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THE POTENTIAL ROLE OF THE MARKET PLACE AS A CENTRE FOR
INNOVATION DIFFUSION IN AGRICULTURAL EXTENSION PROGRAMMES

Exploration of an Idea Related to Muranga District, Kenya

BY

A. Fiona Douglas Mackenzie Thomson

A thesis submitted to the Faculty of
Graduate Studies in partial fulfillment
of the requirements for the Degree
of Master of Arts

Department of Geography

Carleton University

Ottawa, Canada

1977

The undersigned recommend to the Faculty of Graduate Studies
acceptance of the thesis

"The Potential Role of the Market Place as a Centre
for Innovation Diffusion in Agricultural Extension
Programmes - Exploration of an Idea Related to Muranga
District, Kenya"

submitted by A. Fiona Douglas Mackenzie Thomson in partial
fulfilment of the requirements for the degree Master of Arts.

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ABSTRACT

Inequitable development persists in rural Kenya, within the small farm sector as well as between the small- and large-scale farm sectors. This paper is concerned with the small farm sector with special reference to eight sublocations in Muranga District, Central Province.

It is hypothesized that a significant variable in the inequitable development process is the uneven application of agricultural extension service visits. These, it is argued, favour the more progressive farmer at the expense of the non-progressive farmer. If the level of living of the majority of small-scale farmers is to be raised, by increasing the output of both the traditional cash crops and the food crops, group extension techniques need to be focussed on these farmers. Those aspects of Communication Theory and Innovation Diffusion Theory considered relevant are discussed and it is contended that innovation diffusion must be seen as an interactive and therefore two-way process if an extension programme is to be successful. As the major food crop producers are women, and they have previously been ignored by the extension service, some means, in particular, must be found to contact them.

The basic hypothesis of the paper is that the market place, part of the traditional proxemic spatial system and a regular gathering place for women farmers selling food crops, could play a role complementary to other extension programmes in the diffusion of agricultural innovations. Recent proposals for self-reliant development and increased local input into the development process appear to support such a contention.

If this hypothesis is to be further considered, research is needed in several fields: firstly, to define the type of approach to be used in the market place; secondly, to ascertain the type of innovation suitable for diffusion here; and finally, to gain an understanding of the communication network among women farmers.

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LIST OF ABBREVIATIONS

AA	Agricultural Assistant
AAO	Assistant Agricultural Officer
ADC	Agricultural Development Corporation
AFC	Agricultural Finance Corporation
AHA	Animal Health Assistant
CPCs	Cooperative Production Credit Scheme
DAO	District Agricultural Officer
FTC	Farmer Training Centre
GMR	Guaranteed Minimum Return
IDRC	International Development Research Centre
JAA	Junior Agricultural Assistant
JAHA	Junior Animal Health Assistant
KAU	Kenya African Union
KANU	Kenya African National Union
KPU	Kenya People's Union
KTDA	Kenya Tea Development Authority
SRDP	Special Rural Development Programme

'A peasant,' Dirk had written, 'seems stupid to townsmen because, when making a decision, he so often refuses to be guided even by reasonable argument addressed to that decision. But he is not stupid; he is wise. He rejects the particular argument because it bears too closely on the subject to be decided. It is new, raw, human, fallible. He prefers to submit each question, however small, to the sum of his experience and tradition - a method that townsmen find tedious, but one that may well be God's method of judgement. At least, I hope so, for if we have to justify ourselves by reason then we shall be lost, but if we have the benefit of God's experience of mankind there is a chance of salvation. If God is a judge, a statesman, a schoolmaster, a priest or a cultivated woman, we shall all be shut out, but if he is a peasant, he will know that we are fools and give us shelter for the night.'

From: The Fountain by Charles Morgan.

CHAPTER 1

INTRODUCTION: RATIONALE AND HYPOTHESES

A paper entitled 'African Socialism and its Application to Planning in Kenya' published by the Kenyan Government in 1965, outlined the basis for the Kenyan ideal of development (Minogue and Molloy, 1974, p. 130). According to this document, development should draw on the best of African tradition, including such features as political democracy and mutual social responsibility; it should be able to adapt to the changing times and should have no dependency relationship with another country. The chief objectives for development outlined in this paper included political equality, social justice, human dignity, freedom from want, disease and exploitation, equal opportunities, and high and growing per capita incomes, equitably distributed. An emphasis on economic growth was to be the crucial variable in promoting development and the achievement of these goals.

That some of these objectives are far from being met is evident from a report by the International Labour Office (1972), 'Employment, Incomes and Equality: A Strategy for increasing productive employment in Kenya'. The report criticizes the continued existence of strong inequities in the Kenyan scene, and contends that economic growth is still influenced to a significant extent by inherited colonial structures.

The ILO argues:

Unless there is a major change in development strategy and policies, and in the absence of effective and powerful redistributive mechanisms, the heavy concentration of income is likely to continue and may be further intensified in the future. ...

Access to education and to scarce productive assets such as land, capital and credit is increasingly the chief vehicles (sic) to high income and affluence in Kenya. It seems likely that groups of persons who already possess these advantages will be further able to consolidate their economic power and affluence (ILO, 1972, p. 97).

Against this background the ILO places emphasis on:

... putting right the imbalances, on equity in place of gross inequality, in earnings, education, and landholdings, among regions, districts and individuals, and in other respects (ILO, 1972, p. 3).

The ILO report notes that the power of the centre over the periphery has probably increased in recent years on account of the closer association of interests between the urban elite, large farm owners and the large foreign-owned companies. It therefore recommends a strategy of 'redistribution from growth' aimed in large part at the rural areas where 90% of Kenya's population lives. The ILO argues that the question of paramount importance "... is not the availability of jobs, in the sense of paid work for others, but the availability of land, together with the knowledge and supporting services to farm it well and obtain a reasonable income " (ILO, 1972, p. 3).

The problem of equitable development in rural areas is compounded by the rapid increase in the rural population, presently at a rate of 2.7% per annum, and by the fact that under 12% of Kenya's land area is

suitable for the cultivation of crops using current farming techniques. It is estimated that by 1985 there will be about 2.8 million households in the rural areas, compared with 1.7 million in 1969 (ILO, 1972, p. 51).

This paper is primarily concerned with the development of the rural sector, although it is realized that this sector and the urban one are not exclusive to each other, but form part of the same interactive system. Rural development will be defined as:

... the outcome of a series of quantitative and qualitative changes occurring among a given rural population and whose converging effects indicate, in time, a rise in the standard of living and favourable changes in the way of life of the people concerned (Mensah, 1971, p. 1).

Included in this concept also is the idea of making the process of development self-sustaining (Lele, 1974). Lele defines this term: "Self-sustenance (thus) means 'involving', as distinct from simply 'reaching', the subsistence populations through development programmes" (Lele, 1974, p. 2). This would include the development of skills and implementing capacity, and the growth of institutions at local, regional and national levels to ensure the continued functioning of such a process.

Agricultural development is not synonymous with rural development, although certain elements are common to both (Mosher, 1972). The former concept refers only to increases in agricultural production and productivity. B.F. Johnston (1974), in a paper concerned with the objectives and scope of a food and nutrition policy, argues the importance of one aspect of agricultural development:

The major thesis of this paper, however, is that one of the most fundamental factors influencing the achievement of nutritional and many other objectives of economic and social development is

the pattern of agricultural development, ie. whether increases in production are concentrated within a 'modern' subsector of atypically large and capital-intensive farm units or are the result of widespread advances in productivity and income affecting a large and growing fraction of farm households. To achieve the second pattern requires the progressive modernization of the existing small-scale farming systems, emphasizing new technologies and new inputs that enhance the productivity of the labour, land and knowledge already available. And the conclusion is that a critically important task to those responsible for a national food and nutrition policy is to assist in mobilizing support for a well designed and vigorously implemented strategy aimed at the progressive modernization of the millions of small-scale farm units that account for the bulk of the population in most developing countries

(Johnston, 1974b, p. 4).

By far the majority of Kenya's population gaining their livelihood from agriculture operate small-scale farms. The definition for large and small-scale farms used here is that given in the Kenya Statistical Abstract: large farms are defined as those "... which used to be included in the former 'Scheduled Areas', less those which have been transferred for subdivision into settlement schemes. ... The small farms are between 0.2 and 12 hectares though there are some outside this range. In the large farming areas, the average size of farm is over 700 hectares, though there are some relatively small units among these also" (Statistical Abstract, 1976, p. 113). The size distribution of such farms is illustrated in Tables 1.1, 1.2, 1.3.

Within the small-holding sector, approximately one-fifth of the farmers have rapidly increased their income over the last ten years, primarily due to the significant extension of cash crop farming to such farms. About another one-fifth of the farmers have effected some commercialization of their holdings, and have incomes of K£60-110 per annum.

TABLE 1.1
SIZE DISTRIBUTION OF LARGE FARMS, 1974, KENYA

Size of farm (hectares)	No. of farms	Percentage of all farms	Estimated total area* (hectares)	Percentage of all farm land
0 - 19	445	13.8	4,450	0.2
20 - 49	334	10.4	10,020	0.4
50 - 99	302	9.4	22,650	0.9
100 - 199	392	12.2	58,800	2.3
200 - 299	335	10.4	83,750	3.3
300 - 399	259	8.1	90,650	3.6
400 - 499	216	6.7	97,200	3.8
500 - 999	498	15.5	373,500	14.6
1000 - 1999	207	6.4	310,500	12.2
2000 - 3999	113	3.5	339,000	13.3
4000 - 19,999	102	3.2	1,160,000	45.5
20,000 and over	14	0.4		
All sizes	3,217	100.0	2,550,520	100.0

*This was estimated by multiplying the number of farms in each group by the average size of holdings in that group, as given by the mid-point in each size group. The residual land was attributed to farms with 4,000 hectares and more. This follows the method used by the ILO, 1972, p. 36.

Source: Calculated from Statistical Abstract, 1976, Table 93, p. 129.

TABLE 1.2

6.

SIZE DISTRIBUTION OF REGISTERED SMALL HOLDINGS, 1969, KENYA

Size of Farm (hectares)	Number		Total Area	
	Absolute figures (thousands)	Percentages	Absolute figures (thousand hectares)	Percentages
0.0-0.49	91	11.7	28	1.1
0.5-0.99	121	15.5	89	3.4
1.0-1.9	192	24.6	274	10.3
2.0-2.9	128	16.4	303	11.4
3.0-4.9	104	13.3	404	15.1
5.0-9.9	88	11.3	629	23.8
10 and over	54	7.0	923	34.9
All sizes*	777	100.0	2,646	100.0

*column total may not add up exactly owing to rounding.

Source: Statistical Abstract, 1970, Table 79 (a), page 81; and ILO, 1972, page 36. 1970 was the last year for which such data appeared in the Statistical Abstract.

TABLE 1.3

SIZE DISTRIBUTION OF REGISTERED SMALL HOLDINGS, 1969, MURANGA DISTRICT

Size of Farm (hectares)	Number		Total Area	
	Absolute figures	Percentages	Absolute Figures	Percentages
0.0-0.49	24,864	25.0	9,068	5.9
0.5-0.99	21,355	21.5	16,790	10.8
1.0-1.9	31,694	31.9	46,904	30.3
2.0-2.9	11,672	11.7	29,232	18.9
3.0-4.9	6,670	6.7	26,277	17.0
5.0-9.9	2,495	2.5	17,626	11.4
10 and over	666	0.7	8,883	5.7
All sizes	99,416	100.0	154,749	100.0

Source: Calculated from Statistical Abstract, 1970, Table 79 (a), page 81.

It will be argued that Kenya's priorities in agricultural development have exacerbated a situation inherited from colonial times. Since Independence, agricultural policies have focussed on maximizing agricultural production and maintaining the status quo of agriculture as the major foreign exchange earner. Despite the rhetoric of many development plans, the promotion of a more equitable system of income distribution in the rural areas has not been of prime concern. It is hypothesized that the pattern of agricultural development in Kenya, in general, and in Muranga District, in particular, has been one of favouring the modern subsector, that part of the rural economy already engaged in cash crop farming, whether on the large-scale or small-scale farms. The majority of farmers remain relatively unaffected by progressive modernization.

The main problem to be dealt with here, and of vital concern to establishing a more equitable form of development, is, therefore, how to involve the mass of small-scale farmers in a programme of agricultural development, the aim being to increase their level of living, given the constraints of present-day Kenya. The ILO Mission argues that such agricultural development must be based not only on the production of more of the traditional cash crops, coffee, tea, and pyrethrum, by an ever-increasing number of farmers, but also on increased food production, both to meet the needs of an expanding rural population, and an ever-growing urban population. The emphasis in this report will be on food crop production, and its relevance to the development of the small-farm sector.

A major hypothesis of this study is that to a significantly large

extent, the Kenyan agricultural extension services have been of major importance in perpetuating the uneven pattern of agricultural development inherited from the colonial spatial system. It will be argued that this has been accomplished by the extension service's concentration on the progressive farmer, at the expense of the non-progressive farmer. In addition, the women farmers have been excluded from the benefits of agricultural advice. The division of labour within Kikuyu society indicates that it is the women who produce the food crops. With the exception of hybrid maize, research in Kenya has concentrated on cash crops only, and it is with advice on the growing of these crops that the extension service has concerned itself, and therefore with male farmers.

A major assumption in the argument proposed here is that agricultural extension programmes provide a critical input to agricultural development. Support for this assumption can be found from several sources. From the field of agricultural economics, Johnston and Mellor (1961) distinguish three phases of agricultural development. Their argument is based on the premise that a substantial increase in agricultural production can be achieved through a redistribution of the resources already in that sector. Their first phase involves the development of agricultural pre-conditions such as changes in the land tenure system and attitudinal changes on the part of the rural population. This is followed by a second stage in which the expansion of the agricultural sector is based on labour-intensive, capital-saving techniques, relying to a considerable extent on complementary inputs of which the extension service is seen as a major factor. The third stage envisages a move towards capital-

intensive and labour-saving techniques. The latter two phases are distinguished by changing conditions in the demand for food, a function of the rate of population growth and income elasticity for food, and alternative employment opportunities.

Support for the assumption that the extension service is critical in Kenya is found in the work of Ascroft, Chege, Kariuki, and Roling (1971). Their research into the problem of innovation diffusion in the rural sector argues:

In a country of relatively low functional literacy and few other communication alternatives in the rural areas for receiving income-generating ideas, the extension agent stands out as the principal means by which these ideas are introduced to rural farmers. Indeed, remove the extension field worker and the whole process of rural development is likely to come to a grinding halt (Ascroft et al, 1971, p. 21).

The ILO report confirms these findings, and comments on the constraints underlying the more widespread use of extension services:

In a country with a fair amount of illiteracy and inadequate mass communication, extension workers are likely to remain a major source of information on new farming techniques and practices for many years to come. However, their use is expensive in terms both of finance and of scarce manpower. At the moment there is one trained extension worker (agricultural assistant or similar grade) to every 700 farmers - a higher ratio than in most other countries. Ensuring a more effective extension effort is therefore a matter of improving quality rather than quantity. The main effort should be directed at improving the efficiency of the present extension service by reforming its organisation, improving the quality of extension workers and redirecting its efforts

to achieve much more effective and widespread contact with the bulk of the farmers (ILO, 1972, p. 154).

With the aim of contacting a larger section of the farm population, several strategies based on communication theory and innovation diffusion theory have been proposed for the extension service in Kenya. The ILO, for example, argues that more emphasis should be placed on group and mass extension techniques instead of visits to the individual farmer, the main method at present used. Schönherr and Mbugua (1974) propose a model for innovation diffusion based on identifying the average farmer as the target for extension work. In an attempt to establish criteria on which an effective extension strategy could be based, it will be argued that radical changes are needed in the present system if development in rural areas is to be more equitable.

In order to aid in alleviating the problems identified in the rural areas, and to complement other aspects of an agricultural extension programme, it is the basic hypothesis of this paper that the traditional market place has the potential to play a role as a centre for the diffusion of certain types of innovation as well as being a locus for information gathering. The argument for this hypothesis will be based on the role of the market as an integral part of the traditional spatial system, on the multifunctional nature of the market place, and on the importance of contacting the large numbers of women farmers, the chief producers of food and sellers of foodcrops at the market, so far neglected by the extension service. For the purpose here, the market will be defined as "... an authorised public gathering of buyers and sellers of commodities,

meeting at an appointed place at regular intervals " (Hodder, 1975, p. 57). The argument will also be presented that the market place could act as a listening place for feedback up the extension service hierarchy, and could play a part in diffusing local as well as more central impulses for change (Lundqvist, 1975).

Support for consideration of the market place, with its unique relationship in the traditional spatial system, in the role outlined here can be deduced from the argument presented in a recent paper by Stöhr and Tödtling (1976). They stress the importance of social variables in addition to the traditionally-used economic variables in the measurement of the success of spatial development policies, and argue for selective regional closure in order to promote such success. They write:

... it is a commonly observed fact that with the spatial extension of communications media there exists a trend towards increasing uniformity of preference patterns. The spatial and temporal pattern of this pattern towards uniformity has been studied at great length under the euphemistic notion of innovation diffusion by prolific authors such as Brian Berry and Larry Brown. By many authors this phenomenon has ambiguously been equated with development itself (Stöhr and Tödtling, 1976, p. 28).

Further:

The (subconsciously) underlying idea may have been that they should all aspire to buy our industrial products and compete with us via the market mechanism for 'objectively' measurable variables such as real income or value of production (Stöhr and Tödtling, 1976, p. 29).

Stöhr and Tödtling contend that such a system does not lead to an increase in non-market satisfactions, such as leisure time, the comforts of 'belonging', of being useful, of retaining cultural continuity, and of

'sticking to one's habits' (Scitovsky, 1976). This argument would appear to lend support to the idea that the persistence of the market place even in the developed world indicates a need to maintain proxemic space (Hall, 1966). If the market place does meet such needs, its potential as a centre for innovation diffusion and information gathering is further supported.

In executing this piece of work, it is realized that there are limitations with regard to the analysis of the findings and conclusions drawn. Firstly, the potential role of the market place for innovation diffusion will remain speculative until tested in practice. This paper merely explores the theoretical possibilities. Secondly, surrogate variables have been used to test hypotheses in Chapter 5. The data used were gathered in a survey, 1971-1973, in Muranga District, Kenya, as part of a more general survey, and not specifically geared to test the hypotheses posed here. Thirdly, the writer was not involved in the data collection and fieldwork, and therefore has, unfortunately, no first-hand experience of this area in Kenya.

In order to explore the evidence to test the hypotheses outlined above, the report will be organized as follows: Chapter 2 is concerned with a brief history of agricultural development in Kenya, and the government's attitude towards such development. This is followed in Chapter 3 by an introduction to Muranga District and its agriculture, as a basis for hypothesis testing in Chapters 5 and 6. Chapter 4 examines the concept of change as it relates to Innovation Diffusion theory and Communication theory, with their implications for agricultural extension

strategy. Chapter 5 consists of a data-based analysis of characteristics of agriculture and extension work within 8 sublocations of Muranga District. Chapter 6 considers different facets of the topic: the market place. In this context, in 6.1 geographical research in this field in developing countries, is briefly reviewed; in 6.2, the role of the market place in the traditional Kikuyu spatial system is analysed; 6.3 concerns the market place and its relationship to regional development theories; and 6.4 is a detailed analysis of two markets within the study area of Muranga District, on the basis of which weight is given to conclusions reached in Chapter 7.

CHAPTER 2

AGRICULTURAL DEVELOPMENT:

THE GOVERNMENT OF KENYA'S ATTITUDE TO AGRICULTURAL DEVELOPMENT

2.1 Introduction

In a recent report of a Working group on Rural Development, (Foggan, 1970), the writers stress the economic importance of agriculture and the interdependence between that sector and the industrial sector in the development process. They further note the complexity of agricultural development:

There are certain basic requirements without which agricultural development cannot take place and which are universal. They are that the basic technical knowledge exists, together with the means of communicating and applying it; that the physical environment is favourable for the type of development required; that the community has the incentive and the urge to improve itself; and that there is an accessible market for its products within a sound price structure. There is no simple method of ensuring subsequent development, even when these basic requirements are met. There are, however, a number of interrelated factors controlling not only the rate, but the pattern of all agricultural development, among them the system of land tenure, the quality coverage and effectiveness of agricultural extension services and the contribution of the private sector, the ability of the farmer to obtain seeds, fertilizer and other inputs; institutions, cooperative or otherwise, for the supply and distribution of credit and inputs; the balance between hand labour and mechanization; the development of communication and markets, both internal and overseas. All

these must form part of an integrated programme for rural development (Foggan, 1970, p. 18-19).

Bishay (1974) stresses that agricultural development planning must form an integral part of national development planning. He reiterates the idea of complexity and adds other important environmental variables affecting agricultural development to those outlined above:

The nature of the sector makes it less responsive to development programmes than most other non-agricultural sectors. Agricultural production is highly dependent upon soil type, weather conditions and various natural factors. The production process is only partly subject to human control; serious fluctuations in output are often inevitable. Long 'gestation' lags between investment decisions and the actual addition to productive capital stock is a characteristic of many agricultural projects (of land reclamation programmes, big irrigation schemes, trees and forestry production and livestock breeding). Such investments are especially vulnerable to weather and other natural conditions during their maturing periods, which raises the risk element to higher than normal levels (Bishay, 1974, p. 1).

Bishay goes on to argue that against this background a sectoral plan for agriculture must be compiled, and he emphasizes the importance of the spatial aspect in development planning, because of the different conditions existing between and within regions: "For the realization of more equitable regional income distribution, the determination of agricultural investment and production plans should explicitly account for the regional differences at development level (Bishay, 1974, p. 2). Bishay writes that the plan usually stresses at least one of the following objectives: firstly, it may concentrate on maximizing the agricultural contribution to the GNP, usually measured by a certain growth rate in the output of food and

cash crops. Generally, such growth is to be achieved by a combination of improved production techniques such as new crop varieties, fertilizers; a reliance on research and improved extension services, by the application of the concept of an optimum agricultural mix for differing locations, resulting in some degree of specialization both at farm and regional levels, and implying a need for better communication and marketing facilities, and by investment programmes in, for example, irrigation or the education of skilled labour. A second objective of the plan for agricultural development may be employment creation. Reasons given for emphasis here include high rates of population increase and rural-to-urban migration. The aim is often to make the rural areas more attractive as a place in which to live. Thirdly, the development of agriculture is seen as an important vehicle for creating a more equitable system of income distribution, not only between rural and urban areas but also within the rural scene and between the large and small-scale sectors of farming. Finally, an objective of many agricultural development programmes concerns the optimization of the role of agriculture in foreign trade policies. This is evaluated in terms of the continued dominance of primary agricultural exports from the developing country. Their significance as a foreign exchange earner continues despite some growth in the export of manufactured foods. A development programme must take into account the income and price-inelasticity for many agricultural products (Bishay, 1974, p. 14-17).

In the light of the basic requirements for agricultural development, and the objectives of policies of agricultural development, Kenya's record

of development planning and implementation in this field since Independence will be considered. In this chapter it will be argued that despite the rhetoric of Development Plans, Kenya has failed to promote widespread equitable development in the rural areas. Rather the concern has been to maximize agricultural production and maintain agriculture's important role as a foreign exchange earner. It is hypothesized that the 'modern subsector' has been favoured at the expense of the majority of farmers, and this is seen largely as the result of the continued dominance of colonial structures within the agricultural sector. Chapter 3 carries this argument into the case study area of Muranga District, and deals more closely with the impact of colonialism on rural Kenya, and Kikuyu-land in particular.

Before Independence, the Kenyan economy's engine of growth was the export of agricultural produce from large-scale European farms. Sorrenson (1967), commenting on the 1939-52 period, writes, "Economic development was to be based almost entirely on the immigrant, and largely the European communities; Africans were to be regarded as a necessary labour force" (Sorrenson, 1967, p. 55). This situation prevailed despite the fact that in the 1950's, following adoption of the Swynnerton Plan, Africans were allowed to grow cash crops for sale, albeit under rigidly controlled acreages. The ILO (1972) report refers to changes following the Swynnerton Plan:

Important though these changes were, the underlying philosophy concerning economic development was largely unchanged. This was that growth, whether for Europeans or for Africans, could be sustained only by relying on skills, capital and enterprise imported from abroad (ILO, 1972, p. 85).

The inequality of conditions in rural Kenya just prior to Independence can be highlighted by reference to the fact that under 4000 European farmers owned about 3 million hectares of the best land, which constituted four-fifths of the total area of Kenya with reliable and sufficient rainfall for farming (ILO, 1972, p. 86). In addition to this, infrastructure necessary for agricultural development, roads, railways and markets, was very much geared to the needs of the White community, with the resulting concentration of development in selected areas only (Soja, 1968), (Leys, 1974). In summarising the situation, the ILO report states:

Thus Kenya at the coming of Independence inherited a very unequal economy already structured on lines which could efficiently sustain very different levels and styles of living for a tiny minority on the one hand and a very large majority on the other (ILO, 1972, p. 88).

2.2 Early Development Plans

The dual nature of the economy was certainly recognized by the first development plans, the interim plan 1964-70 and its replacement, the plan 1965/66 - 1969/70. Throughout, the battle between efficiency and equity was sustained. The latter plan emphasizes the following:

Africanization of the modern sector alone is not an answer to this problem. It only means that a minority of Africans would become privileged members of the modern sector in the dual economy. To promote national unity and realize the targets of African socialism it is imperative to break the barriers between modern and traditional sectors and thus spread the benefits of development to the rural areas and enlist the participation of all people in the development process. This argument alone is sufficient to justify a strong emphasis in agricultural development during this plan period (Plan 1965/66 - 1969/70, p. 64).

Agriculture was therefore to continue to be the basis of growth for the remainder of the economy, and was also to serve to 'brake' the flow of migrants from rural to urban areas until urban areas could cope with greatly increased numbers of people with jobs and housing. 27.3% of the proposed public sector development expenditure was to be allocated to this sector, surpassed only by the 37.4% for Basic Services (see Table 2.1).

Several policies were outlined to deal with the problem of dualism in the field of agriculture, the main one concerned with the development of the small farm sector, both in the 'former African Areas' and the 'former Scheduled Areas'. Most of the planned development expenditure in this sector, which was referred to in terms of an "agrarian Revolution", was to go to the continuation of land consolidation and registration schemes, smallholder credit, irrigation and land reclamation schemes, and range management programmes (Table 2.2). Justification for the prominence of the small farm sector was seen as follows:

It has been clearly established that productivity in the peasant farming sector will respond to economic incentives, with the help of agricultural credit and extension services (Plan, 1965/66 - 1969/70, p. 126).

This was based on such statistics as the following:

The value of recorded marketed output from small-scale farms increased on the average by 12% per year from ~~£~~5.1 million in 1955 to ~~£~~14.0 million in 1964; coffee accounted for 55% of this increase (Plan, 1965/66 - 1969/70, p. 126).

Despite the fact that a follow-up programme of agricultural credit and extension services was seen as an integral part of the development, the plans lacked detail as to how this would be implemented, aside from

TABLE 2.1
PUBLIC SECTOR DEVELOPMENT EXPENDITURE (K1000)

Sector	Plan 1965/66 - 1969/70		Plan 1970-74		Plan 1974-1978	
	Amount	% of Total	Amount	% of Total	Amount	% of Total
Agriculture	39,177	27.3	39,594	16.3	104,784	22.3
Natural Resources	6,738	4.7	7,619	3.1	10,208	2.2
Tourism	2,791	2.0	4,158	1.7	16,949	3.6
Commerce and Industry	10,135	7.1	11,323	4.7	17,486	3.7
Basic Services	53,769	37.4	112,752	46.5	126,080	26.8
Social Services	27,460	19.1	55,315	22.8	125,492	26.7
Security & Defence	3,522	2.4	6,683	2.8	8,706	1.9
Rural Development	-	-	2,500	1.0	-	-
Financial Institutions	-	-	2,725	1.1	33,280	7.1
Allowance for Unidentified Projects	-	-	-	-	9,000	1.9
Other	-	-	-	-	18,001	3.8
TOTAL	143,602	100.0	242,669	100.0	469,986	100.0

Source: Calculated from: 1. Development Plan, 1965/66-1969/70, Table 12, pages 120-122.
2. Development Plan, 1970-1974, Table 5.3, pages 148-150.
3. Development Plan, 1974-1978, page 173. (Other includes: Office of the President, Directorate of Personnel Management, Ministry of Foreign Affairs, Ministry of Home Affairs and Judicial Department).

TABLE 2.2
DEVELOPMENT EXPENDITURE ON AGRICULTURE,
LAND SETTLEMENT AND COOPERATIVES. 1965/66-1969/70

	Total (K£)	% of Total
Former African Areas		
Land consolidation and Registration	4,360,000	11.3
Smallholder credit (AFC)*	4,300,000	11.2
Development of Pastoral Areas	2,424,000	6.3
Irrigation	1,800,000	4.7
Other Land Reclamation-tsetse control	400,000	1.0
Settlement	353,000	0.9
Rural development schemes	122,000	0.3
Total Former African Areas	13,759,000	35.8
Former Scheduled Areas		
Settlement Schemes (eg. Million Acre scheme)	8,650,000	22.5
Land Transfer to large-scale farmers	3,100,000	8.1
National and transitional	2,940,000	7.7
Compassionate Case farms	1,000,000	2.6
Abandoned and mismanaged farms	1,200,000	3.1
Total Former Scheduled Areas	16,890,000	44.0
Functional Activities		
Credit (AFC-included elsewhere)	1,000,000	2.6
Research	175,000	0.5
Education and Training	600,000	1.6
A.D.C.	650,000	1.7
Soil Conservation	244,000	0.6
Total Functional Activities	2,669,000	7.0
Crop Activities		
Passion fruit	35,000	0.1
Pineapple	80,000	0.2
Tea	1,600,000	4.1
Sugar	1,400,000	3.6
Wheat	150,000	0.4
Total Crop Activities	3,265,000	8.5
Livestock Activities		
Dairying	341,000	0.9
Beef	1,094,000	2.8
Pigs	90,000	0.2
Sheep and goats	130,000	0.3
Other	191,000	0.5
Total Livestock Activities	1,846,000	4.8
Grand Total	38,429,000	100.0

*AFC - Agricultural Finance Corporation

Source: Calculated from: Development Plan, 1965/66-1969/70, Table 1, pages 127-128. (It is noted that the total here does not agree with the figures given for Agriculture in Table 2.1).

references to the establishment of various forms of cooperatives. Indeed the plan 1964/65 - 1969/70 notes that although "Kenya is now on the verge of a many-fold expansion of public credit to smallholder agriculture" (Plan, 1964/65 - 1969/70, p. 132), the loans granted through the Agricultural Finance Corporation (AFC) resulting from loan negotiations with IDB of the World Bank, would "benefit only 3% peasantry (excluding pastoralists), the 3% comprising, moreover, relatively progressive smallholders who are by definition already much better off than the rest" (Plan, 1965/66 - 1969/70, p. 133). Machinery necessary to ensure a more equitable distribution of credit was to await the development of the cooperative movement, where repayments could be secured through deductions from the produce marketed through the cooperative. Leys (1974) has strongly criticised the credit programme carried out by Kenya at this time:

"Credit thus tends to widen already existing differences of wealth and opportunity. This is particularly true when the size of a man's land holding is used as a yardstick of his credit-worthiness, or when security is seen to consist in his having a non-farm source of income such as a salary. Both yardsticks operated in the selection of smallholders for credit in Kenya (Leys, 1974, p. 99).

Agricultural research benefitted chiefly the more progressive farmer also as it was concerned primarily with cash crops, such as coffee, sugar, cotton, and livestock programmes, although research on maize also figured prominently.

The larger proportion (44.0%) of the development expenditure on agriculture in the 1965/66 - 1969/70 plan was to go to the "Former

Scheduled Areas' (Table 2.2). Indeed, one half of Government expenditure in the first three years after Independence was in this field. Of the 7.5 million acres which make up this land category, 4.1 million acres were ranches and plantations (chiefly coffee, tea and sisal) and 3.4 million acres were areas of mixed farming. In order to promote Kenyanization of this modern subsector of agriculture, the government implemented a policy of the transferral of ownership. This involved the creation of both small and large-scale farms from the former mixed farming areas.

Justification for the choice of mixed farming areas for take over was given as the fact that these areas were contiguous with African farming areas, former Reserves, which were suffering from intense population pressure, and the fact that much of the ranching land was seen as too dry for the more intensive land use of small-scale farms. Transfer of plantation land was viewed as too expensive, the cost of such land being five times that of the mixed farm land. Moreover, grants and loans were made available from the UK to effect the takeover of the mixed farms.

The Plan emphasized the importance of maintaining a high agricultural output in the areas to be Africanized, both because of the major roles played by the area as an earner of foreign exchange and as an employer, and because of the £16 million interest-bearing debt the Government had incurred to finance the scheme. It was estimated that 78% of the gross value of marketed agricultural output, and 42% total reported employment were found, in 1962, to come from the former Scheduled areas, from the mixed farming areas, the totals being 32% of the total value of marketed

produce, which made up 23% of the total agricultural exports (Plan, 1965/66 - 1969/70, p. 149).

By 1965, 0.46 million acres had been taken over intact by Africans, often in groups, on a willing-buyer, willing-seller, basis (Leys, 1974, p. 85). Twenty - forty per cent of the purchase price was often required as a deposit (Leys, 1974, p. 91) but this often led to problems, expressed as follows in the 1965/66 - 1969/70 Plan:

However it is quite clear that many of the new African large-scale farmers have run into serious trouble, first of all because most of them had to devote nearly all their savings to purchasing their farms, which left them with very little working capital to operate the farms efficiently. A number of farmers, having gone heavily into debt to purchase both farms and loose assets such as machinery and cattle, still lacked sufficient working capital to generate loan repayments, and were forced to sell off loose assets in order to meet mortgage payments. Another significant factor is that very few of them had the skills and experience required for the complex task of running a modern mixed farm. A number of these farmers had worked on European farms and acquired knowledge in one or more particular lines of activity but few had been given sufficient responsibility by their employers to master the total farm picture. Moreover, when these farmers took over their new properties the Agriculture Department staff in the mixed farming areas was not equipped to work with the farmers, help them prepare farm plans, and advise them on the many operational problems which they encountered (Plan, 1965/66 - 1969/70, p. 154-155).

There were numerous problems in loan repayments including those involving the use of political influence to obviate the necessity to pay (Leys, 1974, p. 96).

The larger proportion of the land transferred, about one-third of the total mixed farming acreage, known as the Million Acre Scheme, involved conversion to smaller farm units and cooperative farms. The High Density Settlement Schemes, with a planned average size unit of 28 acres, were designed to provide a settler with K~~25~~25-K~~70~~70 cash income after subsistence needs and loans were met. Settlers were to be chosen from unemployed and landless people with some knowledge of agriculture, priority being given to those formerly employed on the estate (Plan, 1965/66 - 1969/70). Commenting on this situation, Leys writes:

The 30,000 high-density settlers were supposed to be drawn from the country's most impoverished and underprivileged classes, yet they were being expected to pay the full cost to Kenya of an asset transfer which underwrote the profitability of the rest of the economy. For the next 25 to 30 years the surplus which they would generate by their work on the land would go mainly to the former European settlers, not to themselves (Leys, 1974, p. 82).

Other schemes, such as the Low Density scheme, aimed at an average income of ~~£~~100 above subsistence, and the 'Yeoman Scheme' aimed at ~~£~~250. Both of these schemes were for experienced farmers with substantial capital, the average plot size being 35 acres. Cooperative farms were planned for those areas judged unsuitable for small-scale farming.

By 1971, about 29,000 families were living on the high-density plots, and some 5000 in the low density areas. In addition, 450 families were settled on 'Harambee schemes' on plots aimed at giving an income of K~~40~~40-75. Squatter schemes, initiated in 1965, with plots of 4.5 hectares, were designed to meet the basic needs of 18,000 families by 1970. This latter scheme represented the lowest rung of the settlement scheme ladder

(Leys, 1974, p. 75). The Government estimated that investment in schemes in the former scheduled areas averaged K750 per family and K25 per acre, compared with investment in consolidation and registration in the former African areas, which amounted to K5 - K50 per family, and K1 - 2 per acre (Plan, 1965/66 - 1969/70, p. 126).

Several problems soon became evident in the areas of the settlement schemes. Leys (1975, p. 75) criticized them as carrying less than their potential share of the population, given the better-than-average quality of the land. There was at least a temporary decrease in output, which meant that the Government slowed down the rate of land transfer "to permit consolidation of existing schemes and ensure steady progress in the mixed economy" (Plan, 1965/66 - 1969/70, p. 149).

The problem of loan repayment loomed large. Leys (1974) comments that by 1970, 44% of the debt service and repayment charges were in arrears, and he reasons, in apparent contradiction to his earlier comments about the carrying capacity of the land, that this was due to the small size of the farms and the high percentage of income needed to repay loans. It was hoped by the Government that the settlement schemes would be on their feet after two and a half years, but even after this period there was need for Government supervision. Helleiner (1971) argues that this led to "... the build up of a relatively strong and somewhat paternalistically-oriented staff of agriculturalists strongly committed to the creation of an independent and efficient land-owning farm sector" (Helleiner, 1971, p. 37-38). He proceeds to criticise the whole strategy employed in

Kenya as based on the "orthodox Western ideology of private property" (Helleiner, 1971, p. 38).

2.3 Development Plan 1970-74

In this plan, agriculture was to receive only 16.3% of the total development expenditure, illustrating an overall decrease in emphasis on this sector (Table 2.1). The high cost of land transfer and the settlement programme, relative to the resources available for agricultural development, resulted in certain changes in this Plan. Only 21.7% of development expenditure was to go to land transfer and settlement programmes, and all new schemes were to have even smaller farms than previously (Plan, 1970-74, p. 192). Emphasis was to be given to more careful selection of loan receivers by the Agricultural Finance Corporation (AFC) and the Agricultural Development Corporation (ADC), with regard to their provision of loans for the purchase of large-scale farms.

Again, in this plan, small-scale farming was to be stressed, and the largest single item in the budget for development expenditure (15.9%) concerned land adjudication and registration of such small farms (Table 2.3). Emphasis was also placed on the provision of infrastructure for small-scale farming. For example:

The Government recognizes that lack of agricultural credit has been an important constraint in agricultural development and aims to inject a total of K24.7 million into the agricultural credit programme by 1974 and to find ways to overcome the serious problems facing the provision of credit to small-scale farmers (Plan, 1970-74, p. 11),

TABLE 2.3
DEVELOPMENT EXPENDITURE ON AGRICULTURE,
LAND SETTLEMENT AND COÖPERATIVES. 1970-74. (K£'000)

Item	Total	% of Total
1. Land Settlement*	5,559	14.0
2. Transfer and Development of Large-Scale Farms	3,068	7.7
3. Land Adjudication	6,295	15.9
4. Livestock Development (excluding research, education and credit for range areas)	4,526	11.4
5. Research	3,217	8.1
6. Agricultural Education and Extension	2,199	5.6
7. Credit for Small-Scale Farmers and Farmers in Range Areas	4,748	12.0
8. Irrigation	2,526	6.4
9. Sugar	4,108	10.4
10. Tea	1,185	3.0
11. Wheat and Maize Storage	863	2.2
12. Miscellaneous	1,300	3.3
Total	39,594	100.0

*Since the inception of the Million Acre Settlement Scheme Government expenditure on settlement administration and agricultural extension on settlement schemes has been classified as development expenditure. Now that these settlement schemes are essentially established, this expenditure is more of a recurrent nature. It is therefore excluded here.

Source: Calculated from: Development Plan, 1970-74, Table 8.2, page 195.

Such problems were to be overcome through cooperatives, which, it was noted, would take time to develop. The AFC was to be concerned only with medium term development loans for small-scale farmers, which the Plan admits, by the beginning of 1968, had affected only 1% of the small-scale farmers (Plan, 1970-74, p. 217).

There was also to be an expansion of agricultural education programmes, chiefly in the context of the 29 Farmer Training Centres and the provision of 5 additional ones. The extension service was to be reorganized. The 1970-74 Plan was more specific regarding this than previous plans had been (Gerhart, 1971). The extension service was to be made into a unified system, rather than the joint responsibility of the Veterinary Department and the Department of Agriculture. The purpose was to create a cadre of extension workers whose knowledge would be on a wide range of topics applicable to the farmer, rather than the previous system under which farmers obtained advice from several specialists. The Plan notes:

The great majority of these specialists had concentrated on the largely technical problems of particular aspects of agricultural production and were not always well qualified to advise farmers on the most appropriate policies from the standpoint of the farm business as a whole (Plan, 1970-74, p. 219).

The new Extension Service would provide in-service training for extension workers particularly in the fields of technological advance and farm management. In the past, extension work had involved visits to individual farmers, demonstration plots, farm field days and the use of the mass media. The Plan announced that there would be more emphasis on group extension methods, although no specifics were noted except for the possible

increased use of the mass media as levels of education and literacy increased. The following comment also appeared in the Plan; "Despite its importance, rather little is known about the effectiveness of agricultural extension" (Plan, 1970-74, p. 220). This was hoped to be remedied by carrying out evaluation of the existing services. No mention was made in the plan of who were the chief beneficiaries of the extension service, despite the fact that the latter was concerned primarily with the development of cash crop agriculture.

A similar emphasis on the increased production of cash crops was evident in the allocations made for agricultural research, especially for the field of new cash crop development, the aim being to diversify the export base. Money was also allocated to research into farm management and mechanization, particularly with regard to appropriate technology.

The 1970-74 Plan introduced a Special Rural Development Project (SRDP) which was also to have impact in the agricultural sector. Pilot projects were to be established in 14 districts throughout the country, the aim being to increase agricultural output and raise incomes and employment opportunities in the areas concerned. The main criterion for selection of the sites was to the replicability of the experiment elsewhere. A cross section of the basic ecological zones and major crop areas, with varying levels of development was chosen. The first six schemes to be implemented involved combinations of the following elements: credit to shops, stocking agricultural inputs, improved livestock marketing, a coordinated extension programme, a family planning and child care programme, smallholder seasonal crop credit schemes and

functional literacy programmes (Gerhart, 1971). Later plans (1974-78) have recognized the importance of the experimental component of the SRDP, and the programme is now administered under the respective ministries concerned, rather than operating on a separate budget. The SRDP has been attacked on several accounts including the criticism that local participation in planning and implementation has not been as active as hoped. Livingstone (1976) has commented on the ambitiousness of the programme:

And it could be argued that the SRDP fell between the two stools of experimentation and innovation on the one hand, and integrated area development on the other. For, while the available finance was hardly sufficient to support integrated programmes in these areas in order to produce a significant development impact, the absorption of a considerable proportion of funds into non-experimental projects and into the normal on-going activity of the various ministries operating locally reduced the amount available for genuinely experimental or innovative projects
(Livingstone, 1976, p. 19).

2.4 The Development Plan 1974-78 and the ILO Mission to Kenya, 1972

Shortcomings in previous planning were exposed by an ILO Mission to Kenya, whose report, published in 1972, recommended a series of steps to improve the different sectors of the economy. The recommendations concerning agriculture contained in this Report will be related here to the current Development Plan.

The chief concerns of the Mission were Kenya's ability to meet its rising food needs, and secondly, the contribution of agricultural produce

to industry and foreign exchange earnings. The Report states:

Whether one approaches the task from the angle of raising rural incomes and providing increased employment opportunities or of meeting increasing demand, an agricultural growth rate of 6% a year is needed, in comparison with a (not discreditable) rate of apparently between 4 and 5% in the period 1964-70. To achieve this acceleration while directing more opportunities and resources to the poorer, more backward, farmers is the challenge in this sector (ILO, 1972, p. 152).

The current 1974-78 Development Plan states that the policies contained within it are a continuation of former plans, but the relative importance of priorities have changed to those of increasing employment and the promotion of a more equitable system of income distribution (Plan, 1974-78, p. 2). The specific goals of the Plan for agriculture are enumerated as follows: a 6-7% target of growth of marketed production, to be achieved primarily through more intensive use of the land; a more equitable distribution of rural income by increasing the numbers of farmers growing cash crops; a more equitable regional balance of development; increased employment opportunities in the rural sector; improved nutritional standards in the rural areas; increased agricultural exports; the completion of Kenyanization of the large-scale mixed farms, and progress towards Kenyanization of the ranches and plantations (Plan, 1974-78, p. 197). It was planned to at least double development expenditures in agriculture compared to the previous Plan period (Table 2.1 and 2.4). The Plan saw the chief constraints in agriculture as being:

Knowledge, technology, and credit. Development strategy will therefore concentrate on extension services, training, research, credit, improved supplies of farm inputs, veterinary

TABLE 2.4

AGRICULTURE, LAND SETTLEMENT AND COOPERATIVES

PLANNED DEVELOPMENT EXPENDITURE (K\$million) 1974-78.

Item	Total	% of Total
1. Land Adjudication	9.08	10.1
2. Land Settlement	12.74	14.1
3. Farm Credit (AFC)	19.27	21.4
4. Crop Development	17.62	19.5
5. Livestock Development	15.41	17.1
6. Irrigation	5.74	6.4
7. Cooperatives	3.01	3.3
8. Education, Training and Research	2.85	3.2
9. Agricultural Development Corporation	2.23	2.6
10. Soil Conservation and Land Development	0.76	0.8
11. Projects not yet planned	1.50	1.7
TOTAL	90.21	100.0

Source: Calculated from: Development Plan, 1974-78, Table 10.2, page 202.
 (It is noted that the total here does not agree with that for the sector 'Agriculture' in Table 2.1).

services and markets and cooperatives
(Plan, 1974-78, p. 18).

The ILO Mission's recommendation of concentration on the small-farm sector is taken up by the Plan. The ILO Report recommended a 3-directional thrust in its strategy, the first, to be dealt with here, involves the improvement of farming methods. Noting that the largest number of farmers had small-scale plots, the Mission stressed the need for an intensification of land use, in order to accomplish which, changes would be needed in fields such as agricultural extension, research, credit, farm inputs, pricing policy and marketing. The Mission recommended the rapid introduction of hybrid maize, with improved husbandry practices as a basis for increasing food crops and releasing land for cash crops on small-scale farms (ILO, 1972, p. 161). Once a farmer has succeeded in increasing the productivity of his food crops, the ILO Report recommended the introduction of a suitable cash crop or livestock for market:

For an employment strategy, the most desirable commodities are those which have a high labour requirement per hectare; do not have a marked seasonal labour requirement that clashes with other crops; yield a high return per hectare; and have favourable long-term market prospects (ILO, 1972, p. 162).

Pyrethrum, tea, horticultural crops, and possibly coffee, depending on International Coffee Agreement quotas, were recommended as cash crops.

The 1974-78 Plan justifies a concentration on the small farm sector as creating a more rational use of investment in terms of the existing factor proportions of land, labour and capital (Plan, 1974-78, p. 197).

The extension services were seen as one of the means of effecting increased productivity in the small-scale farm sector. The ILO Mission criticized Kenya for concentrating on the most progressive farmers, and in particular on male farmers, when in fact many farms were managed entirely by women.* Even on those farms owned by men, women are the chief producers of food crops. The Mission recommended a strategy involving group extension work, either along the lines of Ascroft et al's (1971) plans in the SRDP Project in Tetu Division, where farmers were to be categorized according to their progressiveness and given correspondingly relevant courses at local FTCS, or by a strategy concentrating on a group of farmers neglected in the past. The 32 FTCS were seen as needing not only expansion, as at the time of the Report they could contact only 96,000 farmers a year (and thus it would take over 12 years to reach the 1.2 million farmers in the country once), but also a better organization and a higher quality of experienced staff (ILO, 1972, p. 154). In order that extension workers increase rapport with farmers, the Mission recommended that they not be responsible for policing duties. Rather, they recommended the formation of a staff of "rural guards" whose role would be the enforcement of measures such as combatting soil erosion and controlling diseases and pests (ILO, 1972, p. 155). Although the Plan did not mention the formation of such a cadre, it did stress that soil conservation services could be improved, and that the problem would be tackled chiefly through education. Legal action would be taken where there was serious abuse.

* In Muranga District, 29.4% of the farms surveyed were owned by women (Kimani and Taylor, 1973, Farm File, Computer Programme).

The Plan argues that with greater emphasis on small-scale farming methods and the expected increase in cash crop production from small farms, agricultural extension would have added significance, and would be used in future to reach a high proportion of Kenya's farmers, avoiding the former concentration on the more progressive farmers. The Plan states:

Because of the overriding need to reach the majority of Kenya's farmers, the extension service will be placing more reliance on the mass media and group approaches than individual farm visits. The enormous strides made in education and literacy in recent years will make this task much easier (Plan, 1974-78, p. 206).

It is planned to increase in size the Agricultural Information Centre to meet some of these needs, and to produce further extension handbooks.

Education is seen by the Plan as an integral part of the extension programme, not just of the farmers, but also of the extension agents themselves. It was decided to create a new Extension and Training Division to meet these needs, and increase the efficiency of the extension sector. In addition, the Government planned expansion of the Faculty of Agriculture and the Faculty of Veterinary Services at the University of Nairobi, of Egerton College, and several other Institutions where courses for Animal Health Assistants (AHAs) and Range Assistants are held for periods of a few weeks to 2 years. Inservice training, begun in 1972, was to be continued for Junior Agricultural Assistants (JAAs) in order to upgrade the quality of such staff who are most frequently in contact with the farmers (Plan, 1974-78, p. 203). It is noticeable that the Plan makes no reference to specific needs of women farmers in this context.

Research, seen as a priority in the new Plan, was also stressed by the ILO Mission which recommended a much closer relationship between the extension service and research institutions. The latter had in the past failed to effectively disseminate its results, and had also failed to be informed of research needs identified by extension workers (ILO, 1972, p. 147). The agricultural research programme in Kenya was criticized by the Mission also because in the past it had concentrated on cash crops and stock relevant to the large farm and estate sector. The Report states that neglect of the small farm sector:

... has not been without cost to the country, for much of the expenditure on famine relief might have been avoided if more research had been conducted on appropriate farming systems for drought prone areas (ILO, 1972, p. 146).

Other criticisms by the ILO concern the 'ivory tower' image of research stations, and their dissemination of research information in forms inapplicable to most farmers, such as in scientific journals. The Mission therefore recommended a switch in emphasis to research on crops and livestock for small-scale farms:

If hybrid maize has its desired effect in reducing the area which the individual farmer must devote to food crops, it will be essential to consider what other crops and livestock can be incorporated into a very small farming system. This will require intensification of agricultural and economic research aimed at making the small and very small farms more productive and profitable by giving high priority to horticulture, pulses, stall-fed animals, pigs and poultry, pasture improvement, fodder, fishponds, bee-keeping, cheap and simple methods of controlling pests and diseases and appropriate forms of small farm mechanization (ILO, 1972, p. 146).

It was recommended that the farm mechanization research centre at Nakuru be expanded to meet such needs of designing appropriate technology (ILO, 1972, p. 394). Specifically the ILO Report recommended projects such as the production of a small machine to determine the more concentrated planting patterns for hybrid maize. This would decrease the amount of labour needed for planting, but would increase land yields and possibly employment at harvest time. Such ideas as put forward by the ILO, are reiterated by Lele (1974) who calls for "technological packages" appropriate not only to a research station, but also on small farmers' fields. Johnston (1974b) emphasizes the need for additional research on divisible innovations for the small farmer.

In order to coordinate research carried out by the different ministries, Universities, East African Community and the statutory boards, the 1974-78 Plan, placing research as a high priority in its agricultural programme, proposed the creation of an Agricultural Advisory Research Committee. Table 2.5 shows the planned development expenditure in the different research sectors, and it does appear that the small-farm sector will benefit from at least some, such as the emphasis on horticulture and maize. The Plan also specified three areas of research where new projects would be initiated, as recommended by the ILO. These included an emphasis on the development of the drier areas; research into mechanization suitable for the small farm; and the development of oil seeds and pulses. Other recommendations by the ILO such as the setting up of farm testing stations in the various ecological zones of the country were not put into effect.

Another area of concern to the ILO Mission was the emphasis in Kenya

TABLE 2.5

AGRICULTURAL* RESEARCH: PLANNED DEVELOPMENT EXPENDITURES, 1974 - 78.

	Plan Total (K'000)
Maize Agronomy	155
Pasture	230
Horticulture	131
Coconuts and tree crops	68
Wheat	40
Sugar	37
Cotton	96
Potatoes	64
Beans	134
Oil Seeds	76
Irrigation	93
Dryland Farming	159
Soils	169
Mechanization	100
Miscellaneous	148
TOTAL	1,700

* Livestock are dealt with separately in the Plan, and Veterinary Service Research is divided among several different branches, and is therefore not included here.

Source: Development Plan 1974/78, Table 10.5, page 208.

on the provision of credit to the larger-scale rather than to the small-scale farmers. The Mission recommended that the commercial banks be encouraged to become more involved in loans to the larger farmers, which would free the AFC to step up its present commitment to the small farm sector. The success of the Cooperative Production Credit Scheme was noted in the field of extending seasonal credit to smallholders through cooperative societies. Again, however, it was noted, that until the cooperative movement was more widespread in Kenya's rural areas, the majority of small-scale farmers would not be reached. A major constraint to this programme would be its limitation to those areas where cash crops were produced and marketing done through the cooperatives. The results of an SRDP programme in Vihiga suggested alternate approaches to supplying credit to smallholders: credit could be linked with extension advice; intermediaries between the farmer and credit agency could collect the loans, reducing the cost per loan, and enabling each loan administrator to handle more loans; credit could also be extended in kind rather than cash (ILO, 1972, p. 157).

The 1974-78 Plan accepts such evaluations as the ILO's of former credit programmes. It comments, for example, that of the total loans, K14.2 million, made by the AFC in 1972, K12.0 million was allocated to 2500 large-scale farmers and ranchers, compared to K2.5 million to 14,500 small-scale farmers. In addition, K3.1 million went to 5500 maize and wheat producers under the Government's system of Advances on the GMR (Guaranteed Minimum Return) programme for wheat and maize, a programme restricted to farmers with a minimum of 6 hectares of wheat or maize. This programme, administered by the AFC was to be continued under

the present plan (Plan, 1974-78, p. 212). In order to attempt to remedy the lack of credit to smallholders, the Government planned to increase funds firstly, to the AFC for medium-term loans to that sector, secondly to the CPCS (Cooperative Production Credit Scheme), the main source of small-farmer credit until the present, and to pilot schemes run as part of the SRDP. The CPCS provides short-term production loans for periods up to 18 months, and is a low cost scheme as it necessitates little additional administration. In 1972, over 25,000 loans were issued through 91 cooperatives, at a value of K270,000, each loan averaging K10.00. It was expected that the number of loans would increase to 100,000 by 1978 (Plan, 1974-78, p. 211).

With regard to agricultural inputs, mentioned by the Plan as an area of constraint in agricultural development, the ILO Mission noted that the benefits again accrued mainly to the larger-scale farmers, as evidenced, for example, by the fertilizer subsidy. They write:

... in 1969 about 80% of the K700,000 subsidy accrued to large farms and estates. These numbered no more than 3000. Even the small farmers using fertilizers are likely to be, on average, the more prosperous farmers who are growing cash crops. There is also a possibility, given the mechanics of the fertilizer subsidy system and the pricing policy of importers, that part of the subsidy actually goes to importers of fertilizers (ILO, 1972, p. 433).

The Mission therefore recommended alternative strategies aimed at benefiting the smallholder. These included a subsidy to cover the costs of reducing the size of many inputs, such as packaged fertilizer, which were currently sold on the market in a form too large to be purchased by the small-scale farmer. It was also recommended that subsidised

fertilizer be supplied together with hybrid maize seed after training courses at FTC's. In response to this, the 1974-78 plan includes a loan programme for stockists of farm inputs to make the farm inputs available to the small farm sector.

Rather than advocating a complex pricing policy for agricultural goods, the Mission recommended improving marketing, and reducing transport costs through a programme of increased feeder roads linking the more inaccessible rural areas with markets. The lack of such feeder roads is a direct heritage from colonial days when the only rural areas adequately served by such infrastructure were in the White Highlands. The 1974-78 Plan follows this recommendation by outlining a programme for such development of feeder roads, and in particular, the development of Sugar Roads, Tea Roads and Rice Roads. The pricing policy of the Government on some goods is however to be continued, to be relaxed when there is less pressure from inflation (Plan, 1974-78, p. 199). At present, the prices for tea, coffee and sisal are regulated by world market prices, but the Government fixes prices for maize, wheat, rice, sugar cane, beef and milk.

The marketing system in Kenya of agricultural produce is criticized by the ILO Mission as being inefficient. It involves cooperative societies marketing, marketing boards, and the structure of statutory controls on marketing, such as maize. Referring to the latter, the Report states:

These arrangements date in large part from the system established before independence, in quite different circumstances. It is time they were thoroughly re-examined in the light

of the needs of a more broadly based employment strategy (ILO, 1972, p. 160).

Leys (1974) strongly criticizes the marketing boards, controlled by large farmer interests. Quoting the Stamp Report of 1965*, and then commenting on it, he argues:

Prices ... have tended to be biased to the requirements and, to some extent, to the cost of production of the large-scale producer.... The mission thought a reorganisation urgent, before 'the pressure of political and justifiable discontent in some sectors results either in the removal of the Boards altogether, or in their reorganisation merely to the advantage of a different political sector.' The same fears would have been expressed not only about marketing boards, but also about the quasi-public, quasi-private bodies, fully controlled by large farmers, such as the Kenya Cooperative Creameries (KCC), the Kenya Farmers' Association (KFA), and the Kenya Coffee Producers' Union (KCPU); but by 1965 it was already too late. The process of Africanization of the large farm sector was paralleled by the Africanization of all these bodies. The main effect was to widen the concept of the 'large farmer' to include the bigger landowners in the former reserves, whose spokesmen were now included in the policy-making structure. Apart from this, it was a case of plus ça change, plus c'est la même chose (Leys, 1974, p. 103).

The Government in its 1974-78 Plan does recognize some of the limits of the marketing boards, although not in the terms mentioned above. Those boards concerned with export crops such as coffee and pyrethrum are to remain, as it is seen as advantageous to have one body dealing with export negotiations, but marketing boards concerned with local food commodities, such as maize, wheat, rice, and sugar will cease to be monopoly organizations,

* Stamp Report, 1965, 'Report of the Mission Appointed to Advise on Proposals for a Further Transfer of European Farmer in Kenya', pp. 114-117.

although their functions as price stabilizers will continue. The Maize Marketing Board will have the additional responsibility of maintaining a maize reserve.

The second thrust of the agricultural strategy recommended by the ILO Mission involves land redistribution. As has already been mentioned, the Mission favours small-scale, labour-intensive farm holdings, and illustrates the point with reference to a survey in Trans-Nzoia District, 1970-71, and the fact that smaller holdings have, on the average, a higher percentage of their land under crops, higher output, and more employment. They write:

While one can understand the political situation which led originally to the direct transfer of many large farms on the attainment of national independence, a sufficient number of years have now passed for a thorough reappraisal of the need to retain large-scale agriculture in the high potential areas in its existing form (ILO, 1972, p. 167).

They continue:

In view of the rapid growth of the rural population, it was extremely naive to think that land consolidation could or should take place once and for all. Such consolidation must be continuous, adjusting the pattern of individual farming units to the changing population density (ILO, 1972, p. 167-8).

The Mission recommends that wherever the output per unit of land on a large farm is less than that possible on a small farm of about 2-3 hectares, redistribution should be carried out. They even recommend redistribution of the larger farms in Settlement Schemes such as the Million Acres Scheme, as output, net profit, the number of the family employed, and

hired labourers decrease once plots are larger than 6-8 hectares in size. The Mission suggests the creation of either individual plots or cooperative farms, with the Government acting either as a willing buyer, or when poor farming husbandry or underutilization of the land is evident, taking a more aggressive role. Rather than selling the land on a freehold basis, the Mission supports ownership of the land invested in the Government, which would then offer land for leasehold for 10-15 years, rather than the present 99 year lease. This would enable the Government to have more control over land use.

Regarding land redistribution, the 1974-78 plan states that large farms will continue to be subdivided to encourage more intensive land use: "Large-scale farms will be retained intact only to the extent necessary to ensure sufficient supplies of those products which can be best produced on a large-scale basis" (Plan, 1974-78, p. 199). The products involved would be those chiefly on farms operated by the ADC such as those growing wheat and hybrid maize seed, and for the breeding of livestock. It is planned that some of the subdivided land will be formed into settlement schemes of the "shirika" type, started in 1971, in which each settler has his own hectare for food production, held on a leasehold basis with an annual rent of 5% land value, the rest of the land being farmed collectively. The annual target income for the scheme is K260 in addition to subsistence. 350,000 new holdings are to be created from large farms and low density settlement schemes by 1978. The Plan also states that a land tax may be introduced to encourage more intensive land use, and possibly also a tax on certain types of mechanisation which discourage employment (Plan, 1974-

78, p. 8). No mention is made of introducing shorter leaseholds.

Despite such stated emphasis on the small farm however, the Plan goes on to reaffirm its recognition of the economic importance of the large farm sector, that 48% of the gross marketed agricultural production came from this sector in 1972, and stresses the fact that Government programmes such as credit through the AFC will continue to support farmers where there is a shortage of capital and a lack of experience in management (Plan, 1974-78, p. 199).

The third and final thrust of the ILO Mission's strategy for agricultural development concerns the settlement of unused and underutilised land in wide-ranging parts of the country, areas with both high and low potential. The Mission recommends phased settlement programmes in these areas, with adequate planning and the provision of infrastructure. Irrigation schemes were recommended for some of the areas. Particularly, such programmes will be aimed at areas of high potential at a medium altitude, or at the coast, where a major constraint to development has been the narrow variety of suitable cash crops, and in the more arid areas where extensive livestock rearing is to be promoted.

The underutilisation of parts of the country is recognized in the 1974-78 Plan which proposes the development of integrated crop development programmes for each of the four areas it recognizes: areas of highest potential at high altitudes, areas of high potential at medium altitudes and the coast, areas of medium potential, and the more arid areas. Irrigation schemes are to be of greater importance in the future owing to increased population pressure.

2.5 Conclusion

Kenya's current development plan is going some distance, in theory at least, towards meeting recommendations made by the ILO Mission, particularly with regard to the increased emphasis on the small farm sector. It is interesting to note in this regard figures from the 1976 Economic Survey for Kenya, concerning the Gross Marketed Production (GMP) from large and small farms for 1975. In 1963, smallholdings' GMP was valued at K12.4 million, a 25% share of the total. By 1972 this had risen to K54.8 Million, a share of 52% of the total (Economic Survey, 1976, p. 8). Certain cash crops are now produced principally by small farmers: 90% pyrethrum comes from smallholders, all the paddy rice is produced by small farms, as is most of the tea and coffee. Dairy cattle and horticultural crops are becoming increasingly important (Plan, 1974-78, p. 235). However, despite the increasing prosperity of those farmers within the small-farm sector who produce cash crops, those considered to be progressive, and who benefit most from agricultural inputs such as extension advice and credit, there remains a significant number of small scale farmers, estimated as 3/5 of the total (ILO, 1972, p. 35-57), often those with the smallest acreages, unaffected by the impact of developmental financing.

The National Development Plan as yet makes no specific reference to regional planning and budgeting which Bishay (1974), as mentioned previously, argues is an essential element in decreasing disparities in development between regions.

Whether the message of the current Plan is more than rhetoric will have to await evaluation with time. Leys (1974) argues strongly that the

Government's commitment to neo-colonialistic capitalism will prevent any substantial move towards removing inter- and intra-regional inequalities.

Referring to sessional Paper No. 10 of 1973 on Employment, Nairobi, he writes:

Although this new document was rather general in the commitments it made, its main thrust was clear enough. Most of the Mission's recommendations on the informal sector would be adopted. Those on the redistribution of income and assets would be adopted wherever they did not seriously offend the established interests of capital, i.e. very circumspectly, if at all, as regards the salariat and the large-scale farmers, for instance, though with more vigour as regards unionized labour; while the Government declared itself determined to give priority in all its policies to the 60 per cent of households earning less than K60 per year, and above all to 'those who are absolutely landless and without work and pastoralists in semi-arid and arid areas', and to try to provide either a wage job or land to everyone by 1980.

... Where the ILO Mission differed from the Government was that it was much less sensitive to the interests of the middle and higher bureaucracy, and of the large-scale farmers and the auxiliary bourgeoisie and those pressing to join them; interests which depended on multiple forms of protection and monopoly and were thus basically opposed to the changes which the Mission had in mind (Leys, 1974, p. 270-271).

Leys furthers his argument by contending that the ILO's strategy of redistribution from growth will be ineffectual in solving Kenya's developmental problems. This hypothesis he bases on the fact that to accept recommendations such as cuts in income and increased taxes for the wealthy,

or reduced acreages for a large-scale farmer, would be out of character for those in power: .

The obvious puzzle presented by these proposals is what incentive the Mission thought all these groups - the heart and soul of the alliance of domestic and foreign capital - might possibly have for making such sacrifices (Leys, 1974, p. 262).

Leys criticizes the Mission for judging the situation in Kenya to be only an "imbalance" with a series of "conflicts of interests" which the leaders could resolve:

The Mission saw that poverty and unemployment were connected with 'income inequality' and that this in turn was linked to the role of 'foreign capital' (in the sense of foreign companies producing capital-intensively for narrow markets of relatively affluent consumers). But it did not see that these in turn were an expression of, and a condition for, the power structure in Kenya and in the international capitalist system as a whole (Leys, 1974, p. 264).

Leys argues that the Mission treats inequality as something produced in the past "rather than as constantly developing and evolving as the result not merely of continued old policies, but of new policies adopted since independence which extended inequality in fresh ways"(Leys, 1974, p. 265). Equality he therefore considers an unattainable goal given present political structures in Kenya.

CHAPTER 3

AGRICULTURAL DEVELOPMENT:

AN INTRODUCTION TO MURANGA DISTRICT, CENTRAL PROVINCE, KENYA

3.1 Introduction

In his writings on development, Brookfield (1972, 1973) refers to the interaction of two forces - an intrusive or invasive, colonizing and centralized system with strong external linkages, and a residentiary system composed primarily of series of interpersonal links and which has little centralization and a lack of external networks. The invasive system tends to change the indigenous society as a result of linkages with the outside world, whereas in response, the residentiary system attempts to keep local control and generally opposes the move to a state of dependency. The two forces are however seen as unequal. Colonialism, the stronger force, is defined by Brookfield as:

... a thoroughgoing, comprehensive and deliberate penetration of a local or 'residentiary' system by the agents of an external system, who aim to restructure the patterns of organization, resource use, circulation and outlook so as to bring them into a linked relationship with their own system. The objective is an externally wrought or guided transformation of the residentiary system, revolutionary in the sense that it involves termination or diversion of former evolutionary trends (Brookfield, 1972, p. 1).

'Independence' is here taken as the converse of this process, as the whole reaction of the residentiary system with the object of either retaining or regaining control both of its own evolution and its relationships with other systems. The defence or acquisition of political independence is the most obvious expression of this process, hence the use of this term in this context. However, independence may be sought in both economic and cultural fields as well, and vigorous conflict between 'colonial' and 'independent' forces may take place in these areas within a context of complete political independence,.... (Brookfield, 1972, p. 2).

The pattern of interaction between a residentiary system and colonial system in Kikuyuland can be identified by referring to agricultural developments which have taken place in the twentieth century in Muranga District. It is the purpose of this section to provide a background to the area of case study in this report, in which the major hypotheses outlined in the introduction can be tested. In doing so, it will be argued that the present ordering of the structures relevant to agricultural development owes much to the impact of colonialism on the residentiary system.

3.2 The Resource Base

Muranga District, together with the Districts of Nyeri and Kiambu comprise the land of the Kikuyu in the Central Province of Kenya (Fig. 3.1). The predominant physical feature of the landscape here is the deeply dissected volcanic plateau which falls from 3657 m in the West at the edge of the Aberdare Mountains to 1219 m in the East (Taylor, 1969, p. 463). Parallel ridges run West-East, divided by streams flowing from the

Figure 3.1
LOCATION OF MURANGA DISTRICT, KENYA

Aberdares in a generally easterly direction to join, in most cases, the River Tana. The dissected nature of the country has had an important influence on human spatial patterns.

The Kikuyu plateau can be divided into three altitudinal and ecological zones which run roughly north-south (Fig. 3.2). High Kikuyu, lying between 1800 m and 2250 m, has over 1400 mm of rain per annum; Middle Kikuyu, 1500 m to 1800 m, with a rainfall of 1140 - 1400 mm, is the most populated zone; Low Kikuyu, the land below 1500 m has the least reliable rainfall, averaging 1140 mm a year. The precipitation is seasonal in nature: the Long Rains occur between March and June, the Short Rains between October and December. Temperatures are moderate, the mean annual temperature being 10 - 15°C, providing the Plateau with a year-round growing season (Kimani and Taylor, 1973, p. 8). This factor and the general fertility of the soils, deep red earths formed from the volcanic tuffs and with a deep humus component from a former forest cover, have contributed to making this an area of intensive agriculture, and supportive of a high rural population density (Sorrenson, 1967, p. 3).

The 1969 Census showed the population of Muranga District to be 445,000, the density being 180 per square kilometre, making Muranga the fourth most densely populated rural district of Kenya. These figures include the Makuyu Division of the District, which Division in 1969 consisted primarily of European estates, and whose density averaged only 59 persons per square kilometre. The other Divisions show much greater densities, and are areas of African small-scale farming: Kigumo 132 persons per square kilometre; Kiharu 226; Kangema 251; and Kandara 302.

Figure 3.2

CROSS SECTION OF THE KIKUYU PLATEAU

Source: Taylor, 1967, p. 122.

(Kenya Population Census, 1969, Volume 1). Figure 3.3 shows the location of these divisions. More recent figures show the estimated average density of Muranga District to be 201 per square kilometre in 1974, with an expected increase to 236 per square kilometre by 1978 (Plan, 1974-78, p. 101).

3.3 Land Tenure Systems

The traditional or residentiary agricultural system of Kikuyu county was based on a pattern of dispersed households, mucii, located usually on the edge of a ridge. The land around, ngündũ was farmed by the individual family and formed an economically self-sufficient unit (Sorrenson, 1967, p. 4). The farm extended generally from the ridge top to valley floor, thus providing the family with a variety of soil conditions. Often the land comprising one ngündũ was fragmented, the result of inheritance traditions among the Kikuyu, whereby plots farmed by the mother were divided equally between the sons.

A mixed farming economy was practiced. Each household cultivated on the average 3.675 acres, on which both seasonal and perennial crops were found. The major seasonal crop was millet, or mwere, planted during the short rains. Beans were the chief long rains crop, with some sorghum and maize also being grown (Taylor, 1969, p. 465). Of the perennial crops, bananas, sweet potatoes, colocasia and yams were widely grown. In addition to such cultivation, sheep and goats formed an integral part of the traditional economy, and were looked after communally on the uncultivated land of the mbari (see below). Later, cattle, acquired

FIGURE 3.3

MURANGA DISTRICT: ADMINISTRATIVE BOUNDARIES AND THE
LOCATION OF SUBLOCATIONS FOR CASE STUDY

FIGURE 3.3

DISTRICT: ADMINISTRATIVE BOUNDARIES AND THE
LOCATION OF SUBLOCATIONS FOR CASE STUDY

particularly from trade with the Masai, became an important source of milk as well as being a status symbol. Dung from the livestock was sometimes applied to the land, although its use was restricted as dung heaps were also the burial ground for calves and still-born children.

Within this system, the tasks of clearing the land, tending some crops, such as tree crops, and looking after the livestock were the men's responsibilities, whereas women were concerned with the planting, weeding and harvesting of food crops.

Within Kikuyu society each household joined part of a larger social unit, the mbari:

The mbari was a lineage grouping of all Kikuyu who traced their descent through the male line from a known ancestor. But, because of the continuing processes of growth and fusion in Kikuyu society, a mbari could consist of anything from an extended family to a sub-clan, and this of anything from a few dozen people to a few thousand, depending on the prosperity of the mbari (Sorrenson, 1967, p. 5).

The total amount of land owned by a mbari was referred to as the githaka. The githaka system of land tenure has been variously interpreted. Early Europeans considered the land to be held communally by the tribe, but Sorrenson (1967) and Taylor (1969) argue otherwise. Sorrenson writes:

As has been suggested, the landowning unit was the mbari the members of which traced their descent from a known male ancestor Originally the ownership of the land and the authority over it was vested in the founder..... On the death of the founder the usufruct of the land passed to his sons in such a way that they had equal shares of the land cultivated by their mother. On the other hand, the authority over the githaka (the status of

muramati) passed to a single heir, usually the first born son. The muramati was responsible for re-allocating land within the githaka and had a final veto on the admission of tenants and the alienation of land to strangers. But he did not have a greater share of cultivated land than other male heirs. Usually, if a right holder wished to sell land to an outsider he had first to offer it to members of the mbari; if they refused it and the muramati approved, the land could be sold. But some mbari placed a total embargo on alienation to non-mbari members. It was in these respects that something less than a full individual title emerged after the death of the founder, even though the land continued to be utilized on the basis of individual households (Sorrenson, 1967, p. 10).

Several types of tenancies existed within the githaka system. Two of the principal ways involved contractual tenancies: the mugari was given the use of land in return for the loan of stock; the muhoi received cultivation rights on the basis of friendship. Such tenancies could be terminated by the redemption of stock in the former case, or after the harvest had been reaped by the muhoi in the latter. A second class of tenancies were based on status ties, such as the muthori relationship, in which a father-in-law gave the use of land to a son-in-law, who himself received no title, but any children inherited according to the usual Kikuyu custom (Sorrenson, 1967, p. 11).

3.4 The Impact of Colonialism

The insecurity of such tenancies became increasingly contentious as population densities increased, especially as Kikuyuland became hemmed in by European estate development after 1910. Previous to European colonization, the precise location of farming units varied as a form of

shifting cultivation was practiced, and whenever there was insufficient land for a new family to farm, the family would move to another area. The traditional system operated very successfully to sustain a considerable rural population, but the impact of colonialism between 1910 - 1950 changed this. On the invading system Sorreson comments:

The introduction of British rule, followed by European settlement on the borders of the Kikuyu country, was effectively to prevent Kikuyu expansion in its traditional form and to set up a rival status and governing system - most notably in the creation of chiefs - which was severely to disrupt, if not utterly to destroy, the generation-set and age-set systems (Sorrenson, 1967, p. 14).

The first impact of the colonizing power on Kikuyuland therefore resulted in increased population densities within the Reserve Areas, and in further subdivision and fragmentation of the farms. Individualization of control over the land increased, and land held in common under the githaka system became absorbed into individual ngindũ so that by 1930 none was left (Taylor, 1969, p. 470). Referring to Fort Hall District (Muranga District), Taylor (1969) notes that the estimated population increased from 162,890 in 1927 to 200,000 in 1940, with a density of 352 per square mile in 1940. An indication of the supersaturation of rural population in the Reserves is gained from the estimation of Kikuyu outside the Reserve: 12,000 in 1912; 200,000 in 1939 (Taylor, 1969, p. 470-472).

The increasing difficulties of the Reserves continued until the 1950's, the situation becoming more radicalized as political groups such as the one led by Harry Thuku and the young Kikuyu reacted not only

against the colonizers, but also against the Kikuyu Association which was composed of chiefs and regarded by the colonial government as true representatives of the Kikuyu (Lamb, 1974). The depression of the 1930's exacerbated the problems and a decrease of squatter settlement in the White Highlands led to increased pressures on the Reserve. Taylor (1969, p. 471) quotes the District Commissioner's report for Fort Hall District, 1948, "... the fertility of the land decreases, the population increases and the fragmentation never ceases so that economic return gets smaller to the family each year" (Annual Report, Fort Hall District, 1948).

During the period prior to the 1950's there were Government attempts to improve agriculture in the Reserves. For example, a new crop such as white maize was promoted, and it replaced millet as the chief food-crop. However, the maize was of inferior nutritional value compared to both millet and the mixed coloured maize traditionally grown. Research is now producing hybrid maize varieties higher in both nutritional value and yield. They are also more drought and disease resistant than former varieties, and need a shorter growing season to mature. The chief disadvantage of the use of hybrid maize now is the relative complexity of this innovation as seeds and insecticides must be purchased.

Other innovations in the field of agriculture included the introduction of various types of beans and European vegetables, wattle as a cash crop, and the inoculation of cattle, reported in Fort Hall (Muranga) District as early as 1942 (Annual Report, Fort Hall District, 1942, p. 13-14). Other measures promoted included the use of boma manure, contour planting and other anti-soil erosion methods. Some improvements were

made during colonial times in the field of marketing facilities, such as the formation of a Native Producers' Cooperative Society, of importance particularly for the sale of wattle bark. Drying sheds were built in the District by 1932. However, many of these efforts were fraught with political connotations which undermined their effectiveness. Sorrenson (1967) comments: (KAU - Kenya African Union)

Government attempts to arrest erosion and improve farming in the reserves were suspected by the KAU politicians as being designed to avoid the provision of land elsewhere and especially in the Highlands; there was even the fear that such measures as contour terracing were intended to make more land available in the reserve for Europeans. This was groundless but sufficient land was still being set aside under the Native Lands Trust Ordinance - for road and railway alignments, schools and for the East African Power and Lighting Company - to cause anxiety (Sorrenson, 1967, p. 90-91).

Sorrenson does not comment here on the fact that the KAU opposed such anti-erosion measures on the grounds that if they were successful there would be an entrenched bloc of prosperous peasants satisfied with the encumbent government and unwilling to fight for Independence.

Among constant references to difficulties in introducing farm innovations, the Annual Report for FHD 1927 specifically notes the uphill battle in attempting to control soil erosion. A basic reason for the lack of acceptance of such measures was the Government's lack of consideration for traditional rights in its decisions, and facts such as the ban on African coffee planting until 1951. The ban restricted agricultural commercialization among the Kikuyu and contributed to the increasing tensions. Land consolidation was tried in Nyeri District, but opposition

to land policies finally exploded into violence in 1952 when the 'Emergency' was declared.

3.5 The "Emergency"

During the eight years of the Emergency, increased direct intervention by the Government into the way of life of the Kikuyu had important repercussions in the agricultural scene. Owing to difficulties in controlling guerilla movements and support for Mau Mau among the Kikuyu, a programme of villagization was initiated in which people were forced into villages located generally on the ridge tops. Although this measure was in large part punitive, it offered protection to the loyalist element among the Kikuyu. The significance of this scheme is argued by Sorrensen:

... villagization paved the way for consolidating all land in the Kikuyu country: it removed the people from their land which meant that government could go ahead with adjudication of claims to fragments and then with re-planning the new consolidated fragments without the hindrance of established homesteads on the land (Sorrenson, 1967, p. 112).

Further:

Before the Emergency land consolidation was regarded as a necessary measure of agrarian reform, at least for the few progressive farmers who were ready to follow the advice of the Department of Agriculture.... The Emergency completely altered this situation.... villagization gave the administration control over the mass of the peasantry and provided a golden opportunity to force through consolidation without political interference. But it was essential to hurry, lest the returning detainees wreck the scheme when Emergency regulations were released (Sorrenson, 1967, p. 112),

Lamb (1974) refers to the land consolidation scheme, together with the subsequent registration of freehold title as the "mainspring of changes in Kikuyu society" (Lamb, 1974, p. 13-14).

The prime purpose of such a programme of change, and its significance with regard to Kenya's future, lay in the creation of a politically stable, land-owning peasant class of farmers whom, it was assumed, would be more interested in economic gain than in further radicalization of the situation. It was also considered that land consolidation was an essential base for an agricultural revolution and for legal reform concerning land tenure (Sorrenson, 1967, p. 201). As a result, consolidation began in Nyeri District in 1953, in Fort Hall District in June 1954, and later in the same year in Kiambu. Land belonging to terrorists was confiscated and added to a common pool. For example, by 1956, 3510 people, including 868 from Fort Hall District had had their land taken away (Lamb, 1974, p. 11). Fort Hall District was regarded as the most conservative of the three Kikuyu Districts with reference to their reaction to land consolidation as there was stronger community control of the land and more active support for Mau Mau here (Sorrenson, 1967, p. 165). Referring to Fort Hall District, Lamb writes:

An assessment of the political composition of the district in 1954 ran as follows: 10% of the population actively involved in Mau Mau, 70% passive supporters of the movement, 10% actively against it (Home Guard, Tribal Police, and some government servants and mission adherents), and 10% passively anti-Mau Mau (employees of government or of Europeans) (Lamb, 1974, p. 13).

As there was more resistance to government measures in Muranga District there was difficulty in choosing as pilot areas for consolidation those sublocations considered "good" i.e. loyal to the Government. This task was to be done by a Coordinating Committee for Land Consolidation, headed by the District Commissioner. Once an area was chosen, the project was explained to the people and a committee of elders set up to adjudicate ownership of the fragments which were then measured and listed according to their owner. A survey, by plane tabling initially, and later by air, was made at the same time. Before land was re-allocated, the District Agricultural Officer (DAO) marked on the map of the area all land needed for public use, roads, villages, schools, and a percentage of this was deducted from the total owned by each farmer. The holdings were then delineated on the map, an effort being made to locate the new holding on the site of the largest former fragment, and to give everyone a fair amount of the best and poorer land. Generally roads were located along ridge tops, with buildings located near them, the farm plots running down to the valley bottom, providing the farmer with a long narrow holding comprising a range of environments. Small holdings of under three acres were generally located near the villages, and larger holdings further away. A 60-day appeal period was allowed for objections to the land consolidation allocation (Sorrenson, 1967). The extent of the problem to be dealt with in Middle Kikuyu in particular is noted by Sorrenson:

With consolidation one man was found to own 108 fragments, covering an area of 40 acres; but at the other end of the scale there were many whose fragments aggregated less than one acre, and many others again who owned less than three acres (Sorrenson, 1967, p. 165).

Problems encountered in the process of land consolidation included those associated with inaccurate measurements due largely to inadequate supervision, particularly in Fort Hall District, and this resulted in many cases of inflated acreages and the recording of fictitious fragments. Consequently the land had to be re-consolidated in the latter half of 1960 in a more difficult situation when most people had already returned to the land and to a more dispersed settlement pattern. However, the necessarily more active support for consolidation at this later time meant that there were fewer unsettled grievances (Sorrenson, 1967, p. 181). Registration was carried out after some delay, decisions with regard to leasehold title or freehold having to be decided on.

The resulting pattern of land distribution can be seen from Table 1.3 and Table 3.1.

TABLE 3.1
Distribution of Agricultural Land by Size of Holdings, 1969-70
(Percentages)

District	< 1 ha.		< 2 ha.		< 5 ha.		< 10 ha.	
	Holdings	Land	Holdings	Land	Holdings	Land	Holdings	Land
KIAMBU	33.8	3.5	57.0	10.9	90.8	33.2	97.9	43.8
MURANGA	46.5	13.4	78.4	37.6	96.8	66.3	99.3	75.4
NYERI	35.9	6.3	68.6	21.3	95.6	45.4	99.2	52.7

Source: Statistical Abstract, 1970 and Agricultural Census, 1969, as quoted in ILO, 1972, p. 335.

The distribution of land by the size of holding has been much criticized by Sorrenson (1967) as creating for the most part uneconomic units

capable of maintaining only a subsistence form of agriculture. He argues:

The important point is not that consolidation created a landless class - this was present already although it was more sharply defined by consolidation - but that it failed to pave the way for improving the lot of all but a small minority of the landed class. Far from providing employment for the 100,000 extra souls thrown on to the reserve during the Emergency, consolidation and the limited agricultural advance that followed failed even to provide a sufficient livelihood for more than two-thirds of the landowners (Sorrenson, 1967, p. 227).

He further contends that the larger scale farmers of pre-Emergency times were the ones who benefitted most from consolidation. As their fixed assets, buildings or permanent crops, on the land were greater, the cost of redistribution of their land would have been too expensive. Sorrenson continues, "What is continuing to emerge in Kikuyuland is not so much a middle class as a small landed gentry. This had already started to appear before consolidation (Sorrenson, 1967, p. 233). Lamb emphasizes the point:

Even if, as has sometimes been argued, the Emergency did not radically alter the distribution of land ownership in the Kikuyu Reserve, what it indubitably did was to consolidate and stabilize the position of the pre-Emergency power-holders in Kikuyu Society • (Lamb, 1974, p. 15).

Referring to Muranga District in particular, Lamb contends:

(Furthermore) economic cleavages are more marked and disparities wider in Muranga than in any other district in the Province. The largest land operators, those operating 20 acres or more, constituted only 1.6% of all sample households; but this upper section of the rural population operated

no less than 8.1% of the total land area operated by all households. In Muranga the large land-operators (more than 20 acres) are more numerous - 3.8% and this group operated almost 1/4 of all land under use in Muranga. At the other end of the scale, the smallest land operators - less than 2 acres - constituted 31.8% of all households in the Province, yet they operated only 13.1% of all land under use. In Muranga, these very small operators accounted for a slightly lower proportion of all households (26.4%), but a much lower proportion of total acreage - a mere 4.7%.

Lamb continues:

The biggest category of peasant households - some 50% operated between 2 and 6 acres: in the province as a whole this half of the peasantry operated a commensurate proportion of the total land area - again, just under half. In the case of Muranga, however, the 48.4% of peasant households operating between 2 and 6 acres operated only 34% of the land.

... The comparative distribution of land between large and small operators can be succinctly expressed. Looking at the distribution of total land acreage under use between these groups, the following rounded figures emerge. Holdings of less than 6 acres: Kiambu 81%; Embu 57%; Nyeri 70%; Meru 61%; Muranga 38%. Holdings of 10 acres and above: Kiambu 8%; Embu 21%; Nyeri 19%; Meru 20%; Muranga 39% (Lamb, 1974, p. 133).*

The pattern of the benefits of land consolidation has therefore persisted into post-colonial times.

* Lamb quotes evidence from: "Economic Survey of Central Province 1963-64". Statistics Division, Ministry of Economic Planning and Development, Nairobi, 1968, p. 42. This survey sampled 900 rural households in Central Province.

3.6 The Swynnerton Plan

It was realized by the colonial government that land consolidation was not the panacea for the agricultural sector, despite its contribution to farming efficiency, the decrease in litigation, and the ability to use land as security for credit. The Swynnerton Plan, introduced in 1954, proposed follow-up programmes to the land consolidation already mentioned. Although intended for Kenya as a whole its budget was chiefly spent in Kikuyu country. This plan for integrated rural development aimed:

... to raise the productivity of the African lands, their human and stock-carrying capacity, the income and standards of living of the people, while at the same time effecting a substantial increase in the resources and economy of the colony (Taylor, 1969, p. 472).

This was to be achieved by a series of measures which included, in addition to land consolidation, increased extension services, technical assistance, the increased introduction of cash crops particularly coffee and pyrethrum, a mixed farming system, better marketing facilities such as through cooperatives, increased accessibility to credit facilities, rural water supplies and the trading of livestock. Land use planning was also carefully considered and a three-fold strategy was proposed. The first stage, referred to as the Minimum Standard Layout, was implemented as consolidation took place and involved advice to farmers on conservation measures such as planting food crops on slopes of under 20°, cash crops on slopes 20° - 40°, and trees and permanent grass on slopes at a greater angle (Fort Hall Gazetteer, Section VI, December 1962). Buildings were to be so located as to facilitate later development. The second stage, the Simple Farm Layout, develops the ideas of the first,

dealing more precisely with the land use division. During the final stage, the Farm Plan, the farmer was to be given advice on developing the farm to make it self-sufficient as well as producing cash crops. It was a complex holistic plan. Despite such aims however, a lack of resources - of money, and staff - resulted in only 20% holdings in Muranga reaching the second stage, and under 1% the Farm Plan stage (Taylor, 1969, p. 478). Such plans were found to be more suitable for the larger holdings, owing to their expense and elaborateness and therefore the larger-scale farmers benefitted most from them (Sorrenson, 1967, p. 231). In 1960, a simplified plan was introduced, but it again has been criticized as of limited value to small-scale farmers.

Perhaps the most significant contribution of the Swynnerton Plan to Kenyan agriculture was the introduction of cash crops, of which high quality Arabica coffee became by far the most important. The rapid growth of this cash crop is shown by the following table:

TABLE 3.2

Growth of Planting and Value of Coffee, Muranga District, 1969

Year	No. of growers	Acres	Value K's
1953-4	109	14.2	nil
1964-5	13,920	7,894.0	750,000

Source: Taylor, 1969, page 478, Table 17.3

Further expansion of this crop was curtailed by world market quotas. A ban was placed on further coffee planting after 1963, so that those farmers who had already planted their coffee, i.e. the more progressive, benefitted. Other cash crops introduced were: pyrethrum, tea, pineapple and tobacco. There was also a programme to upgrade local cattle by artificial insemination.

It is generally agreed that the Swynnerton Plan led to an increase in the level of living of the Kikuyu, but writers, such as Sorrenson (1967) argue that the Plan failed to initiate the agrarian revolution which was envisaged. The main reason for this, in his view, was not the shortcomings of the follow-up operations resulting from the overstrained resources of the Ministry of Agriculture, although these were a constraint, but rather:

The real reason for the failure of consolidation farm planning and cash cropping to lead to an agrarian revolution was that consolidation and registration consolidated the position of nearly all the landowners and there were too many of them to obtain more than a subsistence living from the land available. For good political reasons government refrained from taking the drastic remedy favoured by agriculturalists - of taking every opportunity to facilitate the creation of economic holdings - and adopted the safer, though economically disastrous, expedient of a peasant-based settlement (Sorrenson, 1967, p. 335-6).

Sorrenson contends that the situation could have been avoided by following recommendations of the U.K., East African Royal Commission, 1953-55, Report (Cmd 9475, London, 1955) which advocated a wider view of resettlement in other parts of the country, and in doing so, implementing a policy of removing tribal and racial land boundaries. In the light of

the ILO Report (1972) and given the present aims of the Kenyan Government as laid down in the 1974-78 Development Plan, the "economically disastrous" view of the results of land consolidation can be strongly criticized as irrelevant. The situation in Kikuyuland just prior to Independence in 1962, was however, one of a dense rural population. Taylor (1969, p. 480) writes that the 636,300 acres of Nyeri, Muranga and Kiambu supported a population of 1,005,800, which meant that each person averaged 6/10 acre. If only agriculturally-suitable land was counted, this amounted to 1/2 acre per person. Six to ten per cent of the population was landless, a situation which threatened to lead again to refragmentation of the land.

3.7 Post-Independence Agricultural Development

Since Independence, the Government has instituted certain settlement schemes to alleviate the problem of landlessness, as noted in Chapter 2. In Kikuyuland, Maragua Ridge, lying between the Maragua and Sabasaba rivers, was developed as a high-density scheme of 5,500 acres divided into 240 small holdings varying between 10 and 130 acres each, depending on the type of land. All were valued at 1600 sh. (Taylor, 1969, p. 482). The settlers paid in advance a sum of 80 sh. for legal fees and stamp duty, and then had to pay for the land in 6-monthly installments over a period of 30 years, interest being set at 6 1/2%. The land is, on the whole, of an insufficiently high potential, owing to poor soil types and low rainfall, for the intensive type of cultivation planned for it. Food crops include maize and beans, and cash crops, some cotton, poor quality coffee, sunflower seeds, castor seeds and fruit, where the slopes are not too steep (Muranga District Annual Report, 1968, p. 24).

Elsewhere grazing is the dominant activity. Problems have arisen in the scheme as a result of the inadequate provision of infrastructure and social services, as well as a general lack of farming experience on the part of the settlers.

Other settlement schemes of a smaller scale initiated in Kikuyuland include those at Ngoliba and Ithanga. At Ngoliba, the Ministry of Agriculture Annual Report notes that in 1966, 160 plots of 5 acres each were allocated to the landless. Cotton was to be the main cash crop, and katumani maize and beans for food. Problems included the failure of cotton, the lack of water, and poor organization. The Annual Report for Muranga District, (1967, p. 21), suggested that more extension work was needed. By 1968, Ngoliba had 237 squatter families, and Ithanga, a settlement scheme of 11,000 acres, had 767 squatters by 1968, concerned with beef ranching.

The lack of adequate infrastructure is not restricted to settlement schemes but remains one of the main constraints in Muranga District, as a whole, being a direct result of colonial emphasis in developing areas of white settlers. The present programme of providing feeder roads is a necessary one if small-scale farms are to be linked with outside markets. At present, Muranga District follows Kiambu and Kisii with regard to kilometres of road per 1000 square kilometres (Muranga District has 204.1 km of road per 1000 square kilometres). Taylor writes:

Poor communications appear to be the biggest single barrier to further agricultural development in the Kikuyu Plateau as they are restricting marketing at all levels, especially the grading of products for the Kenya market, which is the greatest potential market for the products of the Kikuyu plateau. (Taylor, 1969, p. 491-2).

Taylor refers to the sudden growth of Mukuyu Market in Muranga District when a feeder road linked it to the main north-south road.

A further constraint to agricultural development in Muranga District has been the emphasis in the past on coffee as the major cash crop, although tea now holds as prominent a place. It has already been mentioned that the more progressive farmers were the ones who benefitted most from coffee planting, as their acreages were already established when the 1963 ban on planting came into effect. After this time, the government's plan was that increased output would come from increased productivity rather than increased acreage. The recent rise in coffee prices on the world market has increased differences in wealth between coffee growers and non-coffee growers. Lamb (1974) has criticized the restriction of growing coffee, contending that non-quota markets, outside the International Coffee Agreement, could have been found, and that the government by its legislation was merely supporting the estate growers of coffee. He writes:

From the estate owners' viewpoint, however, an important rationale was that prices for non-quota coffee were lower, and hence average returns paid to growers would drop, with high-quality producers (predominantly estates) consequently suffering from a larger proportion of their crop being sold in non-quota markets. Kenya's strict adherence to the I.C.A. thus detracted from the full potential of non-quota markets being explored, to the benefit of the estates but to the potential disadvantage of most existing African growers, for whom coffee, even at a lower rate of return, would still have been an attractive farming proposition (Lamb, 1974, p. 86).

The 1970-74 Plan did mention hopes for expanding non-quota sales to countries such as the USSR, East Europe and Japan.

The importance of coffee as a cash crop to Muranga District can be seen from the following figures. In 1965, coffee earned K£548,306 for the district. Wattle, next most valuable cash crop earned K£75,000 (Muranga District Annual Report, 1965, p. 32). By 1966, when many trees had just reached maturity, coffee earned K£1,192,308 (Muranga's Cooperative Department Annual Report, 1966, p. 1, quoted in Lamb, 1974, p. 88).

The benefits accruing to coffee growers were seen to be so great that much subversion of coffee control has occurred since 1964. The primary cooperative societies, of which there were 16 in Muranga District, all members of the Muranga Farmers' Cooperative Union, had their own nurseries of coffee seedlings, and these were sold to members as "infillings". The 1964-66 infill-limit of 6% maximum (i.e. growers could buy seedlings to replace old or diseased trees up to 6% of their total number of trees) was supposed to stop this, but the Ministry of Agriculture was unable to enforce this as it did not control the nurseries. By 1966, according to a Department of Agriculture census, it was estimated that farmers in Muranga District had planted three times the amount to which they were entitled. In 1967, a 2% infill quota was introduced. To enforce this, the Coffee Authority had been set up in 1966, and only seedlings to cover the 2% infill were allowed to be distributed and a growers' certificate was needed to sell seedlings. There was much confusion at this time as to whose figures for coffee acreages to use: the Ministry of Agriculture's, or the Cooperatives, the former being based on the 1963 position, the latter including "illegally" increased acreages. Much political action resulted from the 1967 legislation, particularly in

Kandara Division, where half of Muranga's coffee acreage is located, anger being felt that because of late consolidation, few trees had been initially planted and therefore it was unfair to take the records of 1963. By 1967, all restrictions on coffee growing were seen as unacceptable by the cooperative union, and were regarded as favouring the White settler community (Lamb, 1974, p. 88-98), which had been allowed to develop its coffee acreages unrestricted for years before the African farmer was permitted to grow any. The local Cooperative Union wanted a reduction of the large coffee plantation acreages so that small-scale African farmers might increase their quota. Eventually, the African growers, with the assistance of the local KANU branch, won their case, and in Muranga District, no further uprooting was allowed, and the 2% infill restriction on African holdings was abandoned. Supervision of coffee was turned over to Coffee Inspectors, the Ministry of Agriculture wanting to free itself from the unpopular supervision duties, so that its other programmes would not be sabotaged (Lamb, 1974, p. 55). The Ministry of Agriculture Annual Report to Muranga District, 1969, (p. 30), notes that of the 70,000 estimated number of families in Muranga District, under 40,000 had tea or coffee as the major income earner for the family, most living by subsistence only.

Since Independence, efforts have been made to diversify the cash crop situation in Muranga District. In High Kikuyu, tea, vegetables, and temperate fruits are now grown, and the dairying industry is expanding. Middle Kikuyu is the main area for coffee. Pineapples, citrus fruits, vegetables, and maize are also grown for cash, and livestock are fattened

here. In Low Kikuyu, stock rearing is important, and where soil conditions permit, tobacco, sisal, groundnuts, sesame, chillies, capsicum, and castor seed are grown for cash (Taylor, 1969, p. 484). The ILO reports that the area under cash crops, as a percentage of the cultivated area in Muranga District was 40% by Definition A and 18% by Definition B.

(Definition A: includes as cash crops: improved maize, wheat, all pulses other than beans, all temporary industrial crops (including cotton, sugar cane, pyrethrum, groundnuts and oil seeds), English potatoes, cabbages, certain other vegetables and other temporary crops and all permanent crops (including coffee, tea, coconuts, cashew nuts, pawpaws, bananas and other fruit.

Definition B: includes as cash crops: wheat, all temporary industrial crops, English potatoes, cabbages and certain other vegetables, coffee, tea, coconuts and cashew nuts.) (ILO, 1972, p. 338).

It is recognized that there is still a need for further diversification of cash crops because of the fluctuation of tea and coffee prices on world markets. It would appear that the most promising area for further development lies with horticultural crops.

Other efforts of the Ministry of Agriculture have included the introduction of hybrid maize, on account of its greater productivity per unit of land, in accordance with ILO (1972) recommendation. However, Muranga District has one of the lowest acreage percentages of this crop. The ILO (1972, p. 338) for 1969-70 gives the figure of 2% of the total area under maize as under improved maize. The Annual Report for Muranga District, 1971, (P. 18), indicates that the situation was rapidly improving and noted an hybrid maize acreage increase of 30% over 1970.

Recent reports of the Ministry of Agriculture for the District have indicated other improvements: soil conservation measures are now more widespread, particularly the construction of narrow based terraces and the use of trash lines (Report, 1969, p. 25); water conservation, chiefly in the form of tanks, has increased, but mainly on the estates; farm layouts have been extended, with improvements mentioned for each division but Kandara for 1969; the Report for 1969 indicates little mechanization within the area, the reason given being the small size of many holdings. Makuyu Division is the exception here on account of the large scale estates growing sisal, with some ranching, coffee, horticulture and dairying (Report, 1969, p. 26); the use of fertilizers has increased over the years, particularly for cash crops. It is supplied by the co-operatives, such as the Coffee Cooperative, as well as by dukas (small shops). Irrigation is mentioned in several reports as being largely concentrated on the larger coffee estates and horticultural holdings of Makuyu Division. If horticultural crops are to become more widespread, water supplies need to be extended as so much time is at present already spent on carrying water. Brief references only are given in the reports to extension services, demonstrations and farmer's courses being mentioned.

Muranga District has a large percentage of high potential agricultural land, 84.0% of the total considered suitable for farming.* This compares with 48.6% for Nyeri and 48.1% for Kiambu, the other Kikuyu areas of Central Province (ILO, 1972, p. 78). So far the potential has not been realized, investment in Kenyan agriculture in the past having been concentrated not

* High potential land is defined as that having an annual rainfall of 857.5 mm or more, Statistical Abstract, 1976, p. 114.

only in the large former-European holdings, but also among the larger farms of the small farm sector, these being the major cash crop producers of the residentiary system.

Inequity has continued into the present. Farms in Muranga District belong to the small farm sector, but even within this sector there are significant size differences. 78.4 % of the farms (Table 1.3) of the District are under 2 hectares in size. Within Muranga District, 18.0% of those farmers interviewed by Kimani and Taylor (1973), and whose cash income over the past few years had declined, gave the smallness of their farm as the primary reason. Table 3.3 illustrates the farm size distribution among the sublocations of the case study area in Muranga District, and a further breakdown of farms into size groupings is given in Appendix A, Tables 2 and 3.1 - 3.8.

TABLE 3.3

Farm Size Distribution in Case Study Areas of Muranga District

	Sublocation	Mean	Minimum	Maximum	Range
401	Kaguthi	3.74	0.30	21.00	20.70
404	Gakarara	3.70	0.10	14.00	13.90
409	Muruka	4.74	0.20	20.00	19.80
505	Kagumoini	3.55	0.50	15.40	15.90
508	Kabati	6.91	0.80	45.00	44.20
1004	Makangu	5.96	1.00	27.00	26.00
1005	Gitui	5.30	0.30	63.00	62.70
1806	Iriguini	5.22	1.00	18.00	17.00
	Entire Sample	4.58	0.10	63.00	62.90

Source: Kimani and Taylor, 1973, Farm File on Computer Tape.

Leys (1974) argues that at Independence, Kenyatta had the option to change the status quo. Rather than implementing proposals made by the Kenya People's Union (KPU), the opposition was banned. The traditional Kikuyu hierarchy remained unchanged, none of those who were loyal to the British Government lost land, and those freedom fighters whose land was confiscated during the Emergency were allocated land only in settlement schemes. Those farmers who retained more land, and who were, as a result, generally wealthier, managed to gain the services of credit and extension agencies to further their cash crop production and remain the progressive group of farmers, at the expense of the smaller farmer. The relationship between farm size, progressiveness, and the extension service will be analysed in Chapter 5.

The present Development Plan (1974-78) calls for an emphasis on the small farm sector, but whether this will broaden the terms of reference of the extension service in particular is a question that remains to be answered. Until now, among those excluded from agricultural development have been the farmers with the smallest acreages and women farmers. The latter are the major food crop producers in Kenya. Past agricultural research, with the exception of hybrid maize, has concentrated on cash crops for the export market, and this largely accounts for a lack of innovations to be passed on to the subsistence sector of the rural community, and the food producers, by the agricultural extension service.

The ILO (1972) estimates that approximately three-fifths of the small farm sector in Kenya has been unaffected by development inputs, and therefore it appears that unless there is a definite re-ordering of those structures which at present lock the poorest farmers into a subsistence cycle, inequity will continue in rural areas.

CHAPTER 4

THE CONCEPT OF CHANGE - COMMUNICATION THEORY, INNOVATION DIFFUSION THEORY, AND THEIR IMPLICATIONS FOR AGRICULTURAL EXTENSION STRATEGY

The African experience of change has, it begins to appear, as long and turbulent a history as anywhere else in the world. At least in those societies which survived, there must always have been a respect for innovation beside the respect for custom, an ability to recognize and reward pioneers. If this is so, the way in which a particular society accommodated change - the values and relationships which determined where, and by whom, innovation was possible - may influence its adjustment to the contemporary world more than any other aspect of its traditions

(Marris and Somerset, 1970, p. 24).

4.1 Introduction

In discussing the implementation of agricultural development policies, Hunter (1974) stresses the importance of recognizing felt-needs for change at the grass-roots level in the planning process. Continuing his argument, he writes:

If the need for closer adaption of policies and programmes to local situations is accepted the clear implication is that these situations must be known, and the knowledge acted upon. They are, of course, known by the people who live in them, but they must also be known to government, administrators, decision-makers, and also, perhaps, analysed,

quantified and recorded, since this is the language which officials and planners understand. This leads to the major central implication: that local programming decisions must be made very near to the field because it is only there that there is any real chance of effective local knowledge (Hunter, 1974, p. 12).

Duncan, (1974), working on small-farmer communication in Colombia, refers to the need for "mutual-awareness" communication. This concept he defines as: "... a system to ensure that the social knowledge of farmers and the scientific knowledge of planners can be synthesized" (Duncan, 1974, p. 2). In regard to programme planning, communication is mutual in that it should be dependent on the farmers' input.

In order for such planning to be effected, Hunter contends that four processes are necessary:

To push decision-making and discretion downwards from the centre; to establish an acceptable point to which it is pushed; to establish an effective contact with farmers and an upward flow of information from them; and to retrain field staff to listen first and advise afterwards (Hunter, 1974, p. 12).

The latter two processes of communication and diffusion are the concern of this chapter, the first two, of Chapter 6. The aim here is, by means of a discussion of those parts of communication theory and innovation diffusion theory considered relevant, to attempt to establish those criteria on which an effective agricultural extension programme could be based, given the declared emphasis of the Kenyan Government on equitable development, as outlined in Chapter 2, and the criticisms made of the present extension service. It will be contended that, on the basis of this

discussion, there is need for radical change in extension strategy in Kenya,

The conceptual plan of this section will follow the model outlined in Figure 4.1, in which Rogers and Shoemaker (1971) link elements of communication theory with elements of the diffusion of innovation theory. The model identifies the five major elements held in common by the theories: from a source, here defined as researchers, change agents or opinion leaders, a message, in this context the innovation, is transmitted via an interpersonal or a mass-media channel to the receiver, with certain resultant effects.

Reference can be made here to Jones' 'Unified Field Theory of Political Geography', concerned with the spatial implications of such phenomena as the communication of ideas. Jones argues, "The theory is 'geographical' in that it makes mappable, through the concept of the field, the results of ideas and decisions that are themselves not mappable" (Jones, 1954, p. 123). The "field" is one element in the theory which states that the "idea" and the "state" are two ends of a chain:

The chain is as follows: Political Idea - Decision - Movement - Field - Political Area. This "chain" should be visualized as a chain of lakes or basins, not an iron chain of separate links. The basins interconnect at one level, so that whatever enters one will spread to all the others (Jones, 1954, p. 115).

Although formulated specifically to unify political theories of several disciplines, Jones considered it applicable to other branches of geography. The theory essentially deals with the communication of political ideas from nation-state down to a city-level scale, rather than at the

2

FIGURE 4.1

ELEMENTS IN THE DIFFUSION OF INNOVATIONS AND THE S-M-C-R-E COMMUNICATION MODEL

Source: Rogers and Shoemaker, 1971, p. 20.

interpersonal scale of Rogers and Shoemaker's model. However, a partial analogy can be made between the two models. An idea to introduce an innovation, such as hybrid maize, can be decided on by the Ministry of Agriculture. This results in some movement or spread of the idea or message, whether by the mass media or a change agent, the 'channel' of Rogers and Shoemaker's model. This movement has spatial expression in the field, in that the distribution of the receivers, those who adopt the innovation, as well as the area of adoption, can be mapped.

Despite the fact that Rogers and Shoemaker's model is not concerned specifically with the spatial aspect of innovation diffusion per se, and that there is some awkwardness in using this structure to discuss the topic being studied, it is felt to be a useful approach to the concept of change at the scale required by the hypotheses posed.

Spatial innovation diffusion studies themselves have evolved at basically three levels: macro-scale, concerned with diffusion between large urban centres (Pred, 1971); meso-scale, dealing with diffusion from an urban centre to its hinterland, Berry (1972), Brown (1974); and micro-scale, relevant to the study here, and defined by its concentration on the adoption of innovation at the personal level. Much of the pioneering work at the micro-scale has been carried out by Hägerstrand (1967), working in the Östergötland region of Southern Sweden. In developing an inductive theory, Hägerstrand outlined three stages in the diffusion process: a stage of "initial agglomeration", in which there are local concentrations of initial acceptances; a second stage in which a radial diffusion pattern grows through the neighbourhood effect; and a final

stage, during which the adoption rate slows down as saturation point is reached. The wave-like theory of diffusion proposed by Hagerstrand included also an analysis of the processes of innovation diffusion: the dissemination of information and the adoption of innovations; the significance of distance and time decay; the spread of information by the mass media and by interpersonal communication, of which he considered the latter more important; and the pattern of interpersonal communication, seen as a network of nodes and links.

At a larger scale, Hagerstrand (1965) analysed the spread of Rotary International in Europe, finding that hierarchical diffusion down through the urban system was the dominant pattern. Later empirical evidence by Berry (1972) supported this, as he traced the diffusion of television stations and market penetration in the U.S. between 1940 and 1968. In this work, Berry is criticized by Gaile (1975) for overemphasizing the role of diffusion in development. Gaile argues that, "Diffusion of innovation is but one of a complex set of processes that comprise spread" (Gaile, 1975, p. 20). He further contends that integrated structural change is important if the periphery is to develop. Pred's (1971) view of innovation diffusion differs from that of Berry in that additional to hierarchical filtering down the urban hierarchy, he considers that lateral diffusion between centres at the hierarchical level and diffusion from lower to higher order centres takes place.

Research in developing countries has tended to follow the trends outlined by Berry. Riddell (1970) in Sierra Leone mapped the diffusion of a series of variables which he summarized as the diffusion of modernization.

He concluded that the basic trend was for innovation to diffuse from Freetown down the urban hierarchy and along the transportation lines, ignoring the evidence of one of his variables, the cooperative movement, whose diffusion is mapped as spreading from a source in the rural areas, an example of 'spontaneous' development' from below. Later work by Harvey and Greenberg (1974) in Sierra Leone, indicates that some urban-based innovations, such as banking facilities, do diffuse down the urban system, whereas rural-based innovations, such as the cooperative movement, are propagated more by personal contact, with a strong frictional distance component. Harvey and Greenberg also comment on the differences between methods of communication and general information dissemination in developing countries compared to developed countries, but conclude that diffusion processes seem similar.

The purpose of mentioning these larger scale studies is to illustrate contrasting perceptions of innovation diffusion: those who consider it unidirectional, the 'conventional view' of Lundqvist (1975) and those who, like Lundqvist, propose instead a model illustrating a two-way responsibility for innovation diffusion, one which includes the possibility of locally-based innovations. Lundqvist's (1975) research in the Morogoro District of Tanzania into local and central impulses for change and development supports the significance of the local impulse for change. Lundqvist's views are confirmed by Taylor (1975) who cites evidence from Kenya that innovations occur from both the "bottom up" and the "top down".

It is a basic thesis of the approach to this chapter that communication and innovation diffusion must be seen as an interactive and therefore two-way

process if success in communicating innovations is to be achieved.

4.2 The Communication of Innovations: The Source

In their study of the "Communication of Innovations - A Cross-Cultural Approach" (1971), Rogers and Shoemaker, concerned with the micro-level, define communication as, "... the process by which messages are transferred from a source to a receiver" (Rogers and Shoemaker, 1971, p. 11). Diffusion is seen as a particular type of communication, dealing with the spread of new ideas, and whose purpose is to promote behavioural change, rather than changes only in knowledge or attitude.

The first element in their linkage S-M-C-R-E model (Figure 4.1) is the source of communication or innovation. A source they define as, "... an individual or an institution that originates a message" (Rogers and Shoemaker, 1971, p. 251). Lundqvist (1975) argues that changes in society have two sources:

The first comprises authorities and institutions in central positions. These impulses are referred to as planning, which is in turn a combination of an underlying ideology, the organization of the administration and its personnel. The other source is of a general nature and could be referred to as an endogenous process in society, in which people themselves act as individual development planners and executors.

... It is clear that the distinction between planned and endogenous development is problematic, since there are a number of processes in society which are obviously influenced by both, and some processes are taken into account by plans while they are the result of forces outside planning (Lundqvist, 1975, p. 119-120).

Lundqvist tests an hypothesis regarding the importance of horizontal impulses in an agrarian society, in Morogoro District in Tanzania, and concludes that an increase in agricultural production in cash crops has been the result of locally, rather than centrally, generated impulses, although he does not specify particular local impulses which have achieved this. A recent paper by Kjekshus (1976) cites further evidence of the significance of endogenous sources for innovation. With reference to pre-colonial Tanzania, he argues that rather than the commonly-held view of pre-colonial farmers whose "interaction with the land has been held to be predatory, never actively improving it, but exhausting it through thoughtless tilling" (Kjekshus, 1976, p. 1), the African farmer had vast ecological knowledge. Kjekshus cites evidence of such agricultural practices as manuring, crop rotation, including the use of nitrogen-fixing leguminous plants, continuous cropping, intercropping, mixed farming, terracing as well as other conservation measures, irrigation, and the introduction of new crops. He maintains that the mainspring for such developments was the pressure to feed a growing population; external stimuli, such as coastal trading and caravans were, he argues, relatively insignificant in this regard.

More is written about 'vertical' and 'diagonal' impulses for change. Rogers and Shoemaker (1971), referring to the induced diffusion of innovations, comment on the 'vertical' source:

In most nations the power elite make decisions affecting the entire system, including the traditional masses, hopefully for the maximum welfare of all. To do so, the elite must understand the needs, beliefs, and reactions of the masses. However, most communication patterns occur horizontally (homophilously)

FIGURE 4.2

LUNDQVIST'S MODEL OF INFLUENCES THOUGHT TO GENERATE DEVELOPMENT

Source: Lundqvist, 1975. Diagram 14, p. 126.

rather than vertically (heterophilously). Such vertical communication as does occur is mostly downward; the elite do the talking and writing, and the masses are passive recipients of governmental and commercial change campaigns. Only very rarely do the masses, especially the lower masses, communicate to the elite. So the ruling elite know little about the lower masses, and hence find it particularly difficult to communicate effectively with them. The elite need feedback as to the results of their campaigns of change, launched in order to fill certain needs of the lower masses. Often these programs "scratch where there is no itch" because the elite cannot empathize adequately with the masses whose more traditional style of life is so different from their own

(Rogers and Shoemaker, 1971, p. 84).

Criticism of the inadequate nature of the 'vertical' source of technological innovation, with reference to Government research institutes in Kenya, is made by Mbithi (1972). He argues that these institutions are seen by local farmers as ivory towers, practising a form of agriculture with tractors, aerial irrigation and using bookkeeping, which the farmers themselves cannot implement for lack of capital. Mbithi cites the example that those farms near Embu and Katumani Research Stations, whose main research programme concerned hybrid maize, had a much lower rate of adoption of hybrid maize than those farms 20 - 100 miles away. Mbithi comments:

The use of the research station as a source for direct dissemination of technology is very poor. Where farmers have never seen a research station but receive information direct from extension agents or demonstration plots, the message is more neutral and farmers' basic cognitions vis à vis the technology are also simpler (Mbithi, 1972, p. 11).

Research carried out in these stations is often largely irrelevant to the small-scale farmer, emphasis having been given to larger-scale units.

Referring to problems created by such an approach to research, Duncan (1975) comments on a similar situation in Caqueza, Colombia:

... scientifically sound information can be nullified by non-acceptance because it is not 'sound' in terms of local social knowledge. With small farmers it is necessary to use social and cultural information as well as agronomic and economic information because adoption and use by farmers are essential to ultimately validate the significance of scientific innovations in plant or soil information (Duncan, 1975, p. 1-2).

Harwood (1975) proposes on-farm research to help overcome such difficulties:

We are scientists involved in a learning and evaluation process, making use of all available expertise and facilities at our disposal. An experienced farmer thus becomes a valuable part of our learning process if our research is properly structured (Harwood, 1975, p. 3).

Much research in Kenya has been carried out concerning Lundqvist's 'diagonal' source, specifically here, the change agent. Rogers and Shoemaker (1971) define such a person as:

... a professional who influences innovation decisions in a direction deemed desirable by a change agency. In most cases he seeks to secure the adoption of new ideas, but he may also attempt to slow the diffusion and prevent the adoption of certain innovations (Rogers and Shoemaker, 1971, p. 227).

They see a change agent as a link between two systems, the change agency system, here the Ministry of Agriculture, and the client system, the farmer. These two systems are essentially heterophilous, and therefore the change agent is in a position of role conflict. The concepts of heterophily and

homophily ~~are central~~ to Rogers and Shoemakers' arguments for effective communication:

Homophily is the degree to which pairs of individuals who interact are similar in certain attributes, such as beliefs, values, education, social status, and the like. In a free-choice situation, when a source can interact with any one of a number of receivers, there is a strong tendency for him to select a receiver who is most like himself.

Further:

More effective communication occurs when source and receiver are homophilous, unless the source and receiver have high empathy (Rogers and Shoemaker, 1971, p. 14).

Rogers and Shoemaker argue that one of the main problems in communicating innovations, and here they visualise the only source as a change agency, rather than the farmer, is that the source is usually very heterophilous to the receiver. They refer to the ideal situation between a source and receiver as one in which they are homophilous with regard to variables such as education and social status, and heterophilous only with regard to the innovation. Rogers and Shoemaker also stress the importance of change agent effort in successfully diffusing an innovation, arguing also that a client— rather than a change agency— oriented extension worker is more likely to be successful, as he would be more aware of the client's needs and the significance of feed-back. The importance of such an emphasis is noted by Hulls (1969), particularly as a starting point in extension activity.

Interesting evidence supporting the importance of the concept of homophily is given by Johnson (1976) in a discussion of government versus

mission-inspired change in Langtang Division, Nigeria. Johnson argues:

It is suggested here, however, that the church has certain advantages over Government at the initial and crucial stages of awareness, evaluation and adoption, since by the nature of its organization and outlook it already forms part of the socio-cultural environment of the potential adopter, while Government services are still, in most developing countries, extraneous to the societies they are attempting to change (Johnson, 1976, p. 1).

Johnson also argues that the effectiveness of Mission change-agents was enhanced by the fact that they had to maintain themselves by farming, having no salary, and were kept up to date through newsletters and visits from senior staff. They could themselves therefore provide an actual example to other farmers.

Analysis of the patterns of communication among change agents, here extension workers for the Ministry of Agriculture, in the Western Province of Kenya, has been carried out by Leonard (1973). His findings indicate that on the average an extension agent makes 57% of his visits to progressive farmers who make up 10% of all farmers. Progressive farmers he defines as those who use hybrid maize and have one or more cash producing farm enterprises, such as grade cattle, cotton, coffee or tea. In contrast, 6% of an extension agent's visits are made to so-called non-innovative farmers, 47% of the total. Leonard argues that this skew in favour of the more progressive and wealthy farmers is not due to social class alliance, although he notes that the extension agent is more the social equal of the progressive farmer than of the average or non-innovative farmer. He finds no positive correlation between the percentage

FIGURE 4.3

THE DISTRIBUTION OF AGRICULTURAL EXTENSION VISITS BETWEEN
PROGRESSIVE, MIDDLE, AND NON-INNOVATIVE FARMERS

Source: Leonard, 1973, p. 5.

of an extension worker's high and upper middle status friends, and the proportion of the visits he devotes to progressive farmers. Leonard writes:

If anything, there is a slight tendency for those who name the smallest percentage of friends in the high and upper middle groups

to give a larger proportion of their time to progressive farmers than do the staff who identify more with the elite
(Leonard, 1972a, p. 13).

The inequality of extension coverage, Leonard contends, is a function of several factors:

Attention to the complainers and the invisibility of the rural poor probably account for a substantial part of the inequality in the distribution of extension. Nonetheless, the dominant explanatory variable must be the progressive farmer strategy and its supporting ideas of the diffusion of innovation and the maximization of economic efficiency and growth
(Leonard, 1973, p. 17).

This final point is also referred to by Ascroft, Chege, Kariuki and Roling (1971) who write:

The propensity for the extension workers to concentrate their efforts mainly upon more progressive farmers in the small farm sector is reinforced by the Governmental practice of setting production quotas as the target for extension efforts (Ascroft et al, 1971, p. 17).

They recommend producer rather than production targets, which would force the extension worker to pay attention to less progressive farmers and would result in more equitable agricultural development.

Mbithi (1972) is likewise critical of the extension strategy practised in Kenya. He considers that the extension agents have little empathy with smaller farmers, lack communicational as well as technical skills, and that their paternalistic attitude alienates the majority of their clients. Lele (1974) argues further that paternalism is one of the severest constraints on rural development, and that local responsibility is essential for the

success of a programme of innovation diffusion. Lele writes, referring to such paternalism:

This attitude often tends to lead to excessive protection and subsidization of local organizations at the outset, resulting in inefficiencies and a lack of willingness on the part of the rural people to share responsibility along with the benefits (Lele, 1974, p. 16).

Duncan (1974) argues that a major variable in the successful adoption of an innovation is the self-conception farmers hold: the more positive a farmer's self-image, the more likely he is to want to be a better farmer. A paternalistic attitude on the part of the change agent does not promote this. Too frequently the farmer is not respected as a person who uses his resources efficiently (Harwood, 1975).

Research on the educational status of extension workers in Kenya has been conducted by Leonard (1972b). On the basis of interviews of a sample of 40% of the junior extension agents of the Ministry of Agriculture in the Western Province of Kenya, Leonard, referring to post-independence change, writes:

Contrary to expectations, this improvement in the formal education of extension workers has not always been a good thing. Among agricultural extension agents, those with upper primary education (Standard V through Certificate of Primary Education) have a clear tendency to know more than those either with secondary education or with only lower primary schooling (Leonard, 1972b, p. 4).

Leonard argues that a possible explanation for this situation is to be found in the fact that many extension agents with secondary education have been divorced from agricultural experience at home through being in school for so long, and have generally assimilated the attitude that

farming as an occupation is "beneath" them.

Such an attitude is evident also at the University level where the Faculty of Agriculture is seen by many students as a last resort. Cochrane (1974) comments on this:

The sons and daughters of farmers have typically had such limited educational experience that they are not eligible for admittance to agricultural colleges for advanced training. Students in agricultural colleges have thus tended to be sons and daughters of city families who did not get admitted to colleges of their first or second choice - failed to be admitted, for example, to colleges of medicine, law, or engineering. Consequently, it is often the case that students receiving advanced training in agriculture in the less developed world are not interested in their field of study. Such students are attending an agricultural college only to obtain that coveted college degree, and it is their hope to escape from the 'low status' profession of agriculture at the first opportunity (Cochrane, 1974, p. 154-155).

A staff built on this calibre of people, Cochrane argues, will fail to understand the farmers and their problems.

Leonard (1972b) measures the degree of informedness and persuasiveness of the extension agent to reach his conclusions that the most effective and hard-working extension agents are those with some upper primary education, and those with long non-certificate courses in agriculture. This he attributes to the fact that such agents have sufficient understanding of agricultural technology and modernization of agriculture without feeling they are working below their station.

Lack of opportunity for promotion is seen by Leonard as contributing significantly to low morale and a lack of effort among higher status

extension agents, such as Agricultural Assistants and Assistant Agricultural Officers. There is at present a rigid 4-fold hierarchy within the Extension Service and promotion is based on formal education. The Junior Agricultural Assistant's (JAAs) and Junior Animal Husbandry Assistants (JAHAs) form the lowest rung of the ladder, have no formal agricultural training and on-the-job training is restricted to a narrow range of improved farming practices. These are the extension agents who work directly with farmers at the sub-location level. The ILO (1972) reports that recruitment for this level has now been discontinued. Agricultural Assistants (AAs) and Animal Health Assistants (AHAs), the next level up, have certificate training and work with farmers at the location level. Assistant Agricultural Officers (AAOs) and Technical officers need an agricultural diploma and work at the divisional level. The highest level of the Extension Service is reserved for those with a relevant university degree, the Agricultural Officers, and these work at the District level. Commenting on this hierarchy, the ILO Mission (1972) remarks:

Not only does the structure make for a very long and cumbersome administrative chain of command (headquarters, provincial director of agriculture, district agricultural officer, divisional assistant agricultural officer, locational agricultural assistant, junior agricultural assistant) but it is virtually impossible for anyone to advance from one grade to the next without first taking the full entry qualification for that level.

... Clearly some better and more efficient system is required. The above system seems based only on the academic requirements of independent training institutions, not on the needs of the job to be done in the field. Ideally, there should be only one entry level to the general agricultural services. Thereafter, a man's advancement and promotion should depend on his demonstrated ability, aptitude and field experience, rather than on his acquiring further paper qualifications (ILO, 1972, p. 423.).

At present, once someone is accepted into one of the levels mentioned, and as the Ministry is reluctant to provide further training, promotion is restricted. There is often bitterness among the junior staff, who, if they had gained a better School Certificate pass, would have been given a year's agricultural training for a diploma and become AAOs, receiving a salary of K714, rather than the K354 allowed the Agricultural Assistant (ILO, 1972, p. 424). This situation can be seen as an inheritance from the colonial system when AAOs were Europeans and the Agricultural Assistants African. Leonard (1972b) argues that promotion should be based on job performance and no-one should be selected for the extension service who is not capable of being upgraded. Each year a percentage of those at each level should be promoted, and given some further training, but this should be of a shorter duration and a different nature from training given to those entering the service for the first time, owing to their extended practical experience.

The ILO Mission suggests that upgrading the Extension Service should be focussed on the JAA and AA grades, as these are the agents in direct contact with the farmers. The Mission argues that:

Their local knowledge and practical experience should be capitalized, not discarded.... They also tend to be more content to stay in rural areas and to adapt themselves to local conditions
(ILO, 1972, p. 425).

It therefore appears that the most successful extension agents at present are those who are most homophilous with the farmers, both in terms of being rural residents and of educational background, farmers in

Kikuyuland having in the main at least a few years of primary education.* Leonard (1972b) contends, however, that if the certificate training course were made more applicable to the needs of secondary school leavers, particularly in providing practical experience, that if a better selection process were in operation to select those with an aptitude to the job, and better promotion prospects were in existence, extension workers with secondary school education could be an asset. Mbithi (1974) argues against the need for a change agent to be an 'expert', contending rather than his role should be that of an explicator, generating ideas and suggesting alternatives, decision being made at the farm or community level. He advocates 'growth from below': "we are not rejecting the necessity for expertise from the centre or above but the rural unit also possesses expertise" (Mbithi, 1974, p. 123).

Sex as a variable in assessing characteristics of an extension worker engaged in disseminating information is mentioned in the relevant literature by only the ILO Mission. Even Rogers and Shoemaker's (1971) extensive study of the communication of innovation fails to discuss the relevance to homophilous communication of the sex of the extension agent. The ILO Mission recommends that the question of whether women farmers, of whom there are a significant number, would respond better to women

* As early as 1920, there were 67 primary schools in Fort Hall (now Muranga) District. A secondary school was not operating until 1961. It can be assumed therefore that all farmers are likely to have had at least the first four years of primary education, but anyone over the age of 20 will not have had secondary education, except under rare circumstances. (Kimani and Taylor, 1973, File A2).

extension workers should be researched. The Mission argues that women should have as much choice as men in training facilities for agriculture, and they should not be automatically relegated to home economics faculties. They are critical of the recent attitude toward women in agricultural education circles:

Moreover, a few years ago it was deliberate policy not to give advice to women farmers, even though it was known that a very large number of small holdings in Kenya were worked and possibly managed entirely by women, most obviously when the husband or other male members of the household were in town. This bias arose in part from the assumption that male farmers and farmers with large holdings were more likely to respond to extension advice
(ILO, 1972, p. 153).

Discussion of the role of women in agriculture will be returned to in Chapter 5.

A further 'diagonal' source for the diffusion of innovations mentioned by Rogers and Shoemaker is the opinion leader. Opinion leadership they define as; "the degree to which an individual is able to informally influence other individuals' attitudes or overt behaviour in a desired way with relative frequency" (Rogers and Shoemaker, 1971, p. 35). The opinion leader is viewed as someone who, when compared to his followers, is more exposed to external communication, more cosmopolite, has a higher social status and is generally more innovative. Rogers and Shoemaker discuss the potential value of an opinion leader in terms of his usefulness to the extension worker:

... by enlisting the aid of leaders, the change agent provides the aegis of local sponsorship and sanction for his ideas. Directed change takes on the guise of

spontaneous change. Working through leaders improves the credibility of the innovation, thereby increasing its probability of adoption (Rogers and Shoemaker, 1971, p. 244).

They note, however, that there are limits to the usefulness of opinion leaders in this role. If an opinion leader is too innovative, a heterophilic gap exists with the followers and he is seen as an unrealistic model. Innovations are likely to be diffused only within his homophilic circle, a situation which Rogers and Shoemaker describe as follows:

Homophily can act as an invisible barrier to the rapid flow of innovations within a system.

... Homophilic diffusion patterns cause new ideas to spread horizontally, rather than vertically within a system (Rogers and Shoemaker, 1971, p. 212).

In Kenya, the rationale behind the extension strategy of concentrating on the more progressive farmers, it is argued by Leonard (1973), is that as the progressive farmers represent informal leadership in the farming community, there will be a diffusion of ideas and a wide distribution of benefits, thereby proving to be the most efficient use of an extension agent's time. However, as both Leonard (1973) and Schönherr and Mbugua (1974) point out, such an assumption is based on the contention that there are no significant barriers to communication between progressive farmers and others, and that the innovation itself will be available for adoption by all farmers. Schönherr and Mbugua (1974) stress that opinion leaders often do not actively diffuse an innovation:

On the contrary, their experience with innovations and their awareness of marketing has taught them that an agricultural innovation is particularly valuable only as long as it is not adopted by many (Schönherr and Mbugua, 1974, p. 7).

Incorrect information may be given out by the early adopters of an innovation to prevent further adoption, or the amount of profit may not be revealed in order to avoid higher taxation or increased social obligations (Leonard, 1973).

Neither work by Leonard (1973) nor Schönherr and Mbugua (1974) indicates that no diffusion occurs by concentrating on the progressive farmer, but rather that this is an inefficient strategy and one that only exacerbates existing rural disparities in wealth. Their work therefore would appear to underline conclusions reached in communication theory.

Finally, with regard to the source of an innovation, the use of the press and radio has received little mention in the literature. Mbithi (1972) criticizes the written material that has appeared in Kenya as academic and irrelevant to the average farmer.

The subject of the farmer as a source for innovation is not treated in writing on the extension service. On several counts, therefore, it would appear that improvements need to be made in the source element of the communication of innovations process, if a more effective extension strategy is to be implemented.

4.3 The Message

The message forms the second element in Rogers and Shoemaker's model. The message is in this context the innovation, defined as: "an idea, practice, or object perceived as new by an individual" (Rogers and Shoemaker, 1971, p. 19). The concern here is not with the level of institutional or organizational innovations, as researched by Young (1972) and Wheelock and Young (1973), but rather with small-scale innovations themselves.

Certain characteristics of the innovation affect the rate of its adoption. These include, firstly, whether it is seen as possessing a relative advantage over existing ideas:

There are undoubtedly a number of sub-dimensions of relative advantage: The degree of economic profitability, low initial cost, lower perceived risk, a decrease in discomfort, a saving in time and effort and the immediacy of the reward (Rogers and Shoemaker, 1971, p. 138).

This concept is particularly relevant at the persuasion stage of adoption (Figure 4.4).

Secondly, and of importance at the knowledge stage, the compatibility of the innovation with social values and the needs of the receivers is significant. Referring to Kenya, Mbithi (1972) writes:

New ideas are not sown in neutral ground but in an environment where the safeguarding of vested interests and a 'way of life' is very conspicuous. Change agents have often failed to sense these undercurrents and the adoption of new practices has often been temporary (Mbithi, 1972, p. 16).

He argues that many innovations introduced in Kenya have been incompatible with the small farmers' need to produce food crops. New cash crops may interfere with planting and harvesting times and are therefore neglected, resulting in low yields and the innovation being discarded.

Thirdly, the more complex an innovation, the slower will be its rate of adoption. Mbithi (1972) argues that the hybrid maize introduced in Kenya has a slow rate of adoption for this reason: the seed must be bought from the Kenya Seed Company, be planted early, before the rains, in rows spaced 3' x 1' or 3' x 2', and dressed with an insecticide. A

FIGURE 4.4
PARADIGM OF THE INNOVATION-DECISION PROCESS

Source: Rogers and Shoemaker, 1971, p. 102.

phosphate fertiliser must be used, frequent weeding is necessary, and a fungicidal spray applied.

Fourthly, the trialability of an innovation is significant in its adoption, particularly at the decision state. The trialability refers to: "the degree to which an innovation may be experimented with on a limited basis" (Rogers and Shoemaker, 1971, p. 155). If an innovation can be tried on a small scale, less risk is posed for the potential adopter. The more observable an innovation, similarly, the greater the rate of adoption. This point is emphasized by Hulls (1969) who refers to his work in Sukumaland, Western Tanzania:

If an innovation is to be successfully communicated to farmers, its benefits need to be obviously visible, and, obviously the result of the adoption of the innovation, as well as being coincident with their felt needs (Hulls, 1969, p. 17).

He demonstrates the difficulty of getting farmers to uproot and burn old cotton stalks to reduce the incidence of pests and disease, because of lack of observability. The amount of insect damage varies from year to year whether or not a farmer uproots, and the results are beneficial only if 100% of the farmers adopt the policy. The association between cause and effect is too tenuous for many. Hulls also explains that obvious visibility means a very high percentage increase in a crop. A 20% increase could be explained by the farmer as seasonal fluctuation in yield.

The fact that an innovation should be cheap in order to have widespread adoption is also noted by Hulls (1969). The implications and relevance of this to the concept of timing is further argued by Johnston (1974a):

The purchasing power constraint has some important implications. It means that the nature and time sequence of farm innovations and associated inputs will determine the proportion of a country's farm households that will be able to participate in the process of agricultural modernization (Johnston, 1974a, p. 8).

Johnston elsewhere suggests that a sequence of divisible innovations is crucial in the promotion of the progressive modernization of millions of small farm units:

The argument in brief is that an agricultural strategy which emphasizes a sequence of divisible innovations, such as high yielding varieties and fertilizers, which are capable of being used efficiently by small farmers and progressively adopted by the bulk of the nation's farm households, has important economic and social advantages (Johnston, 1974b, p. 9).

Referring to the Kenyan scene, Mbithi (1972) criticizes many of the innovations introduced:

Research findings have been tailored for the large-scale and not small-scale farmer. Thus one finds research recommendations in quantities per acre or bulking of inputs in large quantities such as hundredweights, bags, drums or as 40 hp tractors, X horse-power water pumps etc. For a farmer who simply wants to grow one-quarter acre crop or half acre mixture of pulses and cereals there are no recommendations or available supplies or even appropriate machinery (Mbithi, 1972, p. 12).

In addition to the above characteristics of an innovation, recent work by Rogers, Eveland and Kleppen (1976) on the diffusion and adoption of GBF/DIME in the U.S. has indicated the importance of the potential adaptability of an innovation in the diffusion process, an aspect not previously

researched, although of obvious significance regarding the innovation's appropriateness. Rogers et al write:

DBF/DIME is capable of assuring an almost endless number of characteristics depending on the local setting. What we are looking at then, is not so much the "adoption" of a particular innovation as the shaping of an idea into a particular operational reality. It is our suspicion that this phenomenon occurs in most cases of innovation, particularly in areas crucial to public policy. But past research approaches, focussing on innovativeness rather than on in-depth tracings of the innovative process, could not detect such "re-invention" of an innovation by each adopter (Rogers et al, 1976, p. 9).

From this study, the authors conclude that an innovation should be viewed as much less linear and unidirectional than has traditionally been the case, as the individual adopter often has a role to play in shaping the innovation. Although Rogers et al refer these findings to innovation processes in organizations, their conclusions may well have relevance at the level of an individual adopter of an innovation. For example, work by Leonard (1972b) in Kenya has indicated that a major reason for the failure to adopt an innovation in many areas is due to the lack of adaptation to very local conditions, such as soil characteristics. He argues that this will come about only with more open communication between receivers and the traditional sources of innovations, and within the hierarchy of the Ministry of Agriculture. With the establishment of two-way communication channels, farmers may well feel able to take an initiative in adopting innovations to suit their own situation. The present unidirectional chain of command from the Ministry of Agriculture blindly recommends national standards and does not favour such local input.

4.4 The Channel and Effects, or Consequences, of Innovation Diffusion

The third element in the diffusion of innovations and S-M-C-R-E model concerns the communication channel adopted. This channel is defined by Rogers and Shoemaker (1971) as: "... the means by which a message gets from a source to a receiver" (1971, p. 251). They argue that the two types of channel, mass media and interpersonal, have different roles to play during the innovation-decision process owing to the unique characteristics of each. A mass-media channel is able to reach a large audience rapidly, creating knowledge and spreading information, and leading to changes in attitude if these are weakly held. An interpersonal channel allows for two-way communication which can provide more information, increase understanding, and be more effective in persuading individuals with strongly held ideas.

Rogers and Shoemaker's paradigm of the innovation-decision process includes the subprocesses of knowledge, persuasion, decision and confirmation, and also concerns the fifth element of their model, effects, or consequences (Figure 4.4). These they define as: "... the changes that occur within a social system as a result of the adoption or rejection of an innovation" (Rogers and Shoemaker, 1971, p. 17). Such changes are generally thought to be positive, but as Lundqvist (1975) notes, 'development noise' or negative effects can result. Rogers and Shoemaker stress the need for more research in the field of the consequences of innovations, rather than on innovativeness per se. In their model, innovativeness, the main dependent variable in much past research, becomes the predictor of the more ultimately dependent variable, the consequences of the innovation. They argue:

Consequences should be judged as to their

functionality in terms of the clients' culture, without imposing outsiders' normative beliefs about the needs of the client system (Rogers and Shoemaker, 1971, p. 325).

The knowledge subprocess previously mentioned includes awareness of an innovation, how to adopt it, and the principles involved in the innovation adoption process. Rogers and Shoemaker argue that most change agents concentrate on creating an awareness of an innovation, although this could be more efficiently carried out by the mass media. The change agent could play a more effective role by imparting how-to knowledge. Rogers and Shoemaker note that the lack of reliance on the mass media in developing countries results from less mass media exposure of the farmers, lower literacy levels and a lack of relevant messages on the existing mass media channels. Their evidence for this comes from work in Colombia. Rather, the cosmopolite-interpersonal channel plays a part here, and includes change agents, visitors from outside the local area, and visits to outside areas. Mass media channels are seen to be of greater importance for the early adopter, who is more cosmopolite in nature. Such an argument of course assumes that the innovations are of external origin to the system in question.

The interpersonal channel is seen by Rogers and Shoemaker as more significant at the persuasion stage of adoption. This stage concerns both attitudinal change towards a specific innovation, and a more general change in attitude toward innovations. The potential receiver of the innovation then decides whether to adopt or reject the proposed innovation, and later seeks confirmation. In this final stage, the interpersonal channel is again important, the change agent reinforcing the decision.

Rogers and Shoemaker propose a media forum, a combination of mass-media and interpersonal channels, as the most effective setting in which to introduce an innovation. First developed among farmers in Canada and later used in Ghana, the media forum involves a group approach to the problem. A group of individuals meet to receive a mass media programme and then discuss the contents. The mass media involved can be radio, television, or a school group or study group, using magazine or newspaper articles. Rogers and Shoemaker emphasize the significance of the group context of these meetings: group pressure can become a force for change, and such a forum allows for more efficient use of a change agent's time. The authors feel that much research is needed in this field, particularly whether it is more effective to give a one-sided presentation or to discuss the many facets of the proposed change.

Duncan (1974) places more emphasis than Rogers and Shoemaker (1971) on the need for farmer reaction and interchange in a presentation. He even argues for farmer-control of their own meeting, and on the choice of subject matter:

The traditional extension approach is that extension agents talk and direct the meeting, resulting in minimal interaction on the part of the farmer. That lack of interaction seems to have led to a passive resistance to the information communicated
(Duncan, 1974, p. 23).

The only drawback to this approach that concerns Duncan is the possibility of one political faction gaining control of the meeting as chairman and resulting in other factions not attending.

In Kenya, the main channel used in the diffusion of innovations has

been the interpersonal one. Indeed, Mbithi (1972) contends that those radio programmes or periodical articles so far produced are not suitable for the majority of small-scale farmers. Rather than an emphasis on group extension work, so far practiced only at Farmer Training Centres and field demonstrations, the chief strategy has been one of individual farm visits, chiefly to the more progressive farmers (Leonard, 1973). Although specific studies have not been made in Muranga District, there is little basis to suspect difference (See Chapter 5).

4.5 The Receivers

Characteristics of the receivers form a fourth major element in the diffusion of innovation communication. The receivers are often assumed, in extension strategy, to have the same receptive capacity (Mbithi, 1972), whereas, in fact, although they may all be members of the same social system, there is much differentiation among them:

The social structure acts to impede or facilitate the rate of diffusion and adoption of new ideas through what are called "system effects."

The basic notion of system effects is that the norms, social statuses, hierarchy, and so on of a social system influence the behaviour of individual members of that system. System effects are the influences of the system's social structure on the behaviour of the individual members of the social system (Rogers and Shoemaker, 1971, p. 29).

For the purposes here of innovation adoption, receivers can be classified according to their rate of adoption. The categories identified by Rogers and Shoemaker are based on the normal curve of the diffusion of

FIGURE 4.5

ADOPTER CATEGORIZATION, ROGERS AND SHOEMAKER

innovation in a social unit. Figure 4.5 illustrates an initial slow rate of adoption which accelerates to a maximum as half the population has adopted the innovation. The rate then decreases. The innovators are characterized as more venturesome, more wealthy, able to take greater risks than the majority, and more cosmopolite in their interpersonal relationships.

Early adopters are distinguished from the former by being "respectable" in the sense of being more integrated into the social system. They are the ones often chosen by the change agent to disseminate information. The early majority, in contrast, are not leaders and weigh the merits of the proposed change more carefully before deciding to adopt. Late majority adopters are even more sceptical and cautious and may adopt only with increasing social pressure or the realization of economic necessity. The laggards are viewed as traditionalist, the most localite in outlook, and the most suspicious of change.

Progressive farmers comprise the first two adopter categories, and form the group which has been the focus of Kenyan extension workers. Disadvantages of this approach have previously been outlined. As more research on the rate of adoption has been carried out alternative strategies have been proposed. Schönherr and Mbugua (1974), for example, advocate the introduction of innovations through less progressive farmers. Their recommendations are based on results of an experiment carried out 1970-73 by the Institute of Development Studies in Kenya as part of the SRDP Programme in Tetu Division. This concerned the introduction of hybrid maize through existing communication channels to least progressive farmers (Roling, Chege and Ascroft, 1973). The basic problem in Tetu was the need to find a means of livelihood for a rapidly increasing rural population. The area is one in which the average farm size is below seven acres and the inequality between more and less progressive farmers had been increasing. Baseline research conducted here indicated:

... the lopsided flow of income-generating ideas from government extension personnel mainly to the more progressive farmers as

being a major bottleneck in the process of accelerating broadly-based rural development (Ascroft et al, 1971, p. 16).

See Table 4.1.

The strategy proposed in this SRDP project was to accelerate the development of the small farms through an integrated programme involving extension workers, Farmer Training Centres, AFC credit and the stockist or Cooperative Union, for inputs. The starting point for change was seen to be the extension service. Roling, Chege and Ascroft (1973) remark:

The present extension machinery, though making a valiant effort, is not eminently geared to the rapid development of Kenya's small-holder areas through the introduction of food-, income- and employment-generating innovation (Roling et al, 1973, p. 2).

As evidence for this, they cite the slowness of innovation diffusion:

For instance, hybrid maize was introduced in Tetu in 1964 but in 1970 only 30% of Tetu farmers had adopted it (especially the Progressive ones). By 1973, 60% of Tetu farmers still bought maize every year (Roling, et al, 1973, p. 3).

The authors note that Kenya has the highest extension worker/farmer ratio in East Africa, (1:500, compared to 1:1500 in Tanzania and 1:1800 in Uganda), but that individual farm visits allow for only slow innovation diffusion and concentrate on the progressive farmers. They also comment on the fact that Farmer Training Centres are used at only 50% capacity, and that there is a lack of integration between the different rural agencies, such as extension, credit, the provision of inputs, marketing, transport and processing.

TABLE 4.1
PROGRESSIVENESS BY SELECTED FACTORS OF PRODUCTION

		PROGRESSIVENESS				TOTAL
		Most Prgrsv	Upper Middle	Lower Middle	Lagg ards	
AGENT-INITIATED CONTACT	Crops	100%	96%	85%	41%	84%
	Livestock	93	77	63	22	68
CLIENT-INITIATED CONTACT	Crops	81	65	56	17	58
	Livestock	88	64	50	14	57
DEMONSTRATIONS ATTENDED	Crops	92	76	76	37	70
	Livestock	91	72	61	32	67
	Farm Planning	30	9	0	0	10
DEMO PLOTS	Owners	13	3	0	0	4
FARMER TRAINING	FTC Attended	48	26	13	5	24
COOP SOCIETY MEMBERSHIP	Member	91	76	61	35	70
	Office-bearer	9	2	1	0	3
FARM SIZE	Mean Acreage	9.7	6.7	4.2	2.6	6.0
FRAGMENTATION	2-plus Parcels	40%	24%	9%	4%	5%
PAID SEASONAL LABOUR	Mean No Hired	3.7	3.0	1.3	0.3	2.2
FARM ENTERPRISES	Grade Cattle	93%	70%	49%	11%	60
	Coffee	72	68	30	0	45
	Hybrid Maize	63	32	22	0	31
	Pigs	57	35	21	1	30
	Local Cattle	22	28	25	22	25
	Macadamia	30	31	16	0	21
	Pyrethrum	22	13	10	0	12
	Tea	22	12	3	0	10
	Cert. Potatoes	9	2	1	0	3
PERCENTAGING BASE:		92	97	102	63	354

Source: Ascroft et al, 1971, p. 17.

The experiment involved, firstly, the choice of 25-30 farmers by a subchief or JAA of non-innovative farmers from an ecologically homogeneous area, together with 2-4 progressive farmers to act as motivators. Farmers were then taken from two adjacent sublocations (i.e. 50-60 farmers) to a Farmer Training Centre where they underwent a 3-day course concerned with economic motivation, relevant husbandry and details of credit and other inputs for the proposed innovation. The farmers were provided by the ARC with a credit voucher sufficient to purchase the inputs for one acre and the Cooperative union or supplier exchanged these vouchers for the inputs. On return to the farm, the JAA was engaged in follow-up work, loan repayments being made after the harvest. Slight variations to this strategy include the choice of farmers, who are to attend the FTCs by the villagers themselves. Ascroft et al (1971) argue: "This involvement of the entire population in an extension programme follows the communication and interaction essential for the diffusion process" (1971, p. 13). They also recommend that groups of neighbours be chosen to facilitate supervision, and that demonstrations could take place in a field of one of the selected farmers. It would also be possible to run a series of such demonstrations for the different levels of farmers, classified according to innovativeness.

The results of the tests indicated that of the 798 below average farmers exposed to hybrid maize training, 97% had adopted and 78% had voluntarily repaid the unsecured crop loan, the incentive for the latter being permission to secure a new loan. The figure of 78% repayment was higher than the national average for secured GMR crop loans (Schönherr and Mbugua, 1974). Roling et al (1973) announced that the innovation had

spread to a further 2000 farmers. Referring to the potential of the scheme, the authors note that in the two months before the rains, the most effective time for holding courses, 14 courses per FTC could be held, so that 700 farms in 28 sublocations per year per FTC could be reached. With diffusion, over 3000 farmers per year per FTC could be reached. If a field, rather than the FTC, were used as a classroom, the impact in terms of numbers could be significantly increased.

As a result of the strategy here, Schönherr and Mbugua conclude:

This was empirical evidence that the diffusion process for agricultural innovation is greatly improved when the innovations are introduced by less progressive farmers (1974, p. 10).

They reform Rogers' and Shoemakers' 5 adopter categories into three (Figure 4.6). Their first two categories are joined to form the most progressive farmers. The average farmers form the largest group, 60-80% of the total, and the laggards form the third group. Schönherr and Mbugua argue that the target for innovation diffusion should be the largest group, the average farmers, a group which can be effectively reached by group methods. This group has the fewest communication barriers within it and there is less individualization among such farmers, compared to the progressive farmers. Group pressure for change the authors consider will be effective here. They also contend that diffusion will be more rapid from the average to the progressive farmer than vice versa. The progressive farmers can observe the new crops in the fields of the average farmers and, because of their higher social status, can initiate communication with the average farmers, and with their greater wealth, are more likely to acquire the necessary inputs. Schönherr and Mbugua also argue that diffusion from the average farmer to the laggard is more likely than from the progressive

ADOPTER CATEGORIZATION, SCHÖNHERR AND MBUGUA

Source: Schönherr and Mbugua, 1974, p. 11.

farmer to the laggard, as the social distance is less.

Leonard (1973) argues similarly that the average farmer, for reasons both of more equitable development and greater diffusion, should be the target group for an extension strategy, although he does mention that it might be wise to introduce an innovation first to the progressive farmer category as they are more willing to take risks, but once the innovation is established, the focus should shift to the average farmer. Leonard also advocates a group approach to extension work.

Further research into the group approach to extension work has been made by Hulls (1969) in Western Tanzania. Here a new maize variety with a 300-600% yield increase over traditional varieties, given a reasonable standard of husbandry, was to be introduced. The maize was to be the focal point of a series of demonstrations run by local farmers on land belonging

to one of the group under the supervision of the local Bwana Shamba, or extension agent. The group was to be self-financing with regard to cash needed for seeds, fertilizers, and insecticides, but would be insured against crop failure by the Interdisciplinary Rural Research Project of the University of Dar-es-Salaam. It was found that there was most success where farmers were younger and better educated, and the Bwana Shamba (extension worker) was younger. The programme was on the whole considered a success, and Hulls blamed the lack of effort of the Bwana Shamba where failure resulted. Hulls emphasizes that group methods must be related to the felt needs of the farmer, and cites four factors as important in running an effective demonstration: the characteristics of the innovations being demonstrated should already have been discussed; the demonstration should take place on the land of an average farmer, rather than of a progressive farmer; the demonstration, if run by a local farmer, is more likely to be viewed as replicable, than if run by a change agent himself; and finally, social pressures in a group situation can aid in the diffusion of an innovation.

A further benefit of the group approach to interpersonal communication is that supervision of the JAA is easier. Leonard (1972b) comments that individual visits of an extension worker are difficult to supervise, and considers such supervision necessary because of the low level of effort on the part of the extension worker, who makes on the average 1.75 farm visits per day on a day devoted to that activity. If a group strategy is implemented, a supervisor can judge the extension worker's performance from the demonstrations he gives or from the progress of 'his' farmers at a Farmer Training Centre. This means that extension work becomes more visible, and comprehensive extension programme planning more feasible.

4.6 Conclusion

To conclude, it would appear that certain recurring themes may be seen as critical to the successful communication of innovations. It is of the greatest importance to recognize the felt-needs of farmers as a starting point for an extension programme. In order for this to be achieved, an extension worker must learn to listen, a reversal of the usual communication pattern (Chambers, 1977). As Hunter (1974) remarks: "This style contrasts, unfortunately, with the most common style of extension staff, who come with a package of supposedly superior practices, usually centrally devised, which they try to persuade the community to adopt" (Hunter, 1974, p. 6). This approach involves the recognition that farmers have a positive contribution to make in the diffusion process, and that some innovations have an endogenous source. Analyses by Barker, Oguntoyiubo and Richards (1976) emphasize the sophistication of problem-solving methods among African farmers that could assist agricultural planning. It is important that approaches to the farmer be "integrated with his reality", (Mbithi, 1974, p. 123), that the message be adaptable to the local condition, and the farmer be involved in the planning process. Lele (1974) comments on the success of the Kenya Tea Development Authority in delegating some responsibility for credit and marketing among farmers. It is also significant that if more farmers are to be reached, the strategy needs to change its emphasis to the average rather than the progressive farmer.

Despite much recent work in Kenya on the diffusion of innovations, two areas have lacked investigation. Firstly, the role of women as farmers or extension workers, and the relevance of this to the concept of homophily has been neglected. Secondly, the potential use of traditional networks of communication, in which the market place figures prominently, have not been looked into. The following chapters will attempt to comment on and evaluate this situation.

CHAPTER 5

AGRICULTURAL EXTENSION AND MURANGA DISTRICT

5.1 Introduction

With reference to eight sublocations within Muranga District, it is the purpose here to examine, quantitatively where the data permits it, certain characteristics relevant to the concept of agricultural extension work. It will be hypothesized, firstly, that extension services are critical to agricultural development within the District; secondly, that extension workers tend to concentrate on the most progressive farmers; thirdly, that extension workers concentrate on the more accessible farms; fourthly, that it is the women who are the chief producers of food crops; and lastly, that women farmers are virtually excluded from extension visits.

5.2 Note on Data Collection and Reliability

The data used here was collected in Muranga District during the period June 1972 - August 1973 by a field research team which consisted of three Canadians and fifteen Kenyan Research assistants under the auspices of an International Development Research Centre (IRDC) Research Project. All the primary field data collection was conducted by Kenyans, most of them local to Muranga. Interviews were therefore carried out in the Kikuyu language.

The primary data collected was computerized in topic files, the

farm studies file being the major one consulted here. Detailed information on 5141 farms located throughout the District was gathered. Interviewers were asked to choose such farms from a spectrum of progressive to non-progressive farms, and, often the farms being chosen were located near a village. The data includes information on the age and sex of the farmer, household size, farm acreage, different cash crop acreages, crop income, number of and income from livestock, membership of a cooperative, and whether the cash income of the farm had improved or declined recently. Kimani and Taylor (1973) advocate caution in the use of the cash income figures as they may well be low estimates. They write, referring to these figures:

They represent profit rather than actual income and are useful on a comparative rather than an absolute basis. Many of the researchers mentioned the unwillingness of the farmers to give an accurate total for their household size for superstitious reasons (Kimani and Taylor, 1973, p. 26).

C Farmers were also asked to give primary and secondary reasons for the the improvement or decline of cash income on their farms. Their responses were chosen from the following:

A. If improvement was noted, the reason was:

1. better agricultural and veterinary services
2. new or better cash crops available
3. transportation improved
4. marketing system improved
5. loans available
6. better weather conditions
7. other
8. better soil conditions.

B. If decline, the reason was:

1. inadequate agricultural and veterinary services
2. cash crops not available
3. poor transportation
4. poor marketing system
5. no loans available
6. poor weather conditions
7. other
8. poor soil conditions
9. farm too small to be viable.

It has previously been mentioned in the introduction that as the data were not collected to test the specific questions asked here, surrogate variables have had to be used. It has therefore not proved possible to test several of the hypotheses as rigorously as would have been liked.

5.3 Choice of Areas for Hypothesis Testing

Muranga District comprises four divisions: Kangema, Kiharu, Kigumo and Kandara. These divisions are elongated in shape in a general east-west direction, in turn being divided into locations, which are further subdivided to produce the smallest administrative unit, the sublocation (Figure 3.3). All such units follow the basic west-east or northwest-southeast trend of the topography, which decreases in altitude from west to east (Figure 3.2).

For the purposes of this study, it was decided to compare farms within one broadly similar ecological zone, Middle Kikuyu. This is an area with the densest population in Kikuyuland, and where most of the markets are found. As several of the hypotheses are concerned with the extension service of the Ministry of Agriculture, it was decided to exclude

TABLE 5.1

IMPROVEMENT AND DECLINE OF FARMS IN SUBLOCATIONS SELECTED FOR STUDY

Location No. Name	Sublocation No. Name	No. of Farms	% Farms Reason 1 improved	% Farms Reason 1 declined	% Total Farms in subloc. showing increase	% Total Farms in subloc. showing decrease
4 Muruka	401 Kaguthi	118	68	33	56	27
	404 Gakerera	96	74	25	44	37
	409 Muruka	70	81	32	54	39
5 Gaichanjiru	505 Kagumoini	72	69	19	31	62
	508 Kabati	51	85	34	41	45
10 Weithaga	1004 Mukangu	40	37	30	39	32
	1005 Gitui	63	61	31	28	30
18 Kigumo	1806 Iriguini	44	63	26	50	34
TOTAL		544				

High Kikuyu, as here the Kenya Tea Development Authority (KTDA) with its own extension service has been active. It would therefore be difficult to isolate the regular Ministry of Agriculture extension service.

Within Middle Kikuyu, the sample of sublocations chosen was based on the following criteria: firstly, all sublocations with a sample of under 40 farms were excluded. Secondly, from the remaining sublocations, all sublocations were selected in which the variable better agricultural and veterinary services or inadequate agricultural and veterinary services was given as the prime reason, respectively, for increase or decrease in cash crop income, by the largest percentage of farmers. The choice of this variable was based on the fact that several of the hypotheses are concerned with the characteristics of farmers who are served most by the agricultural

extension service. The variable is used as a surrogate for the actual visits made by an extension worker. It will be noted from Table 5.1 that better agricultural and veterinary services (hereafter referred to as Reason 1, improved) is given more frequently as a reason for an increase in cash income, compared to a more dispersed pattern of responses given where decline has been noted.

5.4 Hypotheses to be Tested

5.4.1 Extension Services are Critical to Agricultural Development in Muranga District

A total of 5142 farms was included in the 1972-73 survey. Of these 2404 (46.9%) registered improvement in cash crop income over the past few years, 1652 (32.2%) decline, 913 (17.8%) remained the same, and 165 (3.3%) farmers replied that they were uncertain whether there had been a change in cash income over the past few years. Table 5.2 illustrates the distribution of responses to the question of why there was an improvement or decline in cash income.

From such responses, it appears that among the farms which noted improvement, better agricultural and veterinary services were seen to be significant, being given by 46.5% of farms as the primary reason for improvement. When the second reason, the availability of new or better cash crops, which are predominantly obtained through the extension worker, is added to the first, the significance increases substantially. Secondary

TABLE 5.2
REASONS GIVEN FOR IMPROVEMENT OR DECLINE OF FARMS, MURANGA DISTRICT

	Farm Improvement (Number and %)		Farm Decline (Number and %)	
	Primary Reason	Secondary Reason	Primary Reason	Secondary Reason
1. Better agricultural and veterinary services	1,121 46.5%	485 21.1%	1. inadequate agricultural and veterinary services	261 15.9%
2. new or better cash crops available	793 32.9%	710 32.7%	2. cash crops not available	192 11.7%
3. transportation improved	43 1.8%	102 4.7%	3. poor transportation	13 0.8%
4. marketing systems improved	47 2.0%	90 4.2%	4. poor marketing system	203 12.4%
5. loans available	29 1.3%	66 3.1%	5. no loans available	170 10.4%
6. better weather conditions	169 7.0%	265 12.2%	6. poor weather conditions	140 8.5%
7. other	30 1.3%	89 4.1%	7. other	98 6.0%
8. better soil conditions	183 7.6%	397 18.3%	8. poor soil conditions	276 16.8%
			9. farms too small to be viable	297 18.0%
				237 17.4%

reasons emphasize this trend. When farms which noted a decline are considered, the reason given by the largest percentage of the farmers was that their farms were too small to be viable. This was followed by the reason that they considered poor soil conditions the chief explanatory variable for their decline. Inadequate agricultural and veterinary services ranked third. Whether this reason was considered relatively unimportant because many of the poorer farmers or those whose income has declined have never been visited by an extension worker and can therefore not assess potential assistance from this source, or because the other reasons are in reality more significant, cannot be assessed from the data available. However, one can at least conclude that the extension service is given credit for farm improvement by a significant proportion of the farmers who registered an increase in farm income, and can therefore be seen as critical to agricultural development.

5.4.2 Agricultural Extension Workers tend to Concentrate on the Most Progressive Farmers

For the purpose of testing this hypothesis, the eight sublocations chosen will be analysed, using better agricultural and veterinary services as the surrogate variable for extension worker visits. Such visits have formed the chief strategy of the Ministry of Agriculture, as noted in Chapter 4, and on that basis can be justified as a surrogate for actual visits. The characteristics of the farmers who gave such responses are here analysed to assess whether there is any extension agent-farmer-type concentration in this sample, as has been indicated in research by Leonard (1972) and Mbithi (1972) in other parts of Kenya. A progressive

farmer is defined for this purpose as one with a larger cash crop acreage and cash income than average. He also tends to have a larger than average holding. Characteristics of the farmers with regard to cattle ownership and income, cooperative membership and age will also be considered.

For the following analysis, those farms which give better agricultural and veterinary services as the prime reason for their improvement will be referred to as Type A farms, and those which give inadequate agricultural and veterinary services as the prime reason for their decline, as Type B farms.

5.4.2.1. Relationship of Type A and B farms to farm size

TABLE 5.3

FARM ACREAGE (MEAN, PER SUBLOCATION)

Sublocation	Sublocation mean	Type A mean	Type B mean
401	3.75	3.94	3.61
404	3.70	4.45	2.89
409	4.74	5.23	6.67
505	3.55	4.60	2.86
508	6.91	9.83	3.66
1004	5.97	6.38	8.08
1005	5.30	11.16	5.10
1806	5.22	5.59	4.25
Entire Sample	4.58	5.61	4.34

The above table indicates that Type A farms tend to be larger than the

average for their location, and Type B farms smaller. Sublocations 409 (Muruka) and 1004 (Makangu) are the exceptions to this. Referring to the range of farm size (Appendix A, Table 1.), although the minima and maxima for Type A farms were higher in general than those for Type B farms, the range was considered large enough to warrant a closer examination of farm distribution.

As 93.7% of the sample farms are under 10 acres in size, and 64.1% are under 4 acres, in order that the categories reflect this distribution, it was decided to increase the categories by 1 acre units up to 10, then by 5 acre units to 20 acres (Figure 5.1). Figure 5.1, based on Appendix A, Table 2, illustrates these results for the entire sample of 554 farms and the 174 Type A farms and 60 Type B farms.

The breakdown of farm size distribution serves to support the hypothesis that it is the larger farms which identify their improvement with extension agent visits (Appendix A, Tables 3.1 - 3.8). 66.7% Type A farms are under 5 acres, compared with 76.7% Type B farms. The discrepancy of sublocation 1004 can be explained by the fact that only 4 farms identified Reason 1 declined, and one of these recorded a farm size of over 20.1 acres, thereby raising the average. Sublocation 409 had 9 Type B farms, and although 55.6% of the farms were under 5 acres, the remainder were over 10 acres in size. This led to the higher average of Type B compared to Type A farms, which remains unexplained.

With the exception of 2 sublocations, however, the hypothesis that extension workers visit the larger farms, identified here as Type A, is supported.

FIGURE 5.1

FARM SIZE DISTRIBUTION, CASE STUDY AREA, MURANGA DISTRICT

5.4.2.2 Relationship of Type A and B Farms with cash crop acreage and income

Cash crops are here defined as coffee, pineapples, maize, beans, sisal, fruit and vegetables.

TABLE 5.4

CASH CROP ACREAGE MEAN, PER SUBLOCATION

Sublocation	Sublocation mean	Type A mean	Type B mean
401	2.69	2.83	2.49
404	2.81	3.28	1.98
409	3.09	3.47	3.61
505	2.46	3.21	1.82
508	3.59	3.93	2.45
1004	3.66	4.65	1.15
1005	3.49	7.82	2.98
1806	3.45	3.76	2.40
Entire sample	3.04	3.63	2.43

With the exception of sublocation 409, Type A farms register a higher cash crop acreage than those of Type B (additional data in Appendix A, Table 4). A similar trend is noticeable in Table 5.5.

Sublocation 1004 stands out as having an extraordinarily large difference between Type A and B farms, but it must be remembered that the figure for Type B comes from a sample of 4 farms. Type B farms in sublocation 409, although having an average cash crop income substantially below that of Type A, nevertheless have an income above the average for that sublocation (Appendix A, Table 5).

TABLE 5.5
CASH CROP INCOME MEAN, PER SUBLOCATION
(shillings)

Sublocation	Sublocation mean	Type A mean	Type B mean
401	725.87	857.72	845.45
404	560.89	998.13	277.78
409	708.64	997.75	792.22
505	670.18	1063.75	105.56
508	682.65	926.11	417.50
1004	833.50	1466.67	25.00
1005	850.79	2609.09	1158.33
1806	1014.07	1025.00	635.00
Entire sample	728.75	1076.15	546.83

Pearson Correlation coefficients were calculated to assess the relationship between farm size, cash crop acreage and cash crop income, with the following results:

TABLE 5.6
CORRELATION COEFFICIENTS: FARM SIZE: CASH CROP ACREAGE: CASH CROP INCOME
(significance level = .001)

	Entire Sample	Type A Farms	Type B Farms
Farm size and cash crop acreage	.6868	.6064	.7055
Cash crop acreage and cash crop income	.5254	.6000	.3801
Farm size and cash crop income	.5594	.6047	.3909

It is interesting to note that although all the coefficients are positive, there is a stronger relationship between farm size and cash crop acreage among the Type B farms, ($r = .7055$), than Type A farms, but a weaker relationship when cash crop acreage and cash crop income, and farm size and cash crop income are correlated. The correlation of .5594 between farm size and cash crop income compares with $r = .45$ for the District Average (Taylor, 1977, unpublished Research Analysis).

5.4.2.3 Relationship of Type A and B farms with number of cattle and income from cattle

TABLE 5.7
CATTLE OWNERSHIP MEAN, PER SUBLOCATION

Sublocation	Sublocation mean number per farm	Type A mean	Type B mean
401	0.90	0.98	0.45
404	1.10	1.34	0.66
409	1.23	1.42	1.66
505	0.96	0.94	0.44
508	1.43	2.44	0.50
1004	1.93	2.33	1.25
1005	1.48	2.09	3.00
1806	1.80	1.93	1.00
Entire sample	1.24	1.47	1.02

TABLE 5.8
INCOME FROM CATTLE, MEAN, PER SUBLOCATION
(shillings)

Sublocation	Sublocation mean per farm	Type A	Type B
401	87.87	88.24	4.55
404	161.27	415.00	0.00
409	125.00	274.10	20.00
505	130.61	81.25	0.00
508	63.14	138.89	0.00
1004	172.70	415.00	0.00
1005	379.65	1954.55	38.33
1806	249.32	257.14	0.00
Entire sample	160.69	324.07	7.67

It is clear from the above tables that cattle are not important as cash earners in the Middle Kikuyu sublocations chosen. Rather the area is one of small scale crop farming. There are differences nevertheless between Type A and B farms, Type A farms having more cattle than Type B, with the exception of sublocations 409 and 1005. Even in the latter two cases however, income from cattle was negligible compared with Type A farms.

5.4.2.4. Relationship of Type A and B farms and cooperative membership

From the following information, there is no clear distinction between Type A and B farms on the basis of cooperative membership.

TABLE 5.9
COOPERATIVE MEMBERSHIP

Sublocation	Entire Sublocation		Type A		Type B	
	#	%	#	%	#	%
401	104	89.7	42	93.3	8	72.7
404	73	76.0	26	81.3	8	88.9
409	55	78.6	26	83.9	8	88.9
505	51	43.1	10	62.5	4	44.4
508	36	70.6	13	72.2	5	62.5
1004	27	67.5	6	100.0	1	25.0
1005	45	71.4	11	100.0	5	83.3
1806	38	86.4	12	85.7	4	100.0
Entire sample	409	74.1	136	78.2	43	71.7

5.4.2.5. Relationship of Type A and B farmers and age

The average age of farmers for the entire sample is 45.57 years. For the 409 male farmers, the average was 47.97 years, and for the 145 female farmers, 38.83 years (Appendix A, Table 6). The following table illustrates the breakdown of male and female farmers of Type A and B farms according to age group:

TABLE 5.10

PERCENTAGE OF FARMERS IN EACH AGE GROUP ACCORDING TO FARM TYPE

Age groups (years)	MALE		FEMALE	
	Type A	Type B	Type A	Type B
21-30	11.19	11.36	13.51	35.71
31-40	26.12	18.18	43.24	28.57
41-50	26.12	22.73	32.43	14.29
51-60	20.90	31.82	5.41	14.29
> 60	15.67	15.91	5.41	7.14

Evidence from the previous table appears to indicate a tendency for the majority of Type A farmers to be younger than those of Type B, and for female farmers to be younger than male.

To conclude, on the basis of available evidence and using a surrogate variable to assess extension worker activity, it would appear that it is those farmers who have larger farms, a larger cash crop acreage and income, more cattle and income from them, and who are younger, who attribute their farm improvement to extension worker visits, and that it is among such progressive farmers that the extension service is concentrating in the sample chosen.

5.4.3 Agricultural Extension Workers Concentrate on Those Farms which are More Accessible

In order to test this hypothesis, information on the accessibility of farms to the main road was used. Such data was available at the village level only, rather than for each farm, in the sublocations selected for the case study.

From such information (Table 5.11), it is evident that all villages in the sublocations chosen have bus and/or lorry connections with the main road in the dry season which took under half an hour or in two cases one half hour to one hour to reach. During the wet season, the time taken to reach the main road from some of the villages amounted to over 24 hours, a function of the ridge and valley topography. Even this fact, however, does not appear to be of significance in overall extension coverage, as can be seen from the following two examples. Muruka village has poor communications in the wet season, buses and lorries taking over 24 hours to reach the main road. The farms sampled near the village record 53.6 improved and 40.9% declined.

TABLE 5.11
ACCESSIBILITY OF VILLAGES TO MAIN ROAD
(hours)

Villages Name and Number	BUS		LORRY	
	dry season	wet season	dry season	wet season
Kaguthi 404010101	0	0	$\frac{1}{2}$ -1	>24
Kabati 404010501	< $\frac{1}{2}$	$\frac{1}{2}$ -1	< $\frac{1}{2}$	$\frac{1}{2}$ -1
Munyori 404040301	< $\frac{1}{2}$	1-2	< $\frac{1}{2}$	< $\frac{1}{2}$
Kandara 404040701	< $\frac{1}{2}$	$\frac{1}{2}$ -1	< $\frac{1}{2}$	< $\frac{1}{2}$
Muruka 404090401	< $\frac{1}{2}$	>24	< $\frac{1}{2}$	>24
Gaichanjiru 504040201	0	0	< $\frac{1}{2}$	>24
Kagumoini 405050501	0	0	< $\frac{1}{2}$	>24
Manjuu 405050601	0	0	< $\frac{1}{2}$	>24
Kabati 405080101	< $\frac{1}{2}$	< $\frac{1}{2}$	< $\frac{1}{2}$	< $\frac{1}{2}$
Mukangu 1r0050401	< $\frac{1}{2}$	< $\frac{1}{2}$	< $\frac{1}{2}$	< $\frac{1}{2}$
Gatheru 110050401	< $\frac{1}{2}$	< $\frac{1}{2}$	$\frac{1}{2}$ -1	$\frac{1}{2}$ -1
Gitige 110050401	< $\frac{1}{2}$	1-2	< $\frac{1}{2}$	$\frac{1}{2}$ -1
Gitui 110050601	< $\frac{1}{2}$	>24	< $\frac{1}{2}$	>24
Karega 218060101	< $\frac{1}{2}$	< $\frac{1}{2}$	< $\frac{1}{2}$	< $\frac{1}{2}$
Kigumo 208060201	$\frac{1}{2}$ -1	$\frac{1}{2}$ -1	< $\frac{1}{2}$	< $\frac{1}{2}$

Eighty-three point eight per cent (83.8%) gave better agricultural and veterinary services as the primary reason where improvement was noted. Of the reasons given for decline, 31.1% attributed inadequate agricultural and veterinary services as the cause, the highest percentage of responses going to any of the reasons. Gitui similarly has poor communications during the wet season. Here only 22.3% farms registered improvement but 100% of these farmers gave improved agricultural and veterinary services as the primary reason for improvement. The 44.5% farms which noted a decline gave the main reason for this as the farms being too small to be viable (33.4% gave this response). However, inadequate agricultural and veterinary services (22.3% of the responses) and cash crops not being available (22.3% of the responses) ranked second and third as explanatory variables for the decline. In both Muruka and Gitui, the fact that inadequate agricultural and veterinary services are frequently given as the prime reason for farm decline may well suggest that such services are visible to the majority of farmers in the area, but that such services concentrate on the progressive rather than the poorer farmers. The high percentages of farmers attributing their improvement to better agricultural and veterinary services would support the idea that the extension service is very visible here.

Accessibility therefore appears not to be a relevant variable in explaining where agricultural extension workers concentrate in the sample chosen. This is very likely to be a function of the choice of sublocations which was based on those areas which identified agricultural and veterinary services as the prime reason for improvement or decline, and it may well be that accessibility on a District level is a major explanatory variable.

5.4.4 It is the Women who are the Chief Producers of Food Crops

TABLE 5.12
A COMPARISON OF MALE AND FEMALE-OWNED FARMS

Sublocation	MALE				FEMALE			
	a.	b.	c.	d.	a.	b.	c.	d.
401	3.66	2.67	73.0	690.85	3.98	2.74	68.9	820.00
404	3.97	2.97	74.4	654.93	2.69	2.23	82.8	203.50
409	4.94	3.19	64.6	768.97	3.00	2.19	73.0	165.71
505	4.01	2.74	68.3	856.96	2.78	2.00	72.0	358.89
508	7.18	3.43	48.4	606.67	6.42	3.89	60.7	821.94
1004	5.84	3.97	68.0	995.94	6.48	2.41	34.2	620.00
1005	5.68	3.80	66.9	838.54	4.58	2.91	63.5	873.64
1806	5.20	3.51	67.5	1075.73	5.27	3.28	62.2	829.09
Entire sample	4.73	3.16	66.6	777.42	4.16	2.70	64.9	591.48

a. = mean acreage	c. = b. as % of a.
b. = cash crop acreage	d. = crop income (shillings)

Traditionally in Kikuyu country, it is the men who are the landowners and producers of cash crops. Since land consolidation, however, women have gained a foothold in landholding, in the sample area owning approximately 26% of the total farms. This compares with a District average of 29.4%. That these women farmers produce cash crops is evident from Table 5.12, and in half of the sublocations devote a larger percentage of their land to cash crops than the male farmers. Correlation coefficients illustrating the relationship at the entire sample level follow.

TABLE 5.13
CORRELATION COEFFICIENTS
(significance level = .001)

	Type A farms		Type B farms	
	male	female	male	female
farm size with cash crop acreage	.8227	.8628	.7799	.1834
cash crop acreage with cash crop income	.6000	.6611	.3096	.7862
farm size and cash crop income	.5266	.7750	.3653	.2509

It is interesting to note from Table 5.13 that, among Type A farms, all correlations are significant, but that there is a stronger correlation between farm size and cash crop income, and between cash crop acreage and cash crop income among the female as opposed to the male farmers. Among the farms which have noted a decline, there is little relationship between farm size and cash crop acreage and between farm size and cash crop income of the female-owned farms. This compares with a strong correlation between farm size and cash crop acreage of the male farms. Among the female-owned farms there is however a stronger relationship between cash crop acreage and cash crop income than among the male-owned farms.

The above data are concerned with farm ownership, and as a result it is impossible to deduce quantitatively the role played by women farmers who are not farm owners. In Kikuyu society, however, as has been mentioned previously, it is the women who produce the food crops, and most of these

farmers are the wives of male farm-owners. Surrogate evidence from the sellers of food produce at the markets indicates that 80% are women, and that these women have produced the food sold. The pattern of women growing food crops appears, therefore, to prevail.

5.4.5 Women Farmers are Virtually Excluded from Extension Visits

TABLE 5.14

FARM OWNERSHIP (MALE/FEMALE) AND FARM TYPE

Sub-loc.	Entire sublocation				Type A				Type B			
	Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%*	No.	%**	No.	%*	No.	%**
401	86	72.9	32	27.1	31	36.0	15	46.8	7	8.1	4	12.5
404	76	79.2	20	20.8	26	34.2	6	30.0	8	10.5	1	5.0
409	63	90.0	7	10.0	29	46.0	2	28.6	8	12.7	1	14.3
505	45	62.5	27	37.5	12	26.7	4	14.8	6	13.3	3	11.1
508	33	64.7	18	35.3	12	36.4	6	18.2	6	18.2	2	11.1
1004	32	80.0	8	20.0	6	18.7	-	-	2	6.3	2	25.0
1005	41	65.1	22	34.9	9	22.0	2	9.1	5	12.2	1	4.6
1806	33	75.0	11	25.0	11	33.3	3	27.2	3	9.1	1	9.1
Entire Sample	409	73.8	145	26.2	136	33.3	38	26.2	45	11.0	15	10.3

* % of Total Males

** % of Total Females

From the above table, it would appear that male and female farm owners have equal access to visits from extension workers, given the use of Reason 1

improved and declined as a surrogate variable for the actual visits. There is however qualitative evidence for discrimination between the sexes from traditions within Kikuyu society. Most of the women farmers are not farm owners, and therefore have not been enumerated under the terms of the field survey. Being the wives of the male owners, such women are the chief producers of food crops, and according to findings of Leonard (1972, 1973) and Mbithi (1972) are not a target for the extension service which concentrates more on cash crop information (Chapter 4). The majority of women farmers are therefore still untouched by the extension service.

5.5 Conclusion

Evidence assembled here indicates the significance of certain themes relevant to the basic hypothesis of this paper. It would appear that the majority of farmers in the case study area do consider the extension service as a critical variable in agricultural development. It is also significant that the data from the sublocations chosen support the findings of Leonard (1972a, 1972b, 1973) and Mbithi (1972) that the extension service at present concentrates on the more progressive farmer. If more equality is sought in the rural areas, a change in strategy is needed. Alternate models were outlined in Chapter 4 and included the recommendation by Schönherr and Mbugua (1974) of concentrating extension efforts among 'average' farmers. If a purpose of agricultural development is to increase food production in Kenya, and a strong case has been made for this (Chapters 1 and 2), then the women farmers must be reached. The evidence suggests that their needs are at present ignored by the extension service. A location in which women are present in significant numbers, and at regular

intervals, is the market place. The potential of this site for the diffusion of innovations will be evaluated in the two following chapters.

CHAPTER 6

THE MARKET PLACE

Questions will shift from those about where things are or where things have been to a greater concern with where things can be and where things should be, but the fundamental concern with explanations of location will persist (Abler, Adams and Gould, 1971, p. 573).

6.1 Introduction

A paper presented by Ward, Howlett, Kissling and Weinand at the 1974 International Geographical Union Regional Geography Conference outlined constraints to, and proposals for rural development in Papua New Guinea. Specifically, attention was drawn to problems imposed by the duality between the traditional and modern sectors which characterizes the country's economy. Ward et al write:

The interface between the traditional and modern sectors remains largely unexplored. The sharp dichotomy postulated between the two sectors in the dual economy model, frequently prevents planners from seeking improvements through small changes compatible in scale and organisation with the traditional sector. However, such changes, by using existing institutions and channels of communication, are likely to produce far-reaching chain reactions (Ward et al, 1974, p. 129).

The authors proceed to propose the establishment of a series of 'market rauns' or market places of a periodic nature which would provide a site to be served by mobile services to meet the needs of the rural population.

In addition to the provision of facilities for the buying and selling of agricultural produce and consumer goods, services located there would include those concerned with agricultural extension, postal and banking services, vehicle maintenance and entertainment facilities and government services of an advisory, welfare (including maternal and child care) and educative nature. Ward et al conclude their suggestions by contending:

Most growth centre proposals for Papua New Guinea, as for other developing countries, have been firmly based in the context of the modern urban/industrial system. To participate, people have had to accept major social changes. We believe that this approach has proved inadequate. The proposals which have been put forward in our reports to the Papua New Guinea Central Planning Office, and which are summarized here, are intentionally modest. This stems from a belief that innovations which are based on and extend the traditional sector are likely to be more effective in the long run, and will have a less traumatic effect on society, than those which depend on dramatic changes. Thus we have sought strategies for improvement through increments to the traditional sector which will form a bridge towards the modern sector
(Ward et al, 1974, p. 129-131).

It is the basic hypothesis of this chapter that the market place in Kikuyu society could form such a bridge from the traditional to the modern sector. It will be argued that the market place is part of the traditional proxemic spatial system in Kikuyuland with its established channels of communication and as such has the potential to play a role complementary to other agricultural extension programmes by being the locus for information gathering and the centre for the diffusion of certain types of agricultural innovation. It is hypothesized that the market can meet those needs identified for successful communication in the conclusion

of Chapter 4. The significance of the market place with regard to the role of women in farming, largely neglected by the extension services, will also be stressed.

In order to assess available information relevant to such hypotheses, the chapter will be organized as follows:

- 6.2 Geographical Research and the characteristics of markets in developing countries;
- 6.3 The market place in the traditional Kikuyu spatial system;
- 6.4 The market place and its potential in regional development.

6.2 Geographical Research and the Characteristics of Markets in LDCs

Following Hodder's (1965) definition of the term 'market' given in the introduction, the concept is used in its locational sense here, as a market place. Bromley (1971) assesses the focus of past geographical research into markets, and argues that markets have been much neglected:

The market has often been depicted as merely a primitive trade mechanism or an historical anachronism, more an object of folklore than of economic importance. The study of individual markets and of integrated market systems, however, gives us a valuable insight into general economic and social conditions. The present upsurge of research on markets should lead to a more complete understanding of the intermediate stages of cultural and material developments. In the underdeveloped countries, markets are certainly one of the most important "elemental components in the spatial articulation of economic and social activities"* (Bromley, 1971, p. 131).

* M.L. McNulty, 1969, "Market Centres for the Distribution of Foods and Services in Developing Countries", Department of Geography, University of Iowa, Mimeo, page 1.

With few exceptions there has been a lack of research into the role played by markets in innovation diffusion; rather the focus has been on the origin of markets, market distribution and periodicity, the role of the market through time, the multifunctional nature of markets, marketing chains and the classification of markets. A brief review of such research follows, to place the present paper in context. This is chiefly concerned with work in Africa, with a few major exceptions.

6.2.1 The Origin of Markets

Research by Bohannon and Dalton (1961) represents some of the early work in the field of market study, which although concerned primarily with the evolution of the market principle within societies, hypothesizes that markets per se owe their origin to colonial intervention in the spatial system, and the development of external trade. Berry (1967) echoes such an idea:

No society can be found in which exchange is absent, although in many, market place trading is a relatively recent innovation that has spread with the extension of western colonial influence. General factors influential in stimulating market-place development include establishment of law and order, introduction of cash as an exchange medium, expansion of transport facilities, and growth of non-agricultural markets for foodstuffs
(Berry, 1967, p. 89-90).

An exogeneous theory of market establishment is held also by writers such as Meillassoux (1971) and Bromley, Symanski and Good (1975). The latter argue that markets in Africa tended to develop with stimulation from long distance trading. Bromley et al contend:

Markets require economically complementary societies, and agents whose social position

freed them from obligatory participation in traditional prestation and personalized gift exchange. This theory is supported by the lack of markets in areas where economic relations are dominantly person-to-person, where foreign traders are not active, and by the numbers of markets on the borders of complementary economic zones (Bromley et al, 1975, p. 533).

The question, however, of whether the origin of markets owes more to exogenous than endogenous influences may well be principally a matter of the scale at which the problem is viewed, and which part of Africa is examined. Both theories may provide insights into historical reality. Research by Hodder (1969) in Yorubaland, Nigeria, supports the exogenous theory, that the earliest markets were established in the contact zone between forest and savanna and along the major trading routes. However, a population of at least 50 persons per square mile and well-developed political units were also needed for such market development. Hodder does point out that some markets owe their origin to local demands for food and crafts, although he finds no direct evidence for this in Yorubaland. Obudho's (1970) work in Kenya reached the following conclusions:

The markets in Nyanza Province started because of the African's propensity to barter - perhaps involving silent bartering. This small scale local exchange was strengthened by the necessity for long-distance or external trade which developed among the Nyanza tribes before the arrival of the Europeans (Obudho, 1970, p. 79).

Taylor (1976) argues that if markets are viewed as an hierarchical system, exogenous factors may be of greater relative importance higher up the hierarchy, and endogenous factors at the lower end. He contends that there were three levels of indigenous spatial organization in East Africa.

At the lowest level, markets were organized by the Kikuyu for trade among themselves at the boundaries of differing ecological zones. At the second level, markets were established at border contact points for trade with non-Kikuyu for foods not produced locally. The third level markets include those focal trading points for commodities such as salt and iron whose occurrence was infrequent, but which were of importance to most societies.

6.2.2 Market Distribution and Periodicity

Past research has also focussed on the locational rationale of markets, with particular emphasis on periodic markets. Stine (1961), one of the earliest proponents of the significance of economic criteria as a major explanatory variable for market location, argued in terms of the maximum and minimum range of commodities, applying his concepts to the system of central places in Korea. He writes:

If the central place is without competitors and the surrounding countryside is characterized by homogenous access and income, the maximum range may be regarded as the radius, generating a circle within which all consumers are willing to purchase at least some of the commodity. Just beyond the maximum range is the point (boundary) of zero demand (Stine, 1961, p. 73).

In contrast to this, the minimum range refers to the profit level of a firm:

The minimum range represents the radius of a circle enclosing a total amount of demand just large enough to insure the success of the firm (Stine, 1961, p. 73).

Stine contends that firms will be fixed in their location wherever the maximum range is greater than, or equal to, the minimum range, whereas where the maximum range is less than the minimum range the firm either

ceases to exist or becomes mobile. Mobility increases the greater the difference between maximum and minimum ranges. Stine then relates this concept to influences of transport costs, population densities and the level of income and demand elasticity. Bromley (1971) criticizes Stine's model as being an oversimplification, in that Stine fails to comment on a trader's ability to either diversify his goods to meet local demand, or to carry out some other activity in addition to trading.

Referring to her work in Northern Tamil Nadu, India, Harris (1976) argues that at least here Stine's notion of ranges is inapplicable, that there is a lack of time-space regularity, and that the markets are not integrated into the urban system. This lack of conformity, she argues, is primarily due to the caste system:

The one regularity shown by the North Arcot system is that the people who trade within it tend to be of lower social status in terms of indigenous categories and it is this rather than class or mode of production which characterises its use (Harris, 1976, p. 6-7).

The poorer people frequent the rural markets because of lower price levels. Transport costs are low and small amounts of goods for sale can be carried free on buses. There is also more chance of a bargain and bargaining at the market, compared to shops in a town.

Skinner's (1964-1965) work in rural China sought to explain the distribution of periodic markets in Szechwan by applying economic criteria. This research represents one of the most comprehensive and detailed studies of work in the field of spatial distribution of markets. Skinner focusses on the structure of marketing systems, relating the types of markets, their periodicities and spacing to the central place system of

Christaller (1933) and Lüscher (1954), and identifying a model of markets as central places with hexagonal trade areas. Three levels of rural market are distinguished: the standard market town at the lowest level, then the intermediate market and finally, the central market. The standard market town is characterized as the point from which agricultural products begin to move up the central place hierarchy and down to which imported items move. Below the standard market town are the minor markets of local villages which deal solely with the exchange of local foods. The central market has major wholesaling functions. Skinner found that the periodicity of rural markets, following either the lunar hsin system or the duodenary cycle, reflects the level of local demand for foods, the fact that many firms are both producers and traders, and the fact that many households, being largely self-sufficient, do not need the foods and services provided by the market every day. The periodicity of such markets reduces the distance which must be travelled to arrive at a market. Markets, therefore, are more densely distributed than would be the case if they were diurnal. Skinner comments on the functions of markets, as meeting not only economic needs, but acting also as centres for social interaction, medical practitioners, craftsmen, fortune tellers, credit facilities and other services. He goes on to analyse the evolution of the central place system with increasing population density, and the gradual decline of the smallest centres as they are bypassed with the provision of better transportation linkages to higher level places. Wood (1970) cites evidence from Muranga District, Kenya, in support of this trend of decreasing numbers of markets. His data was, however, collected by questionnaire and mail from local authorities, and disagrees with evidence from a fieldwork

survey conducted by Kimani and Taylor (1973) in the same area. Their work indicates a recent increase in the number of markets.

Bromley (1971) criticizes Skinner's evolutionary model as it gives:

... too much emphasis to formal, geometrical aspects of Christaller's reasoning and neglected the more basic and universally applicable concepts of the maximum and minimum range of a good (Bromley, 1971, p. 128).

Recent research by Bromley, Symanski and Good (1975) has emphasized tradition and local social systems in explaining the periodicity of markets and the occurrence of marketing chains. They also argue that the needs of producers, who are often part-time traders, and the organization of time, which is culture-specific, are major explanatory variables of periodicity:

In most parts of the world early trading institutions had to be coordinated with a calendar defined by the routine of production, religion, administration, rest and recreation (Bromley et al, 1975, p. 531).

Bromley et al contend that inertia has also played its role in the periodicity of markets, that their location may well have had comparative advantage at the time of their founding:

It was efficient, logical, and convenient for early markets to be periodic, and these periodic markets persisted, or only changed with notable lag effects, because of social and cultural resistance to change and the cumulative advantages that accrued to the first markets. Traditional economic analyses have not misread history, but have ignored it. As a result, both the origin conditions of periodic markets, and the role of positive feedback in the persistence of social and economic phenomena, have also been ignored (Bromley et al, 1975, p. 537).

Hodder (1969) makes a case for the efficiency of periodic marketing, despite

the apparent duplication of many processes:

In developed countries a great deal of capital is spent in the various stages of the distribution process; but in Yorubaland capital is scarce and unskilled labour abundant. Before a commodity reaches the periodic market from a farmer's farm, it may have gone through two or three intermediaries, each of whom must make her profit. Yet the "profits" made by all these intermediaries are small, often infinitesimal, and it is by no means certain that the final retail price would be lower if only one, rather than say, three intermediaries were used. Traders have low overheads and can operate on very low profit margins (rarely over 2 1/2 - 5%) (Hodder, 1969, p. 92).

Recent work on periodicity by Adalemo (1976) uses linear and polynomial regression analysis to examine the relationship between spatial proximity and temporal proximity. His study indicates only a slight relationship between the two, but he concludes that a simpler approach may produce clearer results.

Linked with the concept of periodicity is that of marketing rings.

Bromley (1971) defines these as interrelated groups of neighbouring periodic markets, holding their functions on different days. Hodder (1969) describes a common situation:

Very few market rings, admittedly, are in any case self-contained, and adjacent market rings often impinge on one another, resulting in a loose chain-mail pattern of rings stretching over most of Yorubaland (Hodder, 1969, p. 67).

Research by Allison (1975) on the Yola region of Northeastern Nigeria supports this view.

Research in the spatial distribution of markets has been carried out

by Hodder (1969). He argues that, in Yorubaland, with a population of over twenty per square kilometre, markets are regularly spaced at intervals of 11.5 km. Below such a population density, markets are infrequent. In Kenya, Wood (1970) finds markets evenly distributed in areas with less population density, such as Kitui District, with 13.8 per square kilometre. McKim's (1972) findings in Northern Ghana give similar results. Wood (1970) finds an inverse relationship between population density and mean market area and more specifically between mean area per market day and population density.

6.2.3 The Role of the Market Through Time

Hierarchies of markets have been researched not only by Skinner (1964, 1965) but by geographers such as Berry (1967). Referring to the cross-cultural context and dealing primarily with economic aspects of periodic market location, Berry stresses the place of markets in the hierarchical central place system, and their changes through time. Ukwu (1969) develops the idea of an hierarchical system with reference to Ibo markets in Nigeria, distinguishing between the Central Place sub-system and the market place sub-system. Troin's work (1976) among suqs in Morocco refers to their pyramidal organization and he discusses their role in the urbanization process:

Générateur de bourgs et de villes, le souk commande assez étroitement les formes spatiales de la morphologie urbaine. On reconnaît ainsi divers stades ou familles depuis le marché de plein air non bâti, jusqu'au marché intégré au tissu urbain avant son exil en périphérie de la cité (Troin, 1976, p. 67).

The role played by the market in time is also commented on by Bohannan and Dalton (1962) who argue for its demise:

Just as its economic importance lapses with the 'development of the economy' and it becomes merely a place of final sale, so its political importance lapses with the development of the polity, its religious significance with the acceptance of world religions, and its social significance with the adoption of the guitar, the radio, the 'hoteli' and high life (Bohannan and Dalton, 1962, p. 26).

Hodder and Ukwu (1969) argue that markets in Nigeria, and probably in West Africa at least: "... may be seen as intermediate stages on a single, albeit many-stranded continuum from the most elementary to the most complicated economies" (Hodder and Ukwu, 1969, p. xii). They contend that a periodic market which deals with the injection of local foodstuffs and craft products into the exchange economy leads on to a secondary stage in which the daily market predominates. This stage is seen to be associated with urban life. This type of market, they argue, gives way, in time, either to retail shops or specialized wholesale markets (Hodder and Ukwu, 1969, p. xii).

Such generalizations as these, however, appear to be based on a Western capitalist view of development, and may prove inaccurate when applied to Africa. It is interesting to note that even in some developed countries, such as the U.K., markets continue to play a vital role in many communities. Allison (1975), referring to the Yola area of Nigeria, argues that although there appears to be a shift from periodic to daily markets with an increase in population, improved transportation, more occupational specialization and increased income and demand, this should not lead to the atrophy of a market's retail functions on account of the

multifunctional nature of markets and their role in the social and cultural life of a people.

Reference will be made in section 6.3 to work by Kimani and Taylor (1973) on the multifunctional characteristics of markets in Kenya. Larson (1973) in Togo found that the following activities took place at the market: social functions, such as the selection of a mate, tax collecting, announcements by headmen, the broadcasting of propaganda and information by government officials, minor court cases, and the dissemination of local information.

6.2.4. Marketing Chains

Marketing chains are defined by Bromley (1971) as follows: "The sequence of transactions and commodity movements between the initial producer and ultimate consumer is known as the marketing chain" (Bromley, 1971, p. 129). His research in this field indicates that as market systems develop, the importance of direct producer to consumer transactions decreases, and the importance of trading intermediaries increases. He refers to both bulking and distributing chains in his analysis. In marketing chain development, the chains at first extend in length, but with improved transportation, larger scale wholesalers with more capital predominate, and the chains decrease in length. Amonoo's (1975) study, in Ghana, of the interactions from producer to intermediary to final consumer, suggests changes which could increase the efficiency of the system. For example, he recommends the establishment, with Government assistance, of producer-seller cooperatives.

6.2.5. The Classification of Markets

An early focus of geographical research into markets concerned their classification. Bohannan (1961) based his classification on the market's function within the distributional chain proposing feeder markets, bulking centres, major markets and large-scale trading centres as the major divisions. Hodder (1969) criticized such a system as lacking sufficient detail of the movement of goods and traders within an area. He proposed a five-fold classification based on the location of the market in a rural or an urban area, and its periodicity. Ukwur (1969) used location, urban or rural, and the position in the central place or market place subsystem for his classification. Johnson (1970) proposed a classification according to the internal spatial pattern of a market. Allison (1975) found a combination of variables which included periodicity and location to meet the needs of the Yola area.

Within Kenya itself, Alvis (1970) proposed a three-fold classification of markets based on the extent of the localization of relevant demand and supply forces. Obudho (1970) referred to seven market types in Nyanza Province, based on differences in location and periodicity.

Such classifications as have been proposed in research have tended to be region specific. Little progress has been made in the cross-cultural context.

6.2.6. The Role of Markets in Innovation Diffusion

In their work on Muranga District, Kimani and Taylor (1973) comment that traditional markets, bars and teashops are important points from which

innovations diffuse. The implications of this for agricultural innovations have, to the writer's knowledge, been explored in only two projects: one previously mentioned, in Papua New Guinea, and the other in rural Colombia.

Referring to the former project, Ward et al (1974) argue that higher order services such as extension services can only be made available to the rural population of Papua New Guinea, (90.5% of the total), by increasing the mobility of such services, and coordinating them in time and space in "maket rauns".

Harris (1976) refers to this study in her work in India. She argues that the use of growth centres as a planning device will be socially discriminating as the poorer population does not use the towns, and the village is considered too small a unit for development planning. She poses the question: "Can the rural markets which are patronized by socially and economically poorer people be used by the Government for redistribution purposes?" (Harris, 1976, p. 9). She concludes:

Many of the functions for the deliberately planned 'maket rauns' in New Guinea - wholesale purchasing of marketed surplus, banking, agricultural extension and vehicle maintenance (Ward et al, 1974), would not be appropriate to the North Arcot type of periodic marketing system. However, the locating of mobile medical, dental and veterinary services, family and child welfare facilities, basic adult education in hygiene and literacy might enable the Minimum Needs Programme of the fifth 5 year Plan to penetrate more effectively into rural areas such as North Arcot, characterised by generalised poverty and by severe social and spatial income and 'access' inequalities (Harris, 1976, p. 9).

The second project planning to use markets for the introduction of agricultural innovations is a joint project of the Interdisciplinary Rural Development Research Group of the Colombian Agricultural Institute and the International Development Research Centre of Canada. The project focusses on constraints to small farm production in the Caqueza area of Colombia (Zandstra et al, 1975). A report written in connection with this project, on the topic of small farmer communication, by Duncan (1975), mentions the importance of using the weekly market day to show films or slides about rural development, in the market place. Duncan notes that not only are about five hundred farmers present, on the average, at one time, but also that within the market place environment, farmer reaction can more realistically be assessed, and two-way communication can more readily take place. He writes: "The existing communicational infrastructure of the community is the most potent means of communication within the local community" (Duncan, 1975, p. 22).

With reference to Kenya, before proposing the use of the market place as a centre from which agricultural innovations can be diffused, it is essential to establish the role markets play in the existing spatial and communicational network. This will be attempted in the following section.

6.3 The Market Place in the Traditional Kikuyu Spatial System

6.3.1. Introduction

Those who would restructure space to meet the new aims of African governments might find utility in looking to the past
(Taylor, 1976, p. 16).

So argues Taylor in discussing the relevance of the spatial system to

the aims of Modern Kenya. It is the purpose here to discuss the role of the market place in Kikuyuland and it will be argued that, as the market place is an integral part of the traditional spatial system, has a multi-functional nature, and is used predominantly by women, the main foodcrop producers, it has potential for use as a centre for agricultural innovation.

6.3.2. The Traditional Kikuyu Spatial System

In discussing the evolution of East Africa's spatial system, Taylor (1976) proposes the concept of the 'invisible town'. This he defines as:

... a location where many of the functions of a town are carried on but where there are fewer, if any, permanent structures associated with these functions than observers, used to a Western concept of towns, might expect (Taylor, 1976, p. 1).

Trading and marketing are seen as the chief functions of such towns, although they also had non-economic functions such as political, religious, social and personal. Residence was not one of the functions of such towns. Details of a sample of 25,000 present day users of markets indicated the following:

TABLE 6.1
REASONS FOR MARKET ATTENDANCE, MURANGA DISTRICT

	Primary reason	Secondary Reason
To sell products	40.5%	11.7%
To buy products	37.2%	44.6%
Social Reasons	21.0%	35.3%
Other	1.6%	8.5%

The category 'social reasons', when broken down, revealed the following:

	Primary reason .	Secondary reason
To socialize	4.2%	11.5%
To meet friends	3.0%	11.8%
Curiosity	13.8%	12.1%

Source: Taylor, 1976, p.1 and.3.

Taylor (1976) argues that market places, on the sites of invisible towns, are no new phenomenon, but date back several centuries. They used to occupy permanent sites, were linked together by a communication network of paths, and were of different sizes. Taylor envisages a four-fold hierarchy of central places based primarily on the market functions of the town. At the lowest level is the central place for one community, varying in size according to the population density of the area, but generally serving a hinterland with a radius of 5-10 miles. Such markets had 9, 7, 5, 4, or 1 day cycles. Wood (1970) notes that twice weekly markets are common in Muranga District. Their location was generally at the juxtaposition of different ecological zones.

Invisible towns on the next rung of the hierarchical ladder were generally located in the border area between two ethnic groups at sites where the exchange of different goods took place. The radius of the hinterland was generally greater than one day's walking distance. Thirdly, invisible towns serving hinterlands of often hundreds of miles and peoples from several ethnic groups form the next central place type. Salt markets are included in this group. At the apex of the hierarchy are international contact and exchange points, with hinterlands of over 1000 miles radii. Berbera, a coastal town, is given as an example here. Taylor notes that such coastal sites were generally chosen by Arab, Persian and Indian traders as part of their spatial pattern.

Referring to Kikuyuland, Taylor (1976) argues that only the two lowest levels of the hierarchy are evident in the traditional Kikuyu spatial system. Markets at the lowest level occurred on the boundaries between different ecological zones. The largest such markets were located between 1500 m and 1800 m in Middle Kikuyu where produce from the three ecological zones is exchanged (Taylor, 1967) (Figure 3.2). To these markets, people from High Kikuyu bring firewood, charcoal and vegetables (cabbages, potatoes and onions) and those from Low Kikuyu, gourds, livestock, sisal ropes and medicines. These are exchanged for the food produced in Middle Kikuyu. Smaller markets exist at 1500 m and 1800 m on the border between Low and Middle Kikuyu and Middle and High Kikuyu, respectively. Within each zone there are also minor markets serving that particular zone, being most common in Middle Kikuyu where a greater variety of produce is grown.

Markets forming the second level of the hierarchy are found at the borders of Kikuyuland. Taylor (1967) cites as examples Kinyona and Kairo in High Kikuyu. These were linked by footpath across the Aberdare mountains to the Rift Valley, enabling goods to be exchanged with the cattle-raising Masai.

6.3.3. The Influence of Arab and Indian Traders

Superimposed on this centuries-old spatial pattern have been Arab and Indian influences, and later British colonial ones. The earlier Arab and Indian aims of penetration were to extend their trading network, and initially this affected only coastal sites, the traders relying on the

indigenous spatial system to procure the ivory, gold or slaves for export. Only later in the nineteenth century did Arab and Indian traders move inland and use the existing spatial pattern, but re-orienting the direction, more strongly towards the coast. Coastal towns therefore grew in importance, and this, Taylor (1976) contends, was at the expense of some third level towns, such as Kazembe. Markets of the first two hierarchical levels probably grew in size, stimulated by the need for food for the traders.

6.3.4. British Colonialism and Its Impact on the Spatial System

The British superimposed on this a spatial pattern which reflected their aims of exploitation of raw materials and administration, exemplified by the construction of railway lines and roads serving primarily the areas of European settlement in the White Highlands. Despite this, however, Taylor (1976) argues that the traditional markets persisted as they were still serving the needs of the 'residential' system. With the Mau Mau Emergency in 1952-60, and the colonial government's policy of villagization, settlements were often located at the market sites, many "towns" thereby becoming visible.

6.3.5. Markets in Present-Day Muranga District

In a survey of 128 villages in Muranga District carried out in 1963/64 by Taylor (1968), and which made an inventory of the major services of each centre, it was noted that those villages located at or near a traditional Kikuyu market showed the most rapid growth. The hinterlands of the markets of the district, when mapped, appeared hexagonal in shape, influenced by the ridge and valley topography. The north-south distance

of the areas served by markets is about 6 miles, while the east-west extent is 12 miles, travel being easier in the latter direction along the ridge top. Taylor (1968) notes that markets are 5 miles apart east-west, and 3 miles apart north-south. With the introduction of modern transport routes the shape of the hinterland is changing, becoming more elongated. Mukuyu market outside Muranga town is an example here, stretching out along the newly paved road.

The number of markets in Kikuyuland has expanded with time. In 1915 there were 8 markets in Fort Hall District (now Muranga District), in 1928, 15, in 1965, 42 (Taylor, 1967), and in 1973, 51 (Kimani and Taylor, 1973).

The market places often lack facilities other than being fenced off, the latter so that entry charges can be made from sellers of produce. Such a charge was reported by Taylor (1967) as being 10¢ (100¢ = 1 shilling). Alvis (1970) notes that Kenyan markets in general lack storage facilities. In rural areas, women are the main sellers of agricultural produce, men selling tobacco and clothing. Sellers of one commodity tend to sit together in a specific part of the market. Both men and women are often part-time traders. Alvis writes:

The characteristics of consumers blend with those of producers and traders, since farming is to a large extent for home consumption and farm wives intermittently sell their surplus food in the markets as part-time traders (Alvis, 1970, p. 3).

Export crops are often collected at or near the market place on non-market days and are then taken away by assemblers.

The persistence of local markets in Kenya is attributed by Alvis (1970) to economic factors:

The survival of the peasant marketing system in Kenya in the face of potential and actual competition from more commercialized large-scale methods strongly suggests that the existing market structure meets the requirements at lower cost than can the available marketing boards.... The distribution system appears to have adjusted itself to demands made upon it by consumers and producers in the economy (Alvis, 1970, p. 21-22).

In this regard he refers to the intensive use of labour and the low risks of any one trader as marketing units are small. He continues:

The private marketing of staple foodstuffs for both rural and urban markets makes efficient use of available resources. Virtually the only resource used in supplying rural markets is the labor of farm wives. These women are illiterate, have no alternative opportunities for employment, and employ very little capital. By using their skills, which are considerable in marketing, and assuming the risk-taking functions of entrepreneurs, they release supervisory skills, managerial and capital for employment elsewhere (Alvis, 1970, p. 22).

With such a disparaging view of the role of women, Alvis fails to note the importance of the "farm wives" as the chief producers of food crops and hence valuably employed in this field, as well as being skillful in marketing. It is the contention of this paper that the women, as food producers and sellers at the market place, have a crucial role to play in agricultural development through the process of innovation diffusion using the proxemic network of communication of the market and its environs.

6.4 The Market Place and Its Potential in Regional Development

Distance and accessibility are inextricably interwoven into the process of development. In countries such as Kenya where the agricultural sector will continue to play a primary role in development, development strategies must be designed which serve to reinforce their contribution
(Gaile, 1976, p. 14).

6.4.1 Introduction

Stöhr and Tüdtling, in their paper on spatial equity (1976), propose a counter-argument to widely held views on regional development. They contend that spatial equality of levels of living should be considered in wider terms than previously:

Equity is therefore considered not only in terms of equal socio-economic levels of living but also in terms of equal chances of individuals and groups for diversity and for being different.... With the diversity of individual (and group) aspirations and dispositions this is the only way of facilitating opportunities for a maximum degree of human self-realization (Stöhr and Tüdtling, 1976, p. 4).

Such opportunities, they argue, have been reduced in the past in developing and developed countries alike by "backwash effects" in economic, socio-cultural and political terms as a result of indiscriminate use of new technology, scale economies, specialization, and spatial integration at national and international levels. Such strategies have been concentrated in geographical space in growth centres, and Stöhr and Tüdtling attribute such negative results to the growth centre approach to planning. Friedmann, formerly a proponent of Growth Centre strategy, now concurs with such a view, and with Douglass (1976) argues that such a strategy exacerbated many spatial problems. Friedmann (1977) considers the growth centre

strategy as consistent with the transnational ideology of development, and in antithesis to the "basic need approach" to development he now proposes. Self-reliant development is the underlying concept of Friedmann's work, and this terminology is now also used by Stöhr and Palme (1977) replacing the phrase "selective regional closure" of Stöhr and Todtling (1976).

One implication of the self-reliance approach to development concerns the need to examine those structures within a rural area, whose utilization, if given the opportunity, could lead to more equitable development. It will be argued, in this chapter, that markets, forming part of the traditional and proxemic spatial network, could fulfil such a function. Specifically, it is hypothesized that markets in Kenya, and in Muranga District in particular, could play a major role in agricultural development, both with reference to the diffusion of innovations such as food crops, and to information gathering on the part of the extension service.

The chapter is therefore concerned with those processes identified in the introduction to Chapter 4: pushing decision-making downwards from the centre, and establishing an acceptable point to which it is pushed. After a discussion of the growth pole concept and the drawbacks of its application in developing countries, more recent strategies for regional development will be considered.

6.4.2 The Growth Pole Concept and Regional Development

Early theories of regional development relied heavily on the growth pole concept first formulated by Perroux (1955), an economist, based on the observation that:

... development does not appear everywhere and all at once: it appears in points or development poles with variable intensities; it spreads along diverse channels and has varying terminal effects on the whole economy (Hermansen, 1972, p. 3).

Centrifugal forces emanate from and centripetal forces are attracted to such poles, according to Perroux's argument, which was chiefly concerned with industrial location and its forward and backward linkages.

Hermansen (1972) describes the evolution of the concept:

The concept of growth poles and the related body of theory were originally developed as a tool to describe and explain the anatomy of economic development in abstract economic space.

However, in the course of time the scope of the theory and the concept itself have been broadened and re-oriented to include also the normative issues of policy-intervention and planning. Thus the theory is now viewed as a general theory of development in a simultaneous sectoral-temporal-spatial setting

(Hermansen, 1972, p. 2).

One of the first to relate the concept of polarized economic growth to geographical space was Boudeville (1961). His work relied heavily on the central place theory of Christaller (1933) and the location theories of Losch (1954) which seek to explain the existing pattern and distribution of spatial organization, although they are not concerned with prediction, nor with the process of growth. Assuming an homogenous plain evenly distributed with natural resources, Christaller (1933) deductively arrived at a model of spatial organization with the following salient features: horizontally, human activities are regularly spaced in triangular form, and are centrally located within hexagonally-shaped trading areas; higher order central places are more widely spaced than those of a lower order; vertically, the arrangement is hierarchical, higher order centres supplying

goods to lower order ones, and those higher order places having a greater range of goods than the lower ones. Lüscher (1954) somewhat modified Christaller's model by taking account of specialization in some central places, and the division of labour. His concept provided for more flexibility in the horizontal and vertical organization of space. Hermansen (1972) considers the value of central place theory to lie in its contribution to the understanding of spatial relations, despite the fact that evidence is often lacking for the regularity assumed by Christaller and Lüscher.

Hermansen attempts to synthesize central place theory, a static concept, with Boudeville's dynamic one of localized poles of development.

Friedmann (1972) proposed a 'General Theory of Polarized Development' as a basis for regional planning. This theory:

... treats economic growth as a function of changes in the structure that inevitably limit a system's capacity for expansion and, in the specific case of growth based on the application of science to problems of economic production, also on the system's capacity for continuous generation and absorption of innovation. This formulation assigns a decisive influence to the institutional and organizational framework of society, and specifically, to the patterns of authority and dependency that result from the unusual capacity of certain areas to serve as cradles of innovation
(Friedmann, 1972, p. 83).

Friedmann's conflict theory of change envisages, at first, increasing polarization of development in the core area, at the same time as which the periphery, as a result of backwash effects (Myrdal, 1957), becomes poorer, until a critical point is reached:

The further growth of core regions, however, is in the final analysis constrained by the tensions that tend to build up from the ever

more visible discrepancies in the rates of expansion and modernization between the core and periphery. The increasing flow of information from core to periphery, together with the aroused awareness of potentially modernizing elites in the periphery of the conditions of their own dependency, produce conflict with core region authorities over the extent of permissible autonomy (Friedmann, 1972, p. 97).

Four possible outcomes of this situation are foreseen by Friedmann which result in deviation-amplifying or deviation-counteracting situations. If the former occurred, growth without development would take place, and planning to change the centre-periphery relationship would be needed. To do this, Friedmann proposed an hierarchically nested urban system similar to Christaller and Lüscher's model, showing by his assumptions that he viewed modernization or development in a top-down process, at this time.

Brown (1974) advocates the synthesis of growth pole theory with that of spatial diffusion, in order to achieve a theory of value to regional development. He argues:

Needed of course, is the development of theory that delineates the growth pole process in terms of the mechanisms involved and from which an expected surface of growth could be derived
(Brown, 1974, p. 249).

Brown adheres to the view that ideas, as well as consumer goods, diffuse outwards from a growth centre. With reference to entrepreneurial activity, however, he sees polarization effects as greater than diffusion effects, so far unaccounted for by spatial diffusion theory.

Other attempts at synthesis have been proposed by Misra (1974), again based on what he terms 'growth foci':

Suffice it to mention that the integration of the central place and growth pole theories leads to a sectoral (primary, secondary and tertiary) integration in space, and the theory of diffusion of innovations gives the spatial locations dynamism and centripetal traits (Misra, 1974, p. 144).

Misra's concept is based on a tiered system of functionally integrated growth foci which vary in size as well as function. He is also concerned with the choice of the foci and elaborates a methodology for the collection of data on which to base such a choice.

The growth centre concept and its implications are impossible to divorce from the concept of innovation diffusion, as mentioned in Chapter 4. Work by Pred (1971) in particular has identified this. He contends:

The most realistic descriptive model of diffusion within an urban system would be one that combined the Christallerian hierarchical spread of present models, the lateral and smaller-to-larger place dissemination allowed by a Böschian scheme, and a considerable degree of information exchange between very high-order places, or between places in the size class(es) just below the largest city in the system (Pred, 1971, p. 175).

Pred therefore makes allowance for input into the system from lower levels.

Finally, with regard to growth pole strategies, Gaile (1975, 1976) has helped to clarify the processes which operate in this context. He uses the term 'spread' at the intraregional scale, and diffusion with a stronger hierarchical element at the interregional scale. Spread is defined as an absolute, rather than a relative, change.

Spread is the complex set of processes whereby the absolute level of development of a peripheral area is increased due to spatial interaction with a core area. Backwash results when the same set of processes

effect a decrease in the absolute level of development of a peripheral area
(Gaile, 1975, p. 21).

The elements of the processes for spread include government spending and taxation, the diffusion of innovations, migration, private capital flows, and trade. Gaile (1976) examined quantitatively the impact of such processes in Kenya and concluded that there is significant distance-decay effect when capital is invested in growth centres:

Urban based spatial investment strategies will thus necessarily result in an exacerbated pattern of rural-urban developmental inequity. Planners must weigh the efficiency of urban based investment versus the inequity which is resultant
(Gaile, 1976, p. 14).

6.4.3. The Growth Centre Concept and Developing Countries

Criticism of the application of the growth centre concept to developing countries has come from many other sources. Among the general criticisms is the fact that the proliferation of names - growth poles/centres/foci, development poles/centres - has led to a lack of clarity and precision in usage of the concept, as discussed by Moseley (1973) in his work 'Growth Centres - a Shibboleth'. Until a sharper definition is available, he argues, the concept has little value as a planning tool. Thomas (1972) concurs with this view and also calls for the integration of location and growth theories.

A further criticism concerns the fact that the urban system of many developing countries evolved in response to the different economic conditions of colonialism rather than the needs of newly independent nation states.

Soja (1968) states:

The patterns of human geography which evolved under colonial control have, therefore, frequently proved to be dysfunctional to the goals of the independent government of Kenya. The need to reorganize and reshape the spatial system inherited from Great Britain is one of the key issues facing Kenya today
(Soja, 1968, p. 105).

The growth centre approach is very much a Western concept, emphasizing urban industrial growth. Cities in developing countries often have a parasitic rather than a generative influence on their surroundings (Hoselitz, 1954), and are usually linked more strongly to the primate city than to their own hinterlands, owing to their export-orientation. Corragio (1975) strongly attacks the growth pole strategy as serving elites and Western capitalists, further integrating the developing country into a dependency relationship in the world scene, a view shared by Friedmann (1977). Mabogunje (1977), in recognition of these arguments, refers to the Nigerian situation:

The virtue of present strategies is usually that they invariably represent to governments in these countries relatively painless development effort through the acquisition of gadgetries and technologies from abroad as against the more painful and convulsive process of internal re-organization and adaptation. Yet, only the latter can ensure that structures are created which will facilitate beneficial relationships between urban and rural areas of a country (Mabogunje, 1977, p. 13).

Gaile (1975) comments on the fact that in developed countries, growth centres are recommended for stagnating areas, regions which are "past their peak", whereas in developing countries such a strategy is used to open up regions which are not developing at the same rate as core

areas. Gaile argues that one of the implications of this is that linkages in developing countries need to be strengthened if any spread is to occur.

Some of the strongest criticism has come from Friedmann (1976) whose views on the subject have now radically changed. He, with Douglass, argues that growth centre strategy:

... brought into being dualistic dependency structures that, while they had helped in achieving respectable growth rates, had also created a set of related and potentially explosive problems, including hyperurbanization, increasing rural densities, a spatial structure of dominant core and dependent periphery, widespread urban unemployment and underemployment, rising income inequalities, persistent and growing food shortages, and deteriorating material conditions in the countryside (Friedmann and Douglass, 1976, p. 385-6).

Despite such arguments some continue to see an urbanization model as the only realistic one in the third world. Kudiabor (1971) contends:

Finally, urban culture and civilization have been known throughout history to revolutionize societies. The deliberate creation of growth poles and growth centres will be the surest way of extending urban civilization to the rural areas in Ghana (Kudiabor, 1971, p. 19).

Hansen (1976), replying to Friedmann and Douglass' above-mentioned paper argues:

In sum, then, it could be argued that urban-industrial growth under conditions of (hopefully temporary) economic dualism offers the best long-run hope for developing countries and that in any case feasible alternatives have not been demonstrated (Hansen, p. 176, p. 316-7).

Taylor (1975) has cautioned against the use of the dual centre-periphery model, viewing it as too simplistic, and in the urban context he points out that African cities are not, in general, integrated units, but rather consist of several facets of which the informal and formal sectors are the most significant.* Later work by Taylor (1977) adds a further element to this model: the Asian Community, spanning both formal and informal sectors. As the urban informal sector is regarded as having a generative effect on the rural informal sector, and regional equity is a major goal of many developing nations, Taylor, rather than proposing the growth pole approach at present followed by Kenya, recommends emphasis on the periphery:

What is suggested here, however, is that if change is to take place in the spatial structure in order to bring about both growth and equity, then policies of spatial change must be concentrated in the periphery because, in human terms, that is the 'core' of the nation (Taylor, 1975, p. 230).

Taylor advocates the development of the smaller places of the system, and argues for an adaptation of the growth pole concept to allow this. He

* The informal sector is characterised by:-

a. ease of entry; b. reliance on indigenous resources; c. family ownership of enterprises; d. small scale of operation;	e. labour-intensive and adapted technology f. skills acquired outside the formal school system; and g. unregulated and competitive markets.

The formal sector is characterised by:-

a. difficult entry; b. frequent reliance on overseas resources; c. corporate ownership; d. large scale of operation; e. capital-intensive and often imported technology	f. formally acquired skills, often expatriate; and g. protected markets (through tariffs, quotas and trade licenses).

Source: ILO, 1972, p. 6.

contends that an hierarchical model is only one way in which space can be structured:

If human activities are both space-forming and space-contingent, then an emerging African system geared to the aims of rural development may not find a rigid hierarchy conducive to its future needs (Taylor, 1975, p. 240).

More recently, Taylor (1977) proposes the term "development centre" to replace "growth centre", as the former term denotes a more holistic approach to planning which includes "... the elements of growth, equity, human dignity, employment and integration" (Taylor, 1977, p. 5). A development centre is defined as: "... a small agro-urban place whose function is to provide innovative cultural, social, employment, trade and service functions for itself and its associated rural hinterland."

Kimani and Taylor (1973), argue that such small places should be carefully chosen, and suggest that growing traditional markets would be suitable locations:

Utilization of these indicies of established linkages with the hinterland will ensure the selection of centres with the existing "complementaries" so important to ensuring spread and trickle down effects
(Kimani and Taylor, 1973, p. 16).

Kimani and Taylor, in their study of Muranga District conclude that markets, bars and teashops are the major points for the diffusion of innovations both because of their place in the traditional spatial network, and because such a network is an interpersonal one. They quote Lasuen: "The farmer will listen more attentively, and will be more inclined to act upon, a new piece of farming information from another farmer than from most other new sources, media and agents" (Lasuen, 1969, p. 144-145).

Referring to Muranga District, Kimani and Taylor emphasize that 80% of the market users are women. This compares with men chiefly frequenting the bars and both patronising tea shops. When asked the reason why they attended a market, of a sample population of over 25,000, 21.1% gave social reasons as the primary reason, and 45.2% gave this as their secondary reason (Kimani and Taylor, 1973, p. 18). Such percentages varied between markets, and therefore Kimani and Taylor recommend that the choice of centres for the injection of innovation be based on the social attractiveness of the market, the number of bars and of teashops.

If the diffusion of innovations concerning food crops are the prime objective of an agricultural policy, then the market place, where the women growers predominate, would be the appropriate location. Other criteria on which to base the choice of centres for development should include, Kimani and Taylor contend, people's perception of the centre, the degree of local involvement, the concentration of entrepreneurs, traders, businessmen, shopkeepers, lorry, bar and taxi owners, and the interlinkages with other centres. Obudho (1975) supports the choice of markets as centres for regional planning, as they would allow for the diffusion of ideas up and down the hierarchy. Chambers (1977) supports the idea of decentralization to the lowest levels, arguing that otherwise, development of the urban sector occurs at the expense of the rural.

Gaile (1976), as an alternative to dispersing investment in a large number of smaller centres, suggests a "growth path" strategy:

Growth paths are based on the knowledge that roads positively affect the development of those residents in proximity to them.

The strategy argues that this developmental process can be transformed from a passive reaction to an active one by stimulating that development. This can be activated by mobilizing a number of currently fixed urban services along the roads and providing accessibility to a much larger segment of the rural-based populace (Gaile, 1976, p. 14).

Another alternative to the growth centre approach has been proposed by Prion and Weitz (1968) in Israel. They describe a rural spatial subsystem created "from below" and paralleling a rural-urban subsystem created "from above". They proceed to discuss the problem of how the two subsystems can be integrated so that they are complementary to each other. The "Agropolitan Approach" of Friedmann and Douglass (1976), and Friedmann (1977) similarly seeks to integrate rural with urban development, the countryside with cities. These authors speak in terms of a parallel economy: "a wage goods economy in the domestic market would exist side by side with an export-oriented, internationally competitive economy" (Friedmann, 1977, p. 14). This approach will be further considered in the following section.

6.4.4 Proposals for an Alternate Paradigm of Regional Development

Disillusioned with the growth centre concept as a vehicle to foster spatial equality in developing countries, and the lack of success of approaches such as the ILO Strategy of 'Redistribution from Growth', researchers such as Stöhr and Tödtling (1976), Friedmann and Douglass (1976), Friedmann (1977), and Stöhr and Palme (1977), propose a new paradigm for regional development based on the concept of self-reliance. Although the terminology used differs by author, and the topic is approached from different

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perspectives, the underlying ideology appears similar. In all cases, a strategy based on self-reliant development would involve a high degree of commitment before practical results would be attained.

Stöhr and Tödtling (1976) and Friedmann (1977) argue that an essential element in their respective strategies is the increased emphasis which must be placed on "non-market satisfactions" (Stöhr and Tödtling) or "use values" (Friedmann, 1977) in the development process. Stöhr and Tödtling write:

Scitovsky (1976) shows that with the emphasis of economic development on large scale functional activities relying on the market mechanism, a steady reduction of the production of non-market goods and services has taken place (eg. those rendered within social groups like the family, neighbourhood or clan, and which include mutual help and stimulation, advice, and work as self-stimulation). Increased specialization and mobility have greatly diminished the importance of non-market goods and services which provide 'comforts' essential for human satisfaction, such as the comfort of "belonging", the comfort of "being useful", and of sticking to one's habits (Stöhr and Tödtling, 1976, p. 23).

Non-market satisfactions are referred to by Hall (1966) and Greenbie (1976) in the context of proxemic space. As first used by Hall (1966), this concept is defined as that part of a person's or group's environment in which direct personal contact exists. Proxemic space is used by Greenbie to mean those spheres which "make human life ultimately satisfying" as they are "specific to culture, personality, time, place and circumstance" (Greenbie, 1976, p. 93, quoted in Stöhr and Tödtling, 1976, p. 24).

In their argument, Stöhr and Tödtling note that indicators used to measure the success of spatial development policies have used economic variables related to market interactions, and social variables measuring access to institutional forms of social services. This field of the market mechanism, its interactions and social institutions is referred to by them as "distemic space", following Greenbie's usage. He defines the term as the capacity of man to abstract and depersonalize, alluding to that part of knowledge learned consciously and which is transcultural. Distemic systems are defined as those which are highly organized and centralized, whereas proxemic systems are far smaller in scale and informally self-organized. Stöhr and Tödtling argue that as a result of development policies, distemic activities have replaced those formerly fulfilled by non-market and non-institutional forms. Illich (1973) argued along similar lines when he proposed the replacement of institutions which had taken over proxemic links. He contended that present public services should be delegated to informal self-organizing groups in order to increase local efficiency and involvement. Stöhr and Tödtling (1976) argue that the measurement of development should include indicators of proxemic space, as these are of greater importance in many developing countries, as well as indicators to estimate the negative effects of increasing commercialization and institutionalization. Such negative effects they see chiefly in terms of reduced access to decision-making and decreased self-fulfilment on the part of the average individual. In recognition of this, Friedmann (1977) includes equal access to the use of social power on the part of individuals, together with the communalization of productive wealth, as the two conditions he considers basic to successfully implementing a 'Basic Needs Strategy' through agropolitan development.

In order to decrease spatial inequity in levels of living, Stöhr and Tödtling (1976) argue that the "resilience of territorial systems to external shocks" (Stöhr and Tödtling, 1976, p. 26) should be increased, which concept they refer to as selective spatial closure. A later paper by Stöhr and Palme (1977) refers to this as "selective self-reliance". They suggest that, on the supply side, measures to implement such a strategy could include, for example, community control over natural resources, over the type and rate of exploitation, and waste disposal, and would basically involve a high level of individual participation in decision-making. From the demand side, Stöhr and Tödtling criticize past development and innovation diffusion policies which have tended towards uniformity. Such development, they contend, considered industrialized white man as the ideal to which all aimed. Rather, development should be seen in terms of Scitovsky's non-market satisfactions. Referring to such satisfactions quoted earlier, they continue:

There is no doubt that the relative weighting of such objectives within an aggregate preference function will vary from region to region and that an increase in market-based "objectively measurable" indicators (real income, product employment from market work), if accompanied by a decrease in the non-market satisfaction mentioned, may in fact result in a decrease of the aggregate degree of "happiness" (Scitovsky). The relative weighting of these components of an aggregate preference function will depend on the degree of regional openness to competitive "absolute ranking hierarchies" (Greenbie, 1976, p. 94) which measure status in quantitative terms such as income or consumption. In cases of a higher degree of regional closure there tend to exist "relative ranking hierarchies" in which status is attained rather by the position one holds in the proxemic space of a specific culturally defined society. So

a certain degree of regional closure is both a determinant and an expression of regionally differentiated preference patterns (Stöhr and Tödtling, 1976, p. 29).

Stöhr and Tödtling then argue that such differences between regions will in themselves be advantageous in terms of the market mechanism by resulting in regionally specific production which will in turn be attractive to external purchasers. They conclude: "In other words, with increasing uniformity over large areas, non-conformity and resistance to innovations can even become a saleable product and an economic advantage" (Stöhr and Tödtling, 1976, p. 29). Among the instrument variables which could possibly be used for selective regional closure they include, firstly, selective closure on drains of production factors such as: determining which technology is to be allowed, dependent upon its effect on regional factor employment; reducing the capital drain on less developed areas by re-organizing the hierarchical banking structure; and reducing the backwash effect of selective outmigration, for example by excluding incentives to the more developed regions and increasing the attractiveness of peripheral regions. Secondly, in the field of transportation, subsidies can be introduced to make the periphery more attractive, local public contract premiums can also be initiated to increase the competitiveness of local suppliers. Thirdly, Stöhr and Tödtling advocate the introduction of compensation for differential scale economies in basic needs sectors where otherwise low population or low income density would render them uneconomic and therefore non-existent. This would result in, at least basic services being available in the periphery. Finally, it is suggested that decision-making powers be distributed to the level which will be most affected by the decision.

Friedmann and Douglass' (1976) and Friedmann's (1977) concept of 'agropolitan development' supports many of the ideas expressed above.

Referring to social development, rather than economic growth as the new paradigm for development, Friedmann and Douglass write:

According to this paradigm, development must be fitted to ecological constraints; priority attention (in agrarian economies) must be given to rural development; and planning for rural development must be decentralized, participatory, and deeply immersed in the particulars of local settings (Friedmann and Douglass, 1976, p. 334).

Ruddle's (1976) support for such an argument is based on the contention that it makes good sense to view the environment through local people's eyes, as they perceive their resource capabilities and use most realistically.

In proposing a policy of agropolitan development, Friedmann and Douglass (1976) suggest the creation of agropoli or "cities-in-the-fields", urban centres adapted to rural areas to encourage potential migrants to remain in the rural areas. At a larger scale, agropolitan districts, with some degree of autonomy, would be created. Emphasis on the agropolis is here similar to Kimani and Taylor's (1973) recommendation of focus at the local level. Friedmann and Douglass state:

What is envisioned here is a system of governance in which effective power for decisions is devolved to agropolitan districts, to enable them to take advantage of ecological opportunities where they exist (while being mindful of ecological constraints), to harness the richly personal, embodied learning of local inhabitants to the more formal, abstract knowledge of specialists and others experienced in agropolitan development, and to encourage a growing sense of identification of local people with the enlarged communal space of the agropolis (Friedmann and Douglass, 1976, p. 373).

Implicit in the arguments presented above is a perception of the value of indigenous local structures which fulfil non-market satisfactions (Stöhr and Tüdtling, 1976) within a society. The argument presented here is that the market place, in Muranga District in particular, not only fulfils the local needs of buying and selling, (and is therefore part of the exchange value system, Friedmann, 1977) but also has value as part of a proxemic communication network. The market place can be considered part of a proxemic system in that it is small in scale, relatively informally organized and the result of local organization and input. Its characteristics also vary according to culture and it is a location where direct personal contact exists. As a result of this, it is argued, the market has a major role to play in innovation diffusion, particularly among women farmers who dominate the sale of food crops.

Evidence from Kenya supports the contention that such a role needs to be performed:

Agricultural administration has to find some intermediary between official services and the vast multitude of small farmers as a point for distribution of physical or credit inputs, as a channel for distribution of information and as a focus for shared facilities (eg. storage) (Hunter, 1974, p. 8).

Cooperatives have been tried in an attempt to meet such a need, but so far have failed to gain widespread acceptance. They are usually seen as an alien innovation imposed from above.

The market, however, can be seen, as Taylor (1975) notes, as part of the already existing viable spatial pattern which reflects social attraction and economic complementarity with the environment: "The traditional markets have the additional advantage of reaching those most directly

concerned with cultivation as they are dominated by women" (Taylor, 1975, p. 239). Taylor referring specifically to rural Kenya, writes:

The failure of many rural development schemes stems from attempting a transformation path totally unrelated to what existed previously. Consequently, if rural development strategy builds on traditional socio-economic values, then a spatial system which purports to serve the aims of rural development must build on and complement those elements of the traditional spatial pattern which are conducive to that development. In this way, existing economic and social linkages can be utilized and the likelihood of success will increase (Taylor, 1975, p. 238).

Such a statement concurs with the views held by Ward et al (1974) quoted in the introduction to this Chapter, that innovations making use of the existing traditional system are more likely to be adopted. Such an approach is supported by evidence from communication theory outlined in Chapter 4.

6.5 The Market Place in Present-Day Muranga District

In order to discuss the role played by markets in present-day Muranga District, it was decided to choose those markets located in the sublocations identified for hypothesis testing in Chapter 5, in Middle Kikuyu. Although only two markets are found in the case study area, both Kandara and Kabati are of sufficient size and importance to illustrate the salient features of Kikuyu markets, with a view to discussing the potential of markets as centres for innovation diffusion in the concluding Chapter 7.

Both Kandara and Kabati are centres for their respective Locations, and have traditional as opposed to cattle auction or roadside markets.

Kandara market opens twice weekly, Kabati once.

TABLE 6.2
MARKET ATTENDANCE

	Buyers			Sellers		
	Total	male	female	Total	male	female
Kandara	718	139 (19.4%)	579 (80.7%)	755	149 (19.8%)	606 (80.3%)
Kabati	559	129 (23.1%)	430 (77.0%)	434	90 (20.8%)	334 (79.3%)
District	14,579	3177 (21.8%)	11,402 (78.3%)	11,654	2132 (18.3%)	9522 (81.8%)

The above table 6.2 indicates that women predominate among both the sellers and the buyers at the markets. In addition to this, there is evidence that a large percentage of market attendance is regular. 38.6% of those who attend Kandara market and 47.1% of those at Kabati rarely miss a day. A further 32.4% at Kandara and 20.7% at Kabati, often, but not always, visit the market. These figures are in line with District averages, 40.2% attending regularly, and 35.1% often.

Food, household goods, clothing, beverages and food eaten at the market, medicines, ornaments and other miscellaneous items, are available at both markets. Kandara also has a livestock market. Unfortunately no quantitative data is available to indicate the relative proportions of the products sold, although other sources indicate that food crops sold by women predominate (Wilson, 1973; Taylor 1967, 1968). Men are responsible for the sale of household goods, clothing, medicines and ornaments.

TABLE 6.3.

	Kandara		Kabati		District	
	a.	b.	a.	b.	a.	b.
1. to sell products	40.2	1.0	44.6	0.0	40.5	11.7
2. to buy products	37.5	38.8	35.8	54.2	37.2	44.6
3. to socialize	2.8	12.0	4.6	1.7	4.2	11.5
4. To meet friends	1.5	9.5	1.5	26.7	3.0	11.8
5. Curiosity	17.1	23.9	13.1	0.9	13.8	12.1
6. Other	1.0	15.2	0.7	16.7	1.6	8.5

a. Primary Reason % b. Secondary Reason %

At Kabati, there is an Agricultural Instructor, a Veterinary Officer, and a Livestock Officer, and again, none of these facilities were used by market visitors. 93.4% said they used other services in Kabati, as follows: 65.0% visited shops, and 35.1% bars. These figures are in agreement with District averages.

Despite the variety of services available at Kandara and Kabati, the fact that none of the government-provided services are used by market visitors is striking. If agricultural extension agents were to be located actually in the market place as part of an attempt to contact the chief producers of food crops, this trend might be altered.

Of relevance to a discussion of whether the market place has potential for innovation diffusion, is the size of hinterland served by each market. Figure 6.1 illustrates the market areas of Kandara and of Kabati. It also shows the effect of local topography on hinterland shape. Most market users live within walking distance of the market, 82.5% in the case of Kandara, and 74.1% for Kabati. A further 15.8% reach Kandara, and 18.1% Kabati, by bus. Cars, lorries and bicycles are infrequently used to reach these markets.

The implications of these findings to the basic hypothesis of the thesis will be considered in the following concluding chapter.

CHAPTER 7

CONCLUSIONS

When we dream of what has gone before
And what is to come after;
When the sun comes up over the hills in the mornings
And sets the way it rose with the moon and stars;
When at last we hang up our weapons upon our mud walls
And weep with joy because the battle is over and won;
When the women who fought with us
Bring water in cracked calabashes
And beckon us to the spot where the water
Should drop, drop by drop, in tearful libations,
Do we know indeed what has gone before
And what is to come after?

(From: Questions of our Time / Kwesi Brew)

The stated aims of Kenya's Development Plan, 1974-78 include tackling the problems of inequality manifested at inter- and intra-regional, and interpersonal levels. Inequitable development has been a characteristic of Kenya's agriculture since the early days of colonialism, and Independence, while bringing changes in land ownership and size of holdings, has failed to produce an equitable rural economy. The ILO Mission (1972) to Kenya, suggested that a vital rural economy could be created by emphasizing the development of the small farm sector. Such a strategy is now being put into effect and the small farm sector now produces 55.3% of the total gross marketed production from large and small farms (Economic Survey, 1976, p. 81). However, such statistics hide the fact that the vast majority of small farms are still uninvolved, to any significant extent, in commercialization. Within the small farm sector, inequity persists, and the gap between rich and poor continues to widen.

One of the variables considered significant in exacerbating differences in the levels of living among the farm population is the uneven application of agricultural extension inputs. Evidence from those sublocations within Muranga District chosen for case study indicates that these areas follow trends noted elsewhere in Kenya by Leonard (1972a, 1972b, 1973) and Mbithi (1972), that resources such as extension service visits are more available to the progressive farmer, who often owns the larger farms within the small farm sector, than to the non-progressive farmer.

As large numbers of farmers need to be reached by the extension service if their farms are to be brought into the "modern subsector" (Hunter, 1974), group techniques have been suggested as an alternate strategy to the individual visits made by extension personnel in the past. Schönherr and Mbugua (1974) propose, in this context, a focus on the "average" farmers, rather than the progressive ones, to bring about more equitable rural development. In recognition of this factor, it is proposed that the market place has a role to play complementary to other agricultural extension programmes in the diffusion of agricultural innovations.

The market place forms an integral part of the established Kikuyu spatial system. The market is multifunctional in nature, (Table 6.3), people coming not only to buy and sell, but also for social reasons. The market appears to reflect the need for interpersonal characteristics of proxemic space, and it is the one location where women farmers gather on a regular basis to sell their crops. So far such women have been virtually ignored by the extension service. As the need to produce more food has now been recognized by the Kenyan Government, following the recommendation of the ILO Mission (1972), a way needs to be found to establish contact

between the large numbers of women food producers and the Ministry of Agriculture.

It was noted in Chapter 6.5 that no visitors to the markets of Kandara and Kabati used the various services provided by the Ministry of Agriculture in these centres. However, if the extension personnel were to be located in the market place itself, the potential for interaction with the farmers would be increased. In particular, this might be the case if the extension agent were female and there were a high degree of homophily between her and the women farmers. Also, the opportunity for two-way communication, for the agent to listen first, advising later, (Hunter, 1974), and for the diffusion of both centrally and locally originating innovations would improve. In such a situation of 'mutual awareness' (Duncan, 1974), a built-in mechanism for feedback as to the compatibility of the innovation within the total farming scene, would exist. The probability of the felt-needs of the farmer being met would therefore be increased.

If such a proposal is to be considered further, research is needed in several directions. Firstly, into the type of approach to be used in the market place. Rogers and Shoemaker (1971) propose a media forum, a combination of mass-media and interpersonal channels as the most effective approach, in general. Such a technique could be adapted to the market place. In the Caqueza project in Colombia, part of the extension strategy includes the screening of films in the market place. These films feature the farmers themselves tackling specific problems and involved in the decision-making and planning process of innovation diffusion. The self-concept of

the farmer improves as a result of this, and respect is shown for his intimate and well-tried knowledge in the use of his resources. This type of approach is far from the traditional extension presentation featuring a research scientist demonstrating a technique from his 'ivory-towered' research station. Discussion could follow an audio-visual presentation in the market place on both group and individual levels. Duncan (1974) suggests that group meetings be controlled by one of the farmers as a means of promoting farmer reaction and interaction. Group pressure for the adoption of an innovation would probably play a part in this type of situation.

Secondly, research is needed into the types of innovation suitable for diffusion from the market place, possibly new varieties of food crops and methods of cultivation. Thirdly, characteristics of the communication network it is intended to use need to be researched. It is important to know the percentage of total women farmers attending the market, whether they would respond more readily to a female than a male extension agent, and what interpersonal communication links exist between the women sellers and other women farmers. It would also be necessary to know whether any forestalling takes place, and from what income and farm size groups the sellers of food produce come.

By focussing research on part of the existing traditional spatial infrastructure, the market place, the potential role of this centre for the diffusion of both locally and centrally generated agricultural innovations can be more comprehensively assessed. Growth centre strategies have

failed to involve the mass of rural people in the mainstream of the developmental process. More local 'grass-roots' input as specified in the recent proposals for self-reliant development could change this, and the market could in this way be a vehicle for such change.

APPENDIX

TABLE 1

RANGE OF FARM SIZE AND ITS RELATIONSHIP TO TYPE A AND B FARMS

Sublocation	Entire sublocation			Type A farms			Type B farms		
	min	max	range	min	max	range	min	max	range
401	0.30	21.00	20.70	0.50	12.00	11.50	1.00	10.60	9.60
404	0.10	14.00	13.90	0.80	14.00	13.20	0.70	5.00	4.30
409	0.20	20.00	19.80	1.00	16.50	15.50	0.50	16.00	15.50
505	0.50	16.40	15.90	1.00	13.00	12.00	0.50	9.00	8.50
508	0.80	45.00	44.20	1.50	45.00	43.50	0.80	10.00	9.20
1004	1.00	27.00	26.00	2.80	10.00	7.20	1.50	24.00	22.50
1005	0.30	63.00	62.70	3.00	63.00	60.00	1.00	10.00	9.00
1806	1.00	18.00	17.00	2.30	13.00	10.70	2.50	7.50	5.00
Entire Sample	0.10	63.00	62.90	0.50	63.00	62.50	0.50	24.00	23.50

TABLE 2

FARM SIZE DISTRIBUTION AND ITS RELATIONSHIP TO TYPE A AND B FARMS

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre	Cum Fre	Abs Fre	Rel Fre	Cum Fre	Abs Fre	Rel Fre	Cum Fre
		%	%		%	%		%	%
<1	60	10.8	10.8	11	6.3	6.3	9	15.0	15.0
1.1 - 2	97	17.5	28.3	25	14.4	20.7	12	20.0	35.0
2.1 - 3	118	21.3	49.6	30	17.2	37.9	11	18.3	53.3
3.1 - 4	80	14.4	64.1	29	16.7	54.6	8	13.3	66.7
4.1 - 5	49	8.8	72.9	21	12.1	66.7	6	10.0	76.7
5.1 - 6	43	7.8	80.7	16	9.2	75.9	2	3.3	80.0
6.1 - 7	27	4.9	85.6	11	6.3	82.2	1	1.7	81.7
7.1 - 8	14	2.5	88.1	3	1.7	83.9	2	3.3	85.0
8.1 - 9	15	2.7	90.8	4	2.3	86.2	1	1.7	86.7
9.1 - 10	16	2.9	93.7	7	4.0	90.2	4	6.7	93.3
10.1 - 15	21	3.8	97.5	12	6.9	97.1	2	3.3	96.6
15.1 - 20	6	1.1	98.6	1	0.6	97.7	1	1.7	98.3
20.1 +	8	1.4	100.0	4	2.3	100.0	1	1.7	100.0
TOTAL	554	100.0	-	174	100.0	-	60	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 3.1

FARM SIZE DISTRIBUTION: SUBLOCATION 401

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %
<1	13	11.0	11.0	4	8.7	8.7	1	9.1	9.1
1.1 - 2	23	19.5	30.5	11	23.9	32.6	2	18.2	27.3
2.1 - 3	31	26.3	56.8	10	21.7	54.3	3	27.3	54.5
3.1 - 4	17	14.4	71.2	5	10.9	65.2	2	18.2	72.7
4.1 - 5	9	7.6	78.8	5	10.9	76.1	2	18.2	90.9
5.1 - 6	10	8.5	87.3	4	8.7	84.8	0	0.0	-
6.1 - 7	5	4.2	91.5	2	4.3	89.1	0	0.0	-
7.1 - 8	1	0.8	92.4	0	0.0	-	0	0.0	-
8.1 - 9	1	0.8	93.2	0	0.0	-	0	0.0	-
9.1 - 10	4	3.4	96.6	3	6.5	95.7	0	0.0	-
10.1 - 15	3	2.5	99.2	2	4.3	100.0	1	9.1	100.0
15.1 - 20	0	0.0	-	0	0.0	-	0	0.0	-
20.1+	1	0.8	100.0	0	0.0	-	0	0.0	-
TOTAL	118	100.0	-	46	100.0	-	11	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 3.2
FARM SIZE DISTRIBUTION: SUBLOCATION 404

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %
<1	14	14.6	14.6	3	9.4	9.4	2	22.2	22.2
1.1 - 2	11	11.5	26.0	6	18.8	28.1	1	11.1	33.3
2.1 - 3	27	28.1	54.2	5	15.6	43.8	2	22.2	55.6
3.1 - 4	18	18.8	72.9	5	15.6	59.4	2	22.2	77.8
4.1 - 5	9	9.4	82.3	4	12.5	71.9	2	22.2	100.0
5.1 - 6	6	6.3	88.5	4	12.5	84.4	0	0.0	-
6.1 - 7	3	3.1	91.7	1	3.1	87.5	0	0.0	-
7.1 - 8	2	2.1	93.8	0	0.0	-	0	0.0	-
8.1 - 9	0	0.0	-	0	0.0	-	0	0.0	-
9.1 - 10	1	1.0	94.8	1	3.1	90.6	0	0.0	-
10.1 - 15	5	5.2	100.0	3	9.4	100.0	0	0.0	-
15.1 - 20	0	0.0	-	0	0.0	-	0	0.0	-
20.1+	0	0.0	-	0	0.0	-	0	0.0	-
TOTAL	96	100.0	-	32	100.0	-	9	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 3.3
FARM SIZE DISTRIBUTION: SUBLOCATION 409

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre %	Cum. Fre %	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %
<1	6	8.6	8.6	1	3.2	3.2	1	11.1	11.1
1.1 - 2	13	18.6	27.1	3	9.7	12.9	0	0.0	-
2.1 - 3	17	24.3	51.4	6	19.4	32.3	3	83.3	44.4
3.1 - 4	8	11.4	62.9	6	19.4	51.6	0	0.0	-
4.1 - 5	8	11.4	74.3	6	19.4	71.0	1	11.1	55.6
5.1 - 6	3	4.3	78.6	1	3.2	74.2	0	0.0	-
6.1 - 7	2	2.9	81.4	2	6.5	80.6	0	0.0	-
7.1 - 8	0	0.0	-	0	0.0	-	0	0.0	-
8.1 - 9	2	2.9	84.3	2	6.5	87.1	0	0.0	-
9.1 - 10	3	4.3	88.6	1	3.2	90.3	2	22.2	77.8
10.1 - 15	5	7.1	95.6	2	6.5	96.8	1	11.1	88.9
15.1 - 20	3	4.3	100.0	1	3.2	100.0	1	11.1	100.0
20.1+	0	0.0	-	0	0.0	-	0	0.0	-
TOTAL	70	100.0	-	31	100.0	-	9	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 3.4

FARM SIZE DISTRIBUTION: SUBLOCATION 505

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %
<1	12	16.7	16.7	3	18.8	18.8	1	11.1	11.1
1.1 - 2	20	27.8	44.4	1	6.3	25.0	5	55.6	55.6
2.1 - 3	11	15.3	59.7	4	25.0	50.0	0	0.0	-
3.1 - 4	10	13.9	73.6	1	6.3	56.3	2	22.2	88.9
4.1 - 5	3	4.2	77.8	2	12.5	68.8	0	0.0	-
5.1 - 6	7	9.7	87.5	0	0.0	-	0	0.0	-
6.1 - 7	3	4.2	91.7	3	18.8	87.5	0	0.0	-
7.1 - 8	1	1.4	93.1	0	0.0	-	0	0.0	-
8.1 - 9	1	1.4	94.4	0	0.0	-	1	11.1	100.0
9.1 - 10	1	1.4	95.8	0	0.0	-	0	0.0	-
10.1 - 15	2	2.8	98.6	2	12.5	100.0	0	0.0	-
15.1 - 20	1	1.4	100.0	0	0.0	-	0	0.0	-
20.1+	0	0.0	-	0	0.0	-	0	0.0	-
TOTAL	72	100.0	-	16	100.0	-	9	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 3.5

FARM SIZE DISTRIBUTION: SUBLOCATION 508

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %
<1	4	7.8	7.8	0	0.0	-	3	37.5	37.5
1.1 - 2	9	17.6	25.5	4	22.2	22.2	1	12.5	50.0
2.1 - 3	6	11.8	37.3	0	0.0	-	1	12.5	62.5
3.1 - 4	9	17.6	54.9	4	22.2	44.4	1	12.5	75.0
4.1 - 5	3	5.9	60.8	0	0.0	-	0	0.0	-
5.1 - 6	4	7.8	68.6	3	16.7	61.1	0	0.0	-
6.1 - 7	2	3.9	72.5	2	11.1	72.2	0	0.0	-
7.1 - 8	1	2.0	74.5	0	0.0	-	1	12.5	87.5
8.1 - 9	5	9.8	84.3	1	5.6	77.8	0	0.0	-
9.1 - 10	3	5.9	90.2	1	5.6	83.3	1	12.5	100.0
10.1 - 15	1	2.0	92.2	0	0.0	-	0	0.0	-
15.1 - 20	0	0.0	-	0	0.0	-	0	0.0	-
20.1+	4	7.8	100.0	3	16.7	100.0	0	0.0	-
TOTAL	51	100.0	-	18	100.0	-	8	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 3.6
FARM SIZE DISTRIBUTION: SUBLOCATION 1004

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %
<1	2	5.0	5.0	0	0.0	-	0	0.0	-
1.1 - 2	6	15.0	20.0	0	0.0	-	2	50.0	50.0
2.1 - 3	6	15.0	35.0	1	16.7	16.7	0	0.0	-
3.1 - 4	4	10.0	45.0	1	16.7	33.3	0	0.0	-
4.1 - 5	5	12.5	57.5	0	0.0	-	1	25.0	75.0
5.1 - 6	3	7.5	65.0	1	16.7	50.0	0	0.0	-
6.1 - 7	3	7.5	72.5	0	0.0	-	0	0.0	-
7.1 - 8	4	10.0	82.5	2	33.3	83.3	0	0.0	-
8.1 - 9	3	7.5	90.0	0	0.0	-	0	0.0	-
9.1 - 10	1	2.5	92.5	1	16.7	100.0	0	0.0	-
10.1 - 15	1	2.5	95.0	0	0.0	-	0	0.0	-
15.1 - 20	0	0.0	-	0	0.0	-	0	0.0	-
20.1+	2	5.0	100.0	0	0.0	-	1	25.0	100.0
TOTAL	40	100.0	-	6	100.0	-	4	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 3.7

FARM SIZE DISTRIBUTION: SUBLOCATION 1005

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %	Abs Fre	Rel Fre %	Cum Fre %
<1	8	12.7	12.7	0	0.0	-	1	16.7	16.7
1.1 - 2	11	17.5	30.2	0	0.0	-	1	16.7	33.3
2.1 - 3	13	20.6	50.8	2	18.2	18.2	0	0.0	-
3.1 - 4	4	6.3	57.1	2	18.2	36.4	0	0.0	-
4.1 - 5	4	6.3	63.5	1	9.1	45.5	0	0.0	-
5.1 - 6	6	9.5	73.0	2	18.2	63.6	2	33.3	66.7
6.1 - 7	7	11.1	84.1	1	9.1	72.7	1	16.7	83.3
7.1 - 8	4	6.3	90.5	1	9.1	81.8	0	0.0	-
8.1 - 9	1	1.6	92.1	0	0.0	-	0	0.0	-
9.1 - 10	2	3.2	95.2	0	0.0	-	1	16.7	100.0
10.1 - 15	1	1.6	96.8	1	9.1	90.9	0	0.0	-
15.1 - 20	1	1.6	98.4	0	0.0	-	0	0.0	-
20.1+	1	1.6	100.0	1	9.1	100.0	0	0.0	-
TOTAL	63	100.0	-	11	100.0	-	6	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 3.8

FARM SIZE DISTRIBUTION: SUBLOCATION 1806

Farm size (acres)	Entire sample			Type A Farms			Type B Farms		
	Abs Fre	Rel Fre	Cum Fre	Abs Fre	Rel Fre	Cum Fre	Abs Fre	Rel Fre	Cum Fre
		%	%		%	%		%	%
<1	1	2.3	2.3	0	0.0	-	0	0.0	-
1.1 - 2	4	9.1	11.4	0	0.0	-	0	0.0	-
2.1 - 3	7	15.9	27.3	2	14.3	14.3	2	50.0	50.0
3.1 - 4	10	22.7	50.0	5	35.7	50.0	1	25.0	75.0
4.1 - 5	8	18.2	68.2	3	21.4	71.4	0	0.0	-
5.1 - 6	4	9.1	77.3	1	7.1	78.6	0	0.0	-
6.1 - 7	2	4.5	81.8	0	0.0	-	0	0.0	-
7.1 - 8	1	2.3	84.1	0	0.0	-	1	25.0	100.0
8.1 - 9	2	4.5	88.6	1	7.1	85.7	0	0.0	-
9.1 - 10	1	2.3	90.9	0	0.0	-	0	0.0	-
10.1 - 15	3	6.8	97.7	2	14.3	100.0	0	0.0	-
15.1 - 20	1	2.3	100.0	0	0.0	-	0	0.0	-
20.1+	0	0.0	-	0	0.0	-	0	0.0	-
TOTAL	44	100.0	-	14	100.0	-	4	100.0	-

Abs Fre - Absolute Frequency

Rel Fre - Relative Frequency

Cum Fre - Cumulative Frequency

TABLE 4

RELATIONSHIP OF FARM TYPES A AND B TO CASH CROP ACREAGE

subloc.	<u>Entire sublocation</u>			<u>Type A Farms</u>			<u>Type B Farms</u>		
	min	max	range	min	max	range	min	max	range
401	0.30	14.00	13.70	0.50	10.00	9.50	0.90	4.30	3.40
404	0.10	10.00	9.90	0.50	9.50	9.00	0.50	4.70	4.20
409	0.20	14.00	13.80	0.50	12.50	12.00	0.40	8.20	7.80
505	0.40	8.00	7.60	0.50	8.00	7.50	0.40	3.50	3.10
508	0.70	17.00	16.30	1.00	8.00	7.00	0.70	8.00	7.30
1004	0.30	24.00	23.70	0.90	9.00	8.10	0.30	2.00	1.70
1005	0.20	51.00	50.80	1.40	51.00	49.60	0.60	5.00	4.40
1806	0.80	14.50	13.70	2.00	8.80	6.80	2.10	2.50	4.00
Entire Sample	0.10	51.00	50.90	0.50	51.00	50.50	0.30	8.20	7.90

TABLE 5
 RELATIONSHIP OF TYPE A AND B FARMS TO CASH CROP INCOME
 (shillings)

subloc.	<u>Entire sublocation</u>			<u>Type A Farms</u>			<u>Type B Farms</u>		
	min	max	range	min	max	range	min	max	range
401	0	8,000	8,000	0	8,000	8,000	0	5,000	5,000
404	0	9,000	9,000	0	9,000	9,000	0	600	600
409	0	4,800	4,800	0	4,800	4,800	0	3,000	3,000
505	0	9,400	9,400	0	6,100	6,100	0	500	500
508	0	5,000	5,000	0	3,900	3,900	0	2,400	2,400
1004	0	7,700	7,700	300	4,400	4,100	0	100	100
1005	0	7,800	7,800	600	7,800	7,200	0	6,000	6,000
1806	0	9,999	9,999	0	3,000	3,000	0	1,000	1,000
Entire Sample	0	9,999	9,999	0	9,000	9,000	0	6,000	6,000

TABLE 6
AVERAGE AGE OF FARMERS BY SUBLOCATION
(years)

Sublocation	Total Farmers mean	mean male	mean female
401	47.84	49.39	43.72
404	46.86	49.30	37.60
409	43.71	44.87	33.29
505	45.40	49.42	38.70
508	41.65	43.91	37.50
1004	42.10	45.13	30.38
1005	44.08	47.00	38.64
1806	49.70	53.12	39.45
entire sample	45.57	47.97	38.83

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