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Ministry of Agriculture, Kenya

Large Farm Sector Study Volume 2 Main Report

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Large Farm Sector Study
Volume 2
Main Report

S.D. Gathiuni Esq.,
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Ministry of Agriculture,
P.O. Box 30028,
Nairobi,
Kenya.

Dear Mr. Gathiuni,

Large Farm Sector Study: Final Report

In accordance with our contract with the Kenya Government we have pleasure in submitting our Final Report on the Large Farm Sector. The report is in three volumes as follows:—

Volume I — Summary
Volume II — Main Report
Volume III — Annexes

In finalising the report we have given careful consideration to your Ministry's comments on our Draft Report submitted in May this year.

We would like to express our appreciation of the considerable assistance and co-operation that we have received from the staff of your Ministry both in the field and at headquarters. We are also indebted to the Ministries of Lands and Settlement and Co-operative Development and to the Agricultural Finance Corporation.

Yours sincerely,

Harry Piper

H. Piper
Director.

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1

Introduction

1.1 GENERAL

Kenya's agricultural sector is characterised by a marked dichotomy between small scale and large scale farming areas. The small scale or traditional areas comprise around one and a half million arable holdings, the majority of which are less than two hectares and the vast area of non-arable land occupied by some 200,000 pastoralist families. The large scale areas, including farms which have illegally or unofficially subdivided now occupy around 2.4 million hectares. Until the early 1960's the distinction between the two coincided with the division between the so-called 'scheduled areas' and 'non-scheduled areas'. The former then extending to some three million hectares were reserved for European ownership whilst the latter comprised the traditional African areas. Since 1961 the transfer of the majority of farms in the scheduled areas into African ownership has made the distinction less clear. Firstly, there has been the conversion of many large farms into settlement schemes and secondly, many farms were purchased by groups of owners often with several hundred members forming co-operatives, partnerships and limited companies. A major proportion of these groups have unofficially subdivided their farms into smallholdings or subsistence plots. The large farm sector is now generally regarded as the remaining 2.4 million hectares of the former scheduled areas after the excision of some 637,000 hectares for official settlement schemes such as the Million Acre, Harambee, Haraka and Ol Kalou Schemes. It comprises approximately 2,700 farms, of which between 450 and 500 are coffee, tea or sisal estates, 200–250 are ranches and 200 are either sugar cane estates, specialist livestock or horticultural enterprises. The remaining 1,800 are almost entirely mixed farms although a few do have a small area devoted to plantation crops.

The transfer of ownership into African hands has proceeded more rapidly with the mixed farms than with either the ranches or plantations. Less than five per cent of the mixed farms remain in European ownership whilst a significant proportion of the plantations and ranches are still run by individual expatriates or large expatriate-owned companies. Overall the transfer in ownership has been relatively successful. Of the three subsectors, plantations, ranches and mixed farms, the mixed farms have fared least well. Production from the plantations and ranches has been maintained and in the case of coffee is increasing. In the mixed farms, the area under wheat has stabilised after a period of decline between 1968 and 1973. In contrast, the maize area has increased steadily and taking the combined maize and wheat areas, the difference between 1963 and 1974 is negligible. Livestock production, however, has fallen significantly over this period.

The problems and poor performance can be attributed primarily to inexperienced management and lack of finance. The most serious problems and poorest performance, however, are generally associated with those farms owned by large groups. Usually group owners had barely enough money for the purchase deposit, consequently funds for the balance of the land purchase price, land development, machinery and stock purchase and for short term working capital had to be borrowed. The high ratio of borrowed capital to the group's own capital resources coupled with poor management frequently led to financial difficulties and the taking on of new members for a cash settlement. Thus many of these farms have a steadily increasing membership most of whom are unregistered. With growing membership, the problems of management and dissension have become more serious and inevitably the farms have continued to decline.

Although the problems are greatest in the group-owned farms, poor management and low levels of production are also found in the individually-owned farms. An assessment of the performance of the mixed farms was made in 1973 by the Ministry of Agriculture. The survey concluded that one-third of the mixed farms were performing reasonably well, one-third were holding their own and the remaining third were regarded as problem farms experiencing severe financial and production difficulties.

Several programmes to deal with the problem farms have been instituted. The one regarded as being most successful involved the provision of farm managers and some finance to a few farms and was carried out by the Agricultural Finance Corporation (AFC) and the Ministry of Agriculture. A much larger programme based on this approach was initiated in 1975 by the Ministry of Agriculture with the assistance of the World Bank.

Under the programme 90 group-owned mixed farms in the Nakuru, Uasin Gishu and Trans Nzoia Districts of Rift Valley Province and 36 group-owned coffee estates in Kiambu and Thika districts of Central Province will receive managerial and financial assistance. The project also provided for the setting up of a training programme for farm managers and for the current study of the Large Farm Sector to be carried out. The total costs of the project were estimated to be KShs 166 million (US\$ 23.2 million) of which 65 per cent would be financed by the World Bank Group. The progress of the project is reviewed as part of this study.

1.2 THE OBJECTIVES AND SCOPE OF THE STUDY

The primary objectives of the study are to identify the main problems facing the Large Farm Sector, and to formulate a long term strategy for the development of the sector. The emphasis therefore is on defining a long term strategy rather than on detailed preparation of specific projects.

The large mixed farm subsector is experiencing most difficulties at present and the Ministry of Agriculture have, therefore, requested that the study should concentrate on the 1,800 mixed farms. This has been done; detailed investigations and analyses have been carried out solely on the mixed farms. The other subsectors, plantations and ranching, have been discussed briefly in an overall review of the sector and outline recommendations given for their future development.

1.3 APPROACH TO THE STUDY

The study has involved five main components, namely a review of the overall contribution of the Large Farm Sector to national agricultural production, a detailed analysis of the present situation regarding the large scale mixed farms, an evaluation of progress on related Government projects, a study of factors affecting the future development of the sector and lastly, the definition of a strategy for the future development of the sector.

1.3.1 Review of the Large Farm Sector's Contribution to National Agricultural Production

This review describes the development of the sector and changes which have occurred from the early 1900's until the present day. The period until 1955 is given brief coverage and as requested in the Terms of Reference the past twenty years are considered in detail. The Sector's contribution is discussed primarily in terms of the increase of areas under particular crops, the increases in production and the growth in value of production. The main factors affecting increases or decline in output are mentioned and the sector's contribution to gross marketed production relative to the contribution of the small farm sector shown.

1.3.2 Detailed Analysis of the Present Situation on the Large Scale Mixed Farms

After a short period of discussions in Nairobi and visits to the Provincial and main District Agricultural Offices it was decided that information should be collected at two levels. Firstly and as originally intended, a detailed farm management survey of a sample of mixed farms distributed throughout Nakuru, Uasin Gishu, Trans Nzoia and Kericho Districts would be carried out and secondly a less detailed survey or census covering all the farms in these and other districts would be undertaken. The latter would run concurrently with the detailed survey.

(a) The detailed farm management survey

The primary objective of the detailed survey was to establish the present level of performance on mixed farms and to establish the extent to which resources were currently being underutilised. The survey would also be important in identifying problems faced by individual farmers and give some insight into their present levels of indebtedness.

During the initial visits to District Agricultural Offices, information on the numbers of farms, the types of ownership, enterprises on the farm and extent of subdivision, was obtained. Also each Divisional Extension Officer was asked to give a subjective assessment of the quality of management on the farms in his Division. The variation in these factors was immense; overall there were four types of private ownership, four main farming systems and varying degrees of subdivision. Management also varied and was assessed in three categories, good, average and poor. A sample of farms was selected to as far as possible represent the relative importance of each of these variables. It is emphasised, however, that given the size of the sample, 88 farms, in relation to the numerous strata, the results of the survey must be regarded as indicative only and cannot be expected to have statistical validity.

(b) The farm census

The farm census covered all types of large farms and like the detailed survey, was concentrated in the four main mixed farming Districts. The Extension Officer in each Division was given a questionnaire containing the list of farms in his Division and a number of columns for recording specific information. The information requested included the type of ownership, number of owners (registered and unregistered), the farm enterprises, the extent of subdivision, the manager's training and whether he was an owner or hired, an assessment of the standard of management and an indication of whether or not the farm had Guaranteed Minimum Return Programme (GMR) arrears. Through this census, information was obtained on approximately 1,500 farms of which 1,240 were mixed farms.

1.3.3 Review of Related Government Projects

The review concentrates on the Group Farms Rehabilitation Project which commenced in 1975. This is the most important project to-date aimed specifically at improving output from the group-owned farms. An evaluation of its progress is of particular importance to the formulation of future projects or phases of the current programme to rehabilitate the large farms. In the review, progress in terms of recruitment of farms to the project, the implementation of institutional arrangements and performance of the farms since joining the project is assessed. Other projects such as the Commercial Farming Project are discussed briefly.

1.3.4 Study of Factors Affecting the Future Development of the Sector

In addition to those factors which are of an on-farm nature, a number of additional more general factors which will affect the formulation of a development strategy have been considered in some detail. These include such aspects as the future market prospects, pricing policies for crop and livestock products, future input costs, population increase, employment and pressure on land, the question of large versus small farms, social factors and institutional and legal aspects. The main conclusions from these analyses are drawn together and their implication on future policy discussed.

1.3.5 The Formulation of a Development Strategy

The latter part of the report describes a future development strategy for the sector. The mixed farms are dealt with in considerable detail and outline recommendations are made for the plantation and ranching subsectors. The question of priority for the different categories of farms identified are also discussed and recommendations made. In the final chapter, the phasing of implementation of the strategy, the institutional and legal arrangements necessary, the organisation and management and the staff and training requirements are described. Lastly, the plan is justified in terms of national parameters such as **national income contribution**, balance of payment contribution and employment opportunities created.

2

Background

2.1 GENERAL

Kenya has a total area of 583,000 km² and an estimated present population of some 14 million. Its main features are shown in Figure 2.1. Despite the rapid growth of industry and services and of urbanisation, it is still a predominantly agricultural country. About 90 per cent of the population lives in rural areas and depends mainly on agriculture for its livelihood.

Since Independence the country's economy has grown rapidly, the average growth rate between 1964 and 1973 being over 6.5 per cent per annum. Recently, however, progress has faltered, due primarily to the severe world inflation of the past 3–4 years and the oil crisis. During this period internal inflation became a serious problem and the growth in incomes and employment slowed down. There are now signs that the economy is recovering and that conditions are improving.

The Kenyan economy is dominated by agriculture, although the sector's share of GDP (Gross Domestic Product) has declined to some extent over the past two decades, as industry, services and other sectors have expanded. In the period 1956–1963, agriculture provided about 40 per cent of GDP, compared with 38 per cent in 1964, 35 per cent in 1969 and an estimated 32 per cent in 1974. In this last year just over half the agricultural contribution came from outside the monetary economy. These figures for the agricultural sector's share of GDP can be compared with those of 10–12 per cent for manufacturing, 10 per cent from commerce and 13–15 per cent from the Government sector. In recent years agricultural exports have comprised over two-thirds of Kenya's total. Per capita incomes are still fairly low, being around KShs. 1,000 (US\$ 120) per annum, despite the economic expansion of the past 10–15 years. With an annual growth of 3.3–3.5 per cent, Kenya has one of the most rapid rates of population increase in Africa. Unemployment has become a problem, especially in the urban areas. As discussed in Chapter 8, there is little likelihood of a major decline in the population growth rate before the turn of the century. Even if Kenya is able to return to the steady economic expansion of the pre-1974 period, there will thus inevitably be ever-increasing pressure on land and employment during the next 20–25 years. There is little doubt that this is the most serious problem facing Kenya.

The economy is heavily dependent on foreign trade, and the country suffered from the massive rise in import prices after 1974. Generally Kenya has a deficit on the balance of trade, but until 1974 this was kept to manageable proportions. After the adverse trade performance of the past 2–3 years, there has recently been a considerable improvement, partly because of the spectacular rise in the price of coffee, the largest single export. In 1972–1973 coffee provided 27–29 per cent of total exports, tea 14–18 per cent, meat and pyrethrum 3–5 per cent each, sisal 2–4 per cent and maize 5 per cent in 1973 (none was exported in 1972), whilst a wide range of other crop and livestock products was exported on a smaller scale. Kenya is not a major importer of agricultural products, except vegetable oils, sugar, wheat and cotton.

In comparison with many African countries Kenya has a well-developed infrastructure and services. Road and rail communications between and within the main areas of economic activity are good and on the whole the supporting services to agriculture are reasonably effective.

Kenya's successful economic performance has been based on a mixed economy, reliance being placed on private ownership and market forces supplemented by selective government intervention where required, through measures such as price and other controls, provision of finance and direct operations by parastatal bodies. Government involvement has been particularly strong in the fields of crop and livestock marketing, price fixing and in agricultural supporting services. Apart from the operations of the Agricultural Development Corporation (ADC), the Ministry of Lands and Settlement (MLS) and certain other bodies, the State has not become heavily engaged in direct agricultural production.

At present the country is in the middle of its Third Five Year Plan, the 1974–1978 Development Plan. Due to the massive rise in import prices in 1974, this was revised soon after its commencement, increased emphasis being placed on the control of inflation and the improvement of the balance of payments. In this revision it was recognised that the mid-1970's would be years of considerable economic difficulty and that these aspects would require particular attention. Apart from dealing with these immediate problems, the Plan's main emphasis is on rural development, employment creation, a more equitable income distribution, better educational opportunities and the increased participation of the population in the planning and development process. It is intended that the Government should assume a much greater role in directing the economy than in the past. The particular plans for the agricultural sector are outlined in Section 2.2.

2.2 THE AGRICULTURAL SECTOR

2.2.1 Introduction

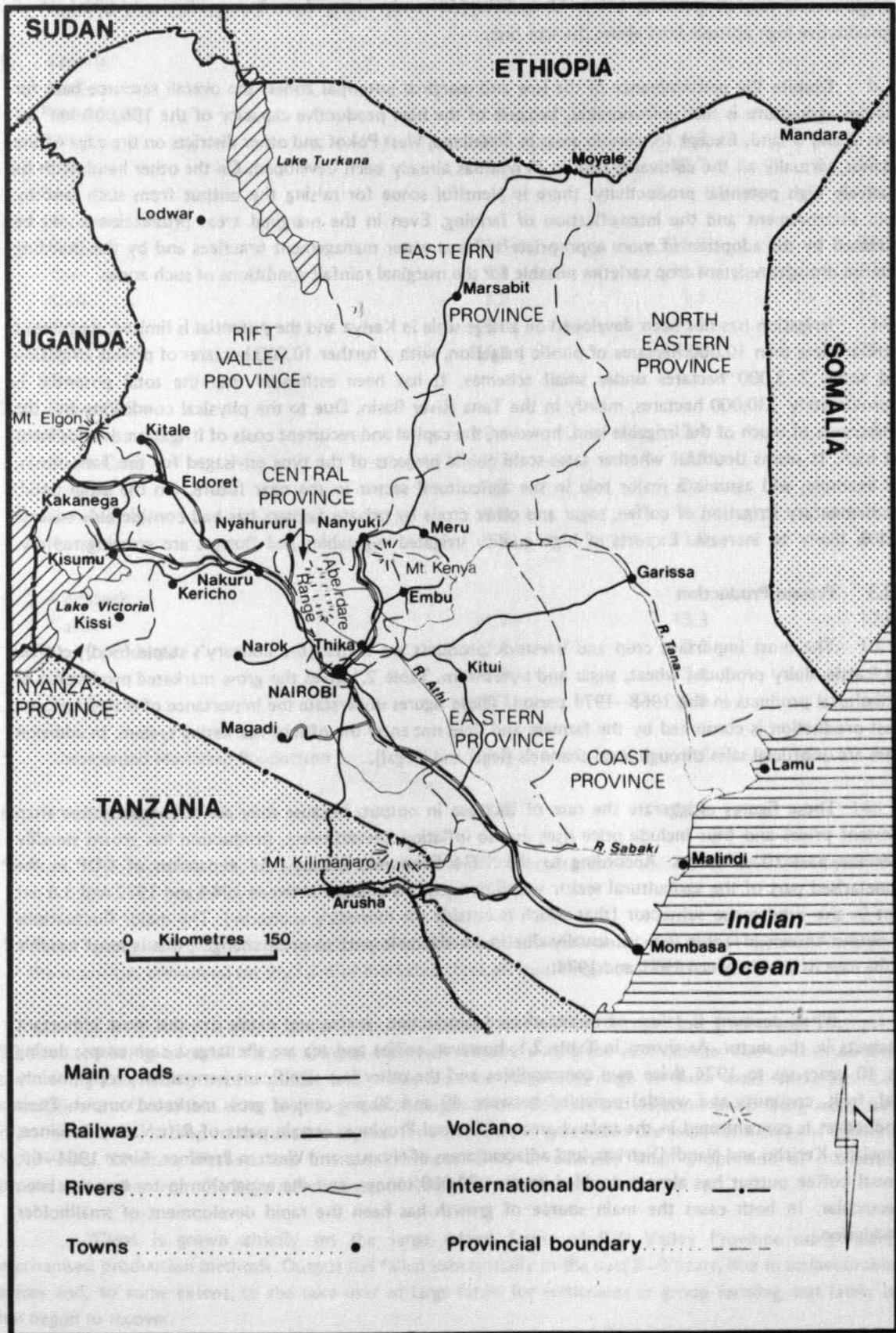
The dominance of Kenya's agricultural sector as a source of national output, exports and employment has been highlighted in Section 2.1. Although the sector's share of GDP has fallen to some extent, Kenya has been more successful than many other countries in developing its agriculture, and production has expanded substantially in recent years. At the same time more of the farming population has been drawn into the monetary sector, although roughly half the total output still comes from subsistence farms.

During the past 10 years the most notable features of Kenya's agricultural development have been the continued overall growth of the sector, the expansion in the production of coffee, maize, tea and sugar, the stagnation in wheat output, the increasing importance of the commercial smallholder sector, the continued transfer of large farms into African ownership, the spread of cultivation into unsuitable marginal areas due to increasing land pressure and the poor performance of parts of the Large Farm Sector, especially many of the group-owned farms.

2.2.2 The Physical Resource Base

As a result of the enormous range of physical conditions found in Kenya, its agricultural potential varies greatly from zone to zone. The most widely used classification of land potential in Kenya is that prepared by Pratt, Greenway and Gwyne in 1966. Under this classification about 18 per cent of the country's total area, or 106,000 km², has favourable ecological conditions for crop and livestock production. This comprises the 53,000 km² of Ecological Zone 2 : High Potential and the area covered by Ecological Zone 3 : Medium Potential. Average rainfall usually exceeds 30 inches (750 mm) per annum and is well over 50 inches (1,250 mm) in parts. The Zone 2 and 3 land is concentrated in the upland areas of Central and Rift Valley Provinces, much of which are occupied by large farms, in Western and Nyanza Provinces and in the coastal belt. A further 9 per cent or 53,000 km² is classified as Zone 4, having only marginal potential. Here, average rainfall is between 15 and 30 inches (375 mm and 750 mm) per annum. Crops can be grown, but failures due to climatic fluctuations are a constant danger and the zone is best suited to livestock production, particularly ranching.

Figure 2.1
Kenya location map



Over half of Kenya's total area, or 300,000 km², is in Ecological Zone 5. With an average rainfall of 10–20 inches (250 mm–500 mm) per annum, this is essentially rangeland and in most areas is suitable only for extensive livestock rearing. Zone 6 has even less favourable conditions, being semi-desert, with an average annual rainfall generally below 10 inches (250 mm), whilst Zone 1 comprises only 800 km² of unproductive high altitude land above the tree line.

Despite the predominance of the low and marginal potential zones, the overall resource base for Kenyan agriculture is not unfavourable, because of the high productive capacity of the 106,000 km² of Zone 2 and 3 land. Except for certain areas in Masailand, West Pokot and other districts on the edge of the uplands, virtually all the cultivable land in Kenya has already been developed. On the other hand, with its relatively high potential productivity, there is plentiful scope for raising the output from such land by yield improvement and the intensification of farming. Even in the marginal areas production could be increased by the adoption of more appropriate soil and water management practices and by the breeding of more drought-resistant crop varieties suitable for the marginal rainfall conditions of such zones.

Irrigation has not been developed on a large scale in Kenya and the potential is limited. At present there are less than 10,000 hectares of public irrigation, with a further 10,000 hectares of private irrigation and some 2–3,000 hectares under small schemes. It has been estimated that the total potential is approximately 230,000 hectares, mainly in the Tana River Basin. Due to the physical conditions and the remoteness of much of the irrigable land, however, the capital and recurrent costs of irrigation development are high. It seems doubtful whether large-scale public projects of the type envisaged for the Tana Basin, for example, will assume a major role in the agricultural sector in the near future. On the other hand, supplementary irrigation of coffee, sugar and other crops by private farmers has had considerable success and is likely to increase. Exports of high quality irrigated vegetables and flowers are growing rapidly.

2.2.3 Present Production

The most important crop and livestock products are maize (the country's staple food), coffee, tea, cattle, dairy products, wheat, sugar and pyrethrum. Table 2.1 gives the gross marketed production of agricultural products in the 1968–1974 period. These figures understate the importance of maize, because most production is consumed by the farmers and does not enter the official marketing system. In addition there are unofficial sales through local channels (legal and illegal).

These figures exaggerate the rate of increase in output, because they are at current rather than constant prices and thus include price rises due to inflation. Nevertheless, production has grown steadily over the past 10–15 years. According to the 1974 Economic Survey, the expansion of GDP in the monetarised part of the agricultural sector was 6 per cent per annum between 1964 and 1972 and 3.6 per cent in the subsistence subsector (that which is outside the monetary economy). The major fluctuations in output shown in Table 2.1 are usually due in considerable part to price changes; this is most notable in the case of sisal between 1971 and 1974.

When account is taken of non-marketed production, maize and cattle are the most important products in the sector. As shown in Table 2.1, however, coffee and tea are the largest cash crops; during the 10 years up to 1974 these two commodities and the other less significant permanent crops (mainly sisal, fruit, coconuts and wattle) provided between 40 and 50 per cent of gross marketed output. Their production is concentrated in the upland areas of Central Province, certain parts of Rift Valley Province, especially Kericho and Nandi Districts, and adjacent areas of Nyanza and Western Province. Since 1964–65, annual coffee output has almost doubled to over 70,000 tonnes, and the expansion in tea has also been spectacular. In both cases the main source of growth has been the rapid development of smallholder production.

Table 2.1 Gross Marketed Production 1968-74¹ (K£ million at current prices)

Crop	1968	1971	1974
1. Cereals			
Maize	5.4	4.3	8.5
Wheat	6.6	5.2	7.0
Others	0.9	1.2	2.3
Total	12.9	10.7	17.8
2. Permanent Crops			
Coffee	12.3	18.9	34.5
Tea	9.3	11.8	19.3
Sisal	2.2	1.5	18.3
Others	2.0	3.0	3.0
Total	25.8	35.2	75.1
3. Other Crops			
Pyrethrum	2.6	2.4	4.2
Sugar Cane	2.2	3.5	5.9
Cotton	0.7	0.9	1.2
Others	2.0	4.2	5.4
Total	7.5	11.0	16.7
4. Livestock			
Cattle	11.7	13.3	17.6
Dairy products	7.1	9.3	10.1
Others	2.9	3.4	4.8
Total	21.7	26.0	32.5
5. Unrecorded Marketed Production	3.3	3.7	4.6
6. Grand Total	71.2	86.6	146.7

Source: Republic of Kenya, Economic Survey 1974 and 1975, extracted from 'Agricultural Development in Kenya' by J. Heyer, J. Maitha and W. Senga, 1976.

¹ These figures are for production marketed through official channels only; they do not account for the quantities consumed on the farm or marketed through local illegal channels.

Maize is Kenya's staple food crop and at least one million hectares are grown annually, over 90 per cent being on small farms. Output has risen steadily during the past decade, due in considerable part to higher yielding hybrid maize, and yields are now reasonably high in those areas where physical conditions are favourable. The crop is grown throughout the uplands and adjacent lower-lying areas, but is not such a major crop in the coastal region. Its dominance is greatest in the small farm areas of Central, Rift Valley, Nyanza, Western and Eastern Provinces. Only a relatively small proportion of marketed production comes from the large mixed farms of Rift Valley Province.

Wheat is grown chiefly on the large mixed farms of Rift Valley Province using heavily mechanised production methods. Output has fallen substantially in the past 8-9 years, due to unfavourable prices and, to some extent, to the take over of large farms for settlement or group farming, but lately it has begun to recover.

Kenya produces about 70 per cent of the world's pyrethrum. It is grown in the upland areas, mainly by small farmers, but is still important in parts of the Large Farm Sector.

Kenya produces a wide range of livestock products, of which beef and dairy produce are the most important. The national herd is estimated to comprise about 10 million cattle, 10 million sheep and goats and much smaller numbers of other stock. Commercial dairying is widespread in both the large farm and smallholder sectors, generally under mixed farming systems. Production is based on exotic or exotic x Zebu stock, but overall productivity is not high and milk output has not been rising as fast as demand. Beef is produced under a wide range of farming conditions, from the traditional extensive nomadic systems practised in the low rainfall areas to the ranches of the Large Farm Sector and the mixed smallholding systems of the uplands.

The agricultural sector provides the bulk of Kenya's exports. Table 2.2 shows the relative share of major crop and livestock commodities in Kenya's total exports in 1968, 1971 and 1973.

Table 2.2 Agricultural Exports as Percentages of Kenya's Total Exports

Item	1968	1971	1973
1. Total exports (K£ million)	89.3	112.3	167.7
2. Percentage share of crop and livestock products (%)			
Coffee, not roasted	22.2	26.8	29.2
Tea	17.4	16.2	13.8
Pyrethrum extract and flowers	5.3	4.6	3.0
Meat and meat products	5.2	5.0	3.1
Maize	8.3	—	4.6
Hides and skins	2.9	3.3	4.2
Sisal	3.2	2.1	3.9
Wattle bark and extract	2.1	1.6	1.0
Cotton lint	0.7	1.6	1.1
Tinned pineapples	0.8	1.3	1.2
Others	4.2	2.7	3.2
Total	72.3	65.2	68.3
3. Total value of agricultural exports (K£ million)	64.6	73.2	114.5

Source: 'Agricultural Development in Kenya', Heyer, Maitha and Senga, 1976.

Coffee and tea are by far the largest exports; the other important agricultural exports are livestock products, sisal, pyrethrum and, in some years, maize. Although cotton is exported on a limited scale, Kenya is a net importer, the exports of high quality rainfed and irrigated lint being outweighed by the imports of lower grade cotton for use by the local textile industry.

2.2.4 The Structure of Production

A major characteristic of Kenya's agriculture is the dichotomy between large scale and small scale farms. Since Independence (12th December 1963), the dichotomy has become somewhat less pronounced, due to subdivision of some farms for settlement and the growth of group farming on others, but it is still an important feature.

The history and contribution of the Large Farm Sector (mainly comprising farms of over 20 hectares) are described in detail in Chapter 3. Briefly, the large farms are confined to those areas which were occupied by non-Africans before Independence (the so-called Scheduled Areas). In 1960 they covered some 3.0 million hectares in about 3,400 farms of over 20 hectares, located mainly in the Rift Valley Province, Central Province and adjacent smaller areas of Eastern, Nyanza Coast and Western Province. Of this 3.0 million hectares, about 1.4 million were occupied by mixed farms and 1.6 million by plantations and ranches. Over the past 15 years the number of large farms has fallen to some 2,700, due to subdivision under the Million Acre Settlement Scheme and other schemes. Only a small proportion are still owned by Europeans, although the percentage is higher for ranches and plantations than for mixed farms, which are more suitable for subdivision.

During the past 20 years the importance of the Small Farm Sector has risen rapidly. The most notable feature has been the development of a commercial smallholder sub-sector, particularly as regards coffee, pyrethrum, hybrid maize production and dairying. In fact, the Small Farm Sector now comprises two distinct elements, the commercial smallholders and the subsistence farmers, who remain largely outside the monetary sector of the economy. In contrast to many other African countries, much of the cultivable land in the Small Farm Sector has been registered and the owners issued with freehold titles.

The relative merits of large and small scale farming in Kenya have been the subject of continuous debate. This problem is discussed elsewhere in this report. Over the past 10 years the large farms have supplied just under half the total gross marketed output, whilst the small farms have provided just over half. Most of the seed maize, wheat and pedigree breeding stock are produced on the large farms.

The transfer of the former European farms to African ownership has taken various forms, ranging from purchase by Government and subdivision under official settlement schemes to purchase by wealthy individuals who continue operating the farms as large commercial units. The largest single land transfer programme was the Million Acre Settlement Scheme, the main objective of which was to relieve the heavy land pressure in the thickly-populated African reserves by resettling people on former large farms. These farms were bought by the Government, with the aid of funds provided by the British Government, and were then subdivided into smallholdings for settlement. Over the 10 years of the Scheme, from 1961 to 1971, some 35,000 families were resettled on a total of 470,000 hectares (1.16 million acres).

Other official settlement schemes include the Haraka Settlement Scheme, covering 105,000 hectares, the Harambee Settlement Scheme on 6,500 hectares, and the OI Kalou Settlement Scheme, where 2,000 families were settled on 56,000 hectares. In 1971 the Shirika programme was introduced under which the Government acquired farms and brought in settlers, but instead of subdivision into smallholdings, most farms continued to be operated as large units on a co-operative basis, with management assistance from the Settlement Fund Trustees (SFT) of the Ministry of Lands and Settlement (MLS). By 1975 the scheme included 82 farms with a total area of 82,000 hectares and 4,520 settlers.

Under these official programmes well over 700,000 hectares, about one quarter of the original large farm area, has now been resettled, mainly in the form of individual smallholdings rather than group farms. Although the programme has encountered severe problems, some of which have still not been solved, overall it has been an impressive achievement. Perhaps the most serious difficulty still unresolved is that of the Shirika farms. As noted above, these schemes are based on large scale co-operative farming rather than subdivision into smallholdings, and many suffer from the managerial and other problems typical of co-operative production.

Apart from these official land transfer programmes, private land purchases by Africans have taken place on a large scale. Under the new owners the main types of farm organisations are individual ownership, partnerships, companies and co-operatives. Most of the mixed farms are owned by individuals or small

partnerships and companies and are operated as large farms. The balance is under group ownership. Some of these are still run as large units, though often without great interest on the part of the group members, but the majority have been subdivided, either legally or illegally. Disturbingly, subdivision into arable smallholdings has been taking place in marginal zones, such as former ranches in the Naivasha and Laikipia areas, where crop farming is not really viable.

2.2.5 Institutions and Supporting Services

In general, Kenya's agricultural sector has relatively well-developed and effective supporting services. Perhaps the major weaknesses are in extension and the provision of services to the lower potential areas of the country. A full description of the services to the Large Farm Sector is given in Chapter 6, a brief outline of services to the whole agricultural sector being given here.

The main Government institution responsible for the sector is the Ministry of Agriculture. This has a fairly strong regional organisation, the Provincial and District offices having a substantial degree of autonomy, although effectiveness is reduced by lack of transport and insufficient contact with farmers. Agricultural research is undertaken by a large number of research organisations, including four units within the Ministry. In general, the research support to agriculture is satisfactory, but it does suffer from poor co-ordination between the bodies concerned and from uneven coverage of the different crops and livestock enterprises.

In addition to the Ministry of Agriculture, at least two other Ministries (the Ministries of Lands and Settlement and of Co-operative Development) and 18 Statutory Boards provide substantial services to farmers. Virtually all major crop and livestock products have prices set by Government and implemented largely through these Boards. Many are also involved directly in buying and selling, processing and direct agricultural development (e.g. the development of irrigation by the National Irrigation Board).

Kenya has a well-established and reasonably efficient agricultural credit system. Credit is provided mainly by the Agricultural Finance Corporation (AFC), commercial banks, various statutory boards, the co-operative movement, the Ministry of Lands and Settlement (to the settlers on its schemes), the Kenya Farmers' Association (KFA) and other input suppliers. Seed, fertilisers, insecticides, farm machinery, feeds and other inputs are supplied by the private sector. Generally, crop and livestock processing facilities are adequate.

2.2.6 Government Development Policies for the Agricultural Sector

Under the current Third Development Plan the Government's basic objectives for the agricultural sector are to increase output, create more employment and to improve rural living standards and income distribution. The most important components of the present plan are as follows:-

- (a) Priority would be given to smallholder areas and greater attention would be paid to the less-developed farming areas and to rangeland than has hitherto been the case.
- (b) Major improvements would be made to infrastructure and supporting services, especially credit, extension, research, veterinary services, marketing and input supplies. Increased emphasis would be given to rural roads, health and water supplies. Co-operatives would be encouraged, for marketing and credit and the provision of other services, and also for large scale production on new farms and ranches. The Special Rural Development Programme (SRDP) would continue and more planning would be done at the District level.
- (c) To stimulate employment, labour-intensive crops would be encouraged and further settlement and irrigation schemes would be implemented. Subdivision of large farms

into smallholdings would be promoted, as would group farming on large farms. A rehabilitation programme for existing large group farms would be introduced.

- (d) Land adjudication would be accelerated, so that by 1978 almost all arable high potential land would be registered and the amount of rangeland registered would have substantially increased.
- (e) Improvements would be made to many existing settlement schemes.

From the viewpoint of the Large Farm Sector, the most important points concern the long-term strategy for the Sector and further proposed settlement projects. In the Plan it is stated that 'large scale farms will be retained intact only to the extent necessary to ensure sufficient supplies of those products which can best be produced on a large scale basis. These products include wheat, hybrid maize seed and breeding herds of livestock'. In line with this policy, subdivision of large farms would be promoted, where it can be demonstrated that subdivision would lead to greater employment or productivity. District Land Control Boards would be asked to encourage subdivision on large farms. At the same time, under the Shirika Programme, a further 14,000 families would be established on 139,000 hectares, 41,000 hectares of which would be split into smallholdings.

In practice this policy towards large farms has not yet been implemented. At present the Land Boards discourage subdivision and new areas have not been brought into the Shirika scheme on the scale envisaged.

To implement this proposed programme for the agricultural sector, the Plan proposed that development expenditure should be more than doubled, as compared with the previous five years. A total of K£ 153 million (K£ 90 million for development expenditure and K£ 63 million recurrent expenditure) would be spent, of which the largest amounts would go for livestock development, farm credit, land settlement, land adjudication and irrigation. As a result of the programme it was envisaged that the sector's contribution to GDP would rise by 5.2 per cent per annum, the monetary sector growing by 6.7 per cent and the non-monetary sector by 3.8 per cent per annum. In the former, crop output would rise somewhat faster than livestock.

3

The Historical Background of the Large Farm Sector

3.1 INTRODUCTION

This chapter outlines the development of the Large Farm Sector, particularly from the 1950's to the present day. Its existing characteristics are then described in detail in Chapter 4. As noted in Chapter 1, attention has been concentrated on the mixed farm sub-sector. This accounts for the majority of farms in the Sector and is the sub-sector most urgently in need of attention and improvement. The other major sub-sectors are plantations and ranches.

3.2 DEVELOPMENT UP TO 1945

The development of the Large Farm Sector dates from the completion of the Kenya-Uganda Railway in 1901. This provided communications for extensive areas of inland Kenya which had hitherto been inaccessible. At that time most of the land was under natural pasture, grazed by nomadic pastoralists. Under the Crown Lands Ordinance of 1902 freehold and leasehold grants of land for agricultural purposes were made and farms of 260 hectares or more began being taken up, mainly on 99 year leases. However, the subsequent Crown Lands Ordinance of 1915, which made provision for freehold titles and 999 year leases, formed the main basis for the acquisition of farming land by Europeans.

After initial failures with sheep, cattle and wheat, due to soil deficiencies and disease, by 1914 successful cattle and sheep production had become established in Laikipia and Naivasha, based on cross-breeding of local and imported stock. In Naivasha disease-resistant strains of wheat were developed. By 1908 coffee, wattle, tea and sisal had been introduced. Meanwhile, further land was being brought under the plough, including areas in Northwest Kenya which proved suitable for both maize and wheat. Coffee, grown mainly near Nairobi, became a major export. The First World War (1914-1918) caused a setback to the Sector's growth. During this period many large farms went out of production due to the absence of experienced and efficient management. Recovery after 1918 was slow but subsequently conditions improved and over the period from 1918 to 1939 as a whole output continued to expand. However, much of the 1930's was a period of crisis and depression, due to the world slump and drought and locust problems. The mixed farm sub-sector, especially maize production, was the worst hit and, in fact, required substantial government assistance right up to the mid-1950's to enable it to survive. This assistance took the form of protection from competition by imported commodities and from competition for labour by African smallholders and peasant farmers. In addition the agricultural services such as extension and research were biased towards the requirements of large scale farms. There is little doubt, therefore, that Government policy has favoured the large farms, and little real attention was given to African farming until after 1945.

In 1920 nearly 520,000 hectares were occupied by large farms, but only 30,000 hectares were in arable production. Between 1920 and the later 1930's, however, the area of wheat rose from 2,000 hectares to 20,000 hectares, while that of maize, in spite of a decline in the early and middle 1930's, had by 1939 more than doubled to 41,000 hectares. Large increases also occurred in plantation crops and by 1939 the areas of coffee, sisal, tea and sugar cane were 32,000 hectares, 67,000 hectares, 5,500 hectares and 6,300 hectares respectively. Pyrethrum production on large farms began in 1930 and wattle production was also important. Throughout this period the Large Farm Sector continued to supply most of Kenya's gross marketed output of agricultural products.

Meanwhile, cattle, sheep and other livestock production expanded steadily and a substantial export trade in wool and butter developed. In 1939 wool and butter output were 690 tonnes and 1,250 tonnes respectively.

During this period the framework of institutions and supporting services was built. Legislation on many aspects, such as crop and livestock production and cattle disease control was introduced and organisations dealing with production, marketing, input supplies and other services, such as the Kenya Farmers' Association and the Kenya Co-operative Creameries, were set up. Agricultural research was developed for a number of the important crops.

Within a generation the basis for sound long-term farming development had been laid. However, due to the lack of use of proper mixed farming systems and the continuous cropping of arable land without adequate rotational or conservation practices, soil erosion became increasingly serious. Another problem which began to appear was that of the land question, which was essentially a social and political problem. As population pressures in the African reserves grew and land hunger developed, African feeling against the existence of the large underpopulated farming areas occupied by the large farms began to be aroused.

As with the First World War, the Second World War (1939-1945) resulted in a major setback to development. Many farms were left without management or with only limited supervision. Others were maintained as a group operation. Little or no development could take place and emphasis was given to the immediate need to increase food supplies to support a much increased population. As a result, wheat production rose from 17,800 tonnes in 1941 to 62,100 tonnes in 1944 and total production of cereals and meat was doubled, but this was achieved only by over-exploitation of the resource base, without due regard to the longer-term consequences of soil exhaustion and erosion.

3.3 DEVELOPMENT FROM 1945 TO 1963

The years which followed the 1939-45 War have been described as falling into three phases — recovery, planning and development. The first phase, which lasted until 1950, was devoted to correcting the effects of wartime over-exploitation of the land. It also saw the opening up of new land for cropping. The second phase, lasting until 1955, involved a continuation of the earlier activities but was marked by the preparation of the Troup Report, which set out plans for the long-term expansion and intensification of mixed farming in the Large Farm Sector. The third phase brought about the implementation of the Troup Report recommendations until 1960, when political changes were announced and development slowed down.

One of the Government's early actions was to expand and strengthen its soil conservation service in the Large Farm Sector. A farm planning service was also offered and, where desirable, such plans were integrated with those for larger areas in order to protect local catchments and major drainage ways. The combination of both restorative and preventive measures laid a sound foundation for proper land use and, where appropriate, integrated farming enterprises.

Official policy was now directed towards expansion of agricultural production in the Sector. The number of holdings rose steadily until 1962, but dropped slightly in the next year. The area occupied followed more or less the same trend and the cultivated area increased steadily. In comparison with the year 1920, by 1963 the number of holdings had roughly trebled, the area occupied had risen by 2½ times and the area under cultivation had increased more than eightfold (Table 3.1).

Table 3.1 Land Holdings and Areas in the Large Farm Sector

	1920	1952	1956	1960	1963
Holdings ¹	1,183	3,000	3,163	3,609	3,368
Area occupied (000 ha)	1,278	2,985 ²	2,935	3,130	3,000
Cultivated area (000 ha)	71	250	500	600	600

¹ This includes farms of below 20 ha in the former Scheduled Areas.

² Troup Report estimate.

Changes in the area of pasture are less easy to assess, since the areas quoted by various sources are at variance. Nevertheless, very large areas were brought under controlled management and provided with proper facilities in both the mixed farming and ranching areas, and as a result the area of planted leys expanded rapidly. Livestock numbers, particularly cattle and sheep, also increased substantially. Cattle and sheep numbers reached 980,000 and 583,000 head respectively in 1960, but then fell by 17 per cent and 14 per cent between 1960 and 1963.

Between 1945 and 1960 the area under plantation crops increased appreciably, the greatest gains being in tea and sugar cane. After 1960 the wattle area fell, but in contrast to cropping in the mixed farm sub-sector other plantation crops continued to expand.

Figure 3.1 shows the approximate location of the main large farm areas in 1960. These were concentrated in the Rift Valley Province, where most of the mixed farms were located, in Central Province, the most important plantation zone and in small areas of Western, Nyanza, Eastern and Coast Provinces.

Table 3.2 shows the crop and livestock output from the Large Farm Sector between 1945 and 1962/63.

Table 3.2 Production in the Large Farm Sector, 1945 to 1962/63

Product	1945	1949/50	1955/56	1959/60	1962/63
1. Crops (000 tons)					
Wheat	54.0	129.4	120.9	126.7	111.6
Maize	76.3	113.3	112.2	95.6	100.4
Barley	5.0	9.8	12.6	20.7	19.2
Oats	0.4	6.3	8.0	9.7	*
Sugar	8.2	15.7	16.6	33.5	*
Coffee (clean)	6.3	6.3	12.3	17.9	26.4
Tea (manufactured)	5.8	6.7	8.5	13.5	17.4
Sisal (fibre)	31.7	39.8	37.9	60.7	63.2
Wattle bark	28.1	*	*	50.2	48.8
Pyrethrum	*	*	2.8	6.7	3.9
2. Livestock products (000 tonnes)					
Milk (million litres)	*	89.6	205.2	262.1	*
Butter and cheese	2.6	3.2	4.9	6.3	6.1
Meat	15.1	19.5	27.8	59.5	*
Wool	0.7	0.5	0.6	1.0	*

* = Not available.

Between 1945 and 1949/50 the output of the two major crops from the large mixed farms, wheat and maize, increased markedly. Thereafter production stagnated, mainly because there was no significant improvement in yields in the 1950's. On the other hand, plantation crops expanded rapidly between 1945 and 1960 and in most cases continued to do so in the following three years. Except in the case of tea and sugar cane, the yields of which did not improve in the 1950's, this was a result of increases in both areas and yields.

In terms of output, employment and exports, the most important part of the Large Farm Sector was the estate sub-sector. In the mid-1950's half the gross output from large farms came from plantation crops, although some of this was produced on mixed farms. The overall contribution of the mixed farm sub-sector during this period was probably around 40–45 per cent. By the early 1960's it had, however, risen, being 47 per cent of large farm marketed output in 1962. This growth was primarily a result of the implementation of the measures for mixed farm improvement and expansion proposed in the Troup Report (see below).

Until the mid-1950's well over four-fifths of Kenya's gross marketed output came from the Large Farm Sector. During this decade, however, increasing attention was devoted to African smallholder agriculture. Production from the small farm sector started to expand, although the major growth did not take place until the 1960's. Between 1954 and 1963 the relative shares of the two sectors in the total gross marketed output were as shown on Table 3.3.

Table 3.3 Sectoral Shares of Gross Marketed Output, 1954 to 1963

Period	Large Farms (%)	Small Farms (%)
1954–1957	83.9	16.1
1958–1960	81.1	18.9
1961–1963	77.9	22.1

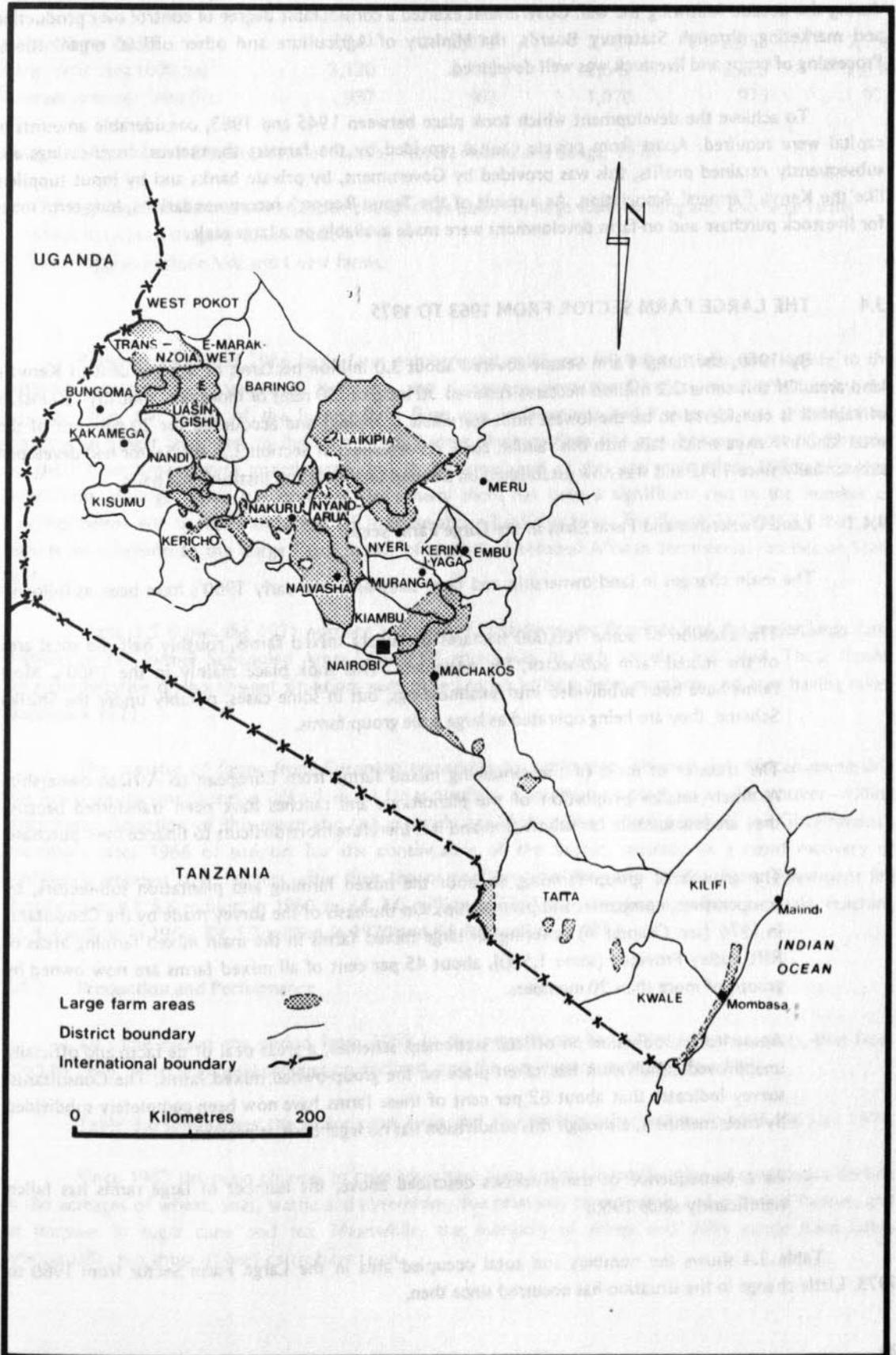
Source: 'Agricultural Development in Kenya', Heyer, Maitha and Senga, 1976.

During the 1950's the land problem came to a head, one of the main causes of the Emergency being land hunger amongst the Kikuyu. It has been estimated that in all some 20 per cent of the total usable land area had been alienated and designated as 'Scheduled Areas', for European settlement. Rising land hunger in the reserves led to increasing political pressures amongst the Africans for a share of this land. By 1960 official recognition was given to the need to relieve land pressure and in 1961 the first settlement scheme in the Scheduled Areas began. The Million Acre Scheme, a major proportion of which was concentrated in the Nyandarua district, followed in 1962.

The Troup Report, published in 1953, was a land mark in development policy for the mixed farming sub-sector (its terms of reference excluded the plantations). It proposed measures for the improvement and intensification of mixed farming, particularly through the better integration of livestock into the production system. These measures included the provision of additional finance, installation of permanent improvements and more technical investigation and advice. Though never fully implemented, the resultant developments led to a substantial improvement in the performance of the mixed farms, as noted above.

Between 1945 and 1963 there were considerable changes in production methods, and farming systems were developed on a sound technical basis. Before 1945 cultivation was based on ox-power, but thereafter mechanisation increased rapidly until by 1960 there were 6,000 tractors with an average of 68 hectares per tractor, and work oxen had virtually disappeared. The Sector's expansion led to a much increased work force, in terms of both numbers and skills. In 1940 the total work force was about 120,000, whereas by 1960 it had risen to 277,000.

Figure 3.1
Large farm areas 1960



By the end of the 1950's the full range of institutional and technical support required for the Sector's prosperity had been built up. The agricultural research programme was steadily expanded, research stations were developed in the low and high rainfall areas, and the East African Agricultural and Forestry Research Organisation (EAAFRO) and the East African Veterinary Research Organisation were established during the decade following the war. Government exerted a considerable degree of control over production and marketing, through Statutory Boards, the Ministry of Agriculture and other official organisations. Processing of crops and livestock was well developed.

To achieve the development which took place between 1945 and 1963, considerable amounts of capital were required. Apart from private capital provided by the farmers themselves, from savings and subsequently retained profits, this was provided by Government, by private banks and by input suppliers like the Kenya Farmers' Association. As a result of the Troup Report's recommendations, long-term loans for livestock purchase and on-farm development were made available on a large scale.

3.4 THE LARGE FARM SECTOR FROM 1963 TO 1975

By 1960, the Large Farm Sector covered about 3.0 million hectares, or 5.5 per cent of Kenya's land area. Of this some 2.2 million hectares received 30 inches (750 mm) or more rain annually (30 inches of rainfall is considered to be the lowest limit for viable cropping) and accounted for 20 per cent of the total land in Kenya which falls into this rainfall zone. As described in Section 3.3, the Sector had developed substantially since 1945 and was now established on a sound technical and institutional basis.

3.4.1 Land Ownership and Farm Sizes in the Large Farm Sector

The main changes in land ownership and farm sizes since the early 1960's have been as follows:-

- The excision of some 700,000 hectares of largely mixed farms, roughly half the total area of the mixed farm sub-sector, for settlement. This took place mainly in the 1960's. Most farms have been subdivided into smallholdings, but in some cases, notably under the Shirika Scheme, they are being operated as large scale group farms.
- The transfer of most of the remaining mixed farms from European to African ownership. A much smaller proportion of the plantations and ranches have been transferred because they are less suitable for subdivision and it is therefore more difficult to finance their purchase.
- The growth of group farming, in both the mixed farming and plantation sub-sectors, by co-operatives, companies and partnerships. On the basis of the survey made by the Consultants in 1976 (see Chapter 4) covering all large mixed farms in the main mixed farming areas of Rift Valley Province (some 1,500), about 45 per cent of all mixed farms are now owned by groups of more than 20 members.
- Apart from subdivision on official settlement schemes, a great deal of de facto and officially unapproved subdivision has taken place on the group-owned mixed farms. The Consultants' survey indicates that about 62 per cent of these farms have now been completely subdivided by their members, although this subdivision has no legal basis at present.
- As a consequence of the processes described above, the number of large farms has fallen significantly since 1960.

Table 3.4 shows the numbers and total occupied area in the Large Farm Sector from 1960 to 1973. Little change in the situation has occurred since then.

Table 3.4 Numbers and Area of Large Farms, 1960 to 1973

	1960	1963	1966	1970	1973
Farms above 20 ha	3,341	3,075	2,469	2,758	2,736
Large farm area (000 ha) ¹	3,130	2,962	2,642	2,689	2,658
Average area per farm (ha)	937	963	1,070	975	971

Source: 'Agricultural Development of Kenya', Heyer, Maitha and Senga, 1976.

- ¹ This includes Shirika and other settlement schemes based on large scale farming and also large farms which have been illegally subdivided.
- ² These figures exclude Voi and Coast farms.

Between 1960 and 1966 large farm numbers and total area fell substantially, due largely to the settlement programme. Nyandarua, Bungoma and Kakamega were the Districts most affected by this process. Since the whole of the former large farm area in Bungoma and Kakamega was settled, these Districts no longer form part of the Large Farm Sector. Average farm size rose because most of the units bought for settlement were mixed farms and at the lower end of the size scale. Since 1966 some legal subdivision of large farms has occurred. In general there has been a significant rise in the number of holdings below 400 hectares and some fall in those above 1,000 hectares. The figures in Table 3.4 may also include an accession to the Large Farm Sector of recently-developed African commercial ranches on State land.

Table 3.5 shows the 1971 number and area of large farms by Province and the major large farm Districts in the former Scheduled Areas. The main enterprises in each are also indicated. These figures are representative of the present situation, very little change in large farm numbers and area having taken place since 1971.

The transfer of farms from European ownership to settlement schemes and African ownership was based on cash purchases at fair prices. As far as possible, transfers took place on a willing buyer-willing seller basis. Adoption of this pragmatic and generally equitable policy, combined with the Government's assurances after 1966 of support for the continuance of the Sector, resulted in a rapid recovery of confidence amongst large farmers, after their loss of confidence in the early 1960's. Farm investment fell sharply from K£ 5.6 million in 1960 to K£ 3.0 million in 1963, but then began to increase again, reaching K£ 4.4 million in 1966, K£ 5.3 million in 1970 and K£ 6.8 million in 1973.

3.4.2 Production and Performance

To some extent the period from 1963 to the present can be divided into two parts, that from 1963 to 1966, when in general production declined, and the subsequent recovery after 1966.

Table 3.6 summarises the major crop areas and livestock numbers of the period 1963 to 1974.

Since 1963 the main changes in crop areas have been a slight intensification of cropping, a decline in the acreages of wheat, sisal, wattle and pyrethrum, due primarily to economic and technical factors, and an increase in sugar cane and tea. Meanwhile, the numbers of sheep and dairy cattle have fallen substantially, but those of beef cattle have risen.

Table 3.5 Location of the Large Farms in 1974

Province and District	Total area (000 ha)	Main Enterprise
1. Rift Valley Province		
Nakuru	456	Mixed farming, ranching, a few plantations
Uasin Gishu	289	Mixed farms, a few plantations
Trans Nzoia	185	Mixed farming
Kericho	85	Tea, mixed farming
Laikipia	735	Ranching, some mixed farming
Nandi	46	Tea and sugar plantations
Baringo	6	Ranching
Total	1,802	
2. Central Province		
Nyandarua	136 ¹	Mixed farming
Kiambu	83	Mainly plantations
Muranga	55	Mainly plantations
Nyeri	49	Mixed farming, some ranching
Total	323	
3. Eastern Province		
Machakos	240	Ranching, sisal
Meru	44	Mixed farming, ranching
Total	284	
4. Nyanza Province (mainly Kisumu District)	25	Sugar plantations
5. Western Province	6	Sugar plantations
6. Coast Province	81	Sisal and other plantations
7. Nairobi	26	Plantations, ranching
8. Total	2,547²	

Source: Statistical Abstract, 1975.

¹ There are only 30–40 privately or group owned large farms in Nyandarua, mainly in the north of the District; the remainder are operated by the Ministry of Land and Settlement as large co-operatives, as under the Shirika Scheme.

² This excludes certain areas (presumably buildings, lakes, etc.) which make up the balance of some 100,000 hectares.

Production figures for the Sector during this period are difficult to obtain, because published figures since 1967 have combined production from both large and small farms together. Apart from tea which almost doubled, the output of plantation crops did not change greatly between 1963 and 1966. Of the major temporary crops wheat output rose by 11 and maize sales from all sectors fell by almost half.

Table 3.6 Crop areas and Livestock Numbers in the Large Farm Sector, 1963 to 1974

Item	1963	1966	1969	1972	1974
1. Crops ('000 ha)					
Wheat	113	121	127	89	89
Maize	45	57	56	77	64
Coffee	31	29	28	29	28
Tea	18	21	22	24	26
Sisal	109	109	86	68	82
Pyrethrum	12	5	3	4	4
Sugar cane	19	17	26	27	29
Wattle	27	23	17	16	14
Temporary leys	97	79	86	95	97
Total cropping intensity (%)	18.7	20.5	20.4	20.2	20.8
2. Livestock ('000 head)					
Dairy cattle	332	262	273	308	299
Beef cattle	481	470	501	489	568
Sheep	502	434	461	366	353

Source: Statistical Abstract, 1975 and 'Agricultural Development in Kenya', 1976.

Table 3.7 shows the gross marketed output from the Large Farm Sector and its share of the national total from 1963 to 1974. The percentage share quoted for this period cannot be compared directly with that of previous years, because in 1963 a change in coverage within the Small Farm Sector occurred. Under the former system the Sector's share of total gross output in 1963 was only 21.7 per cent, but under the revised definition this became 37.1 per cent. Table 3.7 probably overstates the importance of the large farm sector. With regard to total output the small farm sector's share is probably increasing even more rapidly given that the increased subsistence requirement of Kenya's rapidly growing population is met from this sector.

Table 3.7 Gross Marketed Output from the Large Farm Sector 1963 to 1974

	Large Farm Gross Marketed Output (K£ million per annum)	Share of Total Marketed Output (%)
1962-64	37.9	61(1963-64)
1965-67	34.1	53
1968-70	37.8	49
1971-73	50.8	48
1974	72.0	49

Source: 'Agricultural Development in Kenya', Heyer, Maitha and Senga, 1976.

Over the 1963-70 period as a whole production from the Sector stagnated, the decline in the years immediately after 1963 being followed by a recovery to previous levels (between 1963 and 1970 there was no overall rise in crop and livestock prices, in which case the figures in Table 3.7 can be assumed also to represent the trend in physical output). Even after allowing for the high rates of inflation which began in 1972-73 physical output increased significantly after 1970, particularly in coffee, tea and sugar cane. Nevertheless, after the late 1960's the Large Farm Sector's share of Kenya's gross marketed output fell below half for the first time, and has remained there ever since.

The fact that production was not more seriously disrupted by the political and landownership changes which occurred in the 1960's is a tribute to the relative smoothness of the land transfer process.

However, although production in the Large Farm Sector has been maintained, by 1966 it was becoming clear that many of the newly transferred farms were experiencing difficulties. It was officially estimated that on many farms production per hectare was at only 20 per cent of pre-transfer levels (1966-1970 Five Year Development Plan). The problems were most serious on the mixed farms.

On the farms owned by individuals, small partnerships and companies with few shareholders, this poor performance was largely a result of shortages of working and investment capital, lack of suitable managerial skills and experience. On the other major ownership type, the farms owned by large groups, the basic cause was organisational. Although many occupiers had previously worked in the Large Farm Sector and had achieved responsibility in one or two activities, few had acquired the range of skills necessary for good management. Despite these difficulties, however, a survey undertaken by the German Extension Team in 1967-69 indicated that individually-owned farms were on the whole doing well and that company farms were performing better than loose partnerships or co-operatives, because in many cases the shareholders delegated authority to a managing director. The most severe problems were occurring with the group farms, especially the mixed farms. These are discussed in Chapters 4 and 5.

Various measures were taken to overcome these difficulties. From 1965 extension services were strengthened in the large farm areas. Two training centres, at Nyahururu (formerly Thomson's Falls) and Eldoret were set up to train farm managers. Additional development and working capital was made available under more liberal terms than hitherto. For some of the worst-affected farms the AFC (Agricultural Finance Corporation) started a rehabilitation scheme on a small scale in 1968. This formed the basis for the larger IBRD-financed Group Farms Rehabilitation Project, which began in 1975 and is intended to include 90 group-owned mixed farms and 36 coffee estates. A detailed review of the progress of this project is given in Chapter 4.

Briefly, the present situation of the Sector could be summarised as follows:-

- (a) Overall production from the plantation and ranching sub-sectors is being at least maintained, and in certain cases, such as that of coffee, is in fact increasing.
- (b) In the mixed farming sub-sector crop output is probably fairly stable, wheat production having stabilised after its decline between 1968 and 1973. Livestock production is, however, decreasing significantly, due principally to the continuing fall in milk production.
- (c) As has always been the case in the Sector, there is considerable scope for more intensive land use and for raising yields on mixed farms.
- (d) The most serious immediate problem is that of the poor performance of the group farms, especially in the mixed farming sub-sector.
- (e) The majority of the group-owned mixed farms have been unofficially subdivided amongst their members and in most respects can no longer be considered as large farms (Chapter 4).
- (f) In the mixed farming sub-sector, the process of transfer of ownership to Kenyan citizens is almost complete, but is less advanced in the plantation and ranching sub-sectors.

4

The Present Situation of the Large Farm Sector

4.1 INTRODUCTION

In this Chapter the present situation of the Large Farm Sector is discussed in more detail, especially from the viewpoint of farming systems and land ownership and tenure. Existing Government projects (in particular the Group Farms Rehabilitation Project), are also reviewed. The technical and economic performance of large farms is analysed in Chapter 5.

In all, there are just over 2,700 large farms of more than 20 ha. Between 450 and 500 of these are plantations and 200–250 are ranches (of which about 100 are of commercial size). Assuming a total of 700 in the plantation and ranching sub-sectors, this leaves a balance of 2,000 large farms. It is estimated that approximately 200 of these are sugar cane estates, specialist horticultural and livestock enterprises and miscellaneous farms outside the mixed farming sub-sector. The remaining 1,800 are large mixed farms, concentrated mainly in Rift Valley Province.

In addition to the farm management survey of 88 large farms (Chapter 5), the Consultants also undertook a census of most of the large farm sector in Rift Valley Province. This forms the base for the analysis of the existing composition of the mixed farming sub-sector (Section 4.3). In order to present the overall picture for the whole Sector, a brief description of the other sub-sectors, plantations and ranches, has also been given.

4.2 THE PLANTATION AND RANCHING SUB-SECTORS

The plantation and ranching parts of the Large Farm Sector have not so far been studied in such detail as the mixed farms, largely because they comprise considerably fewer units, their problems are less acute and the land transfer process is less advanced.

4.2.1 Plantations

(a) General

The most important plantation crops are coffee, tea and sisal (the sugar industry is not included in the Large Farms Study). Wattle is grown on a substantial scale only in Uasin Gishu District, mainly by the East African Tanning Extract Company, whilst production of the only other significant tree crop in the Large Farm Sector, coconuts, is confined to the coastal zones. In 1974 the total areas of these two crops were 16,600 ha and 1,350 ha respectively.

Table 4.1 shows the 1974 areas of tea, coffee and sisal in those large farm Districts where they are significant.

Large Farm Census results and the area figures quoted in the 1975 Statistical Abstract), they do provide some indication of the present situation regarding ownership and the main production enterprises. Table 4.3 summarises the data obtained.

Table 4.3 Large Farm Data for Limuru, Thika and Ruiru Divisions of Kiambu District (1976)

Enterprise	Ownership				Total	Average Size (ha)	Total Area (ha)
	Individual or partnership	Co-operative	Company	Other ¹			
Tea alone	2	—	5	—	7	611	4,279
Coffee alone	7	4	2	8	21	471	9,890
Tea and livestock	10	1	9	—	20	277	5,541
Coffee and livestock	1	7	1	5	14	607	8,493
Mixed farms	3	—	2	—	5	169	844
Livestock only	6	2	4	3	15	255	3,820
Sisal	—	—	1	—	1	—	N/A
Others ²	3	—	1	1	5	172	862
	32	14	25	17	88		33,729

Overall average size: 383 ha.

Sources: Local staff of the Ministry of Agriculture.

¹ The status of most of the 'Others' category is not known; the balance is made up of government farms and a mission farm.

² The other enterprises are two flower producers, a Government potato research station, a tea-coffee-livestock farm and a tea-pyrethrum farm.

Tea was concentrated entirely in Limuru Division, which is higher and receives more rainfall, whereas coffee was confined to the Thika and Ruiru Divisions. In almost every case the livestock enterprise was dairying.

On the basis of this sample, 32 per cent of the large farms in Kiambu District, the most important large farm area in Central Province, are tea or coffee single enterprise estates and 39 per cent are tea or coffee estates with livestock (mainly dairying) or other subsidiary enterprises. Thus 62 out of the total of 88, or 70 per cent, could be regarded as coffee and tea plantations. Most of the rest are dairy farms. If this percentage were applied to the total number of large farms recorded in the 1971 Census in the Kiambu and Muranga Districts, namely 386, this would suggest that there are some 270 tea and coffee plantations in the two Districts. Allowing for the small plantation area in Nyeri (there is none in Nyandarua) the number of plantations in Central Province is probably around 300.

Of the 74 farms for which information on ownership was provided, 43 per cent were recorded as being owned by individuals or small partnerships, 32 per cent by companies, 18 per cent by co-operatives and the balance by government and a mission. Only one tea plantation was co-operatively owned, whereas almost one third of the coffee estates were co-operatives. Although information on levels of performance was not obtained, reports indicate that productivity and management standards on the estates owned by individuals, small partnerships and small companies are generally good and that this part of the plantation sub-sector is performing satisfactorily. The main problem is with the farms owned by large groups.

These group farms are already the subject of the IBRD-financed Group Farms Rehabilitation Project (GFRP). As discussed in Section 4.4, this part of the GFRP shows signs of being successful and is probably the best approach to rehabilitating group-owned coffee estates. In addition, there are proposals that a detailed study of the coffee sub-sector should be undertaken by the Ministry of Agriculture. In view of these factors, additional proposals for the coffee estate sub-sector are not required at the moment. In general the tea sub-sector is performing well and does not require special attention.

(d) Irrigated horticulture

Although of less importance than coffee, tea and sisal plantation output, irrigated production of vegetables and flowers has been developed on a significant scale on large farms around Lake Naivasha, in Rift Valley Province. In 1974 Kenya exported K£ 1.7 million of horticultural produce, much of it from this area, and exports are increasing.

In the Consultants' census carried out in 1976, 11 specialist horticultural farms were recorded, with an average farm size of 68 ha. Five other farms, averaging 2,458 ha in area, were reported as undertaking irrigated horticulture as a subsidiary enterprise, parts of their land close to Lake Naivasha being irrigated by pumps from the lake (all the horticultural production in this area is irrigated in this way).

According to the information supplied by local Ministry of Agriculture staff, these farms are owned by individuals or companies. They are well-managed and no significant subdivision has occurred. In general they do not require special additional action from Government, except perhaps technical advice to help them combat the problems caused by the current rapid fall in water levels in Lake Naivasha. Guidance on export marketing is already available.

4.2.2 The Commercial Ranching Sub-sector

(a) General description

There is estimated to be a total of between 200 and 250 ranches. Many of these are, however, too small to be regarded as commercial ranching enterprises. Units of below 1,000 ha are most unlikely to be commercially viable and for adequate profitability an area of at least 4,000–5,000 ha is normally necessary. For the purpose of this study commercial ranches are assumed to be those with over 1,000 ha.

Almost all the ranches are located in Laikipia and Nakuru Districts of Rift Valley Province, in Machakos District and to a lesser extent in Coast Province. All are in the former Scheduled Areas. The new commercial ranches being set up on State land in Coast Province and the group ranches being established in Kajiado, Narok, Samburu and elsewhere are not included in this review.

There are estimated to be 40–50 commercial ranches (i.e. over 1,000 ha) in Laikipia District, about 20 in Machakos District and 30 in the Naivasha Division of Nakuru District. Details for the Naivasha area are given in Section (b) below. With the addition of the few commercial units in Coast Province and Baringo District, there is thus a total of some 100 large ranches in the former Scheduled Areas. In Naivasha it was found that there are also 41 small units of below 1,000 ha. Applying this ratio of large to small units to other areas, the total of all ranches would be between 200 and 250.

In Naivasha, the average size of large ranches of more than 1,000 ha is just over 7,000 ha. In Laikipia and Machakos it is fairly similar, being estimated as 6,000 ha in the former and 4,000–6,000 ha in the latter. Within this average there is a considerable range in sizes; for example, the largest ranch in Naivasha is over 32,000 ha.

Most of the ranches are in Ecological Zone 4 : Marginal potential and have an annual rainfall of below 750 mm (30 inches). Under these conditions carrying capacities are not high and only an extensive production system is possible. On the commercial ranches the main activity is therefore extensive beef cattle production, based on improved indigenous stock and exotic x indigenous crosses. Some ranches, mainly in Machakos and the area south of Nakuru, are also engaged in dairy ranching normally as a subsidiary enterprise to beef. Under good management, stocking rates are normally 4–5 ha per livestock unit (a livestock unit is equivalent to a liveweight of about 450 kg, the average for a typical ranch cow).

In all the commercial ranching areas the dominant beef enterprise is breeding-fattening, animals being bred and fattened on the ranch rather than being bought in as stores. In years when grazing conditions are better than normal, ranchers may, however, buy in store stock for fattening in order to make use of spare grazing.

In Laikipia and Machakos probably 30–40 per cent of the commercial ranches have now been transferred to African ownership, the balance being in European hands. Many of the transferred ranches are group-owned. In these cases the groups usually either appoint a manager and continue to run the ranch as a single commercial enterprise, or move into the ranch, subdivide part or all of it for settlement and use the balance for commercial production or communal grazing.

Since rainfall is normally not sufficiently reliable for sustained cropping, subdivision of ranches for cultivation and settlement is in most areas a serious mistake and should be actively discouraged. The main sufferers are the settlers themselves, since crop output is not sufficient to meet their needs. Despite its obvious drawbacks, however, subdivision of ranches for cultivation has already occurred on a significant scale and is still continuing. As an example, in March 1977 it was reported that a local company had bought two large ranches in Gilgil (part of Naivasha Division) and Laikipia and was planning to sell plots of two hectares to several thousand buyers for settlement. The sale prices quoted were very high, ranging from KSh. 1,500 to 2,500 per ha.

On ecological grounds subdivision of ranches in such areas should not be permitted, because of the high probability of crop failure and the long-term damage to the land's productivity. Once rangeland of this type has been cleared and cultivated, it takes some years for its stock-carrying capacity to recover to former levels.

Only 18 commercial ranches have joined the current IBRD-financed Second Livestock Project, under which credit and technical assistance is provided. Since most of the large ranches are well established and managed, the probable explanation is that the majority have adequate existing sources of credit, such as the commercial banks, and do not require the type of assistance being offered by the project.

(b) Ranches in the Naivasha Area

Ranches were included as part of the Consultants' 1976 census of large farms in Nakuru and other Districts. Apart from one unit of 7,039 ha in Uasin Gishu, all the other ranches in the survey area (Nakuru, Uasin Gishu, and Trans Nzoia Districts, and the Kipkelion Division of Kericho) were in Naivasha Division. Table 4.4 summarises the details of the information supplied by local staff of the Ministry of Agriculture.

Table 4.4 Ranches in Naivasha Division (1976)¹

Size (ha)	No.	Total area (ha)	Average size (ha)
Below 500	20	5,734	287
500-1,000	21	13,867	660
Above 1,000	30	211,230	7,041
Total	71	230,831	3,251

Source: Local staff of the Ministry of Agriculture.

¹ These figures include seven ranches for which no information was given and for which average sizes were assumed.

As described above, units of below 1,000 ha are not considered as commercial ranches. The discussion below is therefore concerned with the 30 units with over 1,000 ha.

These 30 ranches have an average size of 7,041 ha ranging from 1,119 ha to 32,400 ha. Of the 27 for which ownership information was available, 22 are owned by companies and only 5 by individuals. It appears that half the company ranches are in fact group-owned, the size of the group varying greatly. In all, therefore, perhaps 40 per cent of the commercial ranches in the Naivasha area are group-owned. In most cases the members do not live on their ranches.

For those farms for which information on management was provided, 18 were considered by the Ministry of Agriculture staff to be well managed, 2 had average management and 4 were poorly managed. All the poorly-managed ranches and one of the two with average management were group-owned. Ten out of 23 ranches employ qualified managers and all but two of the remainder are run by their owners.

Although these figures are only approximate and are inevitably dependent to some extent on subjective judgement, they suggest that most commercial ranches are satisfactorily managed and that the group-owned units are probably not in much danger of being subdivided. In most cases the members live elsewhere, and have joined group ranches primarily as a source of income and security rather than for the purpose of subdividing them into smallholdings. In view of these factors and the limited importance of ranching within the overall Large Farm Sector, further detailed attention is not justified in this report. At present the main requirement is probably a more stringent control over subdivision in those areas where arable cropping is not viable.

4.3 THE MIXED FARM SUB-SECTOR

Overall there are approximately 1,800 mixed farms, with an average size of just over 500 ha, occupying in total about 0.9 million ha. The majority of these are located in Rift Valley Province where there are about 1,530 large mixed farms, of which 1,460 are located in Nakuru, Uasin Gishu, Trans Nzoia and Kericho Districts and the remainder are divided between Nandi and Laikipia. The 1,460 farms located in the four main large farm districts occupy some 0.74 million ha, and represent approximately 81 per cent of the total mixed farms.

The data collection and field work undertaken in the Study in order to provide information on the mixed farming sub-sector, comprised two main elements, a census to give information on the overall situation and a detailed survey of a selected sample of farms.

The census covered all large farms in Nakuru, Uasin Gishu, Trans Nzoia and Nandi Districts and in Kipkelion Division of Kericho. Nandi was examined in less detail than the others because it has few mixed

farms; it is not discussed in this Section. The main objectives were to determine the composition of the mixed farms in these areas, with respect to the number of farms, their area, ownership type, numbers of owners (registered and unregistered), farming systems, quality of management, access to credit and the extent to which subdivision had already occurred. Information on these aspects was supplied by the local Ministry of Agriculture staff, on the basis of the Divisional lists of large farms and their own knowledge of the area. The information from this census is described here. It refers to Rift Valley Province and specifically to Nakuru, Uasin Gishu, Trans Nzoia and Kericho Districts.

The second major part of the field work and data collection was a farm management survey. This was designed to provide detailed information on the efficiency of management on the large farms, and is described in Chapter 5. With the data from the overall census and the detailed management survey, the present levels of performance could be established and the present situation analysed, so that the main problems and constraints within the mixed farming sub-sector could be identified and a strategy for future development could be formulated.

4.3.1 Soils and Climate

(a) Soils

The soils of the mixed farming areas generally fall into one of three types:-

- Soils derived from volcanic ash, which occur principally on the slopes and pediments of the Tertiary and Quaternary volcanoes. Such ash weathers to give strong brown and red clays of high mineral content, usually of considerable depth, as on the slopes of Mt. Elgon and Londiani. Shallower soils, often with murram close to the surface or with rock outcrops, occur on the upper mountain slopes and on the higher plateau areas in Uasin Gishu.
- Soils derived from the Basement Complex occur over much of the central part of Trans Nzoia and extend southwards into Uasin Gishu along the Nzoia valley. On weathering, the parent materials yield brown to dark red friable clays and sandy clays.
- Alluvial soils are scattered widely throughout the area along valley bottoms, on the floor of the Rift and on parts of the plateau in Uasin Gishu.

The soils derived from volcanic ash and from the Basement Complex are generally fertile, deep and well drained and have moderate to high agricultural potential. The alluvial soils, often of 'black cotton' type, are poorly structured, have a low organic content, tend to be acid and usually have more or less impeded drainage, their agricultural potential is limited and the soils are generally used for livestock production.

(b) Climate and Ecological Zones

Three of the climatic zones identified by Pratt, Greenway and Gwynne occur within the mixed areas of Rift Valley Province, as follows:-

Zone II Equatorial: Humid to dry sub-humid climate. The original vegetation was probably closed forest with derived grasslands and bushlands. Within the large farming area this zone is found at altitudes in excess of 2,100 m (7,000 feet) with rainfall of over 1,000 mm (40 inches). There is no completely dry season; rainfall is high between March and September and lowest during January and February. Such areas are found in the west of Trans Nzoia on the eastern slopes of Mount Elgon, down the eastern side of Trans Nzoia, in the east, central and southern parts of Uasin Gishu, in that part of Kericho which has a large farming system, in Nakuru west of the western

Rift Wall, in the north-eastern part of Narok, and in the eastern part of Nakuru from the top of the eastern Rift Wall.

Zone III Dry Sub-humid to Semi-arid climate: Original vegetation not forest but a variety of moist woodland or savanna with broad-leaved trees and evergreen shrubs. This zone occurs at slightly lower elevations than Zone II, at between 1,800 and 2,400 m (6,000–8,000 feet). Rainfall is also lower, between 750 mm and 1,250 mm (30–50 inches) and has a similar seasonal distribution to Zone II. Much of Trans Nzoia and the northern and western parts of Uasin Gishu occur in this zone, as well as a small area in the north and north-west of Nakuru and along the lower Kinangop east of Naivasha.

Zone IV Semi-arid climate: Original vegetation was probably dry woodland, often modified by fire to an *Acacia-Themeda* association. This zone is found at elevations of about 2,100 m (6,000 feet) and below with rainfall generally less than 750 mm (30 inches). The wettest periods are generally between March and May and between October and December. It occurs in Nakuru in the extreme north and along the Rift floor in the basins of Lakes Nakuru, Elementaita and Naivasha.

Figure 4.1 shows the altitude and rainfall throughout the main survey areas and Figure 4.2 gives the main ecological zones.

4.3.2 Farming Systems

Although the farming systems practised have developed primarily as a result of altitude, climate and soils, other factors such as type of ownership, number of owners, subdivision and size of holding have clearly influenced the system adopted. Five systems were identified and are described below:—

- System 1 Wheat/Maize/Dairy:** This system is found largely in Ecological Zone III where soils are not limiting, at intermediate altitudes of 2,000 m to 2,300 m (6,500–7,500 feet). Much of Uasin Gishu and both sides of the Rift in Nakuru are typical of this system. Wheat is the dominant arable crop but some maize and barley are grown.
- System 2 Maize/Dairy (Wheat):** A similar system to the previous one, found in areas of similar ecological potential, possibly at slightly lower altitudes with a higher rainfall. Maize is the dominant arable crop but wheat and barley are also grown. Changes in farm ownership pattern since the mid-sixties have contributed to the expansion of this system, and it is found in some areas (Kipkelion Division) which on purely ecological grounds would be considered more suitable for other systems. The whole of central Trans Nzoia, the Kipkelion Division of Kericho and the Turbo Division of Uasin Gishu are typical of this system.
- System 3 High Altitude and High Rainfall:** Largely related to Zone II at altitudes in excess of 2,300 m (7,500 feet) the system often embodies intensive land use with a wide mix of crops and livestock. Pyrethrum is typical of this system, with wheat and barley as the principal grain crops. Livestock enterprises include dairy, intensive beef production and sheep for fat lamb and wool. Parts of Kipkelion and Molo and part of Bahati Divisions of Nakuru are the main areas of this system.
- System 4 Extensive Livestock Production:** Associated principally with Zone IV, usually at altitudes below 2,000 m (6,500 feet), with rainfall below 750 mm (30 inches). The system is devoted to production of beef from improved indigenous and from indigenous cross exotic stock. A limited number of ranches also produce some milk in addition to beef. The Rift floor from Nakuru south is largely of this system, with individual ranches occurring in other areas.

Figure 4.1
Main survey area. Altitude and rainfall

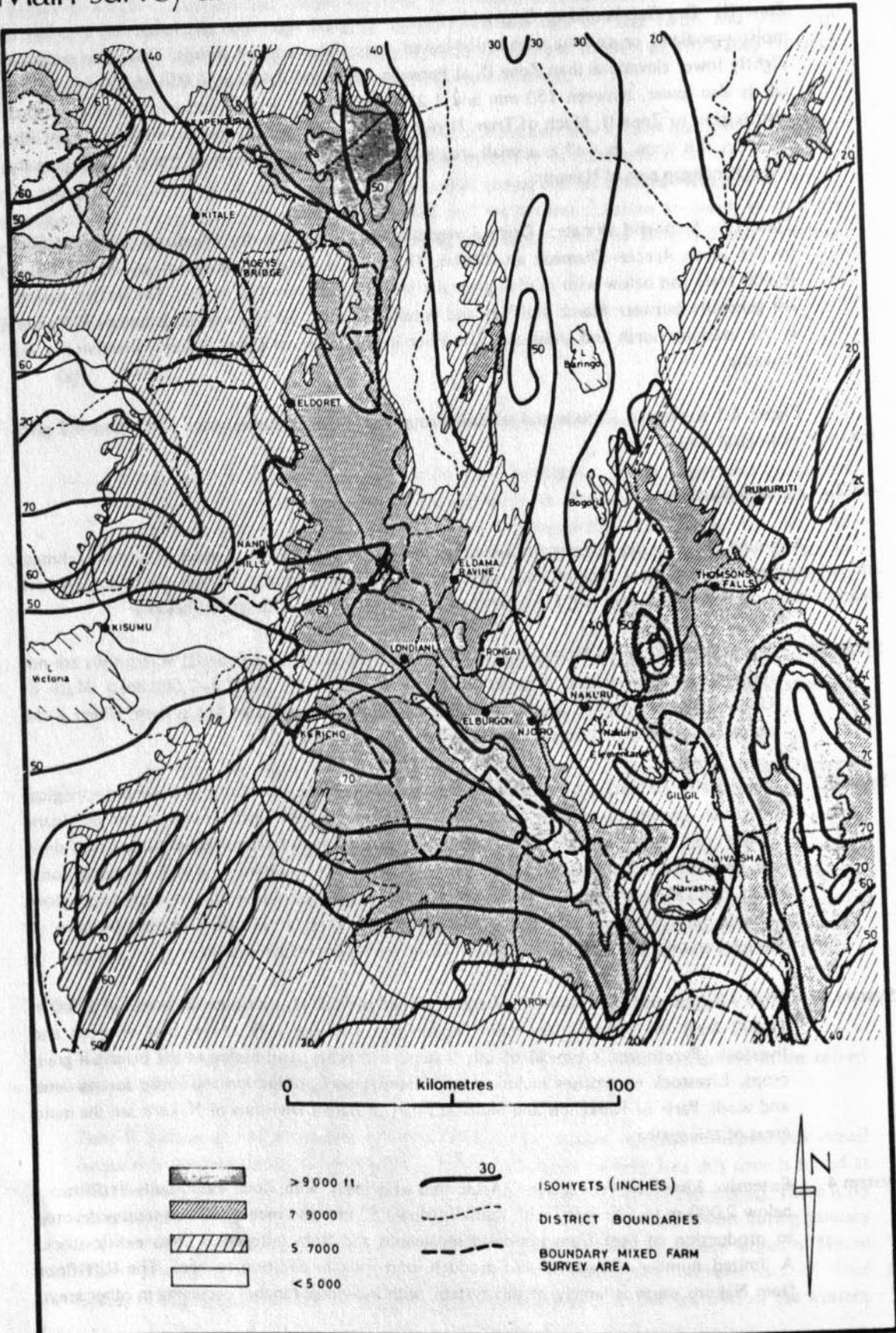


Figure 4.2
Main survey area. Ecological zones

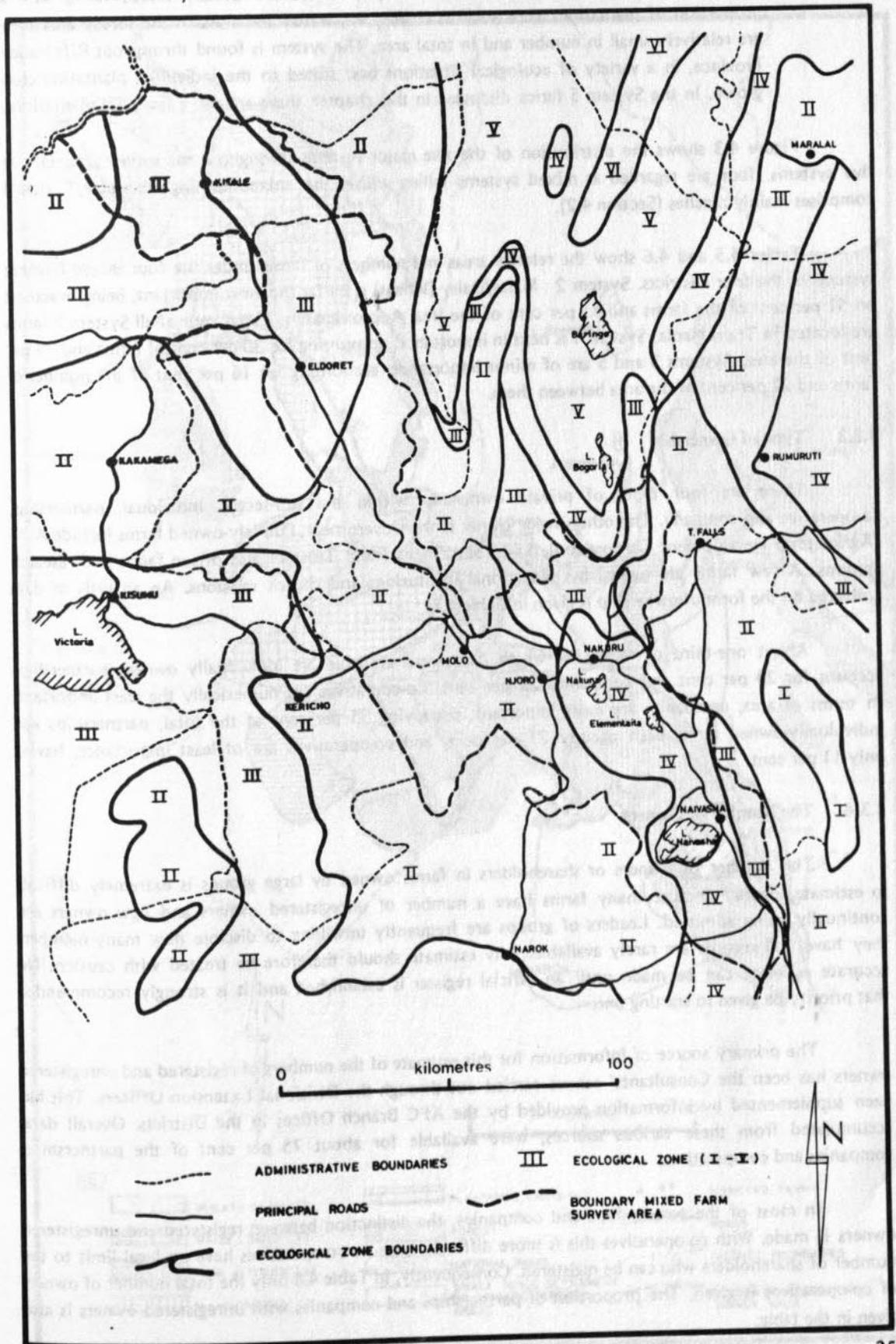


Table 4.5 Analysis of Farming Systems: Proportion by Area (ha)

Farming System	Nakuru		Uasin Gishu		Trans Nzoia		Kericho ¹		All Districts	
	Area	% of Total	Area	% of Total	Area	% of Total	Area	% of Total	Area	% of Total
Wheat (Maize) Dairy	74,161	34	122,604	46	4,634	3	9,912	17	211,311	29
Maize/Dairy (Wheat)	37,858	17	92,336	34	168,157	94	32,209	55	330,560	45
High Altitude	80,212	36	16,450	6	—	—	4,883	8	101,545	14
Plantation	29,139	13	37,217	14	6,047	3	11,867	20	84,270	12
Total	221,370	100	268,607	100	178,838	100	58,871	100	727,686	100

¹ Kipkelion Division only.

Table 4.6 Analysis of Farming Systems: Proportion by Number of Farms

Farming System	Nakuru		Uasin Gishu		Trans Nzoia		Kericho ¹		All Districts	
	No. of Farms	% of Total	No. of Farms	% of Total	No. of Farms	% of Total	No. of Farms	% of Total	No. of Farms	% of Total
Wheat (Maize) Dairy	136	35	222	47	16	5	23	19	397	30
Maize Dairy (Wheat)	73	19	213	46	327	91	74	59	687	51
High Altitude	159	40	25	5	—	—	8	7	192	14
Plantation	25	6	8	2	15	4	18	15	66	5
Total	393	100	468	100	358	100	123	100	1,342	100

¹ Kipkelion Division only.

Table 4.7 Types of Ownership of Large Mixed Farms by Numbers and Area

	Types of Ownership										All Farms farms	All Farms (ha)
	Individual farms	Individual (ha)	Partnership farms	Partnership (ha)	Co-operative farms	Co-operative (ha)	Company farms	Company (ha)	Other ¹ farms	Other ¹ (ha)		
Nakuru ²	168	41,430	51	16,996	3	42,779	179	127,594	40	30,408	441	259,207
Uasin Gishu	141	51,989	228	103,301	28	20,029	87	91,277	21	17,507	505	284,103
Trans Nzoia	140	53,874	110	42,311	24	14,597	51	29,661	41	46,962	366	187,405
Kericho ³	28	6,142	28	7,071	20	14,900	44	26,314	9	5,672	129	60,099
Total	477	153,435	417	169,679	75	92,305	361	274,846	111	100,549	1,441	790,814
%	34	19	29	21	5	12	25	35	7	13	100	100

¹ Includes mainly ADC, SFT and other publicly-owned land.

² Excludes ranches.

³ Kipkelion Division only.

Table 4.8 Number of Registered and Unregistered Owners of Mixed Farms by Type of Ownership

District	Partnerships				Companies		Companies with ⁵ unregistered owners		Co-operatives	
	Small Partnerships ¹ (%)	Average number of owners	Large Partnerships ² (%)	Average number of owners	Companies with ⁴ only registered owners (%)	Average number of shareholders	(%)	Average number of shareholders	Average number of owners	of owners
Nakuru	65	3.2	35	338	33	2.8	23	34	44	435
Uasin Gishu	54	2.9	46	40	11	3.0	53	37	36	212
Trans Nzoia	43	3.1	57	39	17	3.2	25	31	58	245
Kericho ⁶	79	3.2	21	26	23	3.6	19	36	58	128
Total (weighted average)	53	3.1	47	48	21	3.1	32	35	47	255

1 Partnerships with less than 7 members.

2 These unregistered partners are in addition to the 2-7 registered partners.

3 Companies with less than 7 members.

4 Companies with less than 50 shareholders.

5 These unregistered shareholders are in addition to approximately 50 registered shareholders.

6 Kipkelion Division only.

Of the partnerships, about 53 per cent are small, with less than seven registered partners. The remaining 47 per cent have on average 48 unregistered partners. Approximately 21 per cent of the companies are small, with less than seven shareholders, 32 per cent are medium-sized, with an average of 35 shareholders, all registered, and the remaining 47 per cent have on average 255 unregistered members in addition to about 50 registered shareholders. Co-operatives have on average 171 members.

4.3.5 Subdivision

Whether subdivision should be encouraged, discouraged or prohibited has been the centre of debate for some years. The Government's policy itself is not clear on the issue; the 1974-78 Five Year Plan indicates that subdivision of some large farms would be encouraged although the view held in many official circles is that subdivision must be prevented. The arguments for and against subdivision are considered later in Chapters 7 and 8. In this section the present extent of subdivision is estimated.

The estimate is based primarily on the local knowledge of the Extension Officers at the Divisional level, who recorded information on the census forms distributed to them in the early part of the study. Five classes of subdivision were identified in the initial appraisal of the sub-sector. These were defined in the census and the local Officer was required to place each farm in the appropriate class. The five classes were:—

- A No subdivision
- B Less than half the farm subdivided into subsistence plots or smallholdings
- C More than half the farm subdivided into subsistence or smallholdings
- D Completely subdivided into subsistence-sized holdings or smallholdings
- E Completely subdivided, but into holdings which can still be regarded as large scale farms

An analysis of the information obtained from the census sheets is given in Table 4.9. In terms of number of farms or land area the proportions in each group are similar. The most important point to emerge is that already 27 per cent of both the number of farms and land area is already completely subdivided into smallholdings.

If the subdivided portions of Classes B and C are added, up to 35 per cent of the total land area of mixed farms could be regarded as already comprising only smallholdings or subsistence plots. The subdivided farms occur in all areas but are not evenly dispersed throughout the districts. They tend to be concentrated in such areas as the east of Trans Nzoia, in the Cherengani Division, the Turbo, Plateau and Timboroa Divisions of Uasin Gishu and in Bahati Division of Nakuru.

Subdivision is closely linked to those farms owned by a large number of shareholders. An analysis has therefore been carried out within two major classes of ownership, namely:—

- Individually owned, small companies and partnerships of an average 2-4 members (later defined as Category 1 in Chapter 9).
- Group-owned farms, mainly partnerships, companies and co-operatives, usually with more than 20 members and frequently with up to 200 or 300 (later divided into Category 2 and 3 farms in Chapter 9).

An analysis of subdivision within these classes is given in Table 4.10. Of the farms owned by large groups, 62 per cent of the number and 56 per cent of the land area is already completely subdivided into smallholdings or subsistence plots. Of the class with few owners, only 14 per cent are completely subdivided. These subdivided units, however, can still be regarded as large scale farms.

Table 4.9 Extent of Subdivision on the Mixed Farms by Number and Area of Farms¹

District	Subdivision Class												Total	
	A		B		C		D		E		Total		No.	Ha
Nakuru	176	88,002	50	41,332	33	19,394	39	19,629	4	1,564	302	169,921		
Uasin Gishu	165	87,698	31	22,382	39	24,479	163	95,059	59	22,195	457	251,813		
Trans Nzoia	215	117,422	18	9,149	10	5,700	93	44,555	19	5,999	355	182,825		
Kericho ²	48	17,308	14	7,997	11	8,187	41	19,747	12	4,358	126	57,597		
Total	604	310,430	113	80,860	93	57,760	336	178,990	94	34,116	1,240	662,156		
%	48	47	9	12	8	9	27	27	8	5	100	100		

¹ No information was available for 152 farms.

² Kipkelion Division only.

Table 4.10 Extent of Subdivision by Ownership Group

District		Few Owners ¹					Large Group-owned ²			Total
		A	B	C	E	A	B	C	D	
Nakuru	No. of farms	162	2	1	4	14	48	32	39	302
	Area (ha)	82,294	617	1,350	1,567	5,708	40,715	18,044	19,629	169,528
Uasin Gishu	No. of farms	160	11	6	59	5	20	33	163	457
	Area (ha)	83,147	6,554	2,786	22,195	4,551	15,828	21,693	95,059	251,813
Trans Nzoia	No. of farms	212	2	1	19	3	16	9	93	355
	Area (ha)	115,629	673	669	5,999	1,793	8,476	5,031	44,555	182,825
Kericho ³	No. of farms	42	2	—	12	6	12	11	41	126
	Area (ha)	15,887	477	—	4,358	1,421	7,520	8,187	19,747	57,597
Total	No. of farms	576	17	8	94	28	96	85	336	1,240
	Area (ha)	296,957	8,321	4,805	34,119	13,473	72,539	52,955	178,594	661,763
	Total No. of Farms %	83	2	1	14	5	18	16	62	
	Area %	86	2	1	11	4	23	17	56	

¹ Individually-owned, small partnerships and companies with an average of 3-4 owners.

² Companies, Partnerships and Co-operatives with more than 20 owners.

³ Kipkelion Division only.

Source: Consultants Large Farm Sector Study Report: Volume 2. November 1977.

4.3.6 An Assessment of Management Performance

The census of farms was also used to obtain a broad picture of the level of management throughout the mixed farms. Again the Extension Officers at the divisional level were asked to classify the farms in their Division into good, average and poorly-managed farms. This is purely the subjective view of the Extension Officers and should be regarded as no more than an indicator. It is worth noting, however, that the Consultants' more detailed assessment of management on the farms included in the farm survey was compared with that of the local Extension Officers, and apart from a tendency to down-grade a small proportion of good and average farms they were very similar.

A summary and analysis of the data obtained by District are given in Table 4.11. In terms of number of farms, the proportion of well-managed farms is only 27 per cent. The poor farms make up the largest proportion, 42 per cent. In terms of area of land in each group there is a fairly even distribution between good, average and poorly-managed farms.

An analysis has also been carried out relating management to ownership groups. The two ownership groups used, however, are not the legal forms such as individual, partnership, company etc., but are groups based almost solely on the number of owners. The evidence collected in the Study has made it clear that the number of owners or shareholders is a much more important factor determining standards of management than is the particular legal form of ownership. Thus, for the assessment the two main classes were, farms with few owners and farms with a large number of owners, as described in the previous section.

An analysis of management standards within these classes is given in Table 4.12. The overall management in the farms with few owners is markedly better than on the large group-owned farms. For instance, 41 per cent of the farms and 58 per cent of the land in the former are generally well managed, whilst only 9 per cent of the farms or 14 per cent of the area owned by large groups could be regarded as well managed. According to the assessment, the majority of the group-owned farms (67 per cent of the number and 59 per cent of the area) are badly managed.

4.4 REVIEW OF THE GROUP FARMS REHABILITATION PROJECT

A detailed review of the World Bank (IBRD)-financed Group Farms Rehabilitation Project (GFRP) is given in Annex I. The main points are briefly summarised here.

4.4.1 The Project

The Group Farms Rehabilitation Project commenced in March 1975, with the signing of a Development Credit Agreement between the Government of Kenya and the IDA. It was prepared initially by the Ministry of Agriculture, with assistance from the IBRD Permanent Mission for East Africa, and was appraised by IBRD in April-May 1974.

The objective of the project is to assist in the redevelopment of some 90 group-owned mixed farms and 36 coffee estates. Financial assistance is given for short, medium and long-term expenditure on working capital, machinery and infrastructure. The provision of capital is associated with improved management. On the mixed farms, a condition of joining is the acceptance by the farm owners of a trained farm manager recruited and approved by the Agricultural Finance Corporation (AFC). He is supervised by AFC through a system of visiting farm managers. Recruited coffee estates are required either to sign an agreement (approved by AFC) with a management agency such as East African Acceptances or Estate Services, who are responsible for making all financial and managerial decisions after consultation with the owners and AFC, or to employ a suitably qualified estate manager approved by AFC.

The project will extend over eight years. Recruitment of farms will be completed in four years, and assistance to the last lot of farms recruited will be withdrawn by the end of the eighth year.

Overall direction for the project is provided by an interministerial Steering Committee, but AFC is responsible for its implementation. This is done by a Large Farm Management Section created within the AFC as part of the project. Assistance in identification and selection of suitable farms is given by the Land and Farm Management Division of the Ministry of Agriculture.

This review of progress is based on information collected by the Consultants while carrying out a survey of farms between July and October 1976, the findings of their consultant sociologist and a visit to each of the farms already recruited to the project. The visits were made in January 1977, when results from at least one season's efforts were expected to be available.

4.4.2 Farm Recruitment

Ten farms, four coffee estates and six mixed farms, have so far joined the project (two mixed farms which applied were found to be unsuitable and have been rejected). If current negotiations are successful it may be possible to incorporate a further two coffee estates and five mixed farms before the end of the second year, bringing the total to 17 farms, or 31 per cent of the target.

The primary reason for the lack of success in attracting farms to the project is a fundamental dislike or distrust of group enterprise on the part of the farm shareholders (this is discussed in Section 8.3). Other contributing factors have been understaffing of the project and poor promotion. Neither the Ministry of Agriculture nor the AFC have met their staffing obligations. At no time since the project's inception has the establishment of staff reached the complement proposed in the project appraisal document prepared by IBRD in February 1975.

The lack of appeal of the project to group farm owners has resulted in farms being incorporated which would not strictly be regarded as eligible for the project. Two of the coffee estates cannot be regarded as genuinely in need of rehabilitation. One is a wealthy company with considerable assets, managed by an able and experienced estate manager, while the other had been under rehabilitation at the time of joining and was already obtaining reasonable yields of about 1.3 tons of dried coffee per hectare. All of the coffee estates recruited have benefited from the project, and results have largely been as anticipated.

The mixed farms recruited had accumulated considerable debts and joining the project represented the only alternative to eventual loss of the farm. Because of the debt burden it is unlikely that many of the six farms meet the financial criteria for eligibility laid down in the project document, although initial plans and budgets prepared at the time of recruitment indicated that they would.

4.4.3 Farm Plans for the Mixed Farms

All the farm plans and budgets for the mixed farms require complete revision, for the following reasons:-

- (a) The land areas, particularly the potentially arable land, which are available for group large scale operations have been overestimated on all but two farms.
- (b) The crop and livestock projections are too optimistic. For instance, the milk yields assumed are at least one third above what could reasonably be expected.
- (c) Visiting Managers now believe that in the high altitude areas consideration should be

given to replacing dairy enterprises by sheep (this applies to four of the farms). Budgets have yet to be prepared for sheep enterprises.

- (d) On some of the high altitude farms, overemphasis has been placed on pyrethrum, financially the most attractive crop, as a means of increasing gross revenue.

The effect of overestimating both the arable areas available and the yields has been an exaggerated projection of the revenue-earning potential of each of the six farms.

4.4.4 Farm Performance to Date

The actual performance of the farms during the 1976 season has not been encouraging. On the five farms with dairy herds milk yields were in the order of 800–1,000 kg per cow per year, significantly lower than the levels anticipated for at least three of the farms. On certain farms some progress was made with land clearance, crop establishment and the improvement of fencing and infrastructure, but on at least three farms cereal yields were well below projected levels, with in one instance a complete failure of the wheat and barley crops.

Apart from the basic problem of group farming being contrary to members' aspirations the reasons for the poor overall performances are many. The fact that too much of the Visiting Manager's time is spent in travelling (the recruited farms are widely scattered and frequent liaison with the AFC Nairobi Office is necessary) and in meetings either to solve disputes between managers and members or to persuade farms to join the project, has no doubt contributed. Difficulty has also been experienced in controlling stocks and the use of the farm vehicle on some farms.

4.4.5 Farm Ownership Problems

The problem of ownership on farms recruited has not been resolved. Although lists of owners have been prepared, these are thought to be incomplete and additional owners continue to present themselves on some farms. It is therefore difficult to define who the beneficiaries will be and who will be liable to meet the financial obligations of repayment.

Non-resident owners may also pose a problem if or when they decide to take up residence on the farm. No agreement has been reached with these owners and there is the real possibility that they could decide to claim a subsistence plot at the expense of the large scale operation. This is all the more likely because no additional benefits or dividends have been agreed upon in lieu of a subsistence plot. Legislation exists in the co-operative law to prevent this and to limit the rights of non-resident members. It is not, however, invoked.

On the majority of farms, the involvement of the owners has been minimal. Although provision has been made for farm rehabilitation committees to be established, these rarely meet and in most cases show little interest in the large scale area. Also, there is a marked unwillingness on the part of shareholders to provide labour on the group area.

4.4.6 Organisational Aspects

Three areas were neglected when organisational proposals were drawn up by the IBRD appraisal mission for the project. First, the need for legal advice during the recruitment stage was not considered, and no allowance was made for employing legal staff to assist with the project. Secondly, the need for land survey capability to prepare the farm physical plans and lay out subsistence plots was not anticipated and the early difficulty in obtaining survey teams caused delay in implementation (two survey teams have now been allocated specifically for this work). Lastly, the Co-operative Department was not initially

involved in the planning stage, although all six of the participating mixed farms are co-operatives and the local Co-operative Officers have some responsibility for them. In practice the Co-operative Department has provided some of the checks in the present system by intervening when it was thought that the proposed levels of investment were too high. Since May 1976 the Co-operative Department has had a representative on the Loans Committee.

4.4.7 Conclusions

In conclusion, the Consultants do not believe that the objectives of the project or recruitment targets proposed are likely to be achieved. The primary reason (stated in Annex III, Social Aspects) is that the project is in direct conflict with the aspirations of the groups of farm owners whom it is designed to help and in the case of mixed farms only those who can be persuaded that they have no alternative to it will eventually join. It is considered that an alternative approach should be adopted for the group-owned mixed farms. Although recruitment of coffee estates has been slow, some success has been achieved. Given the extremely large numbers of shareholders involved and the fact that most are non-resident on the estate and have become members primarily to earn income from the estates rather than to obtain subdivided plots, group farming has considerably more chance of success than on the mixed farms. It is therefore recommended that the present approach to rehabilitation of group-owned coffee estates should be continued.

It should be noted, however, that the services provided within the project are not only required by the group-owned farms but also by individually-owned mixed farms, small partnerships and companies whose primary aim is to operate a large scale unit. A project of this type would probably be widely acceptable to them.

4.4.8 Other Government Projects for the Large Farm Sector

There are two other Government projects which are aimed to a considerable extent at large farms. The Second IBRD Livestock Project (Section 4.2) involves the provision of credit and technical assistance mainly for the development of group ranches and new commercial ranches on State land. It does, however, also include loans to existing commercial ranches in the former Scheduled Areas. As yet only 18 such ranches have joined the project.

Of greater importance to the Sector is the Commercial Farming Project (detailed in Annex V) which is a continuation of previous IBRD loans channelled through AFC (the Agricultural Finance Corporation) to both smallholders and larger farmers. Essentially it is an injection of credit to increase AFC's lending capacity and has no special project management of its own. It involves seasonal credit and longer term loans for on-farm development, livestock improvement and the purchase of machinery and equipment. Loans of up to KSh 250,000 can be given for development on medium and large commercial farms. Provision is also made for loans to farm contractors for machinery operations and to suppliers of farm inputs.

With these two projects, the Group Farms Rehabilitation Project and existing credit institutions, ample provision has therefore been made for the supply of farm credit to the Large Farm Sector.

4.5 THE ADC AND SFT LARGE FARMS

4.5.1 The Agricultural Development Corporation ADC Farms

The ADC, an independent quasi-Government agency, was established in 1965 to assist in the implementation of the transfer of Land to African owners. It was also charged with purchasing and

operating farms judged to have unique characteristics such as various livestock studs and seed production units. It was believed that their value to the nation would be destroyed if they were subjected to indiscriminate management or subdivision. Initially ADC acquired 125 farms; of these it has retained 23 which it operates as 'State' farms. The balance have been transferred to African control. Originally this was on a 15 year lease basis but recently lease arrangements have been replaced by purchases. ADC has proved to be an effective agricultural agency in the past five years, whose direct farming activities have been profitable. It is currently the most important producer of hybrid maize, is an important grower of grass seed and maintains a number of pedigree dairy herds and beef and sheep studs. The present position regarding the number of farms and land area farmed by ADC is given in Table 4.13. As regards mixed farms, the number under ADC control has stabilised. A recent development has been the purchasing of farms in ranching areas. This should be continued as ADC are efficient operators and a policy of encouraging 'State' ownership and operation of ranches through an agency like ADC should reduce the pressure of subdivision on ranching land.

Table 4.13 The Number and Area of ADC Farms

	Trans Nzoia ¹	Nakuru ²	District Laikipia ³	Machakos ⁴	Coast	Nyanza ⁵
No. of Farms	12	5	1	3	1	1
Area (ha)	23,772	14,614	26,316	14,170	1,462	4,205

Source: ADC Personal Communication.

¹ Mixed farms, pedigree dairy cattle, wheat and hybrid maize seed.

² Includes Old Jarrai Ranch at Elementeita (9,716 ha) a feed lot at Lanet and some mixed farms with sheep studs in Molo.

³ Boran stud.

⁴ Beef cattle and Boran stud.

⁵ Sugar cane and beef cattle.

4.5.2 Settlement Fund Trustee (Shirika) Farms

The idea of the SFT 'Shirika' Farms (Annex V) was conceived primarily to determine whether a more viable form of land acquisition and loan repayment could be evolved than the existing systems of formal settlement schemes and group take-overs, both of which resulted in considerable loan arrears. Under the SFT programme, large scale farms were purchased by the Ministry of Lands and Settlement (MLS) and a number of 'landless people' were settled on one hectare subsistence plots, the total area of which should not exceed 25 per cent of the total farm. The remaining area was to be farmed as a large scale enterprise by a manager and subsidiary staff employed on contract and directly responsible to MLS.

It was expected that the responsibility for management would be transferred progressively to farmers co-operative societies. The land would be held on a leasehold basis, the farmers paying a rent of five per cent of the land value. They would be expected to purchase loose assets and development loans would be provided for this purpose. The programme started in 1971.

In practice the large scale enterprise is normally run directly by the manager with little involvement by the settlers. Divorced from the large scale enterprise, settlers invariably aspire to eventual ownership and subdivision.

Not all of the SFT farms have been committed to 'Shirika' settlement. A small proportion are operated directly as a 'State Farm' by SFT and others have been organised into conventional settlement schemes. The present situation regarding SFT farms is given in Table 4.14.

Table 4.14 SFT and 'Shirika' Farms Ownership (May 1976)

	Nakuru		Uasin Gishu		Trans Nzoia		Nandi		Laikipia		Nyandarua		Nyeri	
	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)	No. of farms	Area (ha)
Shirika	12	13,612	13	11,401	12	13,009	-	-	3	6,395	4	4,210	4	8,638
Conventional Schemes	8	8,461	1	171	5	2,570	1	269	-	-	-	-	-	-
SFT	1	6,098	1	216	8	5,067	2	1,697	-	-	-	-	-	-
Total	21	28,171	15	11,788	25	20,646	3	1,966	3	6,395	4	4,210	4	8,638

Source: Ministry of Lands and Settlement: Personal Communication.

5

The Present Performance of Large Farms

5.1 INTRODUCTION

The data collection and field work undertaken in the Study comprised two main elements. First a census was undertaken of all large farms in Nakuru, Uasin Gishu, Trans Nzoia and Nandi Districts and in Kipkelion Division of Kericho. Second, a farm management survey was made (Annex II) concerned primarily with mixed farms in the same areas to provide detailed information on management standards, the relative performance of different farm types and sizes, the use of inputs and the financial status of farms. Such data would establish the present levels of performance and allow analysis of the present situation, so that the main problems and constraints within the mixed farming sub-sector could be identified and a strategy for future development could be formulated.

Although the survey concentrated on the large mixed farms, of which there are about 1,800, some ranches were also included. There are estimated to be 1,460 large mixed farms in the survey area, or 81 per cent of the national total. Since the four Districts adequately cover the normal range of mixed farming types and include such a high proportion of the total, no advantage would have been gained by spreading the sample frame over a wider area, especially as more of the limited time available would have been wasted on travelling and making local contacts.

The sampling unit was defined as a farm of over 20 ha, the minimum large farm size as defined in government statistical publications. Where large farms have been unofficially subdivided into separate production units, the data supplied by the individuals have been aggregated to give a total estimate for the original large farm, which forms the sampling unit.

Within the mixed farming group, there is considerable diversity in farming system, organisation and ownership. It was therefore decided to stratify the sample frame, on the basis of farming system, ownership and the standard of management as assessed subjectively by the local staff of the Ministry of Agriculture. The five production systems are described in Section 4.3. In the sample the number of each farm type included was based on its percentage of the total in the four Districts, as recorded in the initial census undertaken in the Study. Table 5.1 shows the composition of the farm survey sample.

Originally it had been intended to cover 100 farms, but lack of information reduced the final sample to 88, of which 28 each were in Nakuru and Uasin Gishu, 24 in Trans Nzoia and 8 in Kipkelion. The System 1 : Wheat/maize/dairy farms included were mainly in Uasin Gishu and Nakuru and most of those in System 2 : Maize/dairy (wheat) were in Trans Nzoia and Uasin Gishu. Ranches (four in number) were confined to the Naivasha Division of Nakuru and the System 3 : High Altitude sample was almost entirely in Nakuru. Figure 4.3 in Chapter 4 shows the location of the sampled farms.

Table 5.1 The Farm Survey Sample

Ownership System	Individual		Partnership		Co-operative		Company		Other		Total
	G	A/P	G	A/P	G	A/P	G	A/P	G	A/P	
1. Management standard Wheat/maize/dairy	8	7	4	4	—	3	—	5	1	1	33
2. Maize/dairy (wheat)	5	4	2	14	—	5	—	9	1	—	40
3. High altitude — high rainfall	1	—	—	1	1	1	1	3	1	—	9
4. Ranching	—	—	—	—	—	1	—	3	—	—	4
5. Mixed farms with plantation crops	1	—	—	—	—	1	—	—	—	—	2
Sub-total	15	11	6	19	1	11	1	20	3	1	88
Total		26		25		12		21		4	88

Notes: G = Good management.
A/P = Average to poor management.

Although not given the same degree of prominence in sample selection as the three criteria listed above, the sample was also chosen to reflect the full range of subdivision in the different areas. Of the 88 farms, 38 (43 per cent) were whole units with no subdivision, 18 (20 per cent) were completely subdivided, of which 13 had average holdings of less than 20 ha, 17 (19 per cent) had less than 50 per cent of their area subdivided and 15 (17 per cent) had more than 50 per cent subdivided.

The survey was based on farm interviews, using a very detailed questionnaire which had previously been tested and modified through pilot surveys. Each of the selected farms was visited by a member of the study team in the company of the local Assistant Agricultural Officer, who where necessary acted as interpreter. Most farms had to be visited twice, once to arrange the interview and then to carry it out. The second visit normally comprised the interview itself (this usually took several hours) and a field inspection.

The survey was carried out during a three month period which fell in mid-season, between planting and harvest. Farm records were used as a source of data wherever available, but often were not well kept. Where records were not available invoices or returns from the supplying and purchasing agents (Kenya Farmers Association (KFA), Kenya Seed Company and Kenya Co-operative Creameries (KCC) were used as a source of information; in some instances these agencies themselves were visited. Where no records or alternative source of data were available reliance had to be placed on the word and memory of the farmer. Despite these limitations the data collected are on the whole considered to be reliable.

It must be emphasised that the farm management survey was intended to be indicative, and was not expected to give data which were necessarily statistically valid. Given the limited time available for the whole study (10 months) full-scale survey giving statistically significant results would have been neither feasible nor appropriate. With the lack of recent data on farming conditions and performance in the mixed farming sub-sector as a whole (the last major survey was that done in Trans Nzoia in 1967-71), at this stage the major requirement was to obtain indicators of the present performance and situation of the large mixed farms. For this purpose data considered to be reasonably reliable but not necessarily statistically representative, are normally sufficient.

In Sections 5.2 to 5.8 the results of the farm survey are summarised. Fuller details are given in Annex II. The first three sections deal with general information on farm size, infrastructure and services, credit and finance for all the sample farms, whether whole, partly subdivided or completely subdivided. Sections 5.5 and 5.6 are concerned with farm management and input use on whole large farms and on the large-scale farming area of subdivided units. The following Section, 5.7, gives data on smallholdings and subsistence plots on subdivided farms. Section 5.8 then presents analyses of the influence of farm size on large-scale operations.

Originally some comparison of the performance of group-owned large farms and other types of ownership was intended. The performance data from the former were, however, generally insufficient to enable a really valid comparison to be made.

5.2 FARM SIZES

The mean size of the 84 mixed farms in the sample was 525 ha. There were substantial differences in average size between the different farming systems, ranging from 443 ha for System 2 : Maize/Dairy (wheat) to 812 ha for System 5 : Mixed farms with plantation crops (there were, however, only two System 5 farms in the sample). For System 1 : Wheat/maize/dairy and System 3 : High altitude, the farm size was very similar, the averages being 590 ha and 583 ha respectively. Generally there was no clear relationship between the farm size and the degree of subdivision (see Annex II). In System 2, for example, the average area of completely subdivided farms was over 75 per cent above that on the individual units, whereas under System 1, the other major production system, it was 40 per cent lower.

The influence of farm size on productivity and other factors is discussed in Section 5.8.

5.3 FARM INFRASTRUCTURE AND SERVICES

During the survey, information was recorded on the present condition of the farm buildings, roads, fences and other infrastructure. The general impression gained from the survey was that whilst the level of farm infrastructure, although often basic, was generally adequate, it had in many cases been developed by the former owners but had since been allowed to deteriorate. This deterioration is largely due to poor management or lack of capital and, if continued, will threaten the long-term production potential of the sector.

Generally the farm roads were adequate, though often in a deteriorating condition. Of the farms visited, 25 per cent were estimated to have good roads, being easily accessible and having feeder roads throughout the farm. Forty five per cent were assessed as average and 30 per cent as poor, the latter being accessible only by 4-wheel drive vehicle. Most subdivided farms had poor roads and access was particularly difficult.

As regards buildings, 40 per cent were considered to have good buildings and 30 per cent each average and poor. Some farms classified in the last category in fact had no buildings at all. This was particularly true on subdivided farms. All the subdivided farms and three quarters of large farms classified as being in the average and poor management group (40 out of the mixed farm sample of 84) would require a building improvement programme as part of their long term development.

Most farms had adequate water supplies, although in some cases lack of water was a problem and further water development would eventually be required. One third of all farms had electricity; this is not, however, an essential requirement for efficient large scale farming. Similarly, only about one third had telephones, although the proportion was much higher in Nakuru District.

No large scale irrigation was practised on the sample farms, but seven had small irrigated areas devoted mainly to vegetables. A further 36 farms had some irrigation potential, but in very few cases was it intended to develop this.

5.4 CREDIT AND FINANCE

The lack of capital is generally regarded as one of the main problems of the Large Farm Sector. The financial status and degree of indebtedness were therefore investigated on the farms surveyed. In particular an attempt was made to determine the following:-

- the amounts borrowed for land purchase;
- the amounts borrowed for land development and purchase of assets;
- the amounts borrowed for short term crop loans (GMR);
- the loan agency and terms of the loan (see Section 6.6);
- arrears in repayments for each type of loan.

(a) Land purchase loans

All land purchase loans were from the AFC or its predecessors. Generally the repayment position was good, few farms having substantial arrears. Thirty per cent of all farms had repaid their land purchase loan in full, 9 per cent were ahead in their payments, 39 per cent were up-to-date and 22 per cent were in arrears. The amounts of arrears were not large, averaging slightly over KSh. 10,000 per farm; the maximum arrears outstanding was KSh. 24,000. The average repayment level was KSh. 14,300 per annum.

Of the 14 subdivided farms in the sample, only two had land loan arrears. Significantly, over half of the farms had already paid off their loan commitments and owned the land outright. In the case of subdivided farms this pattern is of course well established and is carried out by the shareholders/partners in an attempt to reduce group commitments and also with a view to obtaining acceptance of their subdivided status.

(b) Loans for on-farm development and the purchase of assets

Medium-term loans for between 5 and 15 years are normally provided by AFC. Once again, the repayment situation was satisfactory. Sixty-one per cent of farms had either never taken out such loans or had repaid an earlier loan. Of the other 39 per cent, only one fifth reported that they were behind in repayments, the amount involved being small. Average annual repayments under current loans were KSh. 21,070 per farm.

(c) Short term credit

The provision of institutional short-term credit is vital to the operation of most farms. Some 61 per cent of the sample farms received loans in 1976, mainly for seed, fertiliser and mechanical cultivation.

The main agency providing short-term credit was the AFC, who administered the credit through the Guaranteed Minimum Return Scheme (GMR). This is provided (according to certain loan conditions) at a rate of approximately KSh. 865 per ha, mainly for wheat and maize enterprises above a minimum area of 6 ha. In only two of the farms surveyed did respondents state that their main source was either a commercial bank or their local supplier of agricultural goods. It is thought, however, that the survey may have underestimated the role of these sources, particularly the commercial banks, which through overdrafts also play an important part. No information was obtained on non-institutional sources of short-term credit.

In contrast to the situation with land purchase and medium term loans, the overall level of short term loan indebtedness was considerable. Of all the sample farms (including those outside the GMR scheme and without access to official credit) 32 per cent of respondents stated they had short-term loan arrears. Of the total, 6 per cent had repaid none of their previous loan and 26 per cent had only partly repaid their loan. The average amount owing was fairly high, at KSh. 54,700. The average amount loaned under the GMR credit in 1976 was KSh. 119,600 per farm. Repayment of short-term loans is by far the biggest repayment commitment on most farms.

Of the 39 per cent of farms which received no short-term credit in 1976, some two fifths had loan arrears going back to at least 1970 and had probably been prevented from taking out further loans because of their indebtedness. The other three fifths had no loan arrears, but some of these were excluded because they are completely subdivided; the others probably obtained credit from bank overdrafts, suppliers or personal funds.

One important observation arising from the survey is that the GMR scheme is operating with a commendable degree of flexibility. This is particularly true as regards supplying credit to completely subdivided farms (in theory these are not eligible) and to farms which have loan arrears, but which appear to have a reasonable chance of eventually repaying them. On the other hand, in some cases GMR loans have been disbursed without sufficient account being taken of farms' credit worthiness.

5.5 FARM MANAGEMENT AND EFFICIENCY

This Section and Section 5.6 refer only to the large-scale farming part of the sample.

5.5.1 Farm Management

In the initial appraisal of large mixed farms, farms were grouped into three categories of management, good, average and bad, based on the subjective judgement of the District Agricultural and Land and Farm Management Officers and the Extension Officers. This initial grouping was used in selecting the farm sample.

From the farm survey a second and more detailed assessment of management standards was made, on the basis of the survey results and the study team's own field observations. In determining management standards, a wide range of criteria were used, including farming intensity, yields, efficiency in input use, technical standards and the general impression created by the farm. Table 5.2 shows the resultant assessment of general management standards on the 75 farms which were not completely subdivided; this includes the four ranches.

Table 5.2 Assessment of General Management Standards on the Large Farms Studied

District	Good	Average	Poor
Trans Nzoia	7	7	7
Uasin Gishu	8	6	5
Nakuru	11	8	8
Kericho (Kipkelion Division)	2	1	5
Total	28	22	25

These figures were found to correspond well with the assessments made by the local Ministry of Agriculture Officers. The main difference is that the latter assumed a slightly higher percentage of well managed farms. A wide range of management standards was found, the farms being divided roughly equally between good, average and poor management. The high proportion of badly managed farms is disturbing.

Nineteen managers, or one quarter of the total, had received at least one year's formal training. Of these, 14 were assessed as being good managers. However, of the other 14 good managers, ten had had no formal training and four had merely attended short courses at farmers' training centres. This indicates that a man with the necessary basic abilities can manage a farm effectively without formal training. Nevertheless, the fact that three quarters of those who had been trained were managing their farms well whereas only one quarter of the untrained managers were doing so underlines the importance of proper training.

Standards of farm record-keeping were generally poor and even where they were adequate the range of records kept were often too limited. Approximately one third of the farms kept no records at all and another third maintained only very basic records of sales and purchases and their labour roll. This problem of poor record-keeping is of course common to commercial farming in most countries.

5.5.2 Indicators of Management Efficiency

(a) Individual crop yields and gross margins

Yield data were analysed primarily by farming system and by two management groups. Results from good farms were analysed separately whilst the average and poor farm results were bulked together. Within the farming system and management grouping, data on farms which are completely whole and data on the commercial area of farms which are partly subdivided were also analysed

separately. Table 5.3 shows the resultant yields for the two major crops, maize and wheat. The indications were that the year in question was average for maize and wheat yields, except that yields were somewhat lower than usual in Uasin Gishu.

Table 5.3 Average Yields of Maize and Wheat on the Large Farms in the Survey (tonnes per ha)

Crops and farming system	Good Management			Average and Poor Management		
	Whole farms	Partly subdivided	All farms	Whole farms	Partly subdivided	All farms
Maize:						
System 1	3.32	3.94	3.39	—	—	3.08
System 2:	4.90	3.81	4.54	3.90	3.53	3.71
System 3:	2.25	—	2.25	—	—	—
Wheat:						
System 1	2.30	1.84	2.23	1.42	0.94	1.21
System 2	1.03	—	1.03	—	—	1.39 ¹
System 3	1.98	1.75	1.89	—	—	1.53

¹ Only one result available.

Generally the levels of yield achieved were reasonable, especially with maize. Yield differences between well managed and average or poorly-managed farms were not all that large. As would be expected, however, the variation in results was considerably higher within the latter group. Usually yields on the whole farms exceeded those on the commercial area of partly subdivided farms, but the results from the latter were too few to be really significant.

Amongst the good farms, the average maize yield in Farming System 2 was 4.54 tonnes or 50.4 bags per ha, considerably higher than in Systems 1 or 3. This is as expected and demonstrates that the areas where System 2 is practised are generally better suited to maize production. The mean yield on average and poor farms in System 2 was 3.71 tonnes (41.2 bags) per ha, which was better than on the well managed Systems 1 and 3 farms.

Results for maize on the good farms in System 2 are strongly influenced by yields in Trans Nzoia, where occasionally up to 8.0 tonnes per ha are recorded. Yields in good System 2 farms, although higher than the others, thus fall far short of the potential yields achievable. It is worth noting that the average maize yield on ADC farms during the 1975 season was 5.0 tonnes per ha.

Wheat yields were highest on the good System 1 farms, where the mean of all the results obtained was 2.23 tonnes or 24.8 bags per ha. Wheat yields recorded on System 2 farms were generally very low, considerably less than those on either Systems 1 or 3 farms.

As regards standards of crop production, the following general conclusions were drawn:—

- Seed rates used at planting are usually at the recommended levels.
- Hybrid maize seed was used on all farms growing maize. Although a major proportion of wheat farmers purchased certified seed from Kenya Seed Company, some preferred to use their own seed.
- The amounts and types of fertiliser applied varied considerably. There was a general tendency to apply less than the recommended levels and on most farms top-dressing of maize with nitrogen, a recommended practice, was ignored.

- The recommended methods of pest control (stem-borer) in maize are usually carried out.
- Seed bed preparation for grain crops is fairly standard throughout, comprising three operations, one ploughing and two disc harrowings or two ploughings and one disc harrowing. In many instances, however, land preparation was late.

Variable costs for the crops grown, namely maize, wheat, barley, sunflower, beans and pyrethrum, do not show major differences between good and average or poor farms or between whole and partly subdivided farms.

Table 5.4 shows the crop gross margins (the gross margin is the gross output minus the variable costs such as seed and fertiliser) calculated for the two main crops, wheat and maize. Details are given in Annex II.

Table 5.4 Crop Gross Margins Calculated from the Survey Results for Large Mixed Farms (KSh./ha)

Crop and farming system	Good management			Average and poor management		
	Whole farms	Partly subdivided	Total	Whole farms	Partly subdivided	Total
Maize:						
System 1	1,392	1,659 ¹	1,445	1,457	1,281	1,340
System 2	2,643	1,605 ¹	2,297	1,690	1,600	1,645
Wheat:²						
System 1	1,756	1,242 ¹	1,710	672	663	668
System 3	1,372	1,040	1,206	—	—	540

¹ Two results only.

² These wheat figures include a deduction of KSh. 150 per ha for harvesting costs.

An analysis of relative gross margins (Annex II) demonstrates the importance of growing crops in the areas to which they are agronomically best suited. For example, maize gross margins on System 2 farms, which are found in the zones best suited for maize, are higher than either wheat or barley (in Systems 1, 2 or 3) and are exceeded only by pyrethrum on good System 3 farms.

As with yields, gross margins on partly subdivided farms are generally below those from whole farms, although the validity of this observation is limited by the small number of the former in the sample. Of greater interest, perhaps, is the relationship between crop gross margins and management standards. For maize, the difference in gross margins between well managed farms and those with average or poor management is not particularly great, when one considers the substantial difference in general standards between these groups. On the other hand, wheat gross margins show a much larger variation with management, the average or poorly managed farms obtaining gross margins per ha of less than half those on well managed units. The poor performance of wheat on the former is due primarily to inadequate and late land preparation, one of the main results of this being the lack of control of perennial grasses like couch. When account is taken of machinery and overhead costs, it is doubtful whether many of the poorly managed farms make a profit on their wheat.

(b) Performance of dairy herds

Apart from maize and wheat production, dairying is the major enterprise on mixed farms. In general, the milk yields and other herd coefficients for dairying are relatively poor, even on the well managed farms.

Mean milk yields on the good farms (Annex II) were 1,296 litres (285 gallons) per cow per year and 802 litres (176 gallons) per cow per year on the average and poor farms. This was partly due to the very long calving interval, which averaged 20 months on the former and 24 months on the latter, compared with that of 12 to 15 months which one would usually expect on a well run commercial dairy farm.

Stock mortality was also found to be extremely high, as shown in Table 5.5. Even on farms classed as well managed, both calf and adult mortality were well above generally accepted levels for commercial dairying.

Table 5.5 Mortality in Dairy Stock (% per annum)

	Good farms	Average and Poor farms
Calves (0-12 months)	14.5	20.0
Other stock	4.8	11.3

Gross margins per dairy cow (calculated in Annex II) are shown in Table 5.6.

Table 5.6 Gross Margins per Dairy Cow (KSh./cow)

Farming system	Good			Average and Poor		Total farms
	Whole farms	Partly subdivided farms	Total farms	Whole farms	Partly subdivided farms	
System 1	613	750	640	—	—	279
System 2	470	547	489	361	343	353
System 3	—	—	964	—	—	345
			599			

The gross margins per cow are low. On the good farms the mean was almost KSh. 600 per cow and on the average and poor farms KSh. 345. Given a carrying capacity of one mature cow per hectare on grass leys (arable land) and hence a gross margin of approximately KSh. 600 per hectare, dairying gives much lower returns than arable crops. Although grass leys should have an important share in a cropping pattern, the farm survey indicated that on the majority of farms grass leys were not being used to provide a break from cereal cropping. On many farms part of the arable area is cropped continuously and the original grass leys are allowed to revert to predominantly local species. A rotation is not being practised and the benefits from a grass ley break are not being realised.

Management of dairy herds and dairy husbandry appears to be the weakest part of the mixed farming systems. Milk yields are low due to poor feeding and long calving intervals. Production is distinctly seasonal, with yields dropping by two thirds during the dry months. On the majority of farms no attempt is made to conserve fodder for this four month period.

Bad husbandry is also reflected in the high levels of mortality, particularly in young stock. On most farms herd sizes remain static despite a small proportion of culls and few calves and heifers sold; the natural increase is in most cases being offset by high mortality.

(c) Intensity of land use

The average intensity of use of cultivable land, which is based on the area cropped as against the total cultivable area, was found to be between 74 per cent and 79 per cent on System 1 (Wheat/maize/dairy) and System 3 (High altitude) farms, with no substantial differences between the well managed units and the others. Under System 2 (Maize/dairy (wheat)) intensities were, however, appreciably lower, at 45 per cent on the average and poorly managed farms and 53 per cent on the good farms. It is possible that these lower intensities are due to maize being a more labour-intensive crop than wheat. Many managers stated that they had difficulties in obtaining and controlling labour, and they may be reducing the area of maize, their major crop, as a result.

In general there is considerable scope for raising cropping intensities. Under the conditions in the mixed farming areas, there is little reason why intensities should not be close to 100 per cent, including temporary leys, since leys can act as the fallow break in the rotation. This means that no bare fallow is required.

An analysis was also made of stocking intensities, comparing actual intensities with the farms' estimated potential carrying capacities. This indicated that present stocking was at more or less the optimum rate on the well managed farms, but that on the average and poorly managed farms there was a very poor adjustment of stock numbers to carrying capacity, with some gross overstocking and some gross understocking.

(d) Overall gross margins per ha

In Annex II an analysis is presented of overall gross output and gross margins per gross ha and per cultivated ha. Gross margins are a better indicator of efficiency, since they take account of both gross output and variable costs. Table 5.7 shows the average gross margins calculated from the farm survey results.

Table 5.7 Gross Margins per ha and per Cultivable ha (KSh. per ha)

Farming systems	Good			Average and Poor		
	Whole farms	Partly subdivided	Total	Whole farms	Partly subdivided	Total
Per gross ha:						
System 1	934	517	873	—	—	332
System 2	779	554	723	332	381	357
System 3	—	—	666	—	—	283
			788			330
Per cultivated ha:						
System 1	1,255	786	1,177	—	—	740
System 2	1,128	630	1,004	553	600	574
System 3	—	—	1,297	—	—	296
			1,139			614

Given the wide variation within the data (the standard deviation is around 35 per cent) the differences between the mean values for each system are of little importance. The major difference demonstrated is between the good and average or poor farms. In the two main systems, 1 and 2, gross margins per cultivated ha in the latter group are 37 per cent and 43 per cent respectively below those on the well managed farms. This illustrates the crucial effects of good management. Although not so significant, with good management whole farms were found to perform better than those which were partly subdivided.

5.6 USE OF MACHINERY AND LABOUR

5.6.1 Use of Machinery

A considerable amount of data was¹ collected on the complement of machinery and the use of machinery contractors and analysed by farming system. The results for the two main systems, Systems 1 and 2, are presented here.

(a) Capital investment

Table 5.8 summarises the capital investment in machinery and equipment under the two main farming systems.

Table 5.8 Capital Investment in Machinery and Equipment

	System 1		System 2	
	Good	Average/poor	Good	Average/poor
Value of machinery per farm (KSh.)	368,400	11,300	155,600	84,200
Cultivated area per tractor (ha)	104	80	61	42
Machinery value per gross ha (KSh.)	690	227	712	226
Machinery value per cultivated ha (KSh.)	1,225	711	¹	745

¹ This figure was distorted by the fact that three out of the eight farms in this group also undertook outside contracting.

On System 1 (Wheat/maize/dairy) a farm's capital investment in machinery and equipment varies enormously, ranging from farms which possess no machinery whatsoever and rely entirely on contractors, to fully mechanised farms using only their own farm equipment. Most farms in the sample, however, use their own equipment for basic operations and contractors' services for operations requiring more specialised or high cost equipment (e.g. spraying and combining). On the well managed farms the capital value of equipment averaged KSh. 368,000 or KSh. 1,225 per cultivated ha, whereas on the others the capital value per cultivated ha was only KSh. 711, more reliance being placed on contractors. Three of these farms had no machinery at all and were entirely dependent on contract services. Some investment in machinery is normally desirable, if only to guard against being let down by contractors at critical periods.

All the well managed farms under both farming systems have the necessary facilities for servicing and minor repairs, but under half were equipped to do major repairs. Of the average and poorly-run farms, between two-thirds and three quarters could do servicing, about half could do minor repairs and 10–20 per cent had the facilities for major repairs.

On the System 2 farms the machinery investment per gross ha is very similar to that in System 1. However, the area per tractor is much less. In the case of the well managed units, this appears to be mainly because the intensity of cultivation on the maize farms in System 2 has fallen in recent years and these farms may now be to some extent over-capitalised in machinery. Another factor is that more operations are usually required for maize, although this may be balanced by the fact that maize is hand harvested whereas wheat is combine harvested.

(b) Annual machinery costs and crop gross output

Table 5.9 shows the annual costs of machinery per cultivated ha and the crop gross output per KSh. 1,000 of these costs.

Table 5.9 Annual Machinery Costs and Crop Gross Output (KSh.)

	System 1		System 2	
	Good	Average and Poor	Good	Average and Poor
Cost per cultivated ha	692	856	699	1,050
Crop gross output per KSh. 1,000 of machinery cost	2,842	2,082	3,091	2,097

On the good farms the annual costs were very similar, being around KSh. 700 per cultivated ha for both systems. This compares with, for instance, estimated contractors' charges of KSh. 800–900 per ha to complete all operations on System 1 farms. On average and poorly managed farms average costs were higher because much greater use was made of contractors.

Gross output per KSh. 1,000 annual expenditure on machinery was fairly similar under both systems, the ratio being about 3:1 under good management and 2:1 under average and poor management.

5.6.2 Use of Labour

Approximately three quarters of wage costs were for permanent employees. Table 5.10 summarises the labour costs and farm gross output per KSh. 1,000 of expenditure on labour, for the two main farming systems.

Table 5.10 Labour Costs and Farm Gross Output (KSh.)

	System 1		System 2	
	Good	Average and Poor	Good	Average and Poor
Labour cost per ha	139	68	202	121
Farm gross output per KSh. 1,000 of labour cost	10,006	9,174	5,932	5,451

Under System 2, which is dominated by maize, a relatively labour-intensive crop, labour inputs per unit of gross output are substantially higher than in System 1, where wheat is more important. Under System 1 the machinery costs per KSh. 1,000 of gross output are 3–4 times above those of labour. System 2 is somewhat more labour-intensive, the ratio of machinery to labour costs being 2–2½.

5.7 SMALLHOLDINGS AND SUBSISTENCE PLOTS

Of the farms surveyed, 44 were either partly or completely subdivided into smallholdings or subsistence plots of less than 20 ha. Within the subdivided farms three categories have been defined:-

- Category B: those with a minor proportion (less than 50 per cent) subdivided.
- Category C: those with a major proportion of the farm subdivided.
- Category D: completely subdivided farms.

About 80 per cent of these farms were in either System 1 or System 2. Data were obtained from 39 of the 44 farms with subdivided areas; on each of these between 5 and 10 plot holders were interviewed. In all, over 200 smallholders supplied information. In all cases the work and memory of the respondents had to be relied upon. The response to questions on livestock was very poor and has not been analysed, although livestock make a significant contribution to farm gross output.

Data analysed within the three categories above and for all holdings are summarised in Table 5.11.

Table 5.11 Analysis of Smallholding or Subsistence Plot Data

Parameter	Category			All farms
	B	C	D	
Total number of farms	17	15	13	45
Number of farms supplying information	13	13	13	39
Plot size (ha)	1.8	4.2	10.8	6.0
Arable area/family (ha)	1.6	1.5	4.9	2.4
Intensity of land use (per cent)	86	77	67	77
Maize yield (tonnes per ha)	3.62	3.62	3.82	3.64
Proportion of crop sold (per cent)	31	46	68	48

The main points arising from the survey of the smallholdings and subsistence plots are as follows:-

- (a) Maize yields averaged 3.64 tonnes per ha, similar to the average of 3.68 tonnes found on large scale maize farms. Although hybrid seed was almost universally used, fertiliser was applied on less than 50 per cent. The farmers on these holdings have very limited access to the services available to smallholders on conventional settlement schemes or other smallholder areas.
- (b) The overall cropping intensity of 77 per cent was similar to that on the large scale Systems 1 and 2 farms in the sample.
- (c) The average holding size is 6.0 ha, the farm size in the sample ranging from 0.5 to 19.0 ha.
- (d) Almost half the maize produced was marketed.
- (e) Partly subdivided farms usually had access to machinery from their large scale commercial area. Of the 13 completely subdivided farms, six had no machinery at all and relied

completely on contractors. Some of the others had pooled resources and bought a group tractor. In some cases this worked well and in others badly. On other farms one or two members owning a significantly larger holding had their own tractors, which were hired out to those with smaller farms.

5.8 THE INFLUENCE OF SIZE ON COMMERCIAL FARM OPERATIONS

A total of 39 regression analyses (Annex II) were made to investigate whether there was any clear relationship between the size of commercial large-scale units and the levels of crop and dairying output.

Few significant relationships were found and no strong general relationships between farm size, land use intensity and productivity within the large scale farming units of the sample were obtained. There was, however, an indication of increasing productivity with decreasing commercial farm size.

5.9 CONCLUSIONS

Once again, it must be stressed that the data presented should be regarded as indicative. With the necessarily limited size of sample and the wide range of farm situations covered, the figures quoted are inevitably only approximately representative of the situation for the mixed farming sub-sector as a whole. Nevertheless, the farm survey has produced some fairly important conclusions. These are as follows:-

- (a) A detailed assessment of standards of farm management has indicated that one third of the farms in the sample were poorly-managed and only one third were well managed. A very wide range of management standards was found. Although the sample of partly subdivided large farms was too small to draw definite conclusions, the indications were that their productivity and profitability on their large scale areas, were lower than on whole (i.e. completely undivided) units.
- (b) Within the sample of large farm operations, there was no significant correlation between productivity and farm size, but the data collected did indicate some increase in productivity with decreasing large farm size.
- (c) On completely subdivided farms, which were analysed separately and in less detail, cropping intensities and maize yields, two of the major indicators of efficient management, appeared to be at the same level as those on large farms. Despite the small average holding size of 6 ha, almost half the total maize output was marketed.
- (d) Standards of crop production were generally satisfactory. The main weaknesses were insufficient use of fertiliser, especially for top-dressing of maize, inadequate land preparation for wheat and late planting for many crops.
- (e) Average maize yields were fairly good, even on the farms with average or poor management. For wheat, the other major crop, yields showed much more variation with management, those on poorly run farms being relatively low and probably unprofitable in many cases. Overall there is considerable scope for yield improvement. Under good management, the gross margins per hectare for maize and wheat in the zones best suited to each were fairly similar, but with poor management maize was considerably more profitable than wheat.

6
Productivity is low in the other major mixed farming enterprise, dairying, even on well managed farms, because of high mortality rates, very long calving intervals and poor feeding, especially in the dry season. Returns per cultivable ha from dairying are well below those from the major crops.

- (g) Cropping intensities are adequate on System 1 : Wheat/maize/dairy farms but low on the System 2 : Maize/dairy (wheat) farms. Intensities did not differ significantly with management standards. In general there is considerable scope for raising cropping intensities.
- (h) Stocking intensities were near the optimum on well managed farms, but on the others there was a very poor adjustment of stock numbers to carrying capacity, some farms being heavily overstocked and others being very understocked.
- (i) Overall gross margins per cultivated ha were around 40 per cent lower under average/poor management than under good management. Some of the poorly managed farms are almost certainly losing money.
- (j) Generally the crop production systems are capital-intensive rather than labour-intensive, farm machinery accounting for a far higher proportion of production costs than labour. Some three quarters of the labour input is from permanent labour. Well managed farms had a substantial stock of farm machinery whereas those with poorer management relied mainly on outside contractors. Throughout the sample of farms there was, however, a considerable use of contractors.
- (k) As regards credit status, the overall situation with respect to long and medium-term loans was reasonable. About one fifth had arrears on their land purchase loans, but the average amount of arrears was only KSh. 10,000 per farm. The arrears position on subdivided farms was better than this. For short-term credit, mainly the AFC's GMR (Guaranteed Minimum Return) Scheme, the situation is worse. One third of all sample farms had arrears, the average being KSh. 55,000. As regards supplying credit to the large farms, AFC is operating with a commendable degree of flexibility, although in some cases insufficient account is taken of a farm's credit worthiness.
- (l) At present the infrastructure and facilities on large farms are adequate, except on completely subdivided farms. Generally, however, they are deteriorating through lack of maintenance. Improvement of water supplies is urgently required in some cases.

6

Institutions and Supporting Services

6.1 INTRODUCTION

The Large Farm Sector is served by a considerable number of institutions and services from both the public and private sectors. As part of the assessment of the present problems of the Sector and the measures which may be required for its future development, a review of the existing institutional framework and supporting services has been made, in order to identify the current problems. Fuller details are given in Annex V : Institutions, which also describes the institutional measures required for implementation of the proposed strategy.

On the whole the supporting services to agriculture are relatively well developed and effective. With regard to the Large Farm Sector, the major weakness is the lack of appropriate extension advice. In the following sections attention has been concentrated on this and other problem areas. Only brief mention has been made of those institutions and services which are operating satisfactorily and which do not require substantial changes to enable them to serve the Sector effectively. The review is concerned primarily with the mixed farm sub-sector. Proposals for the future are given in Chapters 9 and 10, which deal with future development. In addition to institutions and services, the important legal aspects have been discussed.

6.2 THE MINISTRY OF AGRICULTURE

The Ministry of Agriculture is responsible for overall policy and the provision of services for the Sector. From the viewpoint of the Sector the most important technical divisions are Land and Farm Management, Extension and Training, Crop Production and Animal Production. The Land and Farm Management Division (LFMD) is most closely involved since it gives farm management advice to the large mixed farms and is also responsible for the Land Development Section which provides the Ministry with a capacity to prepare farm maps and physical plans. Together with the Agricultural Finance Corporation (AFC), LFMD is responsible for the current Group Farms Rehabilitation Project. As regards development of the Sector, the Ministry's main role is overall planning and coordination and the provision of extension services.

Field services are provided through the Ministry's Provincial and District organisation. This has a considerable degree of autonomy. At the Provincial level there is a Provincial Director of Agriculture (PDA) with a considerable number of technical specialists whose assistance is available to the Districts as requested. In a District the standard establishment normally comprises the District Agricultural Officer (DAO), a Land and Farm Management Officer (LFMO), a Crops Officer and a Livestock Officer. Each Division of a District has a Divisional Extension Officer (normally a diplomate from Egerton) or Assistant Agricultural Officer, who has several Agricultural Assistants for the various parts of his Division. The DAO works closely with the District Agricultural Committee, which is responsible for guiding farming in the District, and the District Development Committee; both are under the chairmanship of the District Commissioner.

From the viewpoint of the future, the Ministry of Agriculture has the necessary institutional framework and organisation to implement the strategy proposed in Chapter 9. Coordination of development of the Large Farm Sector would most logically continue to be the responsibility of the Land and Farm Management Division, particularly as this Division has staff stationed in the large farm districts and is already involved in the Group Farms Rehabilitation Project. Implementation of the specific measures proposed would require the participation of other ministries and organisations, under the Ministry's overall direction.

Although the basic organisational structure in the Ministry of Agriculture is thus already available, improvements in the efficiency of field operations are required and some additional staff would be needed. Apart from general co-ordination the Ministry's most important duties would be agricultural extension (discussed in Section 6.6) and the survey and subdivision of some group-owned farms to be undertaken by the Land Development Section of LFMD.

6.2.1 The Land Development Section

The Land Development Section is one of the largest sections in the Ministry. Besides farm planning and mapping, it is responsible for a number of services including soil and water conservation, two dam construction units, an agricultural machinery testing unit, a central workshop for overhauling heavy equipment, minor irrigation development, a soil survey task force and the Government tractor hire service. Overall it employs around 900 persons.

The mapping and planning units are based at the seven soil conservation stations located at Ruiru, Eldoret, Kipkelion, Kitale, Mariakani and Nyahururu. Apart from the Officer in charge who is usually a graduate agricultural engineer, staff at the stations include an agricultural planner, two surveyors, draughtsmen, plant operators, mechanics, drivers, administrative and junior staff. Each station thus has two surveying/mapping units and the capacity to produce maps and prepare farm physical plans.

The usual procedure is to carry out an initial survey of the farm producing a map with the farm boundaries and existing roads, rivers, fences, etc. Given this framework the farm planner then prepares a physical plan re-organising infrastructure and field layout where necessary. His plan is then drawn up by the draughtsmen, and returned to the surveyors who do the surveying and layout of the proposals on the farm. Overall the procedure takes at least two months from start to finish.

In addition to the mapping units at the district stations, a pool of 25 mapping units each comprising two surveyors has been established at Nakuru. This pool is served by a drawing office and the 25 units are available to work throughout the country. Two mapping units are currently at the disposal of the Group Farms Rehabilitation Project.

6.3 MINISTRY OF LANDS AND SETTLEMENT

The Ministry of Lands and Settlement (MLS) has been one of the main agencies involved in the land transfer programme for the Large Farm Sector. In this field of activity its principal functions are the organisation and management of settlement on former large farms, land adjudication and registration, and the purchase of large farms for subsequent transfer to groups and individuals or for settlement or direct management by MLS itself or other agencies (e.g. the Agricultural Development Corporation). It is responsible for the SFT Shirika farms.

For the proposed programme the main task of the MLS will be to undertake the adjudication and registration of the holdings created by the subdivision of group-owned large farms (see Chapter 9). If Government decides that in the future some purchase and subdivision of other large farms for settlement is necessary, in order to relieve land pressure, this would also be undertaken by MLS. The main Department concerned is the Settlement Department.

MLS has considerable experience of land adjudication and registration and of settlement schemes. On at least 50 of the farms subdivided under the Million Acre Scheme the settlers' holdings have been registered and titles issued. Because this work did not commence immediately there is a large backlog of subdivided farms where titles have still to be registered.

Despite their experience and their well established organisational structure, at present the Settlement Department does not appear to have sufficient capacity to meet the demand for land registration in the large farm area. This demand will be greatly increased by the proposed programme, which will involve the registration of subdivided holdings on at least 500 large mixed farms. If this is to be completed rapidly, parts of the Settlement Department which are involved in land registration will have to be strengthened by improving efficiency and by the provision of additional staff.

6.4 RELATED PROGRAMMES AND PROJECTS

The three programmes or projects which have the most direct bearing on the Sector and the proposed programme are the Group Farms Rehabilitation Project (GFRP), the Commercial Farming Project and the Integrated Agricultural Development Programme (IADP). The GFRP provides credit and management assistance to group farms under a management system controlled centrally by the Agricultural Finance Corporation (AFC) and coordinated with the Land and Farm Management Division (LFMD) of the MOA. The Commercial Farming Project is essentially a continuation of earlier IBRD finance for selected commercial smallholder and large farm credit through AFC, assisted by the LFMD. The IADP is directed at the small subsistence farmer with a target of some 70,000 credit packages through the co-operative system or through AFC, with the LFMD once again assuming the functions of direction and coordination.

A review of the GFRP has been made in Section 4.4 and in Chapters 9 and 10 proposals are presented for its modification to meet more effectively the needs of the mixed farming sub-sector. Since it basically involves the provision of additional funds for agricultural credit, the Commercial Farming Project is discussed in Section 6.6, Credit. Its main relevance to the proposed programme is that it will increase the funds available for farm credit. IADP's importance is that it would enable extension, credit and other assistance to be provided to smallholders on subdivided former large farms. Since the IADP began operations only recently, a realistic assessment of the likely effectiveness of its contribution cannot yet be made.

6.5 EXTENSION SERVICES

In the main large farm districts there is already a fairly well developed organisation structure which should, theoretically be capable of providing effective extension advice. Each District has a Land and Farm Management Officer, Crops Officer and Livestock Officer, thus covering the main disciplines involved in large-scale mixed farming. Each Division of a District has one or more Assistant Agricultural Officers, there being on average one such officer per 50-100 large farms. This is a satisfactory ratio. Thus the problem is not particularly one of too few staff. It is rather one of their limited effectiveness.

On the whole the extension service to the large mixed farms is not effective. This is due to a variety of reasons, the most important of which are:—

- (a) Many of the staff do not have the necessary experience and background to advise large scale commercial farmers on their operations. Many such farmers have the necessary technical knowledge on crop and livestock production but need assistance to help them improve their management, especially to obtain the correct mix of different enterprises and to integrate them successfully. To be able to provide worthwhile advice on these

aspects, it is necessary to have considerable experience, supported if possible by specialist training. Most of the Assistant Agricultural Officers, who deal directly with farmers, are too young to have the necessary experience and have not received sufficient training in farm management.

- (b) There appears to be uncertainty amongst the field staff as to what their precise duties should be. Few staff have definite work programmes and the policy on certain issues is not clear. This is the case, for example, with subdivided large farms. Extension staff are not clear how they should continue to provide advice to such farms, given the illegality of their subdivision.
- (c) The field offices suffer from serious logistical problems, the most important being lack of transport, due primarily to an inadequate recurrent budget to cover fuel and other recurrent expenses.

Most newly recruited extension staff start their work with enthusiasm, but as a result of the problems described in (b) and (c) above, a sense of frustration develops and their motivation and enthusiasm decline. This, together with the frequent lack of experience needed to provide good advice to large scale farmers, accounts largely for the ineffectiveness of the present extension service to the mixed farming sub-sector.

In the Plantation Sub-Sector there has been a significant development of private management services to large farms. Firms such as East African Acceptances, Estate Services and Brooke Bond Liebig provide management advice, and sometimes undertake direct management for coffee estates on contract. Usually a management fee is charged per hectare with a commission on sales. This type of service has proved relatively successful and is being used for the coffee estates in the Group Farms Rehabilitation Project.

A similar type of service has recently begun to develop for commercial ranching. For example, accounting services for a group of new ranches in the Taita area of Coast Province are being provided by a private organisation and proposals have been made to extend the scope of this service into giving management advice.

As yet no such service has been developed for mixed farms, presumably because the demand has not yet been sufficient to warrant it. Unless the extension service is improved, a demand may develop. This would probably be based on a farm management advisory firm providing management advice through periodic visits to each farm. If major improvements to the extension service are not made this type of service would be worth encouraging, provided that its costs were not excessive.

6.6 CREDIT INSTITUTIONS

The major proportion of credit extended to farmers in Kenya comes from Government Institutions. There are a number involved; they operate numerous different programmes and rely heavily on outside finance for their operations (Annex VI).

6.6.1 The Agricultural Finance Corporation (AFC)

The Agricultural Finance Corporation is a statutory body and is the main source of funds, both long-term and short-term, for farmers who are not involved in settlement schemes. It is a highly centralised organisation and although its field establishment has recently been strengthened, it is still not well equipped to make loan servicing arrangements on an individual basis other than to large scale farmers.

AFC lending is divided under four heads: Firstly, there are three large scale and three small scale schemes funded mainly from outside Kenya; in all cases AFC acts as principal in the lending-collection operations. Secondly, there is the Guaranteed Minimum Return (GMR) scheme for providing credit for seasonal inputs for maize and wheat growing; in this case AFC acts as agent only, the funds being provided until 1975 from the Government's Cereals and Sugar Finance Corporation. Thirdly, there is the Group Farms Rehabilitation Project and lastly there are smaller scale, multisectional type schemes within the programme of Special Rural Development Projects which in the future will be incorporated within the Integrated Agricultural Development Programme (IADP), a programme aimed at helping smaller farmers.

Historically AFC has concentrated heavily on the Large Farm Sector. More recently, however, it has become increasingly involved with lending to smallholders who have raised their share of the loan portfolio from about 12 per cent in 1971 to 33 per cent in 1976. This has been done despite arrears in repayment being consistently higher on loans to small farmers than on those to large scale farmers. Overall the arrears position on the large and small scale schemes has improved markedly since 1975 and AFC's recent policy of concentrating on collecting debts is proving effective. Now that earlier overindulgence has been remedied the most urgent need is improvement in the capacity to assess credit worthiness, particularly with individuals or groups of smallholders.

The GMR scheme combines crop insurance and seasonal finance on the basis of a set amount of money per hectare. It is limited to medium and large scale farmers. The scheme now involves some KSh. 100 million and is still expanding. GMR arrears are high and many of the debts are of long standing. It is not a good scheme; it is too open to abuse and its defects are difficult to remedy.

Valuable experience of problems of lending to smallholders has been gained on the Special Rural Development Project schemes. In general these schemes have placed too much emphasis on credit and too little on extension, it is hoped that this fundamental fault will be remedied in the IADP programme which will be operated on a country wide basis and will take over from the SRDPs.

6.6.2 The Agricultural Settlement Fund

The Agricultural Settlement Fund is a completely self-contained organisation within the Ministry of Lands and Settlement which handles all credit for smallholdings on Settlement schemes. Much of the credit issued is for land purchase and is relatively long-term but the Fund also provides short and medium term loans.

Most of the lending by the Fund was done in the 1960's and early 1970's; since 1972 the amount loaned has been relatively low. The present position is that a Settlement Fund of not more than KSh. 16 million was voted by the Government in 1974-75 to operate on a revolving loan basis. This will be drawn on as required and is expected to provide an annual fund of KSh. 1.2-2.0 million. The fund has performed poorly and although the collection rate has improved in recent years, even in 1975 less than half the payments due were actually collected. As a result the outstanding debt rose continuously between 1971 and 1975 from KSh. 87 million to KSh. 175 million.

6.6.3 The Commercial Banks

The Government is currently urging the Commercial Banks to make a greater contribution to lending in the agriculture sector. Advances to agriculture have been increasing both in absolute terms and in terms of agriculture's share of total advances. The great bulk of the advances, however, go to marketing boards, similar agricultural institutions and to financing the processors of primary products such as sugar. Only a relatively small part of the total Commercial Bank advances to agriculture are in fact direct advances to farmers. These are usually loans for six months or advances for land or property purchase which must be repaid within three to five years. Usually they are made against title and where the farm income is known to be supplemented by income from another source.

It is highly desirable that the large commercial farms should be encouraged to make as much use as possible of the commercial banks. It will in turn be necessary for the commercial banks to modify their procedures if this is to be possible. In the meantime indirect lending through intermediaries like the Co-operatives and AFC which have better knowledge should be encouraged particularly in view of the extent of funds available in the commercial banks at present.

6.6.4 Co-operative Credit

The development of banking and farm lending activities by the co-operative movement is the most encouraging feature of agricultural credit in Kenya. It has involved the mobilisation of local savings, it reaches small scale farmers and the institutional framework exists to enable it to develop further.

The Kenya Co-operative Production Credit Scheme (CPCS) was set up in 1970 to provide short term funds for co-operative society members. CPCS credit is available only to members of properly qualified societies which in turn belong to a District Co-operative Union. By 1973 there were 9 qualifying unions and 83 participating societies and by June 1976, 20 unions were listed as receiving CPCS loans. Average CPCS loans to farmers have grown from KSh. 500 in 1970-71 to KSh. 1,150 in 1974-75 and repayment rates have been consistently high.

There is also a Co-operative Savings Scheme (CSS) which has led to an accumulation of funds in excess of those loaned out through CPCS. The success of the savings scheme has been enhanced by the recent prosperity in coffee and tea farms but pyrethrum, sugar and dairying have helped.

In 1976 loans on overdrafts issued by the Co-operative Bank of Kenya included KSh. 17.6 million for crop advances, KSh. 26.0 million for the CPCS and KSh. 11.2 million for farms. Due mainly to the rapid increase in CSS funds the Bank had KSh. 174.2 million at call and short notice and KSh. 105.0 million with the Cereals and Sugar Finance Corporation Ltd. This availability of funds for on-lending demonstrates quite clearly that there is considerable scope for mobilising rural savings and using these as a source of credit funds in the future.

The aim of the Ministry of Co-operative Development is to extend the CPCS and savings schemes to cover some 300,000 members by 1978. The Co-operative Bank and co-operative scheme should become an important source of credit for group-owned farms in the Large Farm Sector.

6.6.5 Conclusions

The following conclusions are drawn regarding the suitability of existing institutions to supply credit to the Large Farm Sector.

- (a) Although there are substantial problems, the basic institutional framework required for the provision of credit to the Large Farm Sector, including smallholdings resulting from subdivision, is already available.
- (b) The AFC is, and will continue to be the main source of credit to farmers. Recovery of loans has been its major problem. Recently, its performance has been improving but the arrears position is still not good. One of the major reasons for this is that the number and geographical distribution of its branches and field offices are inadequate and it has insufficient contact with conditions in the field. Closer contact with the Extension Service is required particularly for the assessment of farmers' credit worthiness. The GMR scheme has very high loan arrears and its operation needs to be improved, both in recovery of loans and in reducing the considerable abuse of GMR funds which now occurs.

- (c) Co-operative credit has been sufficiently successful to be important in the financing of smallholders on subdivided group-owned farms in the Large Farm Sector.
- (d) Although they are increasing their lending to the agricultural sector the commercial banks finance only a few farmers directly and are unlikely to play a major role in provision of farm credit in the immediate future. They should be encouraged, however, to divert funds into agriculture through intermediaries such as the AFC.
- (e) In theory the Agricultural Settlement Fund could be a suitable vehicle for credit to smallholders on subdivided group-owned farms. However, with its bad arrears situation and the fact that new finance has been severely curtailed, it has little to offer.
- (f) Although AFC is temporarily short of finance, generally there appears to be adequate funds available for farm credit. The problem is more one of ensuring that funds are disbursed and used efficiently. Given the growing availability of funds from the CPCS, the IBRD-Financed schemes (IADP, Group Farms Rehabilitation Project, Second Livestock Project, Commercial Farming Project) USAID and other sources, there is not at present an immediate need for major new injections of finance for agricultural credit.

6.7 CO-OPERATIVES

Co-operatives are the responsibility of the Ministry of Co-operative Development. Despite problems, such as those arising from the too rapid expansion in the 1960's, co-operatives have been developed on a considerable scale in the agricultural sector. Except for production co-operatives such as the group farms, a fair degree of success has been achieved. The present study is concerned primarily with co-operatives involved in marketing, input supply, credit and other services and the production co-operatives such as group farms and Shirika farms. Co-operative credit is discussed in Section 6.6.

As regards marketing and input supply for the Large Farm Sector, the main co-operatives are Kenya Co-operative Creameries (KCC), which buy and process milk, and the Kenya Farmers Association (KFA), which supplies a wide range of inputs and also acts as a purchasing agent. Both are well established and successful, although KCC has been having financial problems.

In the Large Farm Sector and former large farm areas which have been taken over for settlement, three main types of co-operatives have been developed. These are the private Farm Purchase Societies, formed by groups to buy up large farms, service co-operatives on settlement schemes and the SFT Shirika settlement schemes. In addition, informal service co-operatives have been set up by members on subdivided group farms.

There are at present 127 Farm Purchase Societies, the form of co-operative which is involved in group farming. The most significant elements in the constitution of these Farm Purchase Societies (FPS) are that there is no limit to the number of members, beyond the fact that they must be residents or occupants of land within the farm and that the farm is to be farmed collectively. This type of production co-operative has not proved successful and is contrary to the aspirations of most members (Section 8.3). This is shown by the large number of these and other group-owned mixed farms which have given up group farming and subdivided the land into individual holdings.

On the settlement schemes the Ministry of Lands and Settlement established farmers on individual holdings on former large farms and provided marketing services and inputs. The Co-operative Department supplied the promotion, training and supervision needed to provide groups of farmers with the necessary co-operative organisation.

The Shirika system described in Section 4.5 has not proved successful.

In general, production co-operatives such as group farms have not worked well, whereas the progress of service co-operatives have been considerably better. Apart from the major co-operatives such as KCC, development of service co-operatives and informal arrangements for sharing services on fully or partly subdivided large farms has been promising. Farmers running their own holdings on such farms have shown themselves capable of co-operating in the sharing of facilities like milking sheds, dips and tractor services. As yet relatively little assistance has been received from official agencies. In many cases major improvements in the management of such services are needed, but at least the farmers have demonstrated their interest in this type of co-operative and some degree of competence in organising them. This indicates that well run co-operatives could have a considerable part to play in the improvement of services to subdivided large group farms.

6.8 TRAINING

6.8.1 Agricultural and Farm Management Training

Formal training in agriculture is available at several levels; degree courses at the University of Nairobi, three year diploma courses at Egerton College, certificate courses at Embu, Bukura and Kabete and short vocational courses with no specific qualification at Narosura (Farm Mechanisation, Naivasha (Dairy) or at the 32 Farmers Training Centres established throughout the country. Nine month courses in farm management have been available at the Nyahururu and Eldoret Large Farm Management Training Centres since 1974.

For the Large Farm Sector the courses at Egerton College and the two Large Farm Management Centres at Nyahururu and Eldoret are of particular importance. Egerton College offers a three year diploma course with the opportunity to specialise in any one of a number of subjects (Annex V) including a specialist course in Farm Management. This course provides a thorough grounding in agriculture with specific emphasis being laid on Agricultural Economics and Farm Management in the final year. It is the most comprehensive course available for prospective farm managers or farm management advisers, and if coupled with some sound practical training would be the most appropriate means of training farm managers or Extension Officers who would be concerned with giving advice and assistance to large scale farmers. The Egerton basic course in agriculture should adequately equip general Extension Officers to deal with technical problems arising in specific crops and enterprises.

A programme for training managers for large farms was incorporated in the Group Farm Rehabilitation Programme. It comprises a nine month course at the Nyahururu or Eldoret Centres followed by a year's training on an approved farm. The courses at each Centre are similar. They aim at being as practical as possible while at the same time providing a sound theoretical background. The teaching syllabus is comprehensive to the extent that it is difficult to envisage how each topic would be covered thoroughly in the nine months available. The educational qualifications for entry are not rigorous and providing applicants are from a rural background with experience on large farms as assistant or manager they are generally accepted.

Teaching staff are usually diplomates fresh from Egerton College with little experience either of teaching or practical farming. The lecturers are appointed for short periods; hence there is neither continuity or time for teaching skills to be build up. So far the training has not been successful and after the nine month course and year's practical training, only a small proportion of the students has reached an acceptable standard. The most obvious measures to improve training would include:—

- setting more rigorous educational requirements for entry to the course;

- increasing the length of the course to enable each subject to be taught thoroughly;
- insistence on good practical experience i.e. at an approved farm before joining the course;
- introducing more experienced lecturers and improving continuity by insisting on a longer period of stay at the college;
- ensuring that practical training after completion of the formal course is on the best managed farms such as some of those run by ADC.

These measures will no doubt improve training, but what is even more important is to attract the highest possible calibre of trainee to the course. This will remain an insoluble problem until an attractive salary can be offered. Diplomates from Egerton on completion of their course can expect a salary of at least KSh. 2,000 per month in the civil service whilst the normal wage for farm managers is around KSh. 500-600 per month. While this disparity exists it will be impossible to attract the best trained and most able students to farm management.

6.8.2 Co-operative Training

The facilities and opportunities for co-operative training at all levels are well developed. The Co-operative College at Langata is the centre of formal training and courses lasting from one week for co-operative committee members, to three months for Co-operative Assistants are available. Correspondence courses are also available and considerable effort is put into organising demonstrations, farm walks and short residential courses at Farmers Training Centres. This effort is not wholly matched, however, by the enthusiasm of participants and frequently courses or demonstrations planned have to be abandoned.

6.9 MARKETING

Marketing of the main products of the mixed farming sub-sector, wheat, maize and milk, is controlled by Government, which establishes official prices. Price levels and policies are discussed in Chapter 8. Although, inevitably, local problems occur, the marketing systems for these and other commodities produced by the Sector work reasonably well and do not act as a constraint on production. No specific major improvements in crop and livestock marketing are therefore considered to be necessary for the further development of the Sector.

6.10 INPUT SUPPLY AND CONTRACTING SERVICES

6.10.1 Availability of Inputs

Seed, fertilisers, insecticides, feedstuffs, fencing wire, tools and other equipment and inputs are supplied mainly through the Kenya Farmers Association (KFA). Some private dealers also handle these goods. Tractors and machinery are supplied by local agents appointed by the manufacturers or distributors.

As with marketing, in general the supply system for inputs and farm machinery appears to work well enough and does not require major improvements. The Kenya Seed Company (KSC) is the main supplier of hybrid maize and other certified seed. Seed supplies are generally adequate and the distribution system good. When shortages do occur, it is often not due to inadequate capacity to produce seed, but because of inaccurate estimates of demand.

A subsidised artificial insemination service, the Kenya National Insemination Service (KNIS) is administered by the Veterinary Services Department of the Ministry of Agriculture. Throughout the large farm areas, Livestock Officers working under the supervision of District Veterinary Officers are responsible for running the service. Each KNIS inseminator is assigned a specific route which he covers each day. A sign left at the roadside by the farmer indicates that the insemination is required. KNIS charges a fee of KSh. 1 for up to three inseminations per cow.

The A1 service has grown rapidly since 1966. There are signs, however, that it is not as effective as it might be and many farmers interviewed during the present study appear to be losing confidence in it. The most usual complaint is that the inseminators sometimes fail to turn up, turn up too late or frequently do not have with them semen from the breed of bull required. Consequently, many farmers now keep bulls on the farm. The shortcomings at the A1 service are sometimes given as reasons for the abnormally long calving intervals generally found in dairy herds throughout the Large Farm Sector. Although perhaps a contributing factor, it is unlikely that the A1 service can be solely to blame.

A shortage of grade cattle is sometimes quoted as a constraint to intensifying or increasing the output of milk or dairy products. This is only partly true as the scarcity results from bad husbandry and a failure to exploit the potential of the existing grade dairy herds. Results from the current survey showed that mortality levels were so high in many herds that surplus replacement heifers were rarely available, although herd sizes were remaining static. Improvement in husbandry and disease control, thereby reducing mortality and replacement requirements for existing herds, is the most effective means available of increasing the supply of grade cattle for both the large and small farm sectors. To do this will require considerably more emphasis on livestock extension and some improvement in disease prevention and control measures.

6.10.2 Availability of Farm Machinery and Contracting Services

In 1974 it was estimated that the total number of tractors in the large Farm Sector was 5,709. Of these about 3,400 or almost 60 per cent were located in the main mixed farm Districts of Nakuru, Uasin Gishu and Trans Nzoia. The total number of tractors available in the large farm Districts has increased slightly since 1971. In the country as a whole, however, imports have fallen, due to restrictions in supply from manufacturers, inflation of prices and controls on imports. The last were removed in 1976 since when imports of machinery are expected to have risen. The farm survey indicated that there was a considerable variation in the level of investment between well managed and average and poor farms (Section 5). The annual costs on the poorer farms, however, were higher than on the well managed indicating either heavy reliance on contractors or older machinery with greater running and repair costs. Overall there is considerable room for more investment in machinery either on the farm or by private contractors. With group-owned farms the latter is the best course. The mixed farm sector is currently adequately served by private contractors. A few farmers stated that contractors were not always available at the time required and occasionally some operations suffered through lack of timeliness, but overall the availability of contractors was good. It was not possible to assess the total number of contractors but clearly the solid nucleus of a machinery contracting service exists within the private sector. Many of the major contractors are ex-farmers, they are aware of their clients' needs and are familiar with operating and maintaining a large complement of machinery. Besides these, there are innumerable smaller farmer/contractors who supplement their income and spread the fixed costs of their farm machinery by contracting on neighbouring farms. In addition to the private contractors, there are units of the Government's Tractor Hire Service (Land Development Section of MOA) stationed in most Districts. Although heavily subsidised, this service is decreasing in importance; compared with private contractors, its share of the work is minimal.

During the survey it was evident that one of the major limitations on effective use of machinery was the centralisation of repair and overhaul facilities in the major towns. On many farms visited it was clear that repairs had been carried out on the farm by the previous owners. Facilities were now in disuse, except on a small proportion of farms (around 25 per cent), and reliance was placed on facilities off the

farm. Consequently, repairs and overhauls took a long time to effect and generally around 25 per cent of tractors on the farms were out of order at any one time. The introduction of short courses in machinery repair and maintenance for owners, managers or drivers with any mechanical aptitude, would revive the use of facilities on the farm and go some way to increasing the effective availability of machines.

6.11 LEGAL ASPECTS

Apart from State ownership by the Agricultural Development Corporation (ADC), the Ministry of Lands and Settlement and other official bodies, there are four legal forms of large farm ownership namely, Individual, Partnership, Company and Co-operative. From the viewpoint of large farm operation and performance the legal form of ownership is of much less significance than the number of owners per farm (Section 4.3). The present legal framework for a large farm ownership does not appear to act as a constraint on production on those farms owned by a small group of owners and major changes are not considered to be necessary. With regard to farms owned by large groups the technical and social problems are similar irrespective of structure. Partnerships are perhaps the least desirable form, having no clearly defined framework for decision making, and frequently having a large number of unregistered shareholders. Companies have more effective decision making machinery but lack supervision and usually have a large number of unregistered shareholders. Co-operatives are the only form in which more than 50 members can be registered. They have a clearly defined institutional structure within identifiable legal restraints. They rarely, however, have an effective decision making machinery.

The existing rules on subdivision and land transfer are of considerable importance to the sector. Changes in farm ownership have to be approved by the respective District Land Control Board. Present policy does not permit subdivision of large farms except in very unusual circumstances. In the census (Section 4.3) 336 of the 545 group-owned mixed farms were found to be completely subdivided but in less than five cases had Land Control Board approval been given. Thus virtually all the subdivision which has occurred is illegal. In practice it has proved impossible to enforce the rule prohibiting subdivision, but the lack of a legal basis for the resultant smallholdings has led to difficulties in securing credit and extension advice.

In effect the present situation suffers from the worst of both worlds. Subdivision is not being prevented even in those cases where it is clearly undesirable, such as with commercial ranches in marginal rainfall areas, yet the subdivided holdings in areas of high and medium potential suffer from lack of legal status. Rationalisation of the situation is obviously necessary. This is discussed in Chapter 9.

6.12 CONCLUSIONS

In general the institutional framework and supporting services for the Large Farm Sector are adequate. The most important measures required are an improvement in the effectiveness of the extension services, particularly with regard to animal husbandry and the A1 services, more efficient application of agricultural credit by improving AFC's local knowledge, assessment of credit worthiness and debt collection, and rationalisation of the legal situation regarding subdivision. The institutional changes needed to implement the proposed strategy for the Sector are described in Chapters 9 and 10.

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Large versus Small Farms

7.1. INTRODUCTION

It has been established during the course of field work associated with the farm survey and by the study team's Consultant Sociologist that the primary objective of shareholders in farms owned by large groups is to farm their own individual holding. This was their original desire, but because of the conditions attached to the purchase agreement of the farms, most shareholders did not immediately subdivide but attempted to farm as a group on a large scale. In many instances they failed and their original desire to operate individually was reinforced. Although a major proportion of the group-owned farms have subsequently been subdivided without the approval of Land Control Boards, the question of whether the aspirations of the others to farm as individuals should be satisfied still remains. There is also the possibility of re-consolidating the subdivided farms back into large-scale units.

The question, in effect, hinges partly on the relative merits of large and smallscale farming and partly on whether subdivision can be prevented. Despite existing regulations, subdivision has continued and of the 45 per cent of the mixed farms that currently are group-owned, 62 per cent are already completely subdivided. Thus only about 38 per cent of group-owned mixed farms have not yet been completely subdivided.

In this section the merits of largescale farms versus smallholdings are discussed, using information from earlier surveys, the Integrated Rural Survey and original data from the current study. The effect of decreasing farm size within the largescale farms through subdivision of some farms into a number of smaller yet still large-scale units is also considered.

7.2. LARGE-SCALE FARMS VERSUS SMALLHOLDINGS

7.2.1 Gross Output and Intensity of Land Use

Information on relative gross output and land use intensities is available from sample surveys of the conventional smallholder settlement schemes established in the medium and high potential large farm areas in the early part of the 1960's, and from case studies of large farms in the Trans Nzoia District. The smallholder surveys were carried out from 1964/65 to 1967/68 and the survey of farms in the Trans Nzoia between 1967/68 and 1970/71. Using information from these surveys the Statistics Division of the Ministry of Finance (1972) have compared large-scale farms and smallholdings with regard to output per acre, intensity of land use, cost of resources to produce a given gross output and employment opportunities created. An analysis of the data collected is given in Tables 7.1 and 7.2 for smallholdings and large-scale farms respectively.

Comparison of the figures in Tables 7.1 and 7.2 is hampered by the fact that they refer to different years. Nevertheless, from Table 7.2 it is evident that very high levels of output per unit of land area can be

achieved on some of the smallest farms. On farms of less than 10 acres (4 hectares) a gross output per acre of KSh. 635 was achieved. Furthermore, this group of farms had the highest percentage of land under crops. Similarly, holdings of between 10 and 20 acres (4–8 hectares) had a high gross output per acre of KSh. 250 and up to 30 per cent of the land was under crops. The table indicates that as farm size increases both gross output and intensity of land use decline. Although the data do indicate an advantage in smaller holdings, the apparent degree of this advantage is probably to some extent exaggerated by differences in land potential and ecological conditions. Generally, the more marginal the conditions the larger the holding sizes will be. This is particularly true of settlement schemes where farm sizes are determined with a view to generating a particular target income.

The situation regarding large farms given in Table 7.2 also indicates decreasing output and intensity of land use with increasing size. On farms below 250 acres (101 hectares) gross output per acre was KSh. 248, of a similar order to that of the 10–20 acre (4–8 hectares) size group of smallholdings. Intensity of land use was, however, significantly higher. On small units, where land is the scarcest resource, intensification of land use is, of course, the obvious way to maximise net returns. As with smallholdings, both gross output per acre and intensity decline as the size of farm increases. The relationship is not, however, quite as strong as for the smallholder settlements.

If the levels of output per acre on the large farms and smallholder settlements are compared it is apparent that the smaller settlement farms, especially those of less than 20 acres (8 hectares) in size, were capable of obtaining very high levels of gross output per acre. Above 20 acres the levels of output and intensity of land use were of a similar order to those large farms of 250 acres (101 hectares) and above.

Data on crop yields and intensity of land use on subdivided farms were collected during the Consultant's survey of large mixed farms. The results from the completely subdivided farms, given in detail in Annex II indicated an average holding size of 10.8 hectares and an intensity of use of arable or cultivable land of 67 per cent; they also indicated that maize yields were of a similar order to the average yield of 3,681 kg per hectare on all the large units surveyed. The use of hybrid seed was widespread, but fertiliser rates applied were considerably below the recommended levels. With the relatively high intensity of use of cultivable land, and yields which were at least equal to the large scale average, the gross output per hectare from individual smallholdings was higher than the average levels for the large maize farms. Given that this was achieved with only limited access to services such as credit, it is apparent that smallholdings were performing at least as well as the large farms in general, and, if provided with agricultural services similar to those smallholdings in the conventional schemes, would do even better.

Data from the 1976 Integrated Rural Survey of smallholdings through each of the seven ecological zones in the country clearly demonstrates that gross output per hectare decreases as holding size increases. Some results from the survey are given in Table 7.3, which presents a summary for all seven ecological zones. Taking each zone separately, the trend remains the same.

7.2.2 Amount of Resources to Produce a Given Level of Output

A comparison of the cost of resources required to produce a given gross output on large farms and smallholdings has been made (Table 7.4) using data from the same smallholder settlement surveys and large farm survey of the Trans Nzoia quoted above.

Table 7.1 The Relationship Between Output, Land Utilisation, Employment and Farm Size on Settlement Schemes, 1967/68 Season.

Farm size group (acres)	Average size (acres)	Gross output (KSh. per acre)	Land Use		Labour Inputs			Expenditure on machinery cultivation ¹ (KSh. per crop acre)
			Proportion of land under crops (per cent)	Grazing acres per stock unit	No. of family labourers	No. of regular labourers (man-equivalents per 1,000 acres)	Total No. of labourers	
Less than 10	7.3	635	45	0.9	781	27	808	6
10-19.9	13.8	250	30	2.6	370	29	399	11
20-29.9	23.5	156	24	3.0	211	23	234	9
30-39.9	34.7	161	16	3.8	135	24	159	28
40-49.9	44.4	113	14	4.1	103	21	124	21
50-59.9	52.3	98	15	5.1	93	18	111	19
60-69.9	64.5	98	19	5.3	77	37	109	12
70 or more	124.8	111	14	3.6	42	28	70	10
All Farms	30.5	156	19	3.5	164	26	190	14

Source: Kenya Statistical Digest, Vol. X No. 1 March 1972 — Statistics Division: Ministry of Finance

¹ These figures do not reflect the charge per acre for machinery services, but indicate the average expenditure over all crop acres.

Table 7.2 The Relationship Between Output, Land Utilisation and Farm Size on Large Farms in Trans Nzoia, 1970-71

Farm Size Group	Land Use				Employment			Expenditure on Machinery on Cultivation ¹
	Average Farm Size	Gross Output	Proportion of Land Under Crops	Stocking Rate	No of Regular Labourers	No of Casual Labourers	Total No. of Labourers	
(Acres)	(Acres)	(KSh. per acre)	(per cent)	Grazing Acres per Stock Unit	(Man-Equivalents per 1,000 usable Acres)	(KSh. per crop acre)		
Less than 250	183	248	46	3.2	38	55	93	135
250-499	326	161	21	3.1	31	31	62	140
500-749	546	133	24	3.8	26	17	43	136
750-999	816	113	19	6.2	29	15	44	146
1,000-1,249	1,012	89	13	4.4	19	15	34	119
1,250-1,499	1,194	149	18	4.2	28	18	46	167
1,500-1,999	1,502	128	10	4.3	18	10	28	155
2,000 or more	2,979	65	9	7.1	7	7	14	131
All Farms	890	117	16	4.8	21	15	36	143

Source: Kenya Statistical Digest, Vol. X No. 1 March 1972 — Statistics Division: Ministry of Finance and Planning

Note: ¹ This is outside the farm size group, as the range was calculated on the basis of total acres.

Table 7.3 Gross Output per Hectare for Different Smallholding Sizes

Farm Size (ha)	Gross Output per hectare (KSh)
0.5-1.0	2,961
1.0-2.0	1,584
2.0-3.0	1,121
3.0-4.0	874
4.0-5.0	892
5.0-8.0	495

Source: Central Bureau of Statistics: Personal Communication.

Table 7.4 The Amount of Resources Required to Produce £100 of Output on Settlement and Large Farms, 1964/65-1967/68 and 1967/68-1970/71

Survey Year	Settlement Farms			Survey Year	Large Farms		
	Machinery ¹	Wages ²	Material Inputs ³		Machinery	Wages	Material Inputs
(KSh. per Farm)				(KSh. per Farm)			
1964/65	113	272	517	1967/68	475	328	533
1965/66	112	254	425	1968/69	455	313	555
1966/67	61	289	349	1969/70	433	339	537
1967/68	35	250	296	1970/71	425	306	530

Source: Kenya Statistical Digest, Vol. X No 1 March 1972: Statistics Division of Ministry of Finance and Planning.

Notes: ¹ Defined as expenditure on fuel and repairs. Part of the decline in the figures on the settlement farms reflected the shortage of these services.

² Refers to hired or wage paid labour.

³ Defined as expenditure on inputs for crops and livestock. No explanation is given for the reduction in expenditure on material inputs on the settlement farms between 1964-65 and 1967-68.

The figures give the average value of each input and indicate clearly that a smaller expenditure on all inputs was required to produce K£100 of gross output on the settlement farms than on the large farms. The most marked difference was in the use of machinery, which on the settlement farms amounted to about a quarter of that on the large farms. Although the difference is great, it was probably influenced by limited availability of machinery or contracting services at the time of the survey. There is little doubt, however, that on the settlement farms there has been a substitution of labour for machinery, which in

terms of real costs to the economy represents an important saving. The difference in the reliance upon machinery is also demonstrated in the final columns of Tables 7.1 and 7.2.

Further information is available from the Integrated Rural Survey (Table 7.5) which shows that a significant proportion of produce is sold from all smallholding sizes. As expected, the proportion increases with size. However, in terms of the value of produce marketed per hectare, the value clearly declines as holding size increases.

7.2.3 Employment Creation

As discussed in Chapter 8, Kenya's high rate of growth in population and labour force will be one of the most important features of the Kenyan economy during the next 25 years. Although the proportion of total employment provided by the non-agricultural sectors will increase, most of the future increase in rural population will be dependent on employment in agriculture. The ability of different farm sizes and systems to provide employment will therefore become increasingly important.

Labour inputs on settlement farms and on large farms in the Trans Nzoia are given in Tables 7.1 and 7.2. The tables show that the smaller settlement farms of less than 30 acres employed and supported a large number of people on the land. Even above the 30 acre (12 hectare) size and up to 70 acres (28 hectares), employment opportunities on the settlement farms were significantly higher than on the large farms. Apart from land preparation, most other operations on smallholdings are carried out by hand and as long as the intensity of land use on the smallholdings can be maintained at a high level this advantage in the creation of employment opportunities will be evident.

7.2.4 Marketable Surpluses

It is frequently argued that the amount of marketable surplus will decline if large farms are subdivided into smallholdings and that this is a major disadvantage of such subdivision. The validity of this argument hinges upon two points: first, how important is the question of whether a farmer consumes his produce or sells it to buy in his subsistence requirements from elsewhere, and, secondly, what influence does size of holding have upon the volume of output sold per hectare.

As regards the first, the distinction between marketable surpluses and home consumption is in most cases an artificial one. What is important is the level of gross and net output, regardless of whether that output is consumed on the farms where it is produced or is sold for consumption elsewhere. Home consumption does in fact have the advantage of reducing overall transport and marketing costs.

With respect to the second point, the available evidence clearly shows that smallholders who produce a surplus over their own requirements do market this surplus. Consumption requirements are diverse, and in general up to 60 per cent of the consumption of smallholder families is in fact purchased. It is reasonable to expect, therefore, that smallholders will attempt to maximise their marketable surpluses in order to finance the purchase of items of consumption not produced on the farm. Results from the Consultants' survey (Annex II) indicated that on average about 67 per cent of all maize grown on completely subdivided farms was marketed. Livestock products were also marketed, but the proportion was not known.

Table 7.5 Proportion of Total Production Marketed on Smallholdings

Farm Size (ha)	Proportion sold ¹ (%)	Amount of production sold per hectare (KSh)
Less than 0.5	33	2,188
0.5-1.0	36	1,066
1.0-2.0	40	631
2.0-3.0	45	502
3.0-4.0	49	426
4.0-5.0	51	458
5.0-8.0	62	308

Source: Central Bureau of Statistics: Personal Communication

Note: ¹ For all seven ecological zones.

7.2.5. The Availability of Managers for Large Farms

Contrary to the current belief that managers for large farms can be trained in a crash programme of one year's formal training and one year's practical experience, we have pointed out in Annex V that the skills required by managers are such that a considerably longer period of training of up to five or six years will be required.

The manager of a large farm requires to be not only technically proficient in crop and livestock production, but also needs additional managerial and analytical skills. On smallholdings the management needs are different, in particular there is not a need to control a high level of capitalisation, maintain technologically complex inputs or organise a large labour force. The primary requirement of smallholders will therefore be for straightforward technical advice on crop and livestock production. This can be provided by extension staff proficient in crop and livestock production techniques and with the ability to persuade. The training of the extension officer, because of his less complex duties, can in fact be shorter and can be achieved in a three year diploma course at Egerton. In fact, most of the field extension work is done by assistants, who do not need such long training.

Given a situation where both skilled farm managers and extension officers are in limited supply, it is desirable to opt for a strategy which will reduce the demand for skills which take longer to acquire and increase the demand for skills which may be acquired in a shorter period. Such a strategy would favour the increase of smallholdings at the expense of large-scale farms.

7.2.6 The Suitability of Crops and Livestock Enterprises to Large and Small-scale Operations.

(a) Crops

The most important crops grown in the large mixed farm areas are maize (commercial and seed maize), wheat, barley and coffee. Although widely grown, sunflower and pyrethrum are of lesser importance.

Of these crops, commercial maize, sunflower and pyrethrum are equally well suited to large or small scale cultivation. With commercial maize and sunflower, most operations can be carried out as effectively by hand or by machine and equally high yields can be obtained under either system. Under both small or large scale systems, pyrethrum is essentially a labour-intensive crop. Once land preparation is complete, most other operations such as planting, weeding, cutting back and picking are essentially hand operations, irrespective of scale. Earthing up may be done by hand or machine.

Coffee is also grown on both a large and small scale. Like pyrethrum, it is a labour-intensive crop, with the main operations, picking and pruning, being done by hand. On the large scale there is a choice between hand and mechanised operations for weed and pest control. Average coffee yields from smallholder growers, however, are approximately only half those achieved on estates, mainly because management expertise, advice and inputs are less available. Given this and the fact that many of the coffee estates are now owned by groups with such a large membership that the individual land entitlement would be extremely small, subdivision into smallholdings should not be encouraged in the short term. The coffee farms currently recruited to the Group Farms Rehabilitation Project are performing well and production is being increased. This approach coincides with the owners' views on keeping the coffee areas intact and for the present is recommended as the best alternative available. The aspirations of most shareholders joining coffee farms appear to differ from those of members joining mixed farms in that in most cases they prefer to operate the coffee area as a group enterprise.

Tea is equally well suited to large and small-scale production, as demonstrated by the success of smallholder tea in Kenya. Subdivision of tea plantations is thus not necessarily disadvantageous. However, many of the larger plantations are owned by commercial companies and are not likely to change hands in the near future.

Commercial sisal production is essentially a large scale commercial operation. Purchase of sisal plantations for sub-division by groups is not to be recommended, because of the danger of removal of the sisal to make way for maize (most sisal plantations are in marginal areas where maize does not do well) and the fact that smallholder sisal production (apart from the growing of 'hedge' sisal) has rarely proved successful.

Wheat and seed maize are best produced on a large scale. Although wheat is a common smallholder crop in other countries (for example, India and Ethiopia), the techniques for smallholder production have not yet been developed in Kenya, and if wheat production in the short term is to be maintained it will have to be on the large scale. It is recommended, however, that a programme of applied research to develop a technology for small scale wheat production in Kenya be given some priority. The production of hybrid maize seed is best carried out on a large scale, where adequate control of quality, husbandry and phytosanitary and other conditions can be maintained.

(b) Livestock

Dairying is equally well suited to large and smallscale production and the success of commercial smallholder dairy enterprises is a feature of recent agricultural development in Kenya. Ranching is of necessity a large-scale operation and subdivision of ranches should be discouraged, the production of breeding livestock is also more suited to largescale operations.

7.3 THE INFLUENCE OF SIZE ON LARGE SCALE FARM PRODUCTION

There are a number of farms owned by few partners, usually less than the legal maximum of seven, where the partners wish to subdivide and operate their own holding. Were they to subdivide, each holding, although a fraction of the original, could still be regarded as a large-scale unit. The effect of decreasing the size of the large-scale farms has been considered using the data from the large farm survey of Trans Nzoia and the data collected during the Consultants' survey of 1976. The former survey clearly indicated (Table 7.2) that intensity of land use declines as farm size increases and that gross output follows the same trend. The data collected during the Consultants' survey were examined to determine whether a close relationship existed between the scale of operation on large units and the output from crops and livestock. The relationships investigated were:-

- Farm size and intensity of use of cultivable land.
- The number of dairy cows and yield per cow per annum.
- Farm size and gross output.
- Farm size and gross margin (gross output minus variable costs).

The results on the analyses carried out are given in detail in Annex II. Of the 39 regression analyses undertaken, only 8 proved significant, indicating that no strong relationship exists between farm size, intensity of land use and productivity within the sample of large farms analysed. However, the analyses give no indication of increasing productivity with size. To the contrary, the higher number of inverse significant relationships and high proportion of negative correlation coefficients would suggest that increased productivity is more likely to be obtained by reducing the average size of the large-scale mixed farms.

7.4 CONCLUSIONS

The main conclusions from the above comparison are as follows:-

- (a) Gross output per ha on smallholdings is at least as high as on large farms and is often greater, especially on holdings of below 8 ha (20 acres).
- (b) Production costs per unit of output are much lower on smallholdings, the main difference being the heavier machinery costs on the large farms. This means that net output per ha (gross output minus costs of production) is higher on the small units.
- (c) The amount of employment generated on smallholdings is far greater than on large farms. On the latter there has been a considerable substitution of machinery for labour, the farming system thus being capital intensive rather than labour intensive. As such, its real costs to the Kenyan economy are considerably higher.
- (d) Even if the marketable surplus per hectare is somewhat lower on small farms, this is in most cases not of crucial importance, provided that gross and net output per ha are as high as on larger units. Evidence from the Integrated Rural Survey and other sources indicates that even the smallest farmers market their surpluses (i.e. they are market-orientated and are not purely subsistence farmers) and that the value of output marketed per ha is at least as great as on the larger units.

- (e) The staff requirements of development based on smallholdings rather than large farms are easier to meet, primarily because the extension staff needed for smallholder agriculture require less training and experience than do the managers required to run large farms.
- (f) Commercial maize, sunflower, pyrethrum and dairying are equally suitable for large or smallscale production. Although on some smallholdings high yields of coffee are obtained, overall coffee does not perform as well under smallholder conditions. Seed maize, wheat, ranching and breeding stock are more suitable for large farms.
- (g) There is likely to be an economic advantage in reducing the average size of the large-scale mixed farms. Where small partnerships or small companies wish to subdivide into three or four individual holdings this should not be discouraged.

One of the points which is sometimes overlooked in the small versus large farms argument is that commercial smallholding has already been developed very successfully in Kenya. The feasibility of commercial smallscale farming for maize production and dairying, two of the major enterprises in the large mixed farm sub-sector, has already been fully proved by the successful performance of small farmers in the high density areas of Central Province and elsewhere. Thus the idea of promoting the development of smallholdings on those group farms which have already subdivided and on others which want to subdivide, need not involve major risks. Provided that adequate extension and other supporting services are available to the same extent as in existing smallholder areas, smallscale farming on subdivided large farms can be expected to be successful.

It has been argued that subdivision of large farms, once permitted, will continue until fragmentation becomes excessive and production suffers. Given the massive expansion in agricultural population which will take place over the next generation, holding size will inevitably decline (Chapter 8) and further subdivision will occur. This will be necessary in order to meet the demand for holdings amongst the increasing population. For example, in the 1974-78 Development Plan, it was estimated that 350,000 new smallholdings would be needed in just the five years of the Plan period in order to satisfy this growing demand.

If it is accepted that further subdivision is inevitable, its effect becomes a vital issue on output. Once the subdivision of a group farm has been officially recognised and the members' holdings have been registered and land title issued, these farms would have the same legal status as those in the adjudicated and registered areas of the former Native Trust lands of Central Province and elsewhere. In such areas, subdivision is normally not officially permitted, but in practice it is impossible to prevent. As yet, however, it does not appear to have adversely affected crop and livestock production.

Moreover, the figures from the Integrated Rural Survey, which are presented in Table 7.4, suggest that output per ha is higher with very small holding sizes. Apart from enterprises like seed maize and wheat, which are not suitable for small-scale production, there do not appear to be major arguments against further subdivision in terms of output per ha.

Subdivision into smallholdings is the professed desire of most group farm members. If properly organised, the subdivision of large group-owned mixed farms should not result in a decline in agricultural production per ha from the areas affected. In many cases it can in fact be expected to result in an increase in output, due to more intensive land use and lower production costs. Thus the official acceptance of subdivision and the provision of supporting services to the resultant smallholdings would have the great advantage of coinciding with the aspirations of the farmers concerned, while at the same time maintaining or increasing production.

The advantages of smallholdings have been recognized by the Government and in the 1974-78 Development Plan it has been clearly stated that policy is to encourage the subdivision of large farms with the objectives of promoting more intensive land use and absorption of more families onto the land.

8

Factors Affecting Development

8.1 MAJOR PROBLEMS AFFECTING PRODUCTION IN THE LARGE FARM SECTOR

Given a satisfactory standard of management there does not appear to be any really serious constraint to production and performance in the Large Farm Sector. Physical conditions are favourable to the farming systems which have developed. Credit, machinery and other inputs are fairly readily available through Government and private agencies and although some farmers complain of either difficulty in obtaining or controlling labour, the labour supply does not emerge as a widespread constraint. Indeed on those farms where wages and conditions meet the official levels, labour supply is not a problem. The pricing policies for most crop and livestock commodities are widely favourable (Section 8.4) being either equivalent to or above border parity prices.

The problems which constrain production at present and which have led to underutilisation of resources are primarily related to the quality of management, provision of managerial advice and to social problems. They are more common and are of greater magnitude in the mixed farm subsector than in the plantation or ranching subsectors.

8.1.1 Plantations

Many of the plantations, tea, coffee, wattle and sisal are still owned by foreign companies with adequate financial and managerial resources. Their operations have expanded and output increased. Many of the smaller coffee and sisal estates, which changed hands after Independence have in fact run into difficulties; they have been allowed to decline with consequent fall off in production. This is particularly common where they have been purchased by large groups of shareholders.

The problems of the coffee estates are essentially managerial and can be solved by linking credit with managerial assistance. They are being met by the current Group Farms Rehabilitation Project (GFRP) which provides for skilled management through the services of reputable managing agents and credit inputs where necessary. Although the project has been in operation for only two years and a slow start made, this approach is proving the most suitable given that a high value crop such as coffee can pay for expensive and highly skilled management. Moreover, in most instances the shareholders are so numerous (often 2,000–3,000 or more), that they cannot expect a subsistence plot on the estate and regard their shareholding as an investment.

Groups purchasing sisal plantations have tended to split up the sisal area into smallholdings or subsistence plots or have simply allowed the sisal to decline. This is likely to lead to a fall in sisal output and hence exports, and since most of the sisal estates are in marginal areas, subsequent failure of the smallholdings, established after subdivision, is likely.

8.1.2 Ranches

The major problem in ranching areas is also associated with group ownership and where subdivision has occurred. Arable cropping is in most cases simply not viable and attempts to cultivate on subdivided ranches have resulted in crop failure, destroyed natural pasture and greatly reduced production potential. This problem could be avoided by discouraging or prohibiting sale of ranching land to large groups or to companies whose policy in the past has been to subdivide and sell the land as individual plots.

8.1.3 Mixed Farms

The major problems with mixed farms fall into two groups; those which are common to all farms irrespective of type of ownership or number of owners and those which are essentially social problems found mainly in farms owned by a large group of owners.

(a) Problems common to all mixed farms

The most important problem throughout all mixed farms is the limited experience of large scale farming and generally poor management which prevails. Associated with this is the inability of the present extension service to fill the gap by maintaining contact with the farmer or manager and providing sound managerial advice. Only about 27 per cent of the 1,240 mixed farms surveyed were well managed (Section 4.3.6). The influence of the number of owners was shown to be important, as the proportion of well managed farms was considerably higher in those individually owned or with only a few partners or shareholders than in those owned by large groups. The affect of poor management was most pronounced in dairy enterprises and to a slightly lesser extent with wheat. Maize yields, although significantly lower on the average to poorly managed farms than on the well managed, are less affected by the quality of management than yields on the other two major enterprises.

The availability of credit and the institutional framework to provide it is not a major problem. Indebtedness, however, is a problem and a significant proportion of farms are heavily in debt. This is often the case from the time of purchase of the farm when all the funds that owners could raise were laid down as a deposit (often more than the minimum proportion required). Consequently capital for medium term investments and working capital had to be borrowed. The fairly readily available capital, coupled with inexperienced management, has led to some farms going increasingly into debt and the accumulation of an excessive repayment burden. Thus in some instances credit has been too freely available, as credit combined with poor management can result in a farm being in a worse financial state than if no credit had been given at all. It is important that the situation regarding indebtedness be improved not only for the farmer's sake but also to make more funds available for lending.

Although poor husbandry is largely responsible for the poor performance of dairy herds, other factors are worth mentioning. Firstly there is a need to improve the AI service and second to make veterinary attention more readily available. Many farmers complain that charges are excessive.

With the change in farm ownership there is much greater reliance upon machinery repairs and overhauls being carried out 'off' the farm and servicing facilities on many farms have fallen into disuse. Most repair facilities are located in the major towns (such as Eldoret and Kitale); thus long distances are involved in transporting machinery for repair. The down time on machinery is high and effective availability is consequently low.

(b) Problems in Group Owned Farms

The problems mentioned above also apply to group owned farms particularly where the owners have not completely subdivided. In addition, however, there are problems which are specific to the large groups. These include; lack of leadership, lack of trust, the conflicting interests of members and leaders, lack of motivation or interest in the group farmed area and an unwillingness to work on it. The existence of unregistered members further complicates these and other problems. On many of the group owned farms where the number of owners is excessive relative to the land area, certain malpractices in land use, such as cultivation on steep slopes, clearing of afforested areas and river banks and cultivation of unsuitable land are evident. Although the groups have tended to purchase land in the maize/dairy areas, some have purchased farms best suited to wheat or high altitude crops. The result has been an attempt to grow maize on land which could be put to a more appropriate use.

8.2 POPULATION, LAND PRESSURE AND EMPLOYMENT

8.2.1 Population

With an annual growth of at least 3.3 per cent, Kenya has one of the highest rates of population increase in Africa. Given the limited availability of cultivable land and the dominance of the agricultural sector as a source of employment, the resultant increasing land pressure is perhaps the most serious problem facing the country today.

It is also a vital factor affecting the future of the Large Farm Sector, especially the mixed farm sub-sector. By its very nature the latter is characterised by relatively large farm sizes and a capital rather than labour-intensive production system. The amount of employment generated per farm hectare is substantially less than in the smallholder areas. The intensity of land use is also generally lower, due largely to the reduced pressure to maximise output per hectare.

In a situation where there are substantial areas occupied at a low intensity by large farms and there are neighbouring smallholder areas with increasingly acute land pressure, the political and economic pressure for the breaking up of such farms to settle the increasing population can be expected to heighten. Pressure of this type led to the Million Acre Scheme of the 1960's and to other settlement schemes on former large farms. In determining the future role and scope of the Large Farm Sector it is therefore important to assess likely population growth and density. Since there are substantial zonal variations in population density and land capability, this must be taken into account.

Population projections have been prepared by District, covering those Districts in which there are large farms and also adjacent Districts. Population pressure in surrounding areas outside the large farm zone itself will clearly be important, since people from such areas will look to the nearby large farms as possible sources of land holdings and employment. It was intended that the population figures should be presented by Divisions (i.e. sub-District). However, small-scale maps showing Divisional boundaries are not available and the data are given below by District.

Projections have been made for the period from 1975 to the year 2000. They are derived from two main sources, the projections made in 'The future growth of Kenya's population and its consequences', Kenya Statistical Digest, June 1971 (these are the source of the estimates used in the 1974-78 Development Plan) and secondly, 'Population projections by District', Kenya Statistical Digest, September 1972. In the

June 1971 paper, four rates of growth involving four different total fertility rates were postulated (the term 'total fertility rate' is the average number of children born alive to a woman who survives to the age of 50). In 1971 Kenya's total fertility rate (TFR) was 7.6, the second highest in Africa. The four rates used in the projections were as follows:-

Series A:	No change in the 1971 rate up till the year 2000
Series B:	TFR falling to 4 by the year 2000
Series C:	TFR falling to 3 over the same period
Series D:	TFR falling to 2 over the same period

The Series A assumption seems unduly pessimistic. As per capita incomes rise and family planning is given increased emphasis, the TFR can be expected to fall considerably below its present very high level of 7.6. On the other hand, it appears unrealistic to envisage that it could decline to as little as 2 during the next 25 years. For planning purposes the Series B projections, which imply a halving of the TFR, have therefore been used: these are the 'low' projections given in the 1974-78 Development Plan.

To obtain the relative growth rates per District, the values calculated in the Kenya Statistical Digest (KSD) September 1972 paper, which were for the 1970-1980 decade, have been extrapolated to cover the period up to the year 2000. The KSD 1970-1980 projections for each District were based on the different rates of increase recorded between the 1962 and 1969 censuses, after adjustment to correct obvious errors in the former. The rates derived thus took account of both variations in natural growth rates and the effects of migration between Districts.

In extrapolating the 1970-1980 KSD growth rates, the implicit assumption is that the differences in rates of increase between Districts will be maintained until that time. Clearly, these would in practice change to some extent, but in the absence of any reliable indication of such changes, extrapolation of existing trends is the best basis for District population projections.

Table 8.1 presents the resulting estimates of the size and density of the population by District for 1975 and the year 2000. These have been calculated by taking the total Kenya population as estimated in the KSD 1971 paper and for each District applying the percentage of the total population in that District according to the forecasts described above. Distinctions are not made between rural and urban population, but in few of these Districts does the urban component form a significant proportion of the total.

8.2.2 Land Pressure

To obtain a proper understanding of the land pressure situation in relation to the large farm areas, it is necessary to take into consideration the location of the large farm zones and the land's potential productivity and its capacity to support people.

Figure 8.1 shows the estimated population density for 1975 for the districts in and around the main areas of large farms. Figure 8.2 gives the population expected in the year 2000 based on an extrapolation of present trends. Figure 8.3 then relates the 1975 population densities to ecological zones, to compare present densities with the land's potential productivity.

From the viewpoint of supportive capacity, Zones 1 (the very high altitude montane zone) and 5 (rangeland suitable only for extensive livestock production) have a very low potential. Zone 4 is of only marginal potential, being essentially ranching country, and also has a low capacity to support population. Thus Zones 2 and 3 are and will remain the most important agricultural areas in the regions covered by

Figure 8.1 Estimated population density in and around large farm areas in 1975

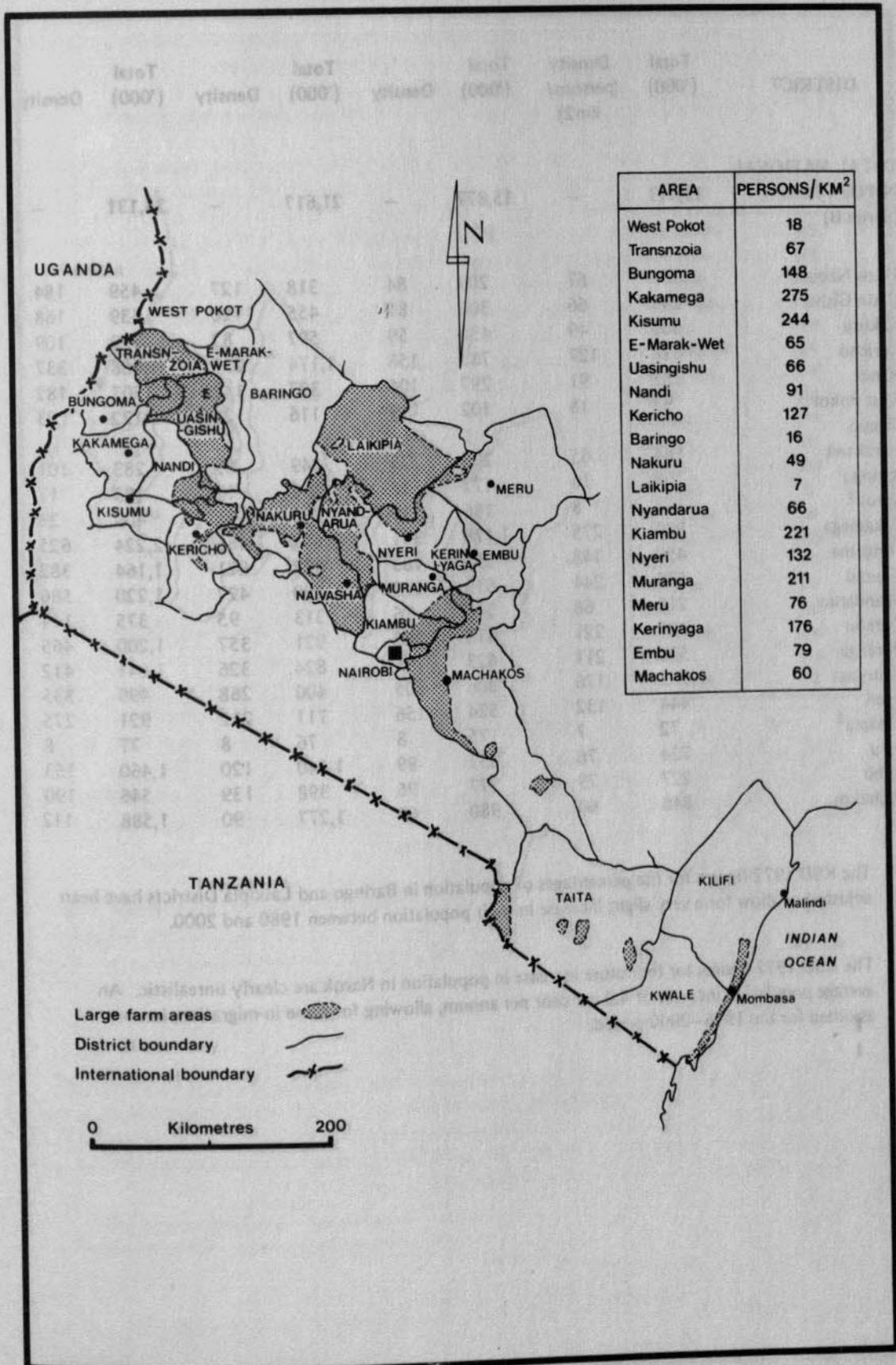


Table 8.1

Projected Population in and Around the Main Large Farm Areas.

Year	1975		1980		1990		2000	
DISTRICT	Total ('000)	Density (persons/km ²)	Total ('000)	Density	Total ('000)	Density	Total ('000)	Density
TOTAL NATIONAL POPULATION (Series B)	13,413	—	15,877	—	21,617	—	28,131	—
Trans Nzoia	166	67	209	84	318	127	459	184
Uasin Gishu	249	66	308	81	455	120	639	168
Nakuru	360	49	430	59	597	82	792	109
Kericho	628	127	783	158	1,174	237	1,668	337
Nandi	253	91	297	106	397	142	507	182
West Pokot	93	18	102	19	116	22	122	23
Elgeyo								
Marakwet	184	65	206	73	249	89	283	101
Baringo ¹	169	16	172	16	178	17	183	17
Narok ²	153	8	186	10	276	15	409	23
Kakamega	979	275	1,178	331	1,657	466	2,224	625
Bungoma	450	148	558	183	827	271	1,164	382
Kisumu	508	244	619	297	890	427	1,220	586
Nyandarua	218	66	248	76	313	95	375	114
Kiambu	570	221	676	262	921	357	1,200	465
Muranga	534	211	623	246	824	326	1,041	412
Kirinyaga	263	176	306	205	400	268	499	335
Nyeri	444	132	524	156	711	212	921	275
Laikipia ¹	72	7	75	8	76	8	77	8
Meru	724	76	851	89	1,140	120	1,460	153
Embu	227	79	277	96	398	139	546	190
Machakos	846	60	980	69	1,277	90	1,588	112

¹ The KSD 1972 figures for the percentages of population in Baringo and Laikipia Districts have been adjusted to allow for a very slight increase in their population between 1980 and 2000.

² The KSD 1972 figures for the future increase in population in Narok are clearly unrealistic. An average population increase of 4.0 per cent per annum, allowing for some in-migration, has been assumed for the 1975–2000 period.

Figure 8.2 Extrapolated population density in and around large farm areas in the year 2000

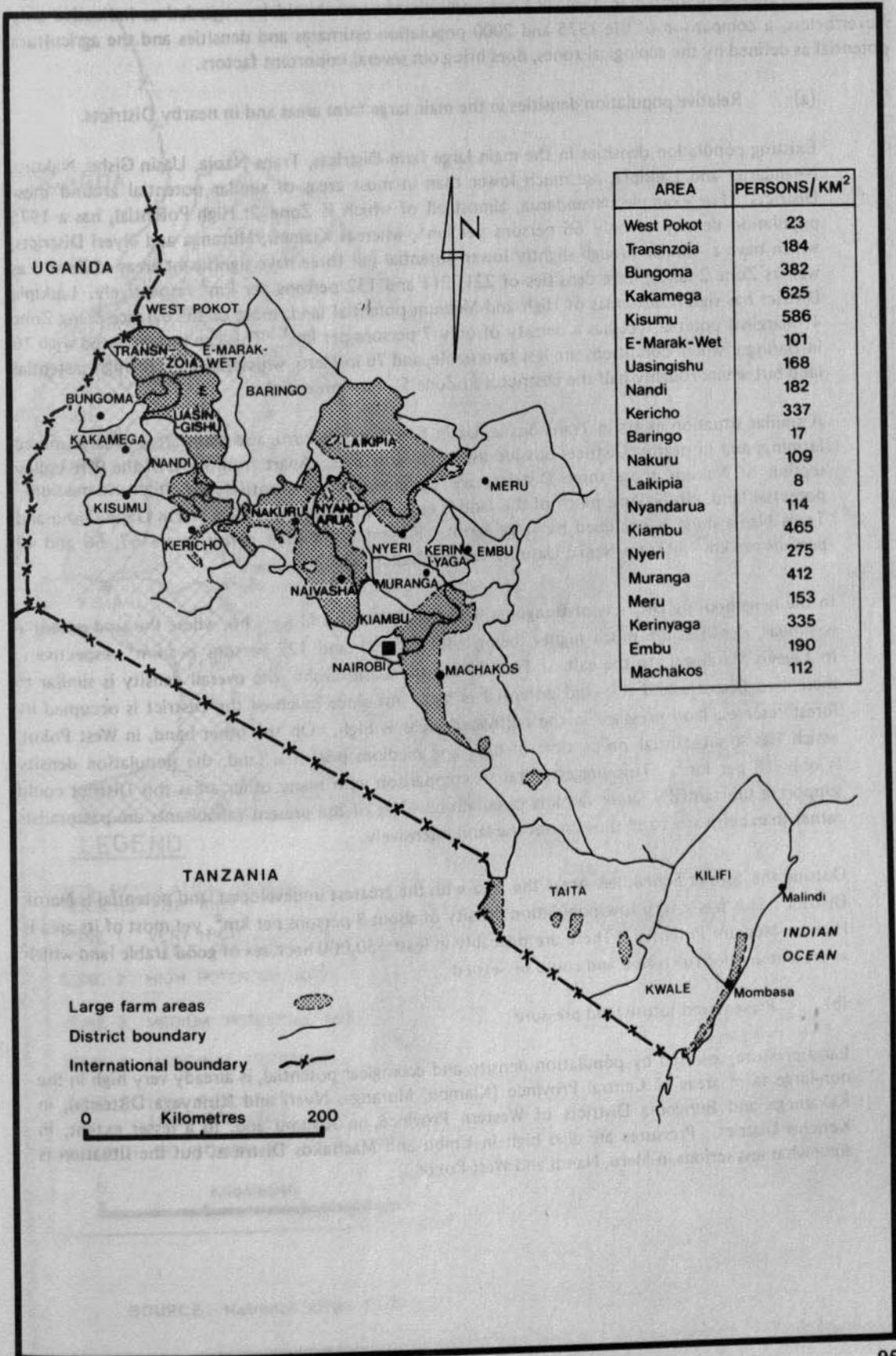


Figure 8.3. Zone 2 has the highest potential and is particularly well suited for coffee, tea, pyrethrum and intensive livestock. Zone 3 is of medium potential and is the main mixed farming area. A wide range of cereal and other crops can be grown and it is very suitable for livestock production.

The figures presented in Table 8.1 are approximate and should be regarded as indicative only. Nevertheless, a comparison of the 1975 and 2000 population estimates and densities and the agricultural potential as defined by the ecological zones, does bring out several important factors.

(a) Relative population densities in the main large farm areas and in nearby Districts.

Existing population densities in the main large farm Districts, Trans Nzoia, Uasin Gishu, Nakuru, Nyandarua and Laikipia, are much lower than in most areas of similar potential around these Districts. For example, Nyandarua, almost all of which is Zone 2: High Potential, has a 1975 population density of only 66 persons per km², whereas Kiambu, Muranga and Nyeri Districts, which have a similar though slightly lower potential (all three have significant areas of Zone 3 as well as Zone 2 land), have densities of 221, 211 and 132 persons per km² respectively. Laikipia District has significant areas of High and Medium potential land, most of the balance being Zone 4: Marginal potential, yet has a density of only 7 persons per km². This can be compared with 16 in Baringo, where conditions are less favourable, and 76 in Meru, which has a lot of high potential land but where roughly half the District is in Zone 5: Low potential.

A similar situation exists in Trans Nzoia, Uasin Gishu and Nakuru, the main areas of large mixed farming, and in nearby Districts outside the large farm area. Apart from most of the Rift Valley section of Nakuru, these three Districts are composed almost entirely of high and medium potential land. In Nakuru much of this land is outside the large farm area, but in Uasin Gishu and Trans Nzoia most is occupied by large farms. Present population densities are 67, 66 and 49 persons per km² in Trans Nzoia, Uasin Gishu and Nakuru Districts.

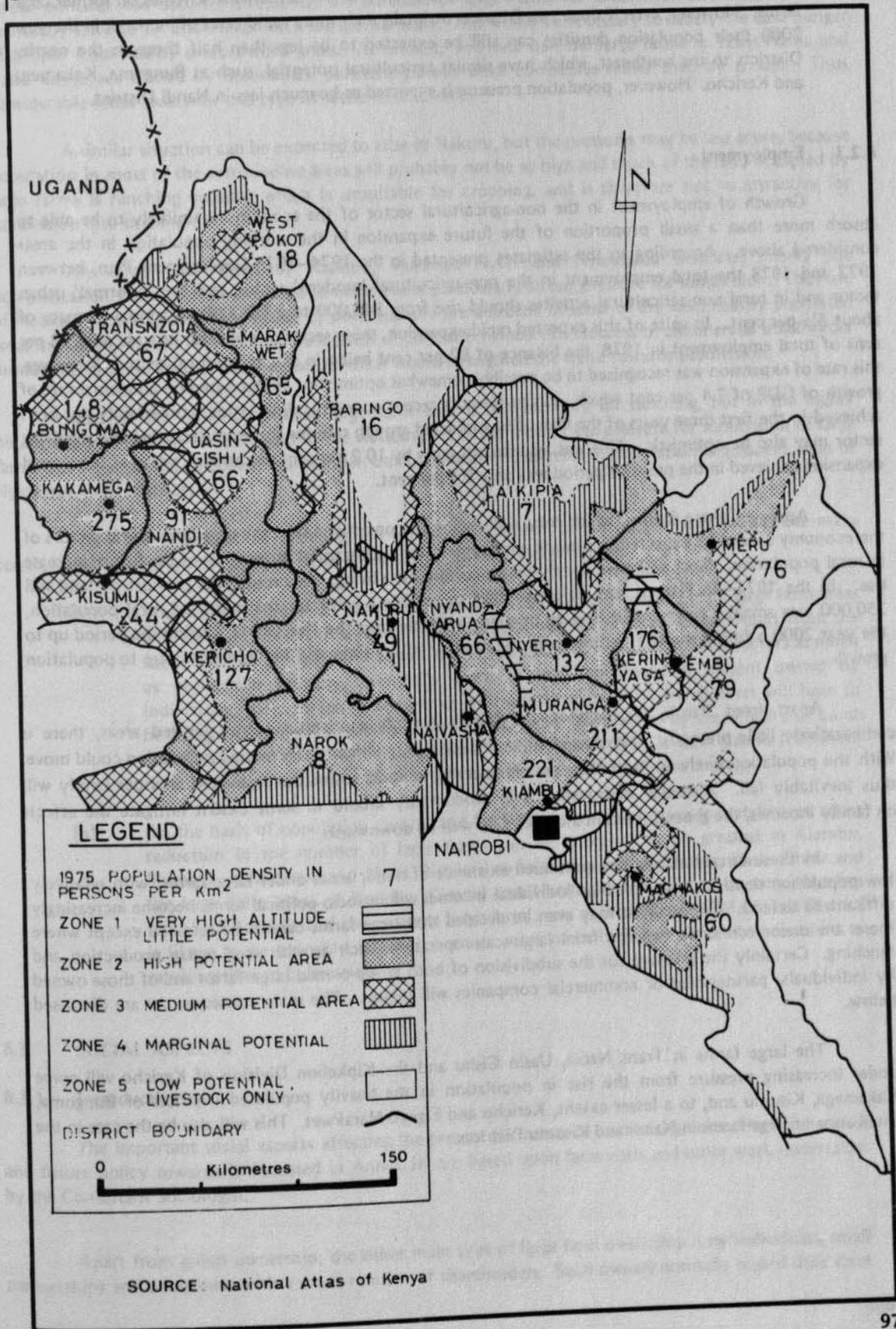
In the neighbouring Districts of Bungoma, Kakamega, Nandi and Kericho, where the land potential is similar, densities are much higher, being 148, 275, 91 and 127 persons per km² respectively. In Elgeyo Marakwet, to the east of Trans Nzoia and Uasin Gishu, the overall density is similar to these two Districts and the land potential is high, but since much of the District is occupied by forest reserves, land pressure in the cultivated areas is high. On the other hand, in West Pokot, which has a substantial proportion of high and medium potential land, the population density is only 18 per km². This suggests that in comparison with many other areas this District could support a substantially larger farming population. Most of the present inhabitants are pastoralists rather than cultivators and thus do not use land intensively.

Outside the former Scheduled Areas the area with the greatest undeveloped land potential is Narok District. This has a very low population density of about 8 persons per km², yet most of its area is High or Medium Potential. There are probably at least 150,000 hectares of good arable land which at present are not cultivated and could be settled.

(b) Present and future land pressure

Land pressure, assessed by population density and ecological potential, is already very high in the non-large farm areas of Central Province (Kiambu, Muranga, Nyeri and Kirinyaga Districts), in Kakamega and Bungoma Districts of Western Province, in Kisumu and, to a lesser extent, in Kericho District. Pressures are also high in Embu and Machakos Districts, but the situation is somewhat less serious in Meru, Nandi and West Pokot.

Figure 8.3 District population density 1975 and ecological potential in and around the main large farm areas



Recent trends suggest that land pressures will rapidly become more acute due to the increasing population. The estimates (Table 8.1) indicate that during the next 25 years population densities will at least double in most Districts. In the recent past, population growth in Trans Nzoia and Uasin Gishu has been particularly rapid, due primarily to the settlement schemes on former large farms. However, even if these two Districts maintain their more rapid rates of increase, in the year 2000 their population densities can still be expected to be less than half those in the nearby Districts to the southeast, which have similar agricultural potential, such as Bungoma, Kakamega and Kericho. However, population pressure is expected to be much less in Nandi District.

8.2.3 Employment

Growth of employment in the non-agricultural sector of the economy is unlikely to be able to absorb more than a small proportion of the future expansion in the working population in the areas considered above. According to the estimates presented in the 1974–1978 Development Plan, between 1972 and 1978 the total employment in the non-agricultural 'modern' sector and the 'informal' urban sector and in rural non-agricultural activities should rise from 846,000 to 1,168,000 an annual increase of about 5½ per cent. In spite of this expected rapid expansion, these sectors would still provide only 18 per cent of total employment in 1978, the balance of 82 per cent being in the agricultural sector. Moreover, this rate of expansion was recognised to be possibly somewhat optimistic. It was based on an annual rate of growth of GDP of 7.4 per cent which, due to Kenya's recent economic difficulties, has certainly not been achieved in the first three years of the Plan. The projected growth rate for the manufacturing and repairing sector may also be optimistic. This was assumed to grow by 10.2 per cent per annum, whereas the annual expansion achieved in the previous period was only 8.1 per cent.

Applying these figures, which may well err on the optimistic side, the non-agricultural sectors of the economy cannot be expected to provide employment for a substantial proportion of the future increase in rural population. Most will have to rely on agriculture for a living. As a result, the pressure on land will rise. In the 1974–78 Plan, it was estimated that to provide a living for the increased rural population, 350,000 new smallholdings would have to be made available over the five years. During the period up to the year 2000 a further massive expansion in the number of holdings will be necessary, due to population growth.

Apart from Narok, West Pokot and Nandi Districts and certain other limited areas, there is comparatively little presently undeveloped cultivable land into which the increasing population could move. With the population likely to more than double over the next 25 years, the cultivated area per family will thus inevitably fall. Although improvements in productivity should to some extent mitigate the effects on family incomes, the general trend in incomes may well be downwards.

In these circumstances the continued existence of major areas under large farms, with relatively low population densities and with high individual incomes will in socio-political terms become increasingly difficult to defend. Eventually it may even be decided that large farms cannot be retained except where there are major economic benefits from large-scale operation, such as with seed maize production and ranching. Certainly the pressure for the subdivision of both group-owned large farms and of those owned by individuals, partnerships or commercial companies will mount. The main consequences are discussed below.

The large farms in Trans Nzoia, Uasin Gishu and the Kipkelion Division of Kericho will come under increasing pressure from the rise in population in the heavily populated Districts of Bungoma, Kakamega, Kisumu and, to a lesser extent, Kericho and Elgeyo Marakwet. This will also be the case in the small zone of large farms in Nandi and Kisumu Districts.

In addition to the subdivision of group-owned farms by the participating owners, considered to be generally acceptable on economic as well as social grounds (Chapter 7) it seems inevitable that, to avoid severe political and security problems, the purchase of large farms for subdivision and settlement will eventually have to be undertaken on a substantial scale. This would be necessary to satisfy the land hunger of people from nearby overcrowded areas. At present, well over half the large farms in Trans Nzoia and Uasin Gishu are owned by individuals, partnerships and small companies rather than by groups. Thus considerable scope exists for this type of settlement scheme.

A similar situation can be expected to arise in Nakuru, but the pressures may be less acute, because population in most of the surrounding areas will probably not be so high and much of the land occupied by large farms is ranching country which is unsuitable for cropping, and is therefore not so attractive for subdivision into smallholdings.

The large farm areas of Kiambu, Muranga, Nyeri and Nyandarua Districts, mainly the non-plantation farms, can be expected to come under particularly strong pressure for subdivision. They are of Medium (Zone 3) and High (Zone 2) potential and are adjacent to some of the most heavily populated areas in Kenya, namely the former Trust lands of Central Province. The success of commercial smallholder production in these areas is another factor which would strengthen the trend towards subdivision.

Most of the Laikipia District large farm area is suitable only for ranching, but in the higher potential zones around Nanyuki and in the western part of the District the pressure for subdivision of large farms can be expected to become substantial, especially with the increase in population in adjacent areas of Nyeri and Meru Districts.

From the viewpoint of planning the future development of the Large Farm Sector, the main conclusions arising from the analysis given above can be summarised as follows:-

- (a) The massive increase in population size and density in and near the main large farm areas will inevitably result in a reduction in the total number of large farms. Apart from the subdivision of group-owned farms, which will occur in response to other factors as much as population pressure, eventually some of the large farms at present owned by individuals, partnerships or companies with a small number of shareholders will have to be bought up for subdivision and settlement, either privately or by the Ministry of Lands and Settlement. The increasing pressure towards a reduction in farm size in the future must be recognised and be taken into account in determining future strategy.
- (b) On the basis of population density and land potential, the pressure for subdivision and a reduction in the number of large farms can be expected to be greatest in Kiambu, Muranga, Nyandarua and Nyeri Districts, to be strong in Trans Nzoia, Uasin Gishu and the large farm areas of Kericho, Kisumu and Nandi Districts, and to be somewhat less serious in Laikipia and the adjacent large farm zone of Meru District. Machakos District is likely to be seriously affected, because most of its large farm area is more suited to ranching than to cultivation.

8.3 SOCIAL ASPECTS

8.3.1 Introduction

The important social aspects affecting the present performance of the large mixed farm sub-sector and future policy towards it discussed in Annex III are based upon farm visits and other work undertaken by the Consultant Sociologist.

Apart from group ownership, the other main type of large farm ownership is by individuals, small partnerships and companies with a small number of shareholders. Such owners normally regard their farm

primarily as an investment from which they can earn income and perhaps also a capital gain. Thus their objectives are primarily commercial. In these circumstances there are not usually major social constraints preventing the holding being operated as a profitable large-scale farm (there will often, of course, be technical, managerial or financial constraints). In the event of serious disputes between the small number of partners or shareholders, the farm can normally be split up into units which are still large enough for large-scale commercial farming. In view of these factors, a detailed appraisal of social aspects for this type of ownership is not considered to be necessary.

Most of the coffee estates and ranches bought by large groups have been purchased with a view to obtaining the financial security that ownership of land brings and to earning income from it. In the majority of cases, there has been little subdivision and comparatively few of the group owners live on the farm. In this situation the social obstacles to efficient large farm operation are not too serious. Although disputes between members do occur, they are less serious than in cases where many of the members live on the land, as in the case of group-owned mixed farms.

In the Large Farm Sector the main social problems are found on the group-owned mixed farm to which attention is now directed.

8.3.2 Background

When the land transfer process began in the early 1960's, the only way to land ownership in the former Scheduled Areas for the majority of people was through group purchase and ownership. The settlement schemes on former large farms were greatly over-subscribed and could not meet the demand for land.

Most groups began with a small nucleus of farmer innovators, businessmen and community leaders, who then canvassed amongst relatives, friends and others for members and their financial contributions. Generally, groups with poorer and less educated leadership formed cooperatives under Government guidance, while businessmen and other more sophisticated people formed companies or partnerships.

Once the formation of groups for farm purchase had begun, it accelerated rapidly. Groups were allowed to buy farms irrespective of their capability to manage and maintain the farm or whether it could support the number of members involved. Inevitably, the situation arose where members of societies and companies with a large number of members had shareholdings which were so small in any one farm that many people joined as many different groups as possible in an effort to maximise total land holdings. In this respect, membership of a group has always been seen by an individual in terms of the right to a piece of land equivalent to the value of his contribution or shareholding. Most groups had a deeply felt need to own their farms outright and concentrated their efforts and resources to this end.

After purchase, some group members moved onto their farm whereas others were absentee shareholders or settled their dependants on the farm while they retained their outside wage employment. With some initial exceptions, the new owners with an agriculturalist background (cultivators as distinct from pastoralists) would probably have preferred to subdivide their farms immediately, but were restrained from doing so for various reasons, including the size of membership compared with the farm area and the fact that large land purchase debts and development and operating loans were tied to group enterprise. Individual members were rarely allocated more than 2-3 hectares, and most often 0.4-1.0 hectare, the balance being used for the group enterprise. With many groups, plot size often coincided with an individual's entitlement should the whole farm be divided amongst all members, the group farmed area being equivalent to the non-resident members' share.

The cattle-owning pastoralists were generally far less formally organised than the agriculturalists, and when they took over their farm they built their houses at random rather than being allocated a specific area. Unless the farm was immediately subdivided, as was possible if purchase was outright and loan repayment need not be considered, each member generally took up a few acres of arable land and, except for minor and intermittent group cropping enterprises, the rest of the farm was used as grazing land.

Only a very few groups, whose members already had an adequate area of land or whose committee was strong enough to stand between the members and a desire for residence, treated the farm not as land to be physically settled but as a potential income-earning asset. In many such cases the land was generally marginal for cropping and the level of education or sophistication of the committee and core membership was of a higher level than the norm.

8.3.3 Group Farm Problems

Most group farms have had substantial managerial and administrative problems for a variety of reasons (Annex III). Although generally possessing a homogeneous background, with few exceptions the members of larger groups had little experience of working together. Each group farm required an elected Committee (Co-operative Societies) or Directors (Companies) for its technical and social management. From the beginning, a central problem has been the shortage of competent leaders to fill these positions. Most have lacked experience or training. Other difficulties have included lack of continuity in policy and management, because of numerous changes in the committee membership, too much interference by group members in the day-to-day running of the group enterprises, inefficient use of hired managers, dishonesty by committee members and often their lack of participation and effort because of outside business interests. Dissent between members has frequently hampered decision-making.

Another factor which has affected the commercial viability of group operations has been the unwillingness of many members to work on the group farm (Annex III). Almost all group farms which are still functioning now employ a majority of non-members. This problem of group work is common to production co-operatives in many countries.

In most instances except where complete subdivision has occurred, the only benefit a member has derived from a large-scale mixed farm is the right to a subsistence plot. Rarely have any cash dividends been realised, and more often the opposite has occurred, members having been required to increase the value of their original subscription in order to meet land purchase debts and operating losses. However, not all group enterprises have failed financially. Judging by experience to date, the essential elements for success appear to be:

- (a) a farming system which is not too complex and not too demanding in its management requirements;
- (b) most members should not be resident on the group farm;
- (c) a relatively skilled or at least honest manager should be employed;
- (d) the level of education or business sophistication of the committee or directors, and preferably also of most members, should be fairly high.

If these conditions cannot be met, then the group must have very strong ties and discipline, such as with radical religious group, or have had a long tradition of cooperation.

Another contributor to the management and operation difficulties of group farms has been the failure of Government agencies to provide the supervision services and technical advice which the group executives and managers so need. With the rapid expansion in the numbers of group farms it would, however, probably have been impossible to meet all the demands for such services.

Apart from co-operatives and companies, some people have formed partnerships. Partnerships of over 20 (which do exist, although they are illegal) are more or less large groups and have been subject to all the problems and stresses of group endeavours. Smaller partnerships, however, have also had their problems and in a majority of cases, unless all except the manager have been virtual sleeping partners, they have divided the farm into a few units still suited to large-scale operations. Except for instances of partner-director misappropriation or the illegal sale of land to others by individual partners, the basic reason

for the dissolution of most partnerships has been an inability to agree on farming methods and management.

As a result of these problems, with time the mood of groups has changed from the early euphoria of ownership, which new groups still display, to one of disillusion. Group farming as a whole has not succeeded. The concept has severe practical drawbacks and people have not been sufficiently trained, prepared or capable of adjusting rapidly to the great technical and social requirements demanded. In reaction, the members have increasingly turned from the group organisation which has failed them to the traditional concept of smallholdings from which they know they can derive a living and are in sole control of their own enterprise. This experience is in fact typical of countries where group farming has been attempted. Even in some Eastern Bloc countries, such as Poland, the move towards co-operative farming has had to be reversed and increased emphasis given to production on individual farms.

8.3.4 Subdivision on Group Farms

Many of those groups who today are free of debt, or at least carry only a small debt load, are those who from the beginning have subdivided and farmed as individuals, or who treated the farm as a piece of land which they grazed and occasionally cultivated in the traditional way. In most group farms subdivision is now the almost unanimous desire of the participants. Many groups, particularly those with larger unit areas per member (this seems more common in the Eldoret-Kitale area than elsewhere), have gone ahead and subdivided.

The critical years for the self-recognition of group failure seems to have been 1973-74, or on average after six to nine years of attempting to group farm. The decision to subdivide almost always assumes either the completion of land purchase debt repayments or alternatively an agreed method of debt repayment, which indicates an encouraging sense of responsibility. In this, individuals are punctilious and willingly and regularly contribute their levied daily amount of milk or annual sacks of maize for the eventual security of their individual plot. There are, however, some groups where subdivision has taken place on a much less responsible basis.

The subdivision is often an acceptably well planned and implemented process. There are two main methods. The first is the formal procedure followed by the owners with an agricultural background, whereby the farm is surveyed and subdivided into equivalent plots, allowing for soil variations, road access and other factors; holdings are then allocated by secret ballot. Once achieved, the result of such subdivision is generally a relatively stable and normal smallholder grouping which could be formally legalised with a minimum of effort or physical adjustment. Second is the more casual method typical of owners from a pastoralist background which rarely involves precise land measurements or third party assistance. Disputes are more common than under the first system. The formal adjudication and registration of group farms which have been subdivided in this way will be far more difficult.

Although the majority of group-owned mixed farms are already subdivided (Section 4.3), there are some groups who, due mostly to outside pressures, are either unwilling to subdivide or incapable of doing so, although subdivision is normally their long term aim. As regards mixed farms, this occurs mainly where there is felt to be a danger that group debts will not be repaid, where membership is so large in relation to the farm area that the subdivided holdings would be too small, where there is a high proportion of non-resident members owning a relatively small farm or where the number of unregistered and unofficial members is substantial. Most of these groups continue trying to reach the point where subdivision is feasible. Some join the Group Farms Rehabilitation Project as a means of eventually repaying their outstanding debts.

Once subdivision has occurred, many of the better large groups have maintained a high degree of co-operation, mainly in the field of providing services and administration. In such cases, the elected committee or directors assume functions such as arranging bulk marketing of members' produce, or allocation and payment of loan repayments and taxes, maintaining a register of individual holdings, coordinating group activities such as school construction and attempting to secure loans on the basis of the original group holding, to be issued to the individual smallholders (at present subdivided farms are not officially eligible for credit).

In general, subdivision has worked reasonably well, although officially the resultant smallholdings received no credit or other assistance from Government. In the majority of cases better individual incomes have been assured than under large-scale group enterprises, there is far less dissension due to management disagreements, inadequacies or theft, and most farmers are much happier running their own holdings.

An evolutionary phase in the Africanisation of former European-owned mixed farms is now taking place in which successful enterprise methods were first copied by both groups and individuals and have now been discarded by groups in favour of more practical arrangements better suited to the people involved. Already subdivided groups have ceased to regard themselves as businesses and are beginning to demand to be recognised and served as communities of smallholders in the fullest sense.

8.3.5 Conclusions

The main conclusions to emerge are as follows:-

- (a) Group farming is alien to the traditions and aspirations of most group farm members. Their primary concern is to own and operate their individual holdings.
- (b) Despite the general dislike of group farming, many farmers have shown themselves capable of cooperating effectively in the provision of services and the undertaking of administrative duties on behalf of the group.

8.4 CROP AND LIVESTOCK PRICING POLICIES

The market prospects and prices for crop and livestock products are analysed in detail in Annex IV. In this section pricing policies as they effect the large farm sector are discussed.

The present pricing policies for crop and livestock products are favourable to the Large Farm Sector. Prices are either at border parity, as in the case of beef sheep and pyrethrum, or are maintained at an artificiaally high level above border parity, as in the case of wheat and maize.

The maize subsidy benefits both small and large farmers (the official maize price of KSh. 80 per 90 kg bag is some KSh. 12, or 18 per cent, above border parity, and is considered to be the 'real' or undistorted price). In overall terms, in fact, most of the benefit goes to the former, since the Large Farm Sector produces less than one fifth of the total marketed output of maize.

The subsidy element in the official wheat price (i.e. the difference between import parity prices and official producer prices) is equivalent to 5-10 per cent of the official price. This benefit goes largely to the Large Farm Sector, because this produces over four fifths of national wheat output.

Liquid milk prices do not have a true border parity equivalent, because there is no major world trade in liquid milk. By international standards, the present producer price of KSh. 1.30 per litre is not excessive, especially in view of the recent stagnation in milk output and the need to raise production.

As regards policy for the future as it affects the mixed farm sub-sector, the present system of basing most producer prices on border parity is sound and should be continued. In view of the continuing rise in milk consumption and the production problems in the Large Farm Sector the maintenance of an attractive producer price for milk is essential, at least for the immediate future.

The maintenance of a maize producer price as much as 18 per cent above border parity appears to be unnecessary. Moreover, it distorts the maize: wheat price ratio, which is an important factor determining the relative production of the two crops in the Sector. An analysis made by J.K. Maitha has indicated that a wheat: maize price ratio of 1.6:1 is needed to induce producers at the margin to substitute wheat for maize. At present producer prices, the ratio is 1.5:1. If both commodities were priced at border parity or had official prices containing the same percentage of effective subsidy, the present price ratio would be 1.6–1.7:1. Thus the existing pricing policy favours maize at the expense of wheat, even though Government is keen to reach self-sufficiency in wheat. From the view-point of the Large Farm Sector alone, there are thus arguments for some reduction in the official price of maize. Before any such change, however, it would be necessary to assess the effects on the rest of the agricultural sector, since this produces the bulk of the nation's maize production and marketed output. Such an analysis is outside the scope of this study.

8.5 ESSENTIAL COMMODITIES BEST SUITED TO LARGE SCALE PRODUCTION

8.5.1 Introduction

There are some essential commodities which are best produced on a large scale. These include hybrid maize seed, wheat and breeding herds of livestock. Hybrid maize seed is more satisfactorily grown on a large scale because of the need to ensure proper control and supervision over its production. Supervision is carried out by the Kenya Inspection Service who ensure that the crop is grown in the correct place in a rotation, that isolation from other maize crops is maintained and that de-tasselling of female rows is timely and effective. It would be virtually impossible to operate an inspection service over a vast number of small producers.

Wheat has always been regarded as a large-scale crop in Kenya. There is no tradition of smallholder cultivation. Until techniques for its cultivation on the small scale can be introduced or developed some large-scale production units will have to be maintained. The responsibility for livestock breeding is better concentrated in a few large units than dispersed over a large number of small herds where adequate control would be difficult.

8.5.2 The Demand for Hybrid Maize Seed

The Kenya Seed Company (KSC) with headquarters in Kitale, has the sole responsibility for the commercial multiplication of seed maize. The company has around 90 growers who between them plant over 5,000 hectares of seed maize (hybrid and Katumani) within a 60 km radius of Kitale. Approximately 11,000 tons of seed maize were produced in 1975 and about 4,850 hectares planted. The Agricultural Development Corporation (ADC) is by far the most important grower; in 1975 it planted about 1,000 hectares with a total production of 5,400 tons, around 50 per cent of the total. In 1976 the area under

seed maize rose to 5,260 hectares and the Kenya Seed Company target for 1977 is 7,000 hectares. Until recently Kenya has exported significant quantities of maize seed to neighbouring countries Ethiopia, Tanzania and Uganda. The present foreign currency shortages and political problems have now curtailed these.

The future demand for hybrid and improved seed will depend on the total area of maize grown and on the rate of uptake of improved varieties. The area of maize in the country is estimated to be approximately 1.2 million hectares of which about 75,000 hectares are grown in the large-scale areas.

The area using improved varieties increased from 16,000 hectares in 1964 to around 300,000 hectares (273,000 hectares were planted with hybrids) in 1972 an increase of approximately 35,000 hectares per annum. Since 1972 the area under hybrid or improved maize is estimated to have grown to around 476,500 hectares in 1976 (KSC Estimate). Assuming a rate of uptake in the use of hybrid and improved varieties of 10 per cent per annum, the total area under new varieties would be approximately 700,000 hectares by 1980. It is unlikely, however, that this fairly optimistic rate will be achieved in the time. Uptake will inevitably slow down because the remaining areas will contain a greater proportion of inaccessible and less receptive farmers. For the purpose of estimating the total area of large-scale farms to provide sufficient suitable land to maintain hybrid maize seed supplies, it is assumed that the ultimate area which will have to be supplied with seed will be 800,000 hectares. Using the KSC estimate of one hectare of seed maize to supply 120 hectares of commercial, then 6,700 hectares of seed maize would be required. If increased to 7,500 hectares this would allow flexibility to accommodate annual variation in yield and a surplus for export. As the maize area should not occupy any more than 10 per cent of a farm after allowing for non-arable land, rotation and isolation requirements, the large-scale area required in total would be approximately 75,000 hectares. These farms could also be involved in grass and minor crop seed production.

8.5.3 Wheat Production

Given that the present rate of increase in wheat consumption of 5 per cent per annum is expected to continue, it is unlikely that Kenya will again produce her own requirement. Indeed the country will probably face a growing deficit despite the fact that the present level of production from the main large-scale wheat areas (these currently amount to some 260,000 hectares) can probably be maintained (even from a reduced acreage) and that new wheat areas extending to 20,000 hectares will probably be developed in Narok. This latter area could provide a potential increase in production of 30,000–35,000 tonnes over the present level. Although the deficit is expected to increase by 1985, Kenya will still be producing the major proportion of her requirement and is unlikely to become heavily dependant upon outside supplies. Self-sufficiency is probably an unattainable objective and is not regarded as being of enough importance to warrant the diversion of resources from production of other commodities to wheat.

8.5.4 Livestock Breeding Herds

It is not envisaged that any recommended land use policy would result in the large-scale areas being reduced to the extent that maintenance of livestock stud or breeding herds would be in jeopardy. Those areas, such as the ranching lands and large parts of Nakuru and Uasin Gishu districts, (which are also well suited to wheat production), should remain as large-scale areas and would adequately meet this need.

It is worth noting that some of the most important studs and breeding herds are in ADC control; these include:

- three pedigree dairy herds and a Hereford stud in Trans Nzoia;
- three sheep studs in Molo division; and
- two Boran studs, one in Laikipia and one in Machakos districts.

Beyond the fact that ADC should continue the role of taking over and running livestock breeding herds, no more specific recommendations are considered necessary.

8.6. POLICY IMPLICATIONS

In certain areas agro-ecological conditions will constrain the use of land. This applies to two main areas namely, the drier ranching lands and the prime wheat areas. The location of these is shown in Figure 8.4.

8.6.1 The Ranching Areas

These areas are marginal for arable cropping but have considerable potential as ranching land. Attempted arable cropping usually accompanies subdivision of these areas and frequently results in crop failure and destroyed grazing potential. These areas should remain under extensive ranching systems and subdivision should not be permitted. This may well mean prohibiting large groups from purchasing these farms. Overall they amount to some 650,000 hectares located in Naivasha, Laikipia and Machakos areas.

8.6.2 The Wheat Areas

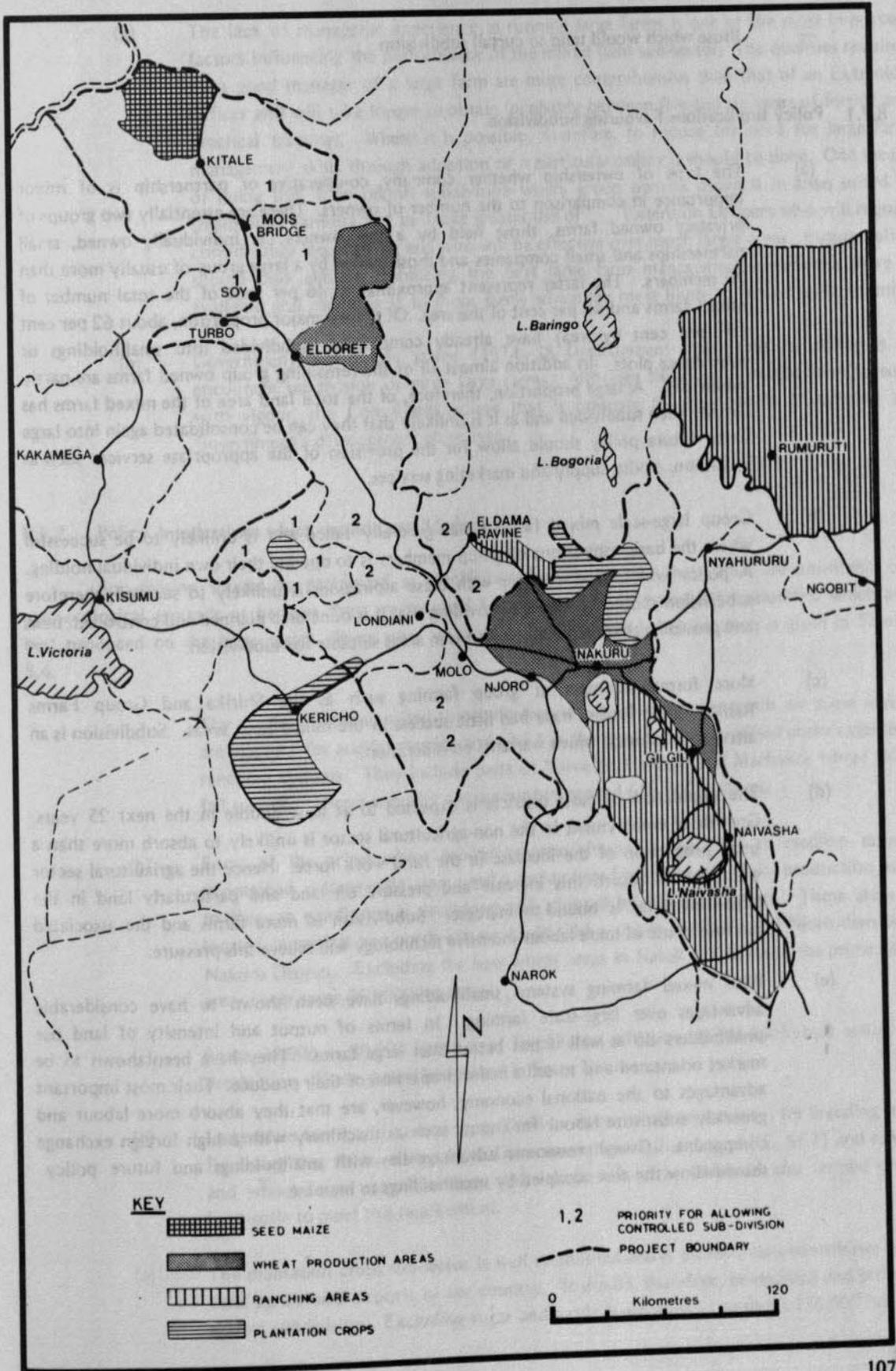
Parts of the wheat/dairy farm system areas, are exceptionally well suited to wheat production. Subdivision of farms in these areas, however, is usually accompanied by a change in land use with the emphasis being put on maize. The present study has shown that maize yields even on the better farms in these areas are lower than the yields on badly managed farms in the maize/dairy farm system areas. Also the gross margin from maize even under better management is significantly less than that for wheat. Given the unsuitability of these areas for maize and the need to maintain a significant proportion of the nation's wheat supplies, future policy should attempt to ensure that until a technology for growing wheat under small scale farm systems is developed, they are retained for their present use and that the risk of subdivision and change in land use is avoided. These areas are located in Nakuru District and in central and north eastern Uasin Gishu.

8.7 CONCLUSIONS AND POLICY IMPLICATIONS

In the preceding chapters the composition and performance of the Large Farm Sector have been reviewed and analysed. Likewise a number of factors which will affect the formulation of a future strategy for the development of the Sector have been discussed. Amongst the latter the question of smallholdings versus large farms has been given particular emphasis. The main conclusions from the review and their implications on future development policy for the mixed farm sub sector are drawn together in this section.

Figure 8.4

Areas where sub-division should be discouraged



They fall into two broad groups namely:

- those which favour a policy of allowing subdivision
- those which would tend to curtail subdivision

8.7.1 Policy Implications Favouring Subdivision

- (a) The type of ownership whether company, co-operative or partnership is of minor importance in comparison to the number of owners. There are essentially two groups of privately owned farms, those held by a few owners i.e. individually owned, small partnerships and small companies and those owned by a large group of usually more than 20 members. The latter represent approximately 46 per cent of the total number of mixed farms and 48 per cent of the area. Of these a major proportion, about 62 per cent (56 per cent by area) have already completely subdivided into smallholdings or subsistence plots. In addition almost all of the remaining group owned farms are partly subdivided. A large proportion, therefore, of the total land area of the mixed farms has already been subdivided and as it is unlikely that they can be consolidated again into large units, future policy should allow for the provision of the appropriate services such as extension, credit, supply and marketing services.
- (b) Group large-scale mixed farming has generally failed and is unlikely to be successful where the basic aspirations of group members is to operate their own individual holding. A policy which is in conflict with these aspirations is unlikely to succeed; therefore subdivision should be allowed providing that it is done on a planned and controlled basis and providing that the land involved is in areas suitable for subdivision.
- (c) More formal attempts at group farming such as the Shirika and Group Farms Rehabilitation Project have had little success in the mixed farm areas. Subdivision is an alternative solution which warrants consideration.
- (d) The population of most districts is expected to at least double in the next 25 years. Growth of employment in the non-agricultural sector is unlikely to absorb more than a small proportion of the increase in the rural work force. Hence the agricultural sector will have to absorb this increase and pressure on land and particularly land in the large-scale areas is bound to increase. Subdivision of more farms and the associated increase in use of more labour intensive technology will relieve this pressure.
- (e) With mixed farming systems, smallholdings have been shown to have considerable advantages over large-scale farming. In terms of output and intensity of land use smallholders do as well if not better than large farms. They have been shown to be market orientated and to sell a major proportion of their produce. Their most important advantages to the national economy, however, are that they absorb more labour and generally substitute labour for inputs such as machinery with a high foreign exchange component. Overall economic advantage lies with smallholdings and future policy should allow the area occupied by smallholdings to increase.

- (f) It has also been shown that a reduction in size of some large farms would not be disadvantageous. Where this is the wish of the members/shareholders in small partnerships and companies with few owners it should not be discouraged.
- (g) The lack of managerial experience in running large farms is one of the most important factors influencing the performance of the mixed farm sub-sector. The qualities required by a good manager of a large farm are more comprehensive than that of an Extension Officer and will take longer to obtain (probably between five and six years of formal and practical training). Where it is possible, therefore, to reduce the need for large farm management skills through adoption of a particular policy it should be done. One means of doing this, is to permit subdivision where group owners desire it in areas suited to smallholder farming and to make greater use of Extension Officers who will require considerably less training and who will be effective over much larger areas. Future policy should also aim at mobilizing the best large farm management experience there is available and directing it to those farms which are most likely to remain as large units.
- (h) Government has clearly stated (1974-78 Development Plan) that its policy is to encourage subdivision of more large farms. Although this policy has not been pursued with vigour, the Consultants believe that it presents the best means of meeting the Government's development objectives.

8.7.2 Policy Implications which would Curtail Sub-division

Sub-division should be prohibited in specific areas either because these areas are unsuitable on agro-ecological grounds or because they are required to produce certain essential commodities which are best produced on the large scale. These areas are summarized below and their location is given in Figure 8.4.

- (a) The ranching areas unsuited to sub-division on agro-ecological grounds are those which are marginal for arable cropping and which in the past have been utilised under extensive ranching systems. They include parts of Naivasha, Laikipia and Machakos where rainfall is under 750mm annually and amount to around 650,000 hectares.
- (b) Some of the prime wheat producing areas should in the short to medium term be maintained as large-scale areas until a technology for small-scale wheat production suited to Kenyan conditions is developed and adopted by Kenyan farmers. These areas are located in central and north eastern Uasin Gishu and in the Molo and Njoro division of Nakuru District. Excluding the new wheat areas in Narok the farms in the prime wheat areas cover some 260,000 hectares.
- (c) Some 75,000 - 80,000 hectares of large farms will be required for hybrid maize seed production. These should be located in Trans Nzoia.
- (d) Large-scale farms will have to be retained to meet the nations need for breeding stock. Providing that farms currently in Government ownership (e.g. ADC, SFT) and ranches and wheat farms remain as large units there will be an adequate area farmed on the large-scale to meet this requirement.
- (e) The plantation crops sub-sector is well established and is an important contributor to the total agricultural exports of the country. It should, therefore, be retained and protected against subdivision. Excluding sugar and cattle it amounts to about 136,000 hectares.

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A Development Strategy for the Large Farm Sector

9.1 INTRODUCTION

The primary objective of this study is to prepare a comprehensive strategy for the future development of the large-scale mixed farms and to give broad strategy guidelines for the other sub-sectors, ranching and plantations. The strategy is defined in this chapter and specific proposals for its implementation given in Chapter 10. The strategy proposed has been determined largely by the conclusions drawn together in Section 8.7 and places importance on the need to accommodate as far as is possible within the national interest, the aspirations of existing owners, (both individual and groups). The national factors regarded as having primary importance include:-

- the need to absorb a rapidly increasing population in the agricultural sector.
- the need to ensure that the nation's land resources are conserved and put to the use for which they are best suited.
- the need to make more effective use of physical resources.
- the need to ensure that the nation's requirement for some essential products can be maintained.

9.2 A STRATEGY FOR THE MIXED FARM SUB-SECTOR

9.2.1 Categories of Mixed Farms

For the purpose of defining a strategy it is necessary to establish the most important categories of farms. Three categories based on the number of owners in relation to the land area available on each farm, have been identified. Each category requires different types of services and assistance. The three categories are:-

- Category 1 farms: Where farms are in individual ownership or are owned by a small number of partners, less than the legal maximum of seven. These farms are still run as a single unit or in units of a size where the techniques of large scale farming are still appropriate.

- Category 2 farms: Where farms are group owned, but where the number of owners in relation to the overall size of the farm would permit each owner in the event of subdivision to have a holding of sufficient size to undertake planned commercial mixed farming.
- Category 3 farms: Where farms are also group owned, but where the number of members is greater than the area could support as individual commercial farmers or sometimes even as subsistence farmers.

9.2.2 Farm Size in Each Category

In this section, guidelines to the size of farm in each category are established. These are no more than guidelines, however, and are used in the present study to estimate the approximate number of farms and the area of land they occupy in each of the three categories. Eventually each farm will have to be assessed individually as yield levels vary from area to area and each farm will comprise different proportions of rough grazing, unusable and cultivable land.

The most crucial parameter to be determined is the minimum area for Category 2 farms. The upper limit for Category 2 (and hence the lower limit for Category 1) is more flexible and has been set at an arbitrary 30 hectares for the three major large mixed farm districts, Nakuru, Uasin Gishu and Trans Nzoia. Farms below the minimum size established for Category 2 would fall into Category 3. In determining the minimum size for farms in Category 2 four factors have been considered. Firstly, the minimum size should generate a farm operating surplus (i.e. net income in cash and kind) which will provide for a reasonable level of consumption. Secondly, it should be large enough to allow a balanced rotation of fodder and arable crops to be practised. Thirdly, it will vary with the farming system practised and lastly, it will be influenced by the land utilisation potential.

(a) Minimum farm income

The farm income should be sufficient to provide a reasonable level of consumption, including both home-consumed farm products (e.g. maize) and goods purchased from outside with cash earned from the sale of farm produce.

The levels of consumption in Rift Valley Province, where the major proportion of the mixed farms are located, and for the country as a whole (Table 9.1), are of the same order, around KSh. 3,500 per family per annum. It has been assumed, therefore, that the minimum individual holding size for Category 2 farms (i.e. the minimum size of the units into which a Category 2 large farm might be subdivided) should be sufficient to produce a net income of at least this level. Since up to 60 per cent of total consumption is purchased, it can be expected that a major part of farm output would have to be marketed, in order to meet the overall consumption requirements of the smallholder farmer and his family and the purchase of agricultural inputs.

(b) Land potential

The Large Farm Agricultural Census provides information on the proportion of unusable land in each of the Districts. Unfortunately, it does not differentiate between cultivable and non-cultivable land within the overall usable area. This is an important omission, because the difference in potential output from cultivable and non-cultivable land is great. In order to provide a breakdown into the main classes of land potential, the Consultants' farm survey data from farms scattered throughout the four Districts Nakuru, Uasin Gishu, Trans Nzoia and Kericho, has been used to provide an indication of the proportion of cultivable land, rough grazing and unusable land in each District. These estimates of land potential are given in Table 9.2.

Given the approximate nature of the data on land utilisation and the fact that the information will ultimately be used in preparing an estimate of the number of farms in each of the three categories, the differences in land potential on large farms in the Nakuru, Trans Nzoia and Uasin Gishu Districts are not considered to be important. In the assessment of farm size for the purposes of categorisation of large farms, the same breakdown of land potential has been assumed for all three Districts, as follows:-

Land Potential	Per cent of farm area
Cultivable land	65
Rough grazing	20
Unusable land	15
	100

(c) The influence of the farming system

Clearly the capacity of farms to generate income is heavily dependent on the farming system practised. The cropping patterns and enterprises used in the analysis of farm incomes and sizes are summarised below. Although based on the existing farming systems found on mixed farms of the Large Farm Sector (Chapter 4), more intensive land use and higher levels of inputs have been assumed.

In the Kipkelion Division of Kericho District the land potential was found to be substantially below the other three areas. For planning purposes the land potential percentages given in Table 9.2 have been applied.

- Nakuru, Uasin Gishu and Trans Nzoia

System 1: Wheat/dairy : 40 per cent wheat/maize, 25 per cent fodder crops and 20 per cent rough grazing. The livestock enterprise would be dairying.

System 2: Maize/dairy: 40 per cent maize, 25 per cent fodder crops and 20 per cent rough grazing.

System 3: High altitude: 20 per cent pyrethrum, 10 per cent maize, 15 per cent wheat and 20 per cent oats for grazing. The livestock enterprise would be sheep or dairying. Although not advisable to grow maize, it is likely that farmers will insist on growing a small area for subsistence.

- Kericho District (Kipkelion Division)

System 1: Wheat/dairy : 25 per cent wheat/maize, 10 per cent fodder and 50 per cent rough grazing. The livestock enterprise would be dairying.

System 2: Maize/dairy: 25 per cent maize, 10 per cent fodder, 50 per cent rough grazing and dairying.

System 3: 15 per cent pyrethrum, 10 per cent maize, 10 per cent grazing oats, 50 per cent rough grazing and a sheep or dairy enterprise.

Table 9.1 Levels of Consumption Recorded on Agricultural Smallholdings in 1976

	Consumption (KShs. per family holding)		Total
	Home grown	Purchased	
Rift Valley Province	1686	1740	3426
Central Province	1530	2943	4473
All farms	1297	2153	3450

Source: Central Bureau of Statistics

Table 9.2 Utilisation Potential of Farm Land in Four Districts

District	Land use %		
	Cultivable	Rough grazing	Unusable
Nakuru	70	18	12
Trans Nzoia	63	20	17
Uasin Gishu	60	23	18
Kericho (Kipkelion Division)	35	30	15

Source: Consultants' Farm Survey

Table 9.3 Minimum Size for Category 2 farms

KSh. gross ha.	Nakuru	Uasin Gishu	Trans Nzoia	Kericho		
	Farming Systems			Farming Systems		
	1	2	3	1	2	3
Weighted gross margin	650	830	865	530	640	680
Overhead costs	100	100	100	100	100	100
Net income	550	730	765	430	540	580
Minimum size of holding (ha)	6	5	5	8	7	6

(d) Budgets and guidelines for the Minimum Size of Category 2 Farms

Using the cropping patterns outlined above, weighted per hectare budgets have been prepared and compared with the target income of KSh. 3,500 per annum, to indicate the minimum size for Category 2 farms under different farming systems. The enterprise budgets, which are given in detail in Appendix A are based on projected long-term market prices of inputs and outputs at 1976 constant values (Chapter 8).

Table 9.3 shows the weighted gross margins (the gross margin is the gross output minus the variable costs of production) net farm income per hectare and the resultant minimum farm sizes for the three most important systems. The minimum size for System 5 farms is assumed to be similar to that for System 2 and 3.

The minimum size of holding for farms in Category 2 in the Nakuru, Uasin Gishu and Trans Nzoia Districts would be more or less the same, 5-6 hectares, for all the major mixed farming systems. In Kericho the size would be somewhat larger, from 6-8 hectares, because of the less favourable physical conditions and the consequently lower farm income per gross hectare.

9.2.3 The Number of Farms and Area of Land in Each Category

From the Consultants' census of 1392 farms, 1240 (70 per cent of the mixed farm total) were rated according to the criteria indicated in Section 9.2. The results are analysed in Table 9.4.

An analysis of the data carried out by farming systems (Table 9.5) indicates that large groups have a tendency to purchase farms in either the maize/dairy or high altitude systems; for instance 48 per cent of the maize/dairy and 54 per cent of the high altitude systems were in group ownership whilst only 35 per cent of the wheat/dairy and 27 per cent of the mixed plantations were owned by large groups. Furthermore the individual entitlement in Category 2 and 3 farms in the wheat/dairy system is significantly higher than in the other systems.

9.2.4 Strategy for Category 1 Farms

Category 1 at present provides a stable core of farms where there are no immediate pressures to subdivide into smallholdings or subsistence plots. The present owners are few in number (average 2.5 per farm) and if they did wish to subdivide, the individual entitlement would be on average about 195 hectares which is still a large-scale unit. Besides privately owned land it also includes land in public ownership such as ADC and SFT farms (not Shirika). An analysis of the Category 1 farms with regard to farming systems and performance as assessed by the local Extension Officer is given in Table 9.6. Subdivision has occurred on about 15 per cent of the farms, the subdivided units are still large-scale and the extent to which it has occurred is not important.

The analysis indicates that a major proportion of the number of farms, 59 per cent, and a significant proportion of the land area, 42 per cent, in Category 1 are currently under average to poor management. Although affected to a lesser extent than the other categories, Category 1 farms will also require considerable assistance if the potential of their physical resources is to be effectively exploited.

Table 9.4 Categorization of Large-Scale Mixed Farms by District

District	Category 1			Category 2			Category 3		
	No. of Farms	Area (ha)	Average No. Owners	No. of Farms	Area (ha)	Average No. Owners	No. of Farms	Area (ha)	Average No. Owners
Nakuru	169	85,223	1.5	64	44,710	49.1	69	39,497	394
Uasin Gishu	236	115,030	4.2	175	102,023	50.6	46	36,372	222
Trans Nzoia	237	120,252	1.7	70	35,613	40.8	51	22,973	199
Kericho	54	20,098	1.9	45	27,485	52.5	24	11,288	180
Total	696	340,603	2.5	354	209,831	48.6	190	110,130	273
Per cent All Mixed Farms ¹	56	52	—	29	31	—	15	17	—
	1008	468,000		522	279,000		270	153,000	

Note: ¹ The proportions from the 1,240 farms covered in the census applied to the total mixed farms.

Furthermore, although 41 per cent of the farms or 58 per cent of the area are classified as 'good' there remains room for improvement in their performance. The assistance needed by these farms will include physical planning, preparation of cropping and operational plans, budget preparation, development credit, short-term loans and managerial assistance. In effect these farms require a similar package of services to those incorporated in the present Group Farms Rehabilitation Project. The strategy proposed, therefore, is that the present Group Farms Rehabilitation Project be modified to include Category 1 farms, which would receive credit and managerial services provided through the AFC Large Farm Management Section. The service would in fact become more advisory in function and have less involvement in direct management. In the majority of cases advice would be channelled through owner/managers rather than through employed managers. This would have the following advantages:-

- Category 1 farmers are likely to be more receptive to this type of programme than Category 2 and 3 farmers, because it provides them with services for which many of them recognize the need and also it is their general wish to farm on a large scale.
- Working through a majority of owner/managers will reduce the need for supervision. Hence Visiting Managers can cover a greater number of farms. Their role will become largely planning and monitoring thus reducing the present burden of day-to-day supervision.
- Visiting Managers will become less involved in social problems and will be able to concentrate on applying their managerial expertise.

Table 9.5 Categorization of Large Scale Mixed Farms by Farming System¹

Farming System	Category 1			Category 2			Category 3				
	No. of Farms	Area (ha)	Average No. of owners per farm	No. of Farms	Area (ha)	Average No of owners per farm	Individual Share (ha)	No. of Farms	Area (ha)	Average No. of owners per farm	Individual Share (ha)
Wheat/dairy	235	102,061	3.4	89	68,195	46	16.5	37	21,470	196	3.0
Maize/dairy	357	155,716	2.2	210	107,818	46	11.1	115	65,372	294	1.9
High Altitude	67	37,117	1.4	45	25,924	53	10.7	34	21,191	282	2.2
Mixed/Plantation	37	45,709	1.3	10	7,894	99	8.0	4	2,097	353	2.3
	696	340,603	2.5	354	209,831	49	12.2	190	110,130	273	2.1

Note: ¹ Analysis for 1,240 farms in which information was obtained through the Consultants' census.

Table 9.6 Category 1 Farms: Management Assessment by Farming System

Farming System	Management Assessment			
	Good		Average & Poor ¹	
	No. of Farms	Area (ha)	No. of Farms	Area (ha)
Wheat/dairy	85	44,077	152	59,911
Maize/dairy	158	106,294	198	47,622
High Altitude	18	13,912	49	23,205
Mixed/Plantation	22	34,295	14	11,287
	283	198,578	413	142,025
Per cent of category 1	41	58	59	42
Per cent of all mixed farms	23	30	33	22

Note: ¹ The average and poor farms have been lumped together as the data from the detailed farm survey indicating yield etc. has been treated in this way.

It is envisaged that the service could eventually operate on similar lines to a farm management consultancy which could, once its advantages and success had been demonstrated, operate on a commercial basis. The services in fact could be paid for either on a fee basis or through a slightly increased rate on credit disbursed as part of the improvement plan.

Lastly, it is recommended that where Category 1 farms wish to subdivide into a few smaller yet still large-scale units, this should not be discouraged. If this was carried through to the maximum extent, which is unlikely, the number of Category 1 holdings would be increased by two and a half times and reduced to an average size of about 195 hectares (Table 9.4).

9.2.5 Strategy for Category 2 Farms

Category 2 farms are those which if subdivided would give each individual shareholder a land entitlement sufficient to produce a net income of KShs 3500(including subsistence)from a balanced system of mixed arable, grass ley or fodder crop farming and which would produce a marketable surplus. The category includes whole, partly subdivided and completely subdivided farms (Table 9.7).

Table 9.7 shows that both the major proportion of farms, 65 per cent, and the area of land, 58 per cent in this category are already completely subdivided into smallholdings. The remaining 35 and 42 per cent of farms and area respectively are either whole or partly subdivided. If the subdivided portions of these are included with the completely subdivided farms approximately 70 per cent of their total land area can be taken as subdivided. The table also shows that owners are aware of the suitability of their farm for subdivision. For instance, over 80 per cent of the System 2 Maize/dairy farms were subdivided completely whilst only 45 per cent of the wheat farms, 31 per cent of the high altitude and 25 per cent of the mixed/plantation systems were completely subdivided.

An analysis of the assessment of management of the Category 2 Farms is given in Table 9.8. The data is misleading in that Extension Officers generally assumed that subdivision implied average or poor management. Although frequently the case, it may not necessarily always be so.

Only 11 per cent of the farms or 16 per cent of the total area were regarded as being reasonably well managed. Although an analysis of management by extent of subdivision has not been carried out, it is clear that those farms regarded as having good management do not include any that are completely subdivided.

The strategy proposed for Category 2 farms is to permit those farms which are (a) still whole or partly subdivided and (b) located in areas which are suitable for subdivision (Section 9.3), to subdivide completely but within well defined limits. The reasons for this proposal are that first, the major proportion of farms and land are already completely subdivided and in need of services and second, that it is the wish of the majority of the owner/members of these farms to do so. Last, it has been demonstrated that there would be economic advantages in allowing this (Chapter 7).

The subdivision would be planned, the holdings would remain part of a group and services would be provided by a group structure called a Smallholder Land Use Society (SLUS). Farms above the minimum size which are already subdivided, would also be eligible for the programme and would have the option of joining. Membership and hence access to services under the programme might, however, be dependant upon reorganisation of individual holdings within the original large farm unit. Advice and guidance would be provided for this.

The ultimate objective for Category 2 is to establish and maintain a number of groups or communities of smallholdings, in which no holding is smaller than the established minimum for that area and on which a farming system based on proper and intensive land use is practised with the support of a specialised extension service. A group approach to the provision of services is proposed (Annex V and Chapter 10). It is necessary, therefore, that organisation of the group is such that the smallholder can identify with it and understand its structure and purpose. There are two types of organisation which would serve this purpose, the co-operative and the company. As it is the policy of the Kenya Government to give co-operative institutions in the agricultural sector full backing, the view taken by the Consultants is that the registered co-operative would be the most appropriate group organisation to encourage.

Most Category 2 farms, particularly partnerships and companies, include unregistered owners in addition to those who are officially registered. The programme of planned subdivision (or re-organisation of existing subdivision) and provision of services would therefore be accompanied by the authentication of unregistered owners' claims through an adjudication procedure and the establishment of a complete register of authentic shareholders. The ultimate objective would be to issue freehold title to each registered shareholder, but this could only be done with the consent of the major creditor AFC or after all debts were cleared. The registration and issue of freehold certificates need not be immediate, the most urgent task will be the authentication of claims, the organisation of subdivision and the provision of appropriate agricultural services.

Applying the proportion of Category 2 farms and the area they occupy to the whole mixed sector indicates that approximately 520 farms occupying 279,000 hectares make up the category. If the subdivision proportions were in turn applied to these, then about 340 farms occupying 162,000 hectares would be completely subdivided. The average number of members per farm would be 49 and average holding size 12.2 hectares.

Table 9.7 Category 2 Farms: Extent of Subdivision by Farming System in Four Districts

Farming System	Class of Subdivision ¹							
	A		B		C		D	
	No. of Farms	Area (ha)	No. of Farms	Area (ha)	No. of Farms	Area (ha)	No. of Farms	Area (ha)
Wheat/dairy	9	5,465	19	21,843	20	15,375	40	24,907
Maize/dairy	6	1,455	15	7,920	17	10,802	173	88,289
High Altitude	9	4,013	16	8,191	6	7,801	14	4,919
Mixed Plantation	—	—	3	2,537	3	2,914	2	1,758
Total	24	10,933	53	40,491	46	36,892	229	119,873
Per cent	7	5	15	19	13	18	65	58

Note: ¹ A: undivided, B: less than half subdivided, C: more than half subdivided, D: completely subdivided.

Table 9.8 Category 2 Farms: Assessment of Management

Farming System	Management Assessment			
	Good		Average and Poor	
	No. of Farms	Area (ha)	No. of Farms	Area (ha)
Wheat/dairy	17	18,831	71	48,759
Maize/dairy	10	7,731	199	98,808
High Altitude	9	5,952	36	19,992
Mixed Plantation	1	614	7	6,595
Total	37	33,128	313	174,154
Per cent of Category 2	11	16	89	84

9.2.6 Strategy for Category 3 Farms

Category 3 comprises farms on which the numbers of shareholders are greater than the land could support as individual commercial smallholdings or sometimes even as subsistence holdings; they present the most serious problems. They comprise whole, partly subdivided and completely subdivided farms (Table 9.9).

Table 9.9 Category 3 Farms: Extent of Subdivision by Farming System

Farming System	Class of Subdivision ¹							
	A		B		C		D	
	No. of Farms	Area (ha)	No. of Farms	Area (ha)	No. of Farms	Area (ha)	No. of Farms	Area (ha)
Wheat/dairy	1	559	11	11,538	10	2,932	16	6,508
Maize/dairy	3	1,759	13	8,271	16	7,168	80	47,533
High Altitude	—	—	17	10,931	10	4,864	7	5,285
Mixed/Plantation	—	—	2	1,292	3	1,099	1	391
Total	4	2,318	43	32,032	39	16,063	107	59,717
Per cent	2	2	23	29	21	15	55	54

Note: ¹ A: undivided, B: less than half subdivided, C: more than half subdivided, D: complete subdivision

Table 9.10 Category 3 Farms: Assessment of Management

Farming System	Management Assessment			
	No. of Farms	Good Area (ha)	Average and Poor No. of Farms	Area (ha)
Wheat/dairy	4	5,708	34	15,829
Maize/dairy	4	1,626	108	63,105
High Altitude	3	3,611	31	17,469
Mixed/Plantation	1	539	5	2,243
Total	12	11,484	178	98,646
Per cent	6	10	94	90

Approximately 55 per cent of the number of farms and the area of Category 3 farms are already completely subdivided. This lower proportion than Category 2 farms may be because the numbers of owners in some cases are so large that the individual entitlement is negligible, hence the decision to farm as a group. There is also likely to be a significant proportion of the owners non-resident. Frequently the non-residents' entitlement remains intact for commercial or group farming. As with Category 2 farms there has been a greater tendency to subdivide completely the maize/dairy farms: 71 per cent of these have been completely subdivided whilst only 42 per cent of the wheat/dairy, 21 per cent of the high altitude and 15 per cent of the mixed/plantation systems are completely subdivided.

The assessment of management (Table 9.10) again suffers from the general assumption of the Extension Officers that all subdivided farms are either average or poorly managed.

An almost negligible proportion of the farms were assessed as having good management. Again as for Category 2, only farms which were not subdivided were classified in the good groups.

The strategy for the Category 3 farms is to introduce gradual change through the provision of agricultural services, extension credit, input supply and marketing assistance with the aim of promoting efficient land use (in terms of agro-economic potential) whilst simultaneously raising them from a predominantly subsistence farming level. On farms which are already subdivided there is little which can be done to increase the individual's holding size to allow him more flexibility in his farming system through better practices, without reducing the number of owner/members. The opportunities for doing this are extremely limited and it would only be possible where an alternative holding could be offered. A contribution could be made if Government maintained a relatively small but continuous settlement programme to meet this need and the needs of landless people. The source of land for such a programme would probably be large scale farms as they come on the market. This would have limited impact, however, and it must be accepted that average plot sizes will not become significantly larger. Highly intensive farming systems must be devised, therefore, which can be sustained by smallholders with a very limited land area. Provided that bad land use practices can be avoided the existence of subsistence sized holdings need not have any economic disadvantages.

Where subdivision has not already taken place it would be permitted on a controlled basis only in areas suited to it and if the numbers of members could be reduced to a level which would allow a balanced farming system to be practised. The possibilities for reducing membership on these farms although not strong, would be slightly better than on the farms which were already subdivided, because frequently there are non-resident members who are also shareholders in one or more other farms. There is, therefore, an urgent need to establish a complete register of owner/members for all farms in order that cases of multiple ownership can be identified. As with Category 2 farms any planned subdivision will require that owners claims are authenticated through an adjudication procedure and a final register of all authentic owners compiled.

Farms in this category will comprise holdings which are very similar to those in the traditional areas. They will, however, have an advantage in that they are already formed into a group and to lesser or greater extent make communal use of facilities on their farms. Apart from the authentication and adjudication of claims and in some cases, surveying and laying out of holdings, the extension, credit, supply and marketing package required by the farm members will be similar to that for smallholders or subsistence farmers for whom the IADP programme is designed. It is recommended, therefore, that the IADP be extended to cover the Category 3 farms in the large-scale areas.

If the proportion of Category 3 farms and the area they occupy is applied to the whole mixed farm sector then there are approximately 270 Category 3 farms occupying 153,000 hectares. If the subdivision proportions are also applied then approximately 148 farms or 82,600 hectares would be completely subdivided. The average number of owners per farm in this category is estimated to be 273 whilst the average entitlement per owner/member would be 2.1 hectares.

9.2.7 Priority of each Category for Development

Three categories of farms have been identified each with a different problem requiring a separate solution. Ideally the solution should be applied in parallel but in practice this may not be possible. Some order of priority must then be established.

In Category 1 the problems are largely technical (mainly managerial) and financial and therefore more straightforward and easily soluble. The economic benefits should accrue rapidly and would be high.

In Category 2 the problems are again technical and financial, but there are also social and legal problems such as authentication of claims of shareholders and the establishment of a basis for subdivision of the farm or re-organisation of existing holdings. The problems are not considered insoluble and economic benefits are again likely to be high.

Category 3 presents the most complex problems ranging from technical, financial, social and legal (land adjudication and registration of claims). Improvement can only be gradual and the objective of moving away completely from subsistence to commercial holdings may be unattainable. The problem of removal of 'surplus' members will have to be dealt with and alternative areas found. Progress will inevitably be slow and the economic benefits more uncertain.

If a priority has to be established our view is that the next phase of rehabilitation of large farms should aim principally at Category 2. The problems are more complex than Category 1 but the economic benefits are likely to be at least as high and furthermore the benefits would reach a greater number of farmers.

9.2.8 Prohibited Areas for Subdivision

Subdivision would be discouraged in specific areas because they are (a) regarded as unsuited to subdivision or (b) because it is necessary that they remain intact for the production of commodities best suited to large-scale production methods. The specific areas have been defined in Sections 8.5 and 8.6 and their locations are shown in Figure 8.4. In summary they include the main ranching areas, the prime wheat areas, present Government owned farms (e.g. ADC) and some 80,000 hectares of large farms for hybrid maize seed production in Trans Nzoia. Discouragement of subdivision of the wheat areas is regarded as necessary in the short and medium term in order to maintain supplies of wheat. In the longer term after a suitable technology for small scale wheat production has been introduced and adopted by Kenyan farmers, wheat areas could be released from these restrictions.

The existing legislation incorporated in the Agriculture, Land Control, Land Adjudication and Land Title Acts provide a legal framework within which a policy of prohibiting subdivision could be implemented. The necessary procedures for making use of this legislation is described in Appendix B.

9.2.9 Land Settlement Schemes

Land settlement is also proposed but it is emphasised that a massive smallholder settlement scheme, such as the 'Million Acre' scheme, would not be appropriate and would have a damaging or disruptive effect on investment and performance in the remaining large scale farms. The process should take place mainly through the market forces with groups buying up land on the open market. It is seen as a means of relieving land pressure as it is built up. The pace can be controlled through the existing Land Control Boards and to a certain extent by the AFC which is the main financing agent for land purchase. Through these controls, it can be ensured that large groups which are likely to sub-divide are discouraged from purchasing in areas unsuitable for sub-division. Restrictions could also be placed on the numbers of owners and the registration of all shareholders or members insisted upon.

This policy does not cater for the landless who do not have the financial resources to join a group. A relatively small but continuous settlement will therefore be necessary, buying up between 10-20 large mixed farms per year and settling them as occurs at present.

Consistent with the general policy for group owned or occupied farms, SFT 'shirika' farms would be subdivided and converted into conventional settlement schemes. Other SFT farms in areas suitable for subdivision would also be converted to settlement schemes as part of the limited settlement programme mentioned above.

9.2.10 Other Aspects

Other general recommendations include prohibiting private speculators buying up farms, subdividing and then selling off plots. Only large groups which have joined together for the purpose of purchasing a farm should be allowed to subdivide; then subdivision should be planned before members of the group take up residence on the farm.

Lastly it is strongly recommended that measures be implemented to prevent the continued decline of milk production and to improve dairy husbandry.

9.3 PLANTATION AND RANCHING SUB-SECTORS

The main plantation crops tea, coffee and sisal have been reviewed in Section 4.2. The conclusions regarding these are as follows:-

(a) Tea

About 95 per cent of the large-scale tea area is found on large well managed company plantations. These estates are well served by research facilities and yields are high. In the remaining estates owned by individuals or small partnerships, an average level of performance is being achieved and there is no apparent pressure for subdivision. In view of the generally good performance and absence of serious production problems, it is concluded that tea plantations do not require any special Government attention.

(b) Coffee

Management and productivity on estates owned by individuals, small partnerships and companies is generally good. The main problem is with the farms owned by large groups. These are already the subject of the Group Farms Rehabilitation Project (GFRP), the coffee part of which shows signs of being successful. It is concluded that group farming is the best solution for these farms because firstly, they have generally a much higher membership than the mixed farms. It is understood that the individual's entitlement, if the estate were subdivided, would be extremely small and splitting up would, therefore, not be worthwhile. Secondly, even on mixed farms with some coffee (e.g. in Rift Valley Province) owned by large groups, the tendency is to keep the coffee area intact. Lastly, the shareholders tend to look upon the estate more as an investment rather than as an acquisition of a subsistence holding. In view of this, it is recommended that the present approach to rehabilitation of the group owned coffee estates be continued.

(c) Sisal

Sisal is not well suited to small scale production and other than ensuring that sale to large groups who might wish to subdivide is prevented, no special Government action is required.

(d) Ranches

Most commercial ranches are well managed. For those in difficulties, the IBRD financed Second Livestock Project is available. The main requirement is for more stringent control over subdivision of ranches to be exercised in those areas where arable cropping is not feasible.

9.4 SUMMARY OF STRATEGY PROPOSALS

9.4.1 The Mixed Farms Sub Sector

The main points of the strategy are summarised as follows:-

- (a) Category 1 farms would be provided with the appropriate advisory and support services. This would be done by modifying the Group Farms Rehabilitation Project (GFRP) to incorporate those large farms with few owners and little internal pressure to subdivide. Where the owners wish to subdivide they would be permitted to do so.
- (b) Category 2 farms which are not already subdivided would be permitted to do so on a planned basis in areas considered suitable for small scale farming. The resultant smallholdings would retain their group structure and be provided with extension, land use planning, credit and marketing services through the group. The cooperative is recommended as the most appropriate group structure.
- (c) Category 2 farms which are already subdivided and where the individual holding size is about the stipulated minimum for Category 2 would be provided with similar services for those which have not yet subdivided. Re-organisation would be carried out where necessary to allow better land use and conservation measures and to enable use to be made of communal services.
- (d) Category 3 farms not already subdivided would be permitted to do so on a planned basis in areas suited to smallholder farming, provided that the individual's holding size would be large enough to allow a balanced farming system to be practised.
- (e) Category 3 farms are essentially subsistence farms and because of their similarity to holdings in the traditional areas, it is recommended that national programmes such as the Integrated Agricultural Development Programme (IADP), Cooperative Production Credit Scheme (CPCS) and Smallholders Production Services and Credit Project (SPSCP) be extended to incorporate these farms. The cooperative structure is recommended for all Category 3 farms.
- (f) For Categories 1 and 2 farms a programme for authentication and adjudication of claims would be introduced with the objective of establishing a complete register of owners and eventual issue of freehold title.
- (g) Purchase of mixed farms by large groups intending to subdivide would be allowed to continue. They would be discouraged from purchasing farms in areas unsuited to small scale farming. Subdivision would be carried out before the group took up residence on the farm.
- (h) A massive smallholder settlement scheme of the 'Million Acre' type is not considered appropriate. The recommended process would take place mainly through market forces

with groups buying land on the open market. It is seen as a means of continuously reducing land pressure as it builds up. It could be controlled by the Land Control Boards and by AFC as the Institution providing funds for land purchase.

- (i) A small but continuous settlement programme is considered necessary in order to cater for the landless who do not have the financial resources to join a group. SFT farms not already settled could be converted into conventional settlement schemes as part of the programme.
- (j) Enough farms would be maintained as large scale units to meet the nation's needs for hybrid maize seed and for breeding livestock. The major proportion of the nation's wheat requirement would be ensured and current levels of production at least maintained.
- (k) Farms in areas unsuitable for subdivision (i.e. ranching and the best wheat areas) would not be sold to large groups which are likely to wish to subdivide.
- (l) In the event of a priority for development having to be established, it is considered that the next phase of the Large Farms Rehabilitation Programme should aim at Category 2 farms. Although the problems are more complex than in Category 1 farms the economic benefits are likely to be at least as high and would be distributed amongst a greater number of farmers.

9.4.2 The Plantation and Ranching Subsectors

The following broad recommendations have been made:-

- (a) About 95 per cent of the large scale tea area is on well managed company plantations. Overall, performance is good and there are few serious production problems. Tea estates therefore do not require any special Government attention.
- (b) The problems within the coffee estates are mainly associated with those which are owned by large groups. These are already the subject of the Group Farms Rehabilitation Programme, the coffee part of which is showing signs of being successful. It is concluded therefore that the present approach should be continued.
- (c) Sisal is not well suited to small scale production and other than ensuring that sales to large groups who might wish to subdivide is not permitted, no special Government action is required.
- (d) Most commercial ranches are reasonably well managed. For those in difficulties, the World Bank financed second livestock project is available. The main requirement is for more stringent control to be exercised over subdivision of ranches in those areas where arable cropping is not feasible.

10

The Proposed Development Programme

10.1 GENERAL DESCRIPTION

The development programme, designed to implement the strategy proposals for the mixed farm sub-sector, is expected to extend over a period of between 16 and 20 years, eventually involving about 760 Category 1 and 2 farms and an unspecified number from Category 3. Wherever possible existing institutions and development programmes would be used. The Ministry of Agriculture through a Large Farm Unit within the Land and Farm Management Division would have overall responsibility for direction and implementation of the programme. Considerable support and services, however, will be required from the Ministry of Lands and Settlement, the Ministry of Co-operative Development and from the Agricultural Finance Corporation. To ensure that the activities of each are co-ordinated, interministerial committees would be established at headquarters and provincial level. The programme is aimed at increasing production from the sector through intensification of land use and raising yields. The means of achieving this on the three categories of farms identified are as follows:--

Category 1 Farms

Under the programme Category 1 farms would be provided with planning, budgetary and managerial assistance. This would be done through the Large Farm Management Section created within the AFC under the Group Farms Rehabilitation Project. Short, medium and long term credit for on-farm investments in machinery, livestock, infrastructural development (buildings, fences, drainage, etc.) and for working capital would also be made available. About 390 farms are eventually expected to benefit from the programme. The Land and Farm Management Division of the Ministry of Agriculture and the AFC will be the main institutions involved in the rehabilitation of these farms.

Category 2 farms

The objective for Category 2 farms is to establish on each farm a community of commercially viable smallholdings to be called a Smallholder Land Use Society. Each individual smallholder within the community would be responsible for production on his holding but would have access to central facilities (usually already on the farm) such as dips, milk cooling, storage and machinery pool.

The programme will provide the assistance necessary to establish these communities including planning and supervising the subdivision of farms into smallholdings or re-organisation of smallholdings already subdivided on a rational basis, the provision of sound technical advice and the training of a manager/book-keeper who would be responsible for organising the supply of inputs, marketing of produce, collection of money for debt repayment and use of other central facilities. This advice and guidance would be given by small teams to be called Smallholder Development Teams (SDT). Assistance would also be given for adjudication of claims to membership of a group and establishing each claimant's entitlement where this is in dispute. Eventually registration and issue of individual titles would follow.

Category 2 farms would retain their present group identity and assistance and services would be channelled through the group structure. The co-operative structure would be encouraged as the most appropriate for providing input supply and marketing services and for organising use of facilities. Also it would enable use to be made of the existing Co-operative Production Credit Scheme (CPCS).

It is expected that eventually 360 Category 2 farms will opt to join the programme. The three Ministries, Agriculture, Co-operative Development and Lands and Settlement will be actively involved in the programme. Staff for the Smallholder Development Teams (SDT) would be drawn from the present establishment of the Ministries of Agriculture and Co-operatives. Training of the teams would be carried out by a specially recruited 'Task Force'.

Category 3 farms

Category 3 farms fall into two sub-categories, those which have already completely subdivided into subsistence plots (i.e. about 55 per cent or 150 farms) and those which have still retained a group farmed large-scale area. Under the programme the former would be helped through the IADP programme to the large scale areas by the provision of an advisory or extension service to farmers, the provision of short and medium term credit and possibly the establishment of land preparation and mechanisation services for farmers. Liaison between the two programmes should not be difficult as overall responsibility for direction and implementation will lie with the L and FMD of the Ministry of Agriculture.

These farms would be encouraged by the Smallholder Development Teams to retain their group identity, to reorganise into regulation multipurpose co-operatives, membership of which would be restricted to registered shareholders, and to make communal use of central facilities. Assistance would also be given for training of a manager/book-keeper with similar responsibilities to their counterparts in Category 2.

Adjudication and authentication of claims will be carried out where necessary to promote better land use practices and to raise these farmers from their present subsistence level to production of a surplus for sale.

The Ministries of Agriculture, Co-operatives and Lands and Settlement will be involved but in addition the Smallholders Production Services and Credit Project (SPSCP) and the Co-operative Production Credit Schemes could also provide some of the essential services.

The two alternatives open to those Category 3 farms which are not already completely subdivided are continuing to operate a large scale area on a group basis or subdivision. In the case of the former, the most appropriate form of assistance would be that provided for Category 1 farms through the AFC Large Farm Management Section coupled with some assistance and advice for the existing subsistence plots. It is unlikely, however, that such proposals would attract many farms.

The other alternative of planned and controlled subdivision is likely to be the most acceptable of the solutions. Assistance would be provided in planning the subdivision and in advising on the means of reducing the number of owners to a level that would allow each individual a holding which is large enough to adopt sound land use practices. The assistance provided would be similar to that provided for farms which had already subdivided but would include some help in establishing a basis for reducing numbers, such as buying out of absentee shareholders or consolidating claims of shareholders with shares in a number of different farms. Again the objective would be to reorganise the groups into regulation multipurpose Co-operative Societies whose members would all be registered.

The choice of alternative would be decided by the group in consultation with the SDT (or Task Force) and the District Agricultural and Co-operative Officers.

10.2 ORGANISATION AND MANAGEMENT STRUCTURE FOR THE PROGRAMME

10.2.1 General Description of the Organisational Structure

Institutional and organisational arrangements have been designed to utilise as far as possible existing institutions and agencies and to create new bodies only where absolutely essential. The organisational proposals provide a basis for planning the development of the large mixed farm sub-sector as a whole and sets out the institutional arrangements necessary for the three categories of farms.

The proposed organisation for the programme is shown in Figure 10.1. The programme would be directed and co-ordinated within the Ministry of Agriculture (MOA), by a Large Farms Project Unit which for administrative purposes would be established within the Land and Farm Management Division (L and FMD). The Unit would be based in Nakuru which is geographically within the large farm areas yet still close enough for liaison in Nairobi with other Divisions of the MOA and with other related programmes such as the IADP being implemented by the Ministry. Close liaison with other Ministries, Co-operative Development (MCD) and Lands and Settlement (MLS), and the AFC will also be necessary at Headquarters level.

A Steering Committee comprising representatives of the three Ministries involved would also be set up and would have responsibility for monitoring progress and giving broad policy direction when necessary.

The existing L and FMD teams established under the Group Farms Rehabilitation Project will be maintained in their present role of identifying farms requiring rehabilitation and recruiting them to the project. These teams would obtain as much information from the farms as possible and forward it to the Large Farms Unit in Nairobi.

Categorising of farms would be carried out by the Project Unit with the assistance of the Task Force (described later) and the L and FMD teams themselves. For the next stage, planning and implementation, Category 1 farms would be assigned to the Large Farm Management Section of the AFC and Categories 2 and 3 farms would be assigned to the proposed Task Force and Smallholder Development Teams (described below). Although Category 3 farms would be provided with most of the services required under the Integrated Agricultural Development Programme (IADP), it would receive some assistance from the Smallholder Development Teams in the training of a manager and arranging for land adjudication procedures to be instituted if required.

To ensure liaison and co-ordination between all the agencies concerned at the Provincial level a Provincial Interministerial Committee is proposed.

10.2.2 New bodies to be Created to Implement the Programme

(a) The Large Farm Project Unit

The Large Farm Project Unit will be a single body, with responsibility for planning and directing the programme for all large scale mixed farms. The unit would be relatively small comprising highly qualified technical staff comprising a Project Manager who by profession would be a Farm Management Economist, a Legal Adviser and a Farm Management Specialist. Clerical and

Administrative staff would be provided by the Ministry of Agriculture. The Unit's main responsibilities would be planning, direction, co-ordination and monitoring, implementation being in the hands of the proposed Task Force, the Smallholder Development Teams and the Large Farm Management Section of the AFC. One of its first tasks would be to review each of the mixed farms in the Large Farm Sector as they are recruited to the Rehabilitation Programme, and place them in one of the three main categories. The unit would be responsible for finalising guidelines for categorising farms taking into account such factors as land potential, the appropriate farm systems, etc.

The Unit would also have responsibility for approving farm plans and budgets prepared by the AFC for Category 1 farms and also development proposals for Categories 2 and 3 farms. The Legal Adviser would have responsibility for ensuring that the correct procedures for settling legal disputes over ownership, liability for debts incurred, etc. were adopted. He would also advise on procedures for registration of titles and division of debts (working closely with AFC).

(b) The Provincial Inter-Ministerial Committee

The Provincial Inter-Ministerial Committee would be established to ensure proper co-ordination between the agencies concerned. It would comprise officials of the three Ministries directly concerned (MOA, MLS and MCD) and AFC. It would liaise with the Large Farm Project Unit at LFMD headquarters in Nairobi and with the Directors of Agriculture and Settlement and the Commissioner for Co-operative Development. Since most of the mixed farms to be included in the project are in Rift Valley Province, only one Provincial Committee, based at Nakuru, may be necessary.

(c) The Task Force

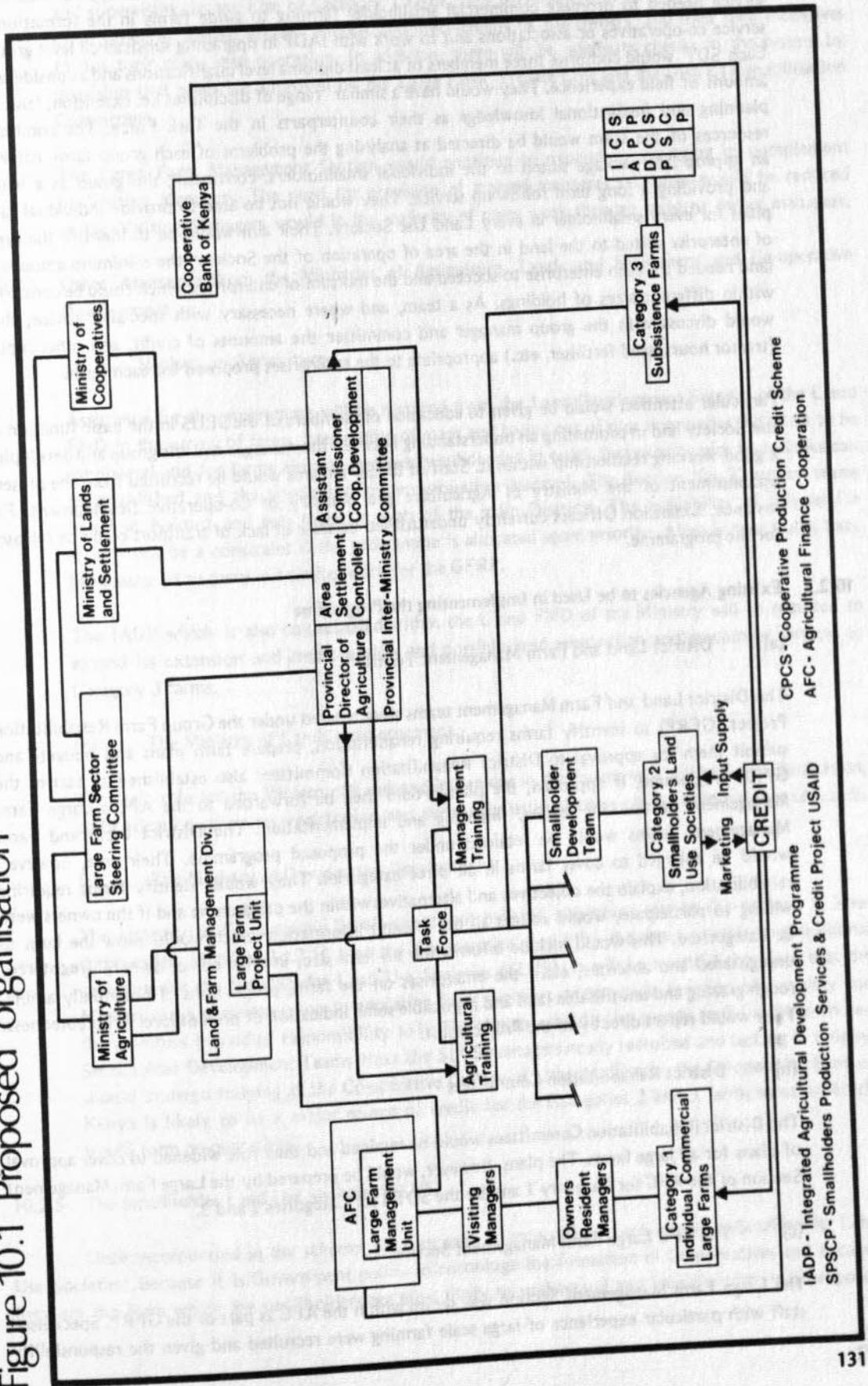
A Task Force would be set up to train a number of Smallholder Development Teams and to initiate the programme for development of commercial smallholdings (Smallholder Land Use Societies). It would consist of three members, all specialists in small farm development but with a wide range of skills. The three specialists would include an extension specialist with a sound farm management background, a land use planning specialist with a good knowledge of land survey and soil conservation and a specialist in institutions.

The Extension specialist would have responsibility for training a counterpart SDT member in formulating the most suitable farm plans for smallholdings on a Category 2 farm, and in extension and advisory techniques. The Land Use planner would concentrate on training a counterpart in planning the subdivision of farms to make the best use of land and to allow conservation measures where necessary. The Institution specialist would teach the administration and management of the proposed Smallholder Land Use Societies (SLUS) and, in particular, would deal with aspects such as book-keeping, store-keeping, ordering of supplies and marketing, all within a co-operative context.

The team would be based in Eldoret which is geographically central to the main areas of Category 2 farms. For administrative purposes, it would be attached to the Provincial offices of the Land and Farm Management Division. It would operate as a team suitably provided with team vehicles and adequate funds to allow unhampered mobility.

Although the Task Force's primary responsibility will be training of Smallholder Development Teams, it will inevitably be involved in planning of farms as the training programme will consist primarily of taking counterparts through the planning procedure on farms recruited. It is expected that by the fifth or sixth year of the programme the Task Force would be disbanded and the staff relocated.

Figure 10.1 Proposed organisation



(d) The Smallholder Development Teams (SDT)

The objectives of the Smallholder Development teams would be to provide the type of extension service needed to promote commercial smallholder farming to guide farms in the formation of service co-operatives or associations and to work with IADP in upgrading subsistence level groups. Each SDT would comprise three members of at least diploma level qualifications and a considerable amount of field experience. They would have a similar range of disciplines i.e. extension, land use planning and institutional knowledge as their counterparts in the Task Force. The combined resources of the team would be directed at analysing the problems of each group farm, offering an appropriate package suited to the individual smallholders, convincing the group as a whole and providing a long term follow-up service. They would not be able to provide individual farm plans for every smallholder in every Land Use Society. Their aim would be to identify the types of enterprise suited to the land in the area of operation of the Society, the minimum amount of land needed for each enterprise to succeed and the mixture of enterprises which could be contained within different sizes of holdings. As a team, and where necessary with specialist advice, they would discuss with the group manager and committee the amounts of credit, and other inputs (tractor hours, seed fertiliser, etc.) appropriate to the enterprises proposed for each farm.

Particular attention would be given to education of members of the SLUS in the basic function of the Society and in promoting an understanding between the manager and the group and developing a good working relationship within it. Staff of the SDT teams would be recruited from the present establishment of the Ministry of Agriculture and Ministry of Co-operative Development. For instance, Extension Officers currently underutilised because of lack of transport could be released for the programme.

10.2.3 Existing Agencies to be Used in Implementing the Programme

(a) District Land and Farm Management Teams

The District Land and Farm Management teams were created under the Group Farm Rehabilitation Project (GFRP) to identify farms requiring rehabilitation, prepare farm plans and budgets and submit them for approval to District Rehabilitation Committees also established as part of the GFRP programme. If approved, the plans would then be forwarded to the AFC's Large Farm Management Section for review, financing and implementation. The District Land and Farm Management Teams would be retained under the proposed programme. Their role, however, would be enlarged to cover farms in all three categories. They would identify farms requiring rehabilitation, explain the objectives and alternatives within the programme and if the owners were willing to participate, would collect all the relevant information which would allow the farm to be categorised. This would include information on farm size, the number of owners (registered, unregistered and absentee, etc.), the enterprises on the farm, proportions of potentially arable, rough grazing and unutilisable land and if possible some indication of present level in indebtedness. They would report directly to the Project Unit.

(b) District Rehabilitation Committees

The District Rehabilitation Committees would be retained and their role widened to cover approval of plans for all large farms. The plans, however, would be prepared by the Large Farm Management Section of the AFC for Category 1 and by the SDT's for Categories 2 and 3.

(c) The AFC Large Farm Management Section

The Large Farm Management Section was set up within the AFC as part of the GFRP. Specialised staff with particular experience of large scale farming were recruited and given the responsibility

of implementing the project. Although it was not originally intended that the AFC would assume the responsibility for preparing the initial plans and budgets for farms recruited to the GFRP this in fact has happened, and AFC has found itself in the position of planning, implementing and supervising. In the case of Category 1 farms, it is preferable that staff should continue to do so in order to sustain greater interest and involvement by the owners and their own incentives to put their plans into operation. In addition, there will be adequate checks in the system by provision that plans are approved by the Large Farm Project Unit and the District Rehabilitation Committees.

The Large Farm Management Section would continue to expand by enlarging its complement of Visiting Managers. The need for provision of trained managers on farms would be reduced as the Visiting Managers would in the majority of cases work through resident owner managers.

10.2.4 Other Assistance from the Ministries of Agriculture, Lands and Settlement and Co-operative Development

(a) Ministry of Agriculture

Assistance for the programme will be required from the Land Development Section of the L and FMD in the survey of farms, preparation of maps and laying out of plot boundaries for farms to be subdivided and for farms already completely subdivided in order that existing plot boundaries can be established and the possibility for reorganisation assessed. The Section has 27 survey teams based in Nakuru and two teams in each of the main Districts. The availability of this service should not be a constraint if the programme is allocated some priority. Already two teams have been assigned to carry out similar work for the GFRP.

The IADP which is also co-ordinated within the L and FMD of the Ministry will be required to extend its extension and credit services and possibly land preparation and machinery services to Category 3 farms.

(b) The Ministry of Lands and Settlement

The main role for the Ministry of Lands and Settlement in the Programme will be land adjudication, authentication of claims, registration and eventually issue of titles by the Commissioner of Lands.

(c) The Ministry of Co-operative Development

The Ministry of Co-operative Development will have an important role in the project. It is recommended (Section 10.2.5) that the Co-operative would be the most suitable organisational structure for the Smallholder Land Use Societies (SLUS). It will be essential therefore that the Ministry pays some attention to educating farm members on the basic function of a society and the members individual responsibility to it. The Ministry should also supply staff for the proposed Smallholder Development Teams. Next the SLUS managers newly recruited and lacking in training should undergo training at the Co-operative College at Langata. Finally, the Co-operative Bank of Kenya is likely to be a major source of credit for the Categories 2 and 3 farms most of which would form co-operatives.

10.2.5 The Smallholder Land Use Societies (SLUS)

Once incorporated in the scheme, the Category 2 farms will become known as Smallholder Land Use Societies. Because it is Government policy to encourage the formation of Co-operatives and because they are the form which the smallholders are most likely to understand and identify with, it is proposed

that the Co-operative structure should be adopted by the SLUS. The role of the Co-operative, however, would be confined to provision of services, such as input supply, marketing, etc.

The manager would, in effect, replace the former large farm manager. His role in the Society would be extremely important. During the development period he would, however, receive assistance from the SDT's. Together they would establish the total inputs and total amounts of credit required. The manager would be responsible for the procurement of inputs (negotiating with contractors if necessary) and subsequently for issuing the quantities and recording the charges against each individual account. The arrangements for marketing would be similar, each smallholder undertaking to market his produce through the Society, the value being offset against his loan. Where the Society was not large enough to support a full-time manager amalgamation of a number of farms to form a larger unit warranting a manager would be considered.

The Society should also promote the proper use of land within the Society's control. This would involve encouraging members to adopt soil conservation measures, advise on stocking intensities and husbandry practices proposed by the SDT's. In addition, it would discourage subdivision below the minimum limits regarded as desirable for that particular farm, (these could eventually be stated as a restriction to the land title). The manager and committee, however, could do no more than encourage adoption of desirable land use practices. Enforcement would have to be by the correct authority invoking the relevant legislation.

10.3 LEGAL ASPECTS

10.3.1 Registration of Owners

Land ownership is not expected to present any problems in the Category 1 farms, many of which are owned by individuals with individual freehold title. In the case of small partnerships and companies, all of the owners are usually registered and their rights are not in dispute.

Difficulties are likely to occur in the Categories 2 and 3 farms owned by large groups of shareholders/members, particularly where a high proportion are not registered. At present the group owns the title by right of purchase and in most instances it is held by the AFC as security against a proportion of the purchase price lent to the group. The overwhelming majority of group members, however, want and eventually expect to become individual title holders after their land purchase loan has been repaid. The proposed programme will help to meet this demand.

Where ownership is not in dispute, the farms could be regarded as ready for survey and demarcation as provided for in the Registered Land Act. Where there are complications, the Smallholder Development Teams (SDT) could promote an attempt to reach a settlement within the group through the District Commissioner and the District Agricultural Committee. If this failed, the Teams would report the fact to the Large Farm Project Unit which would have to decide on the appropriate form of arbitration.

The first stage will be that of verifying the claims of unregistered shareholders. This is not a problem which could be settled in court since there is unlikely to be any evidence of payment on the parts of the claimants and the courts are not geared to handling this type of dispute.

In the difficult cases an adjudication procedure is required, which could take the verbal evidence of all who claimed to have an interest in the farm and authenticate or reject such claims. If the group was registered under the Co-operative Act, the problem could be referred to the Commissioner for Co-operative Development for determination under Section 80 of the Act, which enables the Commissioner to appoint an arbitrator or arbitrators, whose award would be final. If the group was registered under the Companies

Act, then the procedures of the Arbitration Act could be followed. The issue of unregistered members is, however, very sensitive and the important thing is to get the right answer and not to hurry into any arbitrary solutions.

The adjudication procedures established under the Land Adjudication Act give the best framework within which to settle disputes amongst claimants. They provide for the appointment of an Adjudication Committee and an Adjudication Board. The Committee's function is to utilise the knowledge and experience of the group to arrive at an opinion on the validity of each claim, while the Adjudication Board may be called in to advise the Arbitrator should it appear to him that the opinion of the Adjudication Committee is in any way biased. If, after examining the opinion of the Adjudication Committee, or obtaining the advice of the Adjudication Board, the arbitrator decided that the claims of the unregistered partners were valid, then by his award the names of the claimants would be added to the register of shareholders. Ideally this would not be done in cases where the number of shares related to the available area of land would give plot sizes below the minimum size required to operate the farm systems appropriate to the area. In these cases, an attempt could be made to reduce the number of authenticated claimants by buying out those who were willing to sell their shares. It is unlikely there would be many, but some who were not resident, or who had shares in one or more other farms might be persuaded. Those agreeing to sell could be bought out by the registered shareholder to whose shares they have contributed. If he was unable to do this, then his shares could be bought by the Society or by any other member at their face value, and the authenticated claimants and the former owner paid in accordance with the award of the Arbitrator by the new owner. Such a course of action would, of course, raise social and political problems, because once the registers of shareholders had been finalised, any one who was not on the register, would not be a shareholder and would have no rights of residence or occupation. It would, therefore, be important to consider the claimants who held no valid claim but were resident and occupying land. It is suggested that they should be listed with other applicants for plots on settlement farms providing they could prove that they had no shares in any other group farm or land elsewhere. These would eventually be accommodated in the limited settlement programme suggested as part of the strategy in Section 9.2.1.

10.3.2 Subdivision of Farms

Once the farm's register of shareholders has been finalised, the next stage will be the planning of subdivision and laying out of holding boundaries. This would be carried out by the SDT and the Survey and Mapping Units of the Land Section of the L and FMD. Approval of the subdivision plans will be required, however, if the farm lies within an area Gazetted as a Land Control Area or Division. To obtain this, it will be necessary either to go through the lengthy procedures for obtaining the consent of the Land Control Board, or for the Inter-Ministerial Committee to apply to the President for exemption under Section 24 of the Land Control Act in respect of each individual group farm where the preceding steps have been completed. This again will involve a multiplicity of applications and gazettings. It is therefore suggested that a general exemption should be sought in respect of any group farm which applies and is accepted for registration as a Smallholder Land Use Co-operative Society. The By-laws or Articles of Association of these new Societies would make provision, among other things, for maintaining the integrity of shareholders' plots at a minimum size consistent with the objectives of the Society.

One of the central issues is that most of the group farms will in all probability be indebted to AFC for land purchase, development or Guaranteed Minimum Return Programme loans. The title to the land will therefore be mortgaged to the Bank and there would be no question of translating shares into freehold plots so long as this situation remained. The principal concern of AFC is to ensure that loan repayments schedules are kept up to date and that its collateral is in the form of a realisable asset. Because of this the Land Use Societies must continue as registered owners of the land, and retain responsibility for maintaining loan repayment until an agreed procedure has been accepted by all concerned.

There are two alternatives for such a procedure which could only be taken with the consent of the creditor. The situation on each group farm would be assessed by the SDT's and guidance given over the

most appropriate course to adopt. The first alternative would be for a General Meeting of the Land Use Society to pass a resolution to apply for partition under Section 104 of the Registered Land Act, in a manner which would provide shareholders with plots proportionate to their shareholdings. The subsequent survey under Section 20/21 of the Act would provide approximate boundaries for the purpose of registration, and the Freehold Certificates would contain restrictions as to subdivision and would be charged to the Land Use Society. As creditor, AFC could require that the individual charges be transferred to them, but whatever arrangement was made, it would thereafter be the responsibility of the Society to open a loan account in the name of each shareholder with a share of the debt of the original Farm Purchase Society proportionate to the shareholding.

The second alternative would be for the Land Use Society to retain the title to the group land, apply as above for partition, and lease the plots to the registered shareholders. Their leases could be in the form of periodic tenancies subject to an undertaking on the part of the Society to convert the plot to freehold once the Society is freed from all debts. They could alternatively be for a specified term of perhaps 33 or 99 years, in which case they would be registered and the certificate could have the same restrictions and charges entered as with a freehold title. On this basis, the shareholders would pay a rent to the Society in addition to paying for the various services which the Society would be providing. The rents would be set at a level which would enable the Society to enter into an agreement with AFC for liquidating outstanding debts over a specific period.

10.3.3 Co-operative By-laws

For those group farms which adopt the Co-operative structure, one of the early steps will be to discuss the objectives of the Smallholder Land Use Society with the shareholders and to draft by-laws for the new society or to lay down procedures to be followed for amending the by-laws of the former Farm Purchase Societies. This would be done by the Task Force or SD Teams in consultation with the Commissioner for Co-operative Development and the Provincial Assistant Commissioner. Although it appears that Section 10 of the Act may be sufficient authority for changing both the name and objectives of the original group, it is appreciated that there are complex issues involved which would require joint study by the MCD, AFC, the Large Farm Project Unit and the Task Force. One of these is the present indebtedness of the farms to AFC which was discussed in Section 10.3.2.

10.4 PHASING AND STAFFING OF THE PROGRAMME

It is proposed that the programme should be implemented over twenty years. During this period the various units within the MOA should be established and the task of rehabilitating or redeveloping those farms willing to join the Programme, should be completed.

10.4.1 The Number of Farms to be Rehabilitated

For the programme to be successful, it will have to be attractive to farmers. It is unlikely that it will appeal to all farmers needing it, even after the advantages and benefits have been demonstrated. It has been necessary therefore to make some arbitrary assumptions regarding the proportion of suitable farms which will be recruited and the distribution of these by farming systems. For the former it is assumed that 65 per cent of the average and poor Category 1 farms and 75 per cent of all Category 2 farms will, to a certain extent, receive services from this programme but initially the primary source of assistance will be from the IADP programme. No attempt has been made to estimate the rate at which Category 3 farms would be incorporated in the IADP or the rate that they might become eligible to form an SLUS. It is expected, however, that eventually about 175 farms involving 48,000 family holdings might receive services from either of the two programmes.

The composition of the mixed farm sub-sector (i.e. 1,800 farms) by farming system and by performance (Table 10.1) is based on the distribution of farms by farming system and performance established from the farm census.

The distribution of farms from Categories 1 and 2 likely to be recruited is based on the proportion of average and poor farms rather than the total in each system.

Table 10.2 Distribution of Farms Recruited by Category and Farming System¹

	Number of Farms	
	Category 1	Category 2
Wheat/dairy	150	80
Maize/dairy	190	240
High Altitude	50	50
	390	370

¹ The proportion of Mixed/plantation farms is small and has been redistributed between the other three systems.

10.4.2 Staff Requirements and Recruitment

It is anticipated that the rehabilitation of all categories of farm would run concurrently. Firstly, the Large Farm Management Section in the AFC is already operative and the enlargement of its complement of staff to four Senior Visiting Managers should be possible either before or immediately after a commitment to the proposed programme is made. Given this and the fact that economic benefits are likely to be realised fairly rapidly from Category 1 farms, this part of the programme should carry on as soon as is possible. For the reasons given in Section 9.2.9 the implementation of proposals for Category 2 farms should also proceed immediately and should have priority over those in Category 3. The 'task force' would therefore concentrate its attention in the first instance on establishing the SDT teams for recruitment and redevelopment of Category 2 farms. Its involvement with Category 3 farms would be slight and the onus of liaising with the IADP programme over extension of IADP services to these farms would be with the Project Unit. Although steps would be taken to involve Category 3 farms in IADP activities from the outset, progress is expected to be slow, therefore no specific staffing proposals have been made for them.

The most immediate priority at commencement of the programme will be the establishment of the Project Unit comprising the three professional staff (Section 10.2.2) and their clerical and administrative supporting staff. This Unit will require at least three months to become established and to familiarise itself with the economic and agricultural background to the programme. In preparing a time schedule for building up staff and recruiting Category 1 (Table 10.3) and Category 2 farms (Table 10.4) to the project the following assumptions have been made:—

(a) Category 1 farms

The complement of Senior Visiting Managers in the AFC Large Farm Management Section would reach four during the first year of the programme and could be increased to eight by the end of the third year.

The process of rehabilitation of a Category 1 farm will require three years of close supervision. In the first year the farm plan will be prepared and implementation commenced. The following two years will allow for implementing the plan, training and close supervision of the owner/manager or managers.

A Senior Visiting Manager will be expected to cope with four new farms a year plus eight others in either their second or third year in the programme. From the third year of the programme

onwards, he would therefore have four new farms, four farms in their second year and four in the third year.

Table 10.3 Time Schedule for Recruitment and Rehabilitation of Category 1 Farms

	Year								
	1	2	3	4	5	6	7	8	9-16
Number of visiting Managers	—	4	6	8	8	8	8	8	—
New Farms recruited per year	—	16	24	32	32	32	32	32	—
Farms under supervision per year	—	16	40	72	88	96	96	96	—
Farms completed per year	—	—	—	16	24	32	32	32	—
Farms completed cumulative	—	—	—	16	40	72	104	136	390

Table 10.4 Time Schedule for Recruitment and Rehabilitation of Category 2 Farms

	Year								
	1	2	3	4	5	6	7	8	9-20
Task Force Staff	3	3	3	3	3	3	—	—	—
Number of SDTs	—	2	4	6	8	8	8	8	—
SDT Staff	—	6	12	18	24	24	24	24	—
New Farms recruited per year	—	6	12	18	24	24	24	24	—
Farms under planning and supervision	—	6	24	36	54	66	72	72	—
Farms completed	—	—	—	6	12	18	24	24	—
Farms completed cumulative	—	—	—	6	18	36	60	84	370

(b) Category 2 Farms

The Task Force would be recruited within three to six months after the inception of the project or establishment of the Project Unit. It would also require up to three months of familiarisation.

In the first year the Task Force would spend at least six months on promotion of the project (in conjunction with the Project Unit) preparing explanatory brochures, visiting District Agricultural Offices and briefing MOA staff at District and Divisional Level. This period would also be used to establish two Smallholder Development Teams (SDTs) and to recruit six farms for planning and re-development in the following year.

The Task Force would train two SDTs a year for four years; by the end of the fifth year of the programme eight teams would be in operation. The Task Force would be disbanded during the sixth year unless required to train more SDTs or carry on a supervisory role.

The training process for SDTs will comprise the planning of three farms in association with the Task Force. After this, each team should be capable of carrying through the exercise with minimal assistance or supervision from the Task Force.

Of the 370 farms likely to be incorporated in the project, about 150 will require complete survey and plan for laying out smallholdings. These will include those not already subdivided or those subdivided and requiring major reorganisation. A survey, preparation of a map and layout for the group will require up to four months. Therefore it is assumed that four survey units will be available.

Each SDT will plan three new farms each year and supervise implementation of the plan. The process from recruitment to preparation of the plan is expected to take approximately four months. Implementation and supervision would continue until the end of the third year of recruitment. Thus each SDT will at any one time have three new farms in the planning and implementation stage, three in the second year supervision stage and three in the third year supervision stage.

10.4.3 A First Phase

The programme which provides for the rehabilitation and development of some 760 Categories 1 and 2 farms and improvement in some Category 3 farms, should be completed over a 20 year period. It would be worthwhile, however, defining a first phase, in which the proposals suggested can be tried, tested and modified if necessary before continuing with the remainder of the programme.

An appropriate first phase would be the eight year period (Tables 10.3 and 10.4) with recruitment of farms stopping in year 5. In this period rehabilitation of 136 Category 1 and 84 Category 2 farms would be completed, and the Task Force could be disbanded.

10.5 TRAINING

To implement the programme, the following types of training will be required:—

- Training of managers for Category 1 farms.
- Training of Smallholder Development Teams.
- Training of managers for Smallholder Land Use Associations (or Societies).

10.5.1 Training of Managers for Category 1 Farms

Managing a large farm successfully is particularly demanding and a good manager will require both an aptitude for the job and a comprehensive background of formal and practical training. It has been suggested (Annex V and Section 6.8.1) that in general up to six years of combined formal and practical training would be required. The Egerton Farm Management option coupled with two years practical training has been suggested as a minimum but the problem then arises of much more highly paid alternatives being open to someone with this training. The defects of the current courses at the Large Farm Management Centres at Nyahururu and Eldoret have also been pointed out along with measures which should be taken to improve them.

An analysis of information collected on management during the farm census indicated that 36 per cent of owner managers and 87 per cent of hired managers have received formal training in agriculture (a negligible proportion at Egerton). The proportion of good farms within each group (i.e. owner manager and hired manager) was similar about 40 per cent. This would support the view that present training at a lower level than Egerton was of little value. Action is recommended both to reduce the demand for highly

trained managers and to improve the existing training facilities. Adoption of the proposed rehabilitation programme would result in a reduced demand for highly trained managers because the number of large scale units would be reduced and a very high percentage (70 per cent) of owner managers in the Category 1 farms may wish to continue managing their own farms while being guided by Visiting Managers. Improving the courses at the Large Farm Management Centres along the lines suggested in Section 6.8.1 would be the most effective way of achieving the latter. It is unlikely that the overall demand for large scale managers of mixed farms within the programme will exceed 300, many of whom are already available but require retraining or a considerable amount of advice and supervision.

10.5.2 Training of Smallholder Development Teams

Each SDT would comprise three members (Section 10.2.1), an extension farm specialist, a land use planner/soil conservation specialist, and a specialist in institutions. The first two are likely to be seconded from the Ministry of Agriculture and the other from the Co-operative Department. It is assumed that each member will have received the appropriate formal training and be highly experienced before joining the SDT. Two members, the Extension specialist and the Co-operative Department member, would have experience in group training and communication methods. Training would be almost entirely practical and would be obtained in the field by each SDT team member working as a counterpart to a member of the Task Force, whilst going through the process of establishing a number of Land Use Societies. The training content would therefore comprise:—

- (a) analysis of current problems of the group farm being considered;
- (b) preparation of a plan;
- (c) persuasion of group members to its acceptance;
- (d) training of a society manager, and ultimately
- (e) implementation and supervision of the plan.

It is considered that after experience gained on at least three farms the team members will be able to plan other farms with supervision and if necessary, advice from the Task Force. The concept of working as a team providing a planning package would be emphasised continuously throughout the period of in-service training. Regular seminars would be held where formal or classroom type training is required.

10.5.3 Training of Land Use Society Managers

By substituting Land Use Societies for the present Farm Purchase Societies, Farm Companies or Partnerships, the Societies would no longer be concerned directly with farming or production but would instead be involved with the provision of services. These would include disbursement, control and recovery of credit, procurement of supplies of inputs, organisation of group machinery hire with contractors, storage and marketing, record keeping and savings schemes, etc. Training of managers would be undertaken through the co-operative training system, using the Farmer Training Centres and collaborating closely with the Task Force and the SDT, which would themselves be provided with regular one-week seminars at the FTCs, in order to review progress and to evolve working methods under the guidance of the main team (or Task Force).

It is therefore suggested that the training needs of the Large Farm Sector would best be served if the methods of the SDTs were kept under constant critical review at Farmer Training Centres through seminars, and if specially designed courses for the training of potential Smallholder Land Use Society Managers were arranged. As with Farm Managers, a most important attribute of the Society Manager would be his aptitude. Selection would therefore be based on an assessment of this in conjunction with previous training in co-operative management.

The training course at the FTC would be designed to direct his managerial aptitudes towards the purposes of the Land Use Societies and the support it would be expected to give to the smallholder members. Additional training of managers would be given by the Institutions Specialist in the SDT. This training would be primarily concerned with record-keeping, book-keeping and accounting, procurement of supplies and marketing. Managers for the Smallholder Land Use Societies would probably be diplomates from the Co-operative College at Langata, members of the society selected for training as managers, or existing farm managers with some retraining by the SDTs.

10.6 BENEFITS TO THE PROGRAMME

Farm models and budgets have been prepared (Annex VII) for Categories 1 and 2 farms practising the three main farming systems (wheat/dairy, maize/dairy and high altitude) to give an indication of the level of benefits which might accrue to farmers and to the national economy.

10.6.1 Benefit to Farmers

(a) Category 1 Farms

Although the average farm size in this category is over 400 hectares, there is a considerable range, consequently to facilitate comparisons and analysis models and budgets have been prepared for a 100 hectare unit. The present situation assumes the level of performance currently being achieved on average and poor farms as indicated by the farm management survey (Chapter 5). The 'after development' situation (except in the case of the dairy herds) is based on the performance of the better farmers as indicated by the same survey. This is expected to be achieved after a period of three to five years.

The expected improvement in the farms output will result mainly from better management. Long term capital investment will not be high. Up to KShs. 20,000 per 100 hectares has been allowed for improvement in buildings, fences and water supply. Replacement of machinery and purchase of stock has also been allowed for in the budgets. Working capital requirements represent the most significant change and will double as a result of intensifying the farming system.

The prices of inputs and for crop and livestock products sold, are based on the projections given in Section 8.4. The Tables which follow show that with a more intensive system and improved management, the incremental benefits per 100 hectares range between KShs. 32,000 for Maize/dairy farms and KShs. 39,000 for the Wheat/dairy and High Altitude systems. The budget summaries also indicate the precarious position of the poorly managed farms in the latter two systems. Category 1 farm budgets are given in Tables 10.5–10.10.

(b) Category 2 Farms

Models representing Category 2 farms have been produced for group farms which are already completely subdivided into small commercial sized holdings. The model is based on the typical situation of a 500 hectare farm owned by a group of 40 members, each resident on 12.5 hectares. The budget showing the present situation was, where possible, derived from parameters established for the subdivided farms in the farm survey, supplemented by information from the average to poorly managed farms. The budgets showing the 'after development' situation are based on the yield and production levels already attained on the better managed large farms.

An allowance of KShs. 50,000 has been made for on-farm investment in long term capital improvements such as buildings, dips, road construction, etc. This would result in an annual capital charge per hectare of KShs. 11 or KShs. 140 per smallholding.

Table 10.5 Category 1 Farm Model : Wheat/Dairy System¹

Item		100 ha Unit	
		Before Development	After Development
Land use (ha)	Cultivable	65	65
	Rough grazing	20	20
	Unusable	15	15
		100	100
Crop enterprise data (ha)	Wheat	41	38
	Maize	2	2
	Ley	7	25
	Total cultivated	50	65
	Permanent pasture (cultivable)	15	nil
	65	65	
Yields (kg/ha)	Wheat	1,420	2,300
	Maize	3,080	3,320
Livestock numbers (LSU)		19	20
	Cows	15	26
	Followers	34	46
Livestock sales (number)	Total	2	3
	Cull cows	—	3
	Surplus heifers	2	6
Milk production	Steers		
	Yield per cow per year (kgs)	904	1,600

¹ Given in Detail in Annex VII.

Table 10.6 Category 1 Farm Model : Maize/Dairy System¹

Item		100 ha Unit	
		Before Development	After Development
Land use (ha)	Cultivable	65	65
	Rough grazing	20	20
	Unusable	15	15
		100	100
Crop enterprise data (ha)	Maize	28	40
	Ley	5	25
	Total cultivated	33	65
	Permanent pasture (cultivable)	32	nil
	Total cultivable	65	65
Yields (kg/ha)	Maize	3,900	4,910
Livestock numbers (LSU)	Cows	21	22
	Followers	18	29
	Total	39	51
Livestock sales (number)	Cull cows	2	3
	Surplus heifers	—	3
	Steers	2	7
Milk production	Yield per cow per year (kgs)	904	1,600

¹ Given in detail in Annex VII.

Table 10.7 Category 1 Farm Model : High Altitude System¹

Item	100 ha Unit					
	Before Development		After Development			
Land use (ha)	Cultivable	65	65			
	Rough grazing	20	20			
	Unusable	15	15			
		100	100			
Crop enterprise data (ha)	Wheat	43	30			
	Pyrethrum	3	10			
	Oats (fodder)	nil	2			
	Ley	6	23			
	Total cultivated	52	65			
	Permanent pasture (cultivable)	13	nil			
		65	65			
Yields (kg/ha)	Wheat	1,420	2,300			
	Pyrethrum	370	670			
Livestock:		No.	LSU	No.	LSU	
	Sheep	Rams	2		1	
		Ewes	61	12.6	46	9.4
		Lambs	46	2.3	46	2.3
		109	14.9	93	11.7	
Livestock: Dairy cattle (LSU)	Cows		9		12	
	Followers		7		16	
	Total		16		28	
Livestock sales: Sheep	Cull rams		1		1	
	Cull ewes		12		9	
	Fat lambs		34		37	
Cattle	Cull cows		1		2	
	Surplus heifers		—		2	
	Steers		1		4	
Milk production	Milk per cow per year (kgs)		904		1,600	
Wool production	Weight per adult (kgs)		4		4	

¹ Given in detail in Annex VII.

Table 10.8 Category 1 Wheat/Dairy System : Summary Budget

Item	KShs/100 ha Unit per Year		
	Before Development	After Development	Increment
Revenue			
Crops	90,200	133,390	43,190
Livestock	20,180	44,360	24,180
Total Revenue	110,380	177,750	67,370
Costs¹			
Crops	42,410	50,370	7,960
Livestock	4,700	17,820	13,120
Machinery	50,630	52,590	1,960
Labour	8,750	9,300	550
Buildings and overheads	7,000	11,330	4,330
Total Costs	113,490	141,410	27,920
Return to management	(3,110) ²	36,340	39,450

¹ Land loan and GMR repayments not included.

² () indicates negative amount.

Table 10.9 Category 1 Maize/Dairy System : Summary Budget

Item	KShs/100 ha Unit per Year		
	Before Development	After Development	Increment
Revenue			
Crops	84,960	152,800	67,840
Livestock	22,030	49,040	27,010
Total Revenue	106,990	201,840	94,850
Costs¹			
Crops	29,260	54,400	25,140
Livestock	4,700	20,730	16,030
Machinery	32,570	43,680	11,110
Labour	15,930	21,890	5,960
Buildings and overheads	7,000	11,330	4,330
Total Costs	89,460	152,030	62,570
Return to management	17,530	49,810	32,280

¹ Land loan and GMR repayments not included.

Table 10.10 Category 1 High Altitude System : Summary Budget

Item	KShs/100 ha Unit per Year		Increment
	Before Development	After Development	
Revenue			45,180
Crops	96,240	141,420	17,960
Livestock	16,950	34,910	63,140
Total Revenue	113,190	176,330	
Costs ¹		52,900	6,690
Crops	46,210	18,640	11,810
Livestock	6,830	44,410	(6,720)
Machinery	51,130	22,270	7,920
Labour	14,350	11,330	4,330
Buildings and overheads	7,000	149,550	24,030
Total Costs	125,520	26,780	39,110
Return to management	(12,330) ²		

¹ Land loan and GMR repayments not included.

² () indicates negative amount.

The summarised models and budgets (Tables 10.11 to 10.16) indicate that a marked increase in return to family labour and management would be achieved. The increase, however, would be less in the Maize/dairy System farms where the present returns are high, relative to the other systems.

Table 10.11 Category 2 Farm Model : Wheat/Dairy System

Item	per 100 ha		per member 12.5 ha		
	Before Development	After Development	Before Development	After Development	
Land Use (ha)	Cultivable	65	65	8.1	8.1
	Rough grazing	20	20	2.5	2.5
	Unusable	15	15	1.9	1.9
	100	100	12.5	12.5	
Crop Enterprise (ha)	Wheat	33	30	4.1	3.8
	Maize	11	10	1.4	1.2
	Ley	nil	25	nil	3.1
	Total cultivated	44	65	5.5	8.1
	Permanent pasture (cultivable)	21	nil	2.6	nil
	65	65	8.1	8.1	
Yields (kg/ha)	Wheat	1,420	2,300		
	Maize	3,080	3,320		
Livestock (LSU)	Cows	16	19	2	2
	Followers	12	26	1.5	3.6
	Total	28	45	3.5	5.6
Livestock sales (number)	Cull cows	2	3	0.25	0.4
	Surplus heifers	—	3		0.4
	Steers	2	6	0.25	0.8
Milk production	Milk per cow per year (kg)	904	1,600	904	1,600

Table 10.12 Category 2 Farm Model : Maize/Dairy System

Item	per 100 ha		per member 12.5 ha		
	Before Development	After Development	Before Development	After Development	
Land use (ha)	Cultivable	65	65	8.1	8.1
	Rough grazing	20	20	2.5	2.5
	Unusable	15	15	1.9	1.9
		100	100	12.5	12.5
Crop enterprise (ha)	Maize	44	40	5.5	5.0
	Ley	nil	25	nil	3.1
	Total cultivated	44	65	5.5	8.1
	Permanent pasture (cultivable)	21	nil	2.6	nil
	Total cultivable	65	65	8.1	8.1
Yields (kg/ha)	Maize	3,900	4,910	3,900	4,910
Livestock numbers (LSU)	Cows	19	22	2	3
	Followers	15	29	2.2	3.3
	Total	34	51	4.2	6.3
Livestock sales	Cull cows	2	4	0.25	0.5
	Surplus heifers	-	3	-	0.4
	Steers	2	7	0.25	0.9
Milk production	Milk per cow per year (kg)	904	1,600	904	1,600

Table 10.13 Category 2 Farm Model : High Altitude System

Item		per 100 ha		per member 12.5 ha	
		Before Development	After Development	Before Development	After Development
Land use (ha)	Cultivable	65	65	8.1	8.1
	Rough grazing	20	20	2.5	2.5
	Unusable	15	15	1.9	1.9
		100	100	12.5	12.5
Crop enterprise data (ha)	Wheat	20	15	2.5	1.9
	Maize	16	10	2.0	1.2
	Pyrethrum	8	20	1.0	2.5
	Oats (fodder)	nil	12	nil	1.5
	Ley	nil	8	nil	1.0
	Total cultivated	44	65	5.5	8.1
	Permanent pasture (cultivable)	21	nil	2.6	nil
Total cultivable	65	65	8.1	8.1	
Yields (kg/ha)	Wheat	1,420	2,300	1,420	2,300
	Maize	3,080	3,320	3,080	3,320
	Pyrethrum	370	670	370	670
Livestock numbers (LSU)	Cows	14	22	2	3
	Followers	11	29	1	3.4
	Total	25	51	3	6.4
Livestock sales	Cull cows	1	4	0.15	0.5
	Surplus heifers	—	3	—	0.4
	Steers	2	7	0.25	0.9
Milk production	Milk per cow per year (kg)	904	1,600	904	1,600

Table 10.14 Category 2 Farm Summary Budget : Wheat/Dairy System

Item	per 100 ha/yr			per member, 12.5 ha/yr	
	Before Development	After Development	Increment	Before Development	After Development
Revenue					
Crops	95,100	127,050	31,950	11,880	15,880
Livestock	17,490	42,390	24,900	2,190	5,310
Sub-total	112,590	169,440	56,850	14,070	21,190
Costs					
Crops	40,760	47,050	6,290	5,100	5,880
Livestock	2,350	19,310	16,960	300	2,410
Machinery	36,940	38,160	1,220	4,620	4,770
Labour	500	550	50	60	70
Overheads	3,700	3,700	—	460	460
Loan repayment	6,300	6,300	—	790	790
Sub-total	90,550	115,070	24,520	11,330	14,380
Return to management and family labour	22,040	54,370	32,380	2,740	6,810
Return per hectare	220	544	324		

Table 10.15 Category 2 Farm Summary Budget : Maize/Dairy System

Item	per 100 ha/yr			per member, 12.5 ha/yr	
	Before Development	After Development	Increment	Before Development	After Development
Revenue					
Crops	133,500	152,800	19,300	16,690	19,100
Livestock	20,180	49,680	29,500	2,520	6,210
Sub-total	153,680	202,480	48,800	19,210	25,310
Costs					
Crops	45,980	54,400	8,420	5,750	6,800
Livestock	2,740	20,960	18,220	350	2,630
Machinery	34,580	32,320	(2,260)	4,320	4,040
Labour	3,950	4,400	450	490	550
Overheads	3,700	3,700	—	460	460
Loan repayment	6,300	6,300	—	790	790
Sub-total	97,250	122,080	24,830	12,160	15,270
Return to management and family labour	56,430	80,800	24,370	7,050	10,040
Return per hectare	564	808			

Table 10.16 Category 2 Farm Summary Budget : High Altitude System

Item	per 100 ha/yr			per member, 12.5 ha/yr	
	Before Development	After Development	Increment	Before Development	After Development
Revenue					
Crops	97,760	156,840	59,080	12,220	19,610
Livestock	15,160	49,390	34,230	1,890	6,170
Sub-total	112,920	206,230	93,310	14,110	25,780
Costs					
Crops	29,840	56,850	27,010	3,730	7,110
Livestock	2,110	24,540	22,430	280	3,090
Machinery	28,160	30,940	2,780	3,520	3,870
Labour	4,650	12,550	7,900	580	1,570
Overheads	3,700	3,700	—	460	460
Loan repayment	6,300	6,300	—	790	790
Sub-total	74,760	134,880	60,120	9,360	16,890
Return to management and family labour	38,160	71,350	33,190	4,750	8,890
Return per hectare	388	727			

10.6.2 Benefits to the national Economy

At completion of the project it is estimated that some 760 farms, (Categories 1 and 2) extending over an area of 388,800 hectares will have benefited from the programme. In addition, there will have been benefits from the Category 3 farms but no attempt has been made to quantify these. The distribution of the Categories 1 and 2 farms by number and area between the three main farming systems is given in Table 10.17. The number of Category 2 farm shareholders or members benefiting from the project is also shown.

Table 10.17 The Number and Area of Rehabilitated Farms by Farming Systems

Farming system	Category 1		No. of farms	Category 2	
	No. of farms	Area ¹ (ha)		Area ¹ (ha)	No. of Members
Wheat/dairy	150	65,100	80	61,280	4,900
Maize/dairy	190	82,840	240	123,120	9,850
High Altitude	50	27,700	50	28,800	2,300
	390	175,640	370	213,200	17,050

¹ Based on the average area given in Table 10.1.

Using Table 10.17, the benefits to the National Economy at completion of the project have been estimated in terms of the following criteria:—

Table 10.16 Category 2 Farm Summary Budget : High Altitude System

Item	per 100 ha/yr			per member, 12.5 ha/yr	
	Before Development	After Development	Increment	Before Development	After Development
Revenue					
Crops	97,760	156,840	59,080	12,220	19,610
Livestock	15,160	49,390	34,230	1,890	6,170
Sub-total	112,920	206,230	93,310	14,110	25,780
Costs					
Crops	29,840	56,850	27,010	3,730	7,110
Livestock	2,110	24,540	22,430	280	3,090
Machinery	28,160	30,940	2,780	3,520	3,870
Labour	4,650	12,550	7,900	580	1,570
Overheads	3,700	3,700	—	460	460
Loan repayment	6,300	6,300	—	790	790
Sub-total	74,760	134,880	60,120	9,360	16,890
Return to management and family labour	38,160	71,350	33,190	4,750	8,890
Return per hectare	388	727			

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Wheat/dairy	150	65,100	80	61,280	4,900
Maize/dairy	190	82,840	240	123,120	9,850
High Altitude	50	27,700	50	28,800	2,300
	390	175,640	370	213,200	17,050

¹ Based on the average area given in Table 10.1.

Using Table 10.17, the benefits to the National Economy at completion of the project have been estimated in terms of the following criteria:—

- Increase in production of commodities.
- National income contribution.
- Balance of payments.
- Employment creation.

(a) Increase in production of various commodities

The increase in annual production of various commodities after completion of the programme is given in Table 10.18.

Table 10.18 Increase in Annual Output of Main Commodities at Completion of the Programme

Item	Category 1	Category 2	Total
Maize (tonnes)	72,390	34,270	106,660
Wheat (tonnes)	21,200	15,320	36,520
Pyrethrum (tonnes)	1,550	3,010	4,560
Milk sales (tonnes)	22,910	33,780	56,690
Grade heifers (number)	4,990	6,970	11,960
Fat steers (number)	7,580	10,040	17,620
Cull cows (number)	1,760	3,940	5,700

(b) National Income Contribution

An estimate has been made of the annual contribution of the project to national income by comparing incremental costs with the incremental revenues calculated using economic prices. The annual contribution would be KShs. 109.0 million.

(c) Balance of Payments

The annual incremental net Foreign Exchange benefit which could be expected at completion of the programme is KShs. 157 million. The net annual foreign exchange benefit per hectare is compared by farming system for each category in Table 10.19.

Table 10.19 illustrates that there is a significant advantage in Category 2 type farms in terms of contribution to balance of payments. The foreign exchange components used are given in Appendix 3.

Table 10.19 Net Annual Foreign Exchange Benefit per Hectare at Completion of the Project (KShs)

Farming System	Category 1	Category 2
	KShs per hectare	
Wheat/dairy	758	828
Maize/dairy	786	924
High altitude	784	1,260

(d) Employment Creation

An estimate of the increase in employment in Categories 1 and 2 farms arising from implementation of the project has been made using the basic data given in Tables 7.6 and 7.9 of Annex VII. Overall the number of jobs created would be 9,151 of which 5,729 would be in Category 2 farms. Table 10.20 gives the distribution of the increase between category and farming system.

Table 10.20 Increase in Employment Opportunities at Completion of the Programme

Farming system	Category 1	Category 2
	Man equivalents ¹	
Wheat/dairy	170	650
Maize/dairy	2,350	2,510
High altitude	1,110	3,310
	3,630	6,470

¹ One man equivalent is assumed to be equivalent to 300 man days of labour.

The capacity of Categories 1 and 2 farms to absorb labour is compared in Table 10.21. The high altitude system is clearly the most labour demanding but Table 10.21 also illustrates the advantages in labour absorption of smallholder farming.

Table 10.21 Labour Absorption by Farm Category and System

	Category 1		Category 2	
	m.e. ¹ per ha	Man-days per ha	m.e. ¹ per ha	Man-days per ha
Wheat/dairy	0.02	5.3	0.07	22
Maize/dairy	0.12	35	0.15	44
High altitude	0.12	37	0.21	62

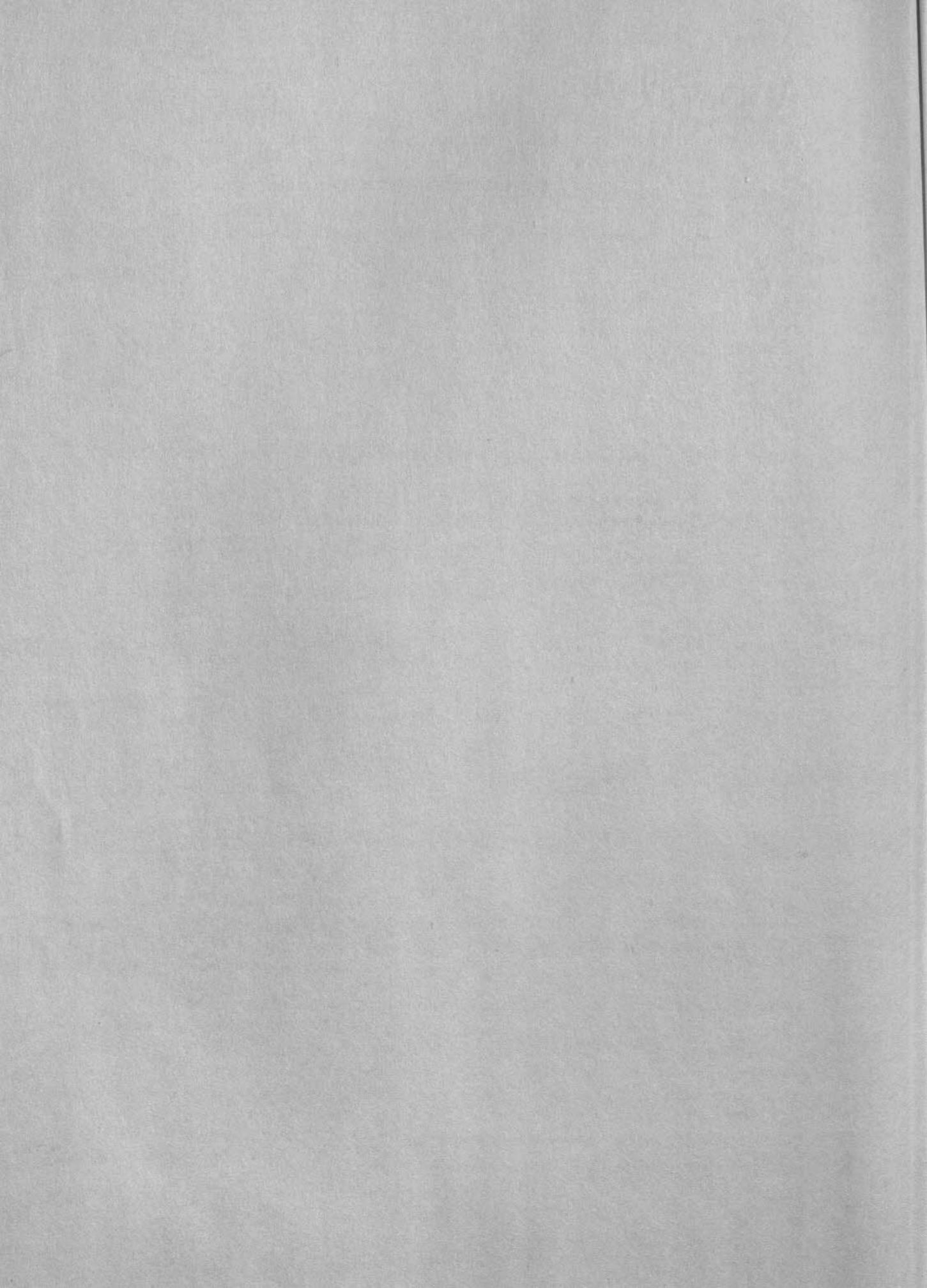
¹ m.e. = man equivalent or 300 man-days.

10.7 CREDIT

The institutions needed for the provision of credit to the three categories of farm are discussed in Section 6.6. It is concluded that the present institutions are adequate and that no major innovations are considered necessary. The question of debt repayment in the event of subdivision of farms has also been discussed in Section 10.4.2 and two alternatives proposed.

The possibility of rescheduling debts has been discussed in Annex VI and rescheduling of short term GMR arrears has been proposed. The farm operating surplus (or return to labour and management) anticipated should easily accommodate the repayment of the average level of GMR arrears of KShs. 110 per reschedule over a five year period. Rescheduling of long term land purchase loans would not be to the farmers' advantage as interest rates on recently disbursed long term loans are higher than the rate on early loans of 6.5 per cent. The most appropriate course would be to take out a new medium to long term loan to the value of the current arrears and use this to repay the arrears. The budgets indicate substantial margins for loan repayment after development.

Appendices



A

Determination of Minimum Sizes for Category 2 Farms

A.1 CROP AND LIVESTOCK BUDGETS

The budgets have been prepared using 1976 input and output prices. This has been done because the net incomes per hectare weighted according to cropping pattern are being compared with a 1976 estimate of smallholder farm families' expenditure on consumption. The following crop and livestock budgets have been prepared:—

- wheat
- maize in System 1 farms
- maize in System 2 farms
- pyrethrum
- grass leys
- grazing oats
- dairy enterprises

		KSh. per ha.
(a) Wheat		
		2,772.00
1. Gross revenue:	21 bags @ 132/—	
2. Variable costs:		
Materials:—	seed	255.00
	fertiliser, 125 kg of compound (11-55-0) @ 170/50 per 50 kg	637.50
	herbicides MCPA @ 3½ l/ha @ 21/— per l	37.00
		929.50
Machinery:—	(contract prices assumed)	
	ploughing	234.00
	harrowing x 2	320.00
	spraying	25.00
	harvesting	240.00
	grain transport	40.00
		859.00
Labour:—	hand sowing 5 man days (family)	1,788.50
	Total variable costs	983.50
3. Gross margin		157

1. Gross revenue:	35 bags at 70/-	2,450.00	
2. Variable costs:			
Material inputs:-	seed - 25 kg	87.50	
	fertiliser - basic	319.50	
	fertiliser - top dressing (2 bags C.A.N.)	270.00	
	DDT - 6 kg 5%	15.00	
			692.00
Machinery:-	(contractors rates)		
	ploughing	234.00	
	disc harrowing	320.00	
	shelling	70.00	
	transport	40.00	
			664.00
Hired Labour:-	weeding	56.00	
	stooking	25.00	
	picking	25.00	
			106.00
	Total variable costs		1,462.00
3. Gross margin:			988.00

(c) Maize in System 2 Areas

1. Gross revenue:	50 bags at 70/-	3,500.00	
2. Variable costs:			
Materials:	seed 25 kg	87.50	
	fertiliser 4 bags single supers 85/-	340.00	
	C.A.N.	810.00	
	DDT 6 kg 5%	15.00	
			1,252.00
Machinery:	(contractors rates)		
	ploughing	234.00	
	disc harrowing x 2	320.00	
	shelling	100.00	
	transport	40.00	
			694.00
Hired Labour:	weeding	56.00	
	stooking	35.00	
	picking	35.00	
			126.00
	Total variable costs		2,072.00
3. Gross margin			1,428.00

1. Gross revenue:	average 620 kg/annum @ 6.00 shs.		
2. Variable costs:			
Materials:	planting material average annual charge assuming 3 year life	40.00 84.00	
	fertiliser T supers 25 kg planting annual charge	16.00	
	insecticides	20.00	
	gunnies		160.00
Machinery costs	(contract rates)	98.00	
	ploughing annual average charge	107.00	
	harrowing x 2 annual charge		202.00
Hired Labour:	planting 75 per cent hired ∴ 35 man days @ 5/75 shs. total 201/- annual average charge	67.00 287.50	
	weeding 98 man days of which 50 hired	75.00	
	ridging up 25 man days 13 hired	279.00	
	picking 50 per cent hired @ 90 cents/kg		708.50
		744.00	
	Drying @ 1.20 per kg	45.00	
	Transport to Pyrethrum Board	1,859.00	
	Total variable costs		1,860.00

3. Gross margin:

(e) Variable costs of Grass Leys

Seed 11 kg @ 24/- per kg	264.00
Fertiliser 125 kg (11-55-0)	637.50
Machinery	554.00
Total costs of establishment	1,455.50

Average annual costs of establishment assuming a 3 year life	485.17
Annual maintenance cost 2 bags C.A.N.	270.00
Total cost per annum	755.00

(f) Variable costs of Grazing Oats

seed	255.00
fertiliser (2.5 bags compound)	637.50
ploughing	234.00
harrowing x 2	320.00
	1,446.00

(g) Dairy enterprises (1 cow = 1 LU)		KShs. per cow
1. Gross revenue:		
	Milk 1,700 kg @ 1.15 shs	1,265.00
	Sale of culls	92.00
		1,357.00
2. Variable costs:		
	Replacements	150.00
	Concentrates	150.00
	Minerals	30.00
	Veterinary and dip	65.00
	Milk cooling	35.00
	Transport	18.00
	Miscellaneous	17.00
		465.00
3. Gross margin per cow or LU:		892.00

A.2 WEIGHTED GROSS MARGINS PER HECTARE

A.2.1 Nakuru, Uasin Gishu and Trans Nzoia

(a) Farming System 1

	Per cent	Land Use Ha per gross farm ha	Gross Margin (KShs.)
Wheat	30	0.30	295.00
Maize	10	0.10	99.00
Grass ley	25	0.25)	257.00 (dairy)
Rough grazing	20	0.20)	
Unusable	15	0.15	
			651.00

(b) Farming System 2

	Per cent	Land Use Ha per gross farm ha	Gross Margin (KShs.)
Maize	40	0.40	571.00
Grass ley	25	0.25)	257.00 (dairy)
Rough grazing	20	0.20)	
Unusable	15	0.15	
			828.00

(c) Farming System 3

	Per cent	Land Use Ha per gross farm ha	Gross Margin (KShs.)
Pyrethrum	20	0.20	372.00
Maize	10	0.10	99.00
Wheat	15	0.15	148.00
Grazing oats	20	0.20) 0.5 LU	246.00
Rough grazing	20	0.20)	865.00

A.2.2 Kericho District : Kipkelion Division

(a) Farming System 1

	Per cent	Land Use Ha per gross farm ha	Gross Margin (KShs.)
Wheat	15	0.15	148.00
Maize	10	0.10	99.00
Fodder	10	0.10)	280.00 (dairy)
Rough grazing	50	0.50) 0.4 LU	
Unusable	15	0.15	527.00

(b) Farming System 2

	Per cent	Land Use Ha per gross farm ha	Gross Margin (KShs.)
Maize	25	0.25	357.00
Fodder	10	0.10)	280.00 (dairy)
Rough grazing	50	0.50) 0.4 LU	
Unusable	15	0.15	637.00

(c) Farming System 3

	Per cent	Land Use Ha per gross farm ha	Gross Margin (KShs.)
Pyrethrum	15	0.15	278.00
Maize	10	0.10	100.00
Grazing oats	10	0.10) carrying	301.0 (dairy)
Rough grazing	50	0.50) capacity .5 LU	
Unusable	15	0.15	679.00

A.3 MINIMUM FARM SIZE

A figure of KShs. 100 per hectare has been assumed to cover overhead costs such as loan repayment, interest on working capital and miscellaneous items. This has been deducted from gross margins to arrive at the net income per hectare, which in turn has been compared with the assumed target income per holding of KShs. 3,500 per annum. The net incomes per hectare and the resultant minimum holding sizes for Category 2 farms are given in Table A.1.

Table A.1 Minimum Sizes for Category 2 Farms

	Nakuru, Uasin Gishu and Trans Nzoia Farming Systems			Kericho Farming Systems		
	1	2	3	1	2	3
Weighted gross margin per hectare	651	828	865	527	637	679
Overhead costs per hectare	100	100	100	100	100	100
Net income per hectare	551	728	765	427	537	579
Minimum size of holding (hectare)	6	5	5	8	7	6

B

Legislative Procedures

A necessarily brief review of the laws of Kenya has led to the conclusion that there already exists the main legislation which would enable Government to act upon the Consultants' recommendations. The relevant Acts are the Agricultural Act (Chapter 318), the Land Control Act (Chapter 302) the Land Adjudication Act (Chapters 283 and 284) and the Land Titles Act (Chapter 282). Some subsidiary legislation would be necessary to identify the areas where controlled subdivision would be actively promoted and the areas where it would be prohibited.

The Agricultural Act empowers the Minister to arrange for the preparation of general schemes for land preservation and development applicable to Scheduled and to Non-Scheduled areas. These schemes can lay down minimum holding sizes, specific developments and particular farming systems. The immediate need is for certain administrative procedures to be established, which could most suitably be achieved in the form of guidelines prepared by the LFPU. In the first instance, each group farm in the large farm sector should be assigned to its appropriate category, as and when the Task Force and the Smallholder Development Teams are set up and operational. The Districts within which Category 2 farms had been recruited would then be made subject to a general Land Preservation and Development scheme, which would be agreed by the District Agricultural Committees. Each general scheme would be scrutinised by the LFPU and would be registered by them in their monitoring register before submitting it to the Minister, who would cause a Land Preservation and Development Order to be gazetted in respect of the areas involved.

The Land Control Act, however, prohibits the sale, division or disposal of land or shares in land in any area which is a Land Control Area, except after the completion of a lengthy procedure with an uncertain outcome. If any area where Category 2 (and later Category 3) farms have been identified is found to be in a Land Control Area, it would be necessary for the LFPU to seek its exemption from the provisions of the Act. This could most simply be achieved by obtaining a Presidential exemption under Section 24 for any farm designated as a Category 2 farm in an area gazetted under the Agricultural Act as a Land Preservation and Development Area. Or, more generally, the exemption could be in respect of any farm on which a Smallholder Land Use Society has been established and recognised or registered as such. This would allow subdivision as 'a controlled transaction' at the same time as continuing to prohibit subdivision where the integrity of Category 1 farms had to be preserved — such as ranches, etc.

The next procedural step would be to apply the Registered Land Act to Category 2 farms on which there was no dispute over unregistered owners, non-resident owners or squatters. This would be a matter for arranging the survey and demarcation of individual farms, providing that each farm thus demarcated was a viable commercial smallholding. As part of this procedure, it would be necessary to ensure that the individual title in each case was charged to the SLUS (for preference), or directly to AFC.

In those cases where the problems of unregistered owners, squatters, etc. exist, the provisions of the Land Adjudication Act should be made to apply. This Act provides 'for the ascertainment of rights and interests in and for the consolidation of, land in the special areas'. 'Special areas' is an expression which is not defined in the Interpretation (Section 4) of the Act. At the time of writing, no copy of the Trust

Land Act was available, but it would appear from Section 2 (3) of the Land Adjudication Act that the Minister (of Lands) may add areas of land to the special areas, and apply the Land Adjudication Act to them. These added areas could be defined in his order as any areas in which 'controlled transactions' on Category 2 farms are to be promoted. Thereafter, the procedures set out in the Arbitration Act could be applied. In those cases where the Category 2 farm is a Farm Purchase Co-operative, the arbitration on claims of unregistered shareholders could in theory be settled by the Commissioner for Co-operative Development appointing an arbitrator. In practice, it would be better to follow the procedures of the Land Adjudication Act, so that all claims would be examined on a uniform basis, and all decisions recorded in Adjudication Registers, thereby giving the owners of subdivided plots undisputed title to apply for registration of their plots.

C

Foreign Exchange Components

Table C.1 Category 1 Farms, Wheat/Dairy System Foreign Exchange Revenue/Costs¹

Item	Foreign Exchange %	Before Development KShs. per 100 ha	After Development
Revenue			
Wheat	90	69,850	104,850
Maize	82	3,250	3,500
Sub-total		73,100	108,350
Livestock	100	20,180	44,360
Total Foreign Exchange Revenue		93,280	152,710
Costs			
Crops	60	25,450	30,220
Livestock	30	1,410	5,350
Machinery (capital)	90	16,220	19,060
Machinery (recurrent)	60	19,570	18,850
Buildings	30	2,100	3,400
Total Foreign Exchange Costs		64,750	76,880
Net Foreign Exchange benefit		28,530	75,830

¹ Border parity prices are used in Tables C.1–C.6 based on the actual shilling/US\$ exchange rate.

Table C.2 Category 1 Farms, Maize/Dairy System Foreign Exchange Revenue/Costs

Item	Foreign Exchange %	Before Development KShs. per 100 ha	After Development
Revenue			
Maize	82	57,670	103,710
Livestock	100	22,030	49,040
Total Foreign Exchange		79,700	152,750
Costs			
Crops	60	17,560	32,640
Livestock	30	1,410	6,220
Machinery (capital)	90	12,410	17,160
Machinery (recurrent)	60	11,270	14,770
Buildings	30	2,100	3,400
Total Foreign Exchange Costs		44,750	74,190
Net Foreign Exchange Benefit		34,950	78,560

Table C.3 Category 1 Farms, High Altitude System Foreign Exchange Revenue/Costs

Item	Foreign Exchange %	Before Development KShs. per 100 ha	After Development
Revenue			
Wheat	90	73,250	82,780
Pyrethrum	100	6,660	40,200
Sub-total		79,910	122,980
Livestock	100	9,740	27,370
Total Foreign Exchange Revenue		89,650	150,350
Costs			
Crops	60	27,730	31,740
Livestock	30	920	4,770
Machinery (capital)	90	16,220	16,140
Machinery (recurrent)	60	19,870	15,890
Buildings/overheads	30	2,100	3,400
Total Foreign Exchange Costs		66,840	71,940
Net Foreign Exchange Benefit		59,470	78,410

Table C.4 Subdivided Group Farm, Category 2, Wheat/Dairy System Foreign Exchange Revenue/Costs

Item	Foreign Exchange %	Before Development KShs. per 100 ha	After Development
Revenue			
Wheat	90	56,220	82,780
Maize	82	17,890	17,530
Sub-total		74,110	100,310
Livestock	100	17,490	42,390
Total Foreign Exchange Revenue		91,600	142,700
Costs			
Crops	60	24,460	28,230
Livestock	30	700	5,790
Machinery (contractors)	65	24,010	24,800
Overheads	30	1,110	1,110
Total Foreign Exchange		50,280	59,930
Net Foreign Exchange Benefit		41,320	82,770

Table C.5 Subdivided Group Farm, Category 2, Maize/Dairy System Foreign Exchange Revenue/Cost

Item	Foreign Exchange %	Before Development KShs. per 100 ha	After Development
Revenue			
Maize	82	90,620	103,710
Livestock	100	20,180	49,690
Total Foreign Exchange Revenue		110,800	153,400
Costs			
Crops	60	27,590	32,640
Livestock	30	820	6,290
Machinery (contractors)	65	22,480	21,008
Overheads	30	1,110	1,110
Total Foreign Exchange Costs		52,000	61,050
Net Foreign Exchange Benefit		58,800	92,350

Table C.6 Subdivided Group Farm, Category 2, High Altitude System Foreign Exchange Revenue/Costs

Item	Foreign Exchange %	Before Development KShs. per 100 ha	After Development KShs. per 100 ha
Revenue			
Wheat	90	34,070	41,390
Maize	82	26,020	17,530
Pyrethrum	100	17,760	80,400
Sub-total		77,850	139,320
Livestock	100	15,160	49,390
Total Foreign Exchange Revenue		93,010	188,710
Costs			
Crops	60	17,900	34,110
Livestock	30	630	7,360
Machinery (contract)	65	18,300	20,110
Overheads	30	1,110	1,110
Total Foreign Exchange Costs		37,940	62,690
Net Foreign Exchange Benefit		55,070	126,020

