KURUNDANKULAMA
DRY FARMING SETTLEMENT

A SOCIO-ECONOMIC APPRAISAL

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FOREWORD

Large extents of land in the Dry Zone will not be served with irrigation water for many more years to come even with the diversion of the Mahaweli. It becomes increasingly important therefore, to examine the prospects for introducing a stable system of rainfed farming in the areas traditionally dominated by a chena system of farming. The technical and socio-economic constraints to evolving a stable system have been numerous. However, on the basis of experiments conducted in the Dry Farming Research Station in Maha Illuppallama, the Department of Agriculture is now experimenting with a few technical programmes (under field conditions) with the intention of developing a suitable cropping system for the area.

The socio-economic aspects relating to the evolution of a suitable farming pattern for this area have not been subjected to any indepth investigation so far. It was with a view to filling this gap that the Agrarian Research and Training Institute embarked on a major study entitled - *"A Socio-Economic Study of Rainfed Farming Systems in Selected Areas of the Dry Zone of Sri Lanka"*.

The present study forms a part of this larger study. Both the Department of Agriculture and the ARTI considered it relevant and useful to evaluate the performance of the *Kurundankulama* Dry Farming Scheme over the last few years in order to obtain detailed information for planning the reorganisation of the scheme. Although the present study was mainly intended to serve this limited purpose it is hoped that along with the other complementary parts of the study that are now under preparation it will provide some useful guidelines for the development of Dry Zone agriculture.

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1. INTRODUCTION

Several dry farming schemes were initiated by the Department of Agriculture in the late 1930s and in the 1940s to see how the "wanni" villager responded to dry land arable farming; ascertain the extent of unirrigable land an average peasant family could farm efficiently using simple bullock-drawn implements, and also the income from it to find out whether the fertility of soil could be maintained under the prevailing conditions of rainfall.

Kurundankulama, the first of these schemes, was started in 1938. Several others were subsequently tried out in the Anuradhapura and Kurunegala districts.[1] Initially these schemes were managed by the Department of Agriculture, but due to management and other difficulties were later entrusted to the Government Agents of the respective districts.

The success or otherwise of the *Kurundankulama* experiment has often been raised and also whether it has provided any useful guidelines for the development and settlement of the unirrigable highland areas in the dry zone. The present study sought to answer some of the questions and more particularly to ascertain the present situation in the scheme in terms of the prevailing socio-economic conditions.

The study forms part of a larger study entitled "A Socio-Economic Study of Rainfed Farming Systems in Selected Areas of the Dry Zone of Sri Lanka", undertaken to examine the problems and prospects of development of the unirrigable highlands in the dry zone. Two village clusters, one representing an "open land resource situation" (long fallow chena), and the other a "closed land resource situation" (short fallow chena), are being intensively studied for this purpose since late 1975. An examination of the performance of the already established dry farming schemes was considered relevant and useful in order to learn from past experiences. It was with this objective that

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1 Relapanawa and Olukaranda

the *Kurundankulama* scheme was included in the study. There was also another important reason for undertaking this study. The Department of Agriculture which had already made arrangements for reorganising the above scheme was interested in obtaining detailed background information for planning the reorganisation.

The scheme was surveyed in December 1975 and an Interim Report was issued in July 1976. As data collection for the main study would continue till late March 1977, it was decided to make available a more detailed report on the *Kurundankulama* scheme to both the staff of the Department of Agriculture and the general public before the publication of the main report.

The data for this study was collected mainly through a questionnaire administered to all heads of households in the scheme. Altogether sixty-six households consisting of fifty-six old settlers and ten second generation settlers were surveyed.

The survey was designed to collect information on the following aspects : Demographic data; Land Ownership and Operation; Land Use and Agricultural Practices; Farm Power and Equipment; Extension, Marketing and Input Supplies; and Farmers' Views on the future of the scheme.

Relevant information on the scheme was also obtained from official records available at the Kachcheri, the District Agricultural Extension Office, Anuradhapura and supplemented by informal interviews with settlers in the scheme and officials who knew about the settlement.

2. EVOLUTION OF THE SCHEME

2.1 The Initial Phase : Individual Farming

The Kurundankulama dry farming scheme[1] was started on a 100 acre block of unirrigable land, four miles East of Anuradhapura. Initially ten families were selected, all of whom except one were from the Wet Zone as the typical Dry Zone farmer was not willing to leave his purana village.[2] The 100 acre block was divided into ten equal units. The development of the land was done by the Agriculture Department at its expense and the settlers paid for their work. The work was completed in 1943. Each farmer was provided with a wattle and daub house, a cattle shed and a poultry run. An acre was reserved for the homestead and the remaining 9 acres were to be developed as follows : 6 acres for annual crops, 1 acre banana for five years, 1 acre napier fodder and 1 acre permanent paddock. Each settler was given a pair of draught bulls, 1 cow, a pen of poultry and implements and tools.

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1 Information on the period prior to 1954 is drawn from the following sources :

a. Jinendradasa, P.T. Rotational Farming Scheme, Kurundankulama. Tropical Agriculturalist Vol. 12, 1948. pp. 191-229.

b. Karunaratne, C.R. "The Progress of Dry Farming Schemes in Ceylon". Tropical Agriculturalist Vol. 112, 1956. pp. 233-250.

2 This is discussed elsewhere.

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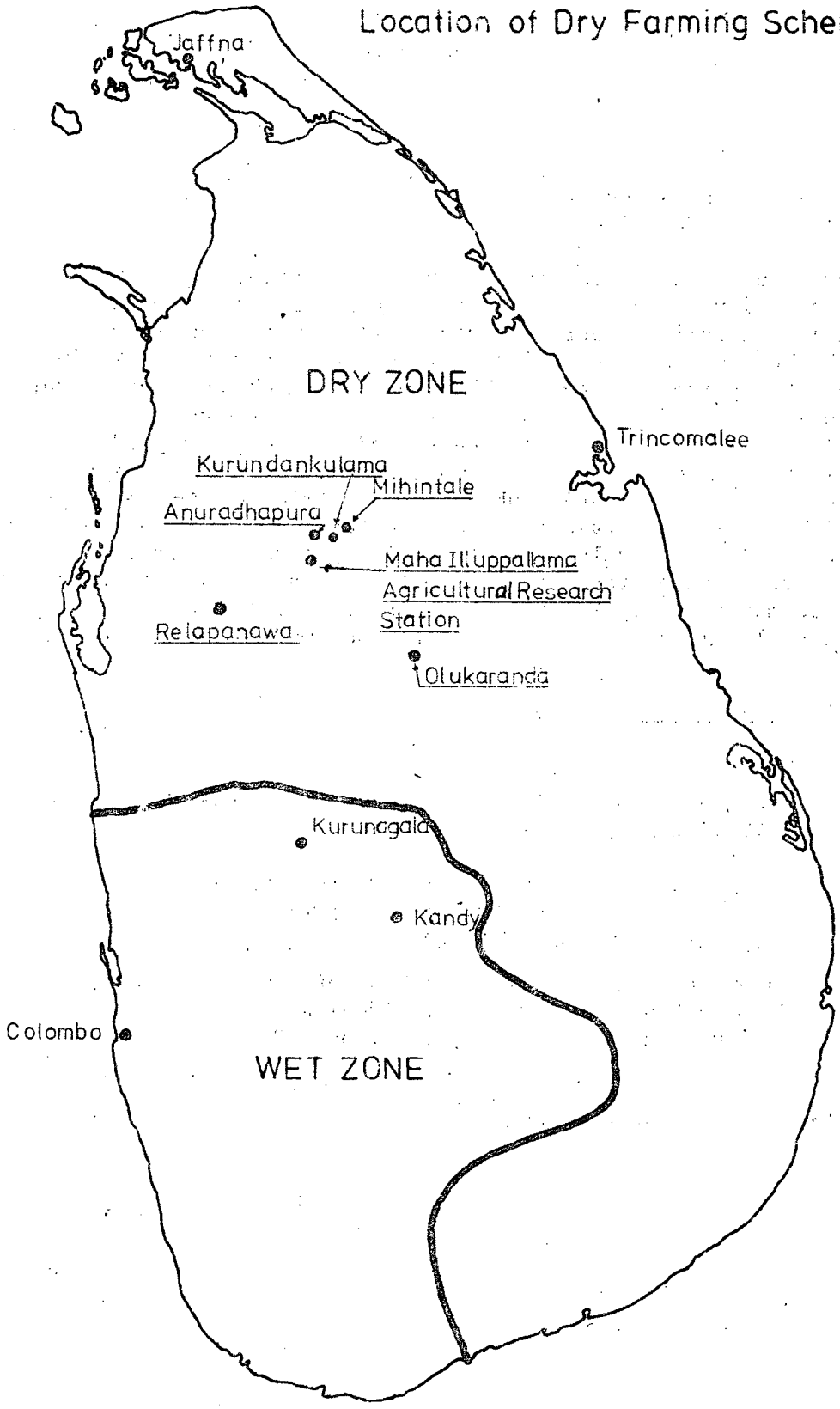
Location of Dry Farming Schemes



Advice on agricultural matters was provided by a resident Agricultural Instructor. The settlers worked their holdings independently.

2.2 Second Phase
Introduction of a Cooperative System

A major change took place in 1948 when six families were settled on an additional extent of 84 acres to be worked cooperatively. Each settler was entitled to 14 acres of land and 2 acres were given to each for a homestead to be worked individually. The remaining extent of 72 acres were to be worked cooperatively on a four year crop-livestock rotation, under the supervision of the resident Agricultural Instructor.

This arrangement continued until 1950. However, several settlers were replaced during this period. The entire scheme was soil conserved on a catchment basis and ten new cottages replaced the wattle and daub houses.

2.3 Third Phase
Transformation of the Scheme to a Cooperative Farm

Another major change occurred in 1950, when the entire settlement was converted into a cooperative farm. The scheme was also extended and the settlement replanned. Eleven units with 4-9 houses and a well in each were established. Seven abandoned tanks were repaired. The new allottees were selected by a Land Kachcheri held in 1951. Preference was given to those with practical farm school training, (mostly young persons). The majority of the settlers selected were from the Wet Zone districts. In 1954 there were fifty-four settlers in the scheme. However, by this time most of the youth had left the scheme and the vacancies were filled with landless peasants from the North Central Province, North Western Province and the Wet Zone districts.

Settlers were allotted 14 acres of land each on a permit and each had to pay Rs 10 per annum for every acre under cultivation. Of these 14 acres, 2 acres constituted the homestead to be worked individually. The rest was to be farmed cooperatively on a crop-livestock rotation.

A Cooperative Agricultural Production and Sales Society was established for the scheme with the allottees as members. The resident Agricultural Instructor was the President and the Treasurer of this society which was responsible for the supply of credit, consumer articles, issue of animals, equipment and inputs on loan or hire to members. The produce from the scheme had to be disposed of through the society.

All cultivation programmes of the settlement were decided by the Dry Farming Officer. Each unit had its own leader (Gamarala) selected each year before the Maha cultivation season. His

functions were to guide members; maintain check lists of labour; record produce harvested; settle petty disputes and quarrels and represent the unit at the Working Committee of the society.

The Gamarala was paid a bonus of 1% of the gross income of each member. The members were paid according to the labour contributed. The President of the society maintained a check role on labour turn out.[1] Each unit farmed separately under the leadership of the Gamarala. The harvested produce from each cooperative unit was handed over to the society stores. These were valued and the settlers were paid in accordance with the labour value they contributed.

2.4 Fourth Phase
Collapse of Cooperative Farming and the General Neglect of the Scheme

The attempt at cooperative farming was short-lived. Gradually co-operative work was being replaced by individual farming. In 1957 the settlers were all cultivating the land individually. By this time there had already been requests by farmers for allotments of individual holdings.[2] Animal husbandry had declined with the collapse of the cooperative system. The farmers had been cultivating only a portion of the entire extent. The close involvement of the Agriculture Department had also been gradually withdrawn.

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1 Labour units :

adult male = 1 unit
adult female and children between 16-18 = 0.75 unit
children between 14-16 = 0.5 unit.

2 Letter from Director of Agriculture to Government Agent, Kurunegala and Anuradhapura dated 7.4.65 - subject : Handover of dry farming schemes to G.A.

This situation seemed to have continued till about 1965 when proposals were made to hand over the scheme from the Agriculture Department to the Land Commissioner or the Government Agent. By this time it was considered that reverting back to communal farming was not possible[1] and that the farmers had to be given individual holdings. It was also felt that the unit of 14 acres was too large for a family and that the family farm should not exceed 5-6 acres.[2]

According to records, by a Land Kachcheri held at Anuradhapura on 1.11.1969, fifty-five settlers were allotted 8 acres each and their eldest child 6 acres each. The allotments were given under the Land Development Ordinance. The situation since then had been somewhat confusing. However, permits have not been issued to the allottees though thirty-two permits were reported to have been issued by the Anuradhapura Preservation Board.[3]

No definite titles have been issued to the settlers to-date. Recent records on the scheme indicate some uncertainty about the scheme. The settlers constantly asked for a solution to the problem through their rural development society or through the Member of Parliament and more recently through the APC.[4] Since the early 1970s, the proposed Sale of State Lands Act seems to have kept the issue in abeyance. The question yet remains unsolved, though the likelihood is that under the Act the land would be sold to settlers.

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1 Letter from Government Agent to Additional Land Commissioner 22.5.1967.

2 Inspection Report - 5.8.1968.

3 Letter from Government Agent to Land Commissioner 3.10.1974.

4 Letter from Secretary, Agricultural Productivity Committee to the Government Agent 16.2.1975.

3. PERFORMANCE OF THE SCHEME

Although one of the objectives of the exercise was to get Wanni farmers to practise settled rainfed farming, it was not possible to draw them into the scheme. The Wanni farmers were not willing to leave their village not only "because of a reluctance to leave their traditional homes",[1] but also because they were not prepared to undertake highland farming without any paddy cultivation. The importance to the traditional Dry Zone farmer of the three-fold land use system comprising irrigated paddy cultivation under the village tank, home garden and chena cultivation has been repeatedly mentioned.[2] If a system of dry land farming is to succeed it is essential that the production programme should include some paddy cultivation as well.

As most settlers came from the Wet Zone areas, the Dry Zone environment presented several problems. The threat of malaria and problems of isolation were still present in the early 1940s. The adjustment to the new environment was a difficult one. This led to many of the early settlers leaving the scheme. Most settlers were also used to wet paddy cultivation and were completely new to Dry Zone crops. The crops that were cultivated fetched low prices, especially due to large scale import at the time of many of the food items. Many settlers got discouraged and left the scheme at various points of time. Vacancies had to be filled with new settlers. Planning a long-term development programme for the entire settlement was thus rendered difficult.

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1 C.R. Karunaratne, op. cit.

2
(a) E.F.L. Abeyratne, "Dry Land Farming in Ceylon". Tropical Agriculturalist Vol. 12,1956, pp. 191-229.
(b) B.H. Farmer - Pioneer Peasant Colonisation in Ceylon, Oxford University Press, 1957.
(c) E.R. Leach - Pul Eliya, a Village in Ceylon, Cambridge University Press, 1961.

Cooperative farming appeared to be successful initially but many problems arose. The cooperative concept was not well understood and the settlers who were from different areas and belonged to different social backgrounds found it difficult to work together. The system was also imposed on the farmers and official records indicate that it was carried out under strict official supervision. The resident Agricultural Instructor functioned as the Scheme Manager. The experiment was first seen as a technical one since its main objective was to explore the possibilities of settled rainfed farming. When the added dimensions of cooperative farming was introduced difficulties associated with cooperation began to tell on the initial programme as well.

The cooperative farming system itself had a number of limitations. First, the supervision and control exercised by the Project Manager did not give the settlers an opportunity to find their own leaders and strengthen their institutions. Also the alleged corruption of the officers in charge of the scheme and who were directing the cooperative farming system led to the settlers losing faith in the system itself.

With the collapse of the cooperative system the settlers experienced several problems.

The scheme was left in a vacuum as withdrawal of extension advice affected the continuity of the agricultural programme. Reverting back to individual operation led to the decline of animal husbandry as rearing of animals under a system of individual ownership presented several problems and the collapse of the animal-crop rotation and the withdrawal of the common use of machinery and other equipment available to the cooperative led to large areas being left fallow.

By late 1950s the interest of the Agriculture Department had declined. The settlers cultivated the land individually. Although intensive extension facilities were not available the farmers continued on the basis of the experience gained. Information on new and better crops filtered into the scheme through enterprising farmers and through the normal extension channels. Expanding markets and favourable prices for certain agricultural products like chillies, pulses and grains too had a favourable impact. Closeness to Anuradhapura town was another factor which helped the farmers to market the produce and even to find additional employment opportunities. The high prices for chillies in particular, and for other products like cowpea, greengram etc., during the recent past, enabled the farmers to obtain good incomes. Since late 1960's the settlement had got established. Even grown up children now remained in the scheme. The social and economic conditions in the scheme, as will be shown later, are relatively more favourable than in many purana villages of the area.

The withdrawal of the Department of Agriculture took place at a time when more research findings on various aspects of dry farming were being made available by the Maha Illupallama Research Station. It was also during this period that the producer was able to get better prices for farm products.

4. GENERAL CHARACTERISTICS OF HOUSEHOLDS IN THE SCHEME

4.1 Population Characteristics

Sixty five households were surveyed, fifty five of which were those of old settlers. Ten second generation households operated independently of the parent households.

Almost all the old settlers had come from the Wet Zone districts and even the majority of the heads of second generation households were born outside the Dry Zone. The present day settlers joined the settlement at various points of time, as indicated below. The majority however, joined after 1950.

Before 1950	8%
Before 1960	73%
After 1960	16%

There were 416 persons in the scheme. The average household had six members, a figure almost identical with the average in the rural sector. The Table below gives the breakdown of the population agewise. 53% of the population is in the age group 10-30 years, and most of them in the age group 15-30. This accounted for 39% of the total male population.

Table 1 Distribution of Population by Age and Sex

		Age Groups					
		10 years	10-14	15-30	31-50	51/	Total
Male	No.	43	34	86	30	25	218
	%	*20*	*16*	*39*	*14*	*12*	*100*
Female	No.	39	37	54	44	12	186
	%	*21*	*20*	*29*	*24*	*7*	*100*
Total	No.	82	71	140	74	37	404
	%	*20*	*18*	*35*	*18*	*9*	*100*

One household has not reported age of their members (six males and six females)

Over 90% of the population above ten years of age have had some formal education. While almost 60% had over six years of schooling only 9% were educated beyond the GCE (O'Level).

Among the heads of households, 16% have had no education. 30% have studied beyond grade 5 but GCE. Almost 50% had received an education up to grade 5 only.[1]

Table 2 Level of Education of Persons Aged 10 and above

Level of Education	No.	%
No schooling	30	9
Upto 5th standard	97	30
6th standard - GCE (OL)	162	51
GCE (OL) and higher	29	9
Technical/professional	4	1
T o t a l	322	100

4.2 Household Activity

Households were classified into two groups on the basis of activity :

(a) agricultural households - 39 (60%) - defined as households in which all working members are engaged in agricultural activity;

(b) agricultural-cum-non-agricultural households - 26 (40%) - defined as households in which at least one member is employed outside agriculture.

Initially all would have started as purely agricultural households, but there had been a trend towards non-farm activity especially with the emergence of the second generation. However, the predominance of agriculture in the economy of the scheme is borne out by the classification of the population on the basis of their activity.

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1 Information in respect of 7% of heads of households was not available.

Table 3 Population Classified on the Basis of Activity

	No.	%
Agriculture	190	47
Agriculture + non-agriculture	24	6
Non-agriculture	7	2
Unemployed	4	1
Students	110	27
Mainly engaged in household work and others	69	17
T o t a l	404*	100

* Information in respect of twelve persons were not available.

Agricultural occupations relate to the following employment status : operator, labourer and unpaid family helper.

The degree of diversification of the Kurundankulama economy is seen to some extent in the structure of non-farm employment. The total number of non-farm employment (full-time and part-time) is not very significant being only 15% of the total employed. Salaried white-collar groups and skilled workers form the most important category.

Table 4 Occupational Classification

	No.	%
Salaried or white-collar	9	28.1
Non-salaried	4	12.5
Trade and commerce	5	15.6
Skilled jobs including weavers	11	34.4
Labourers	3	9.4
Not specified	-	-
T o t a l	32	100.0

86% of the total work force is in agriculture. Only a few were engaged in non-agricultural occupations such as salaried/white-collar jobs, trade and commerce. Most of the non-agricultural workers were employed mainly in Anuradhapura to which they commute daily.

4.3 General Living Conditions

Agriculture is the main source of income of practically all households. Nineteen households had incomes from non-agricultural sources too. Agricultural income was mainly from the land cultivated within the scheme. Several families (22), however, obtained additional incomes from chena cultivation[1] on land outside the scheme.

[1] Shifting cultivation

The average annual income of a household in the scheme was Rs 4,944 in 1975, giving a monthly income of Rs 412. The agricultural-cum-non-agricultural households had higher incomes.

Table 5 Levels of Income - 1975

Type of Household	No. of house-holds reporting	Average household income (annual) Rs
Agricultural households	38	4,276
Agricultural + non-agricultural households	19	6,278
All types of households	57	4,944

The monthly earning of an agricultural household was Rs 356, an income that was generally higher than in the purana villages. The potential income should be much higher as drought conditions had adversely affected production during this crop year. High prices prevailing for highland produce would have arrested the decline in incomes to a certain extent.

Table 6 Composition of Income - 1975
(All types of households)

	Agricultural		Agricultural + non-agricultural		All types	
	Rs	%	Rs	%	Rs	%
Paddy	11	*0.2*	-	-	7	*0.1*
Highland - seasonal	2,190	*51.2*	2,352	*37.5*	2,244	*45.4*
perennial	413	*9.7*	437	*7.0*	421	*8.5*
Chena	543	*12.7*	241	*3.8*	442	*8.9*
Sub-Total	3,157	*73.8*	3,029	*48.2*	3,115	*63.0*
Livestock	668	*15.6*	138	*22*	492	*10.0*
Off-farm employment	216	*5.1*	2,929	*46.6*	1,120	*22.7*
Others	235	*5.5*	182	*2.9*	217	*4.4*
T o t a l	4,276		6,278		4,944	

The share of perennial crops and chena is around 9% each. Some agricultural households still rely on chena cultivation despite the fact that they have been allocated 14 acres of highland each. The reasons for this are discussed elsewhere. It was found that the agricultural and non-agricultural households derive 47% of their income from off-farm employment. This situation raises two important questions - (i) the degree of interest of these households in farming activities; (ii) the extent of investment of their earnings on the farm.

Relatively favourable living conditions are also reflected in housing. The houses, except those of the second generation farmers are of good condition with brick walls and permanent roofs. These were provided by the State. The second generation houses constructed by the farmers themselves have mud walls and thatched roofs. Information on the ownership of consumer durables also serves as a measure of the economic level of the households.

Table 7 Household Goods

	Households Owning	
	No.	%
Bicycle	41	66
Radio	31	50
Sewing machine	27	44
Cart	7	11
Wall-clock	29	47
Petromax lamp	35	56

(Number of households reporting = 62)

Each unit has a common well and several households have constructed their own wells for domestic purposes.

87% of the households had latrines, half of which were of the improved type (water seal). These reflect the better living conditions of the average Kurundankulama farmer relative to his counterpart in neighbouring purana villages.

5. LAND OWNERSHIP

The land tenure system in the scheme had undergone several changes since the allocation of individual holdings in 1969. According to official statistics the scheme has 784 acres of developed agricultural land including homegardens. The survey, however, reported only 660 acres. The discrepancy may be due to several reasons : some settlers are themselves not certain of the extent allocated to them, as none of them possessed any titles or documents; some settlers have left the scheme selling their entire allotment to outsiders; others have sold or leased parts of their land to outsiders or to the colonists themselves. Some of these lands have not been reported during the survey.

The reported extents of land now operated by the colonists show considerable variation from the original allocations in 1969. In some cases the entire family allotment (14 acres) is operated as one unit. In such cases the 6 acres apportioned to the eldest child is not worked independently. In others, the second generation holding is operated separately. Due to part sale or lease,[1] some settlers operate on holdings which are different in size from the standard allotment given originally. Table 8 shows the size distribution of operated holdings.

Table 8 Distribution of Households Operating Paddy Chena and Highlands by Size of Allotted Highland

Size of highland holding (acres)	Paddy land outside the scheme		Chena Maha 1975-76		Allotted highland within scheme	
	No.	%	No.	%	No.	%
14	-	-	4	18	17	26
8 / 14	2	100	13	59	31	48
6 / 8	-	-	1	5	5	8
/ 6	-	-	4	18	12	18
Total	2	100	22	100	65	100

1 Five cases of leasing out and three cases of leasing in were reported. It is likely that hidden land transactions were not always reported.

74% of the households operated on holdings of 8 acres and above. 26% still operated the original standard allotment of 14 acres.

It has been pointed out that a holding of over 5 acres is too large for a household to be worked by family labour using simple equipment. The implications of this situation are discussed under labour, power and agricultural practices.

Almost all the operators owned land only within the scheme. Only two households had some paddy land outside it. However, twenty two households (39%) cultivated chenas outside the scheme (on teak plantations adjacent to the scheme). The majority of those who practise chena cultivation are also the larger operators; many of whom cultivated only a portion of their holding in the scheme.

Food production for home consumption (23%)
As an additional source of income (20%)
Low cost of cultivation (17%) and
Lack of water in the scheme (17%), were the main reasons given for cultivating chenas outside the scheme. However, it is generally known that the preference shown for chena cultivation is due primarily to the low operation cost, less weed control, land preparation, fertiliser, etc. Crops also appear to resist drought better on new chenas than on continuously cultivated highlands.

Some of the major problems associated with land ownership in the scheme are :

i. Absence of any titles to the land. This has created a feeling of uncertainty among the settlers and has therefore prevented permanent improvements to the land. It has also resulted in some farmers leaving the scheme or trying to obtain employment with greater security outside the scheme;

ii. Land transactions[1] have already taken place in the scheme. Some have leased or sold their entire allotment to outsiders who are not cultivators. In addition, some outsiders have obtained land on lease for cultivation by using machinery and hired labour. This tendency needs to be arrested;

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1 It was difficult to assess the extent of these transactions.

iii. In some instances, the allocation of individual holdings have not been properly planned, thereby creating several problems -

(a) the homestead and the agricultural plots are often situated far apart resulting in one of the two being generally neglected (25% of the agricultural plots were situated at a distance of 1/4 mile or more);

(b) in some cases, land allocation has not taken into consideration the terrain of the land. Some have their entire holdings on high-ground and others low elevations.

6. LAND USE AND AGRICULTURAL PRACTICES

6.1 Land Use

A total extent of 658 acres of cultivable land including homegardens was reported. Homegardens consisted of 2 acre holdings in the old allotments and 1 acre in the second generation allotments. All homegardens are planted with perennial crops such as banana, coconut, mango, jak, orange and others. However, crops such as mango, cashew and jak which could generate a reasonable income are not widely grown. In the second generation allotments only a few permanent crops have been planted.

In Maha 1975/76, 263.52 acres (40%) of the agricultural land were cultivated while 166.75 acres (25%) were cultivated during Yala 1975.[1] The extents cultivated under different size classes is shown in Table 9.

Table 9 Highland-Extents Cultivated in Maha and Yala

Size of highland holdings	Total cultivable acreage	Acreage cultivated (Maha 75/76)	%	Acreage cultivated (Yala 75)	%
14 and above	238.0	76.01	*32*	51.75	*22*
8 / 14	332.5	138.64	*42*	80.50	*24*
6 / 8	33.5	29.25	*85*	16.50	*50*
/ 6	54.0	19.62	*37*	18.00	*33*
All size classes	658.00	263.52	*40*	166.75	*25*

The allotted land is under-utilised. Even in Maha, 60% of the land remains uncultivated. This also has to be viewed in the light of 39% of households practising chena cultivation outside the scheme, and the reliance on off-farm work.

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1 Cultivation of perennial crops was not taken into consideration here.

In the largest holdings the proportion of the extent cultivated during both seasons is low compared to smaller size classes.[1] The optimum size of holding a family could farm under rainfed conditions needs therefore, to be examined.

6.2 Cropping Pattern

A tight cultivation schedule is imposed on the farmers due to the sole reliance on rainfall for agriculture. In order to get the maximum benefit from the rainfall farmers are compelled to start planting operations with the initial rains. The demand for labour and farm power is highest during this period. This is particularly important during Maha season when a larger extent is cultivated than in Yala.

In the early days of the scheme, the farmers had grown a variety of crops. The Tables below indicate the cropping pattern in the scheme during the years 1960-1965 and 1975-1976.

Table 10 Cropping Pattern 1960-1965

	Acreage Cropped						
	59/60	60/61	61/62	62/63	63/64	64/65	65/66
Paddy	60	47	57	90	84	154	85
Gingelly	71.25	50.25	100.5	142	136	101	-
Kurakkan and Mustard	30	1	14	11	10	6.5	6
Maize	3	1	1	-	1	-	-
Cowpea	25	8	14	17	4	8	-
Greengram	9	-	6	7	4	4	10
Chillies	60	107	98	150	146	189.5	151
Beans and other vegetables	24	20	22	28	14	17	25
Groundnut	5	4	1	1	2	10.25	8
Cashew	12	-	1	-	-	-	-
Brinjal	17	19	17	19	17	21.5	18
Sorghum	-	-	-	0.5	290	380	-
Other	-	-	-	-	-	-	9

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1 However, it is difficult to make generalisation on the comparative cropping intensity because of the relatively limited extents in the smaller size classes.

Table 11 Cropping Pattern - 1975-76

Crop	Maha 1975/76 Acres	%	Yala 1975 Acres	%
Paddy	21.75	8	2.50	2
Gingelly	-	-	156.00	93
Kurakkan	18.25	7	1.50	1
Maize	6.87	3	-	-
Cowpea	42.74	16	.75	-
Greengram	12.38	5	-	-
Chillies	116.75	44	3.25	2
Yams	27.26	10	.25	-
Vegetables	14.00	5	2.50	2
Others	3.52	2	-	-
T o t a l	263.52	100	166.75	100

A comparison of the two Tables indicate that little changes have occurred in the types of crops cultivated in contrast to the purana villages close to Kurundankulama. It was only recently, particularly with the 'chilli boom', that the purana village farmers took to the cultivation of cash crops such as chillies, cowpea, greengram, etc., instead of the traditional chena crops. On the other hand the Kurundankulama farmers had been growing cash crops since the commencement of the scheme. This is primarily due to the intensive extension services provided by the Department of Agriculture.

A notable feature in the cropping pattern is that chilli continues to be the dominant Maha crop and gingelly the main Yala crop as it was in the early sixties. The acreage under cowpea has increased to 42.74 acres or 16% of the Maha 1975/76 acreage. On the other hand the cultivation of highland paddy in recent years has been greatly reduced amounting to only 21.75 acres (8%) compared to acreages in 1964/65 and 1965/66. This may perhaps be due to the inadequate rainfall in recent years. The cultivation of crops such as cotton, sorghum, groundnut, etc., have now been abandoned. Low prices, poor marketing facilities, difficulties of crop care and management were some of the main reasons given by the farmers for the discontinuance of these crops.

Some farmers also indicated their desire to cultivate or extend the area under cultivation of crops such as Me (Bushitava), cowpea, groundnut and greengram. The reasons for the preference of these crops are given in the next page.

Table 12 Preference for New Crops

Reasons	No. of Households			
	Bushitava	Cowpea	Groundnut	Greengram
Better prices	4	12	1	4
Were resistant to drought	3	5	2	1
Short-term crop	6	3	1	1
High yield	5	2	0	0
Good as a meal	2	8	0	0

Systematic forms of crop or animal-crop-rotation practised at the inception have been gradually abandoned with the collapse of the cooperative system and the allocation of individual holdings.

6.3 Cultural Practices

i. Land Preparation

The land is generally tilled for cultivation. Most of the farmers use tractors for ploughing. Animal drawn implements are used to a lesser degree. Difficulties in obtaining tractors, the high cost of hire and lack of adequate finances are some of the major problems faced by the farmers in land preparation.

Timeliness of initial operation is one of the key factors in successful dry land farming. The land has to be got ready with the first rains. If the extent is large, as is generally the case here, tractor ploughing is imperative. Animal drawn implements are less efficient in this respect. This explains why tractor ploughing is popular even though it is expensive.

ii. Crop Varieties, Fertiliser Use, Weed and Pest Control

The main cash crops cultivated other than crops like kurakkan, gingelly, maize, etc., are of improved varieties. However, the farmers still continue to use seed material from the same stock without renewing them. This has resulted in lowering the vigor of the plants and hence they succumb more readily to unfavourable conditions.

In recent years the farmers have been adopting some improved cultural practices in respect of certain crops. Thirty four households reported fertiliser application for chillies but only seven households reported its use for cowpea. Almost all farmers had adopted weed control for crops like chillies and cowpea. Routine pest and disease control measures are not adopted by all farmers. Only thirty four households reported pest and disease control for chillies and cowpea.

Crop failure had been a common phenomenon during the last five years. This is mainly due to inadequate rainfall. Most farmers reported that they have had only one good season since 1970.

Inadequate family labour, insufficient funds to hire tractors and the absence of supplementary irrigation facilities were some of the main problems faced by farmers during land preparation and planting.

6.4 Irrigation and Land Development

The rainfall obtained in recent years have had often been inadequate for raising a successful crop even during the Maha season. The wells constructed by the State, one in each unit, far from being sufficient for cultivation, barely suffice for domestic purposes. Some farmers have constructed wells on their own and at present there are forty three such wells. But these are sufficient only for domestic purposes. If new wells are constructed or the existing ones deepened water would be available during Maha[1] as well as in Yala for intensive vegetable growing.

In the early days of the scheme, systematic soil development measures like contour bunding, strip cropping, and so on were done which minimised soil erosion. After the land was given to individual farmers this work ceased. A continuous exploiting of the soil without adequate land development work could have drastic effects on cultivation. This is already evident in some areas of the scheme where erosion has made the soil gravelly and unsuitable for cultivation of some crops. There is now an urgent need for the adoption of adequate land development measures involving a considerable financial outlay.

6.5 Animal Husbandry

Forty five households reported that they were engaged in animal husbandry earlier. The total number of cattle owned by them had been almost 1000 and the number of birds about 800 in the fifties. However, in 1964[2] the total cattle population in the scheme had been 386 heads, (9 per household) and a flock of 246 birds.

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1 Such irrigation facilities would be required to tide over drought periods.

2 From official records.

Today the livestock industry does not play any significant role. Only twenty six households (40%) reported the ownership of cattle, eight households (12%) poultry keeping and only one household goat rearing. The breakdown of the ownership of livestock is given in Table 13.

Table 13 Ownership of Livestock

	Households reporting		No. of animals	No/head of reported household	No/head of household in the scheme
	No.	%			
Cattle	26	40	134	5.5	2.2
Neat-cattle	26	40	139	5	2.1
Buffaloes	1	-	4	-	-
Poultry	8	12	54	6.7	1
Goats	1	3	-	-	-

85% of the households engaged in cattle rearing milk their herd. However, only six households (27%) reported the sale of milk. The cows reared are of indigeneous breeds.

The households which were earlier engaged in animal husbandry and have since given it up gave the following reasons for doing so -

Table 14 Reasons for Discontinuing Animal Husbandry

Reasons	No. of households reporting		
	Neat cattle	Poultry	Goats
Sold due to financial difficulties	20	4	1
Lack of pasture land	11	-	-
Disease	10	2	-
Theft	4	2	-
Lack of water	3	1	1
Others	2	3	-

No. reporting = 45

Common grazing lands within the scheme are absent especially since the land was blocked out into individual holdings. However, 85% of the farmers indicated their desire to engage in livestock farming, 65% for milk production, 34% for draught power and 16% to obtain organic manure. The main reasons which prevented the farmers from expanding their livestock are given in Table 15.

Table 15 Problems in Expanding Livestock Enterprises

No. of households reporting = 54

	Households reporting	
	No.	%
Lack of finance	34	63
Lack of pasture land	27	50
Lack of water	15	28
Theft	10	19
Lack of labour	8	14
Difficulty in getting good breed cattle	4	7
Others	9	17

As pointed out earlier, lack of sufficient grazing lands is one of the major constraints for the expansion of animal husbandry. This needs to be given sufficient thought in any future programme for reviving this activity.

7. FARM LABOUR, FARM POWER AND FARM EQUIPMENT

7.1 Farm Labour

The labour use pattern in the Kurundankulama area has special relevance in view of the large size of highland allotments. It has been argued that a unit of 14 acres is too big an area to be farmed with family labour only. The number of labour units available for own-farm work in the Kurundankulama area averaged 1.5 full-time units and 1.8 part-time units. The following Table indicates the availability of family labour on the basis of the size of holding.

Table 16 Labour available for Farm work by Size of Farm

Size of farm (highland) acres	No. of house-holds	Full-time		Part-time	
		Total	Average	Total	Average
/ 6.0	11*	7	1	19	2
6 - 8.0	5	4	1	9	2
8 -14.0	31	55	2	61	2
14 and above	17	28			
All size classes	64	94	1	117	2

* One household did not report activity of family members.

Only twenty-six households expressed the view that the size of highland holding was too large for family labour.[1] However, the experience of a pilot project on rainfed farming at Maha Illupallama Research Station suggests that five acres could be reasonably managed by family labour. Hence the need for reliance on

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1 This may partly be due to the recent drought conditions which restricted the cropped area thereby relieving pressure on available labour supply.

outside labour if reasonable cropping intensities are to be maintained on a 14 acre holding. In cultivation operations, only thirteen households relied on family labour alone, but 75% of the reporting households used both family and hired labour which indicates lack of consistency between the adequacy of family labour as reported and the use of hired labour which was resorted to by forty seven households. The following reasons have been given for using hired labour.

Table 17 Type of Labour Used

Type of labour used	No. of households reporting
Family labour only	13
Family and attan	2
Hired labour only	-
Family + hired labour	45
Family + hired + attan	2

Table 18 Reasons for Using Hired Labour

Reasons	No. of households reporting
Holding is too large	7
Lack of family labour	33
Cultivation has to be done in time	28
Others	2

No. of households reporting = 45

Inadequacy of family labour and tight cultivation schedules were the main reasons for using hired labour. The major operations involving hired labour are : land preparation and ploughing, sowing, weeding/mammotying and harvesting. Most of these operations have to be completed within a very short period of time. The shortage of labour becomes particularly acute when land preparation is delayed because of difficulties in obtaining tractors.

The main sources of hired labour were indicated as follows :

Table 19 Sources of Hired Labour

Source	No. of households
Neighbours	26
Purana village (nearby)	10
Neighbouring villages	21
Other	2

No. reporting = 47

Only twelve households said they experienced a difficulty in hiring labour because of the high wages involved. Peak labour requirements occur in the months of October, November and December. This coincides with the major Maha season operations. Hardly any household reported using hired labour during the May-August period which is the slack season in agricultural activity. The following Table indicates the pattern of activity during slack periods.

Table 20 Type of Work done when no Work is Available in Own Farm

	No. reporting
Labour	20
Mason and carpentry	4
Animal husbandry	2
Other	4
No work	18

This points to the low opportunities available for non-farm activity and also is a reflection of under-utilisation of labour resources. This labour may be absorbed through an agricultural intensification programme or through generation of agro-based industrial activities within the scheme.

7.2 Farm Power

The farm power situation assumes importance in view of the large holdings and different types of operations in a dry farming system.

As pointed out earlier, use of tractors on large holdings is essential if timely cultivation (to match the rainfall pattern) is to be effected. The following Table shows the relative importance of different forms of farm power :

Table 21 Forms of Farm Power

	No. reporting	%
4-wheel tractors only	42	68
2-wheel tractors only	5	8
Buffaloes/cattle	1	2
Tractors and cattle	11	18
Others	3	4
T o t a l	62	100

Both buffaloes and 2-wheel tractors were used for highland cultivation. 68% of households rely on 4-wheel tractors for farm operations. Though most farmers use tractors, only one household owned a tractor. The following are the major sources of tractor supply.

Table 22 Tractor Sources

Source	Households reporting No.	%
Owned	1	2
Private tractor owner	18	32
Government Tractor Unit	24	42
Private and Government Unit	14	25
T o t a l	57	100

Farmers face a number of problems in getting tractors from the Government Tractor Unit. Only a few tractors at this Unit are functional and even these are not readily available to the farmers due to alleged malpractices at the Unit. The farmers are compelled to fall back on private tractor owners who charge a high fee.

The bullock drawn tillage implements given at the inception of the scheme are now seldom used due mainly to lack of draught animals (see under animal husbandry).

7.3 Farm Equipment

A list of implements and tools owned by the farmers is indicated in Table 23.

Table 23 Implements Owned by Farmers

Type of implements	No. of households reporting
Water pump	9
Ploughs	10
Disc harrow	12
Cultivator	12
Rotary weeder	1
Mammoties	62
Katty or axe	59
Digging fork	27
Water cans	8

(Total number of households reporting = 62)

Only a few households own any animal drawn tillage implements. Even these are not in proper working condition. Water pumps were owned by only nine households.

8. INPUT SUPPLIES, EXTENSION AND MARKETING

The services provided at the initial stages of the scheme, input supplies, extension and marketing facilities, were no longer available to the farmers.

8.1 Input Supplies

i. Credit

Most farmers use tractors for ploughing and also depend on hired labour for certain operations and these resulted in considerable cash expenditure. Hence, the need for credit facilities.

Twenty-six households (42%) had obtained credit during the previous Maha, of whom almost half had obtained their credit from money-lenders and traders, the latter being the most important source of credit.

Table 24 Source of Credit

Source	Households reporting No.	%
Cooperative	0	*0*
Bank	3	*12*
Money-lender	3	*12*
Friends and neighbours	5	*19*
Relatives	5	*19*
Traders	10	*38*
T o t a l	26	*100*

Recourse to institutional credit is meagre as many highland crops are not covered by institutional credit schemes and the lack of titles to land prevents farmers from obtaining credit from institutional sources.

Continuous highland farming under rainfed conditions involves greater cash expenditure on inputs, labour, power etc., and investment on land improvement. A tight cultivation schedule call for reliance on hired labour and tractor ploughing; both involving considerable cash expenditure. Absence of suitable credit facilities is a drawback.

Borrowing from traders is most disadvantageous. Apart from the high interest rate,[1] farmers are also compelled to surrender their crops just after the harvest when prices are at their lowest. Credit from private sources is always tied to disposal of produce resulting in a low return.

ii. Material Inputs

At present the facilities available to farmers for obtaining essential inputs are limited.

Table 25 Source of Inputs

Source	Fertiliser		Chemicals		Seeds	
	No.	%	No.	%	No.	%
Agricultural Productivity Committee	-	-	-	-	-	-
Cultivation Committee	-	-	1	*3*	1	*2*
Cooperatives	19	*68*	13	*41*	2	*4*
Private shops	13	*46*	21	*66*	9	*16*
Neighbours	-	-	-	-	5	*9*
Extension Centre	-	-	1	*3*	8	*14*
Own	-	-	-	-	44	*79*
Others	1	*4*	-	-	-	-
No reporting*	28		32		56	

* Some farmers indicated more than one source

Most farmers prepare their own seed material. Private shops constitute the main outside source. Farmers also obtain some of their seed requirements from the extension centre.

Private shops constitute the main source of supply of agro-chemicals. Farmers generally rely on the recommendations of the shop-keepers on the use of particular types of agro-chemicals.[2]

41% of those reporting use of chemicals have obtained them from the cooperatives.

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1 50% of the loans carried an annual interest rate of 20-80%.

2 The shop-keeper naturally recommends what is available at the shop.

68% of the farmers who applied fertiliser in Maha obtained them from the cooperative. A significant proportion also rely on private shops for their fertiliser where the cost is higher.

There is much room for improving the supply of these inputs to farmers by the institutional agencies on favourable terms.

8.2 Extension

Intensive extension facilities had been provided in the early stages of the scheme but subsequently the scale of these services dropped. Only 4% of the households had met an extension officer in the last two years. The majority of the farmers depend solely on their neighbours for advice on agricultural problems. The Table below shows the number of households which, during the last two years, had no contact with the more important extension media.

Table 26 No. of Households which did not attend or see any of the following during the last two years

	No.	%
Farmer training classes	60	98
Demonstration classes	61	99
Demonstration plots	51	82
Leaflets	44	71

(Number of households reporting = 62)

Although farmers now have a fair knowledge of profitable crops and improved varieties and some of them adopt better practices many are not aware of scientific crop management. This often leads to crop failure or to very low yields. This is a matter for extension. Training is also needed in specialised aspects of highland farming.

8.3 Marketing

Marketing facilities available to the farmers in the scheme are poor. 73% of the farmers depend on private traders who buy at least a part of their produce, while 50% of the farmers sell to traders in neighbouring towns, conveying their produce by bus, bicycles or cart.[1]

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1 The scheme is only four miles from the Anuradhapura town. The distance to Mihintale, a smaller town, is also about four miles.

Table 27 Source of Marketing

Source	No. reporting	%
Traders from outside	45	73
Neighbouring town	31	50
Boutique in the village	13	21
Cooperative	10	16
Local fair	8	13
Commission Agents	6	10
Others	3	5

(Number of households reporting = 62)

Marketing is often tied to credit. On the one hand this is shown by the fact that 20% of the farmers set off their produce against debts. On the other, those who reported that the produce was sold for ready cash usually do so to private traders who advance loans. In this case the produce is bought at prices lower than the market prices.

61% of the farmers (37) reported that they were faced with some marketing problem or other. 68% of them indicated low prices as a major problem and 38% lack of transport facilities and 14% lack of marketing channels. Lack of transport facilities and proper marketing channels invariably lead to low prices. 11% felt they had often been cheated by the traders.

9. COMMUNITY DEVELOPMENT

There is a relatively higher degree of community feeling within the scheme than in purana villages. This may be because :

i. The settlers are drawn from various parts of the country and their separation from the purana villages makes it necessary for them to develop a greater sense of unity;

ii. Cooperative farming tried out earlier in this scheme may have brought the settlers closer together in some respects.

Family rivalries and divisions characteristic of the purana village are not very common in the settlement and a revival of the scheme offers a fair promise of success.

At present only a few community organisations like the Rural Development Society, the Young Farmers' Club and the Death Donation Society are found in the scheme. However, except for the Death Donation Society the others are not functioning effectively, probably due to the general neglect of the entire scheme over a long period of time, especially after a period of active Government assistance and participation.

Absence of a Praja Mandalaya[1] or any other organisation which could provide recreational facilities within the scheme has made it an unexciting place for the young. There is much scope for reorganisation of several community activities :

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1 Community Development Society.

i. infrastructure development - improvement to roads, wells, etc., on a shramadana[1] basis;

ii. agricultural improvement activities through Young Farmers' Club;

iii. recreational activities - reading rooms, sports, etc.

The younger generation forms a great proportion of the adult population in the scheme and should be given an important place in the attempts at reviving community activities. They are also better educated and more innovative and receptive to new ideas; such activities, if well organised, would create a more congenial atmosphere especially for the younger people.

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1 Self-help.

10. FARMERS' VIEWS ON THE FUTURE OF THE SCHEME

The views of the farmers were sought on a reorganisation of the scheme. The Table below indicates how the farmers rank different crops in respect of their adaptability to the area and their profitability. The preference for non-traditional crops is clearly shown.

Table 28 Annual Crops Suited to the Area and Profitable to Farmers

Crops	No. of households reporting	
	No.	%
Cowpea	41	69
Chillies	41	69
Greengram	22	37
Vegetables	17	29
Kurakkan	11	19
Groundnuts	8	14
Gingelly	6	10

(Number of households reporting = 59)

The farmers also indicated their desire to expand the cultivation of such crops as cowpea, greengram and groundnuts, if good marketing facilities were made available to them. There is much scope for the expansion of cultivation of such crops.

The majority (66%) believed that the earlier cooperative system had no special advantages. Its failure was attributed mainly to the inefficiency and corruption of people in charge of the project and to disputes and rivalries among the farmers themselves. Almost all farmers indicated a clear preference for private ownership of land on the ground that it provides better incentives to work. As to future farm organisations, 89% were in favour of private farms. However, organisation of certain operations like planting, pest and disease control and marketing on a group basis was thought to be advantageous by some. There was hardly any difference in the attitudes of old and new settlers on these matters. One would have, however, expected new settlers to be more receptive to new forms of organisation.

In the past, Government assistance to the scheme had been very useful, but since 1965 there had been little State involvement. The farmers felt that Government could assist them in improving supplementary irrigation facilities (wells and water pumps) and by providing better credit facilities and inputs. Better extension services were also considered necessary and many considered training in dry farming methods particularly important.

Table 29 Types of Training Required by Farmers

	No.	%
Dry farming methods	38	*62*
Animal husbandry	12	*20*
Farm management	8	*13*
Machine operation	5	*8*
Soil conservation	1	*2*

(Number of farmers reporting = 61)

76% of the settlers wanted their children to remain in the scheme, and be agriculturalists. This certainly is an encouraging situation. The twelve heads of households who did not favour this vocation gave as their reasons, insecurity and low incomes.

SUMMARY AND CONCLUSIONS

A. *Summary*

1. General Characteristics

Sixty five households were surveyed, fifty five of which were those of old settlers and ten of second generation households. The total population of the scheme was 416 of which 53% were in the age group 10-30 years. The literacy level of the settlers was high - it was in the region of 86%. Most households depend on agriculture, but 15% of the total employed were engaged in off-farm employment. The living conditions in the scheme were favourable when compared to the purana villages in the area. This is reflected in the higher per household income (Rs 412), better housing conditions and the accumulation of consumer durables. There is greater social harmony among the settlers than in the purana villages. However, the community organisations were found to be weak.

2. Land Use and Agricultural Practices

The original extent allotted per settler was 14 acres out of which 6 acres were later given to the eldest child. In most cases the 14 acres are still worked as one unit. The absence of titles to land has created a certain amount of uncertainty among the settlers. Many hidden land transactions have also taken place. The reallocation of land as individual holdings was often done without taking into consideration the differences in terrain.

Out of the 658 acres of total cultivable land, only 40% and 25% were cultivated during Maha 1975/76 and Yala 1975 respectively. The under-utilisation of land was due to the large size of the holdings, shortage of family labour, tight cultivation schedules and problems associated with hiring of tractors and procurement of implements and inputs.

Chena cultivation outside the scheme is still practised by some farmers. Only a few settlers practised any lowland paddy cultivation outside the scheme. The extents cultivated with highland paddy has also been reduced due to inadequate rainfall in recent years.

Cash crops have been cultivated by settlers since the commencement of the scheme. At present chilli is the dominant crop in Maha and gingelly the main Yala crop. Crops like cow pea and green gram are fast becoming popular. No systematic crop rotation or animal-crop rotation is practised by the farmers. Improved cultural practices such as control of weeds, pests and diseases are adopted for certain crops like chillies and cow pea.

Livestock industry plays an insignificant role in the settlement. Lack of grazing land and financial difficulties are the main reasons for this situation.

Absence of supplementary irrigation facilities to tide over the drought periods appear to be a major constraint for crop and live-stock production. Systematic soil conservation and land development measures are not adopted by farmers.

3. Production Factors

Majority of the farmers used hired labour for most agricultural operations. The need for hired labour arises from the large size of holdings and tight cultivation schedules. Yet, family labour resources are under-utilised during Yala particularly due to the absence of non-farm activities.

Bullock-drawn tillage implements are seldom used mainly due to lack of draught animals and shortage of suitable tillage implements. The majority of the farmers rely on 4-wheel tractors which are generally hired at a high cost from private owners.

Farming in the scheme involves greater cash expenditure on inputs, labour, power etc. Institutional sources of credit are not available to many farmers due to lack of titles to land and due to the fact that most highland crops are not covered by institutional credit schemes. Traders and money lenders are the major sources of credit.

4. Supplies, Marketing and Extension

Purchased inputs are mostly obtained from private sources, except fertilizer which is available only at the cooperative.

Marketing facilities are poor and most farmers depend on private traders. Marketing is often linked with credit and sometimes farmers set off their produce against debts. Low prices and lack of transport facilities are the major problems in marketing.

Farmers in the scheme have had inadequate extension support pertaining to problems of dry farming during the last several years.

B. Conclusions

The Kurundankulama experience offers valuable guidelines for the future expansion of rainfed arable farming in the dry zone. The scheme was initiated in the 1930s when there was a threat of malaria, problems of isolation, low prices for highland crops and inadequate research on highland farming. The recruitment of settlers, mostly from the wet zone, posed serious problems in regard to the continuity of the scheme. The failure of cooperative farming and the subsequent withdrawal of the Department of Agriculture from the scheme resulted in serious setbacks. Nevertheless, the performance of the scheme appears to be satisfactory as evident from the general living conditions and the agricultural practices adopted in the scheme.

The farmers today show a clear dislike for the type of cooperative farm organisation experimented with earlier though they were generally appreciative of the need for cooperative action in certain aspects of farm work. This may have to be borne in mind in planning the reorganisation of the scheme. It would also be necessary to revamp the community organisations in the area.

Absence of titles to land has created a feeling of uncertainty which had resulted in the settlers not effecting improvements to the land.

The Kurundankulama experience has clearly shown that the farmers are prepared to cultivate non-traditional cash crops provided attractive prices are offered and good marketing facilities are made available to them. It has also demonstrated the need for greater cash investment in rainfed farming. Institutional credit sources should be able to meet the entire needs of the farmers.

Integration of animal husbandry with the agricultural system of the settlement appears to be necessary not only to supplement the income of farmers but also for maintaining soil fertility.

The lack of appropriate tools and simple machinery for dry land farming is a major problem. A solution to this is urgently required if rainfed farming is to be expanded in the dry zone. The provision of supplementary irrigation facilities for farmers to engage in intensive cultivation of certain crops (e.g. vegetables) specially during the Yala season when labour is under-utilised is another aspect that needs careful consideration.

Kurundankulama experience has also thrown some light on the question of the size of holding a family could farm under rainfed conditions with simple tools and equipment. It has definitely demonstrated that a holding larger than 5-6 acres is not manageable under such conditions. More research on this aspect is needed before any firm conclusions can be reached.

APPENDIX I

There are seven permanent buildings within the scheme originally meant for the following purposes :

1. Farm Managers' residence
2. Assistant Farm Manager's residence
3. Circuit bungalow
4. Dispensary
5. Community hall
6. Cooperative store
7. Store

The second and the seventh are now occupied by two landless families from outside. All the other buildings are given to various persons on rent by the Kachcheri.