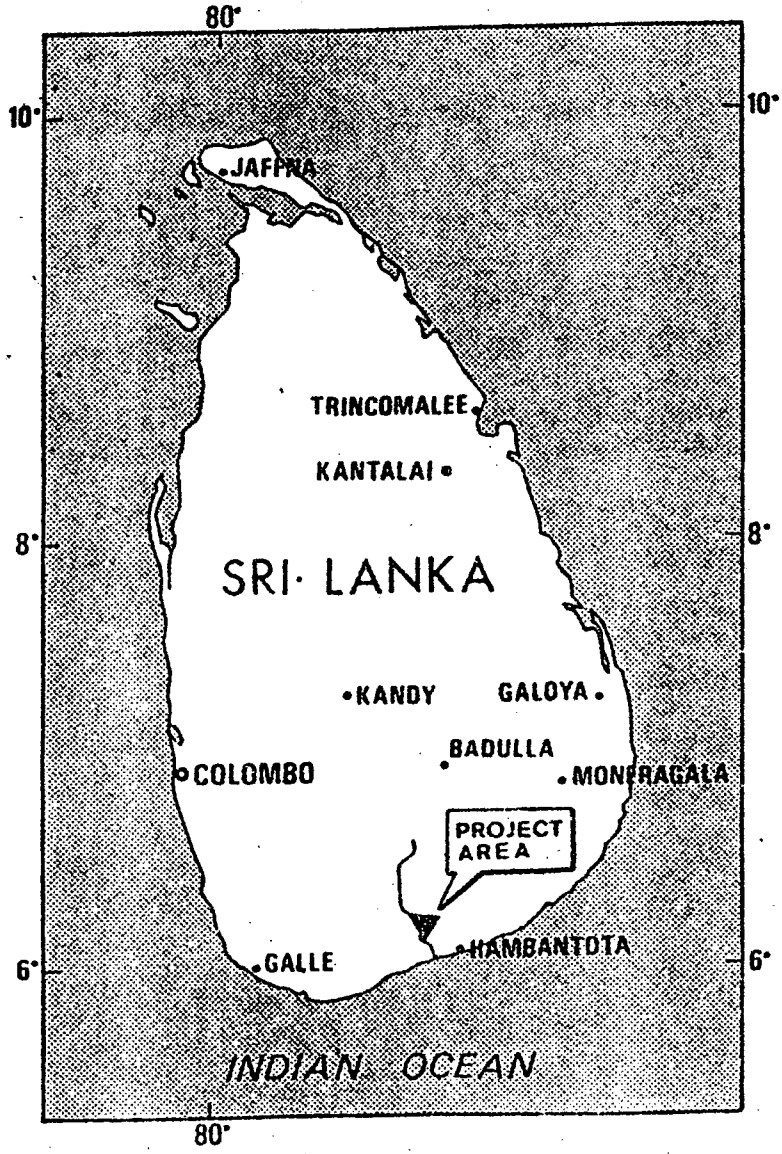

80°
10°
10°
JAFFNA
TRINCOMALEE
KANTALAI
8°
8°
SRI LANKA
KANDY
GALOYA
BADULLA
COLOMBO
MONERAGALA
PROJECT AREA
GALLE
HAMBANTOTA
6°
6°
INDIAN OCEAN
80°

Foreword

The development of the sugar industry in Sri Lanka has taken many routes. It has included the establishment of large state plantations of sugar cane, mostly under irrigation, along with factories for processing sugar, voluntary cultivation by villagers and small holders, the establishment of nucleus plantations supported by "out growers", and by privatisation.

The present study covers the Sevanagala plantation established 25 years ago by the government, and its environs. It examines also how state intervention in land development affected the lives of the villagers whose paddy and chena lands were invaded by the "development" imperatives as seen by the government.

It also raises questions regarding the impact of the transfer of land from food production to a cash crop, on the well-being and life style of those affected by the transition.

The study highlights the need for better project planning and implementation particularly in the matter of land preparation for a crop that was to be rendered irrigable. This study also examines the inter-relationship between the cultivation of paddy and other food crops with respect to the allocation of time of the farm family. It also highlights delays in infrastructure development, inadequate planning of extension programmes and poor education, health and sanitary facilities in the project area. It examines at some length the problems that have arisen as a consequence of inadequate efforts by the project officials to develop a positive and supportive relationship with the settlers.

The problem of a private plantation in relation to its outgrowers are being examined in a current study.

D.G.P. Seneviratne
DIRECTOR.

Acknowledgements

We take this opportunity to express our gratitude and appreciation to the Asian Development Bank and the Chairman of the Sri Lanka Sugar Corporation who provided this opportunity to undertake a Mid-Project Socio-economic Evaluation of the Sevanagala Sugar Development Project. We also acknowledge with appreciation the assistance and support extended by the officials of the Sri Lanka Sugar Corporation, Sevanagala Sugar Development Project and the Sri Lanka Sugarcane Research Institute. A special word of appreciation to both Mr. J. Alwis, former Director and Mr. D.G.P. Seneviratne, Director of the Agrarian Research and Training Institute, Sri Lanka for the encouragement and support given from the inception of the project to the publication of the research findings. We also thank Dr. Terrence Abeysekera, former Head/Agricultural Resource Management Division for offering valuable suggestions during the stage of proposal preparation and research design.

We also wish to acknoledge the ARTI supporting staff, specifically, Mr. P. Tennakoon and Mr. Sunil Epasinghe, two research assistants who gave their untiring assistance during the field data collection.

Our thanks are also due to Miss. Dilanthi Godakanda for typing several drafts of the final report. Finally, we thank Mr. Palitha Gunaratne for preparing the final script for publication.

D. Tennakoon
S. Dharmalingam

Terms of References

The following is an extract of the "Loan Agreement" appearing in schedule 6, vi. (18) of the Appraisal Report - 1978 (ADB: 1978).

"The Borrower shall undertake an in-depth evaluation of the project on the 4th year of its implementation with particular attention to its sociological and economic impact on all the farmers and encroachers living in the project area before the start of Project execution".

Undertaking of an indepth evaluation study at mid-project stage was still impossible, due to unavoidable reasons that SLSC had undergone; the SLSC could not complete even phase I fully at the time the study was proposed. Therefore, SLSC and ARTI came to a compromised agreement that ARTI could undertake an on-going evaluation study instead of an indepth mid-project evaluation of the project.

Major issues related with justification of the economic and social impact on the small farmers are (as given in the Appraisal Report) as follows:

(1) It was thought that an annual net income of Rs.13,000/= for an average farm household by cultivation of sugar cane and paddy was adequate. At present, most farmers have various sources of income in addition to their major occupation in the project.

(2) After completion of the project, it was envisaged that it would provide seasonal employment for farmers i.e. sugar cane harvesting, road construction and maintenance, irrigation infrastructure maintenance and work in factories. It was believed that youth in farmer families could develop their own business in various areas ie. trading, carpentry and masonry.

(3) It was considered that all these changes would bring about economic and social benefits to the project beneficiaries which would ultimately enhance the living standards of the farm households (ADB 1978).

ABBREVIATIONS AND ACRONYMS

ADA	-	Agricultural Development Authority
ADB	-	Asia Development Bank
AI	-	Agricultural Instructor
AIB	-	Agricultural Insurance Board
AO	-	Agricultural Officer
ARTI	-	Agrarian Research and Training Institute
AS	-	Agricultural Superintendants
ASC	-	Agrarian Service Centre
CO	-	Cultivation Officer
ha.	-	Hectare
ID	-	Irrigation Department
IDA	-	International Development Association
IE	-	Irrigation Engineer
Kg	-	Kilogram
Km	-	Kilometer
KVS	-	Krushi Viyapthy Sevaka (Rural Extension Officer)
NIV	-	Newly Improved Varieties
OIV	-	Old Improved Varieties
PMB	-	Paddy Marketing Board
SED	-	Settlement and Extension Division
SLSC	-	Sri Lanka Sugar Corporation
SRI	-	Sugar Research Institute
RCS	-	Recoverable Commercial Sugar
SSDP	-	Sevanagala Sugar Development Project

WEIGHTS AND MEASURES

Conversion Factors

British to Metric Units

1	acere	= 0.405	hectares (ha)
1	pound (lb)	= 0.454	kilograms (kg)
1	long ton (2240 lbs)	= 1.016	meteic ton (mt. ton)
1	hundred weight k (cwt)	= 50.802	kg
1	mile	= 1.609	kilometres (km)
1	lb/acre	= 1.121	Kg/ha
1	cwt/acre	=125.536	kg/ha
1	pint	= 0.57	litres
1	imperial gallon	= 4.55	litres

Metric to British Units

1	hectare	= 2.471	acres
1	kilogram	= 2.205	lbs
1	mt. tone (1000 kg)	= 0.984	long ton
1	metre	= 3.281	feet
1	kilometre	= 0.621	mile
1	litre	= 1.76	pints = 0.219 imp. gallons
1	kg/ha	= 0.892	lb/acre

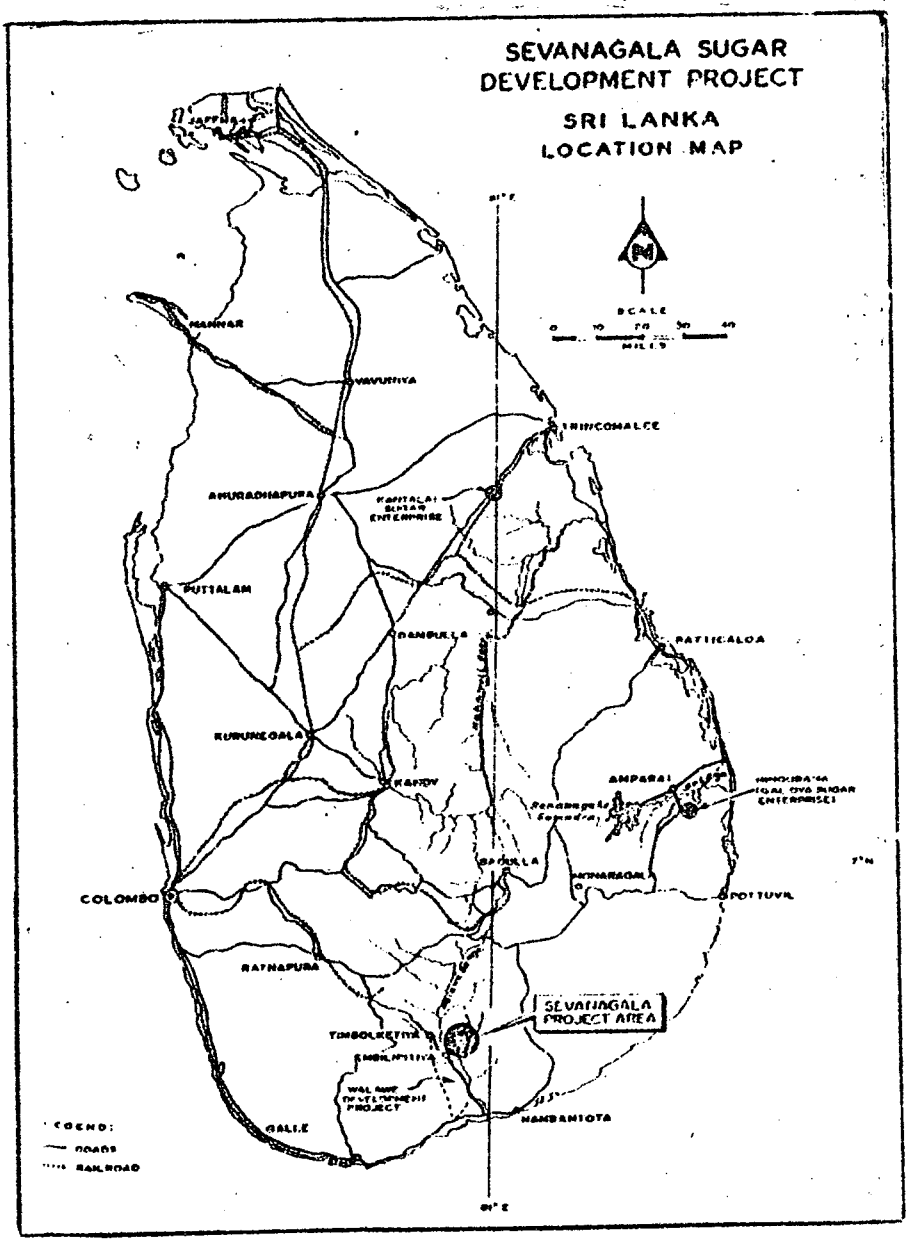
Paddy/Rice Conversions

1	bushel of paddy (46 lbs)	= 20.87	kg
1	mt. ton paddy	= 47.92	bushels paddy
		= 0.7	mt. ton rice
1	mt. ton rice	= 68.46	bushels paddy
		= 1.43	mt. ton paddy
1	bushel paddy/acre	= 51.55	kg. paddy/ha

CONTENTS

CHAPTER EIGHT

Summary and Conclusions; and Policy Implications


SEVANAGALA SUGAR
DEVELOPMENT PROJECT
SRI LANKA
LOCATION MAP
SCALE
MILES
MANNAR
VAVUNIYA
TRINCOMALEE
ANURADHAPURA
KANTALAI SUGAR ENTERPRISE
PUTTALAM
BATTICALOA
KURUNEGALA
AMPARAI
COLOMBO
PUTTUVAL
RATNAPURA
SEVANAGALA PROJECT AREA
WALAWE DEVELOPMENT PROJECT
HAMBANTOTA
GALLE
LEGEND:
ROADS
RAILROAD

CHAPTER ONE

Introduction

One of the priorities of the agricultural development programme of the government since the advent of the open economic policies in 1977 was to increase the acreage under domestic sugar cane cultivation and expand the sugar industry. Under this programme several multi-national organizations have already built factories and started sugar cane cultivation, and production of sugar has been in progress for the past 4-5 years.

The Sevenagala Sugar Development Project is located nearly 160 km from the city of Colombo, at the Left-Bank of the Walawe Ganga (river) and below the Udawalawe reservoir. The project is irrigated by the Udawalawe reservoir, under the Left-Bank main canal of the Udawalawe Irrigation Scheme. The project is located at the junction of three districts, i.e. Ratnapura, Hambantota and Meneragala. The closest town centre is Embilipitiya, where the District Administration, Health, Police and Judicial institutions are located.

The Sevenagala Sugar Project began in 1968, with 220 ha. cultivated on the banks of the Walawe Ganga by the Sri Lanka Sugar Corporation. The strategy of developing local sugar industry under this policy was evolved in 1980 with 13,000 ha. of land on the left bnak of the Walawe being cultivated with sugar cane under rainfed and irrigated conditions under the Sevenagala Sugar Development Project. The project area, prior to its initiation, was occupied by 2,600 families, with an estimated total population of about 10,000, illegally settled on the land. Most of these families had been living in and around the project area before 1970. These original settlers have cultivated approximately 8,000 ha. of undeveloped land with paddy and Chena crops. The total annual production was estimated at about 3,000 tons of paddy from lowlands, about 4,500 tons of banana from highland (rainfed) plots, and approximately 1,000 tons of other crops grown in Chenas (ADB : 1978).

The average farm size in the pre-project stage was between 1.5 to 2.0 hectares. The farm population in the pre-project stage was basically subsistence oriented, with only a small surplus which was mainly due to the adoption of poor farming practices and low crop yields. The net family income was around Rs.3,000/= per year, and all the villagers belonged to the poor strata of the population. In addition, they had no access to social services and other facilities such as schools, clinics and water supply (Ibid, 1978; UC, 1980). At the planning stage of the project, the appraisal mission envisaged that with the modernization of the farming community, there would be a change in the existing low living standards of the farmers to that of a middle class urban community. The strategy was to modernize the community by supplying irrigation water for sugar cane cultivation, improving cultivation practices, creating jobs in the sugar industry and improving infrastructural facilities such as transport, roads, schools, clinics, co-operative shops and marketing facilities.

Primarily, the Sevenagala Sugar Development Project (SSDP) aims (i) to increase the country's sugar production by 37,000 tons through efficient utilization of the upland soils of the project area (ii) to expand the paddy production primarily for subsistence requirements through better irrigation and cultivation of the low land soils to the project area, and (iii) to settle the present encroacher population of the project area and the additional workforce to be employed by the project in an organised manner (Ibid; 1987).

The project was formulated on the basis of an integrated rural development programme, covering aspects of agricultural, infrastructural, agro-industrial and institutional development. In general, it was thought that integrated development would raise sugar and paddy production, generate employment, improve the economic and social conditions of the settlers and the workers, and help save scarce foreign exchange resources of the country.

This study was initiated on a request made by the Chairman, Sri Lanka sugar Corporation (SLSC) for a Mid-Project Socio-Economic Survey on the Sevanagala Sugar Development Project (SSDP), which is funded by the Asian Development Bank (ADB). The overall objective of the study is to undertake a mid-project evaluatioin with particular attention to its socio-economic impact on all the settler families and encroachers living in the project area.

1.1 OBJECTIVES OF THE STUDY

In general, the prime aim of the project development was to uplift the poor peasantry living in the region and to provide them a stabilised and commercialized farming system which would facilitate the people to raise their living standards. On the other hand sugar can be produced as an import substitute; thereby saving vast foreign exchange spent on sugar import. The principle behind the development programme was totally based on our own resources. As Ponnambalam highlighted "The ending of dependency involves of necessity restructuring production in order to achieve self-reliance. Self-reliance means self-sufficiency in meeting the peoples' basic needs for food, clothing, housing, health and education. There should be no dependence on the outside world in regard to meeting these basic essentials. Self-reliance does not, however, mean isolation. It is merely a conviction that development must come from within the country, and be founded on the nation's own resources, natural and human, in accord with the ethos of the people" (Ponnambalam 1980: 186). The question is that whether we could have yet developed the necessary participatory development administrative physiology of our own to cater for achieving the above goal. Still we have management problems involved in more complex industrial management spheres.

The study focuses on three major objectives, namely;

(i) Description of sugar cane production and marketing activities of the settlers and the circumstances faced by them in organizational and other activites;

(ii) The extent to which the activities of the project have deviated from expectations, and

(iii) Identification of the major problems and shortcomings, which have hindered the achievements of the project objectives.

1.3 Sampling Procedures

Taking into consideration the issues and characteristics existing in the project area, the sampling method used was a stratified, simple random sample (Appendix i & ii). The number of settlers was 2397 and all of them have been allotted homestead land: out of these only 520 farmers were given lands for sugar cane cultivation at the time this study commenced. Therefore, the settlers can be divided into two categories; those who hve been allotted land for sugar cane cultivation.

Project programmes, economic and social indicators which are evaluatively assessed, and data and information (collected) are indicated in Appendix i. The farm survey, collection of data, establishment of information links with farmer committees and rural level project officials were done in March 1988. The exchange of correspondence and information with Committees ended in December 1988. These committees assisted the researchers throughout the mid-project evaluation programme, and helped in data collection and interpretation of data. The information, data and the correspondence provided by the farmer committees were collected and assessed in order to be used for on-going project evaluation purposes.

1.3 Data Base

Bulk of this study data were gathered through a farm level survey, which was conducted in May 1988 using a structured questionnaire. Secondary (supportive) data and information were gathered in informal discussions with farmer committes, officials and other interested intelectuals in the study area.

1.4 Organization of the Report

An attempt is made to discuss and examine the existing project infrastructural facilities, farm facilities, employment and labour force in Chapter Two. Chapter Three analysed the role of three principal areas i.e. (i) systems of cultivation, (ii) land utilization and cropping pattern, and (iii) role of irrigation, in the case of sugar cane cultivation in the project area. Chapter Four gives an account of cultivation techniques and farm practices used by the settler farmers in the study area. It also discusses the existing extension and delivery system in support of sugar cane cultivation.

Farm labour utilization patterns in the study area are discussed in Chapter Five, and a discussion on income distribution patterns is included in Chapter Six. Cost of production and income levels in sugar cane cultivation is analysed in Chapter Seven. Chapter Eight provides summary, conclusion and policy implications.

CHAPTER TWO

FARM FACILITIES, EMPLOYMENT AND LABOUR FORCE

In this chapter, an attempt is made to examine the existing project infrastructural facilities, including housing for allottees, and other basic civic amenities. Demographic, employment and other labour force data in the Project area, are also presented.

2.1 Project Management and Administrative Resource

The project management is currently undertaken by the SLSC, through the Residential General Project Manager (RGM) who has been involved in similar projects in the past. Three Resident Project Managers ** assisted by a number of subordinating officers work with guidance from the project management committee chaired by the RGM in the project area.

2.2 Physical Infrastructures

2.2.1 Spatial Organisation of the Project - Different Types of Infrastructures

The development components of the project are as follows:

(i) The sugar cultivation in the SLSC managed "Plantation Sector" (rainfed).

** (i) Factory Manager (ii) Manager, Sevenagala Sugar Plantation Project - Settlement and Extension; (iii) Manager - Plantations (rainfed sector, plantation estate directly managed by the SLSC).

(ii) The sugar cane cultivation in the irrigated settlement sector, and

(iii) The sugar factory development (ADB, 1978; 58, 59, p).

The most prominent feature in the Master Plan is the development of land for irrigated sugar cane cultivation and irrigated paddy cultivation. It is clearly evident that a considerable portion of the prime of project life has been spent on land and irrigation development (SLSC, 1985 & 1986).

Land area (approximately) - land available for utilization as per Master Plan:

Table 2 - A

Utilization/Construction Components	Hectares
1. Rainfed Area	2,598.0
2. Irrigated Area (Total cane cultivation area)	2,000.0
(Total cane cultivation area)	4,598.0
3. Paddy Land	505.0
4. Settlement Area - Homestead etc.	600.0
5. Pasture Land	342.0
6. Forest Reservation	150.0
7. Area covered by Factory, Buildings, Roads and unsuitable land for any of the above	4,180.0
Total Development area	10,375.0

Source : (ADB, 1977, 1978)

Details of the achievements in the "settlement sector", and revised plan schedules are given in Annex I, provided at the end of this chapter.

2.2.2 Work Accomplished and Shortcomings

Objectives of investigations in this part are:

(i) to investigate the progress of infrastructural development and farmers' response to such developments,

(ii) to examine the work accomplished and shortcomings,

(iii) to investigate the maintenance and operation of irrigation infrastructure of the project; and farmers' attitudes and their participation in maintenance activities.

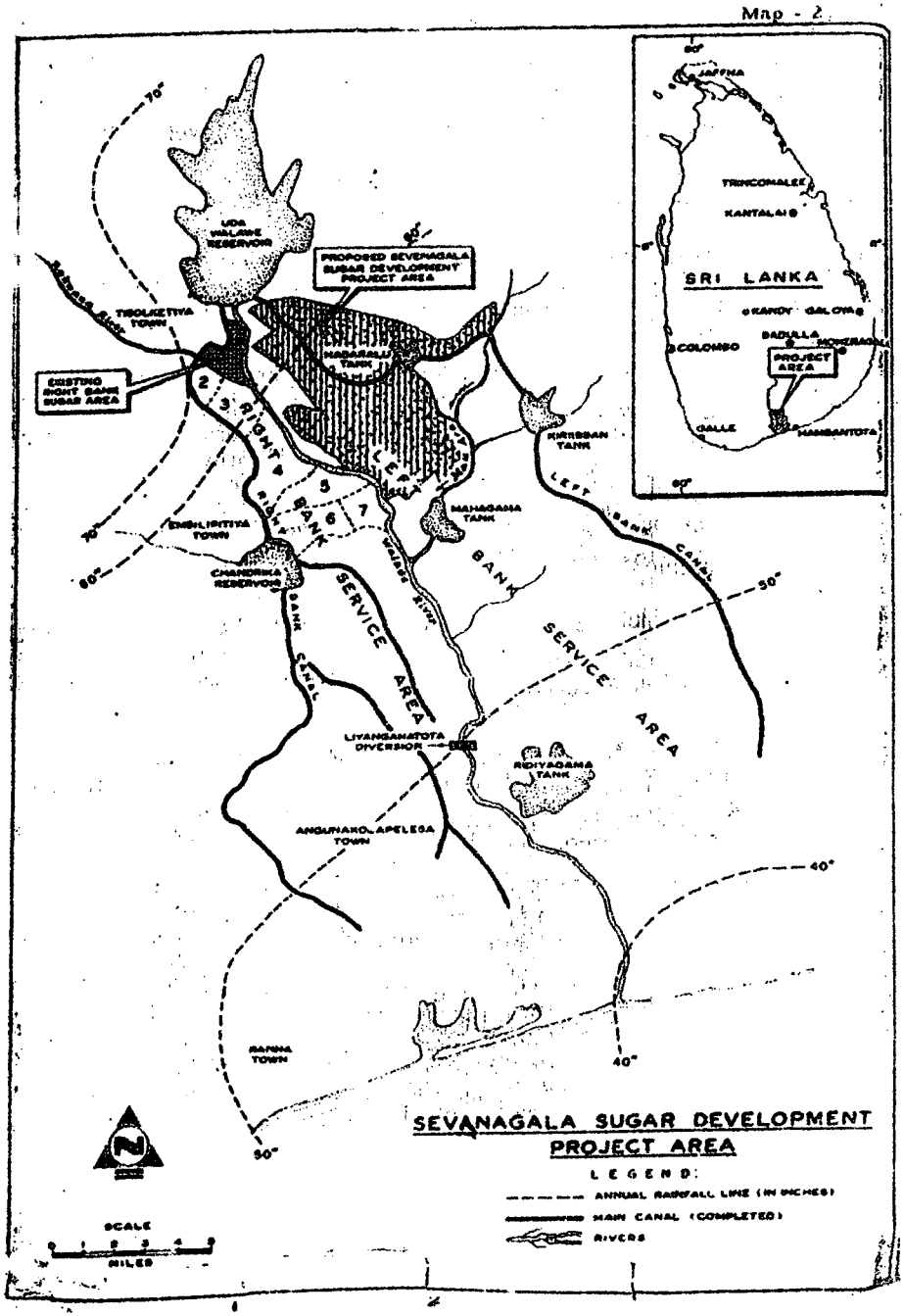
A preliminary field investigation and farmer interviews in the project area revealed several management difficulties. The survey information has confirmed the same. The major drawback of the project was stated to be delays in overall implementation, in the completion of the infrastructure components and land alienation for cultivation. This includes (i) construction of main canals and field canals; (ii) levelling and developing sugar cane land; and (iii) land alienation programmes for sugar allotments and paddy lands among the settlers.

Discussions with project officials revealed that delays in the implementation of the project according to schedule was due to the time spent on awarding contracts for infrastructure and land development.

The actual cultivation of land by farmers commenced only in the latter part of 1986. At the time of the survey, May-Oct. 1988 only 520 farm families had been given sugar cane land and only 20% of the farm households were directly involved in agricultural activities.

The allotments of the sugar cane lands to the other 2100 farmers was hindered due to contractual delays in the laying out of the irrigation system. The farm families are paid a subsistence allowance of Rs.350/= per month for the first year, and Rs.250/= per month in the following years. This allowance continues until the first harvest. Expenditure incurred in 1986, 1987 and 1988 was Rs.7,500,000/=, Rs.6,500,000/= and Rs.5,000,000/= respectively. This has been spent as subsistence payments to the farmers who were settled in the project land but not allotted with plots for sugar cane cultivation.

Map - 2


JAFFNA
TRINCOMALEE
KANTALAI
SRI LANKA
KANDY
GALOYA
COLOMBO
BADULLA
MONERAGALA
PROJECT AREA
GALLE
HAMBANTOTA
UDA WALAWE RESERVOIR
PROPOSED SEVANAGALA SUGAR DEVELOPMENT PROJECT AREA
KUMBALWELA RIVER
TISSAMAHARAMA TOWN
EXISTING RIGHT BANK SUGAR AREA
HAMBANTOTA TANK
RIGHT BANK
LEFT BANK
KIRIBBAN TANK
MAHAGAMA TANK
EMBILIPITIYA TOWN
CHANDIKA RESERVOIR
WALAWE RIVER
SERVICE AREA
LIYANGAHATOTA DIVERSION
RODIYADAMA TANK
ANGUNAKOLAPELESSA TOWN
RAHNA TOWN
70°
80°
90°
40°
SEVANAGALA SUGAR DEVELOPMENT PROJECT AREA
LEGEND:
ANNUAL RAINFALL LINE (IN INCHES)
MAIN CANAL (COMPLETED)
RIVERS
SCALE
MILES

Even the paddy lands were not allotted to the settlers until late 1988. As far as the farmers were concerned, it was a heavy loss to them in monetary terms (Rs. 10,400,000/=) as paddy production could not be realized in the project area.

Despite the lagged progress in project implementation, the farmers who cultivatd sugar cane lands and harvested their crop have obtained satisfactory yields. In certain project villages the yields obtained are higher than the tragetted.

Due to the delay in settlement of the farmers and cultivation of cane land, the factory is operating only at 50% of its capacity. We believe that the most effective way to meet the requirement of the factory would be to encourage outgrowers in lands adjacent to the project area, until the project lands are ready for cultivation. It has been envisaged that the project would be completed during 1990-1991 with the factory running at full capacity and all settlers cultivating both the sugar and paddy lands.

2.2.2.1 Land Development : Rainfed Sector

Land preparation activities (levelling and preparation) for cultivation of sugar cane were initiated, as early as 1982. Obviously the development plan and the cultivation plan fell short of the targetted schedule; nonetheless the project could have developed and planted sugar cane in 1,396 ha. by 1985, which would have brought the total extent under cultivation by mid 1988. According to the SLSC sources, the extent of land in the rainfed sector (Plantation sector) was developed by the Corporation, and the shortfall was due to the shortage of machinery, skilled labour and the unfavourable weather conditions that prevailed (SLSC, 1985, 1986, 1987). A shortage of machinery for land work was constrained; thus, three contractors were employed to complete the preparation of land. However the contractor could not complete the task according to the schedules and work was finally completed in 1988.

Table 2 - B

The Extent of Land Developed Agriculture Non-agricultue Purposes and Value of Production by Agriculture Sector (in rupee as at 31.12.1988)

Area under crop Hectares	Value of Production Rs.	Area Fallow: as land was not cultivated with sugar cane loss of production as at 1st harvested season in 1988	
		Hectares	Imputed Value of Loss of Production Rs. *
1. Plantation Sector Managed by SLSC - 1383.0	27,660,000	900.0	18,000,000/=
2. Settlers Sector (Alottees Sector) Irrigated cultivation - 780.0	35,100,000	1045.0	47,025,000/=
3. Area covered by buildings, housing complex, main roads highlands etc. - 613,0			
4. Allottees Paddy land (irrigated)		611,0	12,220,000/=
5. Area covered by field roads, channels drainages etc. - 812.0			
6. Total land area as at 31.12.1988 - 2975.0	62,760,000	2556.0	77,240.000/=

* In terms of existing market prices for sugar cane and paddy

Source : Socio-Economic Survey, 1988, ARTI.

Table 2 - C

Extent Cultivated with Sugarcane in the Rainfed Sector

Year	Programme (ha.)	Progress (ha.)	Shortfall (ha.)
1983	500.0	208.0	292.0
1984	800.0	503.0	297.0
1985	810.0	685.0	125.0
1986	400.0	320.0	80.0
1987	500.0	480.0	20.0
1988	400.0	400.0	**
Total area		2,596.0	

** Construction was going on

Source: SLSC, Annual Reports and Annual Progress Reports 1983-1988

2.2.2.2 Land Development - Irrigated Sector

Land development activities in the irrigated settlement sector also suffered the same fate. The contract LDI-C7, which was handed over to the Sri Lanka Engineering Corporation (SEC), was not completed satisfactorily and as at 1985 only a part of the C 7 canal was completed. Subsequently the land work in the remaining command area of about 900 ha. of the above canal was completed by the River Valley Development Board (RVDB) in 1985. Further 1200 ha. under the same canal, given on contract No., LD/2 to Morapana Tea Co. Ltd. was completed more or less on time in spite of the field difficulties encountered by the mechanical staff of the company. At the time, a considerable extent in this part of the project had been encroached upon and cultivated with paddy and other cereals. The encroachers were evicted in 1986 and this extent of land was developed by using Corporation machinery in 1987.

2.2.2.3 Public Road Net-work

The construction work of the public road network (main roads) in the project area, which approximates to 30 km. was completed by 1986. The total road network, inclusive of field and village roads covering more than 200 km. in length, was completed in 1987. Most of these are gravel roads, running mostly on irrigation channel bunds. Specifically, the field roads constructed for transporting farm inputs, as well as sugarcane to the factory, are in a poor state due to the lack of maintenance, and some of these roads cannot be used during the rainy season.

2.2.2.4 Buildings

Construction work of buildings for offices, staff quarters, village centres, schools, health facilities and stores for fuel, fertilizer and other agro-inputs were completed by 1988.

2.2.2.5 Settlement and Facilities

Settlement of small holder farmers in the newly planned village clusters was done from the commencement of the project. At the commencement of the project, there were 3051 encroachers in the project area. Of the encroacher families, about 2460 families were selected for the allocation of cane land and the other families were resettled on highlands along the Tanamalwila trunk road, outside the project area. These activities were completed by 1986.

Table 2 - D

Progress of Settlement as at 01.01.1987	Annual	Total
1. No. given homesteads as at 01.01.1983	964	1579
No. given homesteads in 1983	615	1579
No. selected in 1983 for allocation of lands	885	
2. No. given homesteads as at 01.01.1984	1579	
No. given homesteads in 1984 (not settled)		1579
No. selected in 1984 for allocation of land	885	
3. No. given homesteads as at 01.01.1985	1579	
No. given homesteads in 1985	521	2100
No. selected in 1985 for allocation of land	364	
4. No. of homesteads allocated for farmers, as at 31.12.1986		2464

Source : SLSC; Annual Reports of 1983, 1984 and 1985
Settlement & Extension Division, Progress Reports, 1986-1988.

The allocation of homesteads was suspended in 1984 as the cane land was not ready, due to the delay on the part of the State Engineering Corporation to complete the irrigation network and land development activities. Thus, once the homesteads were handed over to the farmers, the Corporation was obliged to pay each settler a subsistence allowance of Rs.350/= per month till the land was ready for sugarcane cultivation (SLSC; ibid).

Table 2 -E

Other settlement activities	Progress 1985	1986	1987	1988
No. selected for animal husbandry	03	02	02	
No. selected for allocation of trade sites	06	04	10	16
No. selected and settled in highland settlement scheme	635	-	-	-

Source : Settlement Division - Provisional Reports, 1988.

Supply of drinking water for the settlers was a serious problem the Corporation encountered at the beginning, and by the end of 1985, around 90 tube wells were constructed by the Water Resources Board (WRB) in the settlement villages, and 80% of these tube wells have been recommended to be used for drinking water in teh settlement area. However, the Corporation also encouraged the farmers to sink their own wells wherever possible especially where the farmers evinced an interest to have their own weils in their homesteads.

2.2.2.6 Sugar Factory

Time taken for the construction of the sugar factory and for the distillery of products has been a crucial factor responsible for the overall delay of the total project activities of the SSDP. The factory/distillery construction work was further delayed until 1986 due partly to the communal disturbances that prevailed throughout the country at that time. The construction contract of the sugar factory, with a capacity of 1250 tons of sugar cane per day with

provisions for expansion to 2000 tons of cane per day, and a distillery with a capacity of 25,000 litres for rectified spirits per day was awarded to the K.C.P, Ltd., of Madras, India. It was expected to commission the factory in July, 1985 but the slow progress in the performance of the contracting company delayed the commissioning until mid 1986.

2.2.2.7 Welfare Activities

Welfare activities for the factory workers as well as for the sugar cane farmers were taken into consideration from the inception of the project. Eleven Trade Unions function in the project area; spatial arrangements providing room for offices have been set up by the project, and the relationship with the management was apparently cordial. Upto 1988, services such as; two Co-operative Stores, a Canteen in the office building site, a Medical Centre with a Medical Practitioner (exclusively for families of the staff of the project) were available. The SLSC further provided assistance to Village Level Voluntary Committees for sports, recreational, religious and library facilities. Four playgrounds in the project area and a Sub-Post Office at Koulara village were constructed in 1988. Land was allocated in 1985 to construct four Rural Development Centres; the work of which is still progressing. To cater to the educational needs for the children of the project beneficiaries, two more schools were constructed in 1988.

2.2.2.8 Educational Facilities

The existing levels of educational facilities in the project area (as at 1988) were not satisfactory as there were only four schools (two were Primary Schools) for nearly 2,500 farm families in the study area.

Table 2 - F

Educational Facilities in the Project Area

School	Staff Strength	Total Enrolement 1988
1. Sevanagala (upto Grade 10)	08 - 10	800 (Approx.)
2. Koul Ara (Primary school)	04 - 06	400 (")
3. Moraketiya (Primary school)	03 - 02	350 (")
4. Muthuminigama (Primary school)	03 - 02	210 (")

Source : Settlement Division Provisional Reports 1988.

The students in the higher grades attend the senior schools in the nearby towns, i.e. Ambilipitiya and Godakawela. There are some who cannot afford to pay for transport and they stay behind and assist their parents in farming. If educational facilities in the project area are adequately provided, the drop out rate can be gradually minimised.

2.2.2.9 Health Facilities

The Community Health Services available for the population living in the project area are presently confined to an outdoor dispensary and a maternity clinic to look after the needs of the Corporation staff. The farm families go to the private dispensers in the Moraketiya town, and in case of serious illnesses they attend the government district hospital at Ambilipitiya. The Community Health Services for the project population was further improved after the completion of the proposed Danduma Town Centre in 1989, where the Corporation negotiated with the Department of Health Services in this respect. According to the project officials, diarrhoea and malaria were reported to be the most recurring diseases in the area, and a project in association with the Department of Health was planning to launch a Community Health Development Programme to make the population aware of the preventive practices of such diseases.

2.2.2.10 Community Services

Two Co-operative Stores are functioning in the project area. The major task of the Co-operative Stores has been the distribution of commodities for food relief stamps for the poor families of the project area. There are a number of small scale retail grocery shops and tea kiosks operating in Moraketiya, Sevanagala and Muthuminigama junction in this area. According to the project officials, the Danduma Town Centre would be functioning as the main town centre for the project area, the construction work of which was going on at the time of the study in 1988 and 1989.

2.2.2.11 Farm Machinery and Transport Services

The total requirement of farm machinery and transport vehicles for the farms in the Project area was provided by the SLSC until 1987. Since 1978, farmers have been encouraged to have their own transport vehicles; in certain instances to procure such services on hire. A few farmers were also reported to have their own two wheel and four wheel tractors. Since the project area was well served with

a good road net-work, the Corporation was making arrangements to provide a bus service between town centres of the project area. Presently the SLTB operates a bus service between the project and the Ambilipitiya town. Commuters complained of the unsatisfactory condition of this service, particularly of not running the buses on schedule. The Corporation's own bus service was criticized for restricting it only to the members of the families of the officials of SLSC in the project area.

2.3 Housing Conditions and Related Amenities

The SLSC has granted Rs.1,000/= for each settler to build his own house in his homestead. With this grant the settlers first could build small houses with wattle and daub walls and thatched roofs. In certain cases, the farmers had their roofs tiled. Each dwelling, built, by the farmers at the inception typically consisted of one room and a verandah, and a separated hut to be used as a kitchen. Later on a few farmers made improvements and extensions to their houses so that they had two rooms, a living room, verandah and a kitchen. These houses are of a permanent nature with brick walls and tiled roofs. Those farmers who pursued non-agricultural activities during the past few years i.e. gemming, small building contracts own new houses in the project area. The majority of farmers did not make any improvements to their original houses. In fact, some of the thatched and daub houses were in a very poor state of disrepair. It was thought that about 150 farmers who sold their first crop would be able to repair their houses in 1978, and the others in 1989.

Table 2- G

Distribution of Farm Houses by Number of Rooms

No. of Rooms	No. of houses reported	Percentage
1. With one room	24	14.9
2. Two rooms	77	47.8
3. Three rooms	36	22.4
4. Four rooms and above	24	14.9
Total houses enumerated	161	100.0

Table 2 - H

Types of Houses According to Materials Used

			No. of Houses Reported	Percentage
1. Floor,	1.1	Cement	30	19.7
	1.2	Mud	122	80.3
		Total	152	100.0
2. Wall,	2.1	Bricks	45	29.6
	2.2	Mud	107	70.4
		Total	152	100.0
3. Roof,	3.1	Tiles, Asbestos or Corrugated Tin	68	44.7
	3.2	Cadjan or Iluk	84	55.3
		Total	152	100.0

Other 9 houses of the sample were temporary houses, made of cadjan (temporary huts)

The Sevenagala Sugar Development Project area is supplied with electricity for the factory premises, the offices, and the staff quarters, but none of the farm households has this facility. Firewood is the only source of energy used for cooking in farm households.

Approximately three fourth of the sample households were reported to be devoid of any toilet facilities. The pit lavotories appear to be common among the farm families in the study area. Drinking water for the farm households was provided by means of tubewells provided by the Corporation. Two minor tanks fed by the LB channel of the Uda Walawa reservoir, the LB Channel and its main canals together with Distributory canals, form the only source of water for bathing and washing purposes for the entire population of the project area. The staff quarters of the Corporation were provided with pipe borne water supply facilities from the central water tank in the project area.

The material assets of the sample households constitute only a very narrow range of some specific utility items, i.e. one chair, several reed mats, reed sacks, bicycles and radios. About one third of the farm households of the sample did not even own a bicycle or radio. Only one fifth of the farm households was reported to be equipped with basic household furniture. Even the ownership of farm equipment required for their agricultural pursuit, left much to be desired. Equipment such as ploughs, hand weeders, hand seeders, sprayers and water pumps were not available with the sample farm families, at the time of the survey. The mammoty and the weed knife were reported to be the only items commonly available among all the farmers. The farmers may not have possessed these farm household assets because of the uncertainity that prevailed as the handing over of land was held in abeyance. This is amply proved by the fact that only a few farmers had their first cane crop in 1988 and none of them had their paddy parcel at the time of the survey. Over 90% of the farmers (inclusive of farmers who had just started cultivation) were entirely dependent on relief and other such assistance given by the SLSC.

2.4 Livestock Assets

During the Pre-project period there were about 20-50 encroachers owning buffalo herds (each herd consisted of 10 or more in the Project area. Since the project's development priorities were sugar-cane cultivation, paddy farming and homesteads, the buffalo owners were given highland plots outside the project area. Of the farmers about three were selected to be settled under the project, land was allocated to them for animal husbandry in paddy land areas. Other farmers were settled in the highlands development scheme. It was also reported that some farmers were keeping herds of unauthorised buffalo and cattle in the cane cultivation area. A number of farmers in Muthuminigama and Ginigalpalassa villages complained that the cattle farmers in their villages did not exercise proper control over their herds and the cattle damaged the cane farm regularly. On the contrary cattle farming in the area seems to be a profitable venture since curd has a popular demand in the open market. Sugar cane farming too is attracting farmers. The project authorities will have to look for ways and means to ensure the co-existence of both systems without one being an impediment to the other.

2.5 Population Characteristics

The total population, inclusive of encroachers, traders, and labourers, was estimated to be approximately 15,000, at the time of the survey. The table 2.1 below which consists of an analysist of the age wise composition of the population shows the predominance of the younger age groups. Nearly 47% are below 14 years of age. About 52% are in the age group of 15-65 years. This situation does not show any remarkable demographic changes, compared with the pre project situations in the population characteristics (C.U: 1980).

Table 2.1

Composition of Population - According to Age and Sex

Age group (years)	Male %	Female %	Total %
0 - 05	14.9	12.4	13.7
06 - 14	29.8	37.0	33.2
15 - 3-	26.1	26.6	26.4
31 - 64	27.1	23.3	25.3
Over 65	2.0	0.7	1.4
All Ages	100.0	100.0	100.0

Source : Appendix 3. Table: 1.1

The educational status and the literacy rate (status) among the population, 5 years and above, are presented in Table 2.2 below. The high literacy rate generally observed in Sri Lanka is maintained in the project area, with females having a slight edge over their male counter parts. About 10% of the heads of households had not received any formal education. Approximately a little more than a half of the population had obtained only primary education. A very small number (3.21%) had obtained G.C.E.(O/L) qualifications whilst only foru students had passed more than two subjects at the G.C.E.(A/L)

examination. Only one had attained higher education in a higher technical college (of the sample population).

Table 2.2

Distribution of the Sample Population (Age 5 and above) by Levels of Education

Levels	%
Illiterate	13.33
Grade 1 - 5	53.57
Grade 6 - 10	23.69
Passed G.C.E.(O/L)	3.21
Passed G.C.E.(A/L)	0.48
Higher Education	0.12

Source: Appendix 3, Table 1.2

The average family size in the project area is 6.5. About 65% of the households have less than 6 members, whilst around 35% of the sample have over 6 occupants, revealing a remarkable change compared with that of the Pre-project situation. After the farm families came into permanent settlement under the project ,the population has increased to a certain extent (SLSC, 1986).

2.6 Origin and Migration Patterns of Farm Families

A considerable segment of the total farm families, traders and labourers living in the project are migrants. About 40% to 50% of them have come from the southern area of the Island. Others are from the Uva and the Sabaragamuwa Provinces. Migration is a continious process in the project area. It was revealed that male and female labour moved into the area in the Maha seasons, seeking work in paddy farms and Chenas outside the project. During the crushing

season, labourers in large numbers come from outside for cane harvesting in settlement farms, and in the Corporation owned plantations.

2.7 Employment and Labour Force

Of the active population, considered to be those between 15-65 years of age,the labour force available in the project area accounted for 51.6 %. The dependent population was as high as 48.3 %. Even in the segment of active population one fourth were in the age group of 15-30 years, a trend common in the other settlement areas and in the island as well (ARTI, 1986). A substantial percentage of this category, (nearly 40%) fall under the school going population. In the corresponding female category (of the active portion of the population) about 30% were housewives, household workers of students and their participation in farm work was confined only to peak seasonal activities, i.e. planting and harvesting.

Table 2.5
The Size of the Available Labour Force in the Project Area

Characteristics	Cane harvested families	Non-harvested families	Non-cane Cultivators	Total Project Area
* Size of the Labour Force in the Sample				
(i) Male	67	95	99	261
(ii) Female	63	84	74	211
* Portion of the Labour Force in the Sample %	55.08%	50.14%	50.88%	51.66%
* Percentage of Female in the Labour Force %	48.46%	43.53%	48.0%	46.85%

Source: Appendix 3, Table 1.4 & 1.5 based on the survey - 1989

Of the total labour force avilable around four fifths were involved in agricultural pursuits or they worked as farm labourers. At the time of the survey the project was yet to be completed and

and some prospective farmers worked as hired labourers in other irrigated settlement areas near the project (about 15%). Thus only about 11.2% of the population was engaged in cane farming on a full time basis while another 12% pursued agricultural and non-agricultural enterprises. (Appendix Table 3.6 - 3.10).

Table 2.6

The Classification of Households by the Source of Involvement

Source of income	Cane harvested Families %	Non-har. Families %	Non-cane Cultivators %	Project Area %
* Agriculture only	45	0	0	11.2
* Agriculture and Hiring labour and other sources	52.5	88.9	8.6	50.9
* Only non-agriculture	2.5	11.1	91.4	37.9
All Sources	100.0	100.0	100.0	100.0

Source: Appendix 3, Table 1.9 and 1.10

The outstanding characteristics of the active labour force and the employment pattern of the project are in common with those prevailing everywhere in the country, i.e. (a) a substantial percentage of the population is of schooling age (between 14-20 years of age) and they are involved in economic activities, only to a certain degree, (b) marked seasonal variations in labour use were shown in agriculture following seasonal climatic changes (c) underemployment was widely evident during lean seasons as well as in off farm seasons, (d) a majority of housewives was engaged in farming activities (agriculture), but mainly confined to harvesting and planting activities, and (e) unemployment was rempant among youths between 18-30; they were expecting white collar or blue collar (mechanical) jobs in government institutions or organisations in the private sector. Relatives, relations and friends exchanged their labour on "Aththan" during busy seasons, when additional farm labour was required. In the overall situation, hired labour assumed the most important secondary

source of employment among males and females. The percentages involved in regular salaried employments were not significant, whilst those who worked on a daily paid basis accounted for 1.8%. The rate of unemployment among the project labour force, was reported to be around 3.5%, relatively a low unemployment rate. Specifically unemployment rate reported among the male group was somewhat lower than that of the female group (Appendix 3, Table 1.9 and 1.10).

Analysis related to employment patterns, trends in family labour, and hired labour, as well as income distribution are included in detail in Chapter Five and Six where resource management, farm labour shortages, harvesting and disposal are analysed and discussed.

Annex I

Achievements and the Revised Settlement Schedule

(A) Factual achievement as opposed to the target

	Sectors	Extent hectares	Achievements by 1988 and Remarks
1.	Settlement Sector extent of irrigation as planned	1860.0	Only one third of the extent was cultivated with irrigation water. Delays in irrigation construction and land Development caused this situation.
2.	"Plantation Sector", rainfed sugar cultivation managed by the SLSC	2900.0	More than 80% were developed and cultivated with sugar cane. Want of sufficient labour caused the delays.
3.	pady land (low land irrigated for settler farmers	620.00	Paddy land was not handed over to farmers. It was reported that delays in irrigation and land development caused this situation.
4.	Homesteads	248.0	Completed
5.	Number of farmers to be settled	2480.0	Completed

(B) Phasing out of the settlement of farmers

As it was reported by the SLSC, due to delays in awarding the contracts for irrigation development, land and other infrastructure development, actual settlement commenced only in the latter part of 1986. As a result of the experience gained in the progress of development, the settlement programme was phased out in the latter part of 1986.

	1986 completed	1987	1988	Total
(a) Number of farmers to be alienated with sugar cane lands	277	1100	1103	2480
(b) Extent to be allocated (ha)	208.0	825.0	827.0	1860.0

(SLSC : 1986)

CHAPTER THREE

FARM COMPOSITION, LAND USE AND IRRIGATION

The principal areas analysed in this chapter include (a) composition of the farm land holdings (b) systems of cultivation, (c) nature of land utilization and, (d) role of irrigation. Appendix: 4, at the end of text includes basic geographical features of the project area.

3.1 Systems of Cultivation

The main crop is sugarcane cultivated in the irrigated allottments of the settlers and in the Corporation managed plantation sector (unirrigated). The pre-settlement situation was completely different from that of the post settlement one. In the pre-settlement years, the systems of farming adopted in each farm unit varied markedly between farms as well as between seasons (U.C. 1980). In the current context surgar cane dominates the irrigated sector as paddy plots have not yet been allotted to the farmers. Once the alienation process is completed by the end of 1989, the system of cultivation can be diversified with lowland paddy units having seasonal variations in time allocation, utilization of labour etc. Homestead units at present are not properly utilized. If the extension activities are further expanded to include homegardens, diversification is possible with the provision for seasonal labour adjustments.

3.2 Operational Land Holding

In conformity with the land distribution practices under this project, the basic farm unit of this project comprises 0.75 ha. (nearly 2 acres) of irrigated cane plots, 0.25 ha. (nearly 1/2 acre) of irrigated paddy (lowland) and 0.10 ha. (nearly 1/4 acre) of unirrigated highland allotted as a homestead. In general, almost all the project allottees

who received sugar cane plots, had cultivated their lands with this perennial crop. Though paddy lands were yet to be distributed some farmers were reported to have resorted to paddy growing in certain lowland blocks. There is a possibility for cultivating fruit and vegetable crops in homesteads if facilities for the irrigation of wells are extended. Encroachment of land reservations for public purposes was not significant in this project area at the time the survey was conducted.

Table 3.1

Average Composition of Farm Units

Ownership Status	Type of farming & remarks	Farm Unit (Extent(ha)
1. Allotted land for sugar cane -Corporation owned and leased out to farmers:	Sugar cane only in the irrigated base; Intercropping can be introduced;	0.75-0.8
2. Allotted land for paddy only -Corporation owned and leased out to farmers;	Paddy cultivation in two seasons; programme not yet commenced. With low availability of water other crops can be cultivated on rotation.	0.10
3. Homesteads -Corporation owned and leased out to farmers;	Fruit and vegetables can be cultivated irrigation of wells can be developed	0.10
4. Encroachments - "reservations for farms"	Used for cultivation of seasonal food crops;	0.1
5. Chena land -In crown land near the project area;	Few farmers temporarily stay in the Chena land adjacent to the project;	0.1
	TOTAL	1.12

Source : Survey data collected by ARTI, 1988.

The farmers, who were awaiting the allocation of land for cane cultivation in the project, did practice Chena cultivation in the villages lying in the vicinity of the project site, especially during Maha. Their utilization of labour and income from Chena farms was not significant compared to that of their income from hiring out their labour in paddy farming in the Udawalawe and Kiriibban Ara settlement schemes in the vicinity of the project. The cane farms in the settlement sector, and in the plantation sector in the project area also yielded satisfactory result.

Table 3.2
Crops Cultivated Prior to Settlement in the Project

Crops	No. of farmers reported (sugar cane cultivators)		No. of farmers reported (non-cane cultivators)		Project Area	
	No.*	%	No.*	%	No.*	%
Sugar cane	0	0	0	0	0	0
Paddy	14	9.2	17	20.0	31	13.1
Chena crops	92	60.5	50	58.8	142	59.9
Banana	46	30.3	18	21.2	64	27.0
Total	152	100.0	85	100.0	237	100.0

* Some farm households have more than one farmer taking management responsibilities.

* Some farmers gave multiple responses

Source : Appendix 3, Table 3.2

No farmer among the settlers had previous farming experience in sugar cane cultivation. Only 13.1% of the settler farmers had engaged in paddy cultivation before their settlement in the project whilst about 59.9% of the farmers had cultivated Chenas. During the pre-project period the people had migrated to the region without any specific purpose, and engaged themselves in a number of activities; they had provided their labour in paddy cultivation and Chena cultivaiton. Some of them were small traders while some others had

worked as temporary labourers in construction sites in several government projects in the region. They had no specific or assured mean of income. In the circumstances these farmers initially will take time to adapt themselves to the farming systems introduced in the project area, which is of a "stabilised" nature.

3.3 Land Use

The land use pattern and the extent of land used for agriculture in each farm unit were next examined. The deductions are based on the response of the respondents of the sample, and as such the analysis tends to be less realistic. However the analysis is comprehensive enough to shed light on the present land use pattern in the project area. Almost all the farmers (cane farmers) had their allotted extent of 0.75 ha. with sugar cane in 1986, 1987 and in 1988. Some farmers reported variations in the size of their land allotments.

Table 3.3

Distribution of Cultivated Extents Per Farm in Highland Allottments (Irrigated sugar cane allotments and homesteads)

A. Extent Cultivated with Sugar Cane Per Farm. ha.	% of farmers reported
0 - 0.5	2.0
0.6 - 0.7	12.0
0.71 - 0.75	80.0
0.76 and over	6.0
	100.0

B. Extent Cultivated with arable crops and fruit per unit in homesteads ha.	% of farmers reported
0 - 0.05	60.0
0.06 - 0.08	18.0
0.09 - 0.10	22.0
	100.0

Source : Socio Economic Survey, 1988.

It is evident that in the project area a vast extent of land to be developed for both paddy and sugar cane, was not ready for cultivation at the time of the present study. It was also observed that non-cane cultivators were engaged in farming on land outside the project, and they also had placed more importance on hiring out their labour rather than taking an interest in intensive cultivation of their homestead allotments. About one fifth of the settlers had utilised their homesteads for agricultue. There are obvious reasons which contribute to a gross underutilization of highland allotments; agronomic and economic issues playing a key role. However, the extension services of the project will have to draw up specific programmes to help the farmers in their day to day cultivation activities. The basic problem of the non-cane cultivators was the expenses they had to incur for their daily subsistence, for the fulfilment of which they resorted to the practice of looking for daily paid jobs in the nearby villages. Thus the economic issues involving labour utilization, income and expenditure are inter-related with land utilization in the project area. These factors are discussed in detail in the next few chapters of the text.

3.4 Role of Irrigation in Sugar Cane Cultivation

An opinion survey was done in May and August to ascertain the role of irrigation in cane cultivation in the project area. Information was collected on the cultivability and the irrigability of the highland irrigated allottments. The information indicates that except for a few instances, almost all the farmers had received good arable land. A few instances were reported where the land (of the farm plots) had been left uncultivated allegedly for such reasons as presence of rock, poor soil conditions and the poorly drained rain marshes towards the lower ends of certain plots. A few farmers, specially those occupying the upper parts of the irrigated plots reported that their plots were poorly irrigated because of the incomplete land levelling and preparation. It was evident that if the extension authorities had clearly explained the situation, the nature of the problems, and stated ways and means to sort them out, the farmers themselves could have levelled their own land.

Farmers complained that field officers were mainly responsible for the problems relating to land. The farmers in all areas except in Ginigalpalassa complained that fieldworkers did not attend to their needs in time at their terminal turn outs to the field to provide and supervise the irrigating process and farm activities. According to the field officer, each farmer had been given a chance for an irrigation turn out, at a dry point from a previous irrigation turn out

Sometimes the mechanism involved 10 - 15 days, from one turn of irrigation to the next. It was evident that the farmers always did not come to the field to receive their turn, thus unused water went down the drainage channels. The Corporation was planning a procedure to reduce such wastage of water in the cane fields.

Table 3.4

The Specific Reasons Given by Farmers for their Irrigation Problems

Reasons	As a % of total Sample
No irrigation problems at all, at present	52.0
Defects in the distributory and field channel system	15.0
Defects in land levelling and preparation	32.0
Irrigation was not provided in a regular timespan	48.0

* Farmers gave multiple reasons.

Source : Socio-economic Survey; 1988

As the farmers emphasized, seeping of water into the field was a common incidence during rainy days. The situation worsened because of the damage caused to the structure of field channels. The availbility of adequate water throughout the year was not raised as a problem, as most of the land and the irrigation systems had not yet been commissioned for cultivation. At the operational stage there can be various irrigation management problems which warrant early attention of the project authorities. Stability of sugar cane cultivation among the farmers augurs well for the future, as approximately 90% of the farmers who were allotted land for cane cultivation in 1986, 1987, 1988 and 1989 had cultivated their land with sugar cane as the Corporation envisaged.

It was also evident that cane farmers had attempted paddy cultivation in lowlands pooled with drained water, in the vicinity of cane areas during the **Maha** season. Many instances were reported of crop

losses since there was no regular means of irrigation. The SLSC further had requested the farmers to refrain from unauthorised use of land in the project area, although there was no harm in allowing the farmers to use such land adjacent to their cane fields. The land too could be developed by installing drainage lines, making ridges and also by cultivating a sugar cane with irrigation facilities. If the farmers have a bigger extent of land, perhaps with land added from the waste land belts at the tail end (lower end) of their plots, such land too could be used for cane growing, provided the viability to the land is improved in the lines mentioned above.

3.5 Farmers' Perception of Irrigated Cane Cultivation

According to the information collected during the survey, almost all the farmers showed equal responses for irrigated cane cultivation in the project area. Farmers were becoming acquainted with the beneficial effects of sugar cane cultivation in the project area, and even in the absence of irrigation facilities, in some highland areas. Consequently they preferred paddy cultivation only in areas with poorly drained soil. Commercial value of cane cultivation assumed the highest priority in the choice of a crop for cultivation. Domestic consumption needs were considered by the farmers in preferring paddy cultivation. The main reasons given by the farmers for their first option for sugar cane cultivation were; are given in table 3.5.

Table 3.5

Categories of Reasons	*Farmers reporting(%)
(* most farmers gave multiple responses)	
1. Comparative advantage in cash value from cane cultivation	80.0
2. Since input, advices and marketing access are given by the Corporation, they have to manage their labour only	60.0
3. Since cultivation of cane was made compulsory in their bonds with the Corporation	32.0
4. Sugar cane cultivation needs more labour only at the harvesting period. At othertimes they have opportunities to do other jobs	14.0
5. Comparatively less expenses on disease and pest control	8.0

N = 103 (sugarcane cultivators of the sample)
Source: Socio-Economic Survey, 1988

The main reasons given by the farmers for their preference for paddy cultivation are tabulated in table 3.6.

Table 3.6

Reasons	*Farmers reporting(%)
1. Entirely for domestic consumption	90.0
2. As a means of additional income	65.0
3. Crops can be managed with family labour, as their main crop (sugar cane) does not need much labour during crop growing months	42.0
4. The land selected for paddy is not suitable for cultivation of other food crops	20.0
5. The Corporation has asked the farmers to cultivate paddy only in irrigated lowlands	18.0

N = 161 (farmers of the sample who are expecting paddy lands)
[* most farmers gave multiple responses]

Source: Socio-economic Survey, 1988.

In pursuing the farmers' responses on the practice of irrigation for cane cultivation (on rotational issues) almost all the farmers agreed to the necessity of the rotational issue of water for the cane crop. They had disagreements on the turns of water issue arranged by the field officers. Therefore, the higher officials dealing with extension activities will have to dispel the farmers' doubts and settle the differences of opinion existing between the farmers and the extension field staff. The farmers were of the opinion that the irrigation intervals should be varied according to the stage of the growth of the crop, (with their first hand knowledge acquaninted with experience in doing husbandry).

CHAPTER FOUR

CULTIVATION TECHNIQUES, FARM PRACTICES AND CREDIT

This chapter discusses the farming practices related to sugar cane cultivation with specific attention on the use of improved farming practices, techniques, and crop output levels prevalent in the project area. It was considered too early for a complete evaluation of the situation in the settlement sector, as the small holder participation in the development programmes, is still at its inception. However an attempt has been made to record and assess the performance on important aspects of crop husbandry during the first year of operation as it was considered useful in term of future improvements and evaluation.

4.1 Extension and Other Services

Another factor central to the agricultural development of the project is the improvement of the living conditions of the families who had encroached on land owned by the government with social and other amenities. The category of settlers termed "encroachers" during the pre-project situations; prior to the implementation of the Sevanagala project, had poor access to any state sponsored social or welfare services and benefits of agricultural extension. The integrated nature of the development programme of the project was foreseen to serve this type of poor farmers; with their participation to increase sugar and paddy production. This was intended to improve social and economic development of the settlers, and to save scarce foreign exchange resources of the country.

Sugar cane grows on a wide range of soils from reddish brown earth to heavy clay in the study area. It has a high demand for water but is extremely susceptible to water logging and therefore requires a well drained soil for optimal growth. More than 8000 ha.

in the Walawe basin is either deep or moderately deep soil which is considered suitable for sugar cane cultivation.

For a high yield, sugar cane requires a rainfall of 1140-1270 mm (45 - 50") per year and a minimum temperature of 70°F or above, and it is highly sensitive to photoperiodism. Such climatic conditions are found in this region where an yearly average of 1400 mm. (62") of rain is distributed from Oct. - Dec. and March - May with a long dry period during the 4 months from June - September. The environmental conditions are suited both for irrigated and non-irrigated sugar cane cultivation where the yield difference is only 20%. The crop cycle includes one plant crop and 3 ratoons extending to a total of 5 years for the best yield which means 4 harvests in 5 years.

The project appraisal emphasised the importance of a well organised extension service to the settlers which is provided by the Sri Lanka Sugar Corporation. This Division is called the Settlement and Extension Division of the Sri Lanka Sugar Corporation, Sevenagala. A separate Unit was considered essential as most of the settlers have not grown sugarcane before the project.

This Division co-ordinates and supervises the farmers/settlers on all activities involving land development, cane cultivation, harvesting and transport of produce to the factory.

The extension section comprises 2 Agricultural Superindents who supervise 3 Agricultural Offieers, under whom 18 Agricultural Instructors work at tract (Yaya) level. This gives a ratio of about 100 small holder per extension worker at the lowest level.

The village level extension committee including AO, All and farm leaders is presumed to advice, coordinate and supervise the farmers on various activities connected with land development, sugarcane cultivation, harvest, transport and other matters such as village development, housing, educational and health facilities and report to the higher extension committee. In addition, the SLSC assists cane farmers for obtaining the inputs which are not provided by the SLSC, but are necessary for sugar cane cultivation. Irrigation facilities, land clearing and initial land preparation of the small holder farm allottments are done by the SLSC using machinery. About one third of the settler farmers were given sugar cane lands. The selected cane farmers were given (some are to be given) land for cultivation of sugar cane, paddy and for homestead on a 30 year lease.

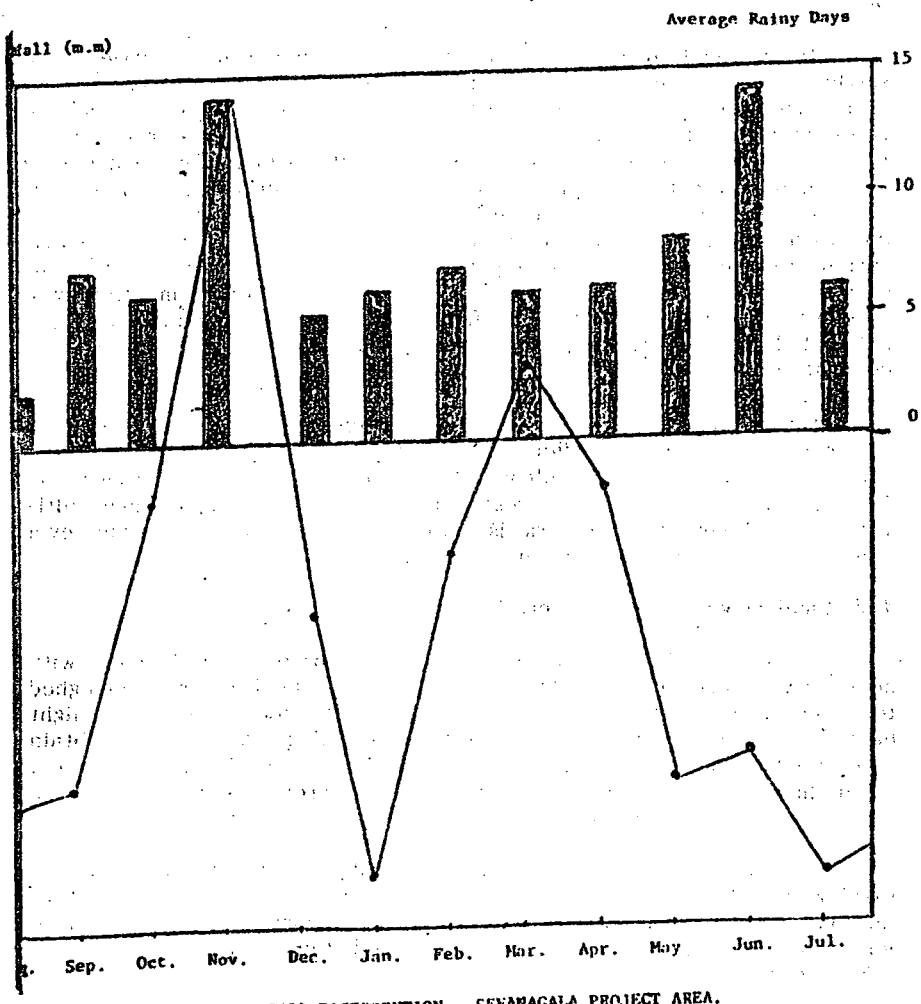


Fig. 1: AVERAGE RAINFALL DISTRIBUTION - SEVANAGALA PROJECT AREA.

A very high degree of contact is to be maintained between the settlers and the extension officers at field level from the time of preparation of the field for cultivation till the crop is harvested and transported to the factory. This was identified as essential, as all the new settlers were new to sugar cane cultivation. The importance of agricultural extension plays a major role for increasing crop production as it was one of the primary aims of the project. A pre-cultivation training programme is held where technicalities of cultivation are discussed and a required schedule is worked out in concurrence with the farmers. In addition, a monthly meeting was scheduled to be held with the farmers designated under each Agricultural Instructor to discuss field level farmer problems related to cultivation, at the field level.

Agricultural inputs (provided in the form of kind) such as seed material, fertilizers, weedicides are provided to all settlers at the appropriate time of the cultivation cycle by the SLSC through the extension division. This, at present is given only for sugar cane cultivation. Although the network is smoothly worked out, the field level situation is unsatisfactory in most cases.

4.2 Land Development/Preperation

In case of the smallholder, initial land preparation is done with heavy machinery provided by the SLSC. The land is cross ploughed to a depth of 380 - 460 mm. (15-18") and then a heavy or light harrow is used to break the clods. Smoothing is done to obtain a gradient of preferably 0.5% - 1.0% which is essential for irrigation. After harvesting of the 3rd ratoon, land is prepared again with sub soiling and heavy harrowing with heavy machinery by the SLSC.

The sugar cane plant is grown on ridges and furrows, with the spacing of 1.4 m (4½ feet) apart and at a depth of 230 mm (9") below the ground surface. Almost all farmers reported that they have followed these methods when they planted the sugar cane seeds in 1986 and 1987 respectively.

4.3 Planting Methods and Varietal Use

Seed material planted in nurseries in the "plantation sector" of the project is given to the smallholders. The variety that is distributed to the farmers is CO 775. The planting of cane is done before April as it is highly sensitive to photoperiodism. Planting is done manually with cuttings containing 3 nodes placed at the bottom of the furrow, and then covered with one third earth. Five tons of cutting are required for planting 1 ha.

4.4 Fertilizer Application

Fertilizer is applied in 3 stages. At the required time the extension officer from the SLSC provides the necessary advice to the farmers, with regard to the time and quantity which is required to the plant. The first application is done prior to planting and the fertilizer used is the basal mixture in the form of Ammonium Sulphate, concentrated Super Phosphate and Murate of Potash. The 2nd application is 45 days later and the 3rd, 45 days after the second. The survey information shows that all the farmers use the prescribed dosage of fertilizer and most farmers used fertilizer at the required time, as advised by the extension officer. There are a few instances reported of lapses in the delivery of inputs.

4.5 Weed and Pest Control

Two inter-cultivation operations meant for weed control and creation of a soil mulch are done for a better growth of the crop. From the survey data it is revealed that both chemical weeding using "**Gramoxene**", and manual weeding are done. Manual weeding is more often a weed earthing up operation to facilitate allocation of perlodation of water and better penetration of roots for the plant. This is done where the soil furrowed clods are broken and furrows filled up after irrigation. This operation simultaneously destroys the weed growth as well. Most farmers reported that manual weeding is more useful than chemical weeding. During the intercultivation operations dried leaves are also removed to facilitate harvesting of cane. About 40% of the sample farmers reported that, (although they used the chemicals given by the Corporation), they could weed only the upper portion of the farm, as they had to attend to off farm employment for wages to meet the day to day household expenses.

4.6 Problems and prospects of Sugar Cane Production Associated with Intensive Farming Techniques in the Project Area

The problem of the sugarcane production in the project area are related to the institutional relationship existing in the overall set up of the industry. There are a very few high yielding new sugarcane varieties in the country. This can be an unfavourable fact which would be negative for the expansion of the industry in critical situation. Until 1985, there has been very little research in sugar cane industry. Different varieties of commercial cane in plantations is very limited at present, being dominated 95% by a single variety Co 775 introduced from India in the mid sixties

(Dharmawardane 1989). This crop needs good management especially with its ratoons while its performance is limited under rainfed conditions. This variety can hardly be grown in all drained soils in the lower parts of the farm tracts in the project area (ibid. 1989).Ratoon cropping, especially in rainfed plantations sector resulted comparatively in lower yields, as there was heavy infection of pests and diseases. On the other hand, lower sugar recovery rates prevailing in this part of the project area tended to increase the cost of production of sugar, in the factory. Inadequate use of inputs, improper use of fertilizer, and poor farming practices unfavourably affect sugar recovery, and also the yield. Disintegrated and deficient training and research facilities can also hinder the proper development of the sugar cane industry in the country. The Sugar Research Institute (SRI) had clearly identified the sugar cane industry could not rely on the existing limited number of cane varieties any longer. All efforts of the SRI are being directed to rectify this situation as quickly as possible by broad basing the varietal spectrum with better varieties. According to the SRI, research efforts of all the divisions in the Institute focused to achieve this goal. The priority theme of research in sugar cane research is varietal improvement (IBID 1989).

4.7 Field Problems in the "Plantation Sector"

Problems associated with the sugar cane industry in the plantations of the SLSC are mainly climatic reasons and management difficulties. There are very few varieties for dry farming conditions. This variety also is susceptible to pests and diseases. Climatic conditions which vary from season to season and from year to year do not permit the expansion of the rainfed farming system as well. As a result the achievements of sugar cane production are not satisfactory and sugar yield are also very low. Management is also hampered by shortage of skilled labour for both plantation and harvesting. However, for the expansion of the sugar industry, two aspects are broadly attributable, i.e. (a) expansion of acreage, and (b) increase in yield by introduction of intensive farming technologies: especially through better supply of improved planting materials of drought resistant varieties for rainfed farming; adequate availability of water supply where necessary, adequate supply of fertilizer and other inputs, and adoption of better plant protection methods.

4.8 Loan Requirements and Recoveries

The estimates of the annual loan requirements in respect of the settlement scheme, as per phased out stages of the development from 1986 - 1989 are given below:

	1986 (Rs)	1987 (Rs)	1988 (Rs)	1989 (Rs)
(i) Medium Term loan	2,107,400	8,355,800	8,376,300	
(ii) Short Term loan (Production loan)	3,212,500	3,184,230	15,519,230	26,911,065
Total	5,319,900	11,540,030	23,895,530	26,911,064

At the first instance, agricultural and subsistence credit was provided by the SLSC in 1986 and 1987. This loan provided to farmers were categorised under the purpose of lending as "Medium Term Loan" and "Short Term Loan" (Production loan). Medium term loan is given for land preparation and purchase of seed cane. Sometimes seed cane is provided by the SLSC. This loan is recovered in five yearly instalments. Short term loan (production loan) benefits only one crop and therefore, this amount of loan is recovered as farmers harvested and handed over the crops to the factory. In 1986, SLSC settled 277 farmers and had incurred an expenditure of Rs.5,319,900.00 in respect of Medium and Short term loans. In 1987 and 1988, as all the farmers (cultivated sugar cane) harvested a more or less good sugar cane crop, the SLSC reimbursed the amount of loans given to farmers. The project was reported to recover 100% of the cultivation credit given to settler farmers in 1987 and 1988.

4.9 Institutional Credit for Cultivation

The provisions for institutional credit were arranged by the SLSC during the end of 1988, with state sponsored Banks. Institutional credit provided to the farmers in the form of loans is categorised under short-term (production form) and long term loans. This is given by both the People's Bank or the Bank of Ceylon. The farmer is required to open an account with the Bank once he starts cultivation of the crop. The corporation deposits the respective amounts payable for the harvested crop to the bank, from which the loan (by instalment) would be deducted by them. Even though this system of credit

was made available to the farmers, there was a certain percentage who still obtained loans from non-institutional services eg. money lenders at high interest rates, due to a variety of reasons. Most farmers need money during the crop season for their subsistence, and also for incidential expenses.

Annex 2

Terms of Agreement (Abstract) Between two Parties

Farmers and Sri Lanka Sugar Corporation (SLSC)

A. Responsibilities of the SLSC - Sevanagala Project

1. Land development and provision for irrigation facilities
2. Selection of settlers and allocation of lands for settler families
3. Assurance for provision of household social educational and health facilities
4. Supervision of irrigation and land use activities
5. Supply and/or arrange farm credit facilities
6. Supply of chemical inputs and extension services
7. Supply of short-term financial relief facilities (on loan) for for harvesting and transport of sugar cane to the factory
8. Recovery of all loans provided and water and land taxes

B. Responsibilities of the Farmer

1. Farmers should utilize and cultivate their lands as SLSC desired and advised
2. Sugar cane should be the only crop to be cultivated in irrigated highlands and paddy in irrigated lowland plots
3. Farmers should follow and adopt the recommendation and advice provided by the settlement and extension division
4. The farmers should sell their sugarcane production only to the sugar factory of the SLSC.

CHAPTER FIVE

FARM LABOUR UTILIZATION ON SUGAR CANE CULTIVATION

The labour utilization data was collected giving high emphasis to the labour application pattern and its distribution over different activities of the cultivation calendar. As already discussed in the preceeding chapters, employment in agriculture constitutes the form of labour utilization compared to that of non-agricultural activities.

5.1 Labour Use Pattern and Distribution

The pattern of labour application in settlement areas where sugar cane cultivation is already started dominates the labour used for farming their own lands. As Tables 5.1 and 5.2 show, the average labour used per farm amounts to 196 mandays (per farm per year or on crop season). The extent of labour in a household used for non-agricultural activities i.e. gemming and trading accounts to 36 mandays per one crop season (Table 5.2). A considerable proportion of farmers repoeted that they were hiring their labour for agricultural purposes, approximately for 40-75 days during one crop season in addition to farming their own land (normally about a season of 12-14 months).

The labour utilization data in the present study reveal that the use of family labour as well as exchange labour in sugar cane cultivation has not been applied in its full potential. The use of family and exchange labour at its maximum possibility can cause a reduction in cash costs to a considerable extent, consequently, increasing the net income per farm. Family labour accounts for 33.2% of the total labour used, while exchange labour is less than 1.25%. Hired labour approximates 65.5%. This can partly be caused by the fact that

sugar cane cultivation needs more labour during specific time periods, i.e. planting, weeding and harvesting

Table 5.1

Percentage Distribution of Labour Used in Mandays According to the Source of Labour Proportional to the Total Mandays in Sugar Cane Cultivation

	Mandays	%
Total mandays used per farm for the season	196.04	100.0
Total mandays of family labour used for the season	65.02	32.2
Total mandays of exchange "Aththan" labour used per farm per season	2.44	1.24
Total mandays of hired labour used	128.58	65.5

Source - Appendix 3, Table 2.1

As shown in Table 5.2, in the overall allocation of labour input the operationwise distribution of labour allocation is remarkable. This indicates that planting of sugar cane and harvesting have recorded the highest demand for labour allocation accounting for 125 mandays (about 63.5%) of total labour per farm per season. A season in sugar cane cultivation constitutes 10-14 months from planting to harvesting which has a long time span to the end of the circle of activities. Other activities, e.g. weeding, watering and fertilizer application mostly span over a period of 6 to 8 months during the season. Data presented in Table 5.2 also show a very close similarity with the labour use pattern in paddy cultivation in this country. As in the case of paddy cultivation, hired labour is utilized in significant proportions in sugar cane cultivation for both land preparation and planting, and harvesting. However, paddy is a crop of short duration compared to sugar cane. Therefore, sugar cane farmers have much free time to devote to any other business; specially they have

Table 5.2

Labour Use Pattern Activity-wise in Sugar Cane Cultivation

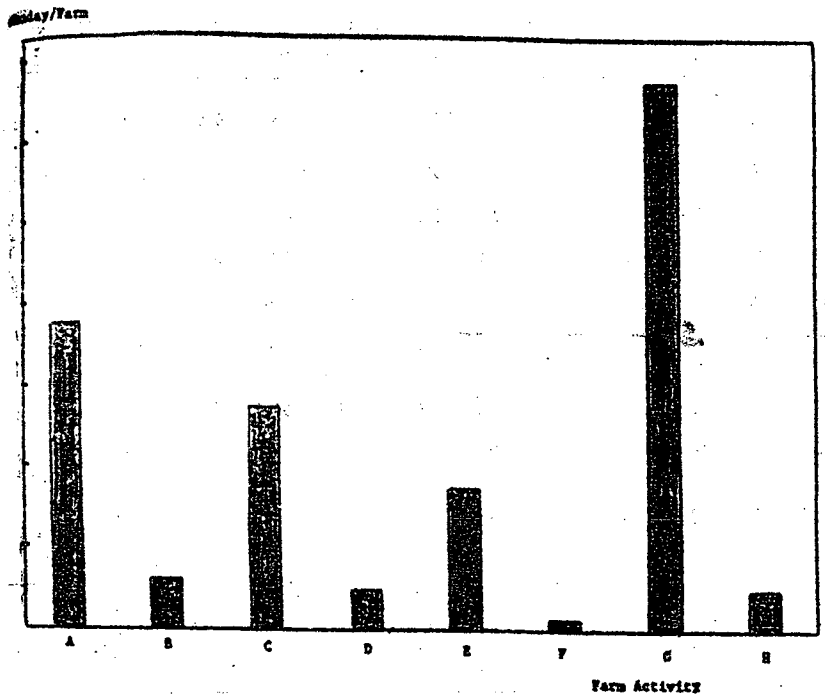
Operations/ Activities	Number of Mandays													
	Family Labour				Exchange Labour				Hired Labour				Total Labour Used	
	Male	Female	Mandays Days	%	M	F	Mandays Days	%	Male	Female	Mandays Days	%	Imputed Days	Mandays %
1. Land Preparation and planting	10.4	5.3	14.7	22.6	1.8	0.8	2.44	100.0	24.8	3.0	27.2	21.2	44.34	22.6
2. Fencing and Clearing Channels	5.32	1.1	6.2	9.5	0.0	0.0	0.0	-	0.8	0.0	0.8	0.62	7.0	3.6
3. Weeding	8.77	7.12	14.5	22.3	0.0	0.0	0.0	-	16.8	2.5	18.8	14.6	33.31	17.0
4. Fertilizer Application	3.65	1.3	4.7	7.2	0.0	0.0	0.0	-	2.1	0.0	2.1	1.6	6.81	3.5
5. Watering	17.5	2.82	19.75	30.4	0.0	0.0	0.0	-	0.6	0.0	0.6	0.46	20.35	10.3
6. After Care	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
7. Harvesting	3.42	0.15	1.74	5.4	0.0	0.0	0.0	-	63.2	16.9	76.7	59.8	80.24	40.9
8. Transport	1.62	0.15	1.74	2.7	0.0	0.0	0.0	-	2.3	0.1	2.38	1.8	4.12	2.1
All	50.7	17.9	65.02	100.0	1.82	0.8	2.44	100.0	110.0	22.4	128.58	100.0	196.04 *	100.0

Source : Appendix 3, Table 2.1 - Cost of Production Per Farm

* Percentages of kinds of labour used to the total number of mandays

Total mandays	196.04	100.0%
Total mandays of family labour	65.02	33.2%
Total mandays of exchange labour	2.44	1.24%
Total mandays of hired labour	128.58	65.5%

Fig. II: DISTRIBUTION OF LABOUR USE IN FARMING ACTIVITIES



Farm Activity

A = Land Preparation and Planting.
B = Fencing and channel cleaning
C = Weeding
D = Fertilizer Application
E = Watering
F = After Care
G = Harvesting
H = Transport

on the one hand, agressive towards the SLSC for committed delays in land alienation and on the other, they were receiving a living allowance of Rs.350/- per month from the SLSC. It was evident that the majority of

time to even initiate planting of another plot of land for sugar cane or to cultivate paddy (if given) in the project area. It was evident that many farmers were in a position to manage even a farm of 1.5 ha. in extent. Provisions facilitating for more labour use add sufficient production to the farm household. A productivity analysis shows that each additional labour unit adds (0.1658) an increment to production. The analysis based on the information of production, total mandays of family labour used, total mandays of hired labour used and total mandays of labour (other variable i.e. levels of input use were constant) indicated that there was a positive relationship between total labour use and production.

The labour utilization data collected in the sample villages relating to non-cane cultivators was incomplete, because many of them were not in a good position to respond to the study team. This was because they were, on the one hand, agressive towards the SLSC for committed delays in land alienation and on the other, they were receiving a living allowance of Rs.350/= per month from the SLSC. It was evident that the majority of settlers were agricultural labourers working for the cane farmers in the project, as well as for settlers in other paddy farming settlements in the vicinity of this project. Nearly 80% of their labour was hired out for agriculture as evident from the foregoing data. There was no assurance of availability of work daily, and the work itself was time specific, for the non-sugar cane cultivating farmers of the project. However, according to the survey data they were completely dependent on the living allowance and the income relief stamps given by the SLSC, during lean season when the demand for hired labour was limited.

5.2 Sugar Cane Harvesting - Labour Problems

Non-availability of sufficient number of labourers for harvesting of sugar cane both in the Corporation's "estate-sector" and the "settlement sector" has been cited by the Sevanagala project authorities as a serious impediment faced by them. At present the "estate-sector" needs 200-300 daily paid labourers for harvesting sugar cane for the factory during the cane crushing season. Average harvesting output per manday for the season is around 0.72 mt. Labour supply for cane harvesting can be a serious problem at the time of project completion, as there are about 1500 ha. to be developed and cultivated with sugar cane. The settlement sector alone will need about 600 labourers per day, and altogether the project will need about 1200-1500 temporary labourers per day for supplying 1200 mt. of sugar cane to the factory during the crushing season.

The leaders of temporary labour gangs explained to us that they are neither paid satisfactory wages nor provided with adequate accomodation during their stay. As most labourers are brought to the project area from different districts by labour contractors provisions for satisfactory accommodation facilities for them are important. Due to these shortcomings, labourers from outlying areas of the project are unwilling to work as cane cutters either for the farmers or for the Corporation.

To overcome the labour shortages, certain methods could be adopted. If the harvesting of the settlement sector can be programmed to begin once the estate sector is over, it would facilitate the continuous supply of labour for both sector as well as supply of sugarcane to the factory. Farmers should be encouraged to use their family labour as well as exchange labour for harvesting their sugarcane. Encouragement for settlers and outsiders to act as labour contractors or labour suppliers to the Corporation, paying workers attractive daily wages and also providing casual workers with adequate accommodation and self catering facilities, are immediate remedial measures to be considered.

5.3 Transport of Sugar Cane Harvests

During the two cropping seasons in 1987, and first harvesting season in 1988, all the farmers transported their cane by private tractors and trailers. Although the SLSC has its own tractors, trailers and cane haulers, this equipment was not used for transporting sugar cane harvest of the allottees as expected. According to the corporation officials this was due to certain drawbacks.

i. It was observed by the SLSC that a heavy financial loss had been incurred by the Corporation by employing officers to supervise tractor operators' performance during working hours. This arrangement was necessitated by the fact that a number of corrupt practices had been reported to them, i.e. taking of bribes (SLSC, 1986 & 1987).

ii. The long time period required to repair tractors and trailers in corporation workshops.

When there was a breakdown of a trailer loaded with cane, it would take a number of days to repair the vehicle. Under the circumstances, additional cost had to be incurred in discharging and reloading which had to be paid by the Corporation. Delays in transporting cane to the factory leads to deterioration of

cane, thus causing considerable financial loss to the allottees, as well as to the industry, since the cane is purchased on R.C.S. value.

iii. Heavy losses have been caused by damages to concrete structures (irrigation network) due to carelessness of corporation tractor operations. But negligence of private tractors and trailer drivers during the harvesting seasons in 1986, 1987 and 1988 was not reported by the Corporation.

Taking into consideration the above circumstances, the Corporation privatised the cane transport system (in the allottees sector) completely. Then the allottees hired private 4 wheel tractors and trailers for transporting their cane to the factory. The farmers were encouraged to organise contractors to supply tractors to the settlement area during the harvesting seasons. The tractor owners hire their tractors to the (middle men/organising contractors) and these contractors in turn hire the tractors to the farmers on a daily contract basis (eg. Rs.400/= per day). One tractor trailer can easily transport 8-10 mt. of cane to the factory, thus the transport cost per 1 mt is around Rs.40/= to Rs.50/=. It was observed that this "organising contractor" system in transportation of cane was operating smoothly during the harvesting seasons in 1988.

Transport of cane can be a problem to the SLSC towards 1990-91 with the completion of the project. When project land is fully cultivated with sugar cane (settlement sector) during the harvest seasons, more than 1000 mt. of sugar cane are expected to be harvested daily. Therefore, there will be a need for 100-130 tractors and trailers per day for transporting cane to the factory. Perhaps this could be solved if the delays in the factory yard could be minimised by a quicker method for unloading and weighing the cane loads, thereby increasing the delivery turns of a tractor and a trailer. Improvement in the efficiency of usage of available tractors in the area can be the immediate solution to the perceived transportation problem.

CHAPTER SIX

INCOME DISTRIBUTION PATTERN IN THE PROJECT AREA

In this chapter, an analysis of income distribution is attempted giving emphasis to categorization of farm families. Farm families fall into two main groups, (a) cane cultivators, and (b) non-cane cultivators. Cane cultivators are again sub-divided into two groups, (a) harvested, and (b) non-harvested. The difference in income shown in Table 6.1 are primarily due to unevenness in farm allocation among farmers. It was evident that about 78.0% of the total farmers of the project were not handed over cane lands at the time of the survey. This chapter discusses a number of aspects relating to household income such as its composition and distribution over the different farmer categories as mentioned above. In order to measure the extent of household income and its distribution (a) over the economic activities, and (b) over the farm households; as basic income units in the project area, the criteria of total cash incomes received per farm household was used.

6.1 A Note on Measuring Income Instability and Inequality of Sugar Cane Farmers and Non-sugar Cane Farmers

This section of the chapter attempts to examine some aspects of instability and inequality in respect of income; in the sugar cane farming and non-farm activities. An effort also was made to explain and examine the implication of income distribution in this project area. An attempt has also been made to provide information on the pattern of farm income distribution and the process of income movements within distribution; based on the following issues.

(a) The incomes used in this part are the incomes of the whole farm enterprise and not the income of farming only.

(b) The study was undertaken to survey the collecting of farm household data relating to the year that the survey was conducted. It was not possible, to study the extent to which individual farm incomes moved within the total distribution from one year to the other.

Table 6.1
Composition of Average Annual Household Income

Source of income	Sugar Cane cultivators Harvested		Non-harvested		Non-sugar Cane Cultivators	
	Rs.	%	Rs.	%	Rs.	%
Farming	48,042.00	94.6	3,665.00	37.5	224.00	2.0
Salaried employment	300.00	0.6	133.00	1.4	186.00	1.7
Self employment	1,110.00	2.2	0	0.0	1,203.00	10.7
Hiring labour	733.00	1,4	1,803.00	18.4	5,620.00	49.9
Living subsidy (given by SLSC)	0	0.0	3,000.00	30.7	2,904.00	25.8
Food stamps	598.00	1,2	1,181.00	12.1	1,123.00	10.0
Total	50,782.00	100.0	9,783.00	100.0	11,260.00	100.0

Source: Apendix 3, Table 2.1 and 2.2

The data presented in Table 6.1 show an uneven distribution of household incomes among farmer categories. The crop harvested category among sugar cane cultivated farmers, which comprise only 13.6% of the total settlers of the project, received a very high income as it had averaged Rs.50,782.00 of an annual income, while the non harvested category *(amounted to 8.7% of the settlers) and non-sugar cane cultivators category (which amounted to about 78.0% of the settlers of the project) had reported (to have received) about a Rs.9,783.00 and Rs.11,26.00 average annual income, respectively. Nearly 60.6% of the average income of non-sugar cane cultivtors was from

self employment activities and hiring out labour. Living subsidy and food relief stamps rank as second and third sources of income; which approximate to 35.8% and 10.2% of the average incomes, respectively. The non-harvested category of the sugar cane cultivator group of the project was soley dependent on living subsiddy (30.7%) and food stamps (12.1%) and on the hiring out of their labour in agricultural activities (37.5%).

Table 6.2

Distribution of Annual Income Among Households of the Project in 1988

Annual income per household Rs.	% of farmers	Cumulative %	% of income	Cumulative % of income
0 - 5,000	30.0	30.0	6.0	6.0
5,000 - 7,500	12.0	42.0	3.8	9.8
7,501 - 10,000	17.0	59.0	7.0	16.0
10,001 - 12,500	16.0	76.0	7.6	23.6
12,501 - 15,500	2.0	78.0	3.8	27.4
15,001 and over	23.0	100.0	72.6	100.0

Source: Appendix 3, Table 2.1 and 2.2

An uneven distribution of income over the income categories shown in Table 6.2 is due mainly to the fact that only about one fourth of the sample households had harvested their cane crop in the project area. About 24.8% of the farm household who sold their cane crops earned more than 72% of the total income earned by the sample households. This was due to the higher incomes (about Rs.50,782.00 of an average farmer income) obtained by sugar cane harvestd farmers. This proves the fact that sugar cane cultivation is becoming a more viable source of farm income in this sugar development project area.

CHAPTER SEVEN

COST OF PRODUCTION AND INCOME LEVELS IN SUGAR CANE CULTIVATION

This chapter presents and discusses the composition of cost and returns associated with sugar cane cultivation in project farms at average levels of the sample farm households. Special attention was paid to ascertain the levels of money receipts and expenses because such criteria can be used to comprehend the commercial orientation of the farmers.

7.1 Cost of Production Per Farm Unit

Production costs, classified in terms of cash and non-cash costs incurred per farm household in respect of the sugar cane cultivation during 1987/88 crop season (plant crop) are given below. The average size of the cane farm unit was 0.75 ha.

As shown in Table 7.1, on an average, the total production costs per farm unit approximates Rs.20,882.57 of which only one third has been incurred for cultivation practices other than harvesting and transport. Of the total costs incurred for harvesting and transport about 90% was for labour charges and vehicles used for transport of cane to the factory.

7.2 Cash Production Costs

Cash inputs in cane cultivation are very high compared with those of paddy cultivation, as it accounts for 87.8% of the total cost. However, only 12.2% of this (of the total cost) is accounted for non-cash

Table 7.1

Average Production Costs Per Farm Unit Classified by Cash Costs and Non-cash Costs - 1987/88

Activity	Non-Cash Rs.	%	Cash Rs.	%	Total	%
A. Seed cane value and seed cane transport	-	-	1,606.38	8.7	1,606.38	8.4
B. Ploughing (paid to SLSC)	-	-	2,405.00	13.1	2,405.00	12.6
C. Land Preparation and Planting	628.50	24.8	999.5	5.4	1,628.00	8.60
D. Fencing and Clearing Channels	223.10	8.9	23.00	0.1	246.10	1.3
E. Weeding	543.60	21.3	1,040.05	5.7	1,583.65	8.30
F. Fertilizer Application	188.60	7.4	1,675.46	9.1	1,864.11	9.80
G. Watering	685.30	26.9	25.00	0.2	710.25	3.7
H. After Care	-	-	-	-	-	-
I. Harvesting	170.90	6.8	4,691.40	25.6	4,862.25	25.6
J. Transport	102.90	4.0	5,874.00	32.0	5,976.80	31.4
All	2,542.90	12.2	18,339.80	87.8	20,882.57	100.0

Source : Appendix 3, Table 2.1

payments, being imputed values of the farmer's own production resources used, specifically, family labour. The direct cash costs incurred through various stages of the husbandry differ markedly. Of the total liquid cash utilized per farm, about 14.2% had been used for primary activities, i.e. seed cane, land preparation, planting and fencing and clearing the irrigation channels. About 13.1% had been incurred for ploughing the land with tractors. Weeding, fertilizer application, watering and after care activities had entailed 15.0% of the total cash costs. Harvesting itself accounted for about 25.6% of the total cash costs whilst transport approximated 32.0%. It was evident that if the farmers could use more family labour and exchange labour ("Aththan") for harvesting and transport of cane, rationally the cash cost involved could have been reduced by 25%. The Table 7.1 given above indicates an activity wise break down of the production expenses as reported by the cane farmers in the farm survey of 1987/88.

An input (use) breakdown of the cash costs is tabulated in Table 7.2, given below.

Table 7.2

***Percentage Distribution of Cash - Production Expenses Classified by Inputs - Averages**

Cash Production Items	Value (Rs.)	%
1. Seed Cane	1,606.00	8.7
2. Vehicles and Tractor Charges	7,812.00	42.5
3. Fertilizer and Agro-chemicals	1,853.00	10.0
4. Hired Labour Charges	7,116.00	38.8
ALL	18,387.00	100.0

* For plant crop only Source: Appendix 3, Table 2

As seen in the Table 7.2 above, in terms of percentages the costs incurred for tractors in ploughing, land preparation and transport approximates 42% of the total cash outlay. Labour charges ranks

second as it amounted to 38.8% of the cash expenses. For plant crop in cane cultivation tractor charges seem to be very high as it involves such land levelling and ploughing which are not required in the use of the ratoon crops. Sugar cane cultivation requires more hired labour for weeding and harvesting for both plant and ratoon crops.

7.3 Composition of Hired Labour Costs

Table 7.3
Composition of Hired Labour Expenses Classified by Farm Activities

Field Operations	Value (Rs)	%
1. Seed cane planting	999.50	15.2
2. Fencing and clearing channels	23.00	0.3
3. Weeding	767.90	11.6
4. Fertilizer application	94.60	1.5
5. Watering (irrigated land)	25.0	0.4
6. After care	-	-
7. Harvesting	4,691.00	71.0
8. Transport	-	-
TOTAL	6,601.00	100.0

Source: Appendix 3, Table 2.1

Table 7.3 above indicates that the bulk of the wage payment of hired labour in cane cultivation is incurred for seed cane planting and harvesting (86.2%). The use of more hired labour during planting, weeding and harvesting seasons is due mainly to inadequacy of family and exchange labour (Aththan) supply to meet the labour demands during specific peak periods of the husbandry.

7.4 Non-cash Production Costs

Table 7.4

Non-cash Production Costs Classified (Field Operations) by Activities

Field Operation	Family & Exchange Labour Use		Other Resources Used	
	Value Rs.	%	Value Rs.	%
1. Seed cane planting	628.50	25.2	-	-
2. Fencing & Clearing channels	323.10	8.9	-	-
3. Weeding	543.60	21.8	-	-
4. Fertilizer Application	188.60	7.6	-	-
5. Watering (irrigated land)	685.30	27.0	-	-
6. After care	-	-	-	-
7. Harvesting	170.90	6.8	-	-
8. Transport	55.90	2.2		
TOTAL	2,495.00	100.0	-	-

Source: Appendix 3, Table 2.1 and 2.2

Generally non-cash, production costs involve the imputed value of owned production resource used by the farmers. In respect of cne farmers in the project area non-cash production costs as given in the Table 7.4 soley constitute the family and exchange labour resources. It has been indicated that more family labour has been utilized in planting and irrigating the farm, but the family labour used for harvesting is remarkably low as compared with the family labour availability in the project area. The employment of more hired labour for harvesting is suggestive of an inadequate familiarity of the available family labour in harvesting, for the majority of the farmers of the project area had cultivated cane for the first time.

7.5 Income

This section of the chapter examines the extent of returns to farmer's production inputs and its viability for covering the total costs incurred for cultivation and for maintaining the subsistence expenses of the farm households.

Table 7.5

Extents of Incomes (Average) and Net-Returns (Average)

A.	Total Cash Expenditure Rs.	Total expenditure (Gross expenditure) Rs.	Gross income (from cane) per year per farm Rs.	per month Rs.
	18,387.00	20,883.00	45,612.00	3,801.00
B.	Total Cash Expenditure Rs.	Total expenditure (including family labour) Rs.	Net income (from cane) per farm per year Rs.	per month Rs.
	18,387.00	20,883.00	27,225.00	2,268.75
C.	Total Cash Expenditure Rs.	Total expenditure (including family labour) Rs.	Net return (from cane) per farm per year Rs.	per month Rs.
	18,387.00	20,883.00	24,729.00	2.060.75

Source: Appendix 3, Table 2.1 and 2.2

As detailed in Table 7.5 above, the gross annual income per farm household in the study area accounted for Rs.45,612.00, with a monthly gross income of around Rs.3,801.00. The gross income constituted the total cash value gained by selling the total cane production. The current level of net-income (exclusive of cash costs) per farm averages Rs.27,225.00 per season (approximately 12 months) with a monthly net income of Rs.2,268.75. The current level of net-returns (exclusive of cash and non-cash expenditure) per cane

per cane farm household approximates a net-annual return of Rs. 24,729/= with a monthly net-return of Rs.2,060.75 form sugar cane, per farm household.

Table 7.6

Input, Output Relationship - Average Farm Household Data

Average yield per farm (in tons)	
Value, family and exchange labour used	Rs. 2,495.90
Value of own transport	Rs. 47.00
Value of hired labour used	Rs. 6,601.40
Contractors cost	Rs. 514.40
Value of other inputs used	Rs.11,223.99
Total value of cash input used	Rs.18,339.79
Total costs (cash input non-cash input)	Rs.20,882.69
Cost of production per one ton of sugar cane	Rs. 230.41
Cash cost per ton of sugar cane	Rs. 202.35
Non cash input per ton of sugar cane	Rs. 28.06
Gross farm-gate value of production	Rs.45.611.69
Value added by a farm household per season	Rs.24,729.00

In terms of net-returns estimated to a farm household by cultivating sugar cane the above table 7.6 shows that irrigated cane cultivation has given higher returns compared with that of irrigated paddy cultivation (Henegedara: 1989).

7.6 Productivity of Farm Resources

In this part of the chapter the farm income analysis is further extended to study the productivity of major farm imputs, i.e. land (farm size), labour and working capital used per farm unit in the study area. The analysis is based on the measures of gross and net returns. The net return serves as a useful index of profitability in farm budget analysis. The net-return values are derived by netting out all the expenses (total production costs) from the gross farm gate value of the total production. As seen in the Table 7.7 labour productivity seems to be very high among the sugar cane cultivators in the project area. On a per ha. basis gross returns from sugar cane cultivation are seen to be nearly two and a half times that of paddy cultivation (based on the current cost of production studies in paddy cultivation).

Table 7.7
Average Productivity of Inputs in Cane Cultivation

Land (Extent of farm is 0.75 ha.		Labour (Total mandays used were: 196.04		Working capital (Total cash cost incurred was Rs.18,387/=	
Gross return per ha. Rs.	Net-returns per ha. Rs.	Gross returns per manday Rs.	Net-returns per manday Rs.	Gross returns per rup. spent Rs.	Net-returns per rupee spent Rs.
60,818.00	32,972.00	310.19	168.19	3.30	1.80

* inputed for one ha. farm

Source : Appendix 3, Table 2.1 and 2.2

7.7 Sugar Cane Yield

The average sugar cane yield for the plant crop has been reported around 90.6 metric tons (per 0.75 ha. farm) in the project area. No farm unit was reported to have harvested its 1st ratoon crop at the item of the survey as all the farm units had cultivated the plant crop at the end of 1986, and in 1987. The average yield of the plant crop in the settlement area appears to be higher than that of the estimated yield at the appraisal stage.

Table 7.8

Cost of Cultivation as SLSC Estimated

Crop	Anticipated yield per acre (0.4ha)Mt.	Cost per mt. Rs.	Cost per acre (0.4 ha)
1. Plant Crop	38.0	272.00	10,350.00
2. Ratoon - 1	34.0	182.00	6,195.00
3. Ratoon - 2	29.0	194.00	5,630.00
4. Ratoon - 3	23.0	235.00	5,410.00
5. Ratoon - 4	20.0	260.00	5,200.00

Sourcer: SLSC - Sevenagala Progress Report (1988)

The sugar Corporation has estimated production cost emphasising use of hired labour, but farmers are used to higher wages in planting and harvesting only. Thus the average cost incurred by farmers seems to be low compared to SLSC's estimate.

Table 7.9

Average Yield of Sugar Cane in the Project Classified by Villages

Villages in the sample	Number of farmers reported & %		Total production (tons)	Average yield (tons)
	No. of farmers	%		
Sevanagala	13	32.5	921.09	70.85
Moraketiya	4	10.0	288.00	72.00
Muthuminigama	11	27.5	1,059.09	96.28
Ginigalpelassa	12	30.00	1,357.19	113.10
Total	40	100.00	3,625.37	90.63

Though the average yield (project level) seems to be, considerably high in some villages this is not so. Two villages of the sample averaged a yield of about 70.85 mt. and 72.0 mt. respectively. The other two villages of the sample show a successful field which averaged 96.28 mt. and 113.10 mt. respectively. The low cane yields in the first two villages (as given in the table 7.8) are mainly resulting from the low standards of cultivation practices adopted. Twelve farmers, out of 17 of the sample in two villages replied that they were unaware of the beneficial effects of sugar cane farming; else they could have paid good after care attention in their sugar cane cultivations. A few farmers complained about shortcomings involved in irrigation and fertilizer application. However, extension authorities will have to strengthen their services focussing the need to help such poor farmers in the project.

CHAPTER EIGHT

SUMMARY AND CONCLUSIONS; AND POLICY IMPLICATIONS

The present study in the Sevenagala Sugar Development Project constitute a Mid-Project Socio Economic Assessment, focussing on effective benefits of the project on settler farmers and encroachers in the area. Sugar cane cultivation has been organized in three systems in the project area, i.e. (1) corporation managed nucleus "plantation estates" (2) farmer allotments partly managed by the corporation (settlement sector), and (3) out growers, who have private lands adjacent to the project areas. The field investigations were referred only to a cropping year, commencing at the end of 1986 and 1st quarter of 1987, and harvest in 1987 and 1st quarter of 1988. Therefore, the farm level data was gathered only for plant crops in the study area.

The irrigable land area of 1860 ha. had been planned to be cultivated with sugar cane under a settlement scheme of 2480 farm families. The sugarcane produced would be used by the factory of SLSC. The irrigable area of 1860 ha. had not been developed and handed over to the settlers as planned, thus the settlers' sector (about 78.0%) failed to grow sugarcane as planned, in 1986, and in 1987; consequently the supply of their produce to the factory was remarkably over low in 1988. Each sugar cane farmer is entitled to have 0.75 ha. of sugar cane land, 0.25 ha. of paddy land and 0.10 ha. of homestead plot totalling 1.10 ha. farm household. The settlers area is planned to be developed for irrigated sugar cane cultivtion, and another highland sugar cane area was planned to be developed for rainfed cultivation under the SLSC's management which is called "plantation sector". The Udawalawe reservoir has sufficient water to meet the full requirement of the settler area for irrigation.

8.1 Summary of Study Findings

(1) The major criticism made by teh farmers on the project development was the delays committed by the SLSC and work contractors in construction of irrigation net-work and land development in the settlement sector. Non-agricultural infrastructural network and other facilities were also reported to be inadequate and also poorly developed. Although the road netwrok in the settlement as well as in the farm areas (presently cultivating areas) had been completed at the time the survey was conducted, many access roads were almost impassable on rainy days. Electricity and telecommunication facilities are provided specially for the use of high ranking officers, official quarters and office and factory buildings. Electricity was also provided for the offices and, for the quarters of the field and factory officials and technocrafts. Electricity was not provided to the settlement villages int he project area. Educational needs of the farm population were not adequate. Community health facilities and cooperative stores were also inadequately provided to the project area. The proposed town centre (Danduma) was not completed at the time of the survey.

(2) About four fifths of the settler farmers have traditional thatched and daub homes. The Corporation, at the beginning of the settlement gave Rs.1,000/= per farm household to build a house. This amount of money was not adequate for farmers to build a house, even insufficient for farmers to buy timber, thus they could buy only some tiles for the roof. Some farmers brought pol-attu (cadjan) for the roof of their daub houses. Farmers who gained satisfactory income from gemming and trading built permanent houses using improved building materials. Domestic water supply, specifically drinking water was supplied through tube wells constructed in the settler villages.

(3) The majority of farmers reported that they possessed only a narrow range of utility items i.e. radios, mammoties, bicycles. A few farmers rported that they had cattle and buffaloes. Livestock farming can be developed in the project area as many farmers had previous knowledge in rearing in the project area. Livestock farming can provide (a) new avenues for employment and additional income to the household, (b) improvement of the diet and reducing malnutrition amongst the farm families, and (c) draught power and manure for homesteads.

(4) A typical land holding in the project constitutes of 0.10 ha. homestead, 0.25 ha. paddy land and 0.75 ha. sugar cane land. Since land preparation is done by the corporations's tractors most farmers reported that they could easily manage a holding of 1.5 ha. sugar cane land and 0.50 ha. paddy land in the project area.

(5) Currently, the cultivation of sugar cane allotments within the project was extremely limited (including land given in 1988 and 1989) to a 24% of the settlers who have access to irrigation facilities. Irrigation facilities for other farmers (as to new schedule) will be provided by 1990.

(6) Income - (Allottee Sector) received by farmers who harvested their cane crop reported to be satisfactory (for more than 70.0% fo the farmers) in the study area. Allottees cultivating sugarcane (in the project allotments) receive income from several other activities such as hiring labour, home gardening, paddy cultivation (in reservations) gemming, cottage industries, trading and others. Our income analysis shows that a few farmers who are cultivating sugarcane, are receiving more than 80% of their income from sugarcane cultivation in the project. Farmers are becoming more enthusiastic in sugar cane cultivation as they have realized the profitability of the crop. In the first harvest in 1988, although the average yield was reported to be more than 112 mt. per ha., a higher yield (above 120 mt. per ha.) was obtained only by the farmers in **Ginigalpalassa** village: other villagers are reported to be receiving lower yield. However, presently, Sevenagala (1987 and 1988 average) farmers have reported high yield as 90.63 mt. per farm (about 0.75 ha.), compared to Kanthalai and Hingurana Projects. The sugar cane yield received in the project area ranged between 30 mt. per farm to 130 mt. per farm. They also receive a monthly average income, of Rs.2,700.00 (net income). The average production costs (including imputed costs) per farm was about Rs.20,800.00 (total cost of production per one ton of sugar cane was equivalent to Rs.230/=). The gross income of a 0.75 ha. farm was about Rs.45,600/= per season. However, out of about 2400 farmers in the project area, nearly 600 farmers who cultivated sugarcane in 1986, 1987 and 1988 have proved that sugarcane can be grown adequately for the factory by settlement schemes with irrigation facilities.

(7) The average labour productivity in sugar cane cultivation is higher than the cultivation of paddy and pulses. Most farmers have access to out-project job opportunities, i.e. trading, gemming, hiring out their labour for agricultural and non-agricultural activities in the farm settlements in the vicinity of the project area. However, they have opportunities to cover about 20% of the average inocme engaging in non-farm (their own farm) activities in the project area.

(8) Income distribution analysis indicated considerable variations among project farms as most of the farmers did not have their own farms at the time the survey was done. Amongst sugar cane cultivation farmers income variations had been caused by the different levels of crop damages for the following reasons i.e the poor drainage conditions of the farms, inadequacy of irrigation provided, less enthusiasm by farmers, and recurrent damages from buffaloes and wild boar. It was observed that encouraging farmers (a) to use their own labour in sugar cane cultivation, (b) to hire their labour in factory work as well as in harvesting sugar cane in plantation, estates, (c) to engage in non-agricultural activities during slack periods when farm activities are not required, and to use family labour, has a desirable potential effect in lessening income inequalities among project allottees.

(9) In the pre-project situation, the majority of farmers was shifting cultivators as well as agricultural labourers. "Chena" farming was a supplementary which was an integral part of the farm household activity. The major problem was unpredictable rainfall on which the success of the shifting farming system depended. This caused a low morale among farmers who had neither liquid cash nor assets, nor produce, nor any alternative means of land use and farm resources application.

The proposed settler modernization programme under the Sevenagala Sugar Development Project envisaged to create an economically viable intensive farm unit provided with improved irrigation facilities, extension service, and agro-inputs. However, the present study reveals that the economic system on which they depend at present on other than irrigated sugar cane farming. The different activities have provided stability to the farm household economy in the project area. The farmers have proved that, by the due to the

labour allocation patterns in sugar cane cultivation, and by the state of provisions of family and hired labour availability a farm household can manage more land than the present extent of cultivation.

(10) At present sugar cane is cultivated soley for use in the sugar factory. According to officials as well as farmers all sugarcane produce was bought by the sugar factory. There are possibilities for other marketing channels to install small scale juggary making plants where sugarcane can be supplied at a higher price than which is afford by SLSC. The arrangements made by the SLSC for purchasing sugar cane products from the farmers were highly criticised by the farmers due to delays committed in issuing permission for cutting, weighing of production at the factory premises, and in purchasing and payments.

(11) The set-up of organizational arrangements for the supply of production inputs for sugar cane cultivation was satisfactory. Though some farmers complained of delays in delivering of fertilizer and other chemicals. According to the farmers this has happened because some field level extension officers had not visited the farms, as shown in the scheduled field visit programmes.

(12) The agricultural extension resources currently provided for servicing the sugar cane farmers in the project area were reported to be inadequate. The training facilities provided for the present extension personnel were also insufficient. The discussion held with officials as well as with farmers based on a few selected indicators which were used to assesws the degree of farmer contacts with the extension activities indicated a remarkably low farmer interaction with field workers, except in Ginigalpalessa village. Ginigalpalessa farmers reported that their field officers often visited the farms, and he was tactful with the farmers when he explained the know-how of particular farming activities.

(13) The information collected on water management did not indicate signs of unequal water distribution according to the location of farm plots. Water was provided to fields in specific turn outs, once in 10-12 days, as the extension officer recommended. Water requirement for a plot depended on the soil texture and the slope of the farm. The farm plots in the same tract

(a number of farms) can vary in farm characteristics i.e texture of soil and slope etc. Water requirements for the farms may even depend on climatic conditions. The irrigation provided to the farms once in 10.12 days was enough just to monitor the plot for a few hours. Some parts of the plot did not receive water due to poor levelling and land preparation. These matters should be taken into consideration in irrigation and land preparation activities.

(14) The project officials reported that there were no disputes reported on water issues and damages to irrigation structures. When development is completed there can be water management constraints, providing irrigation for nearly 2500 farms. Water can be a scarce resource to the project, and therefore due attention should be paid to this aspect.

8.2 Conclusions and Policy Implications

The presentation of this survey highlights observation on land settlement and agricultural problems in the Sevenagala Sugar Development Project on a request from the Secretary, Ministry of Agricultural Development and Research who recognized the urgent need to understand the conditions prevailing in the project, which need careful handling of the sugar industry in the country. This report is aimed at furnishing knowledge on the causes and consequences of the non-achievement of project objectives during the implementation period, which commenced in 1980. Though the Sevenagala project is in its 4th and 5th years of implementation, the infrastructure development target was dampened by various implementation difficulties born of management and administrative realities. As much of this report is concerned with diagnosing problems and identifying solutions, it conveys excessive management constraints faced by the SLSC. There are few effects such as:

(1) failure to keep up with targets of infrastructure development;

(2) lack of adequately planned extension programmes for (except in Ginigalpallessa village) sugarcane cultivators in the project

(3) poor education, health and sanitary facilities; and

(4) unsatisfactory collateral relationship (which are a necessity for a successful project development) between settlers and project officials.

8.2.1 Implementation

(1) The problems associated with the sugar industry, both in the plantation and the settlement sector are due to an inadequate development of infrastructural facilities that are essential for cane cultivation and management. Such difficulties have inhibited adequate expansion of the cultivation of sugar cane causing insufficient supply of sugar cane to the sugar factories. In some projects external management difficulties were partly responsible for such unsatisfactory situations.

(2) Inefficiencies in the use of capital, laobur, machinery and equipment and other associated inputs had decreased the expansion of areas cultivated with sugar cane. Thus the inadequate supply of raw material to the factory was the result rather than the cause, of the main industrial problems arising in the sugar development projects in the country. The overall agricultural and industrial problems in Sugar Development Projects in Sri Lanka can be related to some aspects of overall agricultural production and industrial relations that exist in the country. From this perspective, we could go on to examine the economic forces that have increased the use of modern technology in farm husbandry, namely use of fertilizer, chemicals, farm machinery and use of high yielding varieties which have paved the way for expansion in areas cultivated with food crops, thus increasing production.

(3) Despite those forces which are causing rapid changes in use of technology and output, generally, well managed infrastructure development (irrigation & transport facilities) and efficiency of Project management are vital for the success of project programmes in any country. These lines of investigation have been adopted for assessing the present situation in the Sevenagala Sugar Development Project.

(4) The factors which influence farm production are, (i) use of inputs, (ii) output, (iii) productivity, (iv) labour use, (v) farm size, (vi) nature and skill of farm enterprenureship.

To test and exercise the effectiveness of such factors for the success of project programmes, there should be an actual project initiated production, farmers motivated for production, facilitated with irrigation (due to project conditions) provided with suitable lands. The Sevenagala

Sugar Development Project is a good example for a situation, where programmes are not implemented adeuately. This was evident from the fact that only 150 farmers (out fo about 2400 allottees settled in the project) could harvest their plant crop in the 1st quarter of 1988. This type of delay in the completion of project programmes cause heavy losses to farmers and the corporation.

(5) The mid term project evaluation team of ARTI, after considering the suggestions and criticisms made by the project level officials, leaders of farmer organizations, and individual farmers regarding the present system of project management, recommends the reconstitution of the project co-ordinating or sterring committee-cum-agricultural development and project management committee, and reformulate its functions and responsibilities. This would facilitate optimal participation by relevant professional of the project, and regional political leaders. This proposed project committee will be the Principal body subject oto the directions of the SLSC (Head office) and the Ministry of Agricultural Foods and Co-operatives, responsible for the direction and control of progress and sugar cane supply (row material to the factory) management development, research, extension and farmer welfare in the settlement sector.

(6) Living standards of project beneficiaries include the combination of living and labour conditions resulting in the prevailing levels of social production and systems. Therefore, living standars of the families in the project area are reflections of levels and composition of consumption and production conditions of labour utilization etc. In the project, sugar cane farmers are better off compared to non-sugar cane farmers. They have a good annual income and housing facilities, compared to their pre-project situations as "chena" cultivators. Farmers complained that instead of (o.75 ha. farm allottments) the present size of their allottments, they could easily manage even 2.0 ha. farms. Sugar cane cultivation has partly been mechanized by the corporation, as land levelling weed control and land preparation is done by the tractors belonging to the corporation. Farmers have to use manual labour for only planting, fertilizer application and harvesting activities. Thus, farmers will have more inputs and resources to cultivate more land instead of their present land of 0.75 ha. allottments. We suggest this issue to be considered in future planning of settlement projects. In irrigated

lands (0.75 ha) cost of production seemed to be lower. Economically when the size of farms are increased, the net profit of a farm household will further be increased. Therefore, we would like to suggest that instead of raising prices of sugarcane, the corporation can raise the size of allottments (alienated to settlers) to compensate the possible loss of income.

8.2.2 Cost of Production

This section attempted to reveal the significant features of sugarcane production in the settlement sector in the Sevanagala Sugar Development project area. Emphasis was on the social and physical aspects relating to cultivation of sugarcane in a commercialized small holder farming system.

Therefore, objectives of this part have been further developed as:

i. Estimation of cost of production of sugar cane by small holder cane growers (project settlers)

ii. Developing a suitable framework for pricing of sugarcane, particularly for smallholder farmers, and

iii. Assessment of the relative advantage of SLSC. sponsored smallholder sugar cane cultivation system initiated under the land settlement and irrigation schemes.

Detailed statistics of cost of production and yield are given in the Appendix III, Part II, Table 2.1, which is annexed at the end of this report. All the farmers interviewed had harvested their plant crop in 1988. The plant crop grown by the smallholders recorded the highest yield compared to Hingurana, Kantalai and Moneragala regions. The yield of sugar cane in Sevanagala project area ranged between 30 mt. per farm to 130 mt. per farm of 0.75 ha. The general average yield per farm was 90.63 mt. Use of improved varieties and adequate use of proper inputs used in time, has been the main reason for obtaining higher yields in the project area, The average cost of production of plant crop (cash cost and non-cash cost) is Rs.20,882.69 per farm 0(0.75 ha.) and average cost per metric tone is Rs.230.41 (cash input per one tonne of sugar cane is Rs.202.35, which non-cash input is Rs.28.06). The factory buys one Mt. of sugar cane at the rate of Rs.450.00 for burnt cane and Rs.500.00 mt. for unburnt cane from the farmers, thus the farmer receives a net-return of about Rs.320.00 from selling a ton of sugar cane. According

to different yields received by the farmers, a farmer can receive a net profit between Rs.9,600.00 and Rs.40,000.00 from the sale of his sugarcane. The reported average net profit received by a farmer (excluding all the expenditure) is Rs.27,280.00

On the average, the requirement of sugarcane for production of sugar, range between 8-10 mt. for producing one mt. of sugar due to variation in RCS values (recoverable commercial sugar) in sugar cane. In the case of Sri Lanka, the rates of recoverable commercial sugar can be varied from 10-14 mt. At the highest rate, 14 mt. of sugarcane (worth Rs.7,000.00) is needed to produce one mt. of sugar (worth Rs.20,000.00 - 30.000.00). Therefore, sufficient increase in price of sugarcane is necessary in order to maintain the absolute advantage of sugar cane cultivation, when compared with the competitive profit margins obtained from paddy and subsidiary food crops. Sugarcane pricing can be used as a tool to popularise the sugarcane cultivation among farmers. A considerable increase in sugarcane price can be done without increasing the present consumer sugar price; and such as increase in price of sugarcane can be an incentive for the farmers, and motivation factors for lagged farmers who have not shown satisfactory yields during the past to grow the crop with greater interest.

8.2.3 Research and Extension

(1) There should be a complete re-organization of sugar cane research and advisory services in the project area. Though an individual autonomous Research Institute has been set-up in the Uda-Walawe Project area, its programmes have not influenced the advisory service in the Sevanagala Sugar Development Project area in a satisfactory manner.

(2) The research and training activities of the Sugar Research Institute will have to be changed and reorganized to cope with the government sugar development programme. The government has planned to cultivate sugar cane in special projects managed by SLSC. This project will have corporation sponsored plantation estates, and land settlement based (irrigated and non-irrigated) sugar cane cultivation schemes, which are to be established in various agro-climatic regions in the country. Even in one single project area, soil texture and irrigation facilities can be varied. These types of micro variations of fields can effect the yield. On the other hand, different research and training programmes have to be formulated in different agro-climatical regions as the government intends to expand sugar

industry in other areas of the country. Specifically, sugar research can be conducted on varietal improvements, response to input-use, farming systems and extension approach, and organizations. Experimental farms can be located in specific regions. In such experimental farms which are located in "Yala" of farmers fields, various possible alternative practices would be investigated and evaluated on an economical basis.

(3) The essential function and effort of these experimental farms will evolve new techniques and methods of sugar cane cultivation, including the use of inputs for adoption by farmers. This mechanism does not happen in the project at the moment. At present the advisory staff is merely trying to apply methods of sugar cane cultivation in the plantation sectors of the SLSC; in Kantalai and Hingurana areas. These methods seem to be rather outdated and hence have failed to give satisfactory results. At present links between the project advisory service and the Sugar Research Institute are not satisfactorily developed. Therefore, experimental farms have to be located in sugar cane farming areas, and should function partly as part of the extension and advisory service of the project.

(4) The sugar cane cultivation project should have to be manned by fully qualified extension programming officials with a certain amount of training and experience in rural extension and advisory activities. People involved in farm level extension should have relevant qualifications and training in extension activities. At present a majority of extension programming and supervisory staff, as well as the farm level extension staff of the project have not obtained substantial educational and training qualifications to serve as agricultural extension officers.

(5) Farmers were not using their homesteads, because of extension problems. Farmers reported irrigation problems (in most parts of the project) mainly arising from improperly organised extension and irrigation management communication systems, existing in the project area. Most farmers in low yielding tracts reported that inputs given as credit i.e. fertilizer and chemicals etc. were not suplied in time. Late application of fertilizer will cause a bulk growth of sugar cane reducing the levels of sugar contents. In an industrial viewpoint, sugar cane growing for the sugar factory should be cultivated and supplied to meet the sole requirements (high quality cane) of the sugar industry.

(6) All the farmers had used improved sugar cane varieties and fertilizer as delivered to farms by extension officers at recommended quantities. But the method of application and time varied contrary to extension advice. Extension had advised farmers to use "gramaxone" as a weed control chemical and most farmers had experienced its bad effects on the yield. However, SRI highlights that the variety widely used in the "plantation sector" is unsuitable to be used in some parts of the project. Therefore, SRI's priority has been the "varietal improvement" to provide the industry with improved varieties of sugar cane for different agro-ecological regions and provisions of certified seed material.

8.2.4 Training Needs in the Extension and Settlement Welfare Sector

(1) In this aspect, we could identify certain levels of training needs which the SLSC will have to take into consideration. At present, in SLSC sponsored projects (i.e. even Hingurana, Kantalai and Sevanagala) post-experience and in-service training facilities are provided (not adequately) to the Extension officers. In this training, there is atendency for the courses on offer to be narrow and linked to this inadequately designed programmes which are prepared for certain requirements of the Corporation. Thus, it was recommended that higher level extension Officials (Supervisors and Programmers) to have a Diploma or Masters level training in extension and farmer organisations. The other officers, factory managing staff and factory technicians as well as settlement welfare officers also require academic, post experience and in-service training in their disciplines.

8.2.5 Field Problems (settlement sector)

(1) The project managers, extension and welfare officials of the settlement sector of the project have given less attention to the needs of the farmers than which is requested by them individually as well as through farmer committees. Farmers have complained about difficulties with regard to the use of chemicals, irrigation and water loggings (drainage condition) and wild animal damages. About 80% of sample farmers stated that their complaints were unheeded by the officers.

(2) The Farmers' Committees (one committee for a "KVS" area where there are 100 farmers) were established in the project in 1986. These committees were not functioning during the reference period. This could be seen as a major shortcoming arising out of prevailing weaknesses of the project settlement management. The establishment of farmer organizations in order to overcome such bottlenecks is therefore, suggested.

8.2.6 Rainfed Sector ("Plantations" of the Corporation)

(1) It was programmed to cultivate about 2190 ha. with sugar cnae on rainfed basis under SLSC's plantations, organised as a nucleus estate. By 1988 SLSC cultivated only about 1350 ha. due to unavoidable reasons faced by the corporation. Major constraints ecncountered by the corporation were the lack of labour for land development and plantation activities, and non-availability of sufficient machinery for land preparation work. On the other hand, management of such a big extent of land with timely taking crop protection and input use activities was also another set back encountered by the Plantation Division of the project. In 1988, crushing seasons the "Plantation Sector" supplied only 97,774 mt. of sugar cane to the factory for crushing. This was not sufficient compared to the extent cultivated in the "Plantation Sector" at the Corporation's cost. The average yield from the plantation sector in 1988 was 69.89 mt. per ha. Thus, the plantation cost per metric ton of sugar cane was Rs.1,231.43 in 1988 (SLSC 1988). This production cost seems too high compared to settlement sector as it was averaged to Rs.230.41 per metric ton of sugar cane in the settlement sector (Appendix III, Table 2.1).

(2) Rainfall is the only source of water for the plantation sector as these areas comprise unirrigable highlands. During the reference period crop damages from severe droughts were frequently reported in these areas. The incidence of crop dmages caused by wild animals (including elephants, wild pigs) caused a heavy loss to the corporation, loss of more than 12,000 mt. of sugarcane in addition to expenditure for security services. Settlement of allottees along the border areas (where wild animals crossed the boundry) could be an alternative step to avert crop damages from wild animals.

8.2.7 Marketing

(1) Availability of Marketing/Processing Facilities (Sugar Cane)

The entire farmers' cane are purchased by the SLSC at a guaranteed price, based on quality. At present the buying price of cane by SLSC is Rs.500.00 per mt. where the quality is fixed at 8.5% R.C.S. (Recoverable Cane Sugar), minimum.

(2) Marketing of Food Crops

In the settlement sector, Co-operative and other marketing organizations could ensure better prices to the farmers who are cultivating subsidiary food crops in their non-irrigated farm plots. Since most farmers are used to cultivating unused reservation lands (uplands) with food crops, there could be a large amount of marketable surplus of vegetables from the next crop season in the project area.

8.2.8 Factory Requirement and the Cost of Sugar Production

Sevanagala Sugar factory has a capacity of 1250 mt. to be crushed a day. The factory was still running under capacity as sugar cane harvested in the project was still not sufficient to fulfill the factory requirements. In 1988 crushing seasons, sugar cane crushed by the factory per day was averaged to 975 metric tons. The two seasons duration was 158 crushing days, which was remarkably a short period. Out of the factory production capacity of 27,000 mt. of sugar per year, the factory was producing only about 9,000mt. to 11,000 mt. per year since 1987. As the factory was running under cpacity, the cost of sugar production was unfavourable; the average cost of sugar production was reported as Rs.18.25 per kg., in 1988. Any reduction in production costs incurred in sugar cane plantation can be hopefully affected by reducing the cost of production of sugar, even at the existing level of sugar cane supply (limited crushing extent) to the factory.

The data suggested that although the implementation and construction work of the project had commenced as planned, completion had delayed. The factory was completed and commissioned to the SLSC only in 1986. Accordingly large scale sugarcane cultivation in the "plantation sector" started only in 1985. Therefore, a comprehensive evaluation exercise was not possible at this juncture; and the present study discussed only the performance of various socio-economic indicators for the period of1986-1988.

BIBLIOGRAPHY

ADB (1978), Appraisal of Sevanagala Development Project - in the Democratic Socialist Republic of Sri Lanka, ADB, Bangkok, 132 p.

ADB and SLSC (1978), Sevanagala Sugar Development Project - Final report, Colombo, 86 p.

Amarasena, B and Perera, Maxie, (1989), Sugar Industry in Sri Lanka, (Memeographed) 13 p.

Dharmawardane, N. (1989), Sugar Cane Research Policy Out-line, SRI, Colombo, 11 p.

Henegedara, Mahinda, (1989), Cost of Production of Paddy in Selected Two Districts, ARTI (Memeographed).

Ponnambalam, Satchi (1981) Dependent Capitalism in Crisis: The Sri Lankan Economy; 1984-1980, London, Zed Press, xiii, 233 p.

SLSC (1986-1988), Annual Reports, Colombo.

SLSC (1986, 1987), Progress Reports of the Settlement and Extension Division, (Memeographed).

SLSC (1988), Progress Reports of the Settlement and Extension Division, (Memeographed)

University of Colombo (1980), Baseline Study-Sevanagala Project, Statistical Tables; (Memeographed).

Wickramarachchi, P. (1989), Cost of Production of Paddy in Irrigated Schemes, ARTI (Draft report).

Appendix I - A

Sampling Procedures

Taking into consideration, the issue and characteristics existing in the project area, the sampling method used is a stratified simple random sample. The total number of settlers are 2397 all of whom have been allotted homestead land. The settlers can be divided into two categories those who have been allotted sugar cane land for cultivation and those who are still to be allotted land for cane cultivation.

The sub-unit (village) is taken as a strata for the purpose of sampling. From each strata a sample of 10% or a minimum of 10 whichever was lower have been chosen. (See Table 1).

Based on this criteria, a total sample of 161 farmers were chosen for the farm survey. This represents about 6% of the total. Of the sample, 98 farmers belong to the category of cane cultivators and the remaining 63 belong to the category of non-sugar cane cultivators.

Table 1

Sample Population

Sub-unit (Village)	Total No. of allottes	No. of allottees who are given land for cane cultivation		No.of allottees who are not given land for cane cultivation	
		Total	No. selected	Total	No. selected
1	599	316	30	283	30
2	234	9	9	234	10
3	140	33	10	107	10
4	93	0	-	93	-
5	177	93	10	84	10
6	186	0	-	186	-
7	117	58	10	59	10
8	46	0	-	46	-
9	269	0	-	269	-
10	344	0	-	344	-
11	28	0	-	28	-
12	105	0	-	105	-
13	59	53	10	6	6
Total	2397	562	79	1844	76

* Selected for the survey

Source : Socio economic survey 1988, ARTI.

Type of Data to be Gathered and Methods of Investigation

The data and information that were gathered in this investigation centred around the following;

i. Composition of the farm household by age, sex and marital status;

ii. Education status of farm household;

iii. No. of children attending school;

iv. Trends in production, cost of production and profits in the sugar cane farming in the project area;

v. Changes in the use of purchased inputs;

vi. Existing extension services and other agro-supportive services in the project area;

vii. Ownership pattern of land holdings;

viii. Size of farm holdings and area cultivated by farm family;

x. Farm inputs, use of seeds, use of fertilizer, pesticides and cultivation methods used etc.;

xi. Farm outputs (sugar cane tons, paddy bushels and other crops);

xii. Planted area and yield by crop;

xiii. Farmgate prices of crops cultivated; and

xvi. Status of credit, extension and related services and management activities

For the survey of some aspects of social welfare and living conditions at the household and village level, the sources that were examined will include;

(a) Emergence of small and cottage industries;

(b) Housing conditions and facilities available for the households;

(c) Health and medical facilities available at the project land;

(d) Number of schools and types of schooling facilities available and

(e) Public transport facilities, etc.

Data Base

Bulk of this study data is gathered through a farm level survey. The survey was conducted in March-May 1988. The farm survey was undertaken using a structured questionnaire.

Appendix I - B

Distribution of Sample Households by Villages

Name of the village	Sugar cane harvested		Sugar cane not yet harvested		Non-sugar cane cultivators	
	Identification Numbers	Total No. of houses	Identification Numbers	Total No. of houses	Identification Numbers	Total No. of houses
1. Sevanagala	From: 101 To : 113	13	From: 201 To : 224	25	From: 301 To : 323	23
2. Moraketiya	From: 114 To : 117	4	From: 225 To : 227	3	From: 324 To : 336	13
3. Indikolapelassa	-	-	From: 228 To : 253	25	337	1
4. Muthuminigama	From: 118 To : 128	11	-	-	From: 338 To : 349	12
5. Ginigalpelessa	From: 129 To : 140	12	-	-	From: 350 To : 358	9
6. North Sevanagala	-	-	From: 254 To : 263	10	-	-
Total		40		63		58

Source : ARTI, Socio economic survey 1988.

Appendix 2

Socio Economic Indicators

Objective	Programme	Indicators
Annual Net Income	1. Own cultivation Sugar Paddy Other crops	1. Allotted (1) Size of allotment 1. Sugar 2. Paddy 3. Homestead
	2. Agricultural labour Sugar cane Others 1. Land preparation 2. Planting 3. Cultural practices 4. Harvesting	2. Encroached - Size of allotments 3. Rented/Leased/- Size of Mortgage allotments 4. Total production from allotments Sugar cane Paddy Other crops
	3. Leasing in of land to cultivators	
	4. Off-farm employment Agriculture Non-agriculture	5. Cost of fertilizer, pesticide, weedicide, irrigation and harvesting (a) Sugar cane (b) Paddy (c) Other crops
	5. Other sources of income - rent - trading - gifts - arts	6. Labour cost per day (a) Land preparation (b) Cultural practices (c) Harvesting (d) Transporting
		7. Income from agriculture Sugar Paddy Other crops Rs./day/month
		8. Leasing Cost/acre
		9. How many days a month Rs./day

Source : Socio economic survey 1988, ARTI.

Objectives	Programme	Indicators
Employment Occupation creation - Own land - Sugar cane Plantation	1. Seasonal employment co-operation 2. Permanent employment	1. Employment in terms of (mandays) Own land - time of the year Outside - distance Harvesting No. of days/month Rs/day 2. Non-executive Salary Permanent - Non-skilled Skilled Casual - Non-skilled Skilled Permanent labourers 4. Other source of employment-composition
Training		
Social equity	Living conditions 1. Education 2. Income 3. Housing 4. Employment 5. Health facilities 6. Sanitation 7. Drinking water 8. Organisation	MEASUREMENTS 1. No. of schools distributed-location i. Physical structure of schools 2. Source of income - Agriculture Animal husbandry Non-Agriculture 3. Ownership of house - Rent Lease Own 4. Type of house - Semi permanent - Permanent - No. of rooms - Type of wall - Type fo roof - Floor area

Objective	Programme	Indicators
		4. Type of employment - Farmers Agric. Labourers Labourers Others
		5. Health - No. of dispensaries No. of doctors Midwives
		6. Sanitation - Latrines
		7. Drinking water - Wells - Taps Village - Others Distance from others to the sources of water
		8. Organization - Rural Development Society - Co-operative Society - Community Dev. Society - Young Farmer's Society - Welfare - Sports Clubs - Women's Association

Appendix 3

Statistical Tables

Part One - Socio Economic Characteristics

Table 1.1

Distribution of Sample Population by Age and Sex

Age Groups	Male		Female		Total	
(in years)	No.	%	No.	%	No.	%
1 - 5	73	14.9	55	12.4	128	13.7
6 - 14	146	29.8	164	37.0	310	33.2
15 - 30	128	26.1	118	26.6	246	26.4
31 - 64	133	27.1	103	23.3	236	25.3
Over 65	10	2.0	3	0.7	13	1.4
All Ages	490	100.0	443	100.0	933	100.0

Source : Socio economic survey 1988, ARTI.

Table 1.2

Distribution of Sample Population (Age 5 years & over) by Level of Education

Level of Education	Male		Female		Total	
	No.	%	No.	%	No.	%
Illiterate	50	11.34	62	15.54	112	13.33
Grade 1 to 5	233	52.83	217	54.39	450	53.57
Grade 6 to 10	112	25.40	87	21.80	199	23.69
Passed G.C.E(O/L)	13	2.95	14	3.51	27	3.21
Passed G.C.E(A/L)	3	0.68	1	0.25	4	0.48
Graduate & Higher Technical Training	0	0.00	1	0.25	1	0.12
Not reported	30	6.80	17	4.26	47	5.60
All	441	100.00	399	100.00	840	100.00

Source : Socio economic survey 1988, ARTI.

Table 1.3

Number and Percentage Distribution of Households According to the Number of Occupants

No. of Occupants	Households	
	No.	%
1 - 3	18	11.18
4 - 6	87	54.03
7 & over	56	34.78
Total	161	100.00

Source : Socio economic survey 1988, ARTI.

Table 1.4

Characteristic of Labour Force

(Person in 15-64 years age group)

Characteristics	Sugar Cane Cultivation		Non Sugar Cane Cultivators	Project Area
	(Harvested)	(Non Harvested)		
Propotion of the labour force in the sample	55.08	50.14	50.88	51.66
Percentage of female in the labour force	48.00	23.00	43.00	46.00
Size of Male labour force in the sample	67.00	95.00	99.00	261.00
Size of Female labour force in the sample	63.00	84.00	74.00	221.00

Source : Socio economic survey 1988, ARTI.

Table 1.5

Distribution of Sample Population (age 15 years and over) by Primary Activities and Status of Sugar Cane Cultivation

	Sugar Cane Cultivators (Harvested)		Sugar Cane Cultivators (Non Harvested)		Non Sugar Cultivators		Total	
	No.	%	No.	%	No.	%	No.	%
Employed	70	31.36	109	31.65	92	29.12	271	30.65
Unemployed	5	2.54	15	4.48	12	3.82	32	3.75
Housewife	29	12.29	41	11.48	43	12.65	113	12.11
Students	13	17.80	12	24.93	10	28.53	35	24.44
Disabled and Retired	0	0.00	2	0.56	1	0.29	3	0.32
Not Reported	18	36.02	6	26.89	17	25.59	41	28.72
All	135	100.00	185	100.00	175	100.00	495	100.00

Source : Socio economic survey 1988, ARTI.

Table 1.6

Indicators of the Extent of Employment

Indicators	Sugar Cane Cultivators		Non Sugar Cultivators	Project Area
	(Harvested)	(Non Harvested)		
Percentage Employed in the Sample	7.93	12.11	10.61	30.65
Percentage Employed in the Labour Force	14.52	22.61	19.09	59.34
Percentage Employed in the Economically Activity Sector	92.50	87.60	88.39	89.10

Source : Socio economic survey 1988, ARTI.

Table 1.7

Number and Percentage of Persons Engaged in Secondary Occupation by Sex

Sex	Sugar Cane Cultivation (Harvested)		Sugar Cane Cultivation (Non Harvested)		Non Sugar Cane Cultivation		Project Area	
	No.	%	No.	%	No.	%	No.	%
Male	30	58.82	66	51.97	67	57.76	163	55.44
Female	21	41.18	61	48.03	49	42.24	131	44.56
Total	51	100.00	127	100.00	116	100.00	294	100.00

Source : Socio economic survey 1988, ARTI.

Table 1.8

Indicators of the Extent of Unemployment

Indicators	Sugar Cane Cultivation		Non Sugar Cultivation	Project Area
	(Harvested)	(Non Harvested)		
Percentage Unemployed in the labour force	4.62	8.94	7.51	7.26
Percentage Unemployed in the economically active sector	7.50	12.40	11.61	10.90

Source : Socio economic survey 1988, ARTI.

Table 1.9

Composition of Average Annual Household Income

Source of Income	Sugar Cane Cultivators (Harvested)		Sugar Cane Cultivators ((Non Harvested)		Non Sugar Cultivators		Project Area	
	Rs.	%	Rs.	%	Rs.	%	Rs.	%
Farming	48042	94.6	3665	37.5	224	2.0	13451	65.6
Salaried	300	0.6	133	1.4	186	1.7	194	0.9
Self Employment	1110	2.2	0	0.0	1203	10.7	709	3.5
Hired Labour	733	1.4	1803	18.4	5620	49.9	2912	14.2
Living Subsidy (given by SLSC)	0	0.0	3000	30.7	2904	25.8	2220	10.8
Food Stamps	598	1 2	1181	12.1	1123	10.0	1015	5.0
All	50782	100.0	9783	100.0	11260	100.0	20501	100.0

Source : Socio economic survey 1988, ARTI.

Table 1.10

Distribution of Household According to Source of Income

Source of Income	Sugar Cane Cultivators				Non Sugar Cultivators		Project Area	
	(Harvested)		(Non Harvested)					
	No. of Hous.	%	No. of Hous.	%	No. of Hous.	%	No. of Hous.	%
Entirely Farming Sources	18	45.0	0	0.0	0	0.0	18	11.2
Farming & Other Sources	21	52.5	56	88.9	5	8.6	82	50.9
Entirely Other Sources	1	2.5	7	11.1	53	91.4	61	37.9
All Sources	40	100.0	63	100.0	58	100.0	161	100.0

Source : Socio economic survey 1988, ARTI.

Table 1.11

Distribution of Sample Population by Main Occupation and Sex

Main Occupation	Sample Population					
	Male		Female		Total	
	No.	%	No.	%	No.	%
Farming	123	25.10	32	7.22	155	16.61
Labourers	85	17.35	13	2.93	98	10.50
Monthly Wage Earners	4	0.82	1	0.23	5	0.54
Self Employed	18	3.67	10	2.26	28	3.00
Housewife	1	0.20	112	25.28	113	12.11
Student	103	21.02	125	28.22	228	24.44
Unemployed	20	4.08	15	3.39	35	3.75
Disabled	0	0.00	3	0.68	3	0.32
Not Reported	136	27.76	132	29.80	268	28.72
All	490	100.00	433	100.00	933	100.00

Source : Socio economic survey 1988, ARTI.

Part Two - Cost of Production : Sugar Cane Cultivation

Table 2.1

Cost of Production Per-farm - Sugar Cane Cultivation

Operation	Number of Man Days						Cost of Labour			Cost of Other Inputs				Total Cost	
	Family		Exchange		Hired		*Family Exch.	Hired	Cont.	Total	Transport			Other Inputs	Value	%
	M	F	M	F	M	F					Own	Hired	Corp.			
A	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1606.38	1606.38	8.4
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2405.00	2405.00	12.6
C	10.4	5.3	1.8	0.8	24.8	3.0	628.5	999.0	0.0	1628.0	0.0	0.0	0.0	0.00	1628.00	8.6
D	5.32	1.1	0.0	0.0	0.8	0.0	223.1	23.0	0.0	246.1	0.0	0.0	0.0	0.0	246.13	1.3
E	8.77	7.12	0.0	0.0	16.8	2.5	543.6	767.9	0.0	1311.5	0.0	0.0	0.0	272.15	1583.15	8.3
F	3.65	1.30	0.0	0.0	2.1	0.0	188.6	94.6	0.0	283.3	0.0	0.0	0.0	1580.86	1864.11	9.8
G	17.5	2.82	0.0	0.0	0.6	0.0	685.3	25.0	0.0	710.3	0.0	0.0	0.0	0.0	710.25	3.7
H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0
I	3.42	0.15	0.0	0.0	63.2	16.9	170.9	4691.0	0.0	4862.3	0.0	0.0	0.0	0.0	4862.25	25.6
J	1.62	0.15	0.0	0.0	2.3	0.1	55.9	0.0	514.4	570.3	47.0	5331.6	28.0	0.00	5976.80	31.4
ALL	50.7	17.9	1.82	0.8	110.0	22.4	2495.9	6601.4	514.4	9611.6	47.0	5331.6	28.0	5864.39	20882.57	100.0

* Imputed value

A - Seed Cane Value & Seed Cane Transport

B - Ploughing (Paid SLSC)

C - Land Preparation & Planting

Source : Socio economic survey 1988, ARTI.

D - Fencing and Clearing Canals

E - Weeding

F - Fertilizer Application

G - Watering

H - After Care

I - Transport

J - Transport

Table 2.1 cont.

Input-Output Relationship - Average Farm Household Data

Average yield per farm (in tons)	:	90.63
Value of family and Exchange labour used (in Rs.)	:	2495.90
Value of own transport (in Rs.)	:	47.00
Value of hired labour used (in Rs.)	:	6601.40
Contract cost (in Rs.)	:	514.40
Value of other inputs used (in Rs.)	:	11223.99
Total value of cash input used (in Rs.)	:	18339.79
Total value (cash input + non-cash input)	:	20882.69
Cost of production per one ton to sugar cane (in Rs.)	:	230.41
Cash input per one ton of sugar cane (in Rs.)	:	202.35
Non cash input per one ton of sugar cane (in Rs.)	:	28.06
Gross farmgate value of production Rs.	:	45611.69

Source : Socio economic survey 1988,ARTI.

Table 2.2

Average Yield of Sugar Cane by Villages in the Project

Villages	No of Farmers	Total Production (In Tons)	Average Yield (In Tons)
Sevanagala	13	921.09	70.85
Moraketiya	4	288.00	72.00
Muthuminigama	11	1059.09	96.28
Ginigalpelessa	12	1357.19	113.10

Source : Socio economic survey 1988, ARTI.

Part Three - Input Use and Extension Service

Cultivators-not Harvested

Table 3.1 - A

Sugar Cane Cultivators by Year of Settlement in the Project and Year of Commencing Sugar Cane Cultivation

Year of Settlement in the Project Area	No. of Farm Reporting	Year of Commencing Sugar Cultivation			
		1984	1985	1986	1987
1980	1	0	0	0	1
1981	9	0	0	1	7
1982	40	0	0	1	38
1983	1	0	0	0	1
1984	1	0	0	0	1
1985	0	0	0	0	0
1986	5	0	0	0	5
1987	5	0	0	0	5
1988	0	0	0	0	0

Source : Socio economic survey 1988, ARTI.

Cultivators Harvested

Table 3.1 - B

Sugar Cane Cultivators by Year of Residents in the Project and Year of Commencing Sugar Cultivation

Year of Resident in the Project Area	No. of Farm Reporting	Year of Commencing Sugar Cultivation			
		1984	1985	1986	1987
1980	2	0	0	2	0
1981	6	0	0	4	2
1982	12	0	0	2	10
1983	13	0	0	7	6
1984	6	0	0	2	4
1985	0	0	0	0	0
1986	1	0	0	0	1
1987	0	0	0	0	0
1988	0	0	0	0	0

Source : Socio economic survey 1988, ARTI.

Table 3.2

Crops Cultivated Prior to Settlement in the Project

Crops Cultivated	Number of Farmers Reported			
	Sugar Cane Cultivators		Non Sugar Cane Cultivators	Project Area
	Harvested	Not Harvested		
Sugar Cane	0	0	0	0
Paddy	7	7	17	31
Chena Crops	36	56	50	142
Banana	12	34	18	64

Source : Socio economic survey 1988, ARTI.

Table 3.3

Fertilizer Application

Harvested

Type of Fertilizer	Number Reporting	Amount Applied (Kg)
Basal Clusing	39	7750
Ammonium Sulphate (1½)	39	4900
Ammonium Sulphate (3)	39	4900
All	39	17550

Source : Socio economic survey 1988, ARTI.

Table 3.4

Fertilizer Application

Not Harvested

Type of Fertilizer	Number Reporting	Amount Applied (Kg)
Basal Clusing	63	12250
Ammonium Sulphate (1½)	63	7850
Ammonium Sulphate (3)	61	7650
All	63	27750

Source : Socio economic survey 1988, ARTI.

Table 3.5

Weed Control

Harvested

	No.	%
No. Reporting Chemical Weeding	3	7.50
No. Reporting Hand Weeding	11	27.50
No. Reporting Chemical & Hand Weeding	26	65.00
Not Reported	0	0.00
All	40	100.00

Source : Socio economic survey 1988, ARTI.

Table 3.6

Weed Control

Not Harvested

	No.	%
No. Reporting Chemical Weeding	4	6.35
No. Reporting Hand Weeding	32	50.79
No. Reporting Chemical and Hand Weeding	23	36.51
Not Reported	4	6.35
All	63	100.00

Source : Socio economic survey 1988, ARTI.

Table 3.7

Transport of Harvest

Mode of Transport	Number Reporting	Average Cost per ton	Total cost
Own vehicle	2	40.00	1880.00
Hired vehicle	37	74.62	5763.84
Corporation vehicle	1	28.00	1120.00

Source : Socio economic survey 1988, ARTI.

Table 3.8

Time of Seeking Advise from the Extension Staff

	Sugar Cane Cultivation	
	Harvested N1 = 37	Not Harvested N2 = 59
Land Preparation	27	50
%	72.97	84.75
Planting	33	56
%	89.19	94.92
Weeding	29	51
%	78.38	86.44
Irrigation	28	45
%	75.68	76.27
Application	28	43
%	75.68	72.88
Harvesting	24	9
%	64.86	15.25

Source : Socio economic survey 1988, ARTI.

Table 3.9

Supply of Inputs

Inputs	Number of Farmers	
	Received in Time	Not Received in Time
Fertilizer	37	3
Agrochemicals	37	3

Source : Socio economic survey 1988, ARTI.

Table 3.10 (A)

Borrowers of Loans by Purpose and Source of Loan

Category	Purpose of Loan	Number of borrowers		Source of Credit							
				Sugar Corporation		Money Lender		Friends		Not reported	
		1986	1987	1986	1987	1986	1987	1986	1987	1986	1987
Sugar Cane Cultivators (harvested)	Sugar Cane Cultivation	28	23	26	20	10	11	3	2	1	-
	Consumption	1	14	-	-	-	9	1	5	-	-
	Emergencies	-	1	-	-	-	1	-	-	-	-
Sugar Cane Cultivators (not harvested)	Sugar Cane Cultivation	-	56	-	36	-	37	-	5	-	-
	Consumption	1	7	-	-	1	6	-	-	-	-
	Emergencies	1	1	-	-	-	-	1	1	-	2

Source : Socio economic survey 1988, ARTI.

Table 3.10 (B)

Loans Obtained by Source and Purpose of Loan

Year (Category)	Purpose of Loan	Sugar Corporation			Money Lender							Friends				Not Reported	
		A	B		A	B						A	B			A	B
			5%	6%		0	10%	60%	120%	180%	240%		0	120%	240%		6%
1986 (Harvested)	Sugar Cultivation	3664 (26)	-	26	4950 (10)	1	1	-	3	4	1	5000 (3)	-	2	1	36000 (1)	1
	Consumption	-	-	-	-	-	-	-	-	-	-	1700	1	-	-	-	-
	Emergencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987 (Harvested)	Sugar Cultivation	11490 (20)	1	19	4682 (11)	-	-	1	9	-	-	2500 (2)	-	2	-	-	-
	Consumption	-	-	-	1967 (9)	-	-	-	6	3	-	920 (5)	4	1	-	-	-
	Emergencies	-	-	-	3000 (1)	-	-	-	1	-	-	-	-	-	-	-	-

A - Average amount obtained in (Rs) B - Distribution of Loans by interest paid

Source : Socio economic survey 1988, ARTI.

Table 3.10 - B

Loans Obtained by Source and Purpose of Loan

Year (Category)	Purpose of Loan	Sugar Corporation			Money Lender					Friends				Not Reported	
		A	B		A	B				A	B			A	B
			5%	6%		0	120%	180%	240%		0	120%	180%		120%
1986 (not harvested)	Sugar Cane cultivation		-	-	-	-	-	-	-	-	-	-	-	-	-
	Consumption	-	-	-	3000 (1)	1	-	-	-	-	-	-	-	-	-
	Emergencies	-	-	-	-	-	-	-	-	1000 (1)	-	-	1	-	-
1987 (not harvested)	Sugar Cane cultivation	1450	5	31	2814	-	19	11	7	3200	2	3	-	-	-
	Consumption	-	-	-	1533 (6)	-	4	1	1	-	-	-	-	1120 (1)	1
	Emergencies	-	-	-	-	-	-	-	-	1000 (1)	-	1	-	-	-

A - Average amount obtained in (Rs)
B - Distribution of Loans by interest paid

Source: Socio economic survey 1988, ARTI.

Part Four - Housing Conditions and Sanitation

Table 4.1

Distribution of Houses According to "Number of Rooms"

Number of Rooms	Number of Houses	Percentage (%)
One roomed	24	14.9
Two roomed	77	47.8
Three roomed	36	22.4
Four roomed	24	14.9
TOTAL	161	100.0

Source : Socio economic survey 1988, ARTI.

Table 4.2

Numerical and Percentage Distributions of Houses by Floor Areas

Floor Area (Sq. feet)	Number of Houses	Percentage of Houses (%)
Less than 250 Sq. f.	101	62.7
250 - 499	40	24.8
500 - 999	20	12.5
TOTAL	161	100.0

Source : Socio economic survey 1988, ARTI.

Table 4.3

Distribution of Farm Households According to Various Characteristics

Characteristics	Sub groups	Number of Houses	%	Total	Total %
1. Ownership of houses	i. Owner occupied	158	98.1	161	100.0
	ii. Rented/Leased	3	1.9	161	100.0
2. Ownership of land	i. Own (by original allottee)	160	99.0	161	
	ii. Leased out from the Farmer	1	1.0		100.0
3. Type of floor	i. Cement	24	15.0	161	
	ii. Mud	137	85.0		100.0
4. Type of walls	i. Brick	24	15.0	161	100.0
	ii. Clay/others	137	85.0		
5. Type of roof	i. Tiles/Aspastos/Metal Sheets	36	23.4	161	100.0
	ii. Cadjan/Iluk or others	125	77.6		
6 Type of kitchen	i. Detatched	137	85.0		
	ii. Undetatched	24	15.0	161	100.0
7. Availability of Drinking water	i. Within ½ Km.	126	79.0	161	100.0
	ii. Within 1 Km.	35	21.0		
8. Accessibility by vehicles	i. Yes	160	99.0	161	100.0
	ii. No	1	1.0		
9. Availability of electricity	i. Yes	0	0.0	161	100.0
	ii. No.	161	100.0		
Total Houses		161		161	100.0

Source : Socio economic survey 1988, ARTI.

Table 4.4

Number and Percentage of Households having Selected Household Items/Transport Facilities

	Item/Transport	No. of Total houses in the sample	No. of households, owned	Percentage of household owned (%)
1.	Wrist Watch	161	82	50.9
2.	Other clocks (Table or wall)	161	45	27.9
3.	Torch	161	158	98.2
4.	Petromax Lamp	161	6	3.8
5.	Radio	161	136	84.5
6.	T.V. sets	161	02	1.3
7.	Cassette Recorder	161	20	12.5
8	Sewing Machines	161	18	11.2
9.	Kerosene cooker	161	-	-
10.	Wardrobe	161	06	3.8
11.	Set of Furniture	161	02	1.3
12.	Carts	161	06	3.8
13.	Bicycles	161	120	74.5
14.	Motor Cycles	161	-	-
15.	Tractors (4&2 wheel)	161	02	1.3
16.	Lorries	161	-	0.6
17.	Cars	161		-

Source : Socio economic survey 1988, ARTI.

Table 4.5

Number of Different Types Farm Equipments Owned by All Household and Per 100

Farm Equipment	No. owned by households	No. of the Sample household	No. owned per 100 household
1. Mammoty	186	161	115.6
2. Plough (Wooden)	26	161	16.2
3. Plough (Iron)	12	161	7.6
4. Sprayers	3	161	1.9
5. Duster	-	161	-
6. Tractor - 2 wheel	1	161	0.7
7. Tractor - 4 wheel	1	161	0.7

Source : Socio economic survey 1988, ARTI.

Table 4.6

Source of Water and Availability of Lavatories

Source of water/ Availability of Toilet	No. of sample houses	No. of Households owned/or obtained services	Percentage (%)
1. Own well or pipe			
i. Drinking	161	08	4.9
ii. Bathing	161	12	7.5
2. Nearby well (Tube wells) constructed by SLSC	161	161	100.0
i. Drinking	161	161	100.0
ii. Bathing	161	30	18.6
3. Tank or river			
i. Drinking	161		-
ii. Bathing	161		28.0
4. Irrigation channel			
i. Drinking	161		-
ii. Bathing	161		54.0
5. Availability of Lavatories			
i. Yes	161		28.6
ii. No	161		71.5

Source : Socio economic survey 1988,ARTI.

Part Five - Service Centres

Table 5.1

Distance	Location of Basic Service Institutions
3 Km	School primary
	Temple
	Bus route
5 Km	Co-operative shop (sugar cooperation project management office)
	School secondary
	Monthly held Health Clinics
	Village Fair (Pola)
	Private (Aurvedic) Despensory
8 Km	School Science (O/L)
	Bazaar
	Post-office
16 Km	School Science A/L
	Hospital
	Bank
	Police Station

Table 5.2

State Sector Facilities in the Project Area

Facilities	Number of existing	No. to be established at full development stage
1. Hospitals and dispensaries	01	03
2. Schools	04	04 (extended to Gr.12)
3. Agrarian Service Centres	-	01
4. Verterinary Service Units	-	01
5. Cooperative shops	01	03
6. Post offices	-	01
7. Police Stations	-	01
8. Banks	01	02
9. Health Clinics	01	06
10. Bazaar (Town Centres)	-	02

Source : Socio economic survey 1988, ARTI.

Table 5.3

Schools in the Project Area

Category	Number (existing)	No. to be established at full development stage
1. Primary schools	02	02 (extended to Gr. 12)
2. Secondary schools	01	02
3. Maha Vidyalas with science O/L & A/L	-	01
4. Madya Maha Vidyalas	-	-

Source : Socio economic survey 1988, ARTI.

Table 5.4

Source of Loans Obtained by the Sample Farmers

Source	Frequency	Percent
1. Loans given by the SLSC	03	82.0%
2. Banks	01	7.0%
3. Money Lender	06	6.0%
4. Friends and Relatives	04	6.0%
5. Others	01	1.0%

Source : Socio economic survey 1988, ARTI.

Part Six - Water Management

Table 6.1

Type of Water Management as to Explained by the Farmers

Type of Water Issue	% of Farmers Responded
1. Rotational Issues of Water (with 10 days intervals)	62%
2. Issue of Water according to the AI's visit to the tract (Yaya)	20%
3. Irregular issues of water	12%
4. No proper control of management of water issues	6%
	100%

Source : Socio economic survey 1988, ARTI.

Table 6.2

Ownership of Agricultural Equipment

Type of equipment	% who owned	Availability**	
		To purchase	For hire
1. Memmoties	100.0	2	-
2. Tractors			
2 wheel	0.7	-	2
4 wheel	0.7	-	2
3. Sprayers	1.6	3	2
4. Weeders	1.2	3	3

** Codes - 1 - Freely
2 - Limited but available
3 - Limited difficult to obtain

Source : Socio economic survey 1988, ARTI.