# KURUNEGALA
# INTEGRATED RURAL DEVELOPMENT PROJECT

# EX- POST EVALUATION



Research Study No. 84

January 1988

AGRARIAN RESEARCH AND TRAINING INSTITUTE,
114, Wijerama Mawatha, Colombo 7.

SRI LANKA

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Sepala Asoka C.K.
Chandrasiri J.K.M.D.
Gamage D.
Jayasena W.G.
Tudawe I.
Abeysekera W.A.T.
Wanigaratne R.D.

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(The Agrarian Research and Training Institute is a Statutory Body under the Ministry of Agricultural Development and Research)

# FOREWORD

The District Integrated Rural Development Projects constitute one of the major strategic approaches adopted by the Government of Sri Lanka in recent years to strengthen the pace of rural development by a decentralized process of enhanced resource allocation in the rural sector. The IRD programme is funded by several donor agencies including the World Bank. Currently, IRDs operate in seventeen districts of Sri Lanka which do not have any "lead" projects. In Kurunegala as the district where IRDP was first introduced the programme commenced in 1979 and was completed in 1986.

With the initiation of the Kurunegala IRD project, the Ministry of Plan Implementation commissioned the Agrarian Research and Training Institute(ARTI) to undertake an evaluation of the programme. Accordingly, the ARTI prepared an evaluation plan in 1979/80 on the basis of which several studies directly related to some of the project activities were carried out.

Of the studies completed, the baseline survey covered the pre-project situation as at 1979. Since then a number of specific studies had been done by the ARTI. These studies provide an indepth assessment of the performance of a number of project components during the project period.

A comprehensive ex-post evaluation of the project performance was envisaged by the evaluation plan on completing of the project in 1986 for the benefit of the project management and the Government of Sri Lanka.

The study was given high priority in the Institute's research programme. A seven member team, Mrs. A.C.K.Sepala, Mr. J.K.M.D. Chandrasiri, Mr. D.Gamage, Mr. W.G.Jayasena, Mrs. Indra Tudawe Dr. R.D.Wanigaratne and Dr. W.A.T.Abeysekera - all researchers of the ARTI- were entrusted with the assignment. Mrs. A.C.K.Sepala functioned as the coordinator of the study. The present report is the outcome of their collective effort.

The main objective of this study was to assess the overall performance of the project and to draw any lessons which are likely to assist the replicability of the project design and implementation framework.

The findings of the study reveal that the existing implementation machinery at the district level is capable of performing the integrated functions of rural development at a relatively low cost. On the strength of this experience, the replication of the KIRDP implementation framework elsewhere for the same purpose, with suitable modifications, may now be considered.

It is hoped that this report will be useful at the policy level to the Government of Sri Lanka and in particular to the Implementing Agency, the Ministry of Plan Implementation.

Finally I wish to record my appreciation of the efforts of the study team and all others who made this publication possible.

J. Alwis

J.Alwis
DIRECTOR
18/11/1987

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This publication is an outcome of the cooperation and assistance extended by many individuals both within and outside ARTI.

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Finally, Mr. T.B.Subasinghe, former Director of ARTI is acknowledged for the administrative support and encouragement extended to the study.

AUTHORS

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## GLOSSARY

| | |
|---|---|
| ASWEDDUMISED LAND | Land which is levelled and bunded to facilitate impounding of water. |
| BETHMA | A traditional system of cultivation in which farmers at the lower end of an irrigation tract are given a portion (usually a half or third share) of the plots allocated to farmers at the upper end for a single season's cultivation. This is done to reduce conveyance losses in times of water shortage in a village tank (reservoir). |
| CHENA | Shifting cultivation. |
| COMMAND AREA | The land area served by an irrigation system. |
| LIYADDE | The smallest bunded unit within a paddy field. |
| MAHA | A cultivation season which, in the Dry Zone, normally extends from about September-October to February-March. The bulk of rainfall received by the Dry Zone in any given year occurs during this season. |
| VEL VIDANE | An individual (often himself a cultivator) charged with the responsibility of ensuring fair and timely implementation of the irrigation schedule under village tanks. |
| YALA | A cultivation season which normally extends from about April to August and coincides with the South-west Monsoon during which time the Dry Zone receives little or no rain. During this season crop cultivation depends upon stored water (in reservoirs) and occasional showers. |
| YAYA | A tract of asweddunised land comprised several farm plots. |

## LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| ARTI | = | Agrarian Research and Training Institute |
| ADA | = | Assistant Director of Agriculture |
| AGA | = | Assistant Government Agent |
| AI | = | Agricultural Instructor |
| AO | = | Agricultural Officer |
| ASC | = | Agrarian Service Centre |
| CCB | = | Coconut Cultivation Board |
| CDO | = | Coconut Development Officer |
| CO | = | Cultivation Officer |
| CF | = | Contact Farmer |
| DA | = | Director of Agriculture |
| DAEO | = | Divisional Agriculture Extension Officer |
| DAPH | = | Department of Animal Production & Health |
| DO | = | Development Officer |
| FF | = | Follower Farmer |
| IE | = | Irrigation Engineer |
| KIRDP | = | Kurunegala Integrated Rural Development Project |
| KVS | = | Field Level Extension Worker |
| LCD | = | Land Commissioners' Department |
| MEC | = | Department of Minor Export Crop |
| MPCS | = | Multi-purpose Co-operative Society |
| PT | = | Preparatory Teams |
| SMOO | = | Subject Matter Officer |
| SMSS | = | Subject Matter Specialist |
| TA | = | Technical Assistant |
| TIMP | = | Tank Irrigation Modernization Project |
| T & V | = | Training & Visit System |
| VIRP | = | Village Irrigation Rehabilitation Programme |

# EXECUTIVE SUMMARY

The Kurunegala IRD Project has amply demonstrated that a strategy of revamping the existing implementing machinery, without overlly creating new structures, is capable of performing efficiently the function of coordinating the implementation of a development programme. It has also demonstrated that such integration can be achieved at relatively low cost by avoiding the creation of new and the expansion of existing bureaucratic organization thereby circumventing problem of redundancy at the end of the project period. The "blue print" approach, though rigid for a target-oriented path, was found to be useful in containing sectoral political pressures during the implementation process. These features taken together point to the possibility of the KIRDP framework being replicated elsewhere, with suitable modifications.

During its implementation period (1979-1986), the KIRDP has been successful in making large investments in the physical development of the production bases of paddy and coconut as well as the social infrastructure and other related amenities within the district. All components of the project, except water management, are recorded to have achieved the targets with minimal delays. The shortfall in the cumulative performance of irrigation rehabilitation, however, is attributed to several reasons. Construction delays relating to minor tanks as well as handing over delays in respect of rehabilitated tanks are adduced as the main causes that led to the long time lag in initiating the envisaged programme of improved water management under the project.

The inadequate recognition given to people's participation in project activities is reflected in the "blue print" as evinced by its central focus placed on the improvement of services and inputs, both material and infrastructural, mainly towards achieving physical targets. This inevitably resulted in a situation where the emphasis was more on strengthening the "delivery mechanism" rather than the "receiving mechanism" at the beneficiaries' end.

The absence of an effective mechanism, particularly during the early years of the project, to express the farmers' needs as regards the design and implementation of the minor tank rehabilitation component was a deficiency. However, a relatively recent move by the project management to introduce a system of prior consultation and discussions with beneficiary farmers in regard to the rehabilitation of minor tanks is a step in the right direction.

The diminishing profit margins of the farmers due to the rapidly rising input prices are likely to have an adverse effect on their decisions regarding the adoption of modern production techniques necessary for increasing the output. This trend is discernible both in paddy and coconut production.

It appears that the crop agriculture bias of the project has precluded it from investing on a programme of rural industrialization. The long-term beneficial effects of such a programme may have resulted in rural employment generation as well as in diverting the surplus labour from agriculture. No evidence is, however, available to suggest that a sustained process of employment generation has ensued from the project. Despite a total project expenditure of around Rs. 430 million, it is unfortunate that a mechanism was not set in motion to monitor the benefit flows and the impact of the project. This deficiency points to the need to incorporate a management information system in future projects.

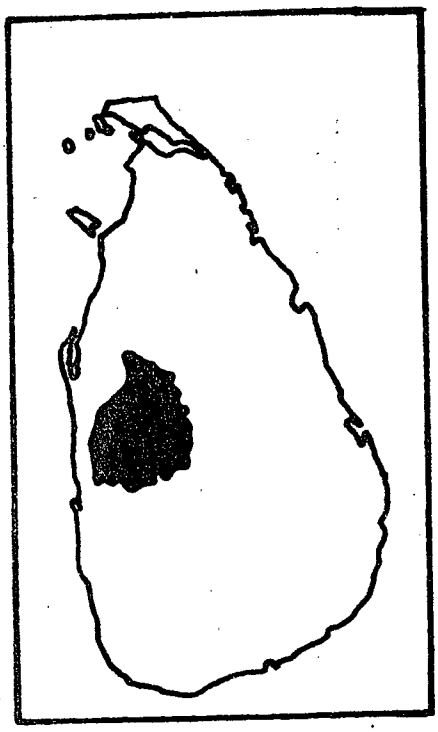
An ex-post impact assessment such as the present one should be conducted in the form of an "assessment series" ideally beginning with a study on conclusion of a project. This is necessary because the impact and effects of individual components are expected to emerge at different points of time after project completion.

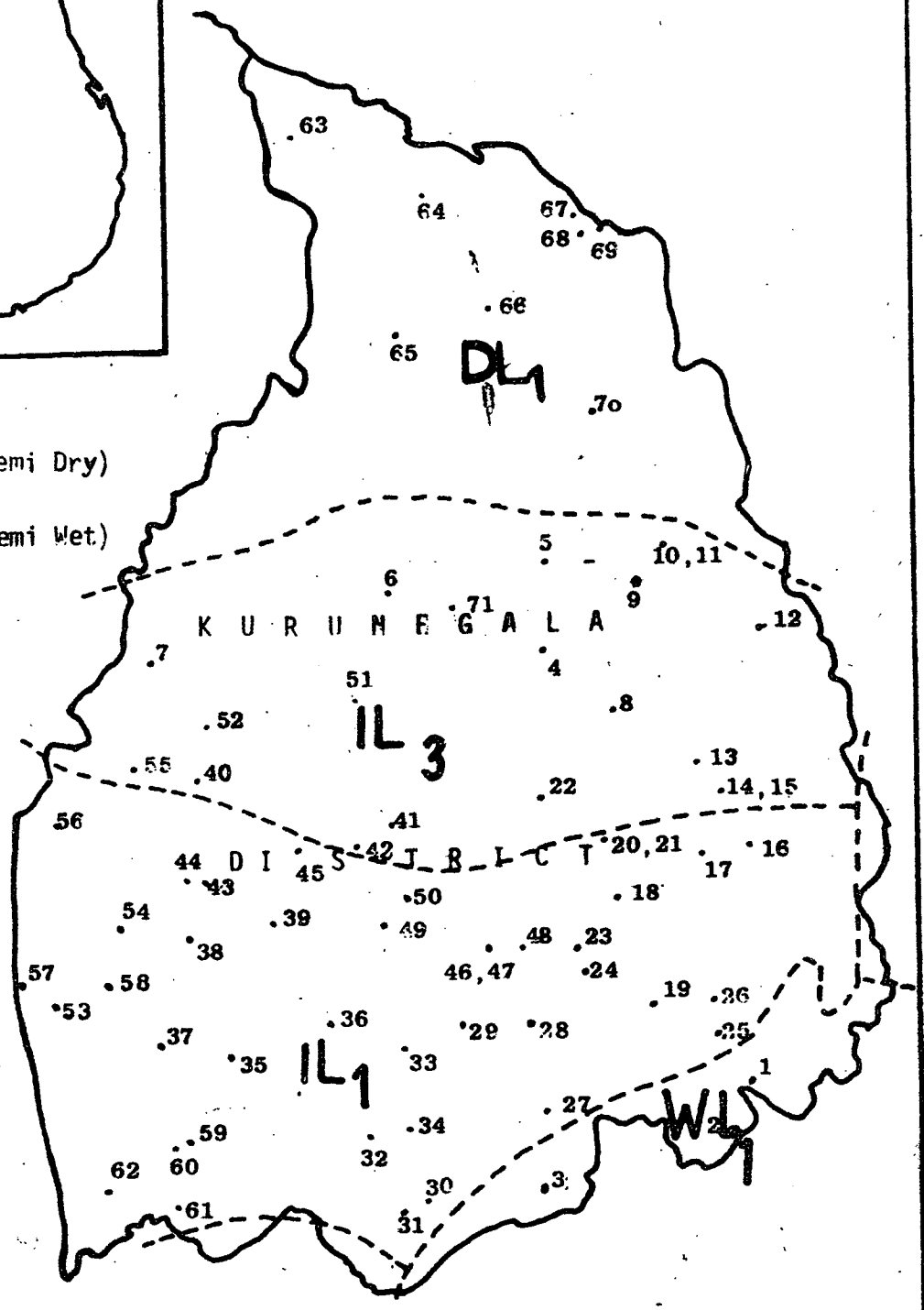
Being the first attempt at using a "blue print" for a district development programme in Sri Lanka, the project obviously had certain limitations. Nevertheless this approach, which helped to obviate local and external pressure, yet proved flexible enough to accommodate changes on the basis of both objectively valid reasons and implementation experiences, demonstrated itself to be a successful model.

The small cadre of staff deployed at the project office, perhaps necessitated by the "blue print" concept, also proved to be a cost-effective way of administrating the project. Thus, adding strength to the model, the overall results of the project presented in this study, in terms of physical targets and the degree of inter-agency co-operation achieved, exemplify the validity of its replicability.

Viewed as a whole, the implementation framework of the KIRDP model, with suitable modifications, appears to be capable of being replicated elsewhere. As a lesson from the KIRDP, continuous monitoring backed by a management information system would be a sine-quo-non consideration for such future projects.

KURUNEGALA I R D P PROJECT AREA - STUDY SAMPLE LOCATION






DL$_1$- Dry Lowland

IL$_3$- Intermediate (Semi Dry) Lowland

IL$_1$- Intermediate (Semi Wet) lowland

WL$_1$- Wet Lowland

List of villages pertaining to the numbers is given in Annex IV

# CHAPTER ONE

## INTRODUCTION

District Integrated Rural Development Projects are a few major innovative programmes initiated in 1979 by the government of Sri Lanka with assistance from foreign funding agencies in order to accelerate the pace of rural development. A major objective of this programme is to achieve increased employment and income of rural families and thereby raise the general standards of living. For this purpose, increased allocations of resources are made to the rural sector in selected administrative districts under a system of decentralized planning. Integrated Rural Development (IRD) Programmes are in fact formulated and implemented on the basis of administrative districts the individual district being treated as a unit for regional development planning purposes.

The above programme presently covers seventeen administrative districts of the country. These are some of the districts which do not benefit directly from the "lead projects" of the government, more specifically, the Mahaweli River Basin Development Project. Accordingly, the implementation of the Integrated Rural Development Programmes has made it possible to achieve some sort of spatial balance in public sector investments in a number of backward rural districts which lie outside the domain of "lead projects".

However, the scope and focus of IRD programmes currently in operation in different districts show considerable variation. Kurunegala with the highest number of agricultural operators as well as area under agricultural activities was the first district to benefit under this programme with World Bank assistance. Here, the emphasis has been largely on agricultural production and income growth and the programme implementation was planned in terms of annual targets for expenditure and achievement, specifically by project components.

In contrast, in some of the other IRD programmes sponsored by donor agencies from Norway, Sweden and Netherlands, the main thrust of development activities is directed towards selected target areas and groups under the district concept using a package of activities tailored to the priority development needs of the groups concerned. Such country-sponsored programmes operate in the districts of Hambantota, Matara and Nuwara Eliya and the scale of development expenditure here is substantially lower compared to those assisted by the World Bank.

## 1.1 Kurunegala District

The Kurunegala administrative district occupies a land area of about 1,186,000 acres and is located in the North Western Province of Sri Lanka. The 1981 census gives the population as 1.2 million of which 96% live in rural areas. The population density varies considerably within the district from 1000 persons per sq. mile in the urban centres to less than 400 persons per sq. mile in the Northern drier areas, with an average of 556 persons per sq. mile.

The agricultural activities in the district closely follow the rainfall pattern. The annual rainfall ranges from below 60 inches to more than 90 inches. The North-East monsoon brings rainfall to the whole district during October-December, while the South West monsoon is confined mostly to the Southern part between March to June. On the basis of rain precipitation the district is divided into three agro-climatic zones.

| Agroclimatic zone | Mean annual rainfall | Coverage in the district |
|---|---|---|
| Dry | 60" | 20% |
| Intermediate | | |
| Semi-dry | 60-75" | 70% |
| Semi-wet | 75-90" | |
| Wet | 90" | 10% |

The Census of Agriculture 1982 reveals that about 677,600 acres are under various agricultural activities, of which 534,400 acres are in the smallholding sector and the balance 21% is in the estate sector. The predominant crop is coconut with about 364,000 acres of which two thirds are in the smallholding sector[1].

Paddy covers the second largest area among cultivated crops with 170,000 acres and is distributed rather evenly across the district. Around 80% of the paddy acreage is either rainfed or fed by small village tanks. Besides, nearly 100,000 acres of non-irrigable lands located mostly in the Northern part of the district are cropped regularly under chena farming. The agriculture sector, particularly coconut and paddy, provides the bulk (68%) of the employment in Kurunegala and the unemployment rate as a percentage of the workforce is only 13%. This is much less than the percentage (22%) in the adjoining district of Kegalle.

1. Coconut is confined broadly to the wetter areas located in the Southern part of the district.

Generally, the social, infrastructural, health and educational facilities are relatively well provided in the district, except in some of the rural areas, which are mostly in the Northern part of the district.

## 1.2 Kurunegala I R D Project

The 'blue print' approach adopted in the Kurunegala I R D project aims to achieve the interrelated objectives of raising agricultural productivity, employment, incomes and living standards of around 170,000 farm families engaged principally in the production of paddy and coconut, the main economic activities in the district. In the process, the planners also aim to evolve a replicable model of regional development for implementation in some of the other districts in the country. The strategy followed in Kurunegala has been one of upgrading the farming systems prevalent in paddy and coconut smallholdings. The underlying assumption has been that a majority of small farmers in the project area operate at a low technical level and with project intervention, production responses to increased use of inputs and improved techniques would be high. Accordingly, the main thrust of the project has been directed towards strengthening the production base of paddy and coconut with a view to improving the resource availability to small holders. In this context, the rehabilitation of irrigation tanks, replanting, underplanting, intercropping and fertilizing of coconut smallholdings, improvements in systems of agricultural extension, credit and input supplies could be considered as the core elements of the project. Complementary to these direct productive components, the project also included limited investments for improvement of transportation, health, education, drinking water supply and rural electrification.

Altogether 12 major components constitute the project, which were handled by 20 existing government agencies, the details of which are presented in Annexs I and II.

The original implementation schedule from 1979-83 had been extended until 1985 largely to accommodate the full realization of the rehabilitation of the minor irrigation schemes and coconut development programmes. The total costs of the project estimated at Rs. 465 million at appraisal were controlled by the Ministry of Plan Implementation, through a full-time Project Director stationed at Kurunegala who coordinated all project activities at the district level.

## 1.3 Project Evaluation

With the initiation of the project in 1979, the Ministry of Plan Implementation commissioned the Agrarian Research and Training Institute (ARTI) to undertake the evaluation of the Kurunegala IRD Project. The ARTI prepared an evaluation plan in 1979/80, and on this basis the undermentioned studies directly related to some of the project activities were carried out.

i Kurunegala district rural development project: an analysis of the preproject situation (1981)
ii Agricultural credit schemes under the Kurunegala rural development project : an evaluation (1981)
iii Water management under small village tanks (1981)
iv Training and visit system of extension (1981)
v Intercropping coconut lands with minor export crops. Kurunegala rural development project (1983)
vi A process evaluation of coconut cultivation in the Kurunegala Integrated Rural Development Project (1984)
vii Kurunegala District Integrated Rural Development Project: a critical analysis of project formulation (1983)
viii Periodic rural markets in the Kurunegala district (1984)
ix Kurunegala Integrated Rural Development Project: evaluation of the irrigation and water management component (1985)

Of the studies completed, the baseline survey covered the pre-project situation as at 1979 in general terms. The component studies on the other hand, have attempted to provide a more in depth assessment of the performance of a number of project components during the first three years of the project. However, hardly any individual component studies had been undertaken during the latter half of the project. In addition, a sample survey planned for the mid project period, as stipulated in the evaluation plan, has also failed to materialize resulting in some gaps in the data that would have been helpful to the present ex-post evaluation exercise.

## 1.4 Ex-post Evaluation

Compared to the monitoring of physical works, which are relatively straightforward, the evaluation of a project in terms of a development process that was set in motion, is methodologically complex. The relevant effects, --the outcome of the use of project inputs -- are not easily measurable nor do they flow from any specific project component. Maturing in periods later than its date of formal completion, they are derived from or induced by the project's primary tasks. All the same, any secondary effects must be taken account of, in a comprehensive evaluation of the project.

An ex-post impact assessment of the Kurunegala IRD Project, with its multiple components, ideally should be conducted as an "assessment series" beginning with an initial one conducted on the eve of the project's completion with succeeding assessments phased out at intervals, in the order of five, ten, fifteen years after the project's completion. The reason behind such an "assessment series" viewpoint is, that the effects and impact of individual components of the project vary in terms of the time taken for chartable multiplier and spread effects to be felt in the project command area and beyond. For example, a project component such as rural credit has a very short gestation period and often its effects begin to surface within a few months after project completion or even during the project period. On the other hand, in the case of the coconut rehabilitation programme at Kurunegala, the effects of replanting, underplanting and intercropping could be realised only many years after project completion. The appraisal report in fact has estimated a time span of 13 years for full realization of the benefits and impact of the particular project component to be felt.

The main objective of the present exercise is to assess the achievement of performance results of the project, both for the benefit of project management and funding agencies, and also to draw any lessons that will aid the design and implementation of similar projects in future. In this context, the principal elements in the ex-post evaluation study are summarised below.

i an assessment of the managerial, administrative and organisational aspects,

ii evaluation of the productivity changes in respect of paddy and coconut smallholdings with special reference to small tank rehabilitation, the water management programme and the coconut rehabilitation programme,

iii an assessment of the success of the extension strategy - the operation of the T & V system,

iv the impact of technological changes particularly in paddy and their impact on output, employment and incomes of beneficiary households,

v assessment of people's participation in the development activities,

vi an assessment of the coverage, efficiency and effectiveness of rural credit,

vii an assessment of the infrastructure improvements,

vii an assessment of project's influences on the quality of life,

ix an overall cost benefit assessment.

## 1.5 Methodology

Since the Kurunegala IRD project is based on public sector investment mainly in two agricultural crops, viz. paddy and coconut, nearly 80% of the total investment has been on these two crops or activities connected with them. This investment is expected to generate an internal rate of return which is significantly higher than that produced by investments in this sector in the pre-project period.

These two directly productive components namely paddy and coconut are evaluated in quantitative and qualitative terms including the computation of an Economic Rate of Return. In the course of the assesment of other components such as education, health, rural electrification and rural roads where quantification of benefits present ccnsiderable difficulties, a qualitative assessment was attempted.

### 1.5.1 Methods of Data Collection

Primary Sources of Data

1. Field surveys,
2. Formal and informal interviews with relevant officials, researchers, farmer leaders and farmers.

Secondary Sources of Data

a) Published and unpublished documents, reports, and statistics obtained from the project office,
b) Published and unpublished statistics from the Department of Census and Statistics,
c) Published data from the Ministry of Coconut Industries.

### 1.5.2 Field Surveys

The main field work for the ex-post evaluation of the KIRDP comprised of one major questionnaire-based sample survey covering the principal components, and four other sub-surveys dealing exclusively with irrigation and water management, coconut, rural credit and extension components. The major survey covered the broader agricultural development in the project area, focusing more specifically on paddy and coconut. This together with the sub-surveys were intended to provide a basis largely for assessing the effects of the major project components.

#### 1.5.2.1 Sampling Procedure

A Stratified two stage random sampling design was adopted for the main evaluation survey and the survey on minor tank irrigation and water management. For the rest, namely coconut development, rural credit, extension, purposively selected samples were used.

1.5.2.2 KIRDP Main Evaluation Survey

Stratified two stage random sampling design was used and the three agroclimatic zones formed the strata. The first stage sampling units were villages.

As primary sampling units a simple random sample of villages was selected from each stratum, the total sample being allocated proportionately to the number of villages in each stratum. 80% of the sample villages were selected from the National Agrarian Sample Survey (NASS) and the KIRDP Baseline Survey were utilized for this evaluation too. For the current survey 20% of the original (NASS + KIRDP Baseline) sample in each agro-climatic zone was replaced by an equal number of villages from an updated list of villages. In the earlier surveys any village that cut across two agro-climatic zones was not included in the population of villages within a stratum. For this survey 20% of the original sample in each agro-climatic zone was replaced.

Thus of the total first stage sample of 71 villages fifty seven (57) villages were selected from the NASS sample and fourteen (14) villages from the updated list. Five households from each village were selected at random making a total of 355 sampling units.

The distribution of the 71 villages were as follows.

| Zone | Percentage of the area covered in the district | NASS/KIRDP baseline survey | 20% replacement of the original sample | Total |
|---|---|---|---|---|
| Dry zone | 20% | 6 | 3 | 9 |
| Intermediate zone(Semi wet & Semi dry) | 70% | 50 | 9 | 59 |
| Wet zone | 10% | 1 | 2 | 3 |
| | | 57 | 14 | 71 |

For a simple random sample, the sample design that would satisfy the stipulated precision is estimated by

$$n = \frac{K2 \quad V2}{D^2}$$

Where K = confidence level
V = coefficient of variation
D = largest acceptable difference between the value estimated from the sample and the true population value

Most of the main variables of the study had coefficient of variations of 40% i.e. V = 0.4

In order to obtain an estimate within 10% of the mean with 95% probability, the sample should have

$$n = \frac{22 \times 0.42}{(0.1)^2} = 64 \text{ units}$$

As the sampling design adopted in this as well as the previous baseline survey involved a two stage process the interclass correlation was examined to determine the size of the sample and the allocation of sampling units between and within clusters.

The interclass correlation $\delta = \frac{\sigma_b^2 - \sigma_m^2}{(m-1)\sigma^2}$

Where $\sigma_b$ = varience between cluster
$\sigma^2$ = total varience
m = number of units within a cluster

$\delta$ approximate to $\frac{\sigma_b^2}{\sigma^2}$ when m increases

But in the NASS survey smaple with m = 5 it was observed that $\frac{\sigma_b^2}{\sigma^2}$ was greater than 90% for most variables.

The relative efficiency of a cluster sample to a simple random sample is

$z = 1 + \delta (m-1)$
$z = 1 + .90(m-1)$
When m = 5 $z = 1 + 3.6 = \pm 4.6$
and m = 20 $z = 1 + 17.01 = \pm 18.01$
Where z is the efficiency factor

Size of the two stage sample of same efficiency as the simple random sample

$Z_n = 4.6 \sqrt{5n}$
$5 \times 64 = 320$

Therefore the specified precision would have been satisfied with 320 households in a two stage sampling process with 5 households per village.

### 1.5.2.3 Sample Selection for the Component Studies

(a) Minor Tank Rehabilitation and Water Management

In the project proposal tanks were categorised into four groups as follows:-

1. Tanks rehabilitated prior to 1982
2. Tanks rehabilitated after 1982
3. Tanks not rehabilitated but are listed for rehabilitation in 1985 and 1986
4. Tanks not rehabilitated and not included under (3).

But this classification was not possible because a complete list of all tanks in Kurunegala district was not available. Hence the procedure was modified as indicated below.

1) Tanks rehabilitated and handed over to the Department of Agrarian Services for operation and maintenance
2) Tanks which are rehabilitated but not handed over to the Department of Agrarian Services
3) Tanks which are not rehabilitated
4) Major irrigation schemes.

A proportionate sample of 21 tanks was drawn from the three agro-climatic zones and subsequently seven households from the command area of each tank was drawn at random. Subject to earlier arguments here again the sample size was reduced from 10 to 7. The total sample size was 147 households. (A list of tanks included in the study is given in annex IV).

(b) Coconut Development Programme

In evaluating the performance of the coconut development programme three types of primary data were used.

1) Information gathered through the main questionnaire survey which represented the whole district,
2) Information gathered through a questionnaire survey in two purposively selected AGA divisions (Kuliyapitiya, an area with a higher response and Nikaweratiya with a lower response to subsidy use),
3) Comparative information gathered in 1982 through a field survey in some selected areas of the district.

The total sample size of the purposively selected sample was 60 and more weightage was given to the formal and informal interviews with relevant officials, growers, traders and coconut processers in the assessment of managerial, administrative and organizational aspects of the coconut development programme.

(c) Rural Credit

A separate questionnaire was administered to the positive respondents of institutional credit who claimed to have obtained credit for any agricultural purpose. This sample was very small which represented about 20% of the main evaluation survey sample and hence a purposive selection of 62 farmers including defaulter farmers were interviewed using a structured questionnaire. Most of the qualitative data needed for the assessment was collected by conducting interviews with district and national level bank officials and private moneylenders. The analysis of non-institutional credit was conducted using the main evaluation survey questionnaire.

(d) Agricultural Extension

The information gathered through the main sample was mainly in respect of follower farmers. Separate questionnaires were administered to a purposive selection of contact farmers, KVSS and AII. In addition, personal interviews with the national and regional level extension officers, village leaders and farmers supplemented the needed qualitative data.

1.5.2.4 Size of the Sample

Table 1.1
Size of the Sample

| Questionnaire Survey Item | Total household/ respondent sampling units |
|---|---|
| Main Sample Survey | 355 |
| Minor Tank Rehabilitation Survey | 161 |
| Coconut Development Programme Survey | 60 |
| Rural Credit Survey | 62 |
| Agricultural Extension Survey | 56 |
| Total Units Surveyed | 694 |

(a) Main evaluation survey — 2% of primary sampling units, i.e. villages, from each stratum (Dry Zone 10; Intermediate 58, Wet Zone 3) amounted to 71 villages; 5 households as secondary sampling units from each village totalled 355 households.

| | | |
|---|---|---|
| (b) | Irrigation Rehabilitation and Water Management | 1% of tanks as primary sampling units, (assuming the presence of 2000 tanks which fall into the category of tanks that could be selected to be rehabilitated with KIRDP funds) amounted to 19 minor tanks and 2 major tanks as primary sampling units. Seven households were selected from each minor tank command area and 14 housoeholds were proportionately selected from the left and the right banks of major tanks. The total sample size was 161 households. |
| (c) | Coconut Development Programme | A purposive selection of two AGA divisions (details given later) served as primary sampling units, and 60 purposively selected households from the two divisions formed the secondary sampling units. |
| (d) | Rural Credit | A purposive sample of 62 farmers was selected according to the type of loan received, agroclimatic zone, and the bank from which the loan was granted. |
| (e) | Extension | Two Agricultural Instructors (AI) ranges were chosen as primary sampling units and 14 AII, 28 KVSS and 56 contact farmers were randomly selected. This amounted to a total of 98 respondents that were surveyed. |

1.5.2.5 Limitations of the Study

The study team was greatly handicapped by the inadequate data base during the ex-post evaluation of the KIRD Project. The data available in the project office and implementing agencies were mostly on financial expenditure, and physical achievements. Qualitative information was largely un-recorded and hence not available to the study team. This made the study team rely heavily on the annual progress reports financial reports, co-ordinating committee meeting minutes, etc. A dearth of information on the rationale for the extension of the project up to 1986 and in the reasons for shortfalls of targets was noted even in these reports. The focus of

co-ordinating committee minutes was too narrow and not capable of generating new information. Overall deficiencies and inconsistancies found in the above-mentioned secondary data sources, necessitated the study team to obtain the needed information mainly through interviews.

The poor database does not necessarily mean the non-availability of data. The project office had a large collection of data but much of it was not in a usable form. Of the data sets made available to the study team, many were either duplications or had large gaps which made time series analyses difficult. Much of these problems may have been reduced, if not entirely averted, had a systematic feedback information system operated throughout the project period. A critical shortfall existed in this regard.

Although somewhat too early the study team sought to observe a measure of the impact of the project so as to determine improvements of the quality of life of the beneficiaries on account of the project. In this context a view of the construction-based short-term employment generation and the resultant income increases among hired labour and skilled worker groups would have been particularly useful. In this area the database was sketchy. Benefit monitoring as an aspect of project progress determination had been overlooked for too long by the project authorities. In this context it is worthwhile even at this late stage if the present system of information flow could be revamped, and a carefully thought out benefit monitoring mechanism be instituted, to serve any impact assessment that may be conducted in future years.

In addition, unenvisaged time and bureaucratic limitations imposed upon the study team also proved to be constraints. The final version of the proposal was approved only towards the end of 1985, with further revisions made as late as 1986. Hence the study team had to complete the evaluation task in 7 months time-- five months short of the original time schedule. This was not an easy task with the compressed work load, including logistics involved in carrying out five field surveys covering a spatially vast area, besides visiting many offices of line departments located across the project area.

In spite of these difficulties the study team was able to meet the deadlines and submit the report well within the scheduled time.

## CHAPTER TWO

## PROJECT MANAGEMENT AND IMPLEMENTATION

The Kurunegala Integrated Rural Development Project is based on a 'blue print' that constitutes a five-year plan of development with pre-set annual targets for expenditure and achievements by sectors. According to the project design, the line departments at the district level had been assigned the implementation responsibility of different components, whilst project co-ordination and other management functions had been entrusted to a Project Director.

### 2.1 Management Organisation

The district office headed by the Project Director had been the pivot of the project management organisation with full responsibility for co-ordination, accounting and progress control of project activities. The organisational set-up of the project office together with the Project Director's specific responsibilities are given annex V and VI.

The management organisation at the district level has been the Project Co-ordinating Committee chaired by the District Minister and comprising the district heads of government agencies responsible for project implementation with the Project Director serving as member-secretary. Its responsibilities included the resolving of inter-departmental co-ordinating problems and monitoring of progress of the implementation schedules.

Above this body, at the national level, a Project Steering Committee comprising of heads of government departments, secretaries of ministries concerned with project activities, the District Minister, the Government Agent and the Project Director Kurunegala had functioned with the Secretary, Ministry of Plan Implementation serving as its Chairman and the Director of the Regional Development Division serving as its Secretary. This body had served as the final arbitrator in solving policy issues, implementation bottlenecks and any co-ordination problems that had remained unsettled at the district level.

## 2.2 Project Implementation

The implementation phase which began operations in January 1979 had progressed two years beyond the original five year time span, when the present evaluation study commenced at the end of 1985. This project being the first attempt to use a 'blue print' for a district development programme in Sri Lanka, the management had experienced some teething problems during the initial phase of project implementation. To begin with, it had to gear itself to a new role in co-ordinating the work of a multiplicity of government agencies engaged in project implementation. Secondly, it also had to get acquainted with new procedures and requirements in the disbursement of loan funds and observe implementation discipline as stressed in the project design. However, as the implementation phase gained momentum, many of the initial problems faced had been largely overcome, and by 1983 most project components had achieved the target rate of implementation, except in the cases of irrigation rehabilitation and coconut development. The overall cumulative performance of the irrigation rehabilitation component had failed to reach the target rate of implementation during the early years of the project, due to the reasons discussed in chapter three. The coconut rehabilitation activities had lagged behind, among other things, due to external factors such as prolonged drought conditions experienced during 1982-1983. In fact, the need for extension of the implementation phase of the project beyond 1983, had arisen largely to accommodate the completion of these two major components, both of which have a direct bearing on the well being of the small farmers operating in the project area.

## 2.3 Co-ordination and Management

The assigning of implementation responsibility to existing government departments at the district level had considerably reduced the management workload at the project office and as a result, its administrative overheads have been small. This office had functioned largely to marshal the efforts of the implementing agencies and to serve as a communication link between line agencies and the Ministry of Plan Implementation. As a result of this arrangement, the government had been able to implement the Kurunegala IRD Project without creating an expensive new management structure and thereby avoid any duplication of effort and consequent wastage of resources. The small cadre of staff deployed at the project office as shown in annex VI reflects on the cost-effective management organisation that had operated in Kurunegala.

Co-ordination of implementation activities had become a key function of the project office due to more than one reason. Firstly, with twenty line departments at the district level involved in implementation work, a single organisation had to assume responsibility for directing, co-ordinating and scheduling of project implementation activities, in order to maintain the required pace of implementation and also to ensure that procedures set down in the project design are followed by the line departments. Indeed, the project office had performed this delicate task in a most capable way, as would be seen later on. Secondly, the close functional inter-relationships introduced into some of the major components under the project, had necessitated the management to play an active role in co-ordinating implementation activities such as irrigation rehabilitation and water management, coconut development, agricultural credit and agricultural input supplies etc., where more than one agency had implementation responsibilities for a single component. On the other hand, the social and physical infrastructural improvements such as rural roads, dug wells, rural electrification, health and education under the project provided a contrast. Such activities had little or no interlinkages with any other components thus minimising the co-ordination role of the management in their implementation.

The overall results of the project presented in the ensuing chapters in terms of physical targets realised imply, among other things, that the management had effectively discharged its co-ordination responsibility. It has secured the cooperation of largely autonomous government agencies to work in harmony as seen in the project annual progress reports for the period 1980-1985. These reports confirm that most of the physical targets specified in the 'blue print' had been accomplished more or less on schedule due to the high degree of inter-agency corporation that had existed during the implementation phase. In this regard, certain features in the project design too had helped the management. For instance in carrying out implementation work under the project, the administrative structure of line agencies had been allowed to remain intact, so that their autonomy was uneffected. Besides, the project management had hardly any mandatory powers over line agencies at district level and as a result, friction with implementing agencies had been minimal. The strengthening of the capacity of the field agencies to expand their normal scheduled activities is another factor that had made the task of achieving inter-agency cooperation easier. The delivery mechanism of line agencies had received many benefits under the project in the way of additional staff,

staff development, living quarters, offices, laboratories, storage facilities, equipment and vehicles etc. Facilities so provided, being outright grants to line agencies to augment the depleted stocks of some of the badly needed new equipment, buildings and staff, the recipient organisations had responded very enthusiastically to project directives and collaborated in the execution of their share of component work.

The foregoing discussion has centered so far mostly around certain features in the project design that had facilitated co-ordination of implementation activities. In this respect, the management role of the Project Director is equally relevant. His responsibilities listed in annex V could be described as more administrative than managerial. Perhaps this was largely intentional, as the Director was expected to adhere closely to pre-set procedures and criteria specified in the project design.

In the management of a project based on a 'blue print' as in Kurunegala, it is often a 'fait accompli' for the chief executive to operate within narrow confines in the use of discretionary powers. However the implementation experiences here provided little or no room for complaint on this score, and there was hardly any evidence of bureaucratic wranglings due to either delays or failures of the management to take timely decisions.

On the other hand, some of the rigid criteria incorporated in the design had occasionally worked to the advantage of the project management to withstand a certain amount of local pressures for modifications of components like irrigation rehabilitation, rural roads and rural electrification etc. In such situations, the 'blue print' had been effective to disregard many of the external pressures for changes, on the grounds that any unapproved deviations from the project design would not be acceptable to the funding agency for reimbursement purposes. This does not mean that the project had been implemented in a 'strait jacket' fashion without due regard for implementation experiences. In fact, the project records show that the management had effected a number of modifications in project activities, when requests for changes were backed with objectively valid reasons. For instance, the irrigation rehabilitation programme had been modified from time to time in the light of actual implementation experiences and in keeping with the construction capacity of the implementing agency. Nevertheless, few attempts to change the socio economic and technical criteria specified for selection of village tanks for rehabilitation under the project had failed to gain acceptance with the management, for the obvious

reason that many such requests for changes were often motivated by narrow political considerations of bestowing benefits upon electorates which fell outside the ambit of less developed areas in the district. If such requests for changes were met, the attempts to reduce intra-regional disparities in infrastructure development under the project would not have been effected to the same degree.

Another modification of a project activity worthy of mention is the substitution of a programme for development of horticultural crops in place of minor export crops, which had a poor performance record all along. Similarly, the home garden programme currently in operation is altogether a new activity introduced to meet certain felt needs of the small holder sector identified during project implementation. The examples quoted above provide some useful insights on how the 'blue print' approach followed in Kurunegala had been modified, based on implementation experiences without the management being too dogmatic about the specifications in the project design.

In this regard the District Development Council and the decentralized budget provided a somewhat contrasting picture. Under both development programmes, Kurunegala district received a financial allocation of Rs. 490 m. for the entire project period of seven years. This amount almost equalled the Kurunegala Integrated Rural Development Project investment. However, the pace of implementation of much of the activities under both these programmes had been relatively slower compared to KIRDP, largely due to the absence of a pre-set plan in the form of a blue print. In KIRDP, the areas for investment had been identified, assessed and appraised well in advance of the project initiation, making the task of decision making and project implementation swift and simple. On the other hand under the DDC and the DCB, areas for investment are invariably assessed and appraised only after the receipt of financial allocations, which makes the implementation process much more complex resulting in inordinate delays in the execution of development programmes.

## 2.4 Progress Control and Management

Monitoring of performance is a major responsibility of the Project Director handled through the Project Co-ordinating Committee of which he functioned as member-secretary. This committee chaired by the District Minister had provided a useful forum for a frank and critical exchange of views among the participating groups, comprising of line department officers, elected representatives of the people, and IRDP

staff etc. It had met regularly, though not at the required monthly frequency to review IRD activities. The project office not being equipped with a monitoring unit of its own had depended mostly on monthly progress reports of line departments for progress control work. Subsequent enlistment of the services of the Agricultural Development Authority, for some of the monitoring work had helped the management to assess progress on a more objective basis.

As implementation was by proxy, the progress reports of line departments were perhaps not the most reliable information source to have been used for review work. The accuracy of some of them had been even contested occasionally at committee meetings, due to conflicting claims and opinions as to the extent of real achievements. Inter-related components where more than one agency had implementation responsibilities for a single component, had often been the focal points for such conflicting claims. In fact, the unequal perception of what constitutes progress, had caused a certain amount of delays in the implementation of the tank rehabilitation programme as discussed later on in chapter 3. Failure to recognise the need for down stream development originally is another issue that had further disorganised progress control work. According to project progress reports, the tank rehabilitation programme had been concerned only with repair of head works of village tanks and there was no down stream development work until 1983. As a result, the improved water management segment of the programme had remained more or less in abeyance for nearly three years. This shortcoming had received considerable attention at successive Coordinating Committee meetings and the necessary corrective measures taken later on. Though remedial measures taken were rather belated, the experience gained had been useful for the management as it has introduced a system of prior consultation and discussions with beneficiary farmers before finalising the rehabilitation plans for any tank. A survey[1] initiated by the project office in 1981 on rehabilitated tanks too had influenced the management's thinking on this issue.

Despite considerable delays and initial difficulties encountered in the first two years, most of the project components had progrssed more or less on schedule. The district heads of line agencies engaged in implementation work, attribute the impressive overall rate of performance achieved mostly to the effective functioning of the Project Coordinating Committee. Their view as expressed to the study

1 A survey of the first twenty seven tanks rehabilitated IRDP Office, Kurunegala. April/May 1981.

team is that the District Minister had provided dynamic and enlightened leadership to the Co-ordinating Committee. The officials further added that the project administration being greatly decentralised, the ministerial leadership had contributed in great measure to accelerate the pace of implementation. Any delays highlighted through the monitoring system, whether due to a slow down in the supply of inputs or to slackness on the part of any of the implementing agencies are reported to have received his personal attention. In addition, his abiding interest in the project had strengthened the management position to withstand much of the local pressures for certain modifications of project activities, according to a management spokesman.

Both the Project Director and the staff of line agencies agree about the usefulness of the 'blue print' in project implementation as well as progress control work. Though public officials are quite familiar in working with quantitative targets in their own spheres of activity, it was altogether a new experience for many of them to participate in a coordinated development effort which constituted a number of mutually supportive and complimentory activities under the project. Furthermore, as the implementation responsibilities of a number of mutually supportive components such as irrigation rehabilitation and water management, coconut development and intercropping, agricultural credit and input supplies had been assigned to distinct departments some of which were under different ministries, a very high degree of interdepartmental collaboration at the district level was called for. In this respect, the criteria and specifications laid down in the project ''blue print' had been handy to both the management and the implementing agencies to resolve conflicting interests and viewpoints without unnecessary debate at the Coordinating Committee meetings. A number of officers engaged in implementation work confirmed this view during discussions with the study team.

In addition, the criteria specified in the 'blue print' had enabled the implementing agencies to fulfil most of their assigned roles without having to refer to the heads of the respective line agencies in Colombo for formal clearance and thereby quickened the pace of implementation. Furthermore, two of the district heads of line agencies interviewed, drew a parallel based on their experiences in working with the District Coordinating Committee and the District Development Committee. Their view was that in operating through committees such as the District Development Committee, the pace of implementation was generally slower not because the scale of funding was lower compared to the project, but

because the decision making machinery moved at a much slower pace. Besides, many of the line agencies maintained that they had less leeway to operate in such cases compared to working with the project. Thus the swift implementation observed in the Kurunegala Project is partly a reflection on the usefulness of a 'blue print' for effective progress control work.

Though project documents record a steady progress achieved over the years in attaining quantitative targets, hardly any mention is made in any of them as to which groups among the rural population were reaping the benefits from specific programmes. At discussions with the study team, the management conceded that the administration was handicapped by a lack of adequate feedback on project effects. In fact the failure to recognize the need for benefit monitoring is seen as a major deficiency in the implementation and the management of the project. It is largely due to this reason that project performances presented in annual reports are given only in terms of physical and expenditure target achievements even after the fifth year of the project. It need hardly be mentioned that a good record of quantitative target achievements is only one aspect required to assess progress. Performance has to be viewed in a much broader context including qualitative perspectives as well. Due to the lack of a management information system, the project administration has not been able to get a true measure of feedback on the extent and pace of changes that were expected to occur among target groups as the implementation phase continued over the years. Despite this institutional drawback, the Project Director had mustered his limited staff to carry out a number of well-planned surveys periodically in order to monitor performance, and diagnose problems under specific project components. According to project documents, such in-house surveys on minor irrigation, coconut development, rural water supply and education facilities etc. have been helpful to the Coordinating Committee in taking some of the necessary corrective steps.

2.5 On-going Evaluations and Management

During discussions with the management on progress control work, it was learnt that some of the on-going evaluation reports of the ARTI have been of limited value to them, particularly for tackling implementation problems and assessing progress. Perhaps this line of thinking could be due to more than one reason. Taking an overall look at the studies completed, it is felt now that some of the survey work has been poorly timed, in that much of the field data collection work had been confined to the first two years of

the project life, even prior to the realisation of many of the expected project outputs. This applies in particular to irrigation rehabilitation and coconut development components, both of which have had a delayed start, as explained in the subsequent chapters. On the other hand, the intensive survey work initiated at project commencement too had failed to continue in the second half of the project, the reasons for which are obscure. Thus due to poor timing of some of the initial field surveys and lack of any surveys later on, the field data used for the ongoing evaluation reports had by and large failed to capture many of the issues that interested the management.

In addition, some of the standard formats used for data collection too have not been very helpful either for idenfification of implementation problems or assessment of progress. Above all, the delays in the release of some of the survey findings had further reduced their utility as far as the project management was concerned. Perhaps, the frequent 'turnover' of ARTI research staff that handled the on going evaluation work in Kurunegala could be a major reason in this regard.

As ongoing evaluation is the analysis of an activity during the implementation phase itself, the results of such exercises are of little value, unless the management has timely access to them, in order to effect the needed adjustments in implementation strategies. In this regard, the experiences reported from Kurunegala are not very gratifying. Much of the delays and other related problems discussed in chapter three could have been reduced, had a systematic feedback mechanism functioned uninterrupted throughout the implementation phase. Similarly due to certain inadequacies in the formats used for monitoring performance under the coconut subsidy programme, neither the management nor the implementing agency had been quite aware, as to how the four instalments constituting the subsidy payments had been utilised by the beneficiaries for almost four years of implementation. The monitoring system currently at the disposal of the management though geared to provide information in respect of implementation schedules and expenditure, is quite inadequate to assess qualitative results of development activities without additional skilled manpower being provided. At present, the project management remains uninformed in such aspects including the impact of its activities, at grass root level. Also, an outside agency like the ARTI could not handle on-going evaluation work effectively including qualitative assessments of development activities without establishing an operational base at the district level on a continuing basis to undertake regular field work so necessary for such assessments. Single interview questionnaire

surveys conducted periodically too have been of limited value to provide timely information to the management in order to adjust implementation strategies and take timely corrective action. This is seen from the reactions of the project management to some of the ARTI's on-going evaluation studies referred to in the preceding paragraph.

Looking back now, the task of ex-post evaluation of the Kurunegala Project has become more complex, as the planned on going evaluation studies had failed to materialise during the latter half of the project causing many gaps in the data needed for such work. The foregoing experiences bring into focus the importance of organizing on-going evaluation studies on a more systematic basis in future projects. There has to be a greater concern for measuring the benefit monitoring among the target population than has hitherto been the case in Kurunegala.

2.6 Training of Project Staff

Thirty six officers from key line agencies involved in project implementation have been sent to neighbouring countries on short-term study tours to observe the design and implementation of similar developmental projects, with a view to strengthening the implementation capacity of the line agencies concerned. A summary of overseas training provided is given in Annex 7.

In addition, project funds have also been utilized to train around 700 district level officers on project implementation at the national level.

2.7 People's Participation and Management

Before bringing this chapter to a close, one other aspect that needs to be mentioned is the role of the management in securing people's participation. The project design has by and large overlooked the need to secure peoples' participation in the formulation and implementation of project components. This is unfortunate as valuable experience and intimate knowledge of rural conditions of the people have been largely ignored. It is correct that elected representatives of the people, in particular the Members of Parliament, had been able to air their views on development proposals as well as implementation problems concerning their electorates, but such dialogues could be hardly called people's participation. In this regard, the study team also learnt that during the first two years, the management had been concerned only with swift implementation according to the 'blue print' and hardly any discussions with the beneficiaries had taken place. However, as the irrigation rehabilitation programme continued to

encounter varied implementation problems discussed in chapter three, the Project Coordinating Committee had seen the need to have a closer dialogue with the communities directly concerned with village tanks selected for rehabilitation. The management sources added that such interactions with beneficiaries had been often fruitful.

The inadequate recognition given for people's participation in project activities is largely reflected in the project 'blue print' itself. The analysis presented in the ensuing chapters highlights the overt concern of the planners to strengthen only the 'delivery mechanism' under the project. In other words, the central focus of the project has been to improve the supply of services and other inputs, both material and infrastructural, required for increasing productivity. In this process, the planners had largely overlooked the need to effect any improvements in the 'receiving mechanism' at the beneficiaries' end. Since the project is directed towards small holders many of whom lack both education as well as adequate access to necessary information, to make fuller use of the facilities provided, more organizational efforts at the grassroot level are deemed necessary for fuller realization of benefits.

# CHAPTER THREE

## IRRIGATION REHABILITATION AND WATER MANAGEMENT

Provision of irrigation water for paddy to supplement the rainfall, forms one of the key strategies underlying the Kurunegala IRD Project. Of the total of 170,000 acres of paddy land in the district, 43% is fed by minor irrigation works, 16% is served by nine major tanks and the remainder is rainfed. The irrigation rehabilitation and water management component is phased over a five year period and covers nine major irrigation tanks and 500 village irrigation works at a cost of Rs. 124 million which is slightly over one fourth of the project budget. This high investment reflects on the very high priority afforded by the government for the improvement of irrigation in the district. In social terms, the improvement of village irrigation is a pressing need to improve water availability to small farmers and thereby increase the yields.

The irrigation rehabilitation component of the project had planned for an increase in the area under cultivation through rehabilitation and/or improvement of the existing irrigation schemes along with strictly enforced improved water management practices. More specifically, the rehabilitation of 500 village tanks is expected to result in an increase of irrigated paddy land by 10,000 acres. On the other hand, under major schemes the action had been on the improvement of irrigation distribution networks aimed largely at increasing the cropping intensity. Due to improved water management practices proposed for both the rehabilitated major and minor tanks, the overall cropping intensity had been expected to rise by about 11% at project completion.

This chapter deals with the progress and the implementation problems of the tank rehabilitation component with special reference to village tanks. It also includes an assessment of the achievements of overall results in terms of efficiency, output and effects. However as the water management segment of the rehabilitation programme had failed to make an effective take-off until the fifth year of the project, an attempt will not be made in the ensuing discussion to assess its effects.

3.1 Minor Tank Rehabilitation

The project appraisal report had estimated the number of village irrigation works in the district to be 3,000 village tanks and 600 village anicuts with a potential service area of 95,000 acres. It further elected that due to inadequate maintenance many of the minor irrigation schemes had been in poor condition and in 1977 the total service area under them was estimated around 70,000 acres. Available literature also points out that the spatial distribution as well as the site and size of these tanks have been dictated more by social factors such as human habitation and the size of population rather than by such technical factors as hydrological relationships of the catchment. Under the project, the irrigation improvement component comprises of two segments :

(a) rehabilitation of 500 deteriorated minor irrigation tanks by the Irrigation Department,

(b) on completion of the rehabilitation work, introduction of a systematic water management programme by the Agrarian Services Department.

This implies a close functional inter-relationship between two line departments for successful implementation as well as strong farmer involvement in improved water management programmes.

The overall cumulative performance of the irrigation rehabilitation component had fallen far below the project expectations particularly during the initial period (1979-82), the reasons for which are many and varied. Despite the extension of the project by two years, the number of tanks rehabilitated at the time of the present study was only 388.

Table 3.1

Physical Progress of the Rehabilitation of Minor Tanks

| | Year 1 (1979) | Year 2 | Year 3 | Year 4 | Year 5 (1983) | Year 6 | Year 7 | Year 8 (1986 April) | Total |
|---|---|---|---|---|---|---|---|---|---|
| No: of tanks rehabilitated | 0 | 37 | 57 | 72 | 114 | 63 | 29 | 16 | 388 |
| Cumulative total | 0 | 37 | 94 | 166 | 280 | 343 | 372 | 388 | 388 |

Source : KIRD Project Office.
A more eloborative analysis is in annex IX.

Due to the slow progress achieved in the first three years and the spiralling costs, the original target of 500 tanks had been revised downwards to a more realistic figure of 330 in the year 1983.

3.1.1 Tank Identification

Of the 500 tanks targetted, only 130 had been identified at the time of the appraisal, which partly reflects the post-haste in which the tank component had been formulated under the project. The planners apparently had worked on the assumption that the selection of 500 tanks out of a total of 3000 would not be difficult. But in the absence of an accurate list of tanks, it had been a long drawn exercise. In this regard, the official lists that were available had not been all that helpful, as tanks in use as well as in disuse had got included therein. The tanks in use had been in different stages of deterioration, and the use of a common norm for rehabilitation work had not been possible. As a result much of the services of the limited technical personnel available with the Irrigation Department at the time had been deployed for identification and preliminary investigations.

3.1.2 Tank Selection

The Irrigation Sub-Committee of the Project Coordinating Committee has served as a Tank Selection Committee as well. The socio-economic and technical criteria specified in the appraisal report had formed the basis for the selection of tanks. The 130 tanks identified during the appraisal which also happened to be the largest and most prominant tanks in the district, were chosen first for rehabilitation work. As the project gained momentum, requests for rehabilitation of village tanks had poured in both from the public as well as from government agencies involved in development activities in rural areas. All such requests which satisfied the basic criteria for selection have been investigated by the Irrigation Department with the assistance of the Planning Consultants.[1] The results of such investigations were duly considered by the Tank Selection Committee and those tanks which attained the laid down specifications had been taken up for rehabilitation. The selection procedure given in Annex VIII, used by the management has been quite comprehensive and had proved helpful in objectively assessing the numerous requests for rehabilitation. In this regard, it is to the credit of the project administration that the Tank Selection Committee had not deviated from the specified criteria and a majority of the beneficiaries interviewed during field visits had no criticism regarding the selection procedure followed.

1. A private sector engineering firm retained by the project to assist the Irrigation Department.

The criteria specified for selection of tanks had served another purpose apart from assisting cost-effective restoration. As mentioned earlier in chapter 2, the rigid specifications in the 'blue print' had enabled the management to withstand much of the local pressures to introduce modifications into this component. In effect, the specifications had helped the implementing agency to spend the allotted funds on the planned rehabilitation of minor tanks in the Dry Zone in keeping with the project objectives, rather than on the repair of village irrigation systems in the South of the Kurunegala district for which there was a certain amount of clamour. The stipulation that a minimum command area of 20 acres was needed to be eligible for assistance under the rehabilitation programme, enabled the Selection Committee to turn down numerous requests from local leaders for rehabilitation of uneconomical small tanks. From a technical stand point, this certainly had been a desirable outcome, as subsequent investigations on water management in rehabilitated tanks have shown that the smaller tanks in any case were not suitable for improved water management as summarised below.[1]

> "Medium size tanks (those feeding around 20-40 acres) seem to be the group which offers fewer constraints and hence greater prospects for improved water management in general and the application of the project model in particular. In the smaller tanks, there is little gain from conserving Maha water for the Yala season (hence the objective should be to make best use of the water in Maha) while the larger tanks seem to demand a modified approach from the one adopted in the project. Dry sowing in particular does not appear to suit this group of tanks".

1.3 Physical Rehabilitation Work

Much of the physical rehabilitation work carried out under the programme included :-

(a) repairs to the bund,
(b) installation of lockable sluices,
(c) repairs to the spillways,
(d) construction of bathing steps,
(e) construction of field channels (only from 1983 onwards)

On the basis of the physical progress presented earlier, the pace of the rehabilitation work at project commencement had been unduly slow. Firstly, the Department of Irrigation had lacked both skilled manpower and equipment including vehicles at project commencement. In addition, it has been compelled

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Mr. A.M.T. Gunawardena Water Management under Small Village Tanks ARTI, Colombo, 1981.

to divert some of its resources to attend to matters connected with tank identification, as only 120 tanks had been identified in the project appraisal documents. Thus, the main implementing agency in 1979 had not been fully geared to cope with the vastly enhanced demand for its services under the project. The full complement of required technical and supervisory personnel, machinery and vehicles had reached the department only in 1982, almost three years after the project was launched. In other words, though the project office had started functioning from 1979, the major implementing agencies such as the Irrigation Department did not have the required implementation capacity to undertake the allotted tasks swiftly. Perhaps, at the time of project formulation, had there been more pre-project consultations between the Ministry of Plan Implementation and the major line agencies responsible for implementation, some of the delays experienced in this particular activity could have been minimised. With the provision of the required manpower and machinery in 1982, the pace of rehabilitation work was stepped up. Nevertheless the rate of progress had continued to lag behind the target rates specified in the 'blue print' and by the 'project year' seven, (1986) only 388 tanks had been rehabilitated.

The study team during field visits also learnt from senior engineers that a target of 500 tanks to be rehabilitated within five years was somewhat far-fetched. Their view was that a rehabilitation target of 75 tanks per year would have been a more realistic figure, considering the current implementation capacity of the department. In fact, the overall progress achieved during seven years of implementation confirms their view. Another aspect highlighted by them was that the project planners had not allowed an adequate time lag between identification and selection of tanks and commencement of construction work. The lack of basic data on tanks selected for rehabilitation had necessitated the engineering staff to visit them at least thrice, first for identification, second for surveying and selection and third for estimation of the work to be done. The preliminary investigations as well as the preparation of estimates etc. have been both time consuming and arduous, resulting in many delays.

The devolution of financial management and controls to the Project Director had helped the implementing agency to process the necessary tenders expeditiously and award contracts for civil engineering works without delay. However at project commencement not many bidders had come forward to undertake jobs in remote areas that lacked proper road access and transport facilities. In many such cases, even the limited bids received have been far higher than the approved estimates

which in turn had caused further delays in initiating construction work. But as the project progressed, due to greater awareness of project activities among the public, the situation had gradually improved and the administration had been able to attract a sufficient number of bidders to proceed with the work even in remote locations. This could be attributed largely to the excess capacity of earth moving equipment available with some of the private contractors working in other construction sites in the district. In the later years the project office in keeping with government policy, had given priority to 'Gramodaya Mandalayas' in the award of contracts valued under Rs. 150,000 for tank rehabilitation work.

In general such organisations have not been too successful in accomplishing the given assignments due to lack of experience and poor organisational ability. During field visits, the study team also learnt that 'Gramodaya Mandalayas' had even sub let some of the contracted jobs to third parties including small time private contractors as well as junior field officers working in the rural areas.

In most instances, work undertaken by 'Gramodaya Mandalayas' has resulted in inordinte delays and the quality of construction work completed too has been below expectations according to some of the engineers interviewed by the study team. On the other hand, the private contractors with vastly superior resources had completed the allotted tasks on schedule and the quality of work too had been better according to an official spokesman.

3.1.4 Farmer responses to physical rehabilitation work

A sample survey among 144 farmers under rehabilitated tanks brought in a mix of reactions regarding the physical improvements effected under the project (Annex IV). Around four-fifths of those interviewed agreed that the physical improvements completed were both essential and useful, but their priorities were different with 92% indicating that desilting of tanks or raising the spillway was far more important to them. A majority disagreed about the importance of repairs to tank bunds as well as spillways.

The official thinking on the above issue is quite contrary to the farmers' view points expressed during the survey. The appraisal team in fact has not considered this aspect due to more than one reason. Firstly, cost-wise desilting is prohibitive. As one of the basic criteria of the rehabilitation programme was that the total costs should not exceed Rs. 7500 per incremental irrigated acre, disilting

apparently has been ruled out on cost considerations. Secondly, even if desilting had been undertaken at prohibitive costs, the resulting increases in the storage capacities of rehabilitated tanks are not sustainable in the long run, due to heavy soil erosion from catchment areas and other tank reservations which are regularly cropped. Given such a scenario, intensive soil conservation measures in catchment areas including reforestation and prohibition of arable cultivation in tank reservations have to proceed 'pari passu' to reduce soil erosion and silting of rehabilitated tanks. Thirdly as many of the village tanks depend entirely on direct rainfall which is highly unstable in the dry zone and run off water from their own small catchment areas and also as the catchment area/tank storage ratios are often unfavourable the minor tanks in most years remain unfillled up to spill level even during the North East monsoon rains. In such circumstances, any attempts to further increase further the storage capacity of minor tanks by desilting at high costs is a moot point.

A high proportion of farmers in the sample village tanks listed in Annex IV had a cause to complaint that their views were not sought regarding the rehabilitation work undertaken. Nearly one half (46%) of them said that they were not consulted regarding the rehabilitation needs, whilst further one fifth complained that though they were consulted their views had not received any consideration. One typical complaint ran as follows :-

> "Field channels constructed could not be used to carry water, hence farmers continued to use pre rehabilitation channels,"
>
> "under one tank in a Yaya where the paddy fields had a slope running from the periphery to the centre, instead of providing two field channels alongside the periphery, one field channel had been constructed along the centre of the Yaya. As a result the newly built channel had not been so helpful to some of the farmers near the periphery."

The above request of farmers for two channels had not been accommodated on cost considerations. The Irrigation Department in fact had planned one central channel with the required gradient to irrigate the fields on the two sides, but the contractors had failed to adhere to the specifications given in the plan which apparently had skipped the attention of the supervising agency and as a result the central channel had not served the purpose intended.

In the course of the minor tank survey, the study team came across some complaints regarding the quality of work in completed tanks. Much of the farmer complaints had been related to the use of sub-standard construction materials, non conformity to some of the specifications poor quality earth work and general workmanship etc. On checking some of the issues raised by the farmers with the management, the study team was assured that all serious complaints regarding sub-standard work had been duly investigated and necessary corrective action taken in most instances. In addition, for tighter control of payments and for better supervision of contract work, some of the financial authority, originally assigned to Divisional Irrigation Engineers, have been withdrawn. Consequently the Regional Deputy Director of Irrigation had taken the overall responsibility for approval of last payments for work done during the latter years.

Since much of the farmer complaints related to civil engineering aspects of the work done, the ARTI retained the services of an experienced engineer to advise the study team on technical aspects of the rehabilitation programme. Some of the salient points of the engineering consultant's report on 25 rehabilitated tanks selected on a random basis indicate as follows.

The consultants' assessment of the physical rehabilitation work of 16 tanks revealed that the work done had been satisfactory in general. Among them he had ranked two tanks 'Mahamitawa' and 'Mahagalkadawala' as superior to the others.

> "The contrast between the improvements effected to Kudamithawa wewa and to Mahamithawa wewa were remarked on during the inspection. In general it may be said that the rehabilitation work done on Kudamithawa wewa was typical, and that done on Mahamithawa wewa was a-typical."

Since Mahagalkadawala is an ancient tank with a known historical record, the field inspections were carried out with special attention to detail.

> "The distribution of water to the two main L.B and R.B channels below the sluice was working well. There appeared to be good water management in this scheme. For example it was possible to inspect the tail end of the 38 chain long L.B channel where water was flowing in the channel and being issued to the fields at the tail end of the yaya."

Among the 25 tanks surveyed there were 7 tanks with unsatisfactory rehabilitation work of which the consultant had not made any comments but had pinpointed some of the short comings.

> "Improvements to the sluice have been done but access to the sluice tower is not satisfactory .....the sluice gate also appeared to be defective; no gauge post has been provided."
>
> - Halmilla wewa -

> "Earth work appears to be incomplete and the bund not to specifications between the R.B tower sluice and the bathing steps."
>
> - Thambagalla wewa -

In view of the many complaints of the sample farmers regarding the poor quality of some of the construction work done, the consultant was asked to take a closer look at the structures in the sample tanks. Some of his relevant comments are reproduced below.

> "Concrete in the structures that were inspected was of a uniformly good quality. The shuttering work had been carefully prepared so that there had been no grout leaks. This was unusual for this type of work done on contract by small-scale contractors."
>
> - Baddegama wewa -

> "Improvements had been effected to the bund, but bund level blocks were not evident. The bund sides were again overgrown with vegetation. The tank bed was overgrown with grass and water weeds. A bathing spot had been constructed, but there were cracks in the concrete due to differential settlement. This is more or less a typical example of cracks seen in bathing steps in many of the tanks that were inspected."
>
> - Hathapola wewa -

> "In the provision of improved irrigation facilities, the channel below the sluice has been paved in rubble masonary for about the first 200 ft. immediately below the sluice outlet. However, the rubble lining has been broken already, at a point just below the outlet, in order to divert water into a field. This shows that the design is not good, or that the water issue management is at fault. Either way, some action is necessary to remedy this before it is further aggravated."
>
> - Kadahatha wewa -

The consultant in conclusion has also stated the following.

> "It was quite evident that there was no visible difference in the quality of the rehabilitation work done by small local societies like 'Gramodaya Mandalayas' on small tanks, using their own very limited resources, and the work done by similar societies as contractors on other projects that were done under the IRDP financed by the World Bank.
>
> There was a vast difference in the cost of such work as compared to the cost of the work done on IRDP tanks, according to figures given at sites by local people, which however could not be verified. This difference in each case of an IRDP small tank would constitute the element of overheads mentioned above."
>
> "However, the method of implementation of the rehabilitation programme has certain in-built shortcomings. The most obvious is that the overhead costs seem to be very high. It would be interesting to do a study of the costs of these schemes to find out what percentage of the costs were actually spent at the village that is benefitted by the rehabilitation, what percentage is spent at district level and what percentage is spent in the capital city, Colombo."

3.1.5 People's Participation

As the project design had not prescribed any specific procedures for people's participation, understandably the project administration during early years had concentrated largely on swift achievement of physical targets. The impression gained by the study team was that during the first three years farmers have not been directly approached in setting priorities for rehabilitation work and as a result, their experiences as well as the intimate knowledge of local conditions had by and large remained untapped by the implementing agency, which is unfortunate. Though the Members of Parliament had an opportunity to air their views on rehabilitation proposals concerning their electorates at Coordinating Committee meetings, such dialogues could hardly be called people's participation, largely due to the fact that observations of electoral representatives made at such meetings often are at very general nature that refer to broad issues concerning a whole electorate.

Even in an earlier ARTI study in 1981, the need for farmer participation in the rehabilitation work had been stressed,[1]

> "In actual fact, there was hardly any participation except for their work as hired labourers. It was noticed in instances where rehabilitation work was going on at the time of the study that farmers did not even know what was being done except for what they heard from their own people. The villagers thought that it was an 'engineering job' and hence they were not kept informed. They often had certain views of what should be done, and what was good for them. Of course they wanted a quick job too, as they were the ones who would lose otherwise. Unfortunately they were not consulted. They had no way of expressing their opinions or suggestions."

The absence of an effective institutional mechanism to express farmer's needs in regard to design and implementing the rehabilitation work had been a major deficiency. Since irrigation improvements are undertaken for the benefit of farmers, their interests and views should have received more consideration. However, as the rehabilitation programme gained momentum, the management had felt the need to move closer to grassroots for efficient implementation. In fact, it is a matter for gratification that the project office had conducted a systematic evaluation of implementation through a survey,[2] in 1981. Based on its findings, the management had introduced a system of prior consultation and discussions with the beneficiary farmers before finalising the rehabilitation scheme for a tank (see annex VIII) This certainly has been a step in the right direction which had helped to bring the implementing staff and the beneficiaries at the local level closer.

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1. A.M.T. Gunawardena. Water Management under small village tanks, ARTI, Colombo 1981.

2. (KIRDP) Office. A Survey of the First Twenty Seven Tanks Rehabilitated under the Irrigation Component , Kurunegala, April/May/1981.

3.1.6 Labour use for the rehabilitation work

The study team was greatly handicapped in this area, due to the non availability of data. Of the 388 tanks completed at the time of the survey records were available pertaining to only about 10% thereof. Hence the information given in this section is mostly estimates.

As much as 40% of the rehabilitation costs account for labour and of this only 8% consist of skilled labour. In most instances the unskilled labour had been recruited from the surrounding area. According to estimations 2129 unskilled man days had been used for an average tank with a 50-acre command area. Hence at least 1.0 m labour days (possibly more) should have been created due to this programme. In addition the road development programme, rural water supply and electrification programme too had created construction phase employment but no quantitative data were available.

The labour wages had varied considerably during the project period. In 1980 the wage rate was Rs. 20/- per day and in 1985 the Irrigation Department had paid Rs. 40/- per day. But the unskilled labourers complained that the contractors had generally paid in the region of Rs. 15-25 per day during the entire project period.

The investigations of the study team revealed that only about 5% of the paddy farmers had participated in construction work. Much of the labour who found employment had been unemployed youth from the neighbouring villages. In this regard a major complaint of the beneficiary farmers was the non-accommodation of their views in undertaking tank restoration work.

3.1.7 Handing over of Rehabilitated Tanks

As mentioned earlier, the implementation of the irrigation and water management component has been the dual responsibility of the Departments of Irrigation and Agrarian Services. The discussion so far in Chapter 3 had focussed on the physical rehabilitation of village tanks by the Irrigation Department.

With the completion of construction work, the rehabilitated tanks had to be handed over to the Agrarian Services Department for operation and maintenance and the introduction of systematic water management envisaged under the project. Unfortunately this had been a painfully slow process as may be seen from the figures given below.

Table 3.2

Progress of handing over of rehabilitated tanks

| Project year | Calendar year | No. Rehabilitated Number | No. Rehabilitated Cumulative total | No. taken over Number | No. taken over Cumulative total |
|---|---|---|---|---|---|
| 1 | (1979) | 0 | 0 | 0 | 0 |
| 2 | (1980) | 37 | 37 | 0 | 0 |
| 3 | (1981) | 57 | 94 | 0 | 0 |
| 4 | (1982) | 72 | 166 | 44 | 44 |
| 5 | (1983) | 114 | 280 | 24 | 68 |
| 6 | (1984) | 63 | 343 | 128 | 196 |
| 7 | (1985) | N.A. | 343 | 90 | 286 |

Numerous difficulties encountered over the transfer of rehabilitated tanks for operation and maintenance had caused considerable delays in the introduction of the improved water management programme which is certain to affect the timely realization of much of the anticipated benefits. On the basis of the information available to the study team, much of the delay referred to earlier could have been minimised, had the project planners adequately recognised the functional inter-relationships in the implementation of this component. In this particular instance, the responsibility of one agency could begin only when that of the other ends and, therefore the appraisal team should have specified the necessary criteria for the smooth transfer of responsibilities from one to the other. In other words, the 'blue print' should have defined the parameters of 'successful' implementation. Apparently, this has escaped the attention of the planners and largely due to this reason, the two line agencies had not been able to agree on a common criterion for judging the degree of completion of minor irrigation works. Due to the unequal perception of what constitutes 'successful completion' of physical rehabilitation by the two line agencies involved, the handing over process of rehabilitated tanks had got dragged over for almost four years.

In the course of discussions the study team had with the implementing agencies, it also transpired that both departments during the early project years had not been quite aware of what their responsibilities were and also the

procedures to be followed in the transfer of the rehabilitated tanks from one agency to the other. On one hand the senior engineers of the Irrigation Department appear to have been under the errorneous impression that handing over of rehabilitated tanks could begin once all the rehabilitation work in the 500 tanks had been completed. As a result, the Irrigation Department had not made any serious attempts to hand over the small number of tanks rehabilitated during the first two years. On the other hand, the Agrarian Services Department which had taken over the responsibility for operation and maintenance of minor tanks in 1978 from the now defunct Territorial Civil Engineering Organization, lacked both the expertise as well as the implementation capability for operation and maintenance of minor tanks during the early project years. In this regard, it is also relevant to bear in mind that as the responsibility for village irrigation works had changed hands among half a dozen or so different state agencies during the past two decades, a majority of minor tanks were in a very poor state of repair in 1978. Thus, the Agrarian Services Department apparently had not been too keen to handle the operation and maintenance of rehabilitated tanks until the necessary trained staff and other facilities were available.

Another snag that had delayed the transfer of rehabilitated tanks to the Agrarian Services Department had been the non-inclusion of down-stream development works in the original implementation programme. Though desilting and enlargement of field channels had been identified in the appraisal report as a necessary item of work to be done, it had failed to get included in the final implementation programme, the reasons for which are obscure. This omission in the project design had been rectified only in 1983, as a result of representations made by the project management to a supervisory mission from the World Bank. The department responsible for water management had understandably refused to take over the rehabilitated tanks without the necessary down-stream development work being completed.

In addition, the poor quality of workmanship in civil engineering works in some of the rehabilitated tanks has been a major bone of contention between the two line agencies that had contributed to a slowing-down of the handing over process. The two agencies with completely different orientation, outlook and interests in the discharge of their respective responsibilities under the project, appear to have had more reasons to disagree than to agree on this particular issue. The Agrarian Services Department with its traditional links with farmer institutions has been generally wary in

taking over rehabilitated tanks where the quality of workmanship was in question. In addition, due to the lack of general maintenance of rehabilitated tanks since the completion of construction work, the Agrarian Services Department had also been diffident about accepting responsibility for them. As mentioned before, this is partly due to the department not having the necessary technical expertise to undertake maintenance work during the early years of the project. On the other hand, the Irrigation Department with its strong engineering base and scanty links with farmer organisations, had been more concerned with physical progress so that its performance could be judged more on quantitative terms. The qualitative aspects of some of the civil engineering works completed had not been the forte of the Irrigation Department in this particular construction programme, as repeatedly pointed out to the study team by the farmers during field visits. Though a chain of events had contributed to the inordinate delays in the transfer of responsibility for rehabilitated tanks, the single most important issue that had arisen was the dubious quality of some of the construction work done under the supervision of the Irrigation Department. As a result, by 1983, the fifth project year, only one fourth of the rehabilitated tanks (68 out of 280) has been taken over by the Agrarian Services Department. This certainly is a sad state on events in the annals of the Kurunegala IRD project implementation, which in turn had disorganised the subsequent initiation of the improved water management programme.

With the commencement of down-stream development work of rehabilitated tanks in 1983 and strengthening of the technical cadres of the Agrarian Services Department in 1984, some of the earlier mentioned difficulties had in fact begun to ease out particularly with the project entering the final phase. The project management too on realising the snail's pace in which this particular aspect of the programme was moving had applied much pressure on the two line agencies to expedite this work through the Project Co-ordinating Committee. This Committee had appointed a three-man Sub-committee comprising of representatives of the project office and the two line agencies to visit all the rehabilitated tanks that were in dispute for one reason or other and take necessary remedial action. Due to the work of this Sub-committee, much of the conflicting views as well as positions taken up by the two agencies previously on this particular issue had been gradually narrowed down. As a result the pace of handing over of the rehabilitated tanks had quickened and during the two years (1984 and 1985) the Agrarian Services Department had taken over 218 tanks

compared to only 68 previously. This is a commendable improvement in the performance for which the project management could be justly proud of, particularly in handling a delicate issue involving two key departments under different ministries.

3.1.8 Improved Water Management Under Rehabilitated Minor Tanks

The project planners had stressed the need for adoption of a package of agricultural practices under rehabilitated tanks in order to realise the benefits from the investments on irrigation improvements. More precisely, the appraisal report has specified that the 'Walagambahuwa' model developed at the Maha Illuppallama Research Station be adopted. In published literature, this model had been described as introducing a new concept of technology to improve cropping intensities which were generally low in minor irrigation schemes, largely due to inefficient water management practices. The principal hypothesis underlying the village tank water management programme was that water saved during the main rainy (Maha) season can be used to cultivate a second crop in the less rainy (Yala) season. Dry sowing the first crop, rotational water issues in Maha season and crop diversification in the second season are some of the key elements in the efforts to improve the efficiency of water use. For this purpose, the appraisal report had emphasised the need for advancing cropping calendars, avoidance of staggered cultivation, use of short duration varieties and mobilization of group action through education and training. The implementation responsibilities for more activities under the project have been assigned to the Agrarian Services Department which is responsible for operation and maintenance of village irrigation works.

However as discussed at length in the preceeding paragraphs, the Agrarian Services Department had not been in a position to initiate the envisaged water management programme until very late in project life. In this regard, some excerpts from project annual progress reports are given below to provide an insight to the activities that had gone on under the water management programme.

> "Much emphasis has been given to the holding of the cultivation meetings (kanna meetings) both in the Yala and Maha of 1981. During the 81/82 Maha season, water management programmes were being advocated and practised in over 250 minor tanks". (1981)

> "Much emphasis had been given to the holding of the cultivation meetings (kanna meetings) both in Yala and Maha 1982. An intensive water management programme on

the lines of the VIR*1 project was implemented on a pilot basis, in one of the tanks in the district namely Ethawa in the Wariapola electorate. It is envisaged to incorporate many more tanks on this same basis with the commencement of the Yala season of 1982. In this connection two water management teams selected for this purpose have been given the necessary training at Maha Illuppallama. An AI, two DOO and two TAA were selected and trained at the Maha Illuppallama Research Station for this purpose, and they are now in the process of preparing proposals to take up atleast 20 tanks during the forthcoming year under the intensified water management programme as envisaged in the VIR Project". (1982)

"An intensive water management programme on the lines of the VIR Project was implemented on a pilot scale in 1982 in one tank in Ethawa in the Wariapola electorate. On these same lines the water management programme was extended to another 28 minor tanks in 1982. During 1983 another 22 tanks have been taken up under the programme making a total of 50 tanks by the end of 1983. The Department of Agrarian Services conducted training classes in water management and in addition had 8 demonstrations to popularise the water management programmes." (1983)

"During the year under review, basic requirements like survey equipment and staff required by the Department of Agrarian Services for their water management programme were made available. A regional irrigation engineer, and supporting staff were made available to the Assistant Commissioner of Agrarian Services for his work in the district. As regards staff training, foreign study tour facilities under the Project were made available to three officers from the Kurunegala district. In addition, 13 officers were trained in water management practices in Maha Illuppallama. Utilising the services of this trained staff in the Department of Agrarian Services in Kurunegala, 54 training classes involving 2500 farmers were held throughout the district in water management. It is hoped to continue these farmer training classes in the forthcoming years with a view of covering most of the farmers in the district." (1984)

The progress reports quoted here indicate that much emphasis has been given to kanna meetings, training of officers at Maha Iluppallama and the training of farmers within the

*1 Village Irrigation Rehabilitation Schemes.

district. The intensive water management referred to in the progress reports for 1982 and 1983 appears to be a part of the island wide water management programme of the Department of Agrarian Services and not the Walagambahuwa model envisaged under the project. In this regard, the detailed discussions the study team had with the senior officials of the Agrarian Services Department in Kurunegala revealed that the basic requirements for water management, both the trained staff as well as equipment, were provided only in 1984 which is also confirmed in the project progress report for that particular year. In addition to the lack of trained staff, most of the rehabilitated tanks themselves were not ready for adoption of the Walagambahuwa model of water management prior to 1983, as down-stream development work was not complete. The departmental spokesman further added that the water management programme intended under the project was initiated in 25 rehabilitated tanks in 1985, on a pilot scale and it would take at least two more cropping seasons for the farmers to get adjusted to the new practices recommended A speciman of a water management programme initiated by the Department of Agrarian Services at the end of 1985 is presented in Annex eleven.

On the basis of discussions the study team had with the researchers at Maha Illuppallama and also field observations, it appears that certain modifications of the Walagambahuwa model is necessary prior to its adoption in the Kurunegala district. In the drier areas of the district where the rainfall is not only low but also irregular, the two-season cropping of paddy on a regular basis under rehabilitated tanks as envisaged in the appraisal report is very doubtful. In such areas, the function of the minor tanks should be to supply bathing and drinking water to beneficiaries during the dry season and not so much irrigation, because such tanks lack water for regular cropping during Yala. The applicability of the Walagambahuwa model appears to be best suited for adoption under rehabilitated tanks in the intermediate zone as the rainfall conditions are more regular.

In concluding this discussion, it is the view of the study team that due to the delayed start of this component, it is premature to attempt to assess the effects of the improved water management programme in the present study. The pilot programme just launched by the Agrarian Services Department should gain momentum and stabilise under the minor tanks before any meaningful evaluation is undertaken.

3.2 Major Tank Rehabilitation

Under the project, nine major tanks in the district namely Magalla, Mediyawa, Kimbulwana Oya, Batalagoda, Hakwatuna

Oya,Abakolawewa, Attaragalla wewa, Palukadawala wewa and Usgala Siyambalangamuwa wewa had been taken up for rehabilitation with a view to facilitating a more equitable water distribution to individual farms. During the past two decades or so, all these tanks had undergone some rehabilitation in their head works but down-stream development so necessary for efficient water distribution had remained unattended largely due to lack of finances.

The major items of work carried out under the rehabilitation programme at a cost of Rs. 38.4 million were:

(a) desilting and enlarging of the main channels and distributaries
(b) repairing, enlarging and gravelling of embankments such as farm roads,
(c) lining of selected reaches of the conveyance system to reduce excessive seepage losses
(d) construction of additional regulators and other drainage outlet structures,
(e) installation of turnouts and distributory gates.

3.2.1 Physical Rehabilitation Work

At the time of the appraisal, as the preliminary investigations for all the nine tanks have been completed, the planners had expected the construction work in two of the schemes to commence in 1979, the first year of the project. However, due to delays in conducting detailed surveys, and the preparation of designs due to shortage of engineering and other supporting staff and procurement of machinery, equipment etc., the implementation work had fallen behind schedule and had moved at a much slower pace than planned. In all the tanks, except in Kimbulwana Oya and Mediyawa, the physical construction work had taken more than 2 calendar years to complete. Magalla Wewa had been an extreme case taking 5 complete years.

Table 3.3
Physical Progress of Civil Works

| | Tank | Year of commencement | Year of completion |
|---|---|---|---|
| 1. | Magallawewa | 1981 | 1985 |
| 2. | Mediyawa | 1981 | 1983 |
| 3. | Kimbulwana Oya | 1979 | 1981 |
| 4. | Batalagoda | 1979 | 1984 |
| 5. | Hakwatuna Oya | 1979 | 1983 |
| 6. | Abakola wewa | 1980 | 1984 |
| 7. | Attragalla | 1980 | 1984 |
| 8. | Palukadawala wewa | 1980 | 1984 |
| 9. | Usgala Siyabalangamuwa | 1980 | 1984 |

In this regard, it is relevant to bear in mind that though the project office had become operational in 1979, the Irrigation Department had not been fully geared at the time to cope up with the enhanced demand for its services at very short notice. As mentioned earlier in the discussion on the minor tank rehabilitation, the securing of necessary staff and the procurement of machinery and equipment had taken longer than envisaged by the appraisal team. Such delays are not uncommon when a very heavy investment programme on civil engineering works is suddenly thrust on a regional irrigation office which has limited staff and equipment. Acquisition of trained staff and machinery take time and Kurunegala IRD project is no exception. It is however, to the credit of the department that despite the delayed start, all the construction work envisaged by the project planners had been completed by the end of 1985.

3.2.2 The Effects of Rehabilitation Works

Prior to the rehabilitation, the major tanks too experienced shortages of water for double cropping. In the baseline survey of the project area, the authors discussed the situation in 1979 as follows:-[1]

> "... cropping intensities achieved under major irrigation are not different from that under minor irrigation indicating water scarcities even under major irrigation".

Since then, the water supply situation under all the nine tanks rehabilitated had improved considerably. The study team observed the improved water supply situation first-hand during their visits to these tank areas in 1985/86. In addition, a sample survey conducted at the beginning of 1986 in the areas under reference provided very encouraging results.

The improvements effected to the conveyance system under major tanks had facilitated a more equitable distribution of irrigation water to individual farms as observed during field visits. Firstly, with the installation of turnouts and distributory gates there is a much better water control all the way from the tanks to the individual fields.

Prior to rehabilitation, as water control was possible only from the main channels, the fields near the main channels invariably got water with every issue and the farmers at the tail end experienced frequent shortages particularly during the dry

1. A.M.T. Gunawardena. "Kurunegala Integrated Rural Development Project, Analysis of the Pre project situation", ARTI, Colombo 1981.

seasons. Besides with the installation of lockable control devices in the water distribution network, illegal tapping as well as unauthorised issues of water had become less frequent. The lining of distributory channels had reduced the seepage and other ground losses of water and with the installation of larger turnout gates, the flow of water had quickened resulting in a larger area being irrigated within a shorter duration.

Nearly two-thirds of the farmers included in the sample survey felt that the improvements effected were both essential and useful. However, only a third of the sample farmers agreed that the quality of construction work was satisfactory. Most of those having fields near the head reach of the tanks considered that improvements to the conveyance system were not essential. With regard to the quality of civil engineering works undertaken, a majority expressed their dissatisfaction due to the lower quality of some of the masonary work in the structures completed as well the durability of the regulatory devices fixed. The observations of the study team during field visits, confirm some of the deficiencies pointed out by the farmers. However, this matter could not be probed further due to the lack of time as well as the necessary technical personnel. Inspite the doubtful quality of some of the construction work, as alleged by the farmers, their own views were that a systematic maintenance programme should be implemented without delay in order to keep the conveyance system at least in the present form.

The project's concern on water management had been appreciated both by the farmers as well as the officers involved in irrigation activities. The attempt to enforce strict rotational issues of water at farm level is a departure from the traditional system of providing irrigation water on a continuous basis for paddy cultivation. As the rehabilitation works in most of the major tanks were completed only at the end of 1984, it is quite premature to assess its performance at present.

However, in the case of Kimbulwana Oya scheme, where rehabilitation work was completed expeditiously in 1981, a remarkable improvement in the use of irrigation water has been recorded. The study team observed that due to efficient water management farmers had regularly cultivated paddy in both seasons according to specified cropping calendars and also attended to routine maintenance tasks in field channels entrusted to them, whilst the Irrigation Department had looked after the head works and main channels. At Kimbulwana Oya, a high degree of farmer and official participation in water management activities was evident during field visits, which is more an exception than the rule when looking at all the major schemes together. The officer-in-charge in this particular scheme is certainly dedicated to ensure the efficient use of irrigation water and his labour has been amply rewarded in terms of improved performance after rehabilitation.

Table 3.4
Cropping Intensity Under Major Irrigation

| Season | Pre Project | At Project Completion |
|---|---|---|
| | 1979/80 cropping year[1] | 1985/86 cropping year[2] |
| Yala | 62 | 97 |
| Maha | 95 | 100 |
| Crop year | 157 | 197 |

Source: 1. Baseline Survey - ARTI - 1979/80.
2. Survey Data - ARTI - 1985/86.

The survey data at project completion show much improvement in the overall cropping intensity particularly during the Yala season reflecting a substantial increase in the area double cropped under major schemes. The discrete data of two cropping seasons are inadequate to discuss any trend in cropping intensity changes in the areas benefitted. As all rehabilitation works under major schemes were completed only in 1985, it is considered desirable to monitor systematically, the cropping intensity as well as rice yields seasonally from now onwards for a period of about five years to assess the effect and impact of this rehabilitation programme. At Kimbulwana Oya where rehabilitation work was completed first in 1981, some of the effects of rehabilitation is already seen. In the left bank where down stream development was completed in 1981, a cropping intensity of 196 was recorded in 1984/85 season compared to only 167 in the right bank which was not rehabilitated. The lower cropping intensity recorded in the right bank is largely due to smaller acreages cultivated in Yala season, arising from the problems associated with the supply of irrigated water.

## CHAPTER FOUR

## PADDY PRODUCTION

In terms of land use, Kurunegala has the highest paddy acreage among all districts and the project has rightly afforded a very high priority for the improvement of the paddy sector. Under the project as the principal thrust had been to rehabilitate the production base of paddy along with the strengthening of the essential supporting services, the project planners had allocated nearly three-fourths of the project budget for a range of activities designed to improve paddy farming in the district. Among them, the single most important component had been the irrigation rehabilitation and water management discussed earlier in Chapter three. In addition, the project investments also covered a number of other activities to improve the supplies of critically needed farm inputs such as improved varieties of seed paddy, fertilizer, agro-chemicals and farm power. Provision of agricultural credit and strengthening of agricultural extension services are among the other major project components designed to benefit paddy farmers in particular.

In essence, the main strategy under the project had been to upgrade the small farmer paddy sector by increased application of inputs and improved technology. However, due to the existing ownership patterns of paddy holdings in the district, the impact of the production increases due to project intervention are likely to be minimal particularly on the poorer sections of the rural community. For instance the sample survey conducted by the study team in 1986, revealed the following paddy land ownership pattern.

Table 4.1

Ownership of Paddy Lands

| Size class | No. of respondents Owning paddy lands % |
|---|---|
| No paddy land | 23 |
| 0 - 1/2 acre | 47 |
| 1/2 - 1 acre | 18 |
| 1 - 5 acre | 10 |
| 5 + | 2 |

Source : Sample Survey Data, 1986.

Given such a land ownership pattern, the number of direct beneficiaries of major investment such as the irrigation rehabilitation programme would be smaller than the anticipated project beneficiaries. In addition, as two fifths of the paddy acreage in the district is dependent on rainfall for cultivation purposes, the number of direct beneficiaries from this particular investment programme is likely to get reduced still further.

At appraisal, the project planners had envisaged an increase of 10,000 acres of irrigated land as a result of the rehabilitation of 500 village tanks. The planned introduction of improved water management in irrigated areas and the increased supply of farm power had targetted for an increase in the cropping intensity from about 140 to 151 by the end of the project. In addition, due to the increased application of vital farm inputs backed up by a reorganised agricultural extension service, the average yield per acre of paddy was also expected to rise by 10 bushels during project life.

This chapter is primarily concerned with the realisation of the expectations of the irrigation rehabilitation and water management programme and the progress achieved in the supply of farm inputs to the paddy sector. As the completion of irrigation rehabilitation work more or less coincided with the present evaluation study, the ensuing discussion is aimed largely to identify the direction of changes that could have taken place in the paddy sector during the past four years. Besides, due to the operation of a number of other national programmes aimed at improving the paddy sector alongside project activities, the isolation of the effects of project-sponsored paddy programmes from the others would not be so simple. Consequently no attempt would be made here to assess the effects of individual components designed to benefit paddy producers in general.

4.1 Irrigated Acreage

The asweddumized acreage under paddy in 1979 was 171,884 acres of which 59% was under irrigation, both minor and major. The 1984 census data reflect an overall increase of 3% in the irrigated area in the district. Looking at the command area under rehabilitated tanks in particular, a substantial increase in the irrigated acreage is seen since the restoration work was completed. In this regard, the detailed records of the changes in extents under command area of individual tanks from project inception, made available to the study team are summerised below.

Table 4.2
Changes in the Command Area of Rehabilitated Tanks

| Zone | Electorate | No. of Tanks | Command Area Before Rehabilitation Acres | Command Area After Rehabilitation Acres | Increase in the Command Area Acres | Increase in the Command Area % Increase |
|---|---|---|---|---|---|---|
| Dry Zone | Nikaweratiya | 65 | 4338 | 5612 | 1224 | 28 |
| | Yapahuwa | 54 | 2084 | 2816 | 732 | 35 |
| | Panduwasnuwara | 16 | 1022 | 1806 | 784 | 77 |
| | Galgamuwa | 60 | 2351 | 2894 | 543 | 23 |
| Sub Total | | 195 | 9845 | 13128 | 3283 | 33 |
| Intermediate Zone | Katugampola | 10 | 439 | 657 | 218 | 50 |
| | Kuliyapitiya | 18 | 1068 | 1608 | 540 | 50 |
| | Bingiriya | 17 | 838 | 1504 | 666 | 79 |
| | Wariyapola | 30 | 1704 | 1888 | 184 | 11 |
| | Hiriyala | 12 | 1241 | 1478 | 237 | 19 |
| | Dodangaslanda | 4 | 207 | 607 | 400 | 193 |
| | Dambadeniya | 3 | 80 | 100 | 20 | 25 |
| | Kurunegala | 22 | 67 | 98 | 31 | 46 |
| Sub Total | | 96 | 5644 | 7940 | 2296 | 41 |
| Wet Zone | Polgahawela | 4 | 271 | 302 | 31 | 11 |
| | Mawathagama | 2 | 70 | 90 | 20 | 28 |
| Sub Total | | 6 | 341 | 392 | 51 | 15 |
| Grand Total | | 297 | 15770 | 21460 | 5690 | 36 |

Source: Survey data, 1985/86.

Looking broadly at the figures, a net increase of 5670 acres in the command areas of 297 tanks is seen. On the average in 90% of the rehabilitated tanks both in the dry as well as in the intermediate zones, the command area has increased. If a similar trend continues, in the balance 200 tanks for which detailed records were not available at the time of the present study, the realisation of the envisaged target of an additional 10,000 acres from the tank rehabilitation programme should not be too difficult.

The study Team, during the sample survey of the rehabilitated minor tanks, also looked independently at the question of the changes in the acreage in command areas of rehabilitated tanks. According to

survey results, in 92% of the rehabilitated tanks there have been increases in the command area due to improvements effected. The increases seen were greater in the intermediate zone, where the cultivable acreage had increased by almost one third, and in the dry zone nearly by one fourth. However the lands added on to the command area after rehabilitation are by no means new lands brought under the plough. Much of such lands had remained fallow over the years due to lack of irrigation water as tanks concerned have been in a very poor state of repair prior to rehabilitation. But with the completion of the necessary restoration work, both the storage capacity as well as the distribution network have improved considerably, and much of the lands that had remained fallow for years appear to have benefitted from the greater availability of water in the restored tanks. This is a very commendable achievement by all concerned, the project planners, management, and the implementing agency could be justly proud of. It is to the credit of the project planners that the appraisal focussed its' attention on the restoration of small tanks as a means of diverting resources to the less developed areas in the district. The performances recorded so far have more than justified their expectations.

In view of the widespread use of tank water for unauthorised cultivation purposes, the study team undertook a detailed study of three tanks for a better understanding of the magnitude of unauthorised cultivation under rehabilitated tanks. The table given below pinpoints that in addition to the increases in the command area officially recorded, a substantial additional acreage is regularly cultivated with irrigation water tapped illicitly from the minor tanks.

Table 4.3

Increased Acreage Under 3 Selected Minor Tanks

| | Tank | Command area 1978 | Command area 1985 | Increase in the command area | Illecitly cultivated acreage in 1985 | Increase in the cultivated acreage (including legal & illecit acreage) |
|---|---|---|---|---|---|---|
| | | Ac. | Ac. | % | Ac. | % |
| i. | Bakmeegahawewa (Nikaweratiya) | 48 | 65 | 35 | 26 | 89 |
| ii. | Talakotuwa (Bingiriya) | 19 | 24 | 26 | 9 | 73 |
| iii. | Potangamapalatha (Galagamuwa) | 80 | 100 | 25 | 10 | 37 |
| | Total | 147 | 189 | 28 | 45 | 59 |

Source: Survey data, 1985/86.

Unauthorised cultivations as noted above partly reflect on the potential of the village tanks in sustaining life in relatively inhospitable environments. Besides, as the acreage effectively dependent on minor tanks appears to have been considerably underestimated in official records, it is very likely that the actual increase in the command area would exceed the anticipated target of 10,000 acres on project completion.

4.2 Cropping Intensity

The records maintained by the Census and Statistics Department as well as results of sample surveys conducted by the ARTI show an increasing trend in the overall cropping intensity during the period 1979-1984.

Table 4.4
Cropping Intensity by source of irrigation
(1978-84)

| Source of Irrigation | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|---|---|
| Major | 160 | 145 | 152 | 177 | 149 | 143 | 186 |
| Minor | 139 | 125 | 133 | 130 | 114 | 94 | 165 |
| Rainfed | 176 | 155 | 171 | 161 | 173 | 156 | 181 |
| All lands | 158 | 141 | 152 | 150 | 143 | 127 | 174 |

(Source: Department of Census and Statistics)

Table 4.5
Cropping Intensity

| Source of Irrigation | 1978/79[1] | 1985/86[2] |
|---|---|---|
| Major | 157 | 190 |
| Minor | 141 | 165 |
| Rainfall | 176 | 191 |
| All Lands | 158 | 182 |

Source: 1. Baseline Survey - ARTI, 1981.
2. Survey Data - 1985/86

In the first project year (1979), the cropping intensity achieved is in conformity with the appraisal estimate for the base year. However, the trend seen in the above figures for the seven-year period shows a faster rate of increase than the appraisal team had anticipated. Perhaps this could be attributed largely to the very favourable weather conditions experienced in the district during greater part of the project life. Since 1977, Kurunegala district generally had received adequate rainfall for paddy cultivation

except in 1982-83, two years of lower rainfall (Annex X). Much of the overall increase in cropping intensity seen during the project life could be attributed more to sustained double cropping in rainfed areas in years of good rainfall, located largely in the wetter part of the district. The overall cropping intensity achieved under conditions of minor irrigation, according to available data, has been uniformely low except in 1984/85, a year of well distributed rainfall.

Except in paddy lands served by major irrigation from perennial water sources, the most important underlying factor determining cropping intensity in this district appears to be the rainfall pattern in a given year. In this regard, the ARTI sample survey results show a high overall cropping intensiity of 182 for the year 1985/86. This again was a year of good rainfall which made it possible for a full Yala cultivation in 1985 particularly in the drier areas of the district where most of the minor tanks are located. The marked difference between the appraisal projections and the cropping intensity recorded could be largely due to the modest increases the appraisal team had allowed in their projections. Perhaps the project planners had opted for a slower growth rate in projecting cropping intensity during project life as the 4 years immediately prior to appraisal (1973/76) have been years of relatively low rainfall with widespread crop failures in the dry zone. However, as mentioned earlier, the relatively favourable weather conditions experienced since 1979 have made it possible for the area cropped under paddy to increase considerably resulting in a much faster increase in cropping intensity than what the planners had anticipated.

In fact the cropping intensity data for the period 1980-85 in respect of 27 minor tanks rehabilitated in 1980 confirm this assertion as presented below.

Table 4.6
Cropping Intensity under Minor Irrigation
1980-1983

| | Sample size | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|---|
| Rehabilitated tanks (1) | 27 | 135 | 163 | 165 | 169 | 180 | 179 |
| Non-rehabilitated tanks (2) | 6 | 130 | 135 | 120 | 108 | 131 | 141 |

Source (1) KIRD project office
(2) Survey data, 1985/86

In the preceding discussion, the increases recorded in cropping intensities had been attributed more to favourable weather conditions experienced in the rainfed areas. This is in no way to underestimate the importance and the effects of the project programmes. The rehabilitation of minor tanks is vital to provide stability for paddy cultivation in the dry and intermediate zones, but the timely and adequate rainfall is more important for the effective functioning of the minor tanks. Since the implementation of the improved water management programme had got delayed due to reasons discussed in chapter 3 at length, their beneficial effects are yet to be seen in the years to come.

4.3 Cropping Calendar

The 'Walagambahuwa model' recommended in the appraisal report aims at maximising the use of North East monsoon rains (Maha) by dry sowing of paddy with the onset of Maha rains instead of waiting for the tanks to fill and thereby save sufficient water for the cultivation of a second crop in the dry season (Yala). The sowing of ungerminated seed paddy suggested in the 'model' is a practice typically followed under rainfed condition in 'chenas' as well as in some unirrigable lowlands in the dry zone in Maha season. However, extending this traditional practice of dry sowing to a wider acreage, comprising of irrigable lowlands under minor tanks, where mud sowing for centuries had been the standard practice, would altogether be a different proposition. As land preparation practices under village tanks are determined by a host of factors, including rainfall patterns, expectations about rainfall, attitudes towards risk, prevalence of chena cultivation, low land holding patterns, water rights, and access to vital inputs such as farm power credit etc., it remains unclear how the project planners had expected a large scale replication of the above model in the project area by manipulating merely the water management input.

In this regard, the agronomists at Maha Illuppallama recently confirmed that the original 'Walagambahuwa model' had been now modified in the light of experiences gained during past several years and that dry sowing is no longer advocated as a means of saving water under village tanks. The study team also learned that even farmers in the Walagambahuwa village do not appear to support dry sowing any longer in their lowlands under village tanks. As the problems associated with the implementation of this model are well documented, it is not intended to discuss them here. However, the experiences under the Tank Irrigation Modernisation Programme (TIMP) funded by the World Bank, where the farmers had rejected its adoption completely, provides a good illustration.[1] Looking

1. Abeysekera W.A.T. A Preliminary Assessment of the Performance of a Major Irrigation Rehabilitation Programme. The case of Tank Irrigation Modernisation Project. ARTI, 1984.

back now, it augurs well that the project authorities did not divert much of its resources to popularise this particular concept of water management under village tanks in the district, as it has yet to prove its economic viability under field conditions.

Instead, the Department of Agrarian Services had introduced a systematic water management programme under an appreciable number of village tanks in the district, as a part of the national effort for rehabilitation of village irrigation schemes with financial support from the World Bank. The following table illustrates the type of water management operated in the 15 rehabilitated minor tanks surveyed.

Table 4.7

Type of Water Management

| Type of Water Issues | % rehabilitated Tanks |
|---|---|
| Rotational issue of water | 60% |
| Issue of water according to the farmer needs | 24% |
| Continuous issue of water | 12% |
| No control of water issues | 6% |

Source : Survey Data, 85/86.

Under the systematic water management programme a 'tank committee' (comprising of farmer representatives headed by the Cultivation Officer, Velvidane and other local officials involved in water management activities) had functioned for each of the tanks, and had prepared the necessary water management programmes for individual tanks. Such programmes had been subsequently approved by farmers at Kanna meetings (which is really a forum for the cultivators to reach a general consensus on a range of issues related to cultivation activities). According to the statistics of the Agrarian Services Department, in the year 1985 there were 236 such organizations representing 7646 farmers. Of these farmer organizations 194 were active and each had at least 5 meetings a year to discuss farmer problems. At Kanna meetings, among other things, cultivation calendars prepared for implementation had been given specific dates by which certain operations such as clearing of field channels, fencing, land preparation, sowing, or transplanting, should commence first and last issues of irrigation water as well as varieties of seed paddy to be used. The observations of the study team indicate that, by and large, the decisions arrived at the Kanna meetings had been followed closely in the field. In fact, in the villages visited during the sample

survey, staggered cultivations under one village tank was hardly seen. The sample survey results for the dry and intermediate zones show that 85% of the respondents had adhered to the agreed cropping calendars during 1985/86 Maha season. But many farmers had paddy allotments under several village tanks and staggering of cultivation among minor tanks was prominent. Seventy eight percent of the farmers in the sample had more than one allotment under village tanks, and cultivation tasks had to be carried out one after the other thus delaying the cultivation of the last allotment at least for about 1 1/2 to 2 months.

All in all, the implementing agency had made a promising start in introducing the concept of improved water management to a few hundred village tanks that had remained neglected for well over a decade, despite the initial difficulties encountered as discussed in chapter 3. With the recent strengthening of the technical cardres of the Agrarian Services Department as well as other additional facilities provided for intensive water management work under the project, the study team is optimistic that the cropping intensity under minor tanks would gradually rise as the new water management programmes get underway.

4.4. Agricultural Equipment

The appraisal team having identified farm power non-availability as a major constraint for agricultural production in the district, had made necessary provision for the import of 500 two-wheel tractors and 200 four-wheel tractors. Besides, a credit scheme for the sale of agricultural machinery to farmers has been operated through the two state banks. Under the scheme followed, buyers have been called upon to make a down payment of 10-20% of the purchase price, which in the case of a four wheeler, had amounted to Rs. 30,000/- to Rs. 40,000/-. As raising cash of such magnitude was largely beyond the resources of the average paddy farmer in the district, the demand for four wheel tractors had not been high. Accordingly much of the sales effected were to the more affluent sections in the district largely for haulage purposes. In the light of such experiences, the management had reviewed the machinery supply scheme in 1982, and the funds earmarked for the purchase of four wheel tractors have been diverted for the supply of 2-wheel tractors. The available records show that altogether 103 four-wheel tractors and 2132 two-wheel tractors had been supplied under the project.

The ownership of agricultural equipment among the sample farm population was lower according to the sample survey, but the farmers stated that there have been no major problems regarding availability.

Table 4.8
Ownership of Agricultural Equipment

| Type of equipment | % farmers owned | Availability to purchase | Availability for hire |
|---|---|---|---|
| Mammoties | 93 | 1 | 1 |
| Tractors | | | |
| 2 wheel | 12 | 2 | 2 |
| 4 wheel | 01 | 2 | 2 |
| Sprayers | 13 | 2 | 2 |
| Weeders | 01 | 2 | 3 |

1. Freely
2. Limited but available
3. Limited difficult to obtain

Source: Survey data, 85/86

Under the credit scheme, the two wheel tractor had proved more popular over the years as the initial capital investment for its purchase was well within the means of a substantial number of paddy growers in the district. In this respect, the project had performed a useful service to the paddy sector by the addition of over 2000 machines to the tractor pool in the district within a matter of five years and thereby helped to restrain the upward revision of tractor hire charges in the face of the increased demand observed in the district. Field observations indicated that the demand for 2 wheel tractors had increased considerably partly due to its versatility in being able to provide power for the operation of 'agrimec' paddy harvester, portable water pumps as well as transportation using small trailors.

Table 4.9
Types of Farm Power Used for Land Preparation

| Source of Power | Dry Zone | | Intermediate Zone | |
|---|---|---|---|---|
| | Pre Project[1] | At Project[2] completion | Pre Project[1] | At Project[2] completion |
| | % | % | % | % |
| Buffaloe | 30 | 53 | 83 | 73 |
| 4-wheel tractors | 49 | 17 | 10 | 04 |
| 2-wheel tractors | 08 | 24 | 03 | 18 |
| Combinations | 08 | 06 | 03 | 05 |

Source :1. - Baseline Survey, 1978/79
2. - Survey Data, 1985/86

In terms of use of the farm power for land preparation, the two zones showed a distinct difference during the pre-project period. In the intermediate zone, use of buffaloes had been more common before the project and it remains so even now. Availability of ample grazing areas in coconut lands of the intermediate zone naturally favours buffaloe rearing and as a result animals continue to remain as the principal source of farm power. On the other hand, in the dry zone where 4-wheel tractors served as the main source of power during the pre project period, the use of buffaloe and the 2-wheel tractors had gained much ground as a source of farm power. The recent (1985/86) sample survey conducted by the study team indicates that one-half of the respondents in the dry zone had used animal power for land preparation compared to less than a third during the pre-project period.

In the dry zone the visible shift from 4-wheel tractors towards buffaloes for land preparation is perhaps not so much due to cost considerations. A majority of those interviewed indicated that hiring of buffaloes was more convenient for them, as hire charges for animals could normally be settled at harvest, often in kind. On the other hand, in the case of 4 wheel tractors, due to the high capital costs as well as heavy depreciation, the owners are reported to be unwilling to postpone the collection of their dues until harvest time as was the practice some years back. Many of the small farmers under village tanks being not credit worthy due to previous defaults, the switch over to buffaloe use for land preparation had helped them to tide over their immediate cash needs by postponing payment obligations for work done until harvest time.

Table 4.10

Cost of Land Preparation (rupees per acre)

| Type of Farm Power | Pre-project[1] Rs. | At Project completion[2] Rs. |
|---|---|---|
| Buffaloe | 106 | 375 |
| 4 wheel tractor | 165 | 450 |
| 2 wheel tractor | - | 400 |

Source (1) Baseline Survey, 1978/79 ARTI.
(2) Survey Data, 1985/86.

The land preparation cost increases seen above reflect largely the high inflationary pressures experienced in the country, particularly during the early project years from 1980-83 together with higher purchase prices of equipment.

However, the study team observed the ratio between a bushel of paddy and the cost of farm power (tractors) has increased from 1:4 to 1:6 while that for buffaloe has increased from 1:2 to 1:5. A similar trend is observed throughout the island.

The appraisal report also had envisaged the supply of 50,000 mammoties and 1,000 hand sprayers to farmers, as the above items have not been freely available in the local market in 1979. Due to the liberalisation of imports both the mammoties as well as hand sprayers had become readily available in the district and, as a result, the demand for such items through the project sources had been low. However, the project had procured the specified number of mammoties and released them to the Multipurpose Coorperative Societies for retail sales. With regard to sprayers, the available records indiate that 181 had been sold under the credit scheme in addition to 744 issued by the Department of Agrarian Services to KVSS and COO.

4.5 Varietal Use

Under the project, a seed processing, storage and distribution complex at Nikaweratiya has been funded. It has a seed processing plant with 2 tonnes per hour processing capacity and 4 large warehouses. This unit functions under an Assistant Director of Agriculture and has no farm of its own, but processes seed from contact growers who are registered with the seed certification service of the Department of Agriculture. The seed processing unit which had begun functioning in 1983, had processed and sold around 50,000 bushels of certified seed paddy per season. In addition, 150 tonnes of certified seed of subsidiary food crops including chillie, and grain legumes had been handled seasonally. Due to the efficient functioning of this complex, with field certification and seed testing facilities going hand in hand, the demand for certified seed had increased steadily and plans are now underway to increase its capacity with assistance from USAID. The establishment of this unit had gone a long way for qualitative upgrading of the certified seed paddy supplies by the Department of Agriculture not only in Kurunegala but also in neighbouring districts. This complex if continued to run well is likely to minimise government expenditure needed for the establishment and running of seed farms in future. All in all, the progress achieved shows that it has been a very productive investment and according to an official spokesman of the Department of Agriculture, Peradeniya, the FAO had described the functioning of this seed complex as a success story in South Asia.

In general, the use of high yielding varieties in Kurunegala had already been quite high. During the baseline survey in 1978/79, around four-fifths of the farmers used high yielding varieties, more particularly BG 34-8, which had displaced the traditional four month varieties cultivated in the earlier Maha season. This trend continued during the project period as well and in the 1985/86

survey period. The same variety [BG 34-8] was found to be the most popular followed by BG 94-1 and BG 34-6.

Table 4.11

Varietal use - Kurunegala District - Maha 83/86

| Variety | % of respondents | | | |
|---|---|---|---|---|
| | Intermediate Zone | Dry Zone | Wet Zone | All Zones |
| BG 34/8 (3 months) | 82 | 86 | 73 | 80 |
| BG 34/6 (3 months) | 10 | 9 | 3 | 8 |
| BG 94/1 (4 months) | 6 | 4 | 22 | 10 |
| Others | 2 | 1 | 2 | 2 |

Source: Survey Data 1985/86.

A similar trend had been reflected in the use of seed paddy in the command areas of village tanks. But seed paddy issus from the seed processing centre at Nikaweratiya showed a different trend. The study team learnt that this centre caters to the whole island and therefore is not able to direct its supplies to fully satisfy the popular farmer requests in Kurunegala.

Table 4.12

Seed Paddy Issues to Kurunegala District

| Seed Paddy Variety | | % of Seed Paddy Issued |
|---|---|---|
| BG | 34/8 | 28 |
| BG | 400/1 | 21 |
| BG | 94/1 | 22 |
| BG | 34/6 | 12 |
| | Others | 12 |
| | Total | 100 |

Source: Seed Processing Centre statistics.

The sample survey farmers had no adverse comment on the quality of seed but were critical about the availability. The study team investigations revealed that the non-availability was due to the shortage of the required variety of seed paddy, especially 3 1/2

month seed varieties. The distribution figures provided in Table 4.12 also confirm this situation.

However, the Department of Agriculture had issued about 10% of the seasonal seed paddy requirements of the farmers, through AII of the Agrarian Services Centres.

Table 4.13
Seed Paddy Issues

| Year | Quality Issues (Bushels) Yala | Maha |
|---|---|---|
| 1979/80 | 7970 | 18006 |
| 1980/81 | 9036 | 27428 |
| 1981/82 | 7892 | 23750 |
| 1982/83 | 4168 | 32776 |
| 1983/84 | 8086 | 38154 |
| 1984/85 | 2590 | 20378 |
| 1985/86 | 10708 | 24790 |

Source : Department of Agriculture, Kurunegala.

Many farmers were unable to purchase seed paddy from the department due to the non-availability of finance during that time of the season. In such situations the seed paddy was obtained from neighbours and friends on the basis of repayment to be made after the harvest.

The department encourages the farmers to produce their own seed paddy or to purchase from a neighbour who is producing for the whole group. In fact this has been one of the extension messages followed during the last three years, and the extension officers had limited success in this respect.

The results of the 1985/86 sample survey show that only one third of the respondents obtained certified seed paddy from government agencies and a further one fourth used their own seed. The rest obtained seed from friends and neighbours etc.

## 4.6 Method of Planting

Relevant data from the sample surveys in 1978/79 and 1985/86 show that broadcast sowing is the most popular practice in the district. However, due to the efforts of the agricultural extension services, as well as other agencies such as the Agriculture Development Authority and the Agrarian Services Department, the percentage of farmers adopting transplanting had shown a commendable increase, particularly in the intermediate zone during the Maha season. The 1985/86 sample survey results reveal that one-third in the intermediate zone and one fourth or so in the dry zone have adopted this improved method in the Maha season.

Table 4.14

Planting Methods by Agro-Ecological Zones

| | Dry Zone | | | | Intermediate Zone | | | |
|---|---|---|---|---|---|---|---|---|
| | Pre-Project | | at Project completion | | Pre-Project | | at Project completion | |
| | 78/79[1] | | 85/86[2] | | 78/79[1] | | 85/86[2] | |
| | Yala | Maha | Yala | Maha | Yala | Maha | Yala | Maha |
| Broadcasting (wet) | 63 | 79 | 70 | 70 | 71 | 51 | 80 | 85 |
| Transplanting | - | 11 | 21 | 25 | 5 | 7 | 12 | 38 |
| Dry Sowing | 19 | 6 | 2 | 5 | 15 | 26 | 08 | 07 |
| Combinations | 18 | 4 | 7 | - | 9 | 16 | - | - |

Source: 1 Pre Project Situation 78/79
2 Survey Data 85/86

In the wet zone 42% of the farmers practised transplanting while 54% broadcasted paddy. Farmer interviews revealed that the reluctance to transplant was mainly due to the uncertainty in the availability of water during the transplanting season. In the command areas of the dry zone village tanks many farmers explained that the present water levels (even after rehabilitation) have not been sufficient for such practices. Only limited success have been obtained in the extension message of establishing Dapog nurseries. A substantial number of farmers under major irrigation schemes adopted this practice. But it has not gained any acceptance from the farmers cultivating under minor tanks. However for the success of this method a transplanter (valued at Rs. 3,750/-) is needed. The study team was concerned about the possible labour displacements, on account of the transplanter even though specific investigations were not made further in that direction.

## 4.7 Fertilizer Distribution

Though the appraisal indicated the establishment of 60 fertilizer stores, the project management targetted for 48 such stores which were completed by 1983. The new stores are reported to be functioning well.

Observations made during field visits and discussions with the sample farmers reveal that the fertilizer distribution scheme was operating effectively. Around one-half of sample farmers had purchased fertilizer from private dealers in small towns. The provision of decentralized storage facilities was appreciated by the farmers.

Recommended fertilizer quantities for paddy during the project period were as follows:-

Table 4.15
Fertilizer recommendations for paddy

| Type of fertilizer | Time of application | Amount needed cwt/acre | |
|---|---|---|---|
| | | For new high yielding varieties | For old high yielding varieties |
| Basel<br>N P K<br>5 15 15 | at sowing | 0.98-2.45 | 0.49-1.21 |
| Urea (46% N) | 2-3 weeks after sowing | 0.23-0.49 | 0.13-0.23 |
| T D M<br>N K<br>30 20 | at flowering | 0.74 | 0.37 |

Source: Department of Agriculture.
(Note:This may vary according to zones)

Only 56% of the farmers had used all three applications of fertilizer. They had used the recommended type and had made the application at recommended times. Another 34% of the farmers used two fertilizer applications omitting either the first or the third, but never the second application of Urea.

Table 4.16
Fertilizer application

| Number of applications | Number of respondents % |
|---|---|
| 3 | 56 |
| 2 | 34 |
| 1 | 4 |
| 0 | 6 |

(Note: Only one response was entertained)
Source: Survey Data, 85/86

The majority of the farmers had a strong preference for urea, and some had been applying two coats of urea per crop.

Table 4.17

Fertilizer use at Farm Level
(cwt per acre)

| | Pre Project Maha 1978/79 | | | At Project Completion Maha 1985/86 | | |
|---|---|---|---|---|---|---|
| | Dry | Inter. | Wet | Dry | Inter. | Wet |
| Basel mixture | 0.22 | 0.21 | - | 0.53 | 0.66 | - |
| Area | 0.42 | 0.64 | - | 1.02 | 0.94 | 1.02 |
| T.D.M. | 0.42 | 0.38 | - | 0.67 | 0.51 | .93 |
| TOTAL | 1.06 | 1.24 | - | 2.22 | 2.11 | 1.95 |

Source: Survey data, 85/86

The average total amount of fertilizer applied to new improved varieties is about 2.2 cwt. per acre, which had been slightly higher than the lowest total rate recommended. The farmer awareness of the positive correlation between yields and fertilizer presumably had been the reason for this higher application in their attempt to overcome the instrinsically low yield levels.

An increasing trend was observed in the amount of fertilizer applied throughout the district. The Department of Agrarian Services issued the following quantities of fertilizer to the paddy farmers during the project period and the district trend has not been different from the national trend. But the data base pertaining to the total fertilizer usage was not strong and therefore no attempt was made to analyse it further.

Table 4.18
Fertilizer usage in the paddy sector
in Kurunegala district
in '000 MT

| | MPCS. | Department of Agrarian Services | Private Dealers | Total |
|---|---|---|---|---|
| 1979 | 7.1 | 3.1 | 5.0 | 15.2 |
| 1980 | 2.2 | 1.6 | 7.3 | 11.1 |
| 1981 | 1.4 | 1.0 | 9.2 | 11.6 |
| 1982 | 1.7 | 2.2 | 6.7 | 10.6 |
| 1983 | 6.8 | 3.7 | 7.7 | 18.2 |
| 1984 | 10.3 | 5.2 | 13.9 | 29.4 |
| 1985 | 14.4 | 5.6 | 12.6 | 32.6 |

Source: Department of Agrarian Services, fertilizer complex, Mahawa Fertilizer Corporation, Colombo, Fertilizer Secretariat, Colombo.

The farmgate price of a hundred weight of fertilizer rose from Rs. 73/- in 1979 to Rs. 150/- in 1984 - an increase of 105%. On the other hand the farmgate price of paddy had increased from Rs. 40/- in 1979 to Rs. 70/- in 1984 - an increase of 75%. Further in 1979, the fertilzer-paddy price ratio was 1:1.33 and in 1984 the margin further reduced to 1:1.21. Therefore with decreasing price margins any appreciable increases in fertilizer application seems doubtful without any concurrent positive measures for the protection of the paddy farmer.

4.8 Weed Control

As much as 76% of the farmers in the project area had applied at least one coating of weedicide, and the cost of agrochemicals was about 6-8% of the production cost.

Table 4.19

Weed Control (1985/86 Maha)

| Zone | % of farmers applying chemical weedicides |
|---|---|
| Dry | 84% |
| Intermediate | 86% |
| Wet | 63% |
| All Zones | 76% |

Source: Survey Data 1985/86

Very few respondents used hand weeding and about 2% maintained water levels to control weeds.

Table 4.20

Application of Agro-Chemicals

Cost Rs./acre

| Season | Dry Zone | | Intermediate Zone | | Wet Zone | All Zones |
|---|---|---|---|---|---|---|
| | Major Irrigation | Minor Irrigation | Major Irrigation | Minor Irrigation | Rainfed | |
| Maha 85/86 | 169 | 128 | 235 | 162 | 78 | 151 |
| Yala 85 | 205 | 70 | 229 | 172 | 90 | 154 |

Source: Survey Data, 1985/86

Higher usage of weedicides was observed in the intermediate zone major irrigation schemes, while the lowest use was reported from the rainfed agriculture sector.

During discussions the study team learnt that instances of lower usage of fertilizer and weed control has been mostly due to the lower income levels of the farmers.

4.9 Pest and Disease Control

Survey data indicate that the use of insecticides in Kurunegala district had been relatively high compared to the pre-project period where 68-75% farmer respondents indicated positive reactions to insecticide use.

Table 4.21
Use of Insecticides

| Zone | No. of respondents % |
|---|---|
| Dry | 76 |
| Intermediate | 84 |
| Wet | 87 |
| All zones | 82 |

Source: Survey Data, Maha 1985/86.

Lesser use of agrochemicals and unified pest control have been two of the extension messages conveyed to the farmers during the latter three years of the project period. But the farmers' response was discouraging due to relatively high incidences of pests during the season. The extents treated with insecticides did not vary between seasons or zones much and this suggests the negative correlation between pest attacks and weather.

4.10 Yields

According to the appraisal report the per acre yields which stood at 45 bushels at project commencement had been expected to rise to 55 by the end of the project. The 10 bushels per acre increase in yields envisaged under the project appears to be a rather modest expectation as seen from the Census and Statistics Department crop cutting survey data for the period 1979-1984.

Table 4.22
Paddy Yields

| Year | Paddy Yields (bushels per acre) |
|---|---|
| 1978/79 | 54 |
| 1979/80 | 59 |
| 1980/81 | 63 |
| 1981/82 | 69 |
| 1982/83 | 68 |
| 1983/84 | 58 |
| 1984/85 | 65 |
| 1985/86 | 68 |

Source: Dept of Census & Statistics

Table 4.23
Paddy Yield by Agro-Ecological Zones

| | Intermediate Zone | | Dry Zone | | Wet Zone | | All Zones | |
|---|---|---|---|---|---|---|---|---|
| | Y | M | Y | M | Y | M | Y | M |
| Pre project[1] | 39 | 50 | 54 | 60 | n.a | | n.a. | |
| At project completion[2] | 56 | 55 | 56 | 58 | 54 | 54 | 55 | 55 |

Source: 1. Baseline survey, 1978/79.
2. Survey data, 1985/86.

At the time of the sample survey of 1985/86, harvesting in an appreciable paddy acreage in the Kurunegala district had not been completed; hence the study team considered the yield reported for this particular season as an underestimate. Preliminary estimates of the Census & Statistics Department average yield for Maha 1985/86 are reported to be 68 bushels per acre. On this basis, paddy yields in Kurunegala had recorded a much higher increase than the planners had anticipated.

However the following statistics on yield levels of rehabilitated minor tanks, before and after rehabilitation proves the success of the project's emphasis on minor tank rehabilitation.

Table 4.24
Paddy Yields in Rehabilitated Tanks

| Electorates | Yield per acre Before rehabilitation 78 Yala | 78/79 Maha | After rehabilitation 84 Yala | 84/85 Maha |
|---|---|---|---|---|
| **Dry Zone** | | | | |
| 1. Nikaweratiya | 56 | 50 | 61 | 62 |
| 2. Yapahuwa | 57 | 49 | 56 | 60 |
| 3. Panduwasnuwara | 48 | 50 | 67 | 64 |
| 4. Galgamuwa | 55 | 49 | 57 | 59 |
| **Intermediate Zone** | | | | |
| 5. Katugampola | 62 | 59 | 75 | 76 |
| 6. Kuliyapitiya | 48 | 48 | 69 | 81 |
| 7. Bingiriya | 60 | 53 | 61 | 58 |
| 8. Wariyapola | 46 | 52 | 57 | 63 |
| 9. Hiriyala | 43 | 46 | 54 | 59 |
| 10. Dodangaslanda | 43 | 48 | 86 | 70 |
| 11. Dambadeniya | 60 | 65 | 66 | 71 |
| 12. Kurunegala | 35 | 35 | 40 | 47 |
| Sub Total | 50 | 51 | 63 | 66 |
| **Wet Zone** | | | | |
| 13. Polgahawela | 54 | 56 | 67 | 61 |
| 14. Mawathagama | 43 | 48 | 70 | 76 |
| Sub total | 48 | 52 | 63 | 65 |
| GRAND TOTAL | 51 | 51 | 63 | 65 |

Source: KIRDP Project Office

Production increases in the yield levels are observed in the intermediate wet and wet zone paddy farms, while the increases in the drier areas are marginal. The increasing trend in paddy production in the Kurunegala district reflected in Table 4.27 was partly on account of increases in the cultivable acreage, in cropping intensities and yields. Relative prices of crop outputs and input costs and favourable weather conditions would have their influence on this trend besides the effects of the project investment in infrastructure.

Table 4.25
Kurunegala District Paddy Production

| | Quantity produced (000' Bushels) | Production Index |
|---|---|---|
| 1977/78 | 10670 | 100 |
| 1978/79 | 9386 | 88 |
| 1979/80 | 14717 | 137.9 |
| 1980/81 | 16582 | 155.4 |
| 1981/82 | 16949 | 158.8 |
| 1982/83 | 13841 | 129.7 |
| 1983/84 | 17954 | 168.3 |
| 1984/85 | 17032 | 159.6 |

Source: Department of Census and Statistics.

A similar production trend was observed in the national level paddy statistics too. Favourable weather conditions together with the strengthening of the delivery mechanism at the national level was responsible for the increases. In Kurunegala too, these were operating in addition to the project performance.

## CHAPTER FIVE

## COCONUT DEVELOPMENT

Kurunegala is one of the largest coconut growing districts and accounts for 363,000 acres or about 36% of the national coconut acreage. According to official sources, the decline in the land area under coconuts, low and declining productivity levels (yields), and lack of production incentives due to unattractive returns to coconut growers, have been listed as the important factors that had contributed to the long term declining trend observed in coconut production not only in Kurunegala but also in other major producing districts. It is in this background that around 18% of the project investments had been channelled for the development of the coconut small holder sector in the district. A preliminary survey of coconut lands undertaken by the Ministry of Planning in Kurunegala in 1978 shows a declining trend in yields in all size groups as shown below.

Table 5.1
Coconut Yields by land size groups, Kurunegala District
(Nuts per acre)

| | acres | | | | | |
|---|---|---|---|---|---|---|
| Year | 0-0.9 | 1-2 | 3-9 | 10-25 | 26 + | Overall |
| 1975 | 1126 | 1056 | 1301 | 1740 | 1802 | 1339 |
| 1976 | 1062 | 957 | 1161 | 1492 | 1758 | 1203 |
| 1977 | 986 | 846 | 1007 | 1225 | 1326 | 1092 |

Source: Coconut Development Strategy,
Ministry of Coconut Industries October,1984.

Table 5.2
Yield per acre Kurunegala District
Nuts per acre

| Year | Size class (acres) | | | | | Total |
|---|---|---|---|---|---|---|
| | 0 - .9 | 1-5 | 6-10 | 11-25 | 26+ | |
| 1979(1) | 3000 | 1856 | 2145 | 1663 | 1980 | 2128 |
| 1980(1) | 2900 | 2224 | 2126 | 1783 | 2153 | 2237 |
| 1981(1) | 2600 | 2376 | 2165 | 1804 | 1847 | 2158 |
| 1982(1) | 2600 | 2496 | 2154 | 1920 | 2110 | 2256 |
| 1985(2) | 2821 | 2656 | 2235 | 2172 | 2520 | 2480 |

Source:(1) Process evaluation of coconut cultivation ARTI 1982
(2) survey data, 1985/86.

The decrease in production observed in Kurunegala during the past decade is attributed to low rainfall, gradual increase in senile palm population, lower use of fertilizer, and uneconomic and overcrowded small holdings. In particular the rainfall records in the district show a significant decline in the annual rainfall during the last two decades.

Table 5.3
Changes in Rainfall

| Rainfall Station | 1963-72 inches | 1973-82 inches | Change % | 1982-86 inches | Change % |
|---|---|---|---|---|---|
| Kurunegala | 91.9 | 76,3 | -16.9 | 70.1 | -8 |

Source: Department of meteorology

The effect of rainfall on coconut yields can be best seen from the yield differences among the three agro-ecological zones.

Table 5.4
Coconut Yields by agro-ecological zones
(Nuts per acre)

| Year | Wet and Semi-Wet Zone | Semi-Dry Zone | Dry Zone | District |
|---|---|---|---|---|
| 1975(1) | 1494 | 1092 | 401 | 1339 |
| 1976(1) | 1343 | 987 | 353 | 1203 |
| 1977(1) | 1130 | 834 | 386 | 1022 |
| 1986(2) | 3114(wet) | 2668(Intermediate | 1202(dry) | 2338 |

Source:(1) Coconut Development Strategy, Ministry of Coconut Industries. October 1984.
(2) Survey data, 1985/86.

In the Wet Zone the yields have been three times higher than those in the Dry Zone, demonstrating the importance of the soil moisture condition as one of the most critical factors affecting coconut yields in the district. It is in the face of declining coconut production, that the government had introduced a rehabilitation subsidy scheme in 1974 for the development of the coconut sector. The subsidy was intended to cover at least 75% of the cost of rehabilitation operations in the form of non-recoverable grants. However due to the steady increase of input prices and general inflation, it has not been possible to maintain the original ratio of non recoverable grants and consequently the subsidy scheme has undergone periodical revisions during the past decade.

The subsidy schemes operated by the Coconut Cultivation Board at the time of the appraisal consisted of six components. Annex XII.

a. Coconut rehabilitation (establishment of contour drains, drainage drains, filling of vacancies, removal of excess palms, replacement of non productive palms),
b. replanting/underplanting,
c. new planting,
d. intercropping coconut with coffee, cocoa, and pepper,
e. pasture development,
f. subsidy for plantings less than one acre

The appraisal team having realised that substantial production increases in coconut cannot be achieved through the operation of the subsidy schemes that were in force at the time, had recommended in 1976 that the whole production base including the infrastructure necessary for coconut development be strengthened under the project.

Of the base cost of Rs. 57 million allocated for coconut development, 42% was for the rehabilitation of coconut lands and 22% for the development of minor export crops under coconut intercrops. The component-wise allocation was as follows:-

Table 5.5
Allocation of funds for the development of coconut lands

| Item | % from the total cost |
|---|---|
| Development and establishment coconut nurseries | 3 |
| Minor Export Crops Department buildings, demonstration plots and vehicles | 12 |
| Coconut Development Board building, equipment and vehicles | 21 |
| Development of coconut lands | 42 |
| Development of intercropping | 21 |
| Training | 1 |
| | 100 |

Source: Project Appraisal Report.

The measures recommended at appraisal included :
a) strengthening of the existing subsidy programmes,
b) introduction of a fertilizer credit scheme,

c) setting up of eight new nurseries in addition to improvements to the existing two nurseries
d) supply of new vehicles, office buildings and other necessary facilities
e) increasing the staff cadres engaged in coconut extension

The stepped up replanting/underplanting and new planting programmes had projected for increases in yields and production particularly in small holdings in the wet and semi-wet zones. Increases in fertilizer use has been the main strategy designed for short run production increases. In contrast, the benefits from replanting, underplanting, and new planting have been projected from the project year 13 onwards due to the seven-year time lag required to commence bearing.

Accordingly the ensuing discussion in this chapter is confined largely to achievements of physical targets under different subsidy programmes and issues that have cropped up during the implementation phase.

## 5.1 Implementation

Strengthening of the implementation capacity of the Coconut Cultivation Board had received much emphasis under the project. In addition to the establishment of eight coconut nurseries, the construction of a regional office for the Coconut Cultivation Board, nursery staff quarters have been completed on schedule. Additional staff for extension work, vehicles and farm equipment mainly for nursery maintenance have also been provided with project funds.

## 5.2 Subsidy Programmes

Broadly, the targets specified for each of the major components for coconut rehabilitation have been achieved except in the case of intercropping. A break-down of the progress achieved by the type of subsidy is presented below:-

Table 5.6
Performance of Subsidy Programmes

| Type of subsidy | Target (acres) | Achievement (acres) | As a % of targetted acreage |
|---|---|---|---|
| i. Rehabilitation | 60,000 | 77,122 | 129 |
| ii. Replanting/under planting | 25,000 | 21,575 | 86 |
| iii. Intercropping | | | |
| a) cocoa | 2,000 | 298 | 30 |
| b) coffee | 3,000 | 1738 | 31 |
| c) pepper | 3,000 | 509 | 34 |
| d) pasture | 2,000 | 1870 | 94 |

Source: Coconut Cultivation Board, Kurunegala.

5.2.1 Holding Sizes and Subsidy distribution

The sample survey data indicated the following distribution of coconut holdings. Only 56% of the households had land more than 1/2 acre while 18% had no coconut land at all.

Table 5.7
Distribution of coconut lands

| Size of coconut holding | % of household |
|---|---|
| No coconut land | 18% |
| 0 - 0.4 acre | 26% |
| 0.5 - 0.9 acre | 19% |
| 1 - 5 acres | 26% |
| 0 - 10 acres | 7% |
| 10 + | 4% |
| | 100 |

Source: Survey Data 1985/86.

Larger holdings were recorded from the dry zone while the holdings were much smaller in the wet zone. Households without coconut lands were recorded mostly from the dry zone areas.

Table 5.8
Distribution of Average Holding Sizes

| Zone | Acreage under coconut holdings (%) | Number of farm families owning coconut land(%) | Average coconut holding size (acres) | Yield per acre (nuts) |
|---|---|---|---|---|
| Dry | 18 | 13 | 2.56 | 1202 |
| Intermediate | 69 | 65 | 1.94 | 2668 |
| Wet | 13 | 22 | 1.05 | 3514 |
| All | 100 (364.9) (acres) | 100 (200) (farmers) | 1.90 | 2461 |

Source: Survey Data, 1985/86

Dry zone coconut holdings were much bigger compared to wet zone holdings but the number of trees per holding was much less. Dry Zone holdings had an average of 49 trees per acre while 68 and 78 trees were recorded from the intermediate and wet zones respectively. The cultivations were more fertile in the wet zone compared to others, had higher yields, and also a higher number of subsidy recipients were from the wet zone.

Of the total sample farmers only 56% owned coconut and 18% out of them (or 7% from the total sample) were subsidy recipients. Therefore 60 purposively selected sample farmers were also included in the sample when a quantitative analysis of the coconut development programme was carried out. The 85 respondents obtaining subsidies were distributed in following manner:-

Table 5.9
Distribution of Subsidies

| Type of subsidy | No. of farmers responding % |
|---|---|
| Rehabilitation | 71.0 |
| Replanting/ underplanting | 15.0 |
| Intercropping | 14.0 |
| Cocoa | 0.4 |
| Coffee | 0.8 |
| Pepper | 1.1 |
| Pasture | 2.3 |
| Less than one acre subsidy | 4.0 |
| New planting | 1.4 |

Source: Survey Data, 1985/86

An imbalanced distribution of subsidies can be seen with 71% obtaining the rehabilitation subsidy. But its validity could be proved when considering the number of palms in each stage requiring subsidies. (Comparison with Table 5.14.)

Table 5.10
Zonal distribution of subsidy recipients

| Type of subsidy | Dry Zone % | Intermediate Zone % | Wet Zone % |
|---|---|---|---|
| Rehabilitation | 12 | 26 | 62 |
| Replanting/under-planting | 1 | 5 | 94 |
| Intercropping | - | 1 | 99 |
| All | 4 | 10 | 86 |

Source: Survey Data, 1985/86

As much as 86% of the subsidy recipients in the sample (including the purposively selected sample respondents) were from the wet zone where fertile coconut lands are situated.

### 5.2.2 Utilisation of Subsidies

The sample survey data indicate that the bulk of the subsidies had been utilised by the growers of holding sizes between 1-5 acres in the wet and intermediate zones. In the dry zone most of the subsidies were obtained by the growers of 5-10 acre holdings. However, 48% of the holdings in the 1-5 acre group and 76% of the holdings in the 5-10 acre group have been obtaining subsidies under various schemes.

Table 5.11
Subsidy use by holding size

| Holding size acres | Holdings in each size group | Holdings using subsidy as a percentage of total holdings in the size group |
|---|---|---|
| | % | % |
| Below 1.0 | 34 | 22 |
| 1- 2.5 | 21 | 34 |
| 2.6- 5.0 | 26 | 62 |
| 5.1-10.0 | 12 | 76 |
| Over 10 | 7 | 74 |

Source: Survey Data, 1985/86

Generally, in the smaller size holdings of less than 2.5 acres lesser use of facilities provided under the project can be seen. Often in such holdings other tree crops of different economic value are present and coconuts as such have failed to receive adequate attention. In these holdings coconut production is mainly for home consumption and therefore there is a general reluctance among growers to make any additional cash investments required for increasing productivity. Besides, land ownership problems and the lack of finance to undertake preliminary on-farm development work such as soil conservation etc. have prevented a substantial number from availing of the facilities provided.

Table 5.12
Reasons for non-use of subsidies
in holdings of less than 2.5 acres

| Reason | No. of farmers responding % |
|---|---|
| a. not qualified for the subsidy due to | |
| i mixed gardens | 24 |
| ii ownership problems | 19 |
| iii others | 06 |
| b. Financial difficulties prevented undertaking preliminary work | 24 |
| c. Cumbersome procedures | 16 |
| d. Others | 16 |

Source: Survey Data, 1985/86

However, the reasons for the non-use of subsidies in less than 2.5 acre holdings were entirely different to those given for the non-use of subsidies in more than 5-acre holdings.

Table 5.13
Reasons for the non-use of subsidies
in holdings more than 5 acres

| Reason | % of farmers responding |
|---|---|
| (a) Financial difficulties prevented undertaking preliminary work | 26% |
| (b) Cumbersome procedures | 18% |
| (c) Not interested | 17% |
| (d) Not qualified | 14% |
| (e) No response | 25% |

Source:Survey data, 1985/86.

Furthermore, the study team found that the majority of the operators in more than 5-acre category had not only regular incomes outside farming, but also better access to information on subsidy programmes as well as the necessary contacts with the implementing agencies to obtain subsidies in time. Since the subsidy provided cover only a part of the costs involved in rehabilitation, it is not surprising

that a high proportion of subsidy users were those with incomes outside farming.

5.2.3 Age structure of the coconut palms

Table 5.14
Age structure of coconut palms

| Age group Years | Percentage Number of trees 1970 % (1) | 1986 % (2) |
|---|---|---|
| 0-5 | 15 | 20 |
| 6-15 | 17 | 12 |
| 16-30 | 26 | 23 |
| 31-45 | 28 | 19 |
| 46-60 | 11 | 18 |
| Over 60 | 3 | 8 |
| | 100 | 100 |

Source:(1) Coconut Development Authority, Sample Survey of Coconut Cultivation.
(2) Survey Data, 1985/86.

Given the percentage of palm population entering the senility group each year and the back log of senile palm population due to the slow rate of replacement prior to the project, it is safe to conclude that the senile palm population in Kurunegala district during the project period would have been much higher than these figures suggest.

However, the senile palm population at the end of the project was 8% and according to the Coconut Cultivation Board's spokesman, 1% of the trees enter senility each year. Therefore in an acre, 8% of the palm population needs to be replanted while 18% needs underplanting. Disregarding these two, around 74% of the palms are in need of the rehabilitation subsidy.

5.2.4 Rehabilitation Subsidy

As mentioned earlier the project had planned for the rehabilitation of 60,000 acres and replanting and underplanting of 25,000 acres during in project life. For a realistic assessment of the effects of such programmes on a future date, it is useful to have an idea of the age structure of coconut palms in the district at project commencement.

Major items included under rehabilitation subsidy were the establishment of contour drains, drainage drains, removal of excess palms, replacement of non-productive palms. The progress achieved presented on an yearly basis show a remarkable pace during the

early project years when the farmgate prices of coconut were high, the implementation pace too was relatively high compared to the latter years of the project.

Table 5.15
Progress of the rehabilitation subsidy
(acres)

| | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | Total |
|---|---|---|---|---|---|---|---|---|
| Target | 5,000 | 10,000 | 15,000 | 20,000 | 10,000 | - | - | 60,000 |
| Progress | 8,933 | 18,929 | 18,936 | 13,969 | 6,127 | 5,625 | 5,863 | 77,122 |

Source: Progress reports, KIRDP Office.

In fact, the appraisal target of 60,000 acres have been achieved by 1983 and by the end of the project in 1985, around 77,000 acres had benefitted from the rehabilitation subsidy. Of the rehabilitation subsidy holders in the sample 56% had claimed the subsidy mainly for contour drains and drainage drains. One lump sum payment for cutting of drains and the ease with which family labour could attend to such work had made this particular item of work under the subsidy scheme more attractive to many of the small holders. On the other hand, a relatively smaller proportion (19%) had obtained subsidies for removal of excess or unproductive palms. Many of the respondents were of the view that the removal of excess palms results in the lowering of farm income from coconuts in the short run.

This subsidy has been the most popular in all zones and in all size groups. In the sample survey many respondents using this subsidy were from the intermediate wet zone.

### 5.2.5 Underplanting/Replanting Subsidy

The appraisal report had specified a target of 25,000 acres for replanting and underplanting. The performance of the subsidy scheme on an yearly basis shows an achievement of around 86% of the target at project completion. However, this overall figure has very limited value in assessing the performance of this scheme as seen from the ensuing discussion.

Table 5.16
Progress of the Replanting/Underplanting Subsidy
(acres)

| | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | Total |
|---|---|---|---|---|---|---|---|---|
| Target | 2000 | 3000 | 4500 | 5000 | 10,500 | - | - | 25,000 |
| Progress | 1880 | 3363 | 3523 | 4009 | 2,412 | 2690 | 4730 | 22,607 |

Source: Progress reports, KIRDP office.

During field interviews, the study team found that land owners showed a preference for underplanting compared to replanting. The small holders in particular were unhappy to remove excess palms or senile palms as many of them were still bearing even a small number of nuts. In fact, though the underplanting subsidy is contingent upon the removal of 25% of old palms, in many of the underplanted holdings, the older palms continued to remain. The total extent replanted due to project intervention had amounted only to 1254 acres which is only 0.3% of the total. In this regard considering the palm population entering the senile stage each year and the back-log of senile palms at project commencement as mentioned in paragraph 5.2.2, the need for accelerating the pace of replanting under future project activities deserves priority consideration.

As this particular subsidy payment involves four instalments, the replanted and underplanted acreage, disaggregated on the basis of the instalments paid, presents a rather depressing picture. Most of the initial participants of this subsidy scheme had dropped out as the years went by due to one reason or another, and by the end of the project the acreage fully benefitted by this programme was negligible.

Table 5.17
Subsidy payments by instalments
(1979-1985 April)

| Type of subsidy | 1st payment Ac. | 2nd payment Ac. | 3rd payment Ac. | 4th payment Ac. |
|---|---|---|---|---|
| Underplanting | 17,253 | 5,821 | 3,006 | 102 |
| Replanting | 1,255 | 443 | 241 | 51 |
| | 18,508 | 4,264 | 3,247 | 153 |
| Performance | 100 (base year) | 34 | 17 | 0.8 |

Source: Coconut Cultivation Board.

An earlier ARTI study on coconuts conducted in Kurunegala in 1982 had raised this very issue in following terms:-[1]

> "It was quite apparent that most of the farmers have not completed the work prescribed by the CCB in order to obtain their second and third instalments required for the adoption of cultural practices as recommended by the CCB. These practices include fertilizing, maintaining of fences, watering and protecting the palms from cattle".

> "Cultivators appeared to be unable to adopt these cultural practices in time, due to lack of interest, and farmers also did not appear to be much interested in obtaining the second and third instalments as they were not so attractive as the first instalment. However, the poor attention paid by cultivators to their plantings was the main reason for the low rates of payment of the second and third instalments". [Henegedera, 1982].

The project management has been quite alive to this situation as reported in the annual progress report of the project for 1982:

> "A study done by the project office has revealed that the utilization of the 2nd and 3rd subsidy instalments is fairly low. Steps are, however, now being taken to improve this situation by granting the subsidy for the 2nd and 3rd instalments in kind whereever possible, whereby fertilizer etc. are made available in suitable packages in lieu of the financial payments".

On the basis of the experiences gained during the early project years, the project authorities had adjusted the value of different instalments of the subsidy to accommodate the rising costs due to inflation. In addition, the value of the fourth instalment has been increased in order to entice the subsidy receivers to undertake particularly the removal of senile palms, a prerequisite for qualifying for the last instalment. Unfortunately, the changes introduced have not had the desired results. The sample survey in fact reveals that the situation regarding the non-availing of the 2nd and 3rd instalments have not improved during the latter phase of the project. According to Table 5.9, only 1% of the respondents were obtaining the replanting subsidy while 14% were claiming the underplanting subsidy. But the number of farmers who obtained the third subsidy was about 0.4% which confirms the validity of the foregoing discussion.

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1. G.M. Henegedara. A Process Evaluation of Coconut Cultivation in the Kurunegala District. ARTI, (1984).

Table 5.18
Farmer responses for not obtaining second and third instalments

| | Response | Farmers responding % |
|---|---|---|
| a) | Required items of work not completed in time | 34 |
| b) | Delays in receiving the first payment | 21 |
| c) | Not interested | 19 |
| d) | Non-removal of specified palms | 12 |
| e) | Others | 12 |

Source: Survey Data, 1985/86.

During field interviews, the study team found that a majority of the receivers of the first instalment of the subsidy had not completed the other specified items of work such as maintainance of fences, watering, protection of palms and fertilizing to qualify for the second and third instalments. As a result the survival rate of seedlings planted has been low. The decline in nut prices in 1984 had further discouraged the growers from undertaking balance work necessary to qualify for subsequent instalment payments.

In this context, it is reasonable to conclude that the replanting and underplanting schemes had not progressed as anticipated by the appraisal team. Though initially underplanting and replanting had begun in 18,500 acres, subsequent maintenance operations have not been carried out in much of this acreage as specified in the project plan. Subsidy payment data in Table 5.16 confirm that only one third of the original participants of the scheme had qualified for the second instalment. Broadly, at the end of a seven-year effort, less than one percent of the initial acreage included under this subsidy scheme had been able to claim all the four instalment payments for replanting and underplanting. Under the circumstances, the benefits from replanting and underplanting as specified in the appraisal report are unlikely to materialize even in the long run.

## 5.3 Intercropping

The target of 10,000 acres for intercropping with cocoa, coffee, and pepper, though described as modest in the appraisal report, appears to be an over-ambitious projection due to more than one reason. Firstly the crops recommended require an annual rainfall

of over 70 inches with few dry spells; much of the coconut acreage in the district really do not enjoy such a favourable rainfall pattern. In fact according to a recent study on inter cropping in coconut lands, 3 of the 14 electorates in the district namely Polgahawela, Mawatagama and Dodangaslanda have been described as best suited for intercropping with the type of perennial crops recommended under the project.[1] Even in the above three electorates when home gardens with mixed crops and young coconut plantations (under 30 years of age), which restrict light penetration for intercrops and patches of unsuitable soils/terrain etc., are excluded, the coconut area ideally suitable for intercropping gets further reduced.

Secondly, the long gestation periods involved in the development of the crops considered tend to make them less attractive for a majority of the small holders who form the bulk of the coconut growers in the district.

Thirdly, economic and financial indicators related to these crops offer much less scope for their expansion in the small holder sector, as summarized below:-[2]

> "It would be seen that in the case of cocoa, coffee, pepper and lime, for which the economic life is 10 years or more, waiting time before output was rather substantial i.e. 2-3 years. The ratio of waiting time (before cash flows become positive) to economic life of the crop comes to 1/5 for cocoa and coffee, little over 1/4 for pepper and almost 1/3 for lime. The long gestation periods involved in the development of these crops were bound to make them unattractive to most of the small coconut holders who lack this 'waiting capacity' and were generally unable to treat farming ventures as investment projects".

In the context of such environmental and economic limitations, the 10,000 acre target for intercropping within five years undoubtedly is an unrealistic target. In the circumstances, the low rate of achievement of targets seen in this particular activity is not surprising.

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1. Ministry of Finance & Planning. A Study of Intercropping in Coconut lands. (1981).

2. Ibid. [1981].

Table 5.19
Progress of Intercropping

| Intercrop | Target | Progress | |
|---|---|---|---|
| | acres | acres | % |
| Coffee | 5500 | 1738 | 32 |
| Pepper | 1500 | 509 | 34 |
| Cocoa | 1000 | 298 | 30 |

Source: KIRD Project Office.

Perhaps the availability of direct subsidies for development of these perennial crops had largely influenced the thinking of the planners, on the choice of intercrops under coconut. The subsidy payments, indicated in Annex XII, undoubtedly had provided considerable relief to new growers, but have not been sufficiently attractive to a large majority of the small holders to take up to new intercrops with which many of them had not been very familiar prior to project commencement. This appears to be due to two main reasons. Firstly, considering the development cost that had prevailed in 1980 (Table 5.19) the quantum of subsidy had been inadequate, particularly for smallholders. Secondly as the bulk of the development cost had to be incurred during the first two years, the existing scheme of making subsidy payments in four equal annual instalments has not been very helpful to smallholders in as regards the necessary finances for establishment of these crops.

Table 5.20
Development costs and subsidies
for intercrops

| Crop | (a) Development Cost (Rs) | (b) Subsidy in 1980 (Rs) | (c) Subsidy in 1984 (Rs) |
|---|---|---|---|
| Cocoa | 3,275 | 1,500 | 2,250 |
| Coffee | 4,033 | 1,375 | 2,125 |
| Pepper | 5,037 | 1,875 | 2,625 |

Source: (a) A Study of Intercropping on Coconut Lands Ministry of Finance and Planning (1981).
(b) Coconut Cultivation Subsidies for perennial crops (1980).
(c) Coconut Cultivation Subsidies for perennial crops (1984).

In this regard, another deficiency seen is the inadequate attention given to processing and marketing of produce. Cocoa in particular needs elaborate processing and coffee and pepper to a lesser degree. Besides, new growers have to acquire the necessary processing skills. However both these aspects had escaped the attention of the planners and in such circumstances, the reluctance shown by small farmers to take up to such crops was understandable.

The very limited success achieved in the project-sponsored intercropping scheme in no way reflect on the general intercropping situation in coconut lands in the district. The sample survey conducted by the study team in 1985 showed that one-fourth of the holdings had some form of intercrops, the most common being banana, pineapple, pepper, betel, vegetable and pasture. At field interviews farmers also expressed a preference for cultivation of crops such as banana, pineapple and betel. However in the case of both pineapple and banana, many non-subsidy recipient farmers were growing the two crops in spite of the relatively long 'gestation period' and these initial high development costs (particularly in the case of pineapples).

Since the first three crops ideally fit most coconut lands in the district and most farmers are quite familiar with their cultivation, and with the present national supply much below the current demand, there is justification to provide some assistance (not necessarily in the form of subsidies) for the promotion of such crops.

Table 5.21

Type of intercrops grown by sample farmers

| Type of intercrop | % No. of Cultivators[1] |
|---|---|
| Banana | 54 |
| Pineapple | 23 |
| Betal/ginger | 12 |
| Vegetables | 05 |
| Pepper | 03 |
| Coffee | 01 |
| Cocoa | 01 |
| Others | 01 |

1 Information was obtained from respondants with intercropped acreages of more than 1/2 acre.

Source: Survey Data, 1985/86.

An earlier ARTI study[1] which noted the slow rate of progress on intercropping of coconut lands with minor export crops arrived at a number of conclusions which, as reproduced below, still remain valid in 1985.

> "Particularly in view of the capital investment and perennial nature of the crops, land selection should be entrusted to competent officers only. Some lands selected for intercropping have been found unsuitable.
>
> The growers owning less than 1/2 acre should be discouraged from intercropping. They should be encouraged to undertake the cultivation of other subsidiary food crops and fuelwood trees. This will be more important in the case of cocoa where large extents will be needed to make the units economically viable.
>
> The present policy of restricting subsidies and other facilities to extents below five acres should be revised. It is suggested that subsidies etc. be also made available to medium and large estate owners. The risk and delay in returns in growing intercrops could be easily cushioned by them, while processing and marketing facilities could also be organised with less government participation. This will be of prime importance in the case of cocoa which needs scientific processing, and pasture which forms an integral part of a livestock industry.
>
> The procedure involved in the payment of subsidies should be simplified, and delays avoided as far as possible. The causes of delays such as ownership of land, unsuitability of soil, excess shade due to closer spacing of coconut trees etc. should be examined at the initial stages of issuing permits and not subsequent to the payment of the first instalment of the subsidy".

---

1. Intercropping Coconut Lands with Minor Export Crops. ARTI, (1983)

In view of the very limited progress achieved in intercropping of minor export crops in coconut lands, the management in 1983 had substituted a scheme for the development of homegardens and horticultural crops including cashew. The performance of the home garden development programme is as follows.

Table 5.22
Performance of the Home Garden Programme

| Year | Number of home gardens | Extent (acres) |
|---|---|---|
| 1983 | 1866 | 800 |
| 1984 | 3315 | 1200 |

Source: KIRD Project Office.

Table 5.23
Horticultural Programme (1984)

| Crop | Target (acres) | Performance (acres) |
|---|---|---|
| Banana | 3,500 | 2,324 |
| Pineapple | 500 | 234 |
| Mango | 1,000 | 1,097 |
| Lime | 1,000 | 950 |
| Orange | 500 | 454 |
| Passion fruit | 150 | 48 |

Source: KIRD Project Office.

5.3.1 Pasture Development:

Under the pasture development programme, altogether 1870 acres had received the subsidy having established the specified pastures under coconuts. In the intermediate wet zone many growers expressed their desire for pasture and hence there will be a good scope for expansion. But the study team observed that the ownership of dairy is as an important pre condition here because marketing avenues for fodder seems to be very weak. Hence the authorities responsible should consider establishing proper market avenues for the successful adoptation of this programme.

5.4 Minor Export Crops

Under the project, assistance was provided for the establishment of six nurseries for production of coffee, cocoa and pepper seedlings. The envisaged target was to raise 200,000 plants of coffee and pepper annually.

Table 5.24
Minor Export Crop Plants Produced

| | Coffee | Pepper | Cocoa |
|---|---|---|---|
| 1980/81 | 944,152 | 123,271 | 79,941 |
| 1982 | 425,468 | 90,960 | 26,912 |
| 1983 | 232,066 | 99,549 | 8,201 |
| 1984 | 196,286 | 107,229 | 5,133 |
| 1985 | 218,594 | 148,300 | 16,545 |
| | 1,832,566 | 569,309 | 136,732 |

Source: KIRDP Progress Reports.

These plants have been issued specifically to intercropping subsidy permit holders of the Coconut Cultivation Board, including home gardens and if available to other non-permit holders within and outside the district. However, due to the limited demand for plants produced, by the cultivators within the district, the project authorities had decided in 1984 to use the nurseries for production of other planting materials. In this regard, the progress report for 1984 states as follows :-

> "In view of the demand for minor export crops in the district being less than expected, it was decided to diversify the minor export crop nurseries to cater to the production of bananas, ginger, pineapple etc. These planting materials would cater to the various intercropping subsidy programmes and the home garden cultivation programme within the district".

## 5.5 Coconut Nursaries

Establishment of eight new seedling nurseries at Dodangaslanda, Nikewaratiya, Bingiriya, Polgahawela, Wennoruwa, Kandeketiya, Wariyapola and Kuliyapitiya have been completed and the two nurseries at Hettipola and Ibbagamuwa improved.

Table 5.25
Progress of Coconut nursery Development Programme
(in '000s)

| Seedling Production | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|---|---|---|---|---|---|
| Target | 700 | 700 | 700 | 700 | 700 | 700 |
| Progress | 285 | 768 | 672 | 517 | 501 | 973 |

Source: Coconut Cultivation Board.

The project had targetted for producing around 700,000 seedlings per year on average from each of the above nurseries. In general, the nursery programme had achieved its annual target except in 1983/84 when severe drought conditions effected the entire coconut sector in the district.

The study team found that the farmers had not experienced any problems in obtaining seedlings for coconut replanting activities. Problems of transport of the seedlings experienced at project commencement had eased out due to the provision of transport facilities to the nearest APC centre at a nominal fee by the Coconut Cultivation Board. According to the CCB, the survival rate of the plants issued had improved from 60% in 1979 to 80% in 1984, which is an encouraging sign.

Table 5.26
Seedlings obtained from the CCB Nurseries

| Subsidy Programme | % of Farmers who obtained seedlings from the Nurseries |
|---|---|
| | % |
| Replanting/ Underplanting | 81% |
| New Planting | 72% |
| Rehabilitation (filling of vacancies) | 21% |
| Less than one acre | 84% |

Source: Survey data 1985/86

The ARTI sample survey data reveal that 75% of those who had planted new seedlings had obtained their requirements from Coconut Cultivation Board nurseries. All seedling requirements of subsidy holders had been met from these nurseries. The seedlings have been issued to the subsidy holders on loan, to be recovered from the subsidy payments and hence neither the non-availability of funds nor their trasnportation had been a problem in replanting programmes, unlike in the pre project period.

The improvement of infrastructure facilities, including buildings, vehicles and equipment needed for the nurseries, has been a great help to the Coconut Cultivation Board, to improve its implementation capacity. During field interviews in Kulipitiya CDO division, the study team found that a majority (around 60%) had used CCB planting material while another quarter had purchased

seedlings from private nurseries; around 10% had used their own seedlings. The price per seedling varied from Rs. 10-20 in private nurseries while the CCB nurseries sold them between Rs. 7.50 - 11 per seedling. Those who used their own planting material or purchased from private nurseries did so mainly because they had felt that the seedlings supplied by the CCB nurseries were costlier. The mortality rate of the seedlings issued had decreased compared to the pre-project situation as indicated earlier.

## 5.6 Fertilizer Application

Since the key input which affects productivity in mature plantations is fertilizer, the project had targetted for fertilizing 50,000 acres of coconut under the project. In order to popularise fertilizer use in coconut, the project had operated a credit scheme through the two state commercial banks, the details of which are discussed later in chapter 7. Despite this effort, the progress achieved has been substantially below the projected target and by the end of the project only 24,788 acres had benefitted from fertilizer use.

The sample survey data of 1985/86 given below confirm the low fertilizer usage in coconuts.

Table 5.27
Fertilizer use in coconut

| Agro-climatic zone | % applying fertizer % (1) | Quantity applied per acre (kg.) (2) | Recommended dpsage per acre Kg. (3) | Quantity applied as a % of the recommended dosage |
|---|---|---|---|---|
| Dry | 12 | 80 | 250 | 32 |
| Intermediate | 14 | 190 | 340 | 56 |
| Wet | 28 | 220 | 390 | 56 |
| All | 14 | 163 | 325 | 50 |

Source:
(1) & (2) Survey data 85/86.
(3) Coconut Cultivation Board.

Broadly, around 14% of the sample farmers had used fertilizer and the average quantity applied has been 163 kg. per acre which is only one-half of the quantity recommended. Among the three zones, the higher usage of fertilizer is seen in the wet zone both in terms of the number of farmers and the quantity applied per acre, mostly due to the better rainfall conditions normally experienced in this particular zone. Because of the risk involved in fertilizer application is lower.

Furthermore, the sample survey data indicate that over the years (except in 1984), the per acre usage of fertilizer had declined. This is largely due to very high prices that prevailed in 1983 together with the favourable rainfall distribution experienced.

However the Coconut Cultivation Board fertilizer issues had recorded an increasing trend during the project period.

Table 5.28
Fertilizer Uses by the CCB

| Year | Total Issues Young Palms in '000 Kgs | Mature Palms in '000 Kgs |
|---|---|---|
| 1979 | 28 | 843 |
| 1980 | 54 | 234 |
| 1981 | 27 | 175 |
| 1982 | 31 | 161 |
| 1983 | 102 | 128 |
| 1984 | 377 | 207 |
| 1985 | 608 | 102 |
| 1986 (upto Sept.) | 226 | n.a. |

Source: Coconut Cultivation Board.

In 1985 the planting of seedlings was very high because of the favourable weather and hence the fertilizer issues were higher, but in 1986 it had reduced again.

Table 5.29
Annual Fertilizer Use

| Year | Fertilizer use per acre Kg |
|---|---|
| 1980 | 208 |
| 1981 | 170 |
| 1982 | 99 |
| 1983 | 118 |
| 1984 | 196 |
| 1985 | 91 |

Source: Survey data, 1985/86.

With regard to the frequency of fertilizer applications, only one-fifth of the sample farmers reported having used fertilizer at least once during the last six years. Only 2% had used fertilizer regularly according to the official recommendations. The survey data arranged by holding size show that with the increase in size both the percentage of farmers using fertilizer as well as the quantity applied per acre had increased (see table 5.28).

Table 5.30
Fertilizer Application by Holding Size

| Holding size | Farmers using fertilizer | Quantity applied per acre |
|---|---|---|
| Acres | % | Kg |
| Less than 1 | - | - |
| 1 - 2.5 | 6 | 80 |
| 2.6 - 5.0 | 10 | 147 |
| 5 - 10.0 | 27 | 168 |
| Over 10 | 57 | 256 |

Source: Survey Data 1985/86.

The limited use of fertilizer in the district is due to a number of reasons. Inadequate returns to the coconut cultivation has been the most important factor. The two-year time lag between the fertilizer application and its reponse, and higher prices of fertilizer are secondary reasons. In addition, the farmgate prices of coconut at a given point of time play a vital role in farmer decisions regarding fertilizer application. The use and effect of fertilizer are also greatly influenced by the rainfall conditions. In fact drought conditions prevelent for more than three months normally reduce the effectiveness of fertilizer use.

The National Fertilizer Secretariat which examines the fertilizer consumption patterns in the country, summarized the fertilizer usage in coconut sector in 1984 in the following terms:-

> "Fertilizer use in product terms increased from 35,650 MT in 1983 to 49,990 MT in 1984, an increase of 40%. This was a significant increase over the performance of the previous year 1983 and even more over the year 1982. However, the level of fertilizer consumption in 1984 is still less than the record level of 1980 and is also less than the figures for 1968 and 1970".

"The substantial increase in fertilizer use in coconut cultivation in 1984 in relation to the previous year, which is the highest increase among major crops in the country, was due to a number of factors. The price of coconut and desicated coconut increased considerably in 1984 compared to the previous year.

It is observed that the price of coconut in the first three quarters of 1984 were much higher than the prices during the 4th quarter of the previous year 1983 This function together with favourable weather conditions for fertilizer application and the stability in fertilizer prices in that year were responsible for the much better performance during the year 1984 under review....."

In view of the substantial increase in the use of fertilzier in the coconut sector in 1984 its share of the total fertilizer consumption in the country increased from 9% to 11% between 1983 and 1984".

(The Review of Fertilizer Year 1984.)

The national picture given above regarding fertilizer usage in coconut during the past few years applies equally to the project area which account for a third of the total acreage in the country. Since 1983, the rates of net returns to total cost of fertilizer had gradually become unfavourable for higher use of fertilizer. Beside the severe drought conditions experienced in 1982/83, the fertilizer prices had increased from Rs. 1890 in 1980 to Rs. 2670 in 1985. But the nut prices had increased from 1.40 in 1980 to 2.00 in 1985. Therefore the price ratio between coconut and fertilzier remained in the same disadvantageous position of 1:0.8. Despite the availability of a credit scheme for coconut fertilizer, many of the small holders complained of financial difficulties in applying fertilizer. Since a majority of the small holdings hardly generate any marketable surplus, there is very little enthusiasm among them for regular fertilizer use.

## 5.7 Yields

The bulk of the project activities concerning coconut relate to the long term development of the coconut sector. Only an increased fertilizer usage had been expected to bring about short term benefits. The sample survey data presented below reflect the lagged relationship between fertilizer use and the yields.

Table 5.31
Fertilizer usage and coconut yields in the Wet Zone

| | Fertilizer use Kgs/acre (2) | Yield nuts/acre (1) |
|---|---|---|
| 1979 | n.a. | 2128 |
| 1980 | 208 | 2237 |
| 1981 | 170 | 2158 |
| 1982 | 99 | 2256 |
| 1983 | 118 | 1809 |
| 1984 | 196 | 1320 |
| 1985 | 91 | 2935 |

1 Process Evaluation in Coconut Development
2 Survey data, 1985/86

In addition, marked yield differences could be seen among the three agroclimatic zones.

Table 5.32
Coconut Yields by Zones

| Zone | Yield per acre (nuts) |
|---|---|
| Dry zone | 1202 |
| Intermediate zone | 2668 |
| Wet zone | 3114 |
| All zones | 2328 |

Source: Survey data, 1985/86.

In the wet zone, the yields exceeded the projected target of 2500 nuts per acre 7 years after project completion. In the Wet Zone, higher yield levels were recorded in the 1-5 acre size category. But a careful study of the yields indicates that they are greatly influenced by weather patterns, in particular, the rainfall distribution. As mentioned earlier, 1984/85 had been a very good rainfall year.

Table 5.33
Coconut Yields by Holding Size
(Wet Zone)

| Size of holding | Yield per acre (nuts) |
|---|---|
| Below 1 | 2821 |
| 1 - 2.5 | 3276 |
| 2.6 - 5 | 3174 |
| 5 - 10 | 2835 |
| 10 + | 2936 |

Source: Survey data.1985/86.

Though costs of production of coconuts are relatively lower compared to paddy, the objectives of the coconut development programme was not fully materialized. The rehabilitation programme has been successful but the replanting programme was moderately successful with about 4/5 target acreage brought into the programme. Lower producer prices and cash flow constraints have discouraged smallholders from uprooting older trees in order to replant new seedlings. Intercropping of coconuts with minor export crops had met with a disappointing response, apparently due to the fact that the recommended crops are not suitable for the district. In that respect home gardens programmes have been more popular than expected and have reached a large number of poor farmers with very small holdings.

Coconut subsidies are offered to the producers (especially smallholders) to overcome cash flow constraints during the gestation periods before the trees yield their first crop. The effectiveness should be evaluated in terms of time consuming paper work needed for subsidy administration, and its cost. In the light of this a suitable methodology should be adopted for the payment of subsidies with the termination of the project and also to recover the costs at least by some taxation so that the programme proves cost effective.

# CHAPTER SIX

## ECONOMIC PROFILE OF THE PROJECT AREA

This Chapter primaily aims to examine the economic profile of the district with special emphasis on the costs and returns to paddy and coconut. Subsequently it examines the employment pattern, incomes quality of life and the economic rate of return within the project area. Since agriculture provides the livelihood to most of the households in the project area, the economic profile emerging from the following discussion would reflect the key features of the economic conditions faced by these farmers during the study period, 1985-86.

### 6.1 Economic Profile

The district has a multiple array of economic activities, types of crops and income sources. But the most prominant feature is its predominance of the smallholders. Of the sample survey data, holdings less than one acre accounted for 84% of the paddy area while the same size category of holdings accounted for 55% of the coconut area.

In addition 36% of the population depend on paddy for their major source of income while 23% depend on coconut. This situation has not changed widely since the pre-project period 1978/79.

Table 6.1
Major Source of Income of the Sample Households

| | Pre-project 1978/79 (1) | | 1985/86 (2) | |
|---|---|---|---|---|
| Agriculture | | | | |
| Coconut | 21.3 | | 23 | |
| Paddy | 31.7 | | 36 | |
| Other | 8.0 | | 5 | |
| | | 61.0 | | 64 |
| Industry and Commerce | | | | |
| Govt. sector | 2.7 | | 3 | |
| Private sector | 10.9 | | 15 | |
| | | 13.6 | | 18 |
| Services | | | | |
| Govt. sector | 16.3 | | 18 | |
| Private sector | 9.1 | | 10 | |
| | | 25.4 | | 18 |
| | | 100 | | 100 |

Source: 1. An analysis of the preproject situation. 1978/79.
2. Survey data, 1985/86.

Of the sample farmers depending on agriculture for their main source of income 12% had no agricultural land, while 23% and 18% of the total sample do not own any paddy or coconut land respectively. Interviews with these sample farmers revealed that they are employed as agricultural labourers mainly in the paddy sector.

Table 6.2
Labour Force and Activity Rates

| | Pre-project 1978/79 (1) | Project completion 1985/86 (2) |
|---|---|---|
| Size of the household | 5.3 | 5.4 |
| % in the labour force | 60.9% | 67.3 |
| Dependancy ratio | 64.2 | 58.4 |
| Number of dependants per employed person | 2.4 | 1.6 |
| % of gainfully employed in the sample | 29.1% | 41.2 |
| Net activity rate | 62.5% | 87.4 |
| Agricultural labourers as a % of employed | 3.6% | 5.0 |
| Unemployment rate | -- | 17.6 |

Source:
1. An analysis of the pre-project situation, 1978/79.
2. Survey data 1985/86.

In 9% of the sample households at least one member had received regular employment during the project period. In many instances salaried employment was considered as new employment. Hence the number of respondants who found active employment in the agricultural sector was largely unaccounted for.

But the study team believes that the additional funds pumped into the district should have created a substantial number of employment opportunities both direct and indirect, than what the survey estimates indicate.

In the paddy sector the average number of labour days required for cultivation has increased from 47 days in 1978/79 Maha to 56 days in 1985/86. This increase though not substantial when considered on per acre basis, may have had an impact on the incomes of substantial number of agricultural labourers. Similarly the yield levels have moved up from 54 bushels per acre to 65 bushels per acre respectively, which results in a marginal increase in the labour productivity from Rs. 80.50 in 1978/79 to Rs. 81.20 in 1985/86 at constant prices. Similarly the land productivity for paddy had varied from Rs. 3780/- per acre in 1978/79 to Rs. 4580/- per acre in 1985/86 which is very modest compared to national and project level expenditures, to increase productivity.

Coconut being a less labour intensive crop had positive marginal productivity to labour. But according to survey data productivity per acre had increased from Rs. 2860 per acre in 1978/79 to Rs. 4942 per acre

in 1985/86 at constant prices. However the increases in yield levels were not sufficient to take up the increases in the production costs of both crops making it rather unattractive to smallholders who depend entirely on the incomes from those crops.

## 6.2 Cost of Paddy Production

At present paddy cultivation is practised by 75% of the sample households in the study area averaging to 1.60 acres per operator. Paddy lands account for 28% of the total land area in the district and the main source of income for the majority of the families is paddy. There are no significant regular sources of labour intensive employment opportunities within the area concerned, and hence, the bulk of the labour force is currently engaged in paddy cultivation as their main economic activity.

The total cost of cultivating paddy reflected the value of the major resources employed except that of land. The sample survey showed a mean of Rs. 2928 and Rs. 3039 per acre for 1985 Yala and 1985/86 Maha season respectively (Table 6.3). The average sizes of the paddy holdings cultivated during these two seasons have been 1.02 and 1.39 acres respectively. On this basis, the total cost of cultivating paddy per farmer averaged Rs. 3493 in Yala season and Rs. 4224 in Maha season, indicating the mobilization of a relatively large volume of production expenses.

Table 6.3
Cost of Paddy Cultivation 1985/86
Cost/per acre

| INPUT | Yala 1985 | | Maha 1985/86 | |
|---|---|---|---|---|
| | Amount (Rs) | % | Amount (Rs) | % |
| Labour | 1244 | 44 | 1421 | 47 |
| Tractors and Buffaloes | 504 | 18 | 496 | 16 |
| Fertilizer | 328 | 12 | 385 | 13 |
| Seed Paddy | 210 | 7 | 208 | 7 |
| Chemicals | 174 | 6 | 151 | 5 |
| Other (a) | 368 | 13 | 378 | 12 |
| TOTAL | 2828 | 100 | 3039 | 100 |

(a)Includes equipment hire, cost of food provided to exchange and hired labour.
Note: All cash and non-cash costs are included.

Source : Survey data, 1985/86.

The total production cost data of the two seasons do not show significant variations. This situation is somewhat contrary to the usual circumstances found in paddy cultivation where farmers incur relatively higher production costs during the Maha season. Normally, in Yala season, due to the risk of crop failure arising from water shortages, farmers show a marked reluctance to employ higher levels of production inputs. However, during the Yala season under study, the rainfall was very favourable, and this to a large extent, explains the similarities in the cost structures between the two seasons. This suggests that if irrigation water is freely available farmer response to other input use will be higher and therefore there is a need for an efficient water management system at field level.

The composition of the total production cost in terms of major production inputs showed that the bulk of the production expenses, more than 40%, have been accounted for by labour, both hired and family. It also showed that fertilizer and draught power inputs represented nearly 17% and 14% respectively of the total costs.

The cost figures discussed so far included the direct value of both purchased inputs (cash costs) as well as the imputed value of farmers' own inputs (non-cash costs) at market prices. Within the two, the cash component is relatively more important, since it indicates the amount of liquid cash required at the farm level for undertaking paddy cultivation. An analysis of this data showed a substantially large cash requirement to cultivate paddy accounting for nearly two-thirds of the total costs, Rs. 1874 per acre or Rs. 2604 per average farmer owning 1.39 acres of paddy.

The bank credit limits have been Rs. 2,100/- per acre, which is sufficient to break even. But many farmers had diverse problems in obtaining institutional credit which will be discussed in Chapter 7.

Table 6.4
Average Cost of Cultivating Paddy
according to cash and non-cash inputs

| Item | Amounts per acre 1985/86 Maha (Rs) | 1985 Yala (Rs) |
|---|---|---|
| **Cash (Purchased) Input** | | |
| Labour | 726 | 434 |
| Tractors and Buffaloes | 404 | 316 |
| Fertilizer | 385 | 328 |
| Chemicals | 151 | 174 |
| Seed | 152 | 30 |
| Other | 56 | 72 |
| Sub-Total : | 1874 | 1354 |
| | (61%) | (48%) |
| **Non-cash (Own) Input** | | |
| Labour | 695 | 810 |
| Tractors and Buffaloes | 92 | 188 |
| Seed | 57 | 180 |
| Others | 321 | 296 |
| Sub-Total: | 1165 | 1474 |
| | (39%) | (52%) |
| GRAND TOTAL | 3039 | 2828 |

Includes the value of food provided for the hired and exchange labour.

Source: Survey data, 1985/86.

A substantial proportion of cash costs incurred in cultivating paddy in the area, nearly 40%, had been in respect of wage payments to hired labour. The wage bill had amounted to Rs. 726 per acre. The daily wage rate of an adult in the area during the survey period had been about Rs. 27.00 without meals, usually the value of meals provided had amounted to an average of about Rs. 9.00 per day. Hiring tractors and buffaloes had accounted for nearly 20% of the cash outlay or Rs. 404 per acre. Fertilizer and chemical application together accounted for nearly a third of the cash outlay (Rs.536 per acre). It is significant that the expenditure for chemicals, mainly for weeds and pest control had been equivalent to that of fertilizer. The fertilizer use in the district had been above the minimum level of 2.2 cwt per acre, on average. However the study team noted that the use of weedicides and pesticides was also higher in the district amounting to 7% of the costs of production, although a major ourbreak of pest attacks was not recorded.

When production costs of Yala are compared with Maha, there is a significant change in the cost structure. In Yala the non cash costs are much higher than the cash costs. This again reflects the farmer reluctance to higher investment on Yala crop due to uncertainty.

The cost data analysed on the basis of three climatic zones in the district, suggest that with respect to expenditure patterns, farms located in dry and wet zones, hardly show any difference. However, paddy farms in the wet zone had higher cash expenses nearly 60%, compared to the other two zones. The study team analysed from the farmer responses of these zones that the risk of crop failure is lower in the wet zone compared to other zones and hence higher investment on production inputs is very likely. In the former case, the average cash expenditure per acre had been Rs. 2615 compared to Rs. 1518 in the dry zone (Table 6.5). In the wet zone wage payments to hired labour is prominant. In fact, paddy farming in the wet zone is relatively more labour intensive, compared to other zones. The small size of paddy holdings, which average about 0.9 acres per farmer, with higher adoption of transplanting had resulted in higher labour use. Furthermore, the farmers being relatively less dependent on tractors, had used buffaloes more often for land preparation. The study team observed that this lesser dependance on tractors is due to the smaller size of the plots, which makes tractor use practically difficult and uneconomical.

In view of the relatively high cash requirements for cultivating paddy short-term production credit for this crop is of vital importance. This is particularly important because most of the paddy farmers in the project area are small scale producers, operating at subsistence levels, who normally do not have adequate cash savings that could be mobilized for cultivation purposes which consequently compell them to borrow funds from outside, mostly from non-institutional sources at exhorbitant interest rates ranging from 10 to 20 percent per month.

The survey information also clearly shows that during the project implementation period, the production costs had increased substantially, from Rs. 1571 in 1978/79 Maha season to Rs. 3040 in 1985/86 Maha season. This signifies an average annual increase of about 13.4%. The bulk of this increase has been due to increases in the cash costs of production as can be seen in Table 6.4.

Table 6.5

PER ACRE COST PRODUCTION IN THE STUDY AREA CLASSIFIED BY CLIMATIC ZONE AND TYPE OF INPUT (MAHA 1985/86)

| ITEM | Dry Zone Farms | | | Intermediate Zone Farms | | | Wet Zone Farms | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cash Rs. | Non-cash Rs. | Total Rs. | Cash Rs. | Non-cash Rs. | Total Rs. | Cash Rs. | Non-cash Rs. | Total Rs. |
| Labour | 328 | 769 | 1097 | 513 | 672 | 1185 | 1340 | 643 | 1983 |
| Seed Paddy | 174 | 53 | 227 | 179 | 31 | 210 | 105 | 83 | 188 |
| Fertilizer | 328 | - | 328 | 394 | - | 394 | 550 | - | 550 |
| Agro-chemicals | 145 | - | 145 | 153 | - | 153 | 78 | - | 78 |
| Farm power | 495 | 70 | 565 | 416 | 92 | 508 | 300 | 116 | 416 |
| Other | 48 | 188 | 236 | 57 | 256 | 313 | 42 | 608 | 650 |
| | 1518 | 1080 | 2598 | 1712 | 1051 | 2763 | 2415 | 1450 | 3965 |

Source: Survey Data. 1985/86

Table 6.6
Changes in Cost Intensity of Paddy Production in the Project Area during the Project Implementation (1978/79 - 1985/86 Maha)

| Item | Pre-project 1978/79 Maha (Rs/Acre)1 | Project 1985/86 Maha (Rs/Acre)2 | Average annual change (Rs/Acre) |
|---|---|---|---|
| Cash cost | 900 | 1874 | 15.5 |
| Non-cash cost | 671 | 1166 | 10.5 |
| All | 1571 | 3040 | 13.4 |

Source : 1. Pre-project situation 1978/79.
2. Survey data 1985/86.

Investigations into the factors that had led to this remarkable increase in production costs during the project period show that much of the increases in cash costs have been due to increased input prices during this period (Table 6.5). For instance, in the period 1979/84, the wage rate for hired labour in the area had more than doubled, from Rs. 15.00 to Rs. 35.00 a day. Increases of similar magnitude could be seen in fertilizer and tractor hire rates as well. The seed paddy price of Rs. 54.00 in 1979 also had increased to Rs.105.00 per bushel in 1985. This upward movement of prices of production inputs is not specific to paddy cultivation in Kurunegala district. It was the general trend common in Sri Lanka's economy. Hence the data suggest that during the 1978/85 period, there has not been a significant shift in the intensity of input use in paddy cultivation on a sustained basis.

Table 6.7
Changes in the Prices of Selected Inputs in Paddy Production in Kurunegala District 1979 and 1984

| Input | Unit Price 1979 | Unit Price 1984 | Increase (%) |
|---|---|---|---|
| Seed Paddy (Rs./Bushel) | 54 | 99 | 83 |
| Fertilizer (Urea, Rs./cwt.) | 73 | 150 | 105 |
| Tractor hire for ploughing (Rs./Acre) | 222 | 436 | 96 |
| Wage Rate (Rs./manday) | 15 | 35 | 133 |

Source: Statistics Department, Central Bank of Ceylon.

## 6.3 Returns to Paddy Farming

The commercial profitability of the paddy enterprise as measured by some selected indicators is discussed in this section.

Table 6.8
Financial Returns to Paddy Farming in the Project Area Classified by Seasons

| | 1985 Yala | | 1985/86 Maha | | Annual | |
|---|---|---|---|---|---|---|
| | Rs/acre | Rs/farm | Rs/acre | Rs/farm | Rs/acre | Rs/farm |
| Gross Returns[1] | 3938 | 4010 | 4213 | 5821 | 8151 | 9831 |
| Net Returns[2] | 1110 | 1125 | 1174 | 1579 | 2284 | 2722 |
| Cash Income[3] | 1575 | 1646 | 2106 | 2910 | 3681 | 4556 |
| Net Cash Income[4] | 221 | 265 | 232 | 306 | 453 | 570 |

1. Average farm size is 1.02 acres in Yala and 1.37 acres in Maha.
2. Market Price of paddy Rs. 71.60 and 76.60 per bushel in Yala and Maha.
3. Amount sold per farm is assumed as 40% in Yala and 50% in Maha.
4. Gross returns =Average output x Market price of paddy; Rs. 71.60 and Rs. 76.60 per bushel in Maha and Yala.
5. Net returns =Gross Income - Total production cost including both cash and non-cash costs
6. Cash Income =Amount sold per farm x Market price
7. Net Cash Income=Cash income - Cash expenses

The annual gross return per farm from paddy cultivation in the area amounted to Rs. 9831.00. However, once all the production costs are netted out, the annual return per farm was Rs. 2722.00. The annual cash farm income had amounted to Rs.4556.00 which represents the cash value of produce sold per farm. However the farmers' total cash returns per year is around Rs. 570/-, but when non-cash costs are accounted for, it is not very profitable for the average farmer. Even if we use the Census and Statistics Department's yield figures (63 bu/acre for yala and 68 bu/acre for Maha) the average net income per acre will be Rs. 1166 which cannot be considered as attractive. Hence the net incomes as a percentage of gross returns in both instances (ie., 6% using survey data and 12% using Census and Statistics department's data) is not attractive to the average farmer to consider paddy farming as a profitable venture.

The lower returns to paddy farming implies two basic factors. The productivity of paddy land is not sufficient to generate sufficient profits. Although the yields have increased, the yield per acre had moved from 54 to 68 from 1979-85 according to the department of Census and Statistics. But technically those high yielding varieties are capable of yielding more than 100 bushels per acre. However the farmer input use levels have been very close to the recommended quantities. But for some reason or other, the average yields have been discouraging, the yield increase being 14 bushels, compared to the pre-project situation. But it has not been sufficient for the farmers to operate on a viable scale.

Production of paddy on most farms being undertaken primarily for domestic consumption needs, smaller cash returns are not surprising. The strong subsistence nature of the average paddy producer in the district

could be seen from the fact that only 40% and 37% of the farmers respectively had reported any sales during the Maha and Yala season under study. As a concluding remark, concerning the paddy economy in the area, it may be stated that the producer margin has been substantially eroded over the project period, mainly due to rapid inflation in the economy. In particular, rural wages as well as farm power costs had increased considerably. In spite of very favourable production conditions experienced in 1985, paddy output in the project area has not shown a significant sustained growth. The trend, therefore, suggests that if incentives are to be maintained and the adverse consequences of major changes in relative costs and returns are to be avoided, a substantial increase in the farmgate price of paddy is needed.

Table 6.9
Profitability of paddy per bushel

| | Rs. |
|---|---|
| a) Average selling price per bushel | 74.00 |
| b) Cash cost of production of paddy | 29.00 |
| c) Non Cash cost of production | 24.00 |
| d) Other costs* | 5.00 |
| e) Profit per bushel | 16.00 |

f) Profit per bushel as a % of selling price 22%
*Includes marketing and other costs not included in b & c.

Source: Survey data, 1985/86.

This finding, therefore, has an important implication on the future directions of the project, as the project success in the long run is determined largely by the degree of adoption of recommended cultural practices by the project beneficiaries, provision of adequate producer incentives etc. Therefore, unless adequate measures are taken to maintain the producer incentives, all attempts of the project such as irrigation rehabilitation, input supplies including agricultural credit as well as extention services are unlikely to bring about expected changes at the farm level.

## 6.4 Costs and Returns from Coconuts

Similar to paddy, coconut assumes critical importance in the economy of the project beneficiaries. In addition to serving as a regular income source, coconut provides a basic daily food need. According to the Consumer Finance Survey of 1982 an average household spends 9% of its total food expenditure on coconut and coconut oil.

The operating costs of coconut lands in the survey area during 1985/86 averaged Rs. 723.00 per acre (Table 6.10). Costs were found to be relatively higher in the intermediate zone (Rs. 753.00) and

wet zone (Rs. 1014.00) compared to the dry zone (Rs.402.00). The most critical determinant of the cost intensity has been the level of fertilizer application. In the wet zone, about 60% of total costs have been incurred in respect of fertilizer use. However it has to be noted that only 28% of the wet zone producers have used fertilizer as already mentioned in chapter 5. If farmers were to follow the recommended dosages, fertilizer costs would amount to Rs. 1000.00 per acre.

Table 6.10

Annual Cost and Returns of Coconut Lands - 1985

| | | Dry Zone Rs/Ac | Intermediate Zone Rs/Ac | Wet Zone Rs/Ac | All Rs/acre |
|---|---|---|---|---|---|
| A. Costs | Labour for all operations Excepting harvesting | 80 | 120 | 300 | 167 |
| | Fertilizer | 216 | 513 | 594 | 440 |
| | Transport & Other | 70 | 80 | 60 | 70 |
| | Harvesting | 36 | 40 | 60 | 46 |
| | Sub Total | 402 | 753 | 1014 | 723 |
| B. Revenue | Yield (Nut/Ac) | 1202 | 2668 | 3114 | 2328 |
| | Price (Rs/Nut) | 0.80 | 0.85 | 0.87 | 0.85 |
| | Gross Income (Rs/Ac) | 961 | 2267 | 2709 | 1978 |
| C. Operating Surplus (Rs/Ac) | | 559 | 1514 | 1695 | 1255 |

Source: Survey Data 1985/86.

With the prevailing high transportation costs, fertilizer costs at the farm level are bound to be substantially higher by at least 10-20%. In addition, it appears that current labour costs to fertilize an acre would be in the region of Rs. 150.00 - Rs. 200.00, thus bringing the total costs to around Rs. 1300.00 per acre. In the case of growers, who obtain fertilizer under the credit scheme, the costs would be still higher due to interest payments.

On the basis of above cost estimates, assuming maximum fertilizer use and farm-gate price of Rs. 0.85 per nut, the yield per acre should be at least 1600 nuts per acre to break even. But with fluctuating prices and yield levels, an incremental increase of about 50% needed for an average farmer to operate on a viable basis.

Given such cost-price relationships, it seems most likely that fertilizer use in coconuts may not be an attractive proposition for the bulk of growers who are smallholders. The high price instability coupled with frequent yield fluctuations is likely to be a further disincentive to fertilizer use in coconuts. In this regard, the most recent decision by the government to reimburse a major part of the transport costs of coconut fertilizer would be welcomed by the producers.

The average gross incomes received from an acre of coconuts, valued at Rs. 0.85 cts per nut, had amounted to Rs. 1978.00. Between the three agro-ecological zones, the highest gross income of Rs. 2709.00 is seen in the wet zone which is nearly thrice the amount reported from the dry zone. The survey data (Table 6.11) also indicate that the marketable surplus is around 30% of the crop harvested. The relatively small marketable surplus seen here reflects the situation in the smallholdings in the district. This is because the study sample chosen was from holdings of less than 20 acres, in keeping with the project design.

Table 6.11
Annual Returns to Coconut Producers (1985)

| | (Zone) | | | |
|---|---|---|---|---|
| | Dry | Inter. | Wet | All |
| Yields (Nuts/acre) | 1202 | 2668 | 3114 | 2328 |
| Quantity sold as a proportion of total yield (%) | 20 | 22 | 40 | 28 |
| Price per nut (ct.) | 0.80 | 0.85 | 0.87 | 0.85 |
| Cash income received (Rs./acre) | 192 | 499 | 1093 | 553 |

Source: Survey data, 1985/86

The overall average annual cash income per producer is Rs. 553.00 and in the wet zone it amounts to Rs. 1083.00 which is five times that of the dry zone (Rs. 192.00). Despite such low limits of annual cash income, a main economic advantage in coconut is its ability to generate a positive cash flow. However the land productivity had been very low and the project aimed to increase productivity by the introduction of intercrops. This idea though appropriate, the selection of crops was not suitable. Hence the government should consider introducing a suitable intercropping programme. In addition, from a cost-return perspective, at the farm level three issues that hinder farmer motivation towards high input usage in production practices are (a) relatively low and fluctuating farm gate prices, (b) higher vulnerability of output to fluctuating rainfall pattern and (c) lagged response to production inputs. Therefore any attempt to increase productivities should consider these issues that determine the level of farmer participation in project activities.

## 6.5 Income distribution

Income data gathered during the survey were confined to twelve calendar months or two cropping seasons. There may be under-estimations of incomes, but the study team largely directed its attention to analysing the composition and distribution of income.

The composition of income is as follows:

Table 6.12

Composition of households income from various sources - 1985/86

| | % of household | | % of income | |
|---|---|---|---|---|
| **Agriculture** | | | | |
| Paddy | 22 | | 26 | |
| Coconut | 19 | | 12 | |
| Other crops | 14 | | 9 | |
| Agriculture labour | 4 | | 3 | |
| Livestock | 4 | | 1 | |
| | | 63 | | 51 |
| **Non Agriculture** | | | | |
| Government Service | 16 | | 20 | |
| Commerce & Private | 8 | | 19 | |
| Other | 13 | | 10 | |
| | | 37 | | 49 |

As much as 63% of the households reported that 51% of their income was from agriculture and 20% from government service. In the zonal distribution, the wet zone clearly stands out with lesser emphasis on

agricultural incomes. In the wet zone 30% of the income was from government sector employment and 28% from other non agricultural occupations. The paddy and coconut incomes are 10% and 12% respectively while in the intermediate and dry zones paddy incomes had been 39% and 28% respectively.

Concentration in the lowest income ranges was reported from the dry zone where the incomes ranged from Rs.1,000/= to Rs.100,000 a year. In the intermediate and wet zones the lower limits were Rs.3,000/= and Rs.6,000/= respectively with the maximum reaching as high as Rs.120,000 a year.

However the average annual per capita incomes ranged from Rs.12,112/= to Rs. 17,196/= in dry and wet zones respectively

Table 6.13
Per capita income per month

| Zone | Rs./month |
|---|---|
| Wet Zone | 1458 |
| Intermediate Zone | 1244 |
| Dry Zone | 1009 |
| All | 1237 |

Source: Survey data 1985/86.

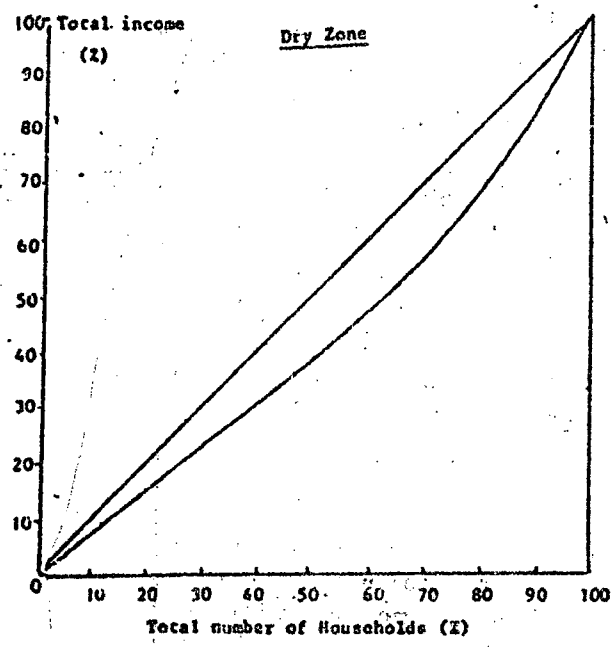
The lowest recorded is from the dry zone where farmers' incomes are low and unstable.

The average income had been higher than the GNP per capita at 1984 prices ie. Rs. 8640. In 1978/79 before the commencement of the project, 19% of the population were below the poverty line, which was recognized as Rs. 3600/= at that time.

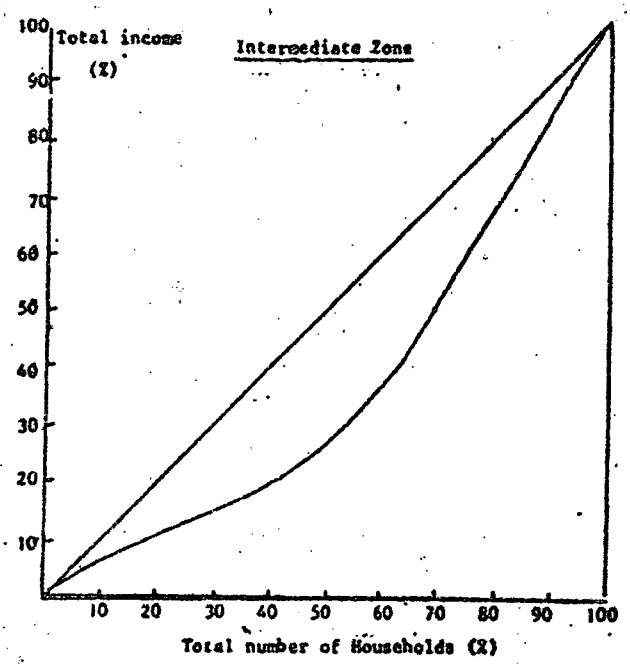
However according to 1985/86 survey data only 17% were below the poverty line of Rs. 7000/= per year. This positive trend has been a good performance but it cannot be solely attributed to the project. It may be due to project as well as national efforts. However the massive allocations of funds invested in the district should have some impact in the incomes though not directly. In the employment data too the employed rate was much higher compared to the 1978/79 situation.

Figure 1

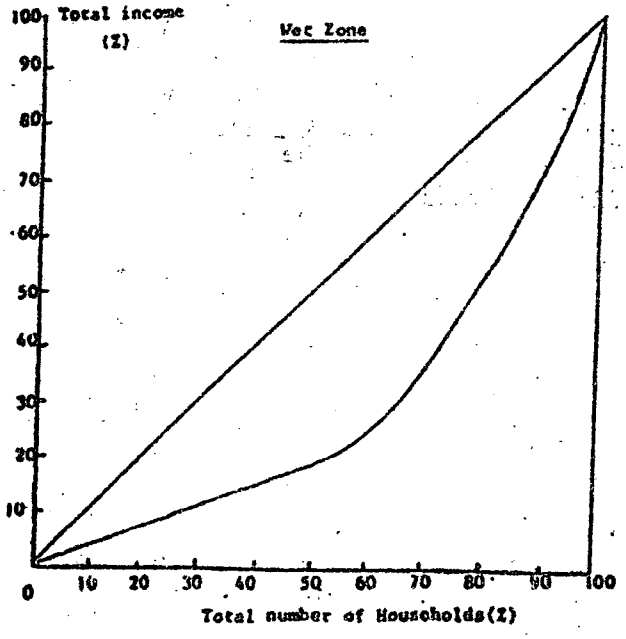
## Distribution of income among sample households in the project area



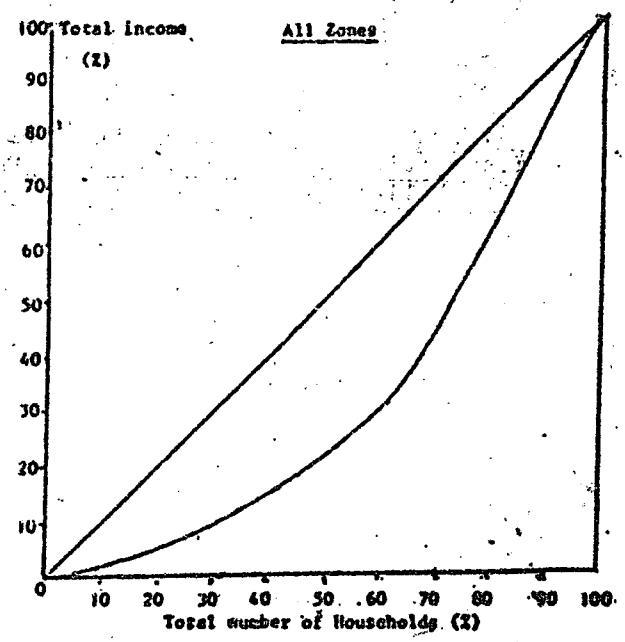

Gini Coefficient = .43




Gini Coefficient = .48




Gini Coefficient = 0.47




Gini Coefficient = 0.47

Table 6.14
Distribution of Income

| | | Income as a percentage of total income | | Number of households as a % of total households | |
|---|---|---|---|---|---|
| | | No. | Cumulative | No. | Cumulative |
| | 1000 | 0 | 0 | 0 | 0 |
| 1001 | " 5000 | 1 | 1 | 6 | 6 |
| 5001 | " 10000 | 6 | 7 | 22 | 28 |
| 10001 | " 15000 | 7 | 13 | 16 | 44 |
| 15001 | " 20000 | 6 | 19 | 10 | 54 |
| 20001 | " 25000 | 7 | 26 | 9 | 63 |
| 25001 | " 30000 | 6 | 32 | 6 | 69 |
| 30001 | " 40000 | 14 | 46 | 11 | 80 |
| 10001 | " 50000 | 8 | 54 | 5 | 85 |
| 50001 | " 60000 | 12 | 66 | 6 | 91 |
| 60001 | " 70000 | 6 | 72 | 3 | 94 |
| 70001 | " 80000 | 4 | 76 | 1 | 95 |
| 80001 | " 90000 | 6 | 82 | 1 | 96 |
| 90001 | "100000 | 18 | 100 | 4 | 100 |

Source: Survey data 1985/86.

Table 6.15 shows the distribution of income. The Lorenz curves are in Table 6.14 and the gini coefficients are in Table 6.17. These reflect the uneven distribution of income when compared with the gini coefficient for the pre-project period which was around 0.3. The present distribution is more diverse. The gini coefficient of dry zone is closer to 0.4 while the other two are almost 0.5

Table 6.15
Gini Coefficient

| Zone | Gini Coefficient |
|---|---|
| Dry | 0.43 |
| Intermediate | 0.48 |
| Wet | 0.47 |
| All | 0.47 |

But even though the study team does not confirm that the income disparities have been widened during the project period there was a firm belief that the present trend is towards widening.

## 6.5 Quality of Life

The study teams final investigation of the project effects was the quality of life index.

Table 6.16
Quality of life Index

| | Survey data 85/86 | |
|---|---|---|
| | Male | Female |
| Life expectancy at age one | 69.1 (Years) | 72.5 (Years) |
| Index No. | 79.4 | 88.5 |
| Infant mortality | 30 | |
| Index No. | 89.6 | |
| Literacy rate | 91.0 | 84.2 |
| Physical Quality of Life Index (PQLI) | 86.6 | 87.4 |

The quality of life index too has reduced though not significantly. But the study team strongly feels that even though the index is not the most suitable one to measure the improvement in the living conditions, the quality of life has detereorated during the project period mostly due to the counteracting forces becoming more powerful than the project, and the national efforts to improve the quality of life.

## 6.7 Economic Rate of Return (ERR)

The economic rate of return for the Kurunegala Integrated Rural Development Project was estimated using the following formula.

ERR

$$\frac{Bt - Ct}{(1 + r)^t} = 0$$

Where

$B_t$ = benefit in each year
$C_t$ = cost in each year
$t$ = 1,2, ..... n
$n$ = number of years
$r$ = discount rate

The appraisal report anticipated 32% economic rate of return considering the project performance on paddy and coconut. The present estimations of ERR too, was based on the same two crops with the following assumptions.

Assumptions:

1. Economic prices and input ratios for the computation of incremental cost of production and the benefits are the same as those used in the appraisal study.

2. Investment cost includes actual investment cost excluding agricultural credit and price contingencies.

3. Figures relating to before project (P), without project (W) and after project (W) situations are revised according to actual performances.

4. Figures relating to without project situation are estimated by using the same percentages envisaged in the appraisal report.

5. Organizational and management costs (O & M costs) are same as those in the appraisal report.

6. Total incremental production cost in the coconut sector was apportioned for each year according to the percentage incremental gross benefits in them over before project situation.

7. Coconut production in the Kurunegala district is estimated as 28 percent of the all island production.

8. In the with and without analysis, the incremental gross benefits in the coconut sector were treated as zero for years where the actual production was less than the expected production in without project situation.

9. Economic Rate of Return was estimated on two basis:-

   a) before and after project situation; and

   b) with and without project situation.

10 The sources of data for this exercise are the survey data 1985/86 ARTI, IRDP Office Kurunegala, Department of Census and Statistics and the Coconut Development Authority.

11. The calculation of economic values, costs and benefits according to the above assumptions are given in annexes XIII, XIV, XV, XVI and XVII respectively.

The estimated costs and benefits streams are shown in tables 6.17 and 6.18 for with and without project and before and after the project respectively. The estimated economic rate of return for with and without project is 71%. The same ERR calculation before and after the project reflected 122%. The estimated actual ERR in both instances is much higher compared to the envisaged estimation of 32% of Economic rate of return in the project appraisal.

Sensitivity Analysis -

A sensitivity test was done on the following two assumptions :

I. Only 60% of the benefits in the paddy sector is due to the project. Under this assumption the Economic Rate of Return (ERR) of the project is 31% (Table 6.19).

II. The actual production of 260,000 tons and a sown acreage of 267,000 acres was taken as the without project situation in 1980.

   Economic Rate of Return (ERR) on this basis is 51% (Table 6.20).

Substantial increase in yield per acre and total production in the paddy sector are the factors that have contributed to a significant rise in the actual ERR (71%) compared with the projected ERR of 32 percent. The actual ERR would have been still higher if the performance in the coconut sector was in confirmity with the projected performance.

Table 6.17

ECONOMIC RATE OF RETURN
(with and without project)

Rs. Million

| Year | Investment costs | O & M costs | Incremental Production Costs | | Gross Incremental Benefits | |
|---|---|---|---|---|---|---|
| | | | Paddy | Coconut | Paddy | Coconut |
| 0 | 29 | | 31 | 1 | 0 | 0 |
| 1 | 80 | | 44 | 6 | 45 | 0 |
| 2 | 54 | | 39 | 7 | 156 | 0 |
| 3 | 58 | | 38 | 10 | 299 | 0 |
| 4 | 66 | | 31 | 16 | 280 | 0 |
| 5 | 75 | 4 | 47 | 10 | 306 | 0 |
| 6 | 59 | 4 | 49 | 19 | 325 | 0 |
| 7 | - | 4 | 49 | 20 | 325 | 0 |
| 8 | - | 4 | 49 | 21 | 325 | 0 |
| 9 | - | 4 | 49 | 22 | 325 | 2 |
| 10 | - | 4 | 49 | 24 | 325 | 10 |
| 11 | - | 4 | 49 | 25 | 325 | 14 |
| 12 | - | 4 | 49 | 26 | 325 | 19 |
| 13 | - | 4 | 49 | 27 | 325 | 28 |

Economic Rate of Return (ERR) = 71%

Table 6.18

ECONOMIC RATE OF RETURN
(Before and After Project)

| Year | Investment Costs | O & M Costs | Incremental Production Costs | | Gross Incremental Benefits | |
|---|---|---|---|---|---|---|
| | | | Paddy | Coconut | Paddy | Coconut |
| 0 | 29 | - | 40 | 1 | 0 | 0 |
| 1 | 80 | - | 52 | 6 | 115 | 0 |
| 2 | 54 | - | 48 | 7 | 223 | 33 |
| 3 | 58 | - | 47 | 10 | 366 | 46 |
| 4 | 66 | - | 40 | 16 | 347 | 76 |
| 5 | 75 | 4 | 57 | 10 | 373 | 46 |
| 6 | 59 | 4 | 58 | 19 | 392 | 91 |
| 7 | - | 4 | 58 | 20 | 392 | 95 |
| 8 | - | 4 | 58 | 21 | 392 | 100 |
| 9 | - | 4 | 58 | 22 | 392 | 107 |
| 10 | - | 4 | 58 | 24 | 392 | 114 |
| 11 | - | 4 | 58 | 25 | 392 | 119 |
| 12 | - | 4 | 58 | 26 | 392 | 123 |
| 13 | - | 4 | 58 | 27 | 392 | 132 |

Economic Rate of Return = 122%

Table 6.19

## ECONOMIC RATE OF RETURN WITH SENSITIVITY ANALYSIS

(Assumption : Only 60 percent of the benefits are due to the Project)

| Year | Investment Costs | O & M Costs | Incremental Production Costs | | Gross Incremental Benefits | |
|---|---|---|---|---|---|---|
| | | | Paddy | Coconut | Paddy | Coconut |
| 0 | 29 | - | 31 | 01 | 00 | 00 |
| 1 | 80 | - | 44 | 06 | 27 | 00 |
| 2 | 54 | - | 39 | 07 | 94 | 00 |
| 3 | 58 | - | 38 | 10 | 179 | 00 |
| 4 | 66 | - | 31 | 16 | 168 | 00 |
| 5 | 75 | 4 | 47 | 10 | 184 | 00 |
| 6 | 59 | 4 | 49 | 19 | 195 | 00 |
| 7 | - | 4 | 49 | 20 | 195 | 00 |
| 8 | - | 4 | 49 | 21 | 195 | 00 |
| 9 | - | 4 | 49 | 22 | 195 | 01 |
| 10 | - | 4 | 49 | 24 | 195 | 06 |
| 11 | - | 4 | 49 | 25 | 195 | 08 |
| 12 | - | 4 | 49 | 26 | 195 | 11 |
| 13 | - | 4 | 49 | 27 | 195 | 17 |

Economic Rate of Return = 31%

Table 6.20

ECONOMIC RATE OF RETURN WITH SENSIVITY ANALYSIS

(Assumption : 1980 production and sown acreage in the Paddy Sector was taken as without project situation

| Year | Investment costs | O & M costs | Incremental Production Costs | | Gross Incremental Benefits | |
|---|---|---|---|---|---|---|
| | | | Paddy | Coconut | Paddy | Coconut |
| 0 | 29 | - | 24 | 01 | 00 | 00 |
| 1 | 80 | - | 37 | 06 | 00 | 00 |
| 2 | 54 | - | 35 | 07 | 111 | 00 |
| 3 | 58 | - | 31 | 10 | 254 | 00 |
| 4 | 66 | - | 24 | 16 | 236 | 00 |
| 5 | 75 | 4 | 41 | 10 | 268 | 00 |
| 6 | 59 | 4 | 42 | 19 | 280 | 00 |
| 7 | - | 4 | 42 | 20 | 280 | 00 |
| 8 | - | 4 | 42 | 21 | 280 | 00 |
| 9 | - | 4 | 42 | 22 | 280 | 02 |
| 10 | - | 4 | 42 | 24 | 280 | 10 |
| 11 | - | 4 | 42 | 25 | 280 | 14 |
| 12 | - | 4 | 42 | 26 | 280 | 19 |
| 13 | - | 4 | 42 | 27 | 280 | 28 |

Economic Rate of Return (ERR) = 52%

# CHAPTER SEVEN

## AGRICULTURAL CREDIT

Having recognised the small farmer credit needs, the project planners had allocated around one fourth of its budget for provision of agricultural credit. As the main strategy followed under the project has been one of upgrading the existing farming systems by increased application of inputs and improved technology, the farmer access to required inputs had received a great deal of emphasis in the project plan. As farmer access to inputs is governed largely by their price levels as well as the availability of credit, the project design had rightly focussed its attention a great deal on this aspect.

According to the appraisal report, a sum of Rs. 118.0 million had been provided for disbursement as credit through the two state commercial banks, Bank of Ceylon and the People's Bank for a number of purposes.

(a) short term production loans for paddy and other field crops,
(b) medium term production loans for coconut fertilizer,
(c) medium term loans for purchase of tractors and sprayers,
(d) medium term loans for purchase of trucks to multi purpose coorporative societies.

The project plan also had stressed the need for the recovery of overdue loans amounting to Rs. 13.0 millions during the implementation of the credit programmes as specified in the 'blue print'. This chapter briefly reviews the progress achieved in credit operations under the project in terms of coverage, efficiency and effectiveness, as well as farmer responses towards them.

Comparison of production costs and credit limits show that the amount given as production loans has been sufficient to meet the cash costs.

Table 7.1
Agricultural Credit and Production Costs of Paddy

| | 1978/79 Rs/per acre | | | 1985/86 Rs/per acre | | |
|---|---|---|---|---|---|---|
| | Cost of production | Cash cost (1) | Credit limit | Cost of production (2) | Cash cost | Credit limit |
| Yala | 1021 | 589 | 700 | 2928 | 1316 | 2100 |
| Maha | 892 | 646 | 700 | 3039 | 1874 | 2100 |

Source: Analysis of the pre-project situation. ARTI, 1979/80
Survey data, 1985/86

Hence the credit limits to satisfy the project appraisal objectives "for a viable agricultural credit system, while encouraging high participation by the farmers particularly small farmers". The expected viability of this component should focus on the increased rates of borrowing and reduced rates in defaulting. Therefore in this respect small farmers intention to borrow heavily depended on the terms of credit, the amount, and the net incomes received. The amount given as production loans is sufficient to cover up the costs, the terms and procedures had improved in favour of the producer and the price per bushel of paddy had also increased. Therefore an increasing trend in the release of credit could be observed.

Table 7.2
Amount of Production Loans Disbursed

| Period | Amount Rs./Million | Average per year Rs./Million |
|---|---|---|
| 1974-1978 | 4.07 | 0.8 |
| 1979-1985 | 63.7 | 9.1 |

Source: Bank of Ceylon, Peoples Bank.

The foregoing figures indicate that the district has increased the lending capacity by providing medium and long term credit, but have fallen short of targets.

Table 7.3
Performance of the Credit Scheme

| Credit disbursement | Short | Medium | Long |
|---|---|---|---|
| Target Rs.Millions | 87.5 | 40.5 | 44.6 |
| Actual Rs.Millions | 54.2 | 16.6 | 57.3 |
| No. of loans | 22864 | 3303 | 1852 |
| Average size of a loan Rs. | 2371 | 5029 | 30966 |
| Achievement of the target | 62 | 41 | 129 |

Source: KIRD Project Office

7.1 Short Term Production Loans

A sum of Rs. 21.5 million has been provided for disbursement as production loans for paddy and other field crops at the rate of Rs. 700/- per acre during the period 1979-83. In this regard, it is relevant to bear in mind that due to severe inflationary pressures experienced during the greater part of the project, paddy

production costs had taken a sharp upturn. To accommodate rising production costs, the quantum of credit given per acre was revised on a number of occasions and finally it averaged to Rs. 2100/- per acre, a rise of about 300% compared with the base year. The cost of production of paddy increased from Rs. 892 in 1979 to Rs. 3039 in 1985, an increase of about 340% compared with the base year. The total credit disbursed for short term production loans had infact trebled vis-a-vis appraisal targets due to the upward revision of the amount of credit given per acre and due to the extension of the project by two years. In all, Rs. 63.7 millions have been channelled by the end of 1985. The cumulative acreage supported by this institutional production credit scheme had amounted to 65,700 acres, which is below the targetted figure of 100,000 acres.

Under the project 26,775 short term cultivation loans were given by the two banks.

Table 7.4
Short Term Cultivation Loans granted from 1979-85

| Bank | Number of loans No. | Value of loans given Rs.'000 |
|---|---|---|
| Peoples' Bank | 8641 | 23,816 |
| Bank of Ceylon | 18134 | 43,814 |

Source: Bank of Ceylon, Peoples Bank.

Of the two banks, the Bank of Ceylon processed two thirds of all the loans granted as short term production loans, out of which around 75% have been channelled for paddy. A similar break-down of credit disbursed was not available with the People's Bank. Thus, the production credit utilisation on a cropwise basis was not identified from the bank credit disbursal viewpoint. Consequently, the survey data were used to derive a cropwise distribution of credit.

Table 7.5
% of Sample Farmers who Obtained Agricultural Credit for 1985/86 Maha

| Crop | % of farmers responding |
|---|---|
| Paddy | 72% |
| Chillies | 09% |
| Green gram | 06% |
| Pulse + Other crops | 13% |

Source: Sample Survey, 1985/86.

Of the paddy farmers who obtained credit for last Maha only 33% had obtained institutional credit.

Table 7.6
Sources of Credit - 1985/86 Maha

| Source of credit*1 | % of farmers |
|---|---|
| Institutional | 33% |
| Non Institutional | 47% |
| Not borrowed | 12% |
| No response | 8% |

Source: Sample Survey, 1985/86.

* Source from which the major portion of cash requirements were financed.

The number of farmers who had taken loans from both sources for last Maha recorded 28% which shows that only 5% of the farmers relied entirely on institutional credit.

According to sample survey data and records available with the banks, a majority of the borrowers of institutional credit were operators of 2 to 3 acre size paddy holdings. It was also found that a majority of the loans granted for paddy (64%) were channelled for production under major irrigation.

The study team during field visits found that the awareness among farmers regarding detailed procedures involved in obtaining institutional credit was relatively low. Besides, conditions specified by the banks for minimum elegibility such as legal ownership of land, tenurial conditions, previous loan defaults, and difficulties in finding guarantors excluded a large majority of small farmers in need of credit from the project sponsored credit schemes. Above all, even some of those who had minimum elegibility expressed a certain amount of reluctance to participate in the credit scheme due to inordinate delays and costs involved in getting the loans processed.

Table 7.7
Reasons for not borrowing Institutional Credit

| Reason | % of farmers |
|---|---|
| Non eligibility | 18 |
| Previous defaulting | 12 |
| No guarantors | 12 |
| Not interested | 12 |
| Delays in lending | 10 |
| Failure to get crop insurance | 9 |
| Other | 25 |

Source: Sample Survey, 1985/86.

Some of the farmers interviewed also complained that often around six visits to the banks were necessary to obtain the full value of the loan. This was particularly hard on the small operators of 1-3 acre holdings as travel involved distances up to 10 miles to reach the nearest bank. The stipulation of crop insurance as a prerequisite for elegibility for production loans was another factor that had discouraged some from participating.

## 7.2 Loans for Coconut Fertilizer

The loan scheme had planned to provide credit worth about Rs. 40.5 millions to support fertilizer use in about 50,000 acres in the coconut sector during the project period. The records available with the banks indicate that the volume of credit disbursed and the acreage benefitted under this programme were about one-half of the projected targets. Altogether Rs. 20.2 millions were given as loans to 3,900 farmer beneficiaries under this scheme. The annual credit disbursements show a dip in 1983, a year of very low rainfall in the district.

Table 7.8
Distribution of Coconut Fertilizer Loans

| Year | Amount of loans | Area benefitted |
|---|---|---|
| 1980 | 3.41 | 5900 |
| 1981 | 3.21 | 3717 |
| 1982 | 2.21 | 2275 |
| 1983 | 1.84 | 2988 |
| 1984 | 5.92 | 5899 |
| 1985 | 3.60 | 4099 |
| Total | 20.2 | 24788 |

Source: Coconut Cultivation Board.

On the other hand, the very high coconut prices experienced in 1983 has had a salutory effect on the fertilizer use in 1984 which in terms of the volume of credit handled trebled, compared to the previous year.

Considering that this is the first attempt to provide fertilizer under a credit scheme for mature coconut holdings, the farmer responses though not very spetacular were nevertheless quite encouraging.

Table 7.9
Farmers applying fertilizer under credit scheme

| | % of farmers applying coconut fertilizer | % of farmers who obtained credit |
|---|---|---|
| Dry | 12 | 10 |
| Intermediate | 14 | 8 |
| Wet | 28 | 14 |
| All | 14 | 10 |

Source: Survey data, 1985/86.

Of the 14% that applied fertilizer, 10% had borrowed money from the bank, but in 1984 this amount was 26%.

Generally, price instability and low farmgate prices of nuts undoubtedly influenced the farmer decisions in securing loan facilities for purchase of fertilizer.

Table 7.10

Holding Size and Fertilizer use Under Credit

| Holding size acres | % of farmer using fertilizers |
|---|---|
| Above 1 | - |
| 1 - 2.5 | 5 |
| 2.6 - 4.9 | 17 |
| 5 - 9.9 | 42 |
| Over 10 | 36 |

Source: Survey data, 1985/86.

The sample survey data revealed that nearly two fifths of the fertilizer users under this scheme were smallholders owning 5-10 acres. With regard to utilisation of credit for coconut fertilizer in general, the low farmgate prices of nuts and the lagged response to fertilizer use were two of the main factors that had influenced the thinking of many a small holder who form a majority among the coconut growers in the district. Among the factors indentified in the earlier ARTI study in 1984[1] regarding the low usage of credit facilities for coconut fertilizer, the lack of sufficient awareness among farmers about this credit scheme and the high cost of fertilizer relative to farmgate prices of nuts remained valid - even at the time of the present study.

## 7.3 Medium Term Loans for Farm Equipment and Dug Wells

At appraisal, a sum of Rs. 38.6 millions had been allocated for disbursement as medium term loans for purchase of farm equipment. In the discussion on farm equipment in chapter four, the factors that had a bearing on machinery purchases with institutional credit were already dealt with. Hence only the progress achieved in the disbursement of medium term loans for machinery purchase are presented below.

1. G.M. Henegedara. A Process Evaluation of Coconut Cultivation in the Kurunegala District. ARTI, (1984).

Table 7.11
Machinery Purchase under medium-term loans

| Type of machinery | Number of units Target | Achievement | Value of loans granted '000 Rs. |
|---|---|---|---|
| Tractors 4 wheel | 200 | 103 | 11,229 |
| Tractors 2 wheel | 500 | 2132 | 63,305 |
| Hand sprayers | 1000 | 181 | 271 |
| Water pumps | 555 | 76 | 447 |
| Opendug wells | 125 | 20 | 323 |

Source: People's Bank and Bank of Ceylon, Kurunegala.

As mentioned earlier in chapter 4, the machinery supply scheme was reviewed in 1982 and the sale of 4-wheel tractors was discontinued. The project management having examined the working of the medium term loans for purchase of farm equipment included both water pumps as well as dug wells under this scheme during the year 1984. In the operation of the above loan scheme, the stipulation of a minimum of 2 acres as an elegibility criterion appears to have had a constraining influence on the disbursement of credit, particularly for purchase of items such as water pumps. The latter aspect was noticed by the study team during field interviews.The banks too agreed on this matter. In Kurunegala district where two-thirds of operational holdings fall into less than 2 acre category this particular stipulation of a minimum acreage needs review.

## 7.4 Recovery of Loans

The appraisal report had stressed the need for recovery of loans disbursed under the project as well as overdue loans amounting to Rs. 13.0 millions given to about 25,000 farmers prior to 1979.

### 7.4.1 Overdue Loans:

Though the appraisal estimate of overdue loans was Rs. 13.0 millions, the records with the two banks showed a higher figure of Rs. 16.0 millions, of which Rs. 11.0 millions were dues to the People's Bank. In 1979, both the banks launched a recovery drive after inventorising the overdue loans. As a result, the Bank of Ceylon recovered 92.7% of its overdue loans and the People's Bank 15.5% by the end of 1981. The final recovery figure according to official sources had stood at 93.4% for Bank of Ceylon and 35% for People's Bank. The limited success seen in the loan recovery drive undertaken by the People's Bank could be attributed largely to the laxity on the part of the Multi-purpose Corperatives through which much of the agricultural credit prior to 1979 had been disbursed.

According to People's Bank sources, the Multi-purpose Corperatives were generally lax in the screening of individual loan applications. Besides, some of the societies had failed to maintain detailed records of loans disbursed, thus making the recovery of overdue loans difficult. Consequently, the People's Bank in disbursing agriculture credit had withdrawn its links from 12 out of 14 MPCSS in the district.

### 7.4.2 Recovery of Loans given under the project

Table 7.12
Overdue amounts as a percentage of total loans disbursed annually

| Bank | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| Bank of Ceylon | 10 | 18 | 23 | 23 | 2 | 25 | 16 |
| People's Bank | n.a. | n.a. | 12 | 15 | 16 | 16 | 25 |

Source: Regional Office of the People's Bank and District Office of the Bank of Ceylon.

Information on overdue loans by item, amounts and number of farmers etc. on a yearly basis was not readily available with the banks. As a result the task of assessing the progress of loan recoveries over the project years was somewhat difficult.

Table 7.13
Recovery of Agricultural Credit

| Type of Loan | Target loaned Rs. M | Amount loaned Rs. M | Actual as a % of target | No. of loans | % of recoveries |
|---|---|---|---|---|---|
| Short(Ag.credit) | 87.5 | 54.20 | 62 | 22864 | 81 |
| Medium(Coconut fertilizer | 40.5 | 16.61 | 41 | 3303 | 96 |
| Long(Machinery/ Vehicles) | 44.6 | 57.35 | 129 | 1852 | 95 |
| Total | 172.6 | 128.16 | 74 | 28019 | - |

Source: KIRD Project Office.

However, the available records show that in the case of coconut fertilizer loans, the overdue rate had been kept under 2 percent in the People's Bank, while in the Bank of Ceylon it had ranged from 2.8 to 4.8 percent during the project period.

On the other hand, 4 wheel tractor loan repayments were very regular in the first two years with almost full recoveries being made. But from 1983 onwards, the overdue rate had risen to 6% in the loans given by the People's Bank while the comparative figure for Bank of Ceylon had been around 3%. However, the overdue rates came down appreciately in the latter part of the project with the settlement of loans in full. A similar trend was seen in the case of 2-wheel tractors as well as loans given for spray machines too.

The rate of recovery in crop production loans could be considered satisfactory compared with all island levels or pre-project levels. The farmer viewpoint had also altered regarding loans as (subsidies or) handouts. Hence Kurunegala experience in lending gives some hope towards reducing the defaulting rate.

According to bank officials the rate of repayment differed according to agroclimatic zones. In the drier areas where crop failures were common, facilities and alternative income opportunities were lower, together with unstable incomes, the repayment rates were lower. On the other hand in the wet zone the repayment rate was higher.

7.4.3 Rescheduling

The appraisal report also had suggested that in the case of non-wilful defaulters, the two banks should reschedule the overdue loans. In this regard, the Bank of Ceylon rescheduled only 89 short term loans as at end of 1985. On the other hand, the People's Bank identified 890 non-wilful defaulters but had not rescheduled any.

# CHAPTER EIGHT

## AGRICULTURAL EXTENSION
## TRAINING AND VISIT SYSTEM

At appraisal, a number of problems impeding the efficiency of the agricultural extension system had been identified. Among them, the operation of seperate extension services focussed on individual crops without adequate concern for overall production possibilities, weak links between extension and research cadres, inadequate in service training for field extension staff, inadequate extension contact with farmers due to lack of manpower, transport facilities, funds and lack of well structured extension work programmes had been listed as more important items needing attention under the project. On this premise, the project planners had proposed among other things, the consolidation and reorganisation of the extension services of the government departments involved in agricultural development work on the lines of the Training and Visit (T&V) System, in order to develop a single modern professional service capable of giving farmers sound technical advice on their entire farming operation. By implication this meant the organisation of agricultural extension work at village level under a single line agency. However, the envisaged unified extension service had failed to materialise due to unforeseen problems in the unification of the field level extension cadres of different technical organisations. Consequently, the bulk of project funds allocated for the extension component had been channeled to provide a package of financial and material inputs to strengthen the district extension service of the Department of Agriculture.

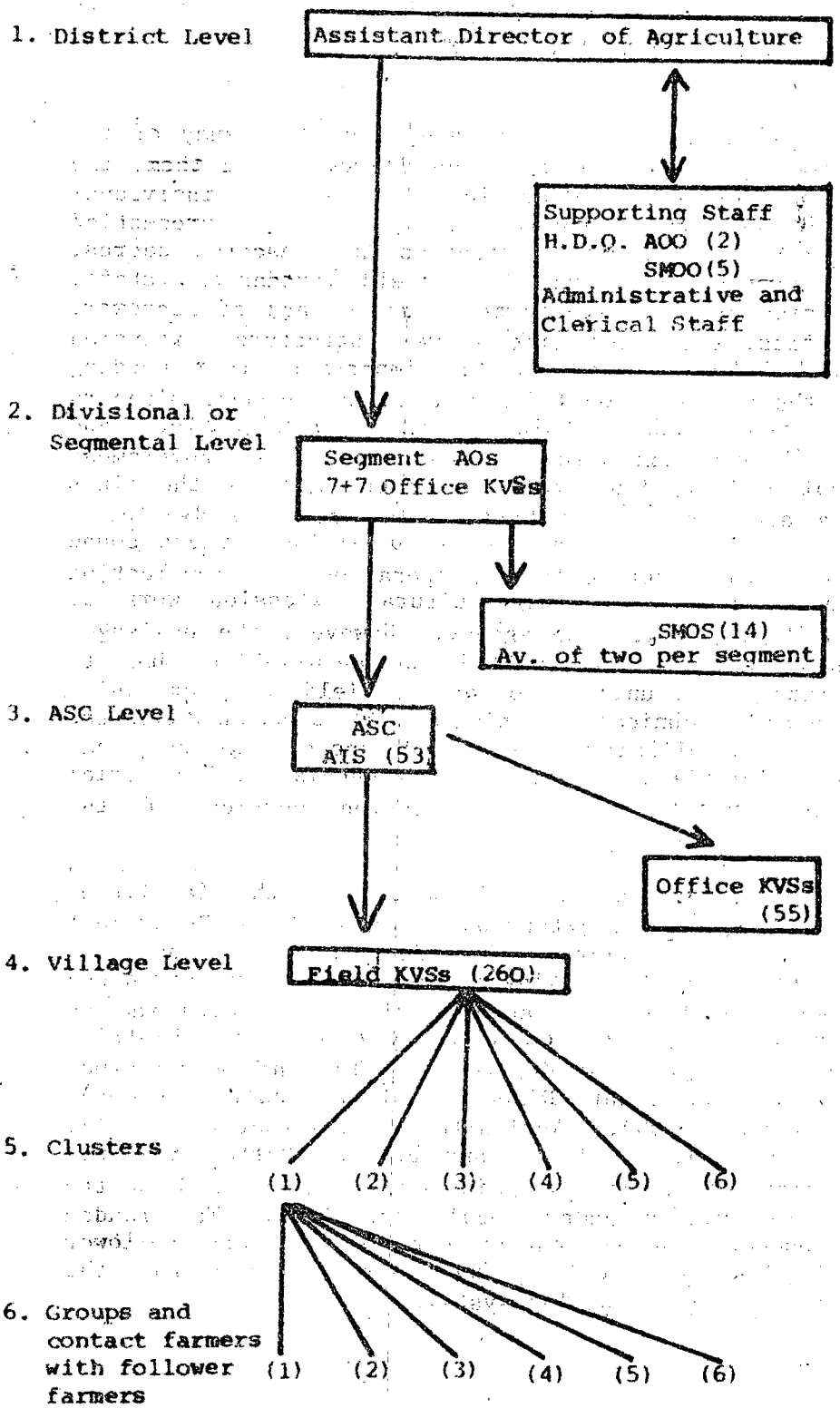
This chapter, first examines the utilisation of the facilities provided by the project to the Extension Division of the Department of Agriculture in the district. In addition, it attempts a preliminary assessment of the working of the T&V system introduced under the project. Much of the ensuing discussion is based on official records made available to the study team by the District Agricultural Extension Office at Kurunegala. The interviews study team had with the Assistant Director of Agriculture (ADA), Agriculture Officers (AOO), Agricultural Instructors (AII), Krushikarma Viyapthi Sevakas (KVSS) and Subject Matter Officers (SMOO) in the district helped to gain useful insights into the working of the T&V system under local conditions. The random sample survey conducted among Contact Farmers (CF) and Follower Farmers (FF) in 1985/86 provided the main database for the discussion on the working of the T&V system.

Figure II

ORGANIZATION STRUCTURE OF EXTENSION SERVICE

IN THE KURUNEGALA DISTRICT

Figure I



## 8.1 Extension Organisation

The organisational changes introduced for the implementation of the T&V system of extension had resulted in the demarcation of the district into seven operational units described as segments, each headed by an Agriculture Officer (figure II). The area constituting an individual segment has been further divided into a number of Agricultural Instructor ranges, each roughly corresponding to the area of an Agrarian Service Centre (ASC). Under each Agricultural Instructor (AI), a number of Krushikarma Viyapthi Sevakas (KVSS) have been placed each of whom attended to agricultural extension work in several villages. In order to establish a high degree of contact between village level extension workers and farm families, each KVS range was grouped into six clusters and the range KVS assigned the responsibility of visiting each of the six clusters in the course of his visiting days. Each cluster group in turn divided into six farmer groups and one contact farmer drawn from each group giving 6 contact farmers per visiting day and 36 contact farmers per KVS six visiting days.

## 8.2 Implementation

Under the project, the strengthening of the capacity of the extension service to expand its scheduled activities had received much emphasis. Due to the addition to technical staff at different levels and redeployment of existing staff systematically, the supervisory and training capacity of the extension service has improved considerably. To begin with, the number of agricultural officer segments in the district has increased from five to seven and in this process, added weightage been given to the dry zone areas where much of the investments for irrigation improvement has been directed. In order to provide necessary technical support to field level officers such as KVSS and AII, the number of Subject Matter Officers has been increased from 10 to 14 under the project.

Table 8.1

Agricultural Officer Segments

| Zone | Pre-Project No. | Under the Project No. |
|---|---|---|
| Wet and Semi Wet | 3 | 3 |
| Dry and Semi Dry | 2 | 4 |
| | 5 | 7 |

Source : Department of Agriculture, Kurunegala.

Furthermore, with the deployment of additional instructor staff, the number of AI ranges in many of the agricultural officer segments have recorded an increase and by 1985, the number of AII per AO segment had averaged seven. With this increase in middle level officers, a more systematic and closer supervision of the work of KVSS under the T&V system has become possible.

Table 8.2
Distribution of Extension Staff
by Agro Climatic Zones

| Zone | AII | | | KVSS | | |
|---|---|---|---|---|---|---|
| | Pre-project | Project | | Pre-Project | Project | |
| | 1978 | 1981 | 1986 | 1978 | 1981 | 1986 |
| Wet and Semi Wet | n.a. | 28 | 28 | n.a. | 138 | 151 |
| Dry and Semi dry | n.a. | 23 | 26 | n.a. | 136 | 171 |
| | 48 | 51 | 54 | 175 | 274 | 322 |

Source: Department of Agriculture.

Under the T&V system, as it is incumbent on the KVS to visit at least the contact farmer once a fortnight on a fixed schedule, the cadre of KVSS has been strengthened substantially. As a result, the number of KVSS have increased by about 84% across the district due to project intervention, with dry zone areas showing a relatively higher percentage increase. The ratio of farm families per KVS which stood around 1200 in 1979 has been reduced to about 750 by 1981. A break down of the number of farm families by KVS ranges is given below.

Table 8.3
Distribution of Farm Families
According to KVSs Ranges

| Zone | No. of Farm Families per KVS | | Paddy Acreage per KVS | |
|---|---|---|---|---|
| | 1981 | At Project completion 1986 | 1981 | At Project completion 1986 |
| Wet and Semi Wet | | | | |
| Kurunegala | 753 | 1000 | 532 | 597 |
| Kuliyapitiya | 784 | 972 | 485 | 565 |
| Mawathagama | 817 | - | 511 | - |
| Ibbagamuwa | - | 960 | - | 694 |
| Sub Total | 784 | 977 | 509 | 618 |
| Dry and Semi Dry | | | | |
| Mahawa | 700 | 834 | 893 | 894 |
| Galgamuwa | - | 631 | - | 941 |
| Nikaweratiya | - | 943 | - | 901 |
| Panduwasnuwara | - | 892 | 636 | - |
| Sub Total | 700 | 825 | 764 | 878 |

Source: Department of Agriculture.

The number of farm families that a KVS services in Kurunegala district is higher than the appraisal figure of 600 according to these figures. Normally since such ratios depend largely on the density of population, roads, the intensity and standard of cropping, and the type and diversity of crops grown, it is not so simple to weigh all such factors to determine the 'right' ratio of KVSs to farm families in a district like Kurunegala with diverse agro-ecological and socio-economic conditions. Besides, the high ratio of 600 farm families per KVS envisaged at appraisal had been arrived at largely on the basis that a single officer would handle a wide array of extension work at the village level. However, as the unified extension service failed to materialise, the scope of the work of KVSS of the Department of Agriculture really has not expanded as anticipated by the project planners.

In this context, it is relevant to point out that both in the wet and the intermediate zones of the district with coconut as the principal crop on highlands, the advisory services of the Coconut Cultivation Board, Minor Export Crops Department as well as Department of Animal Husbandry have continued to render technical advice in their respective fields though not under the T&V system of extension. Under the project, the technical staff engaged in special crop development eg. coconut and minor export crops too had supplemented the work of the extension officers of the Department of Agriculture to service the needs of the farming community.

On the other hand, if the paddy acreage covered by a KVS is used as the criterion in determining the KVS farm family ratio, in

performing efficient extension service the number of farm families that a KVS has to service in the wet zone could be lower than the figures mentioned earlier. Since paddy cultivation is the main economic activity in the peasent agricultural sector in the district, on which extension efforts of the KVSS have been largely directed up to now, it is reasonable to conclude that the extension staff strength has been adequate to implement the T&V programme launched under the project.

In addition to the strengthening of the KVS cadre to improve coverage of farm families, the project also had made provision for housing for extension staff. In the location of houses preference had been given to remote areas in the dry zone such as Yapahuwa, Nikaweratiya and Galgamuwa where housing is generally not available or inappropriately located.

Table 8.4
Provision of Staff Quarters

| Type of Quarters | Number Constructed under the Project | Number Occupied in January 1986 |
|---|---|---|
| Agricultural Officer | 3 | nil |
| Agricultural Instructor & SMO | 20 | 3 |
| KVS | 25 | 13 |

Source: Department of Agriculture.

Of the quarters constructed two thirds remained unoccupied at the time of the present study, though all of them have been taken over by the line agency responsible for agricultural extension work. According to the survey data 58% of the KVSS quarters were not occupied. In some instances occupation was only for registration.

Table 8.5
Reasons for the non occupation of staff quarters

| Reason | % of Respondents |
|---|---|
| No basic amenities | 28 |
| Non-availability of drinking water | 19 |
| Owns a dwelling house | 18 |
| Schooling problem of the children | 16 |
| Long distance to the service centre | 8 |
| Others | 11 |
| | 100 |

Source: Survey Data 1985/86.

On enquiry, it was found that some of the completed houses lacked basic amenities such as drinking water which certainly is a good enough reason for non occupation. However, the lack of electricity given as another important reason does not appear to have much validity, in the context that most of the farming areas in this country lack electricity at present and if field officers engaged in rural development work insist on electricity supply as a pre-condition for occupation of quarters provided, many of the new houses constructed with public funds are certain to remain unoccupied for many more years. Some of the other reasons given for non-occupation of houses being lack of medical and educational facilities needed for family life in the areas concerned, the whole question of channelling funds for rural housing of public officials in future IRD projects needs rethinking.

As far as investments made for housing of extension personnel in Kurunegala are concerned, it has not been a very rewarding experience. Perhaps the funds used for this particular purpose could have been more fruitfully utilised in numerous other alternative ways under the project.

Improved mobility of extension staff is another aspect that had received the attention of the project planners. Under the project, 12 jeeps and 2 mini-buses have been provided to the extension division which had become handy for strengthening the supervisory and training capacity of the relevant officers. The senior extension personnel were greatly appreciative of this outright grant of vehicles. Though project funds were also provided for procurement of 55 motor cycles and 277 pedal cycles for sale to AII and KVSS respectively, the demand for pedal cycles has been quite low and only about one half of them had been purchased by KVSS. At the time of project appraisal pedal cycles were not freely available in the country, and therefore provision of mobile facilities drew a higher attention from the planners. But during the survey period, the following ownership pattern of vehicles was recorded.

Table 8.6
Ownership of Vehicles

| Vehicle | No. of respondents owning vehicles % | |
|---|---|---|
| | AII | KVSs |
| Pedal cycles | 61 | 76 |
| Motor bikes | 72 | 31 |
| Cars | 14 | 3 |
| Others | 2 | 1 |

Source: Survey Data 1985/86

About 36% of the AII and 22% of KVSS recorded the ownership of a pedal cycle and a motor bike. These figures show that the problems of mobility envisaged by the planners at appraisal stage was not critical at the time of the study. Therefore the demand for pedal cycles under project funds had been lower, firstly because many had pedal cycles and secondly the terms of purchase were more attractive in the open market. However for many of the KVSs who live in and around urban centres and commute to work in rural areas, the pedal cycle has not been an attractive proposition because of their regular distance of travel from residence to the place of work often involved distances of over 20 miles.

8.3 Performance of T&V Extension System

The strengthening of the extension organisation, provision of transport and other physical facilities to staff as mentioned earlier are largely institutional building efforts for providing sound technical advice to farmers on their agricultural activities with a view to raise farm productivity levels and incomes. Since agricultural productivity levels are determined by a host of factors which include timely availability of inputs such as seeds, fertilizer, pesticides, credit, irrigation water, agricultural extension, favourable weather conditions as well as a policy framework which could provide farmers with incentives to produce, it would be fallacious to attempt to assess the overall effects of agricultural extension on production levels. Thus the ensuing discussion on the T&V extension system would largely be confined to the performance of its agents particularly in the transmission of extension messages, farmer awareness of the extension system, contact between farmers and extension agents, training activities and links with research.

8.4 Links with Research

The introduction of the T&V extension system under the project had brought the extension services and research institutes into closer contact than had been the case earlier, according to senior extension officers in the district. The setting up of a Research & Training Working Group (RTWG) for the district comprising of the Assistant Director (Extension), Agricultural Officers, Subject Matter Officers, together with the Deputy Director (Research), and Senior Research Officers at Mahailuppallama, as well as the Deputy Director (Research) at Makandura and his staff, had contributed a great deal to forge closer links between extension and research. This working group had looked into both the research and training needs in the district at regular meetings at monthly intervals. In addition other technical problems faced by farmers which the Subject Matter Officers had not been able to sort out had received the attention of the working group.

## 8.5 Training Activities

Since the introduction of the T and V extension system, the training of extension staff as well as farmers has been strengthened. The training programmes conducted during the project include pre-seasonal training of SMOO, AII and KVSS, fortnightly training of AII and KVSS, training of farmers as well as other ad-hoc training sessions for both extension staff and farmers.

The pre-seasonal training classes conducted at regional training centres had normally covered subject matter areas agreed at the meetings of the RTWG. In particular, at such training sessions, the seasonal extension programmes together with necessary subject matter information as well as specific extension messages for transmission to farmers have been dealt with in detail for the benefit of field level extension staff. The Subject Matter Specialists as well as SMOO attached to the training centres and Research Officers from Makandura, Batalagoda and Maha Iluppallama etc. had participated as resource personnel at pre-seasonal training sessions. The available documentary evidence show that both the regularity of such training sessions as well as participation rates of extension staff have improved considerably during the project implementation.

The fortnightly training sessions for AII and KVSS held regularly in Agrarian Service Centres had worked towards up-dating the technical knowledge required to disseminate extension messages chosen and also to equip the extension staff with technical information relevant to important farming activities as well as related problems in their respective ranges. Attendance at the fortnightly training sessions conducted by SMOO for all AII and KVSS have been compulsory and consequently participation rates have been quite high. Of a sample of 14 KVSS interviewed by the study team, twelve responded as having attended all training classes held in 1985. The other two had missed only one and two sessions respectively. The type of training given included lectures, discussions as well as demonstrations largely on aspects such as timely fertilizer use, seed varieties, nursery preparation, pests and disease control as well as weed control. In general, the fortnightly training classes besides serving as a forum for working out solutions to technical problems encountered by extension staff, also have helped to build cordial working relationships among the extension staff at different levels. During field visits the study team was informed by many of the AII and KVSS interviewed that the fortnightly training sessions have been very useful to many of them to improve their subject matter knowledge and also to gain the necessary confidence in giving technical advice to farmers. Furthermore, many of them conceeded that there has been a qualitative upgrading of the technical knowledge of extension staff due to the rigorous training imparted at these sessions over the past few years.

However the study team noted that many farmers had to rely on the cultivation officer for extension work because some times he had been the only field level technical officer. But COO do not have sufficient technical knowledge to advise farmers. Therefore the study team feels that it would be appropriate if some training could be given to COO too, on extension work especially paddy.

Regular fortnightly training sessions were held on water management, operation and maintenance of small farm machinery and equipment, plant protection, coconut cultivation, minor export crops, bee-keeping etc. for the benefit of a number of categories of extension staff including SMOO, AOO, AII and KVSS. In addition, two Agricultural Officers have received short term training abroad with project funds on water management and extension.

## 8.6 Farmer Awareness of Extension System

By and large, the farmer training under the project has given much emphasis to different aspects of paddy cultivation which is quite understandable, as the bulk of project funds has been channelled for improvement of this crop. In particular, fertilizer use, nursery preparation, plant protection, as well as cultivation of other field crops, home gardens, and so on had received a great deal of attention. The total number of farmers who participated in such training programmes has increased from 15,899 in 1981 to 31,174 in 1984. However, the general farmer awareness of the new extension system is quite low according to the results of the survey undertaken by the study team.

Table 8.7
Farmer Awareness of Extension System

| | Contact farmers | Follower farmers |
|---|---|---|
| Awareness about T & V System | 86% | 25% |
| KVSS functions | 100% | 81% |
| Role of contact Farmer | 26% | 11% |
| Extension Messages for 1985 Maha | 48% | 31% |

Source: Survey Data 1985/86.

Only 25% of those interviewed knew about the T&V system. All the contact farmers and the majority (89%) of the follower farmers knew the existence as well as some of the functions of field level extension agent, namely the KVS. But, the majority of contact farmers (75%) had no idea what their real role should be as contact

farmers. Similarly the number of follower farmers who knew the contact farmer in his official capacity was disappointingly low, the relevant figure being only 11%. This perhaps is a very weak link in the T&V extension system that has been operated in the Kurunegala district which deserves the attention of the implementing agency.

8.7 KVS Visits to Farmers

The earlier mentioned institutional building efforts such as the provision of additional staff and physical facilities like transport and housing, the links established with research, and training activities initiated are, all means to provide 'high quality' and 'timely' visits by the KVSS to farmers. In other words, the KVS visits to farmers to offer technical advice on farming operations is the culmination of much of the efforts of the entire extension organisation discussed in the preceeding sections. Under the T&V system, as a systematic programme of extension work on a time frame was scheduled, each KVS had 36 contact farmers. Each contact farmer in turn had 27 follower farmers in the Wet zone and 23 in the Dry zone. In the dry zone areas, where the population is more widely dispersed and farms are larger and with relatively poor road links, regular contact between the KVSS and contact farmers involve longer distance travel and accordingly meeting of contact farmers based on specific time schedules is somewhat difficult. It is largely to overcome commuting and other related problems that the project 'blue print' had made provision both for houses as well as pedal cycles for use by KVSS, but unfortunately such facilities have not been fully availed of as mentioned earlier.

In the implementation of the T&V system of extension, the primary concern of KVSS has been to meet mainly the contact farmers according to pre-set schedules as far as possible. In the process, the other farmers in the different clusters have been more or less forgotten as would be seen in the discussions to follow. The main reason given by the KVSS for distancing themselves from those other than contact farmers is due to their heavy involvement with other activities really not related to the T&V extension work, such as attendance at 'Kanna' meetings, Young Farmers' Club Meetings, Agrarian Service Centre Meetings, Rural Development Society Meetings, meetings summoned by the Assistant Government Agents, and Members of Parliament, Gam Udawa, Mahapola meetings as well as advisory work in school gardens etc. The majority of KVSS felt that due to their participation in many such activities frequently, instances were not uncommon when even the scheduled visits to contact farmers had got disorganised.

Gunawardana and Chandrasiri in 'the T&V system of extension' (1981 ARTI) have attempted to calculate the time available for a KVS for his extension work. Considering all these, it appears that the KVSS' weekly programmes are overcrowded as the following computation reveals.

Table 8.8
KVSS' Fort Nightly Programme

| | | |
|---|---|---|
| Available number of days in a fortnight (considering saturday as a half day) | = | 11 days |
| Demands - | | |
| Fortnightly training | = | 1 day |
| Discussion/Review Sessions | = | 1 day |
| Public Holidays and Annual Leave | = | 2 days |
| Other Activities (listed earlier) | = | 2 1/2 days |
| Total | = | 6 1/2 |
| Available number of days for visits and group activities | = | 4 1/2 days |

This computation perhaps represents a maximum set of KVSS' demands. However, the fact remains that a KVS is unable to spend 8 days on visits and group activities.

But they are a group of highly trained, and skilled field officers welcomed by the farmers, and therefore the study team feels that they should be motivated because many consider other tasks such as fruit subsidies, collection of various statistics, other village level celebratory programmes like Udagama, Gamudawa and home gardening programmes to be more attractive compared to the extension services.

Since many of the above mentioned activities relate to rural development work in one way or another, the presence of KVSS at such discussions no doubt is of mutual benefit to both extension workers as well as the organisations that arrange such meetings. However, there is no gainsay that the KVSS' heavy involvement with such work interferes unduly with their legitimate duties under the T&V system of extension.

According to the sample survey results, 94% of contact farmers have been visited by a KVS though not very regularly. The normal meeting point was the contact farmers's residence, but instances were not uncommon when meetings had taken place in nearby boutiques as well as in paddy fields, etc. and in such circumstances it is

Gunawardena A.M.T., Chandrasiri L.R.A. The T&V System of extension. 1981, ARTI.

rather unlikely that follower farmers could have been present at the meetings. The follower farmer participation at KVS-contact farmer meetings have been estimated as high as 80%, according to an interview conducted among a limited number of KVSS. However a sample survey of follower farmers revealed only about 30% attendance with any regularity. This aspect is highlighted even in an earlier ARTI study in 1981.[1]

"Even the response by KVSS means that 40% of them conceded non-participation of other farmers at KVS-contact farmer meetings. This appeared to be the weaker link in the operation of the T&V extension system in the district".

The above situation was seen even in 1985 and the study team feels that both the farmers as well as KVSS lack enthusiasm for regular fortnightly meetings.

Table 8.9
Attendance in KVSS Meetings

| | % No. of respondents attended | | |
|---|---|---|---|
| | regularly | irregularly | not attended |
| 1. Attended meetings at contact farmers' residence | 30 | 41 | 29 |
| 2. Attended demonstration plots | 38 | 56 | 6 |
| 3. Attended casual meetings called by KVSS. | 11 | 26 | 63 |

Source: Survey Data 1985/86.

The discussions the study team had both with the farmers as well as KVSS during field visits indicated that the majority of them had very little to discuss or learn during regular fortnightly visits of KVSS, particularly in seasons of normal weather conditions with no major pest or disease outbreaks. Much of the farmer interest to attend meetings with KVSS appears to arise when problems connected with pest and disease problems occur. With regard to some of the other aspects of improved methods of crop production etc. the general feeling among farmers was that the majority had acquired a certain amount of technical know-how over the years from frequent exposure to KVSS, AII as well as technical leaflets issued by the Department of Agriculture.

Table 8.10

Extension messages for the years 1984/85

Paddy

* Land preparation prior to the commencement of Maha rains
* Production of own certified seed paddy
* Preparation and use of Dapog nurseries
* Raw transplanting
* Line sowing
* Strip planting
* Timely application of recommended fertilizer in recommended quantities
* Unified pest and weed control
* Storage of seed paddy

Table 8.10 gives some of the extension messages delivered for the cultivation years 84/85 and the observations of the study team reveal that many of these messages have failed to reach the farmers. For example in spite of the extension messages on correct use of fertilizer many farmers were applying excessive amounts of fertilizer while some were applying lower doses. On the other hand the study team noted that extension messages on various types transplanting have been delivered by means of establishing demonstration plots. But many respondents were not interested in transplanting because of inadequate irrigation water, high labour requirements or the high costs.

A relevant question that could be posed in this regard is whether intensified extension services are in fact really needed in a crop such as paddy, with a three decade long history of green revolution technology adoption. Continued and increased use of such technology by farmers presupposes a condition of technical knowledge accumulation. Consequently, what farmers mostly sought was extension advice of a specialized kind particularly during times of crop disease and pest attacks which could not be surmounted through their own technical know-how. Consequently, the gap that exist at present between what farmers can achieve and what they do achieve in the fields could not so much be due to the lack of technical knowledge or skills, but for other reasons such as

lack of funds for cultivation operations, timely access to production inputs, such as credit and irrigation water etc. about which extension personnel have little or no responsibility.

Given such a scenario the current efforts to get the KVSS to have regular contact with follower farmers on a fixed schedule under the T&V system appear to need further thinking as far as Kurunegala experiences go. According to survey results, with regard to contact farmers, the majority had followed improved cultivation practices particularly in their paddy holdings during the past few seasons. Besides, the observations of the study teams show that a high proportion of contact farmers are treated as really progressive farmers in the village to whom their neighbours tend to look up to for advice and assistance when needed, irrespective of whether such persons had any specific links with the T&V extension system or not. Survey data also show that almost the four-fifths of the follower farmers had neither been aware of the role of contact farmers under the T&V system, nor the fortnightly visits by KVSS to contact farmers. This once again confirms the earlier observation of weak links that had existed with the follower farmers in the operation of the T&V system. More surprisingly, the field observations also confirmed that many of the contact farmers too had not been quite aware of their particular role and functions in the T&V system which certainly is a serious drawback in the dissemination of information to the follower farmers.

The survey of follower farmers also indicates that the KVS continues to remain as the principal information source for technical advice, despite the operation of the contact farmer-follower farmers meetings etc. The cultivation officer, invariably a person recruited from the locality itself, was named by the farmers as the second most important source for technical information (Table 8.11).

Table 8.11
Source of Technical Information
of Follower Farmers

| Type of Information Sought | Percentage of farmers receiving information | | | | | |
|---|---|---|---|---|---|---|
| | AI | KVS | CO | CF | Other Farmers | Total |
| | % | % | % | % | % | % |
| On pest control | 02 | 58 | 29 | 04 | 7 | 100 |
| On fertilizer use | 06 | 33 | 32 | 10 | 19 | 100 |
| On Dapog method | 01 | 49 | 45 | 01 | 04 | 100 |

Source : Survey data 1985/86.

On the basis of above summary, the contact farmer had been rated extremely low as a source of technical information by the follower farmers. As mentioned earlier, a majority of follower farmers interviewed had not been really aware of the precise role of contact farmers in tendering technical advice. Some even expressed doubts about the ability and competence of contact farmers to give technical advice to others.

## CHAPTER NINE

## INFRASTRUCTURE DEVELOPMENT

The appraisal report has identified five areas of social infrastructure to be developed through the KIRD project. The aspects that have been developed through the project are rehabilitation of selected farm roads, expansion of rural drinking water supply through the establishment of wells, establishment of rural electrification units, provision of equipment, vehicles and buildings for the health sector and provision of equipment and science rooms for rural schools.

The funds allocated for the above work, however, are a relatively small component of the total budget of the KIRD project as the bulk of the project funds have been invested in the directly productive sector in Kurunegala. The funds allocated for the social infrastructure component constitute 16% of the total budget. The table below shows the percentage of funds set aside for each component under infrastructure development and the actual costs incurred by the project.

Table 9.1

Percentage and Actual Cost of the Infrastructure Component of KIRDP

| Component | % of total Project cost (1) | Actual costs Incurred Rs. | Targetted Units | Completed Units |
|---|---|---|---|---|
| Rural water supply | 3 | 11.078m | 400 wells | 400 wells |
| Rural roads | 4 | 26.423m | 130m + trunk roads | 130m + trunk roads |
| Rural electrification | 3 | 17.36m | 17 units | 17 units |
| Education | 3 | 17.188m | Building and equipment | all completed |
| Ground water exploration | 2 | 29.148m | 200 tube wells | 200 tube wells |
| Health | 1 | 11.886m | Buildings and equipment | all completed |
| Total | 16 | 113.08m | | |

1. The estimated cost of the project is only given as a percentage of the total cost. Calculating estimated cost in terms of rupees is difficult as estimates were made in 1979 when the US Dollar fetched Rs. 16.5, whereas now it is worth around Rs. 27 due to the deterioration of the value of the rupee.

Source: KIRDP Project office records.

Although the current study is to evaluate the KIRD project in terms of its short-term impact on the community, the impact created by the investments in the given social infrastructural development cannot be assessed to the same extent as the other components of the project. This is because both in terms of the number of units constructed and the expenditure thereon is relatively small, when compared with the total project budget and also to the total number of wells, roads, schools etc in the entire district. Hence the impact cannot be quantified. However, the study has attempted to present some qualitative assessments of this investment through observations and interviews with the beneficiary community and has given the physical progress under each component.

## 9.1 Accessibility to service centres

Table 9.2 below shows the accessibility to service centres for 75% of the sample villages. There is a marked difference in the distribution pattern. Many of the wet zone villages have access to many services within a radious of 5 miles. However, when compared with the pre-project situation the accessibility to service facilities in the dry zone villages has not improved much (except near the borders of the Mahaweli project area).

Table 9.2
Accessibility to Service Institutes

| Wet Zone | Intermediate Zone | Dry Zone |
|---|---|---|
| **Service Centres accessible within 2 miles radius** | | |
| Primary school | Primary school | |
| Secondary school(O/L) | Secondary school | Primary school |
| Bazaar | Bazaar | Co-operative |
| Co-operative | Co-operative | Bus route |
| Bus route | Bus route | |
| **Service Centres accessible within 5 miles radius (in addition to the above)** | | |
| Bank | School (science) | Secondary school |
| Post office | Private dispensary | School with science (O/L) |
| | Govt. dispensary | Private dispensary |
| Secondary school (A/L) | Market (Pola) | Post Office |
| Private dispensary | Post Office | |
| | Bazaar | Market (Pola) |

Service Centres accessible within 10 miles radius (in addition to the above)

| | | |
|---|---|---|
| School (science A/L) | School | School |
| Bank | (science A/L) | (science A/1) |
| Market | Bank | Govt. Dispensary |
| Govt. dispensary | | |
| Hospital | Govt. Dispensary | Bank |
| Police station | Police station | |
| AGA office | AGA office | AGA office |
| Agrarian Services Centres | Agrarian Services Centres | Agrarian Services Centres |

## 9.2 Rural Water Supply

The KIRD project aimed at assisting the construction of 400 dug wells for drinking water in water deficient areas in the district which were identified based on the results of a survey. However, subsequently it was observed that the survey results did not clearly reveal the water deficient areas and therefore it was agreed that in locating sites for wells, areas should be selected where the shortage of drinking water was found to be acute. The criterion used for selecting a site for a well was that there had to be 100 people living within a radius of a quarter mile of the place where a well was to be constructed and also the nearest well should be at least half a mile away from the well to be constructed.

Selection of the location of sites in the electorates for wells was done by the Local Government Office in Kurunegala. Two types of wells were constructed Viz. open wells and closed wells (UNICEF wells). Open wells were of two diameters ie. 3 feet and 6 feet. In addition to these, 400 dug wells, and 200 deep tube wells were approved for construction. These additional wells were utilized to serve both the needs of the ground water investigation programme as well as the Rural Water Supply Programme under the project. The number and the location of each of these wells are provided in Table 9.3.

Table 9.3
Electorate-Wise Location of Wells

| Electorate | Zone | Estimated No. of wells (3) | 3 feet diameter open wells(2) | 6 feet diameter open wells(2) | Closed wells (2) | Total comp-leted | Deep tube wells (1) |
|---|---|---|---|---|---|---|---|
| Bingiriya | Intermediate | 50 | 15 | 5 | 24 | 44 | 21 |
| Panduwas-nuwara | " | 20 | 13 | 5 | 10 | 28 | 16 |
| Kuliyapitiya | " | 20 | 6 | 5 | 8 | 19 | 6 |
| Wariyapola | " | 20 | 9 | 4 | 4 | 17 | 16 |
| Hiriyala | " | 51 | 11 | 28 | 13 | 52 | 22 |
| Nikaweratiya | " | 30 | 10 | 5 | 17 | 32 | 25 |
| Yapahuwa | " | 53 | 9 | 30 | 15 | 54 | 31 |
| Dodangaslanda | " | 60 | 3 | 44 | 8 | 55 | 4 |
| Katugampola | " | 5 | - | 5 | 5 | 10 | 7 |
| Kurunegala | " | 5 | 1 | 5 | 5 | 11 | 6 |
| Dambadeniya | " | 5 | - | 4 | 6 | 10 | 7 |
| Galgamuwa | Dry | 50 | 8 | 19 | 22 | 49 | 31 |
| Polgahawela | Wet | 5 | 1 | 5 | 3 | 9 | 5 |
| Mawathagama | Wet | 5 | - | 5 | 5 | 10 | 3 |
| TOTAL | | 379 | 86 | 169 | 145 | 400 | 200 |

Source : (1) Progress Report, third quarter, 1985
(2) Local Government Office, Kurunegala
(3) KIRDP Office

* Closed wells are known as 'UNICEF' wells since they are constructed according to a UNICEF design.

The highest number of wells, (58%) was located in the drier areas of the district, while another 37% was in the intermediate wet zone. Only 5% was in the wet zone where many sample respondents had their own drinking water supply. This five percent was built at the request of the area parliamentary representatives and were located in appropriate places.

According to our sample survey, 21% of the households in Kurunegala district depend upon river streams and tanks for their drinking water supply. The number of households using such water is about 34% in the dry zone.

Table 9.4
Source of water supply available for drinking water

| Item | % of Farmers | | | |
|---|---|---|---|---|
| | Wet Zone | Intermediate Zone | Dry Zone | Total |
| Open well | 89 | 66 | 45 | 67 |
| Tube well | 01 | 10 | 19 | 10 |
| Pipe | 01 | 01 | 02 | 02 |
| Tank | 05 | 22 | 34 | 19 |
| River/Stream | 04 | 01 | nil | 02 |

Source: Survey Data, 1985/86.

About 69% of the sample farmers obtained their drinking water from the wells and of these households only 36% owned wells of their own.

Table 9.5
Ownership of wells

| Item | Wet Zone | Intermediate Zone | Dry Zone | Total |
|---|---|---|---|---|
| Own well | 46 | 39 | 22 | 36 |
| Govt. well | 04 | 12 | 21 | 13 |
| Other well | 50 | 49 | 57 | 51 |

Source: Survey Data, 1985/86.

According to survey data an average village (about 100 households) in the dry zone had about 15 wells while the intermediate and wet zones had 22 and 43 respectively. The study team observed that the number of wells per village has increased during the project period and was greatly appreciated by the sample respondents although the impact is yet to be known.

A number of closed wells ie. UNICEF wells and tube wells had to be turned into open wells as the water in these wells were found to be contaminated. Users of the wells had complained to the Local Government Office regarding the quality and taste of the water. For instance, in some areas the water tasted 'oily', in some others 'rusty' and in others 'salty'. The reasons for the change in the taste in water in these closed wells are: reactions due to lack of sunlight falling on the water, reaction between water and the iron materials used in the well and pumps, etc.(1)

The use of closed wells in Sri Lanka is a relatively new tehcnique. Closed wells are considered to be more hygienic than open wells for drinking water purposes since waste water from washing and bathing

(1) The KIRDP office has done a study on detecting some of the causes for the change in the taste of water in closed wells.

cannot fall back into the well, and other form of contamination can be avoided. However, during the field interviews it was observed that many users of such wells did not know the safety factor of using closed wells for drinking purposes and habitually preferred the use of open wells and tank or canal water for all purposes. This was more common during the wet season when many preferred to obtain their water supply from tanks and canals as water was abundant in them. It was only during the dry season when water was scarce in canals etc. that most of the community turned to the closed wells for their water supply.

In closed wells the taste of water is said to improve as more and more water is drawn out of the well. However, since the use of the well is not constant over the year, i.e. slack and peak periods due to the above reason, there is little chance for the taste of water to improve in these wells.

Another aspect observed during this study with regard to the maintenance of these wells is that there was no programme for this activity so far. The village councils have not taken over the responsibility of maintaining these wells and therefore this activity would have to be performed by the Local Government Office. It is unlikely that the Local Government Office with a limited number of staff would be able to properly maintain all such wells spread all over the district. A country-wide open-well programme launched in 1960s also became unsuccessful due to the absence of maintenance. Therefore, the maintenance aspect of the rural water supply component of KIRD project may need to be examined and where possible encourage collective action by users for maintenance of wells.

## 9.3 Ground Water Exploration

This has not been considered as part of the social infrastructure component in the appraisal report, but for reasons of convenience it has been noted under this chapter.

This project has provided for the exploration of ground water resources of the district together with an assessment of the potential economic exploitation of such resources. Support for this component from the project was in the form of construction of (1) about 150 test wells of about 2 1/2" diameter, (2) construction of about 30 test wells of 6" diameter, (3) provision for hydrogeological mapping and surveying, and (4) equipment and vehicles for implementing the well drilling and testing programme.

The wells were drilled by the Water Resources Board while the installation of pumps and the construction of wells were by the Water Supply and Drainage Board. Of the wells drilled, if any were found to be suitable for community use in terms of quality and other criteria, then the Water Supply and Drainage Board was requested to construct the well as a community well.

Under the project a target of 88 test wells of 6"-8" diameter were constructed together with 9 investigation bore-holes and hydrogeological mapping and surveys. The work carried out so far seems satisfactory. However the study team felt that it was too early to go in for further investigations.

## 9.4 Rural Roads

In Kurunegala, most of its major towns and urban centres are interconnected by a network of about 900 miles of metalled and tarred roads. Most villages and settlements are connected to the main road network through some 7000 miles of gravel roads and cart tracks which are maintained by the village councils. However, many of these roads are impassable during the rainy season, which gives rise to the need for rehabilitating/upgrading some of the well-travelled roads, particularly in the Northern area.

The project has provided for the rehabilitation/upgrading of about 130 metres of high priority rural roads, mostly in backward areas. A total of 26 roads have been approved for construction under the project. In addition to these roads during the latter half of 1983, the World Bank provided funding to upgrade 9 rural roads serving as access roads to major irrigation schemes in the district.

In selecting the 130 miles of rural roads for upgrading, the following factors have been taken into consideration viz. present condition and utilization of roads, potential development impact on the traversed area, population served, and the importance of the road for marketing of farm produce. The locations of the upgraded roads in their respective electorates and their lengths are given in Table 9.5.

The roads would be built upto class 'B' standard with 50 ft. wide right-of-way, 24 ft. platform and 12 ft. roadway. These would be consolidated earthen roads with about 3" of compacted gravel surfacing. This component was implemented by the Department of Highways in Kurunegala.

Among the 26 roads upgraded, 7 provide access to nearby schools. Some of the roads identified in the initial stage were abandoned due to various reasons such as the same road being planned to be improved under some other project or scheme, difficulties in construction due to road being steep and rocky, cost of rehabilitation being very high etc.

Table 9.6
Location and Lengths of the Rehabilitated Roads

| Electorate | No. of Roads | Total Length of Roads (Metres) |
|---|---|---|
| Nikaweratiya | 5 | 29.8 |
| Galgamuwa | 4 | 24.9 |
| Hiriyala | 3 | 9.7 |
| Yapahuwa | 5 | 43.1 |
| Bingiriya | 2 | 5.5 |
| Wariyapola | 2 | 5.6 |
| Dodangaslande | 2 | 3.5 |
| Panduwasnuwara | 2 | 7.7 |
| Katugampola | 1 | 0.5 |
| TOTAL | 26 | 130.3 |

Source: Annual and quarterly progress reports.

Development of roads has been restricted to 9 electorates of the district and nearly 83% of the upgraded roads are in the Northern area of the district. Only 11% was in the wet zone.

Compared to the total number of rural roads in the district, the number upgraded by the project is too small so as to create an impact on the social and economic conditions of the district's population. However, in general, road improvements do benefit any community. Better access roads benefit the community in different ways such as better transportation facilities, better access to schools and services through better transportation. Based on general observations and opinions of those who live near these roads, in this instance it appears that better opportunities for marketing of farm produce is a major outcome due to the road upgrading programme. The extent to which such upgraded roads are beneficial to the small farmers at whom the KIRDP is directed, can only be known by examining the surplus produced by them.

However the study team observed that many of these roads have been built to reach the more remote parts of the district with unexploited agricultural potential and that this has filled a void in Sri Lanka road investment programme. Many villagers in these remote areas responded positively to this programme. The study teams observations on the impact of this programme revealed increased mobility of the beneficiaries and increased marketability to products like Tamarind,

Mango etc. for which there was no market value earlier. In addition to this, the programme had supplied sufficient casual employment to many villagers. Similar to other village level programmes here too the maintainance aspect is overlooked. This suggests additional funds, proper schedules and technical know-how to the Department of Local Government to maintain the roads in proper conditions.

9.5 Rural Electrification

The appraisal report identified this as a priority area in terms of the social infrastructure since electrification in this district had lagged behind compared to the rest of the country. For example, 2% of private houses had electricity in Kurunegala compared to 9% country average. Therefore the demand for electricity is high in the district, the main constraint barring electrification is the high cost of initial investment. This is especially true for small dispersed settlements well away from the existing high tension lines.

Under this component assistance has been provided for the construction of 17 Rural Electrification Schemes. The target of the project is for these schemes to serve about 1403 domestic consumers and around 530 commercial consumers.[1] Of the total target, 90% of domestic and 94% of commercial consumers have been provided with electricity.

Table 9.7
Location of Rural Electrification Schemes and Number of Consumers

| Electorate | No. of Schemes | Target Consumers | | Actual Consumers | |
|---|---|---|---|---|---|
| | | Domestic | Commercial | Domestic | Commercial |
| Nikawaratiya | 1 | 115 | 81 | 138(120) | 51(63) |
| Hiriyala | 2 | 205 | 66 | 212(103) | 85(128) |
| Wariapola | 1 | 45 | 20 | 42(93) | 8(40) |
| Panduwasnuwara | 1 | 53 | 16 | 35(66) | 4(25) |
| Bingiriya | 1 | 35 | 15 | 38(108) | 15(100) |
| Katugampola | 1 | 120 | 26 | 85(71) | 46(177) |
| Kuliyapitiya | 1 | 30 | 13 | 42(140) | 23(177) |
| Dambadeniya | 1 | 160 | 50 | 129(81) | 64(128) |
| Polgahawela | 1 | 85 | 59 | 31(36) | 06(10) |
| Kurunegala | 4 | 320 | 54 | 291(90) | 136(250) |
| Mawathagama | 2 | 145 | 21 | 134(92) | 18(86) |
| Dodangaslanda | 1 | 90 | 109 | 85(94) | 40(37) |
| TOTAL | 17 | 1403 | 530 | 1262 | 496 |

Source: Annual Progress Report 1983, 1984

Although 17 schemes were established the actual number of consumers in some schemes had been much below the target. On interviewing the actual and 'would be' beneficiaries of the programme, the following were highlighted as reasons for under-utilisation of these schemes.

A major factor for under-utilisation was the cost of obtaining a new electrical connection. The majority of domestic consumers who have obtained electricity through these schemes are those residing close to the high tension lines often on either side of the road. Most of them were the relatively wealthy, who could afford the high initial costs. The cost of connection away from the main road was between Rs. 10,000-15,000 per household which is much more than their incomes. In the Dambadeniya scheme this has been the major cause of under-utilization.

The survey data reveals that only 21% of the households use electricity for lighting while only 1% use it for cooking.

Table 9.8
% of Households using electricity for lighting & cooking

| Zone | % Lighting | % Cooking |
|---|---|---|
| Wet Zone | 31 | 02 |
| Intermediate Zone | 22 | 01 |
| Dry Zone | 10 | - |
| All | 21 | 01 |

Source: Survey Data. 1985/86.

The programme had very little impact by way of promotion of rural industries. Domestic use also has been confined to wealthy households but electric lighting has benefitted all in a substantial measure. However 67% of the commercial users of electricity have been from Wet and Intermediate Wet Zones. Therefore the study team felt that the final impacts may have a regional bias in terms of employment, income as well as the quality of life.

Table 9.9
Type of use of Electricity

| Zone | Households % Domestic Use | % Commercial Use |
|---|---|---|
| Wet Zone | 31 | 22 |
| Intermediate Zone | 22 | 9 |
| Dry Zone | 10 | 6 |
| All | 21 | 12 |

Source: Survey Data, 1985/86.

The number of households using commercial electricity has been high compared to the use of domestic electricity. Many of these commercial users are paddy millers and coir millers.

However, in the access where new supplies of electricity have been given, existing mills have obtained electricity and new rice and coir mills have been established, providing employment opportunities to the villagers. Many domestic consumers who have secured an electricity connection were able to prune down the household fuel bill by 40-50 percent. Land values of the electrified areas have increased between 3-5 fold. As expected, due to electrification, an overall change is also seen in the life styles of these consumers in relation to social activities, bed times, etc.

Since the cost factor is a major reason for 'would be' consumers not being able to secure an electricity connection, it would be useful if the district administrators offer loan facilities to such households by linking up with a bank. Also if funds are available, the district administrators could provide electrical connections at a subsidised rate. A scheme such as this would greatly increase the opportunities for these householders obtaining electricity.

## 9.6 Education

The appraisal report lists the following as weaknesses in the district education system: poor equipment in smaller schools together with difficulties in finding qualified teachers for posting at such schools, under-utilisation of smaller outlying schools and over-crowding at main schools, and the need for more science and vocational education to meet the needs of the job market in the country.

Therefore the support under the project includes provision of simple science equipment and other training equipment to schools, construction of 41 teachers quarters in remote areas and the construction of 136 science rooms. Also the project would upgrade 7 schools to 1A type. In 1982, approval was granted to construct permanent roofs to replace damaged roofs in 26 school buildings as well. The total target was met by the project. The locations of these schools are given in Table 9.10.

Table 9.10

Location and the number of schools that were assisted under KIRDP

| Electorate | Teachers Quarters | Science Rooms | Permanent roofs | Upgraded to 1A type | Equipment for school leavers' programme | Science Equipment |
|---|---|---|---|---|---|---|
| Wariyapola | 4 | 10 | 2 | 1 | 4 | 5 |
| Dodangaslanda | 2 | 10 | 2 | 1 | 2 | 5 |
| Hiriyala | 3 | 15 | 2 | - | 5 | 10 |
| Dambadeniya | 1 | 9 | 2 | - | 4 | 4 |
| Mawathagama | 2 | 9 | 2 | 1 | 5 | 5 |
| Nikaweratiya | 5 | 11 | 2 | 1 | 5 | 7 |
| Galgamuwa | 5 | 12 | 2 | 1 | 3 | 5 |
| Yapahuwa | 6 | 7 | - | - | 4 | 7 |
| Katugampola | 2 | 9 | 2 | - | 5 | 6 |
| Panduwasnuwara | 3 | 9 | 2 | 1 | 3 | 5 |
| Kuliyapitiya | 2 | 11 | 2 | - | 9 | 6 |
| Bingiriya | 6 | 8 | 2 | - | 5 | 6 |
| Kurunegala | - | 7 | 2 | 1 | 3 | 8 |
| Polgahawela | - | 10 | 2 | - | 4 | 4 |
| TOTAL | 41 | 137 | 26 | 7 | 61 | 83 |

Source: Office of the Regional Director of Education, Kurunegala.

The extent to which provision of equipment and buildings to schools has improved the quality of education in those schools is difficult to assess at this stage. The implementation of this component was completed in late 1983, and consequently, the period is too short to asses the impact of the programme on the school, because a few years have to pass before a bend can be observed in indicators which are used for such an assessment ie. changes in school drop-outs and attendance rates, pass rate at public examinations, employment rate of school leavers, etc. On visiting some of these schools an observation was made on the absence of water supply to science rooms since the connection from the main water tank was not complete.

Due to the non-availability of usable data the study team was unable to compare the present position with the pre-project situation. Nevertheless, the number enroled in the science medium of the schools was lower compared with other districts.

Table 9.11
School participation rate by medium of Education
(10 - 23 age group)

| Field | Wet Zone | Intermediate Zone | Dry Zone | All Zones |
|---|---|---|---|---|
| General | 52 | 60 | 54 | 55 |
| Arts | 24 | 13 | 22 | 19 |
| Science | 21 | 16 | 14 | 18 |
| Technical | 2 | 7 | 10 | 6 |
| Other | 1 | 4 | - | 2 |

Source: Survey Data, 1985/86

9.7 Health

Under this component of infrastructure development the project aimed at improving the effectiveness of the existing health care delivery system in the district by providing better utilisation of small outlying curative facilities as well as preventive health care facilities. The project planned to assist in the construction of 10 quarters for medical staff in remote areas, construction of 4 MOH officers, supply of urgently needed simple medical equipment and a generator to the main hospiyal in Kurunegala. In addition to these in late 1983 approval was granted for building of extensions to wards, construction of a labour room etc. in several hospitals; the location of these are given in table 9.15.

Table 9.12
Location of health buildings provided under KIRDP

| Electorate | MOH office | MOH quarters | Mid wives' quarters | General wards(12 beds) | Labour rooms and maternity wards |
|---|---|---|---|---|---|
| Hiriyala | 1 | 1 | 1 | - | - |
| Bingiriya | 1 | - | - | - | 1 |
| Dambadeniya | 1 | - | - | - | - |
| Panduwasnuwara | 1 | 1 | 1 | - | - |
| Yapahuwa | 1 | - | 1 | - | - |
| Mawathagama | 1(DMO Office) | - | - | - | - |
| Wariyapola | - | - | - | - | 1 |
| Galgamuwa | - | - | - | 1 | - |
| Katugampola | 1 | 1 | - | - | - |

Source:Annual Progress Reports, KIRDP.

In addition to the above, assistance was given to improve the labour room and mortuary of the Kurunegala hospital together with a casualty ward of 20 beds, an X-ray plant and a water supply scheme. Also a general ward with 12 beds was provided to the Sandalanka hospital in Kurunegala. In terms of vehicles, seven ambulances, 1 lorry, one large and one small jeeps were provided to the district's health service. Numerous medical machinery and equipment were also provided to the hospitals under the project. With regard to the source of medical treatment sought during common illness, western medicine seems to be the most popular with 79% of the households seeking it. But the most interesting feature is that despite lower incomes and the presence of government dispensaries within a radius of 5 miles, a substantial number of people prefer private practitioners.

Table 9.13
Source of Medical Treatment Sought during common illness

| | % of patients | | | |
|---|---|---|---|---|
| Type of treatment | Wet zone | Dry zone | Intermediate zone | All |
| Western | 86 | 67 | 84 | 79 |
| Local | 10 | 20 | 12 | 14 |
| Other | 2 | 4 | 1 | 2 |
| Not recorded | 2 | 9 | 3 | 5 |

Source: Survey data, 1985/86.

Table 9.14
Type of Institution visited for treatment

| | % of patients | | | |
|---|---|---|---|---|
| | Wet Zone | Intermediate Zone | Dry Zone | All |
| Govt. Hospital | 42 | 66 | 61 | 58 |
| Private Practitioner | 30 | 66 | 29 | 21 |
| Private hospital | 10 | 1 | 2 | 4 |
| Not recorded | 18 | 7 | 2 | 29 |

Source: Survey data, 1985/86.

The impact on the overall health service due to the provision of these facilities cannot be assessed except to state that it would assist in enhancing the existing medical services to the population in the area.

In Kurunegala a large share of the funds had been allocated to coconut and irrigated paddy sectors. The rainfed paddy sector rural industries and the cottage industries sector were not considered for fund allocation. The distribution of meagre allocations to welfare and basic needs was not equally distributed. Except for the Rural Water Supply Programme, which had no demand in the wet zone, all the other investments were more biased towards the wet zone. Hence goals of alleviation of rural poverty and the realisation of equity as expressed in the appraisal report remained unrealised during the project period.

# CHAPTER TEN

## CONCLUSIONS AND RECOMMENDATIONS

The main objectives of this study are to assess the overall achievement of the project, both for the benefit of the project management and the funding agencies and to draw any lessons that will assist the replicability of the project design and implementation framework. Within this context our ex-post evaluation study conclusions are organised below.

### 10.1 Achievement of targets

KIRDP's initial years were marked by late commencement of development activities, but a substantial improvement in implementation momentum was gathered over the years. Consequently, the latest available statistics reveal that the KIRDP has been successful in claiming more than 90% of its financial allocation from the World Bank on the basis of its implementation record. In the total amount of funds available and utilised for development work in the Kurunegala district during the 7 year period (1979-1986) the record achieved by the KIRDP far excels what is associated with the DCB and DDC - based programmes. For example, Kurunegala has been successful in absorbing Rs. 150 million of IRDP investment in 1984 while the amount under DCB and DDC was only Rs. 68 million.

Hence it is considered that during the period 1979-1986, the KIRDP was responsible for making the single largest investment in the physical development of the production bases of paddy and coconut, as well as in social infrastructure and other related amenities in the district. In physical terms all components, except water management, more or less met their targets with only limited delays by the end of the project. The physical development achievements are summarised in Table 10.1.

Table 10.1
Kurunegala IRD Project : Physical Target Achievements

| Component | Targets | Progress as at Dec.'83 | Estimated Progress at the end of the project |
|---|---|---|---|
| 1. Irrigation | (a) Rehabilitation | | |
| | (9 major tanks) | 9 | 9 |
| | (500 minor tanks) | 388 | 418 |
| | (b) Increase in irrigable acreage (10,000 acres) | 5690 (under 297 tanks) | 10,000 |
| | (c) Cropping intensity (155) | 182 | 151 |
| | (d) Yields (55 bushels) | 55 | 64 |
| 2. Coconut | (a) Rehabilitation (60,000 acres) | 77122 | 82,000 |
| | (b) Replanting (25,000 acres) | 21575 | 25,000 |
| | (c) Intercrops (8,000 acres) | 2545 | 2545 |
| | (d) Nursery establishment and rehabilitation (10 nurseries) | 10 | 10 |
| 3. Seed and fertilizer | (a) Seed processing centres (1) | 1 | 1 |
| | (b) Fertilizer stores (48) | 48 | 48 |
| 4. Agricultural credit | Medium term: tractors | | |
| | (200 four wheel) | 103 | 103 |
| | (500 two wheel) | 2132 | 2132 |
| | (1000 sprayers) | 181 | 190 |

Contd..

| Component | Targets | Progress as at Dec.'83 | Estimated Progress at the end of the project |
|---|---|---|---|
| 5. Agriculture extension | AII: (48)<br>KVSS: (175) | 54<br>322 | 54<br>322 |
| 6.Economic Rate of Return (Paddy and Coconut) | (32%)a) with & without project<br>b) before and after the project<br>c) sensitivity analysis with 60% paddy production due to project<br>d) with 1980 paddy production and sown acreage | 71%<br>152%<br>31%<br>51% | |
| 7. Ground water exploration | Tube wells:(200) | 200 | 200 |
| 8. Rural water supply | Wells: (400) | 400 | 400 |
| 9. Rural roads | Trunk roads: (130m.) | 130m. | 130m. |
| 10.Rural electrification | Units: (17) | 17 | 17 |

*Figures in parenthesis are targets.
Source: KIRD Project Office.

## 10.2 Component-wise target achievements

Despite the extension of the project by two years, the overall cumulative performance of the irrigation rehabilitation component has fallen way behind the project expectations due to many reasons. Firstly, only 130 tanks were identified at appraisal out of a target of 500. The lack of an up-to-date list of tanks with necessary details at project commencement resulted in much of the limited technical personnel available at the time being deployed for identification and preliminary investigations, which was both time consuming and ardous.

Secondly, the main implementing agency was not fully geared to cope with the enhanced demand for its services at project commencement. Though the project office started functioning in 1979, the Irrigation Department did not have the required implementation capacity to undertake the allotted tasks as rapidly as anticipated by the project planners. According to senior irrigation engineers a target of 500 tanks to be rehabilitated within 5 years was far too ambitious. Their view was that 75 tanks per year would have been a more realistic target considering the current implementation capacity of the department.

Thirdly, the project planners did not appear to have allowed an adequate time lag between identification and selection of tanks and commencement of construction work in fixing achievement targets for this component.

The implementation of the irrigation rehabilitation and water management component was the dual responsibility of two line agencies under two different ministries. Consequently, a considerable delay was encountered in transfering the responsibility of rehabilitated tanks from one department to the other for maintenance and operation as specified in the design. The project planners had not adequately recognised the functional inter-relatinships in the implementation of this component. In this particular case, as the responsibility of one agency begins only when that of the other ends, the appraisal team should have specified the criteria for the smooth transfer of responsibilities from one department to the other.

The two line agencies with completely different orientations, outlooks, and interests in the discharge of their respective responsibilities under the project appear to have had more reasons to disagree than agree, due to the unequal perception of what constitutes 'successful completion' of physical rehabilitation. Another omission in the project plan was the non-inclusion of down-stream development work in the original implementation programme. This was only rectified in 1983, about 4 years after project commencement. All these factors together led to the long delay in initiating the improved water management component under the project.

Due to the construction delays in minor tanks as well as handing over delays of rehabilitated tanks, the commencement of the water management component too was delayed. Accordingly, the present study was unable to assess the effects of improved water management programmes.

The pilot programme recently launched by the Agrarian Services Department needed to gain momentum and stabilise under the minor tanks before any meaningful evaluation of its effects could be undertaken. According to information made available to the study team, the Walagambahuwa concept of water management has yet to prove its viability in farmers' fields. In the major tanks, under the Tank Irrigation Modernisation Programme (TIMP) funded by the World Bank, this concept was completely rejected by the farmers. It augurs well that the project authorities had not directed much of their energy to popularise the Walagambahuwa concept during the past four years, as it has yet to prove its economic viability under field conditions.

In the major irrigation rehabilitation programme Kimbulwana Oya scheme in particular showed a remarkable progress in introducing improved water management. The increase in cropping intensity seen in Yala in this scheme was largely due to efficient water management. The high degree of interaction and mutual cooperation that existed between the officers and farmers in implementing water management activities in this scheme is an approach with replicability potential in other major schemes as well. A systematic seasonal monitoring of cropping intensity and yields in all the nine major irrigation schemes rehabilitated, for a period of five years or so, may be desirable in order to assess the effects and the impact of the rehabilitation programme.

In both the rehabilitated major schemes as well as minor tanks regular maintenance would be required for the efficient use of irrigation water. Accordingly, the two line agencies need to be given adequate funds annually for effective maintenance purposes. Since 28% of project funds were channelled towards rehabilitation, there is a strong case for the project authorities to urge the two ministries concerned to provide adequate funds for systematic maintenance of the tanks beyond the project termination date. The beneficiaries themselves, some of whom though critical of the quality of work done, were emphatic regarding regular maintenance of rehabilitated tanks in order to maintain at least the present form in the conveyance systems under major tanks.

The inadequate recognition given to people's participation in project activities is largely reflected in the project 'blue print' itself. The analysis presented in the foregoing chapters highlights the overt concern of the planners to strengthen only the 'delivery mechanism' under the project. The central focus of the project was to improve the supply of services and other inputs, both material and infrastructural, required for increasing productivity. In this process, the planners largely, overlooked the need to effect any improvement in the 'receiving mechanism at the beneficiaries' end. Since the project is directed towards smallholders who have inadequate access to information and also lack education, more organisational efforts at the grassroot level is deemed necessary for fuller realisation of benefits.

As a result, during the early years the project administration concentrated largely on achievement of physical targets. The absence of an effective mechanism to express farmers' needs as regards design and implementation of the minor tank rehabilitation component was a deficiency particularly during the early years. In this regard a relatively recent move by the management to introduce a system of prior consultation and discussions with beneficiary farmers before funding rehabilitation work in minor tanks is a step in the right direction.

Under the project both the infrastructure necessary for coconut development and the subsidy programme was strengthened. In the case of rehabilitation subsidy, the appraisal target was exceeded, particularly in respect of contour drains and drainage drains. On the other hand, the progress of the underplanting and replanting subsidy scheme was quite disappointing. In essence, at the end of a seven year effort, less than one percent of the initial acreage included under this subsidy scheme has been able to claim all the four instalment payments. Under the circumstances, the benefits from replanting and underplanting as specified in the appraisal report are unlikely to materialise even in the long run.

The very meagre progress achieved in the project sponsored intercropping scheme, in no way reflects on the general intercropping situation in coconut lands in the district. In this regard, it has to be pointed out that much of the coconut acreage in the district really does not provide a favourable environment for successful intercropping with the three perennial crops. According to technical reports of the 14 electorates, only 3 are suitable for intercropping with the specified crops. Besides, due to the inadequate subsidy payment and the complete neglect of processing and marketing aspects of these intercrops in the project design, the implementing agency failed to attract a sufficiently large number of growers to take up to new intercrops. In view of the very limited progress in this component, the project management in 1983 rightly substituted a scheme for the development of home gardens and horticultural crops including cashew.

Investigations on the farm level economic relationship of the paddy sector in the project area indicated a number of significant trends. During the past few years, paddy farming has not undergone any discernible trends in production technology leading to sustained yield increases. It was also evident that project farmers, since late 1970s, faced a situation of rapidly rising input prices, mostly due to inflation in the economy. In particular, wage and farm power rates have shown a three-fold increase. As a consequence, farm costs have shown a remarkable escalation, from Rs. 1571/- in 1979 to Rs. 3040/- in 1985. Although paddy prices at the farm level have shown some increase they have not kept pace with changing input prices. The situation, therefore, suggests that during the project implementation period farmers' profit margins would have undergone a substantial erosion. The diminishing profit margins in turn are likely to have an adverse effect on farmers' decisions regarding the adoption of modern production techniques required to increase output.

Examination of the costs and returns of cultivating coconuts in the smallholder sector in the district indicated that the producers are faced with major economic problems. Production costs in this instance are relatively small in comparison with paddy. However, as with paddy, the coconut sector also witnessed a significant increase in production costs. But, the returns from the sale of produce do not appear to have shown a parallel increase during the project implementation period. The instability of yields arising from rainfall variability together with substantial farmgate price fluctuations are two marked features that have discouraged farmers in practising much of the recommendations of the coconut rehabilitation programme in the project.

A high percentage of lending was recorded in short term production loans and two-wheel tractor loans. The recovery drive launched by the banks resulted in the recovery of 93% of the Bank of Ceylon and 35% of People's Bank pre-project loans. The poorer performance of the People's Bank could be attributed largely to the laxity on the part of the MPCSs through which much of the agricultural credit had been distributed prior to 1979. Certain eligibility conditions imposed by the banks such as the minimum extent of land owned and operated (1/2 acre for cultiation loans and 2 acres for machinery and equipment loans) excluded a high proportion of smallholders.

Overall, the project met the initial targets set by the appraisal report for each sub-component of social infrastructure development. In terms of the rural electrification schemes many, except very poor households appeared to have benefitted. A limited number of new employment opportunities have been created due to the establishment of new rice mills in the areas benefitted from electricity supplies. In a number of closed wells constructed under the rural water supply scheme water was found to be 'unpalatable'. This problem is being pursued by the project authorities at present.

## 10.3 General Assessment of the KIRD Project

The KIRDP achieved the following economic rates of returns which would have been still higher if the expected targets of coconut development were achieved.

Estimated economic rate of return

| | | |
|---|---|---|
| 1. | With and without project | 71% |
| 2. | Before and after the project | 122% |

Economic rates of return with sensitivity analysis

| | | |
|---|---|---|
| 3. | With 60% benefits to paddy cultivation is from project activities | 31% |
| 4. | With the production and sown acreage in 1980 | 51% |

The project as a whole may be considered a success: implementating a strategy of target-oriented rural development, efficiently integrating

and coordinating several line departments to achieve a common set of targets, and in revamping existing service structures and physical infrastructure development of several productive components within a region of marked physical and economic diversity. The compressed investment and development effort made through the project and the resultant high current and expected future rate of reimbursement would not otherwise have materialized adequately in view of the broadening base of competing demands for public sector investment over the long run.

However, in its preoccupation with investment in leading sector production growth-oriented components, through revamping of the existing infrastructure or in creating new ones, the project has adequately taken into account the aspect of employment generation. Consequently, no evidence was found that large-scale and a sustained process of employment generation has ensued on account of the project. The project also had a crop agriculture bias which preclulded it from considering investment in initiating a programme of rural industrialisation. Over the long-run such would have had beneficial effects on rural employment generation as well as in taking off the surplus labour from agriculture which ultimately would have benefitted this sector.

An expressed intention of the project to reduce regional disparities in service provision and the resultant impact on output and incomes within the Kurunegala district was also not adequately realised. With the exception of the irrigation rehabilitation programme and a substantial portion of the wells programme, the investment in other programmes such as paddy and coconut was still biased towards the wet zone. In the wet zone with its already developed infrastructures and greater capacity to absorb investment, the leading sector investment made through the project served to widen the pre-existing wet zone, - dry zone disparities rather than reduce them.

It is too early to assess the project impact on incomes and quality of life. Yet, the physical quality of life index values for the district remain more or less the same as they were before, on the eve of the project initiation. In addition, absolute poverty conditions recorded a decrease of 2 points during the same period. With a total project expenditure of around Rs. 430 m. in infrastructure facilities and service provision over the project period in the district it is expected that the general money supply in the district would have increased resulting in some advances made towards commercialism and development activity, with some inflation effects, than before. While the project impacts on such aspects could not be isolated by the survey it is our opinion that the massive investments made through the IRDP would have had some effect in maintaining the overall quality of life in the district, and perhaps help some of those below the poverty line to improve their income levels, at least during the project period.

## 10.4 Lessons for the Future

This was the first attempt to use a 'blue print' for a district development programme in Sri Lanka with implementation responsibility at

district level assigned to existing government departments. In this regard, the overall results of the project presented in this study, in terms of physical targets achieved, bears out the high degree of success achieved in inter-agency cooperation the management was able to secure from the largely autonomous government agencies. The small cadre of staff deployed at the project office also proved a cost-effective organisation in administering the project. The 'blue print' was implemented obviously with a clearer understanding of the local situation and modifications effected where requests for changes had been made were backed up by objectively valid reasons. At the same time, the rigid criteria incorporated into the design also assisted the project administration to largely withstand 'local pressure' for modification of components like irrigation rehabilitation. All in all, the 'blue print' approach followed in Kurunegala was flexible enough to accommodate changes based on implementation experiences.

The administration was handicapped due to the lack of timely feed-back on implementation problems as well as on the extent and pace of anticipated changes due to project implementation. With a preoccupation in implementation the project planners and implementers did not accord an adequate recognition of a systematic feed-back for timely action. In addition, neither the implementing agencies nor the project office, or any other agency, kept a track of the benefit flows and impact of the project.

Since the achievement of quantitative targets is only one aspect required to assess progress, it is necessary to view performance in a broader context, to include qualitative prospects as well. For this, a well staffed management information system attached to the project office should prove helpful in future projects. The Project Director during the latter half of the project concluded a number of 'in house' surveys on various project components which were very helpful to the coordinating committee in taking necessary corrective steps. Such laudable embryonic efforts at "feed-back monitoring" should, even at this late stage, be instituted as a more lasting and routinised framework for the use of any future long-run impact assessment that may ensue. As a lesson from the KIRDP, such continuous monitoring on a more firmer arrangement is a sine qua non consideration for future projects.

In the KIRDP an inadequate dialogue between the Ministry of Plan Implementation and the ARTI regarding physical progress and benefit monitoring work, after completion of initial baseline surveys, resulted in gaps in data requirements for the ex-post evaluation. An outside agency like ARTI cannot handle ongoing evaluation work effectively, including qualitative assessment of effects of development activities, without having an operational base at the district level on a continuing basis to undertake regular field work so necessary for such assessments. Monitoring work therefore has to be a product of an established intra-organisational framework of the project office, with outside agencies serving as consultants for derivation of relevant development indicators and assistance in data collection, collation and analytical techniques.

We are of the view that an ex-post impact assessment such as the Kurunegala IRD Project, with its multiple components, should be conducted as an 'assessment series' beginning with a study at project completion as the first of such a series. This has become necessary as the effects and impacts of individual components are expected to emerge at different points of time after project completion.

For instance, the full development of coconut related benefits in the KIRDP were expected only from the project-year 13 onwards and in the case of paddy 2 years after project implementation. In the context of the latter crop, delays in the implementation of the irrigation rehabilitation programme are likely to result in consequent delays in realising benefits. In this context, the conduct of a series of 'assessment studies' at intervals appears to be the most desirable course of action to determine a multiple investment sector project impact.

In planning for a suitable implementation organisation responsible for development work concurrently on several components spread within a region, the project design should reflect adequate knowledge of spatial variations in the pre-existing development status of components. Inadequacies in this regard were seen in shortcomings in the a priori stock-taking of tanks earmarked for rehabilitation and in unrealizable target setting in tank rehabilitation. For example, in this regard the capacity of the Irrigation Department to realise such targets was not adequately realised.

It is also noteworthy that while making fund allocations for tank rehabilitation and other infrastructure constructions the project failed to indicate recurrent cost estimates for maintenance of these structures beyond the project period. Taking into account the relatively smaller fund allocations for DCB and DDC work, and the competing demands for such funds, maintenance of structures created through the project in a good state of repair over the long run may be constrained. Consequently, the KIRDP experience highlights the issue that in allocating external funds for setting up of infrastructures of a rural development project an a priori estimate need also to be made of maintenance and repair costs to the public sector for an extended time beyond the project period.

10.4.2 Replicability

Our assessment of the internal workings, performance and achievements of the KIRDP indicates several aspects bearing on the issue of replicability of the KIRDP model. Firstly, KIRDP demonstrated that a strategy of revamping existing implementation machinery, without overtly creating new structures, is capable of performing efficiently the "integration function" of coordinating the implementation of a development programme through existing line agencies. Secondly, it demonstrated that such integration could be achieved at relatively low cost. Thirdly, it avoided creating an expansion of bureaucratic cadres, thereby circumventing problems of redundancy at the end of the project period.

Fourthly, the 'blue print' approach was sufficiently rigid in order to initiate a target-oriented implementation path, while at the same time it greatly contained the impact of external sectoral politics and interests on the implementation process. Concurrently, it had the necessary flexibility to adjust the component-based implementation programme in line with new demands which arose during the implementation period. Taken together, it is our opinion that the implementation framework of the KIRDP, with suitable modifications, may be capable of being replicated elsewhere.

Annex 1

PROJECT COMPONENTS

Although the project did not treat all aspects of regional development, it was expected that substantial scope will exist for further investments in components included under the project as well as incorporation of new components. A brief summary of the twelve components are as follows.

1) Irrigation and Water Management
The project aims to increase the irrigated area under cultivation (primarily for paddy) through rehabilitation and/or improvement of the existing irrigation schemes along with the encouragement of better water management practices. It is expected to rehabilitate nine major and 500 village tank systems. The project also aims to provide assistance to 22 mobile pumping units.

2) Coconut Development
The project objectives are (i) increase productivity through improved husbandry practices eg. Fertilizer use (ii) rehabilitate neglected plantations by replanting/underplanting programmes (iii) intensify the use of coconut land through intercropping.

3) Agricultural Extension
The various agricultural extension services in the district are to be consolidated and reorganised on the basis of the Training and Visit system. The present staff levels are to be strengthened with additional staff at all levels. It is expected to provide one KVS[1] for about every 600 farm families.

4) Agricultural Input Supplies
The project aims to increase the supply of important farm inputs principally fertilizer and seed paddy.

5) Agricultural Credit
Credit facilities are to be provided to finance loans for paddy and field crop production, fertilizer credit for coconut and medium term loans for the purchase of tractors, water pumps and sprayers. The ultimate objective is to create a viable agricultural credit system with greater participation of particularly the small farmers.

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1 KVS - Krushikarma Viyapthi Sevaka; the village level extension agent.

6) Livestock

The project will strengthen animal desease control and verternary services in the district.

7) Ground Water Exploration

The project provides for the exploration of ground water resources in the district.

8) Rural Roads

This includes the rehabilitation/upgrading of about 130 miles of roads mostly in the backward areas of the district.

9) Rural Water Supply

The project provides for the digging of about 400 wells in areas where drinking water is scarce.

10) Rural Electrification

The project will assist in the electrification of 16 rural areas.

11) Health

Health services are to be improved through construction of residential quarters for medical staff, construction of offices, provision of vehicles, and ambulances, electrification of certain hospitals and through the provision of simple medical equipment.

12) Education

The objective of the education component is to improve the equality of education in the school system, strengthening facilities for vocational and technical education, improving the utilisation of outlying smaller schools and reducing the existing disparities within the district.

ANNEX II

KURUNEGALA RURAL DEVELOPMENT PROJECT

Cost Estimates and Schedule of Expenditures
Component-Wise Summary

| Component | Cost Rs M | % |
|---|---|---|
| Irrigation and Water Management | 124.50 | 27 |
| Coconut Development | 81.75 | 17 |
| Agricultural Extension | 20.00 | 04 |
| Agricultural Input Supplies | 20.90 | 05 |
| Agricultural Credit | 118.05 | 25 |
| Livestock | 3.10 | 01 |
| Groundwater Exploration | 9.65 | 02 |
| Rural Roads | 17.00 | 04 |
| Rural Water Supply | 13.35 | 03 |
| Rural Electrification | 15.60 | 04 |
| Health | 6.40 | 01 |
| Education | 14.50 | 03 |
| Project Coordination & Investigations | 20.20 | 04 |
| Total | 465.00 | 100 |

Annex III

## KURUNEGALA INTEGRATED RURAL DEVELOPMENT PROJECT EVALUATION STUDY (1985)

### List of Selected Villages

| | Index No | Village Name | AGA Division |
|---|---|---|---|
| Wet Zone | 01 | Ilukewala | Mawathagama |
| | 02 | Koshinna | |
| | 03 | Kohilapitiya | Polgahawela |
| Intermediate Zone | 04 | Kiralagedara | Mahawa |
| | 05 | Kadubadagama | |
| | 06 | Maduragama | Nikaweratiya |
| | 07 | Polonnaruwa | |
| | 08 | Deegama | Polpithigama |
| | 09 | Eeriminnagama | |
| | 10 | Polpithigama | |
| | 11 | Bogolla | |
| | 12 | Diwulegala | |
| | 13 | Erunkade | Ibbagamuwa |
| | 14 | Kattakaduwa | |
| | 15 | Karuwalagaswewa | |
| | 16 | Hiddana | |
| | 17 | Kiribamuna | |
| | 18 | Wallawa | Kurunegala |
| | 19 | Dagopitiya | |
| | 20 | Mailagammana | |
| | 21 | Mirihabura | |
| | 22 | Pimburuwellegama | |
| | 23 | Furulapola | |
| | 24 | Kohilapokuna | |
| | 25 | Seeradunna | Mawathagama |
| | 26 | Tigola | |
| | 27 | Maningamuwa | Polgahawela |
| | 28 | Danwella | Weerabugedara |
| | 29 | Hanwella Ihala | |
| | 30 | Pabadeniya | Alawuwa |
| | 31 | Henduwawa | |
| | 32 | Weere | |
| | 33 | Badullawa | |
| | 34 | Godakuruwa | |
| | 35 | Eluwapola | Kuliyapitiya |
| | 36 | Manawa | |
| | 37 | Dandagamuwa | |
| | 38 | Katuwella | |
| | 39 | Aguruwagala Ihala | Hettipola |

| | | | |
|---|---|---|---|
| | 40 | Hunnelumbuwa | |
| | 41 | Gallehapitiya | |
| | 42 | Lenapalassa | |
| | 43 | Hormbuwa | |
| | 44 | Pihibeeya | |
| | 45 | Diwulkadawara | |
| | 46 | Dickwehera | Wariyapola |
| | 47 | Wadanda | |
| | 48 | Hambare | |
| | 49 | Galwewa | |
| | 50 | Wadurassapitiya | |
| | 51 | Kuburupitiya | |
| | 52 | Maulle Pahala and Ihala | Kobaigane |
| | 53 | Hormbugama | Bingiriya |
| | 54 | Padiwela | |
| | 55 | Pahala Kiniyama | |
| | 56 | Urapoththa | |
| | 57 | Thunthota | |
| | 58 | Paranagama | |
| | 59 | Siripella | Pannala |
| | 60 | Dampadiya | |
| | 61 | Pallama | |
| | 62 | Idiwinna | |
| Dry Zone | 63 | Warawewa | Giribawa |
| | 64 | Mailawa | |
| | 65 | Ihalanahettikulama | Galgamuwa |
| | 66 | Kanhathkotuwa | |
| | 67 | Meegalawa | |
| | 68 | Katugampolagama | |
| | 69 | Kadudunnawa | |
| | 70 | Ihalabogama | |
| | 71 | Balagollagama | Mahawa |

Annex IV

THE NAMES AND LOCATIONS OF THE TANKS SELECTED FOR THE IRRIGATION AND WATER MANAGEMENT COMPONENT SUB-SAMPLE

| | Name of tank | The tank category | Climatic zone the tank owns | Electorate | Agrarian Services Centre | Cultivation Officer's Division |
|---|---|---|---|---|---|---|
| 1 | Hammillewa wewa | Rehabilitated | IL | Yapahuwa | Nagollagama | Karambe |
| 2 | Hatapolawewa | ,, | IL | Panduwas-nuwara | Hettipola | Yayegedara |
| 3 | Thimibiriyawawewa | ,, | DL | Galgamuwa | Ehetuwewa | Thimbiriyawa |
| 4 | Kudamithawawewa | ,, | DL | Nikaweratiya | - | Monnakulama |
| 5 | Koanwekallawewa | ,, | DL | Nikaweratiya | Kotawehera | Alutgama |
| 6 | Buluwela Ellawela wewa | ,, | IL | Dodamgaslanda | Karandagolla | Buluwala |
| 7 | Ihala Maningamuwa wewa | ,, | IL | Yapahuwa | Ambanpola | Thammitigama |
| 8 | Nelunkanuwawewa | ,, | IL | Wariyapola | Nathagane | Watukana |
| 9 | Waullewawewa | ,, | IL | Yapahuwa | Rambe | Kumbukelewa |
| 10 | Kumbukwewa Mahawewa | ,, | IL | Yapahuwa | Nagollagama | Kumbukwewa |
| 11 | Baddegamawewa | ,, | IL | Nikaweratiya | Kobeigane | Baddegama |
| 12 | Ambakolawewa | Non-rehabili-tated | DL | Galgamuwa | - | - |
| 13 | Thambagallawewa | ,, | IL | Hiriyala | Ganewatta | Thambgalla |
| 14 | Kumbukwewa | Come under official water management | DL | Galgamuwa | Galgamuww wella | Mahagalkada-wela |
| 15 | Moragaswewa | ,, | DL | Yapahuwa | Mahawa | Kattambuwana |
| 16 | Welawamahawewa | ,, | IL | Wariyapola | Awulegama | Rambukana |
| 17 | Mahagalkadawewa | ,, | DL | Galgamuwa | Galgamuwa wela | Mahagalkada-wela |
| 18 | Kotalakemiyawa wewa | ,, | IL | Yapahuwa | Mahawa | Uduweriya |
| 19 | Usgalasiyambalangamuwa Tank | Major Tanks | DL | Galgamuwa | Galmuwa | Usgalasiyamba langamuwa Mahagalkada-wela Padipanchawa |
| 20 | Kimbulwanaoya Tank | ,, | IL | Hiriyala | Kumbukgate Ibbagamuwa | Nelliya |

Annex V

THE PROJECT DIRECTOR'S RESPONSIBILITIES

(a) Preparation of annual work programs and budgets in collaboration with the various implementing agencies;

(b) Release of funds and payments for project expenditures;

(c) Maintenance of consolidated project accounts;

(d) Preparation of claims for reimbursements from IDA credits;

(e) Monthly progress review with each of the implementing agencies;

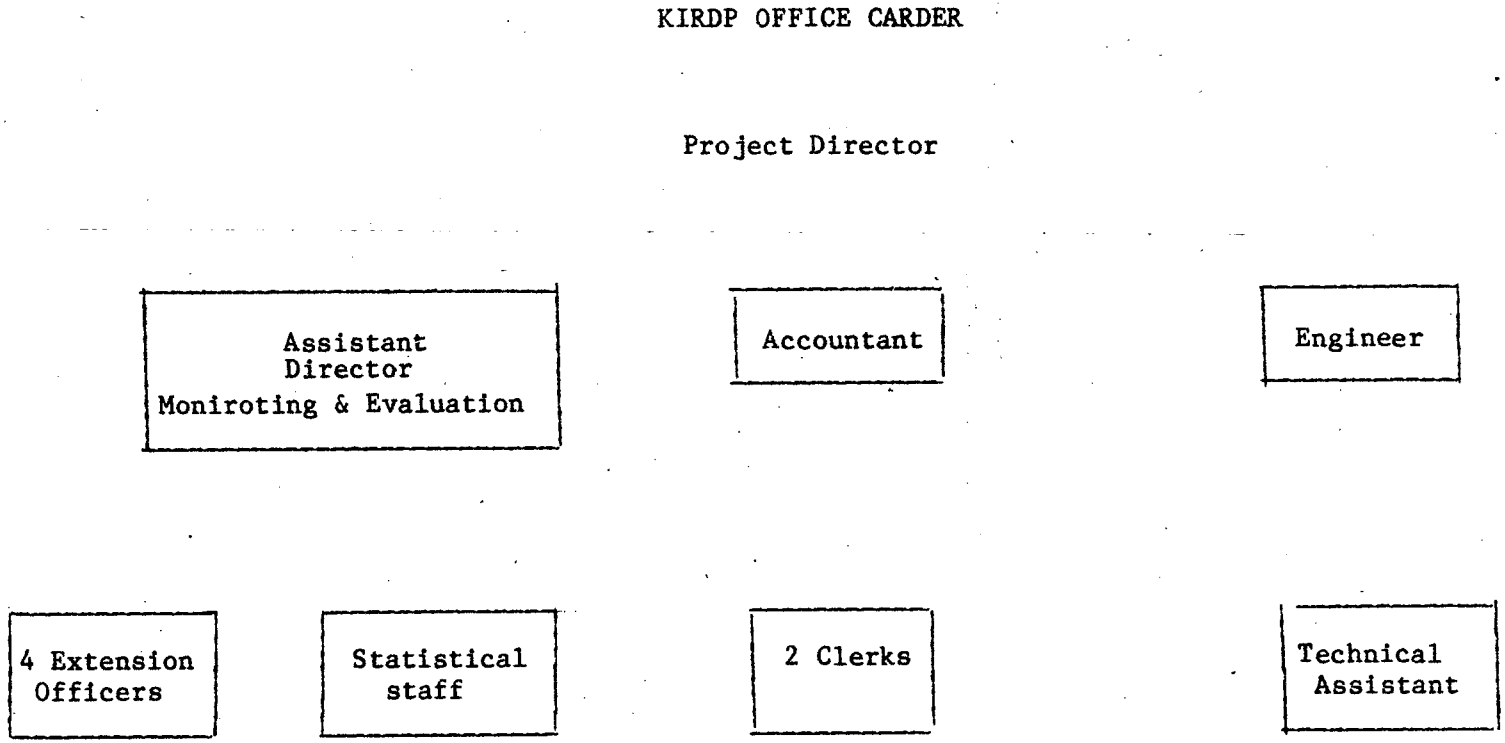
(f) Resolution of implementation bottlenecks; and

(g) Liasing with the Project Steering Committee on all project matters.

Adequate support staff will be provided to the Project Director for proper discharge of his responsibilities.

Annex VI

KIRDP OFFICE CARDER



Annex VII

## OVERSEAS TRAINING OF PROJECT STAFF

| Title of training | No. of officers trained | Implementing agency | No. of man month | Country |
|---|---|---|---|---|
| Foreign training | | | | |
| 1. Accountancy & finance for developing countries | 01 | Project Office | 3.0 | U.K. |
| 2. Water Management | 07 | Agrarian Services | 5.1 | Indonesia and Thailand |
| 3. Cowpea & Soya bean production | 02 | Agriculture Extension | 3.2 | Nigeria |
| 4. Agricultural Project Development | 13 | Project Office Bank of Ceylon, Peoples' Bank | 6.5 | India |
| 5. Coconut Development | 06 | Coconut Cultivation Board | 1.2 | Phillipines |
| 6. Minor Export Crops | 05 | Minor Export Crop Department | 2.2 | Phillipines |
| 7. Rural Banking | 01 | Peoples' Bank | 1.2 | Phillipines |
| 8. Net work analysis | 01 | Ministry of Plan Implementation | 6.0 | U. K. |
| | 36 | | 30.2 | |

*Annex VIII

## SELECTION PROCEDURE OF TANKS FOR REHABILITATION

The following socio economic and technical criteria, which was suggested in the project appraisal was strictly adopted by the project implementors in the selection of village tanks for rehabilitation.

1. The command area under the tanks would not be less than 20 acres.
2. Useful storage of the tank would not be less than 50 ac. ft.
3. Tank would directly benefit at least ten families.
4. Rehabilitation cost would not be more than 7000 per incremental irrigated area.
5. Tank bed would not be of previous soils and the tank should have been filled at least 3 times in the past four years.
6. Total area benefitted would be at least ten times the privately owned land to be submerged.

The following procedure was followed in the preparation of plans and estimates of minor schemes, review of same by the Supervisory Consultants, and approval at the Tank Selection Committee Meetings.

* A list of tanks to be investigated for rehabilitation is prepared by the Deputy Director of Irrigation/Kurunegala based on requests made by the Community Societies, Groups of farmers, Members of Parliament and other Organisations.
* Investigation works were carried out on some tanks by the I.EE, and on the balance by the Planning Consultants.
* Plans and Estimates prepared following such investigations are submitted to D.D.I. by the respective I.EE and the Planning Consultants.
* These plans and estimates are further examined by the C.I.E. under the direction of D.D.I. for conformity with departmental guidelines and selection criteria recommended by the IDA.
* The F.E. of the Supervisory Consultants keeps in touch with the C.I.E.and on submission of plans and estimates, reviews same ensure that the following criteria are followed :

(a) Specifications of the Department of Irrigation.
(b) Criteria and guidelines recommended by IDA.
(c) Included in Annual Implementation Programme.

Any deficiencies noted during reviews are brought to the notice of the D.D.I. or C.I.E. for rectification. In addition, a review report is submitted to Director/RDD, with copies to Project Director andf D.D.I.

* The D.D.I. submits a list of tanks to be rehabilitated to the Project Director from time to time, and with the recommendations of the Consultants, the Project Director tables the list of the Tank Selection Committee Meeting for approval. This Committee is well represented by State Agencies, Political Organisations and any other interested parties.

During the review operations, the following observations were made by the Consultnats :

The utilisation of rations under the World Food Programme could not be implemented, and as such, this possible contribution could not be included in estimates for rehabilitation. Due to the urgent and the work load, the Department of Irrigation did not include a "Shramadana" contribution towards the rehabilitation operation. Yet, two schemes were undertaken by the Department of Irrigation as a joint venture where concrete items in the headworks were undertaken by the Department of Irrigation, whereas the earthwork component was to be carried out by the Department of Agrarian Services under the supervision of the Department of Irrigation.

- About the 95% of the tanks approved for rehabilitation were selected from the dry and semi dry zones in Northern and Western areas of the district.

- Pro-rate costs of about 100% of the approved schemes by the Irrigation Sub Committee exceeded the SAR value at 1985 rates, but they were approved as it was agreed that laid out criteria be based on mid 1980 rates.

- Command area developments have been undertaken on force account in most cases.

Annex IX

NUMBER OF MINOR TANKS REHABILITATED BY ELECTORATE

| Zone | Electorate | Number of tanks completed in | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Dry | | 1980 | 81 | 82 | 83 | 84 | 85 | Total compleed | Work in progress |
| | 1. Nikaweratiya | 3 | - | 17 | 40 | 16 | 10 | 86 | 10 |
| | 2. Yapahuwa | - | 5 | 16 | 20 | 14 | 10 | 65 | 10 |
| | 3. Panduwasnuwara | 2 | 1 | 4 | 7 | 3 | 4 | 21 | 5 |
| | 4. Galgamuwa | 3 | 7 | 15 | 18 | 19 | 19 | 81 | 9 |
| | Total | 8 | 13 | 52 | 85 | 52 | 43 | 253 | 34 |
| Intermediate | | | | | | | | | |
| | 1. Katugampola | 5 | 5 | 2 | 1 | 4 | | 17 | 3 |
| | 2. Kuliyapitiaya | 12 | 8 | - | 7 | 1 | | 28 | |
| | 3. Bingiriya | 2 | 5 | 4 | 9 | - | 2 | 22 | 5 |
| | 4. Wariyapola | 4 | 11 | 7 | 5 | 6 | 6 | 39 | 5 |
| | 5. Hiriyala | 3 | 5 | 2 | 3 | - | 1 | 14 | 1 |
| | 6. Dodangaslands | 3 | - | 1 | - | - | 1 | 5 | 3 |
| | 7. Dambadeniya | - | 1 | 3 | - | - | | 4 | 1 |
| | 8. Kurunegala | - | 2 | - | - | - | 2 | - | |
| | Total | 29 | 37 | 19 | 25 | 11 | 10 | 131 | 18 |
| Wet | | | | | | | | | |
| | 1. Polgahawela | - | 2 | 1 | 2 | - | 1 | 6 | - |
| | 2. Mawathagama | - | 1 | - | 1 | - | 1 | 3 | - |
| | Total | - | 3 | 1 | 3 | - | 2 | 9 | 2 |
| Grand Total | | 37 | 53 | 72 | 113 | 63 | 55 | 393 | 52 |

* Including January - April 1986.

Annex X

KURUNEGALA DISTRICT ANNUAL RAINFALL DATA

| Year | Kurunegala (Wet Zone) | Wariapola (Intermediate Zone) | Maha Illuppallama (Dry Zone) |
|---|---|---|---|
| 1970 | 90.35 | - | 51.51 |
| 1971 | 112.32 | 72.35 | 64.34 |
| 1972 | 115.39 | 69.62 | 45.57 |
| 1973 | 58.32 | 59.90 | 41.95 |
| 1974 | 73.96 | 58.58 | 40.15 |
| 1975 | 80.26 | 71.52 | 51.15 |
| 1976 | 64.83 | 50.88 | 48.92 |
| 1977 | 91.96 | 73.17 | 65.04 |
| 1978 | 94.70 | 65.46 | 63.91 |
| 1979 | 74.27 | 60.45 | 45.49 |
| 1980 | 61.05 | 65.73 | 52.32 |
| 1981 | 61.97 | 67.69 | 46.01 |
| 1982 | 103.48 | 75.57 | 43.81 |
| 1983 | 61.88 | 45.40 | 45.85 |
| 1984 | 99.36 | 35.84 | 85.90 |
| up to May 1985 | 28.18 | 19.42 | 10.19 |

Source : Dept. of Meteorology

Annex XI

KANKANIYAWA TANK NIKAWERATIYA
(Example for present water
Management Programme)

Water Resources

The catchment area is 1.06 sq.mls, and the capacity is 130.14 Ac.ft. This tank normally fills very soon because the spill water flows from the tanks which has been situated in upper side.

4. Agriculture

(a) Cropping Pattern

Only paddy had been grown in the land of command area.

(b) Crop Varieties

Long term variety of paddy - 4 to 4 1/2 months
BG 11/11, BG 400/1 etc. for Maha season

Short term variety - 3 to 3 1/2 months
BG 34/8, BG 276/5 etc. for Yala season

(c) Cultivation Practices

The ploughing is mainly by buffaloes. There are about 5 sprayers in the village. Urea had been used by all farmers at the rate of between 1/2 to 1 cwt. per acre few of them had used Basel mixture and T.D.M. and about 55% share holders used chemicals.

(d) Land Tenure

There are no tenant cultivators and the lands are cultivated by the owners.

(e) Yield

The command area is 17 acres. The average yield per acre is about 70 bushels for Maha season.

(f) Command Area Size and Farm Size

The farm size is 1 to 4 acres.

5. Village Irrigation Scheme

(a) The details of improvements effected for head work are given below. The data before modernization are included for easy reference.

Contd., 2/-

(e) Mid Period

1. Distribution of water
2. Input supply
3. Advice on the use of fertilizer and chemicals

(f) Late Period

1. Crop cutting surveys
2. Marketing arrangements
3. Recovery of credits
4. Computation of actual water duty
5. Programmes of Yala cultivation to minimise evaporation losses during dry seasons

(g) Role of Various Departments and Organisations

1. Agricultural Department
   Supply of seed paddy in time. Demonstration plots with new improved varieties in the command area. Conducting pre-season farmer training classes.

2. Agrarian Services Department
   Annual maintenance like greasing painting of sluice repairs to structures and earth work which involve more than 30 cubes due to floods etc. Supply of inputs such as fertilizer agro-chemicals etc., in the appropriate time through the Agrarian Services centre Nikaweratiya and C.O. of the area is responsible for organizing cultivation meetings, holding inquiries connected with the non adherence of cultivation meeting.

3. Crop Insurance Board
   Collection of insurance premia through cultivation officers.

4. Statistical Department
   Crop cutting surveys.

5. Paddy Marketing Board
   To purchase the outputs through the A.S.C. Nikaweratiya.

6. Peoples Bank
   Issuing loans to farmers.

Contd., 3/-

| BUND | BEFORE IMPROVEMENT | AFTER IMPROVEMENT |
|---|---|---|
| Length | 1830 ft. | 1840 ft. |
| B.T.W. | 4'.6" | 6'.o" |
| B.T.L. | Various | 108.5 R.L. |
| F.S.L. | 104.99 | 105.0 |
| H.F.L. | 106.50 | 106.50 |

| SPILL | NO.-1 | No.-2 | No.-1 | No.-2 |
|---|---|---|---|---|
| Nature | natural | C.O.spill | - | C.O.Spill |
| Location | L.B. | R.B. | - | R.B. |
| Length | 30 ft. | 50 ft. | - | 130 ft. |
| Crest Level | 106.49 | 104.99 | - | 106.50 |

| SLUICE | L.B. | R.B. | L.B. | R.B. |
|---|---|---|---|---|
| Type | J.B. | J.B. | Tower | Tower |
| Size | 6"℄ | 6"℄ | 6"℄ | 6"℄ |
| Level | 100.00R.L. | 100.49 | 100.00 | 100.49 |
| F.S.D. | 5.0 | 4.51 | 5.0 | 4.51 |
| Capacity | 130.14 Ac.ft. | | 130.14 Ac.ft. | |
| Area at F.S.L. | 36.8 Acs. | | 36.8 Acs. | |
| Command Area | 17 acres | | 17 acres | |

CANAL LAY OUT STRUCTURES

| | L. B. Canal | R.B. Canal |
|---|---|---|
| Double banking | - 1700 ft. | |
| Length | - 1'.0" | |
| Bed width | | |
| Side slopes | | |
| Gardient | - 0.0004 | |
| F.S.D. | - | |
| B.T.W. | - | |
| Farm Turn Out | - 6 Nos. | |
| Cascadedrop | - | |
| Cum F.T.O.(1:0) | - 1 Nos. | |

Drainage is done by Liyadda to Liyadda Head works were done by the Irrigation Department. Down stream developments were done by the Dept. of Agrarian Services.

6. Irrigation Duties

(a) Maha

The duty for paddy is 4.0 Ac.ft. per Ac.

(b) Yala

The duty is 6.0 A.ft/Ac. 50 lands can be cultivated for Yala

(c) Water Distribution Practices

Rain water used for preparation of land. So they can save the tank water. The paddy plots were irrigated direct from main canals without any regulatory arrangements. They did not know proper distribution practice.

Contd., 4/-

(d) Maintenance

After improvements of the tank cultivators maintain the bund, canal and structures. They do their works according to the decisions of cultivation meeting.

7. Agricultural Development Potential .

It is proposed dry sowing and new improved short term variety paddy from Maha 1983/84. Every effort will be made to ensure that the cultivators to a timely cultivation and the space of cultivation limited to within 10 days. The farmers will be requested to use rain water for land preparation to save the tank water so that possibility of Yala cultivation could be considered. By means of improved methods of cultivation the average yield can vary from 30 bushels to 80 bushels per acre. The irrigated area cannot be increased according to the capacity.

8. Water Management Programme

(a) Water saving

The water saving will be effected by introducing

1. Dry sowing in the entire command area
2. Usage of rain water for land preparation
3. By reducing space of cultivation
4. Rotational water supply of water equitability distribution
5. Organising if possible agricultural credit
6. Conveying the cultivation meetings
7. Organising water management training

(b) Land Preparation Period

1. Ensuring inputs
2. Ensure timely completion of land preparation
3. Input of fertilizers
4. Maintaining uniform dry sowing with the first rains

(c) Initial period

1. Distribution of water if required
2. Input supply
3. Protection of canals and structures
4. Agricultural advice oin the use of fertilizer and weedicides
5. Punitive action against irrigation offenders
6. Indeminity payments for the first stage of crops

(d) Growth Period

1. Distribution of water in a rotational manner
2. Input supply
3. Advice on the use of fertilizer and chemicals

*Annex XII

COCONUT CULTIVATION BOARD SUBSIDIES FOR PRODUCTION

SCHEMES

1. Coconut rehabilitation subsidy was introduced in 1974. Coconut grown on farms from 0.5 acres to 50 acres in extent with a minimum density of 15 palms over the age of one year in each half acre, are eligible for assistance, on the following scale:

| | Operation | Subsidy |
|---|---|---|
| i | Establishment of contou draind | Rs.55/- per chain |
| ii | Drainage drains | Rs.25/- per chain |
| iii | Filling vacancies | Rs.10/- per vacancy filled |
| iv | Removal of palms in excess of 64 per acre | Rs.50/- per palm removed |
| v | Husk burying per acre | Rs.1000/- |

2. Underplanting/replanting subsidy was started in 1976. Coconut grown on farms between 0.5-50 acres in extent, with a minimum density of 15 palms in each half acre with palms of over 60 years of age and an annual yield of less than 1,000 nuts, are eligible for a subsidy of Rs.4,860 per acre, payable in the instalments.

| Instalment | 1 | 2 | 3 | 4 | Total |
|---|---|---|---|---|---|
| Underplanting | 1500 | 750 | 750 | 1860 | 4860 |
| Replanting | 2250 | 500 | 500 | 1610 | 4860 |

3. Subsidy for New Planting
Potentially cultivable but barren land (0.5 acres or above) situated in the area suitable for coconut cultivation can be developed under this subsidy. The subsidy of Rs. 4650/- per acre is payable as follows:

| Instalment | 1 | 2 | 3 | 4 | Total |
|---|---|---|---|---|---|
| Payment | 1600 | 600 | 600 | 1850 | 4650 |

4. The Subsidy for Planting n Holding of Less than 1 Acre
(introduced in 1977) is available to growers of either private land allotments for a minimum of 10 palms. The subsidy of Rs. 50 per seedling is payable as follows:

| Instalment | 1 | 2 | 3 | 4 | Total |
|---|---|---|---|---|---|
| Payment | 15 | 10 | 10 | 15 | 50 |

Cont'd./- 2

Cont. Annex XII

5. Coconut seedlings
Permit subsidy holders can obtain seedlings at Rs.7.50-10.00 from specified nurseries.

6. The Pasture Fodder Subsidy Scheme started in 1973 is available to growers in certain districts, with evenly distributed rainfall growers in certain districts, with evenly distributed rainfall to Establish Brachia Milliformia. The subsidy of Rs. 800/- per acre is payable in two annual instalments or Rs. 400/- and Rs. 400/- and supply of seeds free of charge.

7. Subsidies for Perennial Crops were introduced to help meet establishment costs of cocoa, pepper and coffee and are available to growers with more than 0.5 acres of coconut, with a minimum of 30 palms per acre, in specified districts.

(i) Cocoa: A subsidy of Rs.2,250/- is payable in four equal annual instalments to growers who establish 290 trees per acre.

(ii) Pepper: The rate of subsidy is Rs. 2,625/- per acre, payable in three equal annual instalments.

(iii) Coffee: The rate is Rs. 2,125/- per acre, payable in three annual instalments.

| Instalments | 1 | 2 | 3 | Total |
|---|---|---|---|---|
| Cocoa | 1050 | 650 | 550 | 2250 |
| Pepper | 1750 | 525 | 350 | 2025 |
| Coffee | 1200 | 550 | 375 | 2125 |

Annex XIII

## PADDY

| | Sown Area ('000ac)a/ | Gross Harvested Area ('000ac)b/ | Net Harvested Area ('000ac)c/ | Production (M bushels) d/ |
|---|---|---|---|---|
| 1978 | 251 | 212 | 180 | 8.2 (171) |
| 1979 | 256 | 200 | 170 | 9.1 (189) |
| 1980 | 267 | 218 | 185 | 9.87 (206) |
| 1981 | 265 | 241 | 205 | 11.54 (241) |
| 1982 | 262 | 238 | 202 | 13.69 (286) |
| 1983 | 256 | 228 | 194 | 13.42 (280) |
| 1984 | 271 | 252 | 214 | 13.81 (288) |
| 1985 | 272 | 257 | 218 | 14.08 (294) |
| 1986-92 | 272 | 257 | 218 | 14.08 (294) |

a/. 5 year average sown acreage.
b/. 5 year average gross harvested acreage.
c/. 85 percent of gross harvested acreage.
d/. I. 3 year average production.
II. Figures in parenthesis are production in thousand metric tons.

Annex XIV

COCONUT

| | Production (M nuts) a/ | Increment (M nuts) | Incremental value (M. Rs.) | Percentage of total Increment b/ |
|---|---|---|---|---|
| 1978 | 593 | - | - | - |
| 1979 | 599 | 6 | 6.6 | 5 |
| 1980 | 618 | 25 | 27.5 | 21 |
| 1981 | 623 | 30 | 33.0 | 25 |
| 1982 | 635 | 42 | 46.2 | 35 |
| 1983 | 662 | 69 | 75.9 | 58 |
| 1984 | 635 | 42 | 46.2 | 35 |
| 1985 | 676 | 83 | 91.3 | 69 |
| 1986 | 679 | 86 | 94.6 | 72 |
| 1987 | 684 | 91 | 100.1 | 76 |
| 1988 | 690 | 97 | 106.7 | 81 |
| 1989 | 697 | 104 | 114.4 | 87 |
| 1990 | 701 | 108 | 118.8 | 90 |
| 1991 | 705 | 112 | 123.2 | 93 |
| 1992 | 713 | 120 | 132.0 | 100 |

a/. (i) 3 year average production.

(ii) Includes expected production from replanted/under-planted area with a lag of 7 years.

Annex XV

## ANNUAL CROP PRODUCTION COST (ECONOMIC VALUES)

| | | Quantity Used | | | | | Economic Cost (Rs.M) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Increment | | | | | Increment | | |
| | | P | $\overline{W}$ | W | W-P | W-$\overline{W}$ | P | $\overline{W}$ | W | W-P | W-$\overline{W}$ |
| A. | Production Inputs for Paddy | | | | | | | | | | |
| | Land Preparation ('000ac) | 251 | 260 | 272 | 21 | 12 | 45.18 | 46.8 | 48.96 | 3.8 | 2.2 |
| | Seed ('000 bushels) | 502 | 520 | 544 | 42 | 24 | 38.7 | 40.0 | 46.2 | 7.5 | 6.2 |
| | Fertilizer Urea | 7490 | 7758 | 10,550 | 3060 | 2792 | 26.7 | 27.9 | 38.0 | 11.3 | 10.1 |
| | Basal Mixture | 7490 | 7758 | 10,550 | 3060 | 2792 | 23.97 | 24.8 | 33.8 | 9.8 | 9.0 |
| | Agrochemicals | - | - | - | - | - | 23.1 | 23.9 | 32.6 | 9.5 | 8.7 |
| | Miscellaneous | - | - | - | - | - | 7.8 | 8.1 | 10.9 | 3.1 | 2.8 |
| | Labour (M man-days) | | | | | | | | | | |
| | Peak Periods | 6.56 | 6.79 | 7.26 | 0.71 | 0.47 | 52.4 | 54.3 | 58.1 | 5.7 | 3.8 |
| | Moderately Peak Periods | 3.05 | 3.16 | 3.78 | 0.73 | 0.62 | 18.3 | 18.97 | 22.6 | 4.3 | 3.6 |
| | Slack Periods | 2.04 | 2.11 | 2.76 | 0.72 | 0.65 | 8.2 | 8.49 | 11.1 | 2.9 | 2.6 |
| | | | | | | | 244.4 | 253.3 | 302.3 | 57.9 | 49.0 |
| 2. | Production Cost (Coconut) | - | - | - | - | - | 84.7 | 84.7 | 111.7 | 27 | 27 |

P = Before Protect  $\overline{W}$ = Without Protect  W = With Protect

Annex XVI

PADDY AREA ; YIELDS & PRODUCTION

| | P | W | W | percentage Increase Over | |
|---|---|---|---|---|---|
| | | | | Before Project | Without Project |
| Asweddumized Area (000Ac) | 170 | 175 | 180 | 6 | 3 |
| Gross Sown Area (000Ac) a/ | 251 (148) | 260 (149) | 272 (151) | 8 | 5 |
| Average Yield (Bushels/Ac) c/ | 45 | 49 | 64 | 42 | 31 |
| Production (Million Bushels) d/ | 8.2 (171) | 9.2 (192) | 14.1 (294) | 72 | 53 |

P = Before Project
W = Without Project
W = With Project

a/ (i) Gross Sown Area represents 5 year average sown acreage
(ii) Figures in parenthesis are cropping intensity percentages.

b/ (i) Gross Harvested area represents 5 year average gross harvested acreage.
(ii) Figures in parenthesis give success rate percentages.

c/ Net harvested area basis (i.e. 85% of gross harvested area)
Figures in parenthesis are yields in metric tons per ac.

d/ (i) Production represent 3 year average production
(ii) Figures in parenthesis are production in thousand metric tons.

Annex XVII

COCONUT AREA ; YIELDS AND PRODUCTION

| | P | W | W |
|---|---|---|---|
| Coconut Area ('000ac) | 370 | 370 | 370 |
| Yields (Nuts/ac) | 1604 | 1859 | 1927 |
| Production (M.nuts)a/ | 593 | 688 | 713 |

P = Before Project
W = Without Project
W = With Project

a/ (i) Production represent 3 year average production.

(ii) Production without project is higher by 16 percent than the before project production, which is same as the percentage increase envisaged in the appraisal report.

(iii) Production with project situation includes production from replanted/under planted area as well.

*Annex XVIII

## KURUNEGALA RURAL DEVELOPMENT PROJECT
### Agricultural Extension

### Cost Estimates and Schedule of Expenditure

| | Item | Total Cost 1979-83 (Rs.Million) |
|---|---|---|
| I. | Civil Works | |
| | Staff Quarters in Remote Areas 1/ | 2.20 |
| | Extension of DAEO's Office | 0.20 |
| | Sub Total | 2.50 |
| II. | Equipment | |
| | Transport Vehicles 3/ | 3.80 |
| | Other Equipment | 0.35 |
| | Sub Total | 4.15 |
| III. | Technical Assistance | |
| | Overseas Study Tours | 0.50 |
| | Farm Management Advisor 4 | 1.85 |
| | Sub Total | 2.35 |
| IV. | Engineering & Administration | |
| | Implementation of Civil works 5/ | 0.35 |
| | Incremental Recurrent cost for Extension Service 6/ | 6.00 |
| | Sub Total | 6.35 |
| V. | Base Cost | 15.25 |
| VI. | Physical Contingencies 7/ | 1.10 |
| VII. | Price Contingencies 8/ | 3.65 |
| VIII. | Total Cost 9/ | 20.00 |

1/ 3 Quarters for AOs at Rs. 100,000 each;
10 Quarters for SMSs at Rs. 45,000 each;
15 Quarters for AIs at Rs. 45,000 each; and
15 Quarters for KVSs at Rs. 30,000 each.

2/ Including 50% import Duty on motor cycles and bycycles which are to be sold to the staff

3/ 3 man-years at US$60,000 per year

4/ 15% of I

5/ 10% of I and IV and 5% of II

6/ Assuming following price escalation factors:

| | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|
| Foreign Costs | 1.03 | 1.07 | 1.16 | 1.23 |
| Local Costs | 1.08 | 1.21 | 1.33 | 1.46 |

9/ Includes about Rs. 0.7M in taxes and duties.

Annex XIX

ANNUAL INCOME LEVELS

| | Dry | | Intermediate | | Wet | | All Zones | |
|---|---|---|---|---|---|---|---|---|
| | No. of HHs | Cumulative Percentage | No. of HHs | Cumulative Percentage | No. of HHs | Cumulative Percentage | No. of HHs | Cumulative Percentage |
| above 7000 | 5 | 12.5 | 47 | 15.7 | 4 | 25 | 56 | 15.8 |
| 7001 -12000 | 9 | 22.5 | 57 | 19.1 | 3 | 18.7 | 69 | 19.4 |
| 12001-20000 | 7 | 17.5 | 60 | 20.1 | 2 | 12.5 | 69 | 19.4 |
| 20001-30000 | 7 | 17.5 | 45 | 15.1 | 2 | 12.5 | 69 | 19.4 |
| 30001-60000 | 9 | 22.5 | 62 | 20.7 | 4 | 25 | 75 | 21.1 |
| 60001-100000 | 3 | 7.5 | 28 | 9.3 | 1 | 6.3 | 32 | 9.0 |
| | 40 | 100 | 299 | 100 | 16 | 100 | 355 | 100 |
| Per capita income | 1426 | | 1444 | | 1358 | | 1438 | |