The Agrarian Revolution in Kenya

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THE AGRARIAN REVOLUTION
IN KENYA

by

Margie Senkowski

A Thesis submitted to the
Faculty of the School of Graduate
Studies in partial fulfillment
of the
Degree of Master of Arts

Western Michigan University
Kalamazoo, Michigan
July 1966
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PREFACE

In the summer of 1965, the author traveled and studied in the Central and Nyanza Provinces of Kenya. (Figs. 1 & 2.) Many agricultural schemes and developments were visited and observed. Much of the material contained in this report was obtained from agricultural officers in the field. Whenever possible the data was verified from official sources.

There was, however, even in Kenya, a dearth of written information concerning the topic of this research. Therefore, much reliance was placed upon the "word-of-mouth" communications from agricultural officers and land settlement guides.

Basic material was obtained from government publications prepared by the Ministry of Agriculture and the Ministry of Economic Planning and Development. The East African Standard newspaper was frequently used as an additional source of information.

The writer wishes to express her sincere appreciation to the many persons, too numerous to mention here, who gave assistance and advice which made the completion of this research possible.

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Special mention is due to Dr. F. Stanley Moore, advisor at Western Michigan University, for his guidance and much-needed encouragement.

Margie Senkowski
Fig. 1: Geographical position of Kenya

Fig. 2: Administrative areas in Kenya

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INTRODUCTION

The objective of this research has been to present a picture of the revolutionary agricultural changes that have been taking place for the last few years in the East African country of Kenya. Kenya is an agricultural country; its economy is dependent almost entirely on agricultural production. In the words of Jomo Kenyatta, Prime Minister of Kenya, "To achieve the growth essential for increased welfare, the country will continue to rely on agriculture, which employs most of our people and provides almost all of our exports."

The progress in agriculture is helping to transform Kenya from a primitive tribal subsistence society to a responsible nation with economic viability.

In the author's opinion, Kenya is a remarkable nation that can serve as a model for other emerging countries. It is true that Kenya does have a favorable econlogy, but this is not the complete answer. Credit must be given to the British, whatever their motives, whose skill and technology left Kenya much

1
more productive than when they arrived sixty years ago. Recognition must also be given to Jomo Kenyatta, who, though much maligned in this country, has proved to be a skillful, competent administrator. Recognition also is due the agricultural officers, both British and African, who ply their trade the length and breadth of Kenya. The people themselves are deserving of mention; the spirit of harambee (let us work together) is helping them to put aside tribal loyalties and traditions in their quest for greater agricultural productivity.

The organization of this report may not always appear consistent; this is not by accident but by design. It was not always possible to follow a set pattern, especially in the discussion of the land settlement schemes, because the same type of material was not always available to the author. However, it should be noted that there is a rationale behind the method of presentation. Whenever, in the discussion of a particular scheme, a crop (or activity) important throughout the country is considered, a brief discussion of its significance within the country is introduced in order to facilitate a proper perspective.
With this word of explanation, let us see what the land of uhuru has accomplished in agriculture with the spirit of harambee.
CHAPTER I

PHYSICAL SETTING

Lying astride the equator on the east coast of the continent of Africa is the newly independent nation of Kenya.

Such a location has endowed Kenya with a wide range of physical characteristics, affording a remarkable variety of natural vegetation and changing limitations on land use within a comparatively small area.¹

Kenya's land area is small, a total of only 224,960 square miles, including 5,171 square miles of water. It is bounded on the north by Ethiopia and the Sudan, on the east by Somalia and the Indian Ocean, on the south by Tanzania, and on the west by Lake Victoria and Uganda. Although lying in equatorial latitudes, between $4^\circ40'\ N.\ lat.$ and $4^\circ4'\ S.\ lat.$, Kenya is not a typical equatorial country.

Topography

Kenya is notable for its topographical variety; diversity is the keynote. The relief ranges from an equatorial coast, through highlands, to snow-capped mountains with vast open upland plains stretching boundless to the view, and lakes which are inland seas. The whole country is underlain by rocks of the Basement system though they are only exposed in Central Kenya. The heterogeneity of land patterns makes it impossible to generalize about Kenya's relief. For the purposes of this report the author has divided Kenya into broad regions according to the main topographical features. Running more or less north-south, they are: (1) the coastal belt, (2) the low eastern plateau, (3) the Eastern Highlands and Rift System, and (4) the Lake Victoria or Central Plateau. The elements of the physical setting of Kenya will be discussed in reference to these regions, except where a general discussion is sufficient for this report.

The low-lying coastal zone varies in width from

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ten to forty miles. The altitude rises steadily from sea-level to six hundred feet. The level of the sea has changed repeatedly over the years, creating a series of coastal benches. The coastal plain is made up of recent sand dunes and coral limestone; light sandy soil is characteristic of this region.  

Beyond the narrow coastal plain, the Kenya uplands are reached by a series of steppes. This series of low plateaus vary in elevation from 300 to 2,000 feet. The Nyika peneplain lies west of the coastal hills. This plain is very dry and contains residual hills and ensetbergs. Almost all of northern Kenya and southeastern Kenya are in this low eastern plateau. It is shaped somewhat like an hour glass with the waist occurring at the border between Kenya and Tanzania. The western boundary is formed by the plateaus and mountains associated with the Eastern Rift System.  

The volcanic belt which includes the highlands of Kenya stretches for 2,000 miles from Lake Magadi in the south to Lake Rudolph in the north. This region

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3Ibid.

is a highly complex mountain, plateau, and rift valley belt. The axis of this system is the Eastern Rift Valley. The rift varies in width from thirty to forty miles and its floor is 2,000 to 3,000 feet lower than the level of the country on either side. It has enormously steep inward facing escarpments, up to 4,000 feet, and relatively flat floors in which are a chain of lakes, mostly without outlets, whose basins are separated by a series of extinct volcanoes. The valley is well marked in Kenya.\(^5\) East of the Rift Valley is the Aberdare Range, rising to about 13,000 feet; at the foot of the Aberdares, in the south, lies the Kinangop plateau with an elevation of 8,000 feet, and to the east of the Aberdares, Mt. Kenya rises to 17,040 feet. While the eastern wall is marked by steep escarpments, the western wall rises more gradually to the Mau Range with elevations up to 10,000 feet. (While crossing the Mau Range near the equator, the author encountered huge pellets of hail.) Lying to the northwest of the highland area and straddling the Uganda border is Mt.

Elgon, whose elevation is 14,178 feet.  

The involved topography of this whole highland region results in notable variety in climate, vegetation, and land use patterns, changes or successions often occurring over very short distances. But this region contains much of the quality area of Kenya, much of its most densely populated districts, the major areas of white settlement, and the vast bulk of areas producing the high-value crop exports of the country.

West of the Rift Valley, the plateau, which is bisected by the rift, descends to the plains which border Lake Victoria, at about 3,000 feet above sea level. This is a huge uplifted basin and occupies the land between the eastern highlands and the mountains and lakes of the Western Rift Zone, which is shared with Congo, Rwanda, Burundi, and Northern Rhodesia.

Drainage

Because the highlands are generally surrounded by dry lands, Kenya has a radial drainage pattern. Within the rift the drainage is internal; west of the
rift, rivers drain into Lake Victoria, while to the east, drainage is towards the Indian Ocean. The two principal rivers are the Tana and the Sabaki.\textsuperscript{9}

Soils

Much of Kenya has been affected by the outpouring of fluid lava which accounts for the volcanic origin of much of the Aberdares, Mau Summit and western Kenya in general. Soils derived from these lavas are productive. Agriculture is well favored here in the highlands where the soil is fertile, being derived from volcanic ash. These gray volcanic soils are easy to work and hold moisture well.\textsuperscript{10}

They are, however, delicate soils, and erosion is an ever-present hazard once the natural vegetation has been removed or excessively exploited by grazing.

All of northern Kenya, which is about half of the area of the country, is covered with chernozemic soil. Much of this area is volcanic desert. Outpourings of fluid lava in northern Kenya have given rise to a

\textsuperscript{9}Lecture by Ojany, Nairobi, Kenya, June 29, 1965.

\textsuperscript{10}Langlands, p. 8.
lava-strewn plateau, which because of its largeness as well as its stoniness is an area of very little value from the standpoint of agriculture and human occupancy.11

In general, the soils suitable for intensive or semi-intensive agriculture lie above the 4,000 foot contour line.

Vegetation

The vegetation in Kenya reflects the variety of its topography and climate. This is a tropical grassland country with wooded savannas.

In the coastal region coconut trees flourish with occasional mangrove swamps and rain forest. The most significant agricultural production of the coastal belt is that of sisal.

More than half of the country, the north and the southeast, is an arid thornbush plain. These vast plains of the hinterland are covered with grass, low bush, and scrub.

The eastern plateau region gives way to the high lying plains; the tropical savanna country of open

11 Ibid., p. 8.
grass dotted with thorn trees. The highland regions are in parts densely forested. Those areas best suited for agriculture are characterized by the presence of Kikuyu Grass or Star Grass. These grasses appear at elevations of 4,500 feet to 6,500 feet. Above 6,500 feet high bracken is found. Below 4,500 feet are perennial grasses and acacia; these are types of vegetation found in semi-arid areas which are marginal for agriculture.²

Climate

Rainfall

Undoubtedly the most impressive anomaly in all of Africa is the widespread deficiency of rainfall in tropical East Africa... The abnormality of this rainfall deficiency in an equatorial-tropical region is emphasized all the more when one notes that this is the eastern side of a continent, in the latitudes of the tropical easterlies, where an almost continuous north-south highland parallels the coast at no great distance inland.³

Rainfall (Fig. 3) is the critical climatic factor for agriculture in Kenya and, as Trewartha points out,

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Fig. 3: Rainfall Map of Kenya

it is an unusual rainfall pattern for an equatorial country. Dry areas are the rule rather than the exception. In the whole country there are only three areas that can reasonably expect as much as twenty inches of rainfall a year: (1) the coast from the Tanzania border to Lamu, (2) the Highlands east and west of the Rift and including the central part of the Rift and Mount Elgon, and (3) the Lake Victoria shores, but even here, in comparison with Uganda the position is less good, as the winds carry more moisture to the northwest shores of the lake.

The winds over Kenya are generally northeasterly during the summer of the southern hemisphere, the northeast monsoons; from May to October the prevailing winds are from the southeast monsoons. The northeast trades blow almost north to south in January. This monsoon has traveled over the deserts of Arabia and the Horn of Africa, so condensation is slight except on the coast. This accounts for the aridity of much of north and east Kenya. The tropical southeast trades bring heavy rain to the coast, especially in April and May, but then tends to blow parallel to it so that its
influence is not felt very far inland.  

Seasonal variations are distinguished by changes of rainfall rather than of temperatures. There are four well-marked seasons. The "long rains" occur from March to May during which about half the mean rainfall of the year falls. Kenya's agriculture is largely dependent on good rains in this season. The "short rains" which fall between October and December give about half the rainfall of the "long rains."

The driest, as well as the hottest season, is January and February. The cool season, or winter, June to October, gives only a small amount of rain in the highlands, but the number of rain days is considerable.

Precipitation in the coastal belt varies from conditions of aridity in eastern Kenya where the plain passes into Somalia to about inches in southern Kenya from Lamu to Tanzania. Monsoons play a prominent role in the climate of this region.

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15 Ibid., pp. 88-91.
The rainfall is least in north Kenya, where large areas have less than ten inches of rain; from this dry tract in the east of Kenya, a wide tongue of forbidding thorn-bush with less than twenty inches protrudes south almost reaching Tanzania between Kilimanjaro and the sea. This arid tendency continues far to the southwest.  

The east Rift Valley is in a rain-shadow, with less than 10" in the north round Lake Rudolph, and less than 20" in the south (Magadi 15"); the west Rift Valley is better watered both by rain (about 40" a year) and rivers, but has less rain than the bounding escarpments and mountains where the totals rise to over 80".  

Rainfall in the Highlands is heavy, varying from forty inches to one hundred inches or more a year. The amount of rainfall increases with altitude. Nairobi, at an altitude of 5,470 feet has a mean annual rainfall of 34.3 inches. In general, the atmosphere in the Highlands is bracing with cool breezes.  

In the Lake Victoria region the climate is typically tropical and receives from forty to seventy inches of rainfall yearly. This area has a highly reliable rainfall in comparison with other parts of

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16 Kendrew, p. 91.

17 Ibid., p. 94.
East Africa. It is the most extensive tract with a reliability figure of over thirty inches a year. In addition, the rain is well distributed over the year.18

Temperature

Seasonal changes in temperature in Kenya are only slight. The mean temperature at the coast is over eighty degrees Fahrenheit and the temperature decreases by a little less than three degrees Fahrenheit with each 1,000 feet increase in altitude. Nairobi has a mean annual temperature of sixty-seven degrees Fahrenheit; at 9,000 feet, the average mean annual temperature is fifty-five degrees Fahrenheit; the arid plains vary from seventy to eighty degrees Fahrenheit. Temperature-wise there is great uniformity throughout the year. The difference between the warmest and the coolest, in most places, is only a matter of a few degrees. This is, of course, not true in the high altitudes where a larger range of temperature is experienced.19

From the previous discussion of the physical


19 Kendrew, p. 95.
setting of Kenya it can be seen that:

There is no doubt that the development of Kenyan agriculture has been made easier by the fact that she has been endowed with a favorable ecology which makes possible the growing of a wide range of high-value crops.  

20 Clayton, p. 2.
CHAPTER II
HISTORICAL BACKGROUND

Agricultural development in Kenya, until the end of World War II, had been almost exclusively dominated by the European British element, presently referred to as the "large-scale" sector. The establishment of British interests in Kenya took place in the late nineteenth and twentieth centuries, and was undertaken, mainly, as a result of pressure to make the East African Railroad economically feasible.

Early 1900's

With encouragement from the British government these first settlers arrived in 1901 and settled around Nairobi. They occupied a large, irregular zone usually called the "White Highlands" of Kenya. This is land above 4,000 feet which is best suited for intensive or semi-intensive mixed farming. Most of the "White Highlands" so alienated or leased from the indigenous Africans were in what is now Central Province.

Most of these early settlers were not farmers, and required a great deal of government help to make
their farms viable. In response to their needs the Colonial Government set up a Department of Agriculture in 1903 which assumed responsibility for the agriculture of the country. Because Kenya was a newly settled colony very little was known of its agricultural potential, and so the department's limited resources were used, mainly, to deal with the problems of European agriculture with little or no attention paid to the problems of the native Africans.

Gradually the large-farm sector was spread over seven and one half million acres, which accounted for 24.9% of the total available arable land.

When the Europeans arrived in Kenya, the Africans that they encountered were practicing the traditional methods of subsistence agriculture, known as shifting cultivation. They used primitive methods on small areas of land, and livestock were hoarded as currency and not developed as sources of food. The White Highlands were the locale of the Bantu tribes, and in particular, the Kikuyu. (Fig. 4.)

1920-30's

It was not until the 1920's that anything was done to improve the African agricultural areas. At
Fig. 4: Land Classification in Kenya

this time, the Department of Agriculture made its first official mention of native agriculture and drew up the outline of a policy related to it.

Two demonstration holdings were set up with the objectives of providing improved seed of existing crops which might suitably be grown by Africans. The main emphasis in this ten-year period was on improved variety of seeds in hopes of increasing yields. The effort was primarily educational through agricultural training and demonstration plots. It was thought that visual demonstration might persuade the African farmer to change his methods or lack of them. As to whether or not the demonstration holdings were successful educational agents is doubtful, but they did play an important part in the production of improved seed for general distribution which became one of the chief agricultural services. These seed farms became a vital link between the regional experiment station and the individual African farmer.

Toward the end of the 1930's there was a change of policy emphasis. In the more densely settled areas there arose a severe problem of soil erosion; this problem was particularly intense on the Kikuyu Reserve. With a rising population, the length of time land was
left fallow declined; in time, fallows were broken long before loss of soil structure and fertility from previous cropping had been restored. Ultimately, in some areas, cropping became almost continuous.

The prevailing tenure and inheritance arrangement of the African peasant was another factor in the erosion problem. By this system, when the head of a family died, his lands and rights of cultivation were distributed equally among his male heirs. The resulting fragmentation gave the countryside a patchwork-quilt appearance.

For example, the Agricultural Census of 1950 revealed a peasant landowner whose aggregate holding was 9 acres, divided up into 29 plots, the farthest of which was 14 miles from his house. In Kiambu, a case was recorded of an aggregate holding of 8 acres divided into 43 separate plots, an average of less than 1/5 of an acre per plot. ¹

Fragmentation had ruinous effects on the land.

The use of primitive farming methods and the absence of rotation or manuring added to the erosion problem.

The measures employed in combating erosion included such physical conservation measures as terracing, trenching, grassing, and tree planting on severe

¹Clayton, p. 12.
slopes.

The agricultural officers sought to introduce farming practices which would help to maintain soil fertility; for example, the use of resting leys\(^2\) instead of bush fallows, the use of organic manure, the stall-feeding of cattle as a source of manure, and the use of village compost pits. In badly-eroded areas land closures and compulsory de-stocking was instigated.\(^3\)

Most of these measures were resisted by the African farmer. They were highly suspicious of the intentions of the government officers. In addition to which they were generally ignorant of the elementary principles on which sound farming measures are based. In fact, the Wakamba tribe marched on Government House in 1938 as a protest against compulsory de-stocking. The Machakos area of the Wakamba people is still suffering today from severe erosion conditions. The African farmer was very resistant to change, and clung tenaciously to the customs and the

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\(^2\)A resting ley is simply a small field planted in grass left fallow until required for grazing.

\(^3\)Clayton, p. 15.
methods practiced by his forefathers. 4

The program was also hindered by the white settlers who didn't want the African farms to produce very much. As long as the African farm regime was subsistence, the Europeans were assured of a cheap source of labor. They were also apprehensive that the African product would cause Kenya to lose its reputation for high quality. 5

A landmark in Kenya's agricultural history is the Carter Land Commission Report which was made in 1934. The Africans were pushing their claim to their tribal lands. Although the Highlands had been reserved exclusively for European settlers, the actual boundaries were not defined until the Carter Land Commission reported in 1934. The Commission had been appointed to investigate tribal claims to lands alienated to Europeans and to define the Highlands. The result of this investigation defined the boundaries of an existing European reserve. Their recommendations were enshrined in two Orders-in-Council which became law in

4 Ibid., p. 16.

1939. One of the two, the Native Lands Trust, legally defined the various tribal areas; the other did the same for the European reserve, which later became known as the scheduled areas. Thus, the native African was thwarted in his attempt to regain his ancient tribal lands.

Post-War Period

During the war period, the colony was forced to rely on its own resources to feed, not only the local population, but also large garrisons of troops stationed there, and prisoners-of-war. The government exhorted the farmers to substantially increase their production of foodstuffs in both African and non-African areas. Price incentives for cereal production were offered as an added inducement. To make matters worse, only a skeleton force of field officers remained in the African areas.

"These factors, together with continued population increase, led to unprecedented overcropping of

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the land and an incalculable loss of soil resources."\(^7\)

Whatever the gains made by pre-war agricultural policy, they were lost during the war period. At the close of hostilities the native areas were in a sad state of depleted soil fertility.

It became urgent for the government to forge some sort of policy to combat these critical agricultural problems. The state of the land called for immediate action; accordingly, a ten-year program of development was drawn up and substantial public funds devoted to soil conservation measures, land settlement, livestock improvement, rural water supplies, and tsetse fly eradication. For this plan, which was drawn up in 1946, the Kenya government made available £15-1/2 million,\(^8\) of which £11 million were to be spent in the agricultural sector. Such mechanical control measures were, of course, helpful, but it was not enough simply to hold the soil in place; it was essential to develop a non-depleting farming system if a viable agriculture was to be fashioned. Once again, as in pre-war days, the Africans were encouraged to

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\(^7\)Clayton, p. 18.

\(^8\) is the symbol for the East African pound. It is equivalent to about $2.80.
use better farming practices such as the use of manure, resting pastures, and so on. But such measures did not solve the fundamental problem. It was necessary to find a sounder basis of agricultural production which would be acceptable to the conservative peasant cultivator.

Wartime policy had introduced a strong commercial element into African agriculture on which there was no going back, and the government was faced with the double task of restoring depleted soil resources with all speed and, no less quickly, of increasing the productivity of native agriculture in terms of cash incomes. Since they were ecologically feasible, the growing of high-value cash crops was the obvious answer to this, provided that the maintenance of cultural standards could be assured ... The mixed smallholding with cash crops was then seen to provide the answer to the problems of maintaining fertility and increasing cash incomes.9

CHAPTER III

THE SWYNNERTON PLAN
AND THE AGRARIAN REVOLUTION

Introduction

The "agrarian revolution" in Kenya was stimulated and given impetus by the Swynnerton Plan, THE landmark in Kenya agriculture. In 1954 Roger Swynnerton, then Kenya's Director of Agriculture, outlined a scheme to accelerate the development of agriculture in African areas based on the individual tenure of land and on the growth of cash crops. It also dealt with the improvement of livestock, the development of water supplies in semi-arid pastoral regions, protective afforestation, and the control of the tsetse fly. This was the most spectacular of the Government's planning efforts directed toward transforming the economy of the land in African areas. The Swynnerton Plan embodied and extended the Government's role in planning as outlined in the Ten Year Program of 1946-55. The long-term objective of the Ten Year Plan had been to increase cash incomes through the growing of high-value cash crops. This was to be accomplished by
resettling the population from the densely settled and drier areas to more sparsely settled regions. Resettlement, in this program, involved, therefore, the opening up of virgin and often semi-arid sites, while the Swynnerton Plan was directly related to developments in the areas of "high potential."¹

Swynnerton set a target for income. His aim was that each family should provide its own subsistence plus a cash income of at least £100 a year. The money comes partly from general revenues, partly from African District Councils, and partly from the initial grant of £5-1/2 million from the United Kingdom. The Plan was put into action at the end of 1954 and up to 1959 had cost about £8 million, although accomplishments were severely curtailed by the Mau Mau Emergency.²

European Sector Pre-settlement

In order to understand the sweeping effects of the third main part of the Swynnerton Plan, land settlement, before proceeding with a discussion of

¹Hance, p. 403.
²Huxley, p. 420.
the main programs of the Swynnerton Plan the author
dees it advisable to present this discussion of the
European cash crop economy pre-settlement period.

Kenya's agriculture has been divided into two
distinct sectors; formerly the European or large-farm
area and the African or small-farm area, now the
scheduled and non-scheduled areas. In 1959 the
alienated or leased lands of the Europeans totaled
12,850 square miles of which 11,763 square miles were
in the White Highlands. Of this total, 7,560 square
miles occupied the land classified as having high
potential, based upon an average yearly precipitation
of thirty inches or over. Kenya has about 41,600
square miles of high potential land; subtracting the
forest and other national reserve land receiving thirty
inches or more, alienated land accounted for 24.9% of
the total available arable land. In 1960, about seven
and one-half million acres of land were occupied by
3,609 European and Asian farms (mostly European). So
that fewer than 1% of the farmers in Kenya owned about
one-fifth of the high potential land.  

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3Hance, p. 396.
In 1960 another agricultural landmark was reached. In London, the Lancaster House Conference repealed the Highlands' Order-in-Council, which had legally defined and safeguarded the European Reserve now known as the scheduled areas. A Land Development and Settlement Board was set up with the intention of buying back land from Europeans and resettling it with Africans. "And in November, 1960, racial criteria were finally eliminated as a feature of the White Highlands, which thereafter became a part of the Scheduled Areas." 4

European farms might be classified as three different types. There are: the large plantation farms producing much of the sisal, tea, and coffee; the generally mixed farms raising livestock and various field crops, though some also grow coffee; and the ranching operations, which include most of the very large holdings. Before the Lancaster House Conference the pattern of farming in the year 1958 in European farming areas was as follows:

Of the approximately 3,600 European farms there were 32% under 500 acres, mostly around Nairobi, 23%
who had between 500 and 1,000 acres, 37% in the 1,000
to 5,000 class, and only 8% had farms over 5,000 acres.
There were a few who had over 100,000 acres. These
farms occupied about 7-1/2 million acres. The capital
stock was 62 million and they were adding a million
per year. Eleven thousand people were employed, 8,700
of which were Africans. The most economically impor­tant farms were the large plantations which held about
6% of the land or 463,000 acres. The major revenue­
producing crops were coffee, teas, and sisal, in that
order, with wattle and sugar to a lesser extent. There
were 64,000 acres in coffee, 23,000 acres devoted to
tea, 244,000 acres of sisal, 88,000 acres of wattle and
27,000 acres of sugar.5

Of the cereal crops cultivated, wheat occupied the
largest acreage, some 250,000 acres. Wheat, which was
dependent upon high import protection market received
this protection from the Colonial Government. Another
favored crop was pyrethrum which was on 22,000 acres.
Small amounts of barley, oats and maize were also
grown. Generally these cereal crops were raised on
mixed farms with cattle.

Cattle ranches were chiefly in the Laikipia District which is in the northern part of the East Rift escarpment. Europeans owned about 400,000 dairy cattle, 500,000 beef cattle, 500,000 sheep and a few pigs.

In June, 1960, Sir Michael Blundell, then Kenya's Minister of Agriculture estimated that between £120,000,000 and £150,000,000 had been invested in the White Highlands. The greater part of this has gone into coffee, tea, and sisal plantations. In human terms, most of the settlers are mixed farmers producing cereal crops and pyrethrum, milk, meat and butter. In 1960 the European farms, plantations and ranches sold off produce valued at £37,800,000 as against £9,600,000 worth sold off land farmed by nearly 7,000,000 Africans.6

Consolidation and Farm Planning

One of the principal features of the Swynnerton Plan was the consolidation of fragmented land and the enclosure of individual holdings. A modest start in consolidation was made in Central Province in 1954;

6Huxley, p. 422.
in 1955 the people of Central Province wholeheartedly voted in favor of consolidation, and by 1959, 290,524 acres out of a total of 1,200,000 acres had been consolidated and demarcated on the ground. Progress in Nyanza Province was slower, where the main Luo tribe are less energetic and receptive to new ideas than are the Kikuyu of Central Province.  

Some of the consolidation in Central Province was "pushed" through from 1957-59 during the Emergency. After the Mau Mau Kikuyu came out of jail there was much discontent and some consolidation had to be redone. Other tribes are voluntarily consolidating; the incentive is that the government withholds aid unless they do so.  

Extraordinary progress has been made in consolidating fragmented land. It is estimated that 2.75 million acres of land in the non-scheduled areas involving 300,000 farms had been consolidated by the end of June 1963. Official sources estimate that there still remain to be consolidated 3.3 million acres. At present, Kenya has a staff available to

8 Ibid.
survey and consolidate about 150,000 acres per annum, 
or a total of 900,000 acres during the planning period 1964-70.⁹

"Introduction of individual tenure is only one part of the plan. Of equal importance are the planning of farm layouts and a continuing effort to promote improved farm practices."¹⁰ Consolidation does not automatically reduce dangers of erosion; farm planning is essential. The policies related to farm planning were developed in 1950 for Central Province and in 1953 for Nyanza. "The plans were based on distinct ecological zones because it was thought that natural vegetation was the best indicator available of the agricultural potential of any area."¹¹

It was hoped that the plans would assist in maintaining fertility and increasing production per unit of land. Agrarian development proceeded so rapidly that planning of all integrated units became impossible, even with the greatly augmented number of field officers.

¹⁰Hance, p. 403.
¹¹Clayton, p. 34.
The next stage was the Farm Layout which is a much simpler farm plan and much quicker to implement. These layouts are arranged by farm experts so that erosion control measures may be used, water will be available, farms will be divided as equitably as possible as far as soil and other factors of productivity are concerned.¹² A farm layout is a farm plan without a detailed survey or a rotation laid down. Farmers are not given it automatically; they must ask for it. The farm layout qualifies him to apply for a loan of £50 for further development.¹³

There is a very urgent need in Kenya for comprehensive research to work out farming systems suitable to the very diverse soil and climate conditions found there. As time goes by the needs have become much more pronounced and large funds have been devoted to research. Since 1957 the agriculture department has spent more than £600,000 annually on research schemes.¹⁴

¹² Hance, p. 404.

¹³ Clayton, p. 50.

¹⁴ Ibid., p. 55.
Land Settlement

Such was the picture of the European cash crop economy when on January 1, 1961, a program to purchase European farms and make them available by sale to Africans was inaugurated. This was the beginning of the African settlement program. "The various settlement schemes for African farmers on the former 'White Highlands' of Kenya undoubtedly constitute the most rapid change in the economic and human geography of an area of this size ever experienced in East Africa."\(^{15}\)

The first plan was a five-year, one million acres scheme, but because of apprehension on the part of the Europeans, who were afraid they would not receive full value for their farms, and suspicion on the part of the Africans who were fearful of conflicting tribal demands, the plan did not get under way until the end of 1962. (Fig. 5.) There were four types of schemes within the plan; they are:

### Fig. a: Settlement Schemes in Western Kenya.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Official Name of Scheme</th>
<th>Area acquired for Settlement (acres)</th>
<th>Number of holdings occupied</th>
<th>Type of Scheme</th>
<th>Tribal Group</th>
<th>Major Cash Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cherangani</td>
<td>7,600</td>
<td>Nil</td>
<td>Low - and Low Density and grazing</td>
<td>Elgeyo, Pokot, and Marakwet</td>
<td>Tea and maize. Beef cattle.</td>
</tr>
<tr>
<td>2</td>
<td>Kabisi</td>
<td>12,400</td>
<td>336</td>
<td>Low Density</td>
<td>Maragoli/Bumout</td>
<td>Maize and cattle.</td>
</tr>
<tr>
<td>3</td>
<td>Lugari</td>
<td>13,300</td>
<td>973</td>
<td>High Density</td>
<td></td>
<td>Beef and maize.</td>
</tr>
<tr>
<td>4</td>
<td>Kapkaren</td>
<td>10,800</td>
<td>Nil</td>
<td>High Density</td>
<td>Abaluhya</td>
<td>Maize.</td>
</tr>
<tr>
<td>5</td>
<td>Ndai</td>
<td>8,100</td>
<td>402</td>
<td>High Density</td>
<td>Nandi</td>
<td>Dairy and maize.</td>
</tr>
<tr>
<td>6</td>
<td>Elgeyo Border</td>
<td>8,700</td>
<td>304</td>
<td>High Density</td>
<td>Elgeyo</td>
<td>Cereals and dairy.</td>
</tr>
<tr>
<td>7</td>
<td>Lesuus and Keho</td>
<td>14,900</td>
<td>333</td>
<td>Low Density</td>
<td></td>
<td>Maize, tea and maize.</td>
</tr>
<tr>
<td>8</td>
<td>Ainakwai East and North</td>
<td>16,100</td>
<td>234</td>
<td>Low Density</td>
<td>Elgeyo/Tugen</td>
<td>Pyrethrum, oats, dairy and wool.</td>
</tr>
<tr>
<td>9</td>
<td>Kibigiri</td>
<td>3,000</td>
<td>Nil</td>
<td>High Density</td>
<td>Luo</td>
<td>Maize.</td>
</tr>
<tr>
<td>10</td>
<td>Mahoroni and Tama</td>
<td>7,200</td>
<td>Nil</td>
<td>Low Density</td>
<td>Luo</td>
<td>Sugar, maize and milk.</td>
</tr>
<tr>
<td>11</td>
<td>West Simik (Larenjo, Gelegele, Kuyer etc.)</td>
<td>19,400</td>
<td>398</td>
<td>Low and High Density</td>
<td>Kipkogei/Kisii</td>
<td>Maize and cream.</td>
</tr>
<tr>
<td>12</td>
<td>East Simik</td>
<td>10,100</td>
<td>187</td>
<td>High Density</td>
<td>Kipkogei</td>
<td>Cream, maize and coffee.</td>
</tr>
<tr>
<td>13</td>
<td>Saburia</td>
<td>10,300</td>
<td>187</td>
<td>Low and High Density and Grazing</td>
<td>Tugen</td>
<td>Dairy, beef, pyrethrum and coffee.</td>
</tr>
<tr>
<td>14</td>
<td>Kilombe</td>
<td>13,700</td>
<td>100</td>
<td>Grazing</td>
<td>Tugen</td>
<td>Beef cattle.</td>
</tr>
</tbody>
</table>

Note: European farms have also been acquired for settlement outside the present scheme at Kaimosi (5,300 acres, 181 settlers) and in the Nandi Saliens (10,000 acres, 87 settlers).

### Fig. b: Settlement Schemes in Eastern Kenya.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Official Name of Scheme</th>
<th>Area acquired for Settlement (acres)</th>
<th>Number of holdings occupied</th>
<th>Type of Scheme</th>
<th>Tribal Group</th>
<th>Major Cash Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Ol Kalou</td>
<td>19,800</td>
<td>650</td>
<td>Low and High Density</td>
<td>Kikuyu</td>
<td>Dairy, wool, wheat, pyrethrum.</td>
</tr>
<tr>
<td>16</td>
<td>Wajibesi, Naivasha and Kipipiri area</td>
<td>76,400</td>
<td>2,300</td>
<td>High Density</td>
<td>Kikuyu</td>
<td>Maize, potatoes, dairy.</td>
</tr>
<tr>
<td>17</td>
<td>South Kinangop and Njahi area</td>
<td>49,400</td>
<td>1750</td>
<td>High Density</td>
<td>Kikuyu</td>
<td>Castle and sheep, maize and vegetables.</td>
</tr>
<tr>
<td>18</td>
<td>Eburu</td>
<td>3,400</td>
<td>Nil</td>
<td>High Density</td>
<td>Masai</td>
<td>Dairy, pyrethrum and vegetables.</td>
</tr>
<tr>
<td>19</td>
<td>Naera/Amboseli (3 schemes)</td>
<td>17,700</td>
<td>800</td>
<td>High Density</td>
<td>Kikuyu/Embu</td>
<td>Pyrethrum and dairy or wheat best.</td>
</tr>
<tr>
<td>20</td>
<td>Naro Moru and Waramo</td>
<td>3,300</td>
<td>1,200</td>
<td>High Density</td>
<td>Kikuyu</td>
<td>Pyrethrum and dairy.</td>
</tr>
<tr>
<td>21</td>
<td>Island Farms</td>
<td>5,300</td>
<td>219</td>
<td>High Density</td>
<td>Kikuyu</td>
<td>Beans, Onions, dairy, and maize.</td>
</tr>
<tr>
<td>22</td>
<td>Maraga Ridge</td>
<td>5,900</td>
<td>237</td>
<td>High Density</td>
<td>Kikuyu</td>
<td>Milk and vegetables and eggs.</td>
</tr>
<tr>
<td>23</td>
<td>Sigona Emissu</td>
<td>500</td>
<td>37</td>
<td>Low Density</td>
<td>Kikuyu</td>
<td>Cream, Onions and peas.</td>
</tr>
<tr>
<td>24</td>
<td>Natchebo (Hua Hills, Kemo Rock, Lakena)</td>
<td>12,100</td>
<td>268</td>
<td>High Density</td>
<td>Kikuyu</td>
<td>Cream, Onions and peas.</td>
</tr>
</tbody>
</table>

Note: A further 1,700 families have been settled on Central Region on 'Set Schemes' on former Crown Land (forest reserves, etc.)

1) The Assisted Owner or Yeoman Scheme

Designed for experienced farmers with substantial capital the scheme calls for the settlement of about 1,800 families on farms ranging from about 50 to 200 acres. Each holding is to be sufficiently large to provide the farmer with subsistence, the means of meeting his financial obligations and a minimum annual net of 250. This scheme has been relatively unsuccessful because few Africans have the necessary capital required to pay 10% of the value of the land plus assets in cash equal to a third of the capital value of the farm. Loans could be secured from the Ministry of Land Settlement.

2) The Low-Density Small Holder Scheme

These schemes are limited to land which is at present underdeveloped and to settlers who have agricultural experience and a certain amount of their own capital. The target income is subsistence plus 100. This scheme was to provide for the settlement of about 6,000 families on holdings of about 15 acres of high potential land. Thirty thousand acres were to be purchased per annum, financed by the World Bank and the Commonwealth Development Corporation, at 6-1/2 per cent interest. By the end of 1963/64, 104,000 acres will have been bought, leaving another 71,000 acres to be purchased by the end of 1966.

3) The High-Density Small Holder Scheme

These are designed for Africans with limited capital and agricultural knowledge, the great majority of schemes are planned for high-density settlement. The only condition covering the selection is that they be landless and unemployed. Target net incomes are

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16 International Bank for Reconstruction and Development, p. 83.
25 to 40 per year, although in areas where land pressure has been less this has been increased to 65 to 70. Development loans range from 100 to 160 per family and the total cost averages 647 per family, of which 395 is recoverable, leaving a net outlay of about 252. Loans for this scheme have been made available by West Germany at 3-1/2 per cent interest rate. It is planned to settle some 12,000 families a year on approximately 200,000 acres for five years on plots averaging 14 acres, which need not be of high potential.

4) Emergency Schemes

"These new schemes have mostly involved forest clearance and are designed to provide landless and destitute families some opportunity to produce subsistence crops."\(^{17}\)

The process of land settlement continued at a rapid pace in 1964. Some 692 former large-scale farms totalling 881,221 acres had been purchased during the twelve months ending 30th June, 1964. At this date, 809,286 acres were already settled with 15,682 families. Of these, 14,455 were on high density and 1,227 on low density schemes. The former vary in size from 11-67 acres and the latter from 16-180 acres. Area as well as the potential of land are taken into consideration in the determination of density.\(^{18}\) The first one

\(^{17}\) Hance, p. 4.

million acres were bought at an average of about $24 an acre, their owners being paid in full. Prices for the second million acres are thus far not as high. The total cost of all settlement schemes at present (July, 1965) is £ 26,500,000. The source of the money was: Britain £ 21,600,000; the World Bank £ 1,600,000; West Germany £ 1,200,000; the Commonwealth Development Corporation £ 800,000, and the Land Bank and Agricultural Finance Corporation £ 1,400,000.19

Mr. Angaine, the Minister for Lands and Settlement, told the Kenya House of Representatives, on July 13, 1965 that ... not as many families were settled in 1964/65 as he had hoped. Some 9,000 plots had been allocated and it was expected that more than 8,000 would be ready in 1965/66, making a total of more than 33,000 since settlement started. Nearly 300,000 acres had been bought during the year—rather more than the Ministry had anticipated when last year's estimates were presented. This had brought the total land purchased to date for the high density and low density schemes to more than 1,000,000 acres. In

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addition, more than 100,000 acres had been bought during the year for co-operative farming in the Ol Kalou Salient, and this land was at present being farmed by the Department of Settlement. He further informed them that preparations were being made for the setting up of co-operatives: a further 100,000 acres will be purchased of which about three-quarters would be for high density schemes and the remainder for low density, completing the land purchase programme for schemes at present approved. Mr. Angaine said that most of these schemes would be in the Western Province, but there would be about 20,000 acres in Nyanza Province and a further 2,000 to complete the purchase programme in the Rift Valley Province.20

The small-farm sector now occupies about 35-1/2 million acres of Kenya's 41-1/2 million acres of arable land. Of the total African population more than 80% are engaged in agriculture. The Highlands are the major area of African farming, accounting for about three quarters of agricultural production from African areas. Considerable differences exist

20 East African Standard, p. 4.
among the various tribes and according to local physical conditions, but for the most part the bulk of production in this sector continues to be used for subsistence. Although marketed production has increased rapidly over the last few years, its share of total output in the African sector has not changed markedly. For the last five years the marketed production has ranged from 14-17% of the total production which is about 25% of Kenya's total marketed production. But the rate of growth per annum has increased substantially, for in 1955, the small sector had contributed only 13% of Kenya's total marketed production. The pattern of exports is changing also; the small farms are contributing more. In 1964 the African sector contributed 33% of Kenya's agricultural exports. This achievement is attributable primarily to the sharp increase in the earnings from coffee.

Crops marketed, in order of importance are: coffee, cattle, maize, sisal, cotton and pyrethrum. The gross revenue of the African sector has increased about 80% since 1956, over and above subsistence production which has also been increasing.

The contribution of African farmers to export earnings is increasing markedly, along with their gross revenue, as a result of the establishment of cash crops on consolidated and enclosed African
farms which has been a feature of the Swynnerton Plan.\textsuperscript{21}

... the Swynnerton Plan stands as one of the most dynamic programs in Africa for agricultural betterment. It has literally remolded vast areas of the Kenya highlands, and has provided a base for moving toward a more efficient and more economic farming system.\textsuperscript{22}

\textsuperscript{21}International Bank for Reconstruction and Development, p. 63.

\textsuperscript{22}Hance, p. 404.
CHAPTER IV

SELECTED EXAMPLES OF SETTLEMENT SCHEMES
AND MAJOR CROP ANALYSIS

Sigona Estates

Central Province is, as the name implies, in the central portion of Kenya. (Fig. 2) It is a fairly compact area extending seventy-five miles from east to west and one hundred miles from north to south. The major tribe of this province is the Kikuyu. The land occupied by the Kikuyu is very fertile; much of it is rich red soil having the greatest potential of any area in Kenya. On it grows a variety of cash crops including coffee, tea (at higher altitudes), wattle, pyrethrum, and fruit.

Location and physical characteristics

Kiambu District of Central Province is adjacent to and extends north of Nairobi, the capital city of Kenya, to the southeast slopes of the Aberdares. It has an area of about 700 square miles. With Mr. Edmondson, a British Agricultural Officer, the author inspected the Sigona Settlement Scheme. (Fig. 6.)
Located about twenty miles north of Nairobi in Kiambu District of Central Province, it is one of the oldest schemes, having been organized in 1962.

Situated at an elevation of about 6,000 feet the climate is temperate with an average annual temperature of sixty-six degrees Fahrenheit and an annual range of only eight degrees Fahrenheit. Rainfall is more abundant here than in Nairobi. Sigona has an average of about forty inches annually. The long rains are from March to May and the short rains are from October to December. The soils are rich and fertile; the principal vegetation cover is Kikuyu Grass.

Organization, administration, and operation

Sigona has 37 holdings occupying 650 acres. (Fig. 5.) It is classified as a low density scheme. This scheme has been financed by the Commonwealth Development Corporation and the World Bank, not by the British government. The method of financing is, in part, responsible for the success of the scheme because the World Bank insists that the farmer have 100 in cash

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1 The acreage given in Figure 7 is 500 acres. The larger number given in the text is the most recent total.
as working capital.

After the land was purchased by the government from the European owners it was surveyed and divided into plots. Rainfall, soil, topography and natural vegetation were taken into consideration in determining the size of each plot; each was designed to produce approximately the same revenue. Prior to the survey it had been determined that each farmer should have enough land to produce subsistence for his family and £ 10 in cash. A family unit was considered to be a man, his wife, and three children. Later this was changed to subsistence and £ 60. There were four classes of land units ranging from ten acres to one hundred fifty acres. The surveyors did make some errors, of course, but the majority of the plots have proved viable.

Would-be settlers with farm experience or the necessary capital were given preference in selection; others were chosen by the regional committee. The majority of the settlers were landless and unemployed. In actuality, local politicians did most of the selecting.

The plots were apportioned to the settler by ballot. If, however, the farmer did not like the plot
so drawn, he could try again by choosing from the remaining ballots. Usually the land was accepted on the first draw.

The farmers paid about £30 per acre for their land less one-third which was subsidized by Britain. The loan was repayable over a thirty-year period at a 6-1/2 per cent interest rate. The farmers could also secure a Development Loan for a short term; ten years at 6-1/2 per cent. About 99% of the farmers did accept this loan which was voluntary.

Those who draw empty land are employed for six months at a minimum wage of 2/-2 a day for four to five hours daily. They work at jobs that are of use to the new community, such as roads, construction or fencing. The rest of the day they work on their own plots. A Settlement Officer lives on the schemes and is "all things to all men."

None of the farmers are encouraged to own machinery. Initially the cooperation of the federal government provided any needed mechanization. Today the Settlement Cooperative employs contractors where machinery

\[2\] The East African unit of currency is one shilling. It is subdivided into 100 cents and 20 shillings equals 1.E.A.
is needed. By previous experience it was found that the individual ownership of machinery was uneconomical.

Prior to settlement, the Sigona Estates had been occupied by six European families with a labor force of twenty-five. Today it provides sustenance for thirty-seven families and twenty full-time employees. All of the inhabitants are Kikuyu who consider this area their rightful tribal lands.

Production

The vast majority of production comes from animal husbandry although pyrethrum and vegetables are important to their economy. Vegetables grown on the scheme include maize (the staple crop of Kenya), sweet potatoes, white potatoes, the indigenous castor beans, other beans and peas. The vegetables are sold on the open market in Nairobi. The farms average about seven animals for each homestead; these are Friesian, Jersey, Ayrshire or Holstein. During the time of the European occupancy, the herd was known as the Sigona Herd and gave one hundred fifty gallons of whole milk daily. By practicing scientific methods of cattle husbandry, the native African has been able to increase this production to 250 gallons of whole milk a day. The milk
is sent to the Kenya Creameries Cooperative. This cooperative owns nine creameries, of which five can handle milk.

Sigona settlers were fortunate to have good stock available and a functioning market system before they started; good reasons why the scheme is viable. That they are following good husbandry practices can be easily seen by watching their sleek healthy cattle going through the dipping sheds. (Fig. 9.) The hillsides were paddocked and planted with good strains of grass for rotational grazing. Cattle sheds for making manure have replaced the traditional open bomas which did not protect the cattle or manure from rain. The Sigona farmers use the indigenous elephant grass for fodder.

Dairying, which is so important to the economy of Sigona, is of equal importance to the economy of Kenya, as a whole. Following the discussion of each settlement scheme the author will present an analysis of the major crops of the scheme on a national level. The discussion of dairying in Kenya follows.

Production of milk and dairy products in Kenya

Kenya has an enormous potential for the production
of milk and dairy products. But the first requirement for realization of this potential must be an increase in the number of female dairy stock. The small farmer has had to look to the European farms for breeding stock because small farms generally have insufficient grazing available on which to rear replacement stock efficiently and economically for their dairy herds. The problem of maintaining quality herds in Kenya is very great since breeds of higher productivity are, in this part of Africa, more susceptible to disease. The Europeans through long and extensive research and careful handling have succeeded in maintaining herds with relative freedom from disease.

From 1962 to 1964 the gross farm revenue from dairy products and livestock in the large farm areas (European) has decreased from £10,620,000 to £9,066,000 while the gross farm revenue for the African farmer has risen from £2,803,000 to £3,374,000. This increase in revenue from dairy production is noteworthy.

3 The statistics given in the discussions pertaining to large crop analysis are from the Statistics Division of Kenya's Ministry of Economic Planning and Development as found in Economic Survey 1965, Statistical Abstract 1964, and Development Plan 1964-70. Also used was A National Cash Crop Policy for Kenya, from the Ministry of Agriculture.
because it is directly related to the introduction of grade stock on small holdings at suitable altitudes. From 1963 to 1964 considerable numbers of dairy cattle have been transferred to small holdings in settlement schemes. However, there must be an increase in extension services in order to instruct and guide the native farmers in methods of husbandry and disease control.

But in spite of the increased production in the small farm sector of Kenya, there is a shortage of milk for a large proportion of the African population and probably the Asian population also. This is true for two reasons. First, because they lack the purchasing power to buy the milk, and secondly because there is still not enough milk produced to supply a rising population. It was estimated that in 1963 about 290,000 gallons of milk were produced daily in the country so that potential consumption was only half a pint per head per day. Thus, the present position is one of chronic shortage for internal consumption while some farmers cannot sell enough milk at attractive prices, and others sell what they produce rather than consume it within the family. The ultimate potential production from African small holders
has been roughly estimated at 3,200,000 gallons of milk daily which would yield about 1,300,000 lb. of butter daily and sufficient skim milk for the total population of humans and for domestic animals.

Policy should therefore be directed towards increasing local sales and exports of butter-fat to increase the farm income, a process which would produce a large surplus of skim milk which is a necessary by-product from the point of view of national health and pig production. Large scale farmers can benefit by acting as breeders of good quality female stock for smaller producers, selling their heifers in calf, as smaller producers cannot afford generally to hold unproductive female stock on their holdings. Expansion of milk production on small holdings largely depends upon the availability of such stock.

The results of such a policy should produce a large increase in the farm income.

Production of pyrethrum in Kenya

All of the farmers at Sigona have allocated a certain portion of their farms to the cultivation of pyrethrum. (Figs. 7 & 8.) Pyrethrum is used in the making of a very effective insecticide which was first grown in Kenya before World War II. About

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Fig. 7 Entrance to Sigona

Fig. 8 Pyrethrum
two-thirds of the world's pyrethrum is produced in Kenya and production has expanded rapidly in the last four years. Output in Kenya has increased from 1,500 tons in 1948 to 4,500 tons in 1958-59 and 10,800 tons in 1961-62. The most significant development in recent years has been the increase in small-scale farming. Africans now account for 27.7% of output as compared with 10% in 1958. In 1962 there were about 32,000 Africans engaged throughout Kenya in producing pyrethrum. Production of the 56 African cooperatives is licensed by the Pyrethrum Board which has pursued a vigorous policy of product research, promotion and market development.

Pyrethrum is not a costly crop to establish and returns of £40 and above per acre are readily obtainable. "Since pyrethrum produces a harvest in the first year after sowing, its value as a rapid cash earner is of considerable importance on high altitude smallholdings which have just come under consolidation or settlement."5

The future expansion of pyrethrum production

depends upon whether or not a cheap non-toxic synthetic insecticide is produced. It seems unlikely on the present market that pyrethrum will be apt to provide a substantial increase in the national income in the next few years. On a long-term basis, however, there is scope for expansion if a wider variety of uses is found for the flower.

Among Kenya's exports pyrethrum ranks fourth. In 1964 it formed 4% of Kenya's total exports, the United States being the principal purchaser. Japan, Yugoslavia, Tanzania and Congo are Kenya's main competitors.

Sample Farm

One of the farms visited at the Sigona Estates belonged to Mr. Waweru Kanja, a Kikuyu settler. Mr. Kanja's farm consists of 15 acres. His homestead and vegetable garden occupied 1-1/2 acres, 1-1/2 acres was devoted to pyrethrum and elephant grass for fodder, 3 acres of arable land was planted in maize, beans, peas, and white potatoes. Mr. Kanja had an excellent potato field (see Figure 9), his maize field yields a return of about 15 bushels per acre which is fairly good by African standards. (Fig. 10.) Nine were reserved for grass, paddocked and ready for rotational grazing.
Fig. 9 Maize field at Sigona Estates

Fig. 10 Potato field at Sigona Estates

Fig. 11 Dipping cattle at Sigona Estates
Mr. Kanja's cattle were being dipped while the author was at the farm. (Fig. 11.)

Through the cooperative Mr. Kanja can have his fields plowed for which he pays the sum of 90/-.
This is done by tractor rather than human labor. Other than the plowing and occasionally the planting, all the field work is done by Mrs. Kanja and their children. It is traditional for Kikuyu women to do the bulk of the farm work.

By law and by agreement Mr. Kanja cannot subdivide nor fragment his land. Mr. Edmondon and Mr. Kanja were justifiably proud of this example of a successful settlement farm enterprise.

Mwea Irrigation Scheme

Location and physical characteristics

Also in Central Province, sixty miles north of Nairobi in Kirinyaga District, is the Mwea Irrigation Settlement. (Fig. 5.) It is centrally located on the Mwea-Tebere plain near the foothills of Mt. Kenya at an altitude of 3,800 feet above sea level.

The water for irrigation is derived from two rivers, the Thiba and Nyamindi, tributaries of the Tana River.
The run-offs from both catchments are relatively high because they arise in the high rainfall zone on the slopes of Mt. Kenya. (Fig. 12.)

Annual rainfall for the last several years has varied from a maximum of fifty inches to a minimum of twenty-five inches. There are two rainy periods, as elsewhere in Kenya, the long rains from April to May; the secondary rains are in October and November. The annual temperature range is from an absolute maximum of 83.6 degrees Fahrenheit to a minimum of 60.2 degrees Fahrenheit. The average relative humidity in the morning is 64.3%; in the afternoon it is 38.0%.

The soils of Mwea are typical of those of much of Kenya. They consist of free-draining reddish-brown lateritic clay loam and impervious heavy clays. The soils are generally rather shallow. The author's clothes, hair and person were a bright reddish color after touring through the Mwea Scheme.

Administration, organization, and operation

The development of this large-scale irrigation scheme has made possible rice-growing, and now there are over 1,300 rice-scheme tenants with their families living in over twenty villages on the plain. The
Fig.12 Irrigation ditches at Mwea Irrigation Scheme
first small plot scheme was established in 1951, and in 1954 it was decided to proceed with the construction of the main irrigation scheme. This decision was precipitated by the need to find useful and constructive employment for several thousand detainees who were held under emergency regulations.

Of the 1,338 tenants at Mwea, 48.5% of them were recruited from Embu and Kirinyaga Districts, the rest are from other districts in Central Province. Most of them are Kikuyu. The sole condition for admission to tenancy at the scheme is landlessness. Approximately 7,000 people make a living at Mwea; none of them have had any previous experience in rice cultivation.

The tenants are selected by the local clans. After selection they are given the opportunity to borrow £50 with which to build their homes. They have three years to repay the loan. Tenants settled before 1960 were provided with a free house in one of the nineteen villages. Schools are built by joint effort of the settlers. First-year tenants are given a monthly cash allowance to help tide them over until the first crop is harvested. All farmers are charged for the water they use on a graduated scale as their
plots are developed.

The scheme is divided into units, and all the tenants and their families of one unit live in the same village. There are approximately 150 tenants to a unit. Unit leaders are selected from each village for supervision of the fields. Because the farmers are unskilled, a great deal of supervision and instruction is required. The leader is also concerned with the discipline and management of the settlers.

Each settler farms four acres, one of which must be rice. They follow a rigid schedule set by the manager who, at the present time, is Mr. D. C. Hunt from London, England. Mr. Hunt has the planting staggered so as to harvest 3,000 bags of rice daily.

The scheme provides the farmer with a pool of cultivation implements, mechanical equipment, and spraying services. Machines prepare the ground but the tenant does all the other tasks. All the services performed for the tenant are charged against his crop and debited to his account.

Essentially the scheme is divided into two blocks of 7,500 acres each, the Mwea block and the Tebere block; 5,352 acres of the two blocks is black cotton
soil under rice, the remaining area consists of 1,000 acres of irrigable red soils presently not in use, 140 acres of irrigated red soils, of which six, four-acre plots, are under pilot holdings; twelve acres of irrigated black soil used for experimental purposes, and the balance is made up of red and black soils not being worked.

By 1960 a total area of 5,020 acres of the black cotton soil in Tebere had been level terraced into one-acre units for rice cultivation, and had been provided with complete irrigation-water distribution systems. The present development of the Mwea block is limited to 3,029 acres, but it has an ultimate irrigation potential of about 15,000 acres of black cotton soil.

As of 1962 this project had cost about two million dollars and made its first profit in 1961. But 1964 the mean income per tenant from his four-acre holding amounted to £124.3. This is the amount received after all payment for charges and services had been made. In addition to this amount each tenant retained for home consumption or private sale nine bags of paddy worth 14. The comparative wealth of the Mwea farmer can be appreciated when it is noted that the basic annual
wage in the area is about \$36. Whereas ten years ago the area was practically uninhabited and produced nothing, in 1964 the scheme produced \$274,000 towards Kenya's gross farm revenue.

Social resources

The tenants have set up their own Thrift Society and are saving money so that they will eventually have their own rice mill. There are three Youth Centers for the scheme, all of which were built by "self-help." While visiting Mwea, the author also visited the Rural Training Center, Mutii wa Urata, which was established in 1958 by a team of Quaker social workers. (Fig. 13.) Since that time this center (sponsored jointly by the Christian Council of Kenya and the Friends Service Council) has engaged in helping the local community to develop its social resources. Management of the center was taken over in 1962 by an independent Board of Governors with representatives from local departments and organizations. The staff of the "Home of Friendship" encourage and help villagers to set up and run Progress Clubs (for adult literacy teaching), Nursery Groups and Youth Centers. The center has a nurse who holds ante-natal clinics
Fig. 13 Mucii wa Urata-Rural Training Center, Mwea

Fig. 14 Agricultural officer in the field at Mwea
in the village. She and the village health workers also teach nutrition and child care. Besides such village activities the Training Center offers short residential training courses for various groups such as the headmen and village elders, rice scheme head cultivators, church leaders, and many others.

Production

The subsistence crops of Mwea are maize and beans. (Fig. 14.) The scheme is experimenting in cash crops of onions and cabbages. Onion seed, at the present, comes from the United States, but they are trying to produce it locally.

A distinctive crop of the scheme is a local variety of bananas. Many of the tenants have a small amount of land planted in bananas. This crop is for internal use only because their closest big market, Nairobi, is sixty miles away.

Other experimental crops are beans, both the Mexican small white canning variety and Michigan beans. Work is being done with tomatoes also. The tomato seeds come from the Heinz Company in America. Another experimental crop is cotton which is being planted on the non-irrigated areas.
The major crop produced at Mwea is rice. (Fig. 15.) The rice planted, the sindani variety, is of high quality, and in cooking and consumption tests has compared very favorably with the imported varieties that are favored among the Asian population. Mwea has had encouraging success in the production of rice and the potential for further development is considerable. Reports from the scheme indicate that the yields of rice after only a few years of operation have averaged over two tons per acre (2.21 tons per acre in 1961). Only in a few other countries, such as Australia, is the yield greater. In 1964 the total crop was 11,847 tons which is about 90% of Kenya's total crop of 13,600 tons. Paddy production increased by 600 tons in Kenya from 1963 to 1964. This increase was due entirely to the expansion of the Mwea Scheme and when the present plans are completed in Mwea by 1969, Kenya will be self-sufficient in rice. The entire crop is sold to the Central Province Marketing Board; from there it is disposed to the various millers in the country for processing.

At the present time, imports of rice are still
Fig. 15  Rice paddy at Mwea
significant although less so than in previous years. In 1963 Kenya imported 4,400 metric tons of rice valued at $945,000. Fifty per cent of this amount came from Pakistan. Rice makes up 3% of the total share of all imports to Kenya.

The Mwea Irrigation Scheme has proved to be a very viable operation. The scheme realized a handsome profit which is more than adequate to repay capital development costs. Mwea has succeeded in fulfilling its two prime functions: (1) to render productive areas of land hitherto almost totally unproductive or at least of very poor productive status, and (2) to provide a means of settling large numbers of persons who were landless without injuring the rest of the economy of the country.

The Mweiga Schemes

Location and physical characteristics

The author travelled north from Nairobi for 65 miles to Nyeri District of Central Province. The scenery in this area is breathtaking. Located on the eastern slopes of the Aberdares, Nyeri faces Mt. Kenya. The Aberdare Range, which is east of the Rift Valley,
rises to about 13,000 feet and sends broken ridges running down towards the plains from its forested slopes. The ridges are divided from each other by valleys through which run swift flowing streams. At an altitude of 6,000 feet to 6,500 feet the climate of Nyeri is cool and invigorating and the rainfall keeps it green throughout most of the year.

The lower soils are the rich red soils that carry their fertility down into their subsoils, while the upper soils are the dark loams of lands that were primeval forest barely a generation ago.\(^6\)

The average rainfall at 6,000 feet is about 36 inches but with increasing latitude, the annual rainfall increases to over 60 inches in places.

Mt. Kenya, which dominates the landscape both spiritually and physically, towers 18,620 feet. This great volcanic mass which has a tribal significance to the Kikuyu people, is snow-capped, with glaciers descending to about 15,000 feet. The southern slopes have heavy rain, over 70 inches, but the northern side is much drier. Forests are found between 5,500 feet and 12,000 feet. The summits are cloud-covered.

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The author visited Nyeri in July which is supposedly a drier season but the weather proved to be very damp and chilly. The mean temperature is about 65 degrees Fahrenheit. There are two rainy seasons: April to June and October to December. The driest months are January and July to September.

While in Nyeri, the author had the pleasure of meeting Mr. Wiggs, a young man from California, serving for the U. S. Peace Corps on the Mweiga Land Settlement Schemes in Nyeri District. Mr. Wiggs expressed the opinion that the Mweiga Schemes were very effectively operated.

Organization, administration, and operation

The Mweiga Schemes are in Upper Nyeri, north and east of Nyeri Township. (Figs. 5 & 7.) They are in the high density class. The farms average 7 to 10 acres, an indication of the high potential land found here. The settler had to have £100 in capital for development plus a working capital of from £150 to £200. Most of them made land loans from £150 to £300 to be repaid over a 30-year period at 6-1/2 per cent interest rate. The farms are supposed to yield £25 a year plus subsistence, which is well
within the capabilities of the land and the peasant farmer, but unfortunately not all of the settlers are "farmers" in the true sense of the word.

There are approximately 500 settlers on the Mweiga Scheme. Many of them are absentee farmers, that is, a farmer may have a wife who lives on the scheme and works the farm, and may also have a wife near Nairobi where he works during the week.

While in Nyeri the author visited several farms in the Mweiga Scheme but the inclement weather made it difficult to accurately assess them. At one farm she met Chief Patrick, a Kikuyu, who was elected by the settlers on the scheme. Formerly the Colonial Government picked the chiefs. On the scheme there is a headman, two to four policemen, and a veterinarian, as well as several assistants. A health officer is also available who inspects every homestead. Here, as on all the schemes, "self-help" is emphasized. Travelling several miles over a tortuous "road" in a lorry in the rain, the author went to see a bridge the people were building by hand. The farmers had waited three hours in the rain for the arrival of the author's party. The finished enterprise would save them several miles of travel over difficult terrain in order to get
their crops to market.

The major cash crops are dairy products, pyrethrum, potatoes and other vegetables, fruits, and coffee. As in the rest of Kenya, maize is the staple crop but the agricolas\textsuperscript{7} are doing their best to discourage its planting. The altitude is much too high here for maize where it takes seven months to mature. In addition, yields are very low, about four bags to an acre. Potatoes, however, do very well. It is possible to get two crops of potatoes a year with a yield of 70 bags to an acre. There are about 180 lbs. to a bag. Beans do well also. Milk products are not up to "snuff".

Shifting agriculture was formerly practiced in this area and the settlers were reluctant to practice rotational cropping. Coffee is the revenue-producing crop.

Production of coffee in Kenya

General Production

A small acreage of coffee had been planted in

\textsuperscript{7}Agricola refers to members of the Department of Agriculture.
native areas just before the war in an effort to encourage cash crop production by Africans. This was not done without considerable opposition by the European settlers, among whom coffee cultivation had been an established estate industry for some years. The Europeans objected to African-grown coffee on the grounds that it would spread disease, spoil the export market and make theft from estates easy. The new venture was not even warmly approved by the native Africans who suspected some hidden motive by the Government. Until 1956 the "white settlers" produced almost all of Kenya's coffee export. But small-scale African coffee production has increased by leaps and bounds. In 1946 there were 786 licensed African growers in Kenya with about 318 acres in coffee. By 1953, when the slow-growing coffee bushes started to become of real importance by putting cash into the African's pocket, the acreage had been increased to 1,500. As of December, 1963, there were 192,844 small-scale farm coffee growers utilizing some 115,117 acres of planted coffee.

The acreage devoted to coffee on European farms was less in 1962 at 74,300 acres than it had been in 1938 when 93,722 acres were planted to coffee. Acreage was reduced by retirement of marginal lands, but production was considerably
above pre-war levels, being about 23,315 tons of the total Kenya production of 33,084.8

By December, 1964, the trend had continued, and of the total Kenya crop of 43,500 tons of clean coffee, the small African farms have contributed 15,300 tons and the large European farm sector 28,200 tons.

Kenya's coffee is high-grade Arabica and because of its high quality commands premium prices on the world market, and ranks as the most important cash crop in Kenya's economy. It forms about 18% of Kenya's total exports. The principal markets are West Germany, the United Kingdom, Sweden, the Netherlands, and the United States.

There is no other crop which can replace coffee as a source of cash to African smallholders living in high potential areas. It has the supreme advantage of being relatively easy to grow and it does not require costly nurseries, or even expensive processing machinery. An acre requires only 540 plants, and it takes only 300 acres to justify erection of an $8,400 factory. An acre of coffee will produce, on average, a net return of over £80 to the African settler.

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Cost to the grower is only a small cash outlay for such items as spray or chemicals.

Coffee does, however, require a fair degree of skill at both the growing and processing stages. Yields and quality will be affected by inadequate cultural practices and inferior processing. The Kenya government has made an effort to maintain standards by providing supervision and training courses for the African farmer.

This system has worked extraordinarily well; and far from managing their coffee shambas in a worse manner than the European farmers, tree for tree the Kikuyu are managing them better. This is not because they are better farmers, but because they are growing on a much smaller scale--on a garden basis rather than a plantation basis--in this way the trees can have individual attention.9

The African is also achieving high yields as well as high quality. On an average he produces 8 to 10 cwt parchment an acre as against 4 to 5 cwt an acre on estates.

But the problem of maintaining or improving the quality of present peasant-grown coffee is a difficult one at best. The recent decision to accelerate

the expansion of cash crops will mean that the existing extension services even though expanded, will be spread more thinly. It has already been noticed that when agricultural officers depart on leave, the cultural standards in their districts decline rapidly which, of course, soon affects the quality and yields.

Because of an acidic quality, Kenya arabica is much favored as a blending coffee but only so long as it falls into the first three classes. Below these classes it loses its special advantage and has to compete with other arabicas. Most of the world's arabica coffees, of which Brazil is the major producer, fall below the top three classes in quality, and in this range, there is substantial overproduction. Indeed, this situation has recently given rise to an international restriction scheme. The overproduction of lower-quality coffees has naturally led to wide quality differentials and recently to export quotas which, to date, Kenya's high-quality coffees have been able to avoid.10

An effort is being made to combat this threat to quality by encouraging the formation of cooperative committees to promote the improvement of quality. African producers are served by 146 cooperative societies (1964), each operating one or more coffee factories. Since the cooperatives were handed over to the African, some of their committees, particularly

10 Clayton, p. 121.
in Nyeri, have been very effective in maintaining quality standards. If the farmer does not work to improve his cultural standard the crop may not be accepted. Some committees in Nyeri have fostered, on this basis, the use of sprays and artificial fertilizers. Clear--this is a zonal monopoly but the Africans will accept it because it is operated by fellow Africans. "But whatever the ethics of the matter, it is sufficiently effective for the government to encourage these cooperatives, in other districts, which are less enlightened." The African coffee grower must legally market his coffee through a cooperative. Members and committee members are entirely African and must supply their cooperative, and no one else, with cherry.

The processing of coffee from cherry into parchment involves two operations--pulping and drying. The processing equipment is financed by government loans. These government-sponsored factories are placed in strategic locations and operated as cooperatives.

Ibid., p. 123.
The North Tetu Coffee Grower's Co-operative

Nyeri District ranks third in the number of African growers of arabica coffee in Kenya. It has 22,512 growers using 13,531 acres. In 1963 Nyeri farms produced 934 tons of clean coffee yielding a revenue of £280,190.

While the author was in Nyeri she observed coffee pickers of all ages bringing in their cherry to the North Tetu Coffee Grower's Co-operative to be inspected, weighed, and credit recorded. (Fig. 16.) The purpose of the inspection is to pick out and reject inferior and damaged cherry prior to weighing and processing. About 300 members of the North Tetu Coffee Grower's Co-operative Society are building a coffee factory on "self-help" basis at a cost of £2,000 at Kamuyu Village near Nyeri Township.

The plan, started at the beginning of the year, includes the construction of a three-mile-long water trench from the Kamuyu River to the six-acre factory site. The sum of £2,000 to be spent on the project came from an agreed deduction of 15% of their income.
Fig. a Coffee co-operative

Fig. b Sorting cherry

Fig. c Selecting cherry

Fig. d Weighing cherry

Fig. e Accepted cherry

Fig. 16 North Tetu Coffee Co-operative in Nyeri
from their coffee sales. The new factory, the fifth in the location, will save the farmers the difficulty of sending their coffee to another factory, 12 miles away.

Future of Coffee Production in Kenya

Opportunities for further expansion in the coffee industry are restricted by world surplus production and also due to the fact that Kenya has acceded to the International Coffee Agreement whose main object is to increase the purchasing power of coffee-exporting countries by keeping prices at equitable levels. Under the agreement Kenya has been allocated a quota of £30,100 for sale to traditional markets in the first year. Large areas of coffee have been planted in recent years and these areas have not come into full production yet. When they do the Kenya crop will rise to 60,000 to 70,000 tons, even if no more coffee is planted. The substantial increase in production which will arise from the coffee already planted will have to be sold, for the most part, in non-quota markets, and at the prices which these markets are prepared to pay. Emphasis, therefore, must be shifted to other crops.
Schemes of the Kericho District

Location and physical characteristics

From the Central Province the author traveled westward to Nyanza Province. Nyanza, the most westerly of the provinces, lies astride the equator. Lake Victoria forms the western boundary of Nyanza. Rift Valley Province lies to the east, and the western and eastern boundaries form an apex at the foot of Mt. Elgon.

Lake Victoria, the largest lake in Africa, wields a strong influence on the climatic pattern and structural history of the province. This great water mass at 3,756 feet above sea level is 200 miles long and 250 miles broad. Nyanza covers the eastern quadrant of the plateau country surrounding the lake. Climatically Victoria influences the provinces in the distribution and amount of rainfall. The lake has well-marked land and sea breezes on its shores. At the north end sea breezes are reinforced by the prevailing winds and moist air and considerable rainfall are the result, even in the dry season. Every month is rainy in the north but the least rain falls in July and August. Much of the rainfall of the lake
shores is the product of evaporation from the lake surface. Nyanza, with an average elevation of about 4,000 feet receives from 40-70 inches of rain yearly. In Kenya, Nyanza is the most extensive tract with a reliability figure of over 30 inches per year.

Not only the amount of rainfall but also its seasonal distribution and intensity is of great importance to Nyanza farming. Rain comes throughout the year but there are two peaks of rainfall. There are the long rains from April to June, and the short rains of August and September.

The author investigated land settlement schemes and tea plantings in the Kericho District. This district lies in the easternmost part of Nyanza Province. It is part of a broad belt of tertiary and recent volcanics stretching between Lakes Rudolph and Magadi, creating a highly dissected landscape with steep hill-sides and flat-bottomed valleys.

Soils in Kericho District vary from the dark-red-brown clay over basic rocks to the more infertile light-brown sandy soils of granitic areas. The westernmost section towards South Nyanza has a deep reddish soil, characteristic of the Highlands; here high rainfall and a rich soil combine to sustain a heavy grass cover. Kericho is characterized by the presence
of Kikuyu Grass or Star Grass dominant in pasture. Situated at an altitude of about 6,500 feet there is an average annual rainfall variation from 62 inches to 72 inches. This district is fortunate; though not all parts have so high a rainfall as North Nyanza, for annual rainfall nowhere falls to a marginal figure. Variation has been from a minimum of 46 inches to a maximum of 96 inches.

The successful cultivation of tea, which ranks second to coffee among Kenya's export crops, requires an acid soil, and a well-distributed and heavy rainfall, normally in excess of 60 inches per year. It grows best at an altitude between 6,000 and 7,200 feet. These conditions are met at Kericho where there are 97 registered growers and 30 factories employing about 38,000 persons of all races. Kericho is the main producer of tea in Kenya.

Production of tea

Tea in Kenya

Tea was first brought to Kenya in 1903, but only very small acreages were put out as a plantation crop until 1924. Development from then until 1939 was steady, though not on a very large scale as, at that
time Kenya supported the International Restriction Scheme. However, after the war the two larger companies and many smaller companies increased their acreages considerably. Tea was raised exclusively on large plantations by Europeans. In 1962, 36.2 million pounds of made tea worth £6.7 million was produced. Of this, 98% was supplied by the large tea estates.

In recent years the African has entered in the production of tea. A start was made in 1950 when the Kenya Government initiated peasant tea-growing schemes in the Tribal Land Units with a view to increasing the number of African cash crops. From this beginning a later plan arose for the development of a further 10,935 acres, together with factories to process the tea which will be completed by the end of 1966 at a cost of £2 million. These bushes will be full-bearing by 1971 with an estimated production of not less than twelve million pounds of made tea. Under this plan, which is under the control of the Kenya Tea Authority, the tea will be grown on small holdings and transported for processing to centrally-located factories built especially for the scheme. The Kenya Tea Authority will, in the near future, enter into partnership with
private tea companies to undertake the erection of these new factories. The growers are to be able to buy out these private companies with their tea earnings, after the factory debts are redeemed. The financial assistance for the scheme is coming for Kenya from the Commonwealth Development Corporation, West Germany, private tea companies, and the Kenya Government.

Prior to 1960 there were only 1,572 acres of tea on small holdings. In 1966 a new program was begun requiring an investment of $.14 million which will permit the increasing African acreage in tea to reach 23,250 acres by 1971. Experience has already proved that tea growing under small-holder cultivation is viable. Over 10,000 Africans now grow tea, principally in Nyeri, Embu, Kericho, and South Nyanza Districts. The gross farm tea revenue of the peasant African farmer has increased from £54,000 in 1962 to 159,000 in 1964.

Tea may become the number one export crop of Kenya if the planned expansion proceeds. Kenya is now the largest tea-producing country in Africa, and her output accounts for about 2 or 3% of the world production. In 1927 Kenya exported less than one ton; in 1947 exports totaled 4,279 tons valued at $3.6 million;
and in 1963 exports were 15.9 tons valued at $16.9 million. Tea provides 9.5% of the total value of all of Kenya's exports. Principally it is sold to the United Kingdom, the United States, Canada, Tanzania, and the Netherlands.

Brooke-Bond Tea Company

The author, while in Kericho, visited the Kimugu Estate of the Brooke-Bond Company. (Fig. 17.) Tea has characteristically been a plantation crop of the large-farm sector because of the high investment required and the great amount of technical skill needed. Much of Kenya's tea is supplied by the Brooke-Bond Group located in Kericho. Mr. Okal, the Director of Public Relations, acted as a guide. Brooke-Bond has twenty-two estates with a total acreage of 12,000 and employing 8,700 laborers.

The Kimugu Estate is made up of 800 acres. The yield from one acre is approximately 1,500 pounds of ready tea. One picker can take off a little more than one acre. The leaf is picked every fourteen days. The bushes are picked to a uniform level. Tea bushes, which have a life span of about one hundred years, grow close to six inches a year. They have to be pruned
Fig. a Picking tea

Fig. b Tea plant

Fig. c Sorting tea

Fig. d Collecting station

Fig. 17 Brooke-Bond Tea Plantation - Kimugu Estate
every four or five years. The pickers must take care to pluck only two leaves and a bud. It takes 100 pounds of green tea to make twenty pounds of ready tea. Physical conditions are excellent here for the growing of tea. The soil is acid and the rainfall of about ninety inches is distributed over 250 days of the year.

The Sotik Schemes

Location and Physical Characteristics

With Mr. Opi, a Senior Settlement Officer, the author visited several land settlement schemes in Sotik, which is about forty miles south of Kericho Township and sixty miles south of the Lumbwa Railway Station. (Fig. 18.) Mr. Opi, a Luo, is in charge of twenty-three schemes occupying 5,500 acres. (Fig. 5.) The tea-growing area is north of the Sotik Township, which is situated at an altitude of 6,000 feet. It has been described by one author as follows:

Tea is grown, often in conjunction with mixed farming, at altitudes of about 5,900 feet to 6,300 feet. Average annual rainfall varies from 50 inches to 53 inches in the tea areas. This area is contiguous to the southern portion of the Kericho tea estates, but the rainfall is
Fig. 18: Settlement Schemes on the Western Highlands

not so well distributed, and the area is liable to longer drought periods.\textsuperscript{12}

Organization, Administration, and Operation

The farms in Sotik are operated by members of the Kipsigis Tribe, who have some of the best-farmed native land units in East Africa. During the war, there was a substantial increase in cropping as a result of government urging. The "Kips" were one of the first indigenous people to practice enclosure. Today, when driving through land units, it can be seen that each holding is divided from its neighbor by neat hedges and subdivided into tidy fields. The farms show evidence of care and pride. The cultivated land is contoured and terraced wherever the slopes require such treatment. The land is protected against surface erosion by grass filter strips. The holdings are generally large by African standards, averaging from 15 to 20 acres depending upon the fertility of the soil. Probably one-third of the Kipsigis land, 630,000 acres, could grow tea. As of 1963 there was

29,500 acres in the Sotik (East and West) Settlement Schemes occupied by 979 holdings. There are both "high" and "low" density schemes.

The Gesuma Scheme

With Mr. Opi, the author visited farms of the Gesuma Scheme of Sotik. This particular scheme of 5,500 acres was financed by the World Bank at 6-1/2 per cent interest rate. There are 219 families on this unit with average holdings of fifteen acres. These farms are designed to produce subsistence plus £100 income. Each farmer had to make a 1700/- deposit.

The soil here is fairly good and the settlers raise tea, passion fruit (Fig. 19.), maize, beans, and pyrethrum. In addition there are from seven to eleven cattle per family.

The Manga Farmers Co-operative

Another scheme in Sotik is the Manga Farmers Co-operative which accommodated 314 families on 7,000 acres. This is a "high density" project. One year ago it was mostly bush country. Today they raise cattle, maize, passion fruit, and have just begun to
Fig. a Limes

Fig. b Passion fruit

Fig. 19 Fruits grown on Sotik Settlement Scheme
Milk production by smallholders at Manga is a problem which will increase as the source of supply increases. Because milk is perishable, rapid collection and movement is essential. Manga can not supply whole milk. They can only provide about 30 gallons a day; the rest is processed. About 10% of the milk collected is rejected for one reason or another. This project is being assisted by a Peace Corps worker from the United States.

A Sample Farm

A sample farm visited was owned by Mr. Charles Ungau, a Kisii tribesman. (Fig. 20.) Before operating this farm, Mr. Ungau had studies for one year at an Agricultural School. His farm of twenty acres is of the "low density" class. He was given 4,000/- by the government and after three years of farming has already paid back 3,000/- on his loan which has an interest rate of 6-1/2 per cent. Mr. Ungau raises maize, passion fruit, and finger millet. In addition to the field crops he has nine cattle, one of which was a prize to him from the government for high yields from his farm.
Fig. a Maize and millet used in brewing beer

Fig. b Cows in pasture at Sotik

Fig. 20 Farm of Mr. Charles Ungau at Sotik Settlement
Five and one-fourth acres of his farm acreage is cultivated. His fields are in six units and are rotated for grazing. By African standards his homestead was comparatively modern. His fields were neatly laid out and enclosed; some by fencing and some by hedging. Grass filter strips were employed as a soil conservation practice. This was a fine example of a well-planned and developed farm which was supplying its owner with an above-average African standard of living.
CHAPTER V

THE FUTURE?

Will the Land Settlement Schemes in Kenya prove successful? This is the question that time alone can answer. Among the agricultural experts in Kenya there were conflicting points of view. Some were highly enthusiastic and optimistic; others were extremely sceptical and pessimistic. All of the schemes that the author visited were viable and good examples of what could be done, but it is natural to show a guest the best that is available. There have been disastrous results in some schemes; in fact, there has been total starvation in some schemes for two years. The entire program is fraught with problems.¹

One of the problems is that many of the settlers are "just not farmers." Without constant supervision they will plant the wrong crops at the wrong time in the wrong place. It seems advisable to select competent people for resettlement so that their efforts will bolster the agricultural economy.

¹Lecture by Heyer, July 8, 1965.
Poor farming practices can be disastrous. The agricultural knowledge of the settler will be a determination, to a large extent, of whether or not he is successful. In the selection of settlers there should be some priority for those with agricultural knowledge.

Another problem is the economic size of the holding. This is particularly pertinent to the high-density schemes. Emphasis has been placed on a number to be settled rather than on an adequate size. In their effort to get a large number of people on the land some of the holdings were as small as five acres in the beginning. Technical experts succeeded in getting the holding size increased but they may still be too small to cover fluctuations in the price of the main cash product and seasonal adversity. If returns prove inadequate, the settler will be unable to make his loan payments, and the whole program will be endangered.

The settlement schemes do not actually relieve the unemployment problem as many believe. The maximum number of people that can be accommodated in five years is 40,000 to 50,000. At the present time unemployment already exceeds these numbers; but these estimates
pale when one considers that the increase in population in the next five years will be in the region of 150,000 to 200,000 families.  

There is much comment on the break-up of large units of viable farm land into small peasant holdings. This may mean the destruction of capital assets and the adoption of less efficient forms of production. Some sixty European farms had been abandoned up to the end of 1962; some of these were then taken over by squatters and others were run down before the government had taken them over. The dairying operations with high-bred European cows simply can not be broken down successfully. This period of transition refocuses attention on the problem of productivity. Can the small farms maintain or increase the productivity of the former European farm; if so, will they? This is a key question for a country with a heavy physical trade imbalance. On one hand, it may be possible to get greater yields by reason of a greater intensity of cropping and cultivation; it is just as possible that

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a fall in production can be visualized, due to the loss of the benefits of large-scale farming.

It has been difficult to find a cash crop which would yield a high return on the small area of the farm used for other than subsistence. Coffee and pyrethrum seem to be the most likely but both are crops governed by quotas to prevent overproduction.

Another problem to be faced is the disposition of present African residents on purchased farms. In some cases there are more people, employees, and "squatters" on the farms than would be accommodated by breaking the large holding into small plots. However, even though there may be numerous cases of injustice, there is no doubt that a considerably larger number of Africans will reside on subdivided areas than on the predecessor farms.

To be successful, the settlement scheme requires careful layout of the subdivided farm, technical assistance to the new proprietor, a certain amount of farm training, especially for those with little or no previous experience, maintenance of the necessary scientific and advisory services after settlement has been completed. These services require a fairly substantial staff of trained agricultural workers and fairly heavy government budgetary support. But it is very doubtful whether an independent government will be prepared to allocate the needed funds and perhaps even more doubtful whether there
will be enough skilled advisers and techni-
cians.  

Without adequate planning and supervision, settle-
ment schemes of this kind would become a burden on
the community.

There are many who believe that the settlement
schemes are larger than is desirable at such an early
stage. African leaders are, for the most part, aware
of the inherent dangers of trying to do too much too
fast; but the land-hungry populace are demanding ac-
tion and responsible politicians are finding it hard
to withstand the pressure. Then too, there were un-
scrupulous agitators who led the Africans to believe
that with independence the European land would be
distributed free. Graft and corruption have infil-
trated aspects of the program also.  

Much depends on
the future actions of the remaining Europeans. About
one-third have already left; there appears to be about
a second third who are determined to stay; the remain-
ing third is the unknown quantity. A mass exodus in
the future among the Europeans in the scheduled areas

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3 Hance, p. 401.

4 Lecture by Heyer, July 8, 1965.
will lead to a decline in production and export earnings in the years immediately ahead.

William Hance, in his book *The Geography of Modern Africa*, made several predictions concerning the European sector. It appeared likely to him that the big tea and sisal plantations would be kept intact because of their great importance to exports and in providing agricultural employment. He thought that pyrethrum production could be shifted to the small farms with relative ease. In his opinion the productive livestock activities depending upon exotic breeds and skilled management will be most severely affected. His prediction that coffee production, as much as possible, would be switched to the African farms is proceeding at the present time in Kenya at a rapid rate and is proving successful.\(^5\)

Another problem that has unexpectedly appeared is that of nutrition. In the area where cash crops are grown the indigenous African farmer is neglecting the dietary needs of his family, particularly the women and children. The African settler, especially among the Kikuyu tribe, is selling his crops and

\(^5\)Hance, p. 402.
accumulating a big bank balance instead of feeding his family adequately. The problem is not a lack of bulk but a lack of balance.6

As far as production on settlement schemes is concerned, an evaluation must wait until the settlers establish themselves. In 1964 most of them had not seen a full season of production on their new holdings. But as of that year it appeared that a few of the agricultural development schemes had passed the crucial test of providing incomes that were higher than those earned by the participants in their previous activities.

According to Mr. R. H. Clough who made an economic survey in four districts of land settlement in Western Kenya, "Land Settlement in Kenya will have a 'fair chance of success' if real efforts are made now to try to help settlers to increase their incomes." Another comment by Mr. Clough, "This is no mean achievement when the speed and size of settlement is considered and Kenya may be proud of being one of the few countries where land settlement has been even a moderate

6 Lecture by Heyer, June 8, 1965.
success from an economic point of view." Mr. Clough warned that unless something is done to help settlers to increase their incomes, a considerable proportion of them are going to fail to repay their loans. Fortunately there are a large number of settlers who have been able to make the income expected. Mr. Clouth made the specific recommendation that more care should be exercised in the selection of settlers, particularly with regard to their ability as farmers. Selection from among the landless and unemployed may be expected to involve the selection of the less successful members of the community. In his opinion, a more lasting contribution to the problem of unemployment would be provided by a prosperous, well-farmed settlement.7

There is cause for optimism in spite of the present and potential dangers. Prof. Clayton of the University of London says, "As a result of these policies, African agriculture is more soundly based than it has ever been. In effect, these reforms are leading to a commercialized agriculture which derives its impetus

from private enterprise and initiative." Overall cash incomes have increased in a few years by about \( \text{£} 4 \) million.

Tom Mboya, Kenya's Minister for Economic Planning and Development, attributes Kenya's 7.4% economic growth rate for 1964 to the earnings from agricultural produce. The achieved rate was 2% above the original aim, and the settlement schemes are mainly responsible for the increase in the national wealth. This progress was remarkable because it was attained despite the fluctuations in world prices which have so distressed the developing countries. Kenya, as a primary producing country, must maintain firm prices or planning will be ineffective. Kenya has looked to its quality coffee as its top dependable revenue earner, but there are good reasons for hoping tea will soon be in the same bracket. Mr. Mboya thought that this progress should confound those prophets of gloom who have belittled Kenya's efforts, especially land settlement, as undermining the national economy.9

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8 Clayton, p. 144.

9 East African Standard, July 12, p. 2.
Settlement began in Kenya as an essentially political and social exercise. Its contribution to political stability has been considerable at this point. The main efforts of the program have, however, been directed to the economic aspects, because it is in the interests of the settler and the country that maximum output from the land be achieved. It is important that the economic viability of settlement be kept firmly in mind or the inevitable result will be damaging to the economy, and very little actual political and social advantage will have been achieved.

It can be seen from the preceding discussion that it is impossible to predict with any sureness the outcome of the land settlement program. The opposing points of view can both present valid arguments to substantiate their observations. But there are encouraging signs that Kenya will be able to increase her agricultural viability. The Department of Settlement has been quick to learn from its experience and has already made the necessary changes where conditions allowed. The story of agricultural development of Kenya for the last ten years has been for the most part a success story.
A large number of Kenya farmers have awakened from their former slumbers to adopt, with zest, highly productive farming systems which not only increase their own cash incomes and standard of living significantly but, by the same token, increase the wealth of their country and so the opportunities for all round development.\textsuperscript{10}

\textsuperscript{10}Clayton, p. 21.
APPENDIX I

THE MAJOR CROPS OF EAST AFRICA

8. Groundnut
THE MAJOR CROPS OF EAST AFRICA (continued)


### Value of Major Agricultural Products Marketed

(Millions of £)

<table>
<thead>
<tr>
<th>Product</th>
<th>1956</th>
<th>1961</th>
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<tbody>
<tr>
<td>Wheat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td></td>
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<tr>
<td>Coffee</td>
<td></td>
<td></td>
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<tr>
<td>Tea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sisal</td>
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<td>Pyrethrum</td>
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<tr>
<td>Dairy Products</td>
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</tr>
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</table>

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