BASIC AGRICULTURAL RESOURCES OF

KENYA

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U.S. DEPARTMENT OF AGRICULTURE
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ABSTRACT

Since 1960, expansion of cash crops for export has been significant to Kenya's economic growth. Important agricultural exports include coffee, tea, pyrethrum, fruits and vegetables, meat and meat preparations, and sisal. Production of substantial quantities of corn, wheat, sorghum, millet, vegetables, other crops, and livestock products enables the country to be largely self-sufficient with respect to food. Major food imports include vegetable oils, sugar, tobacco, fruits and vegetables, cereals and cereal preparations, dairy products, and animal oils and fats. Agricultural imports from the United States include nonfat dry milk, corn, wheat, tobacco, tallow, and miscellaneous foods.

With external assistance, Kenya has instituted economic development plans and projects aimed at developing the agricultural and agribusiness sectors through introduction of improved seeds, product diversification, expansion of irrigation, and improvement of marketing facilities and infrastructure. During the past decade, the smallholder has made significant contributions toward increasing Kenya's agricultural production and furthering the African farm sector's transition from a subsistence to a market economy.

Keywords: Kenya, East African Community, agricultural production, agricultural trade, resettlement, smallholder, coffee, tea, pyrethrum, sisal, cotton, dairy products, livestock.

CURRENCY, WEIGHTS, AND MEASURES IN KENYA

Kenya shilling (KSH) = 14 U.S. cents
1 Kenya pound (K£) = U.S. $2.80
1 U.S. dollar = KSH 7.14
The Kenya pound is divided into 20 Kenya shillings.
The Kenya shilling is divided into 100 Kenya cents.

1 kilogram = 2.2046 pounds
1 metric ton = 2,204.6 pounds
The net weight of the Kenyan bale (cotton) is 400 pounds.
For coffee, 1 bag of 60 kilos = 132.3 pounds, 16.7 bags = 1 metric ton.

1 meter = 3.28084 feet
1 kilometer = 0.621371 mile
1 mile = 1.6093 kilometers
1 hectare = 2.4711 acres
1 acre = 0.4047 hectares
Unless otherwise specified, tonnages in this report are metric.

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GLOSSARY

The following terms either appear in this report or are likely to be encountered by persons doing further study of Kenya.

Africans—The indigenous population of Kenya. Does not include Indians, Pakistanis, white Europeans, or Arabs.

ALDEV—African Land Development Board.

Alienated Land—Land used by non-Africans.

Boma—A thorn-bush barrier erected about a village, camp, or animal pen, mainly for protection against wild animals.

East Africa—The nations of Kenya, Uganda, and Tanzania.

EARH—East African Railways and Harbours Administration.

Gross Domestic Product—Measurement of the value of the domestic gross production taking place in the country. No allowance in the measurement is made for balance-of-payment transactions.

Ghee—Clarified butter widely used by Asians in their diet.

IBRD—International Bank for Reconstruction and Development. Also called World Bank.

Invisibles—External transactions other than trade in commodities and movements of capital; for example, payment for services and tourism.

KANU—Kenya African National Union, Kenya's major political party.

Local Government Authorities—Local authorities, particularly in rural areas, developed from the traditional tribal or subtribal authority. They were known in the past as Native Authorities.

Miombo—Open-canopy type of woodland characteristic of the drier areas of 1,000 to 4,000 feet elevation.

Nonscheduled Areas—In the colonial period, land reserved for African settlement. Since independence, referred to as Small Farm Areas.

Paddy Rice—Rice in the husk.

Pombe—African beer.

Royal Commission (East Africa)—A commission appointed by Royal Warrant in the United Kingdom in 1953 ". . .to examine the measures necessary to be taken to achieve an improved standard of living. . ." in the East African countries of Kenya, Uganda, and Tanzania.

Scheduled Areas—In the colonial period, land alienated to exclusively European settlement. Largely coterminous with the "white Highlands." Since independence, referred to as Large Farm Areas.

Shamba—A small African farm.

Smallholders—Farmers, primarily African, of small landholdings producing subsistence and cash crops.

Swahili—The official language of East Africa. It is the habitual language of many Africans along the coast but is a second language, taught in primary schools, in the inland areas. English is the most prevalently used language in official publications, periodicals, newspapers, and so forth.

Wattle—Tree of the acacia family. Bark extract is used in tanning.

SUMMARY

Kenya is striving to accelerate its industrial development, but the country's economic fate for at least the next 10 years lies primarily in its agricultural and agribusiness sectors. Like many developing countries with a paucity of natural resources, Kenya must expand its production and exports of agricultural raw materials and processed goods to gain the capital needed for industrial development and economic growth. Thus, Kenya's 1970-74 Development Plan aims to improve farming and livestock-raising methods and management so as to expand production and bring about increased purchasing power in rural areas. This should spur further economic growth and lead to an increase in the local production of processed goods; consequently, utilization of agricultural raw materials would expand. The long-term goal is to achieve increased production of primary and processed agricultural products to permit (1) a rise in the level of exports, to new markets as well as old ones, and hence an increase in foreign exchange earnings; (2) an increase in per capita food supplies; (3) a rise in the level of living in rural areas; and (4) a reduction in agricultural imports.

Reducing agricultural and consumer goods imports is a goal of particularly high priority in the Kenyan Government. It wants to substitute these imports with capital goods needed to accelerate industrial and agribusiness development.

In addition to providing development capital, agriculture and agribusiness must also be relied on to provide employment during the 1970's. Over 75 percent of Kenya's 11.5 million people are engaged in crop farming or livestock raising, but Kenya's cities are annually receiving an influx of thousands of rural young men who lack urban skills. Because appropriate urban opportunities are not likely to grow fast enough to absorb them, the agricultural and agribusiness sectors will have to provide more jobs. The Government hopes to develop rural areas to provide nonagricultural employment opportunities also.

Kenya's efforts to increase agricultural production and thereby raise export earnings are aimed primarily toward African subsistence farms and, especially, African smallholder farms—rather than the remaining large European-owned operations that once dominated commercial agriculture in Kenya. During the past decade, Kenya has had marked success in bringing African farmers into the market economy as smallholder producers.

Although Kenya has developed an excellent research organization over the years, its efficiency is hampered by a shortage of qualified senior research personnel. Some of Kenya's research stations are closely linked to marketing or regulatory boards, through which the agricultural industry assumes a large measure of financial responsibility for the cost of research.

During the past decade, cash crop yields have exceeded anticipated levels through technological changes, research, and use of improved varieties. In particular, considerable success has been achieved in developing high-yielding varieties of corn, pyrethrum, coffee, and tea for production in Kenya. Tea yields are likely to further increase substantially as a result of recent research, particularly on vegetatively propagated materials.

A breakthrough in corn production was made in 1966 when local corn-breeding stations, aided by the Rockefeller Foundation and by U.S. Agency for International Development assistance programs, simultaneously developed high-yielding varietal hybrids and synthetic varieties of seed corn for areas not suitable for hybrids. This has resulted in a very rapid increase in acreage planted with improved seed, especially in the smallholder sector.

Pyrethrum research in the next few years will emphasize raising pyrethrum productivity by using varieties with a higher pyrethrins content. Research and extension programs are being designed to identify and introduce to smallholders varieties with this quality.

All replacement coffee trees are from seed of selected high-yielding varieties grown in special seed gardens organized and maintained by the Ministry of Agriculture. Regional nurseries supply African smallholders with seedlings, while the coffee plantations maintain their own nurseries.

The trend of African smallholders increasing their share of total production—primarily of tea, coffee, pyrethrum, corn, and dairy and livestock products—is expected to intensify during the 1970's and to continue to be significant to Kenya's future agricultural development. It had its beginnings in one of the most ambitious land resettlement programs in Africa. Beginning in the early 1960's, it resulted in some 1.2 million acres changing hands, with 35,000 African farmers settled on land that had been farmed by 930 Europeans. The greatest shift took place on mixed farmland in the central Highlands.

There is little doubt that expansion of short-term agricultural credit availability and education of these smallholders in the proper use of credit would make a significant contribution to further agricultural development in Kenya. However, there remains a problem that expanded credit alone cannot solve. Although African smallholders need farming equipment, and credit to purchase it, the additional equipment they could use economically is somewhat limited. As is usual in underdeveloped countries, the ability to make effective use of capital is limited by the farmers' lack of technical knowledge and skills.

Expansion of tropical and temperate cash crops for export—from large commercial farms and smallholdings—has been of major importance in Kenya's economic growth. In 1970, Kenya's agricultural exports were valued at $162 million—56 percent of the value of total exports—compared with $103 million in 1960. Coffee and tea occupy dominant positions in the country's trade and economy. Kenya also produces and exports pyrethrum, pineapple, sisal, and cashew nuts. Sisal was the third most important export crop in 1960 but had dropped to sixth place by 1970 because of competition from synthetic fibers. Kenya's exports of pyrethrum extract nearly doubled during 1960-70. A revitalized demand has developed for pyrethrum as a result of the growing restrictions on use of synthetic insecticides in many industrial countries because of their pollutant effects and the relatively safe use of pyrethrum. Half of the world supply of pyrethrum comes from Kenya.

Uganda, the United Kingdom, and Tanzania are the major customers for Kenya's farm products. The United States—in fourth place in 1970—received farm commodities valued at about $21 million, or 13 percent of Kenya's total agricultural exports for the year. Coffee, tea, and pyrethrum extract are the chief products exported to the United States. Kenya ships approximately 15 percent of its coffee and 12 percent of its tea to the United States annually. U.S. purchases of 9,900 tons of coffee from Kenya in 1970 were valued at $10.7 million. Tea shipped to the United States was valued at $3.5 million. The United States is Kenya's major customer for pyrethrum extract, importing 199,000 pounds of extract valued at $1.8 million in 1970.

A pronounced change in the composition of Kenya's exports has occurred during the past decade. In 1960, nonagricultural exports represented only 25 percent of the value of total exports; by 1970, their share had increased to 44 percent. This indicates substantial diversification and growth of the agribusiness and manufacturing sectors of Kenya's economy over the decade. Kenya's total export earnings increased about 9 percent each year—from $150 million in 1960 to $289 million by 1970.

Kenya's agricultural imports in 1970 were valued at about $38 million. Fats and oils, sugar, unmanufactured tobacco, and fruits and vegetables accounted for approximately half of the total value. The United States supplied $2.1 million, or 5 percent of Kenya's total agricultural imports. U.S. shipments consisted primarily of corn, nonfat dry milk, tobacco, and tallow. The major supplier of agricultural products to Kenya is the United Kingdom.

Agricultural imports from the United States probably could be increased substantially in the near future. The major imported commodities from the United States have consistently been manufactured goods, machinery and transportation equipment, fuels and lubricants, and chemicals. However, the outlook for continued growth of U.S. shipments to Kenya is promising for both agricultural and nonagricultural goods. The broadening of Kenya's productive base and the gradually rising level of consumer purchasing power are creating a growing market. American products have a favorable reputation for quality in Kenya, and a wide range of consumer items have received good acceptance.

Kenya's foreign exchange earnings from tourism were about $52 million in 1970, or 18 percent of total foreign exchange earnings. As air transportation services to East Africa improve and new generation giant jet aircraft are introduced to the region, Kenya should begin to realize more and more of its vast tourism potential. Tourism has been a major factor in alleviating balance of payments difficulties caused by Kenya's heavy imports. The bright prospects for tourism seem to indicate that this industry will continue to be a major source of foreign exchange during the next decade. Further investment in tourism will also be one of the most efficient ways for Kenya to expand employment and national income.

BASIC AGRICULTURAL RESOURCES OF KENYA

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HISTORICAL BACKGROUND

Foreign Economic and Political Influence

Kenya, on the east coast of Africa, traces its foreign influence back to the days of the ancient Greek mariners. After the Greeks, Arabian and Persian trading caravans came by land and by sea, and to this day, Arab communities exist in Nairobi and Mombasa. Following Vasco da Gama's landing at what is now Malindi, Kenya, in 1498 on his way to India, the Portuguese succeeded in establishing control over the East African coastline and its trade. At the beginning of the 18th century, the Portuguese were removed by the Omani Arabs, who assumed control of the coastal area. During the 18th century and on into the 19th, numerous conflicts among local tribal rulers were resolved only when the Arab Sultan of Zanzibar enforced his authority over the Kenya coastal area and claimed a loose and ephemeral sovereignty over the hinterland, which had by this time been penetrated in the search for ivory and slaves.

During the 19th century, Europeans extended their influence in East Africa. Native chiefs granted concessions beyond the coastal area to various private interests—missionaries, explorers, and commercial enterprises. Their separate activities were quickly brought within the framework of the various European countries' national "spheres of interest" during the latter part of the 19th century and the early 20th century.

Seeing competition intensify among rival Europeans in East Africa, the United Kingdom, Germany, and Italy reached a series of agreements to define their claims. Britain's sphere of influence extended over what is now Kenya. The British Government took over the rights and obligations of the Imperial British East Africa Company, which had been operating in the area, and declared Kenya a Protectorate in 1895.

British interests at this time had expanded primarily because of the access Kenya provided for missionaries and traders to Uganda. When construction of a railway from Mombasa to Lake Victoria was started in 1896, British interests were further stimulated. (The railway required skilled and unskilled foreign labor, mostly from what is now India and Pakistan, and many of the workers remained after completing construction of the railway.)

With the completion of the railway, Britain came to appreciate Kenya's potential for agricultural development in the Highlands, an area offering substantial room for agricultural settlements or livestock farms. Adopting a policy to encourage European settlement, Britain in the early 1900's opened up about 16,000 square miles of the Highlands area for Europeans. At the same time, 52,000 square miles of good agricultural land was reserved for African farmers in the Highlands area. The legal measure which formed the basis of this early land policy was the Crown Land Ordinance of 1902. The act established the conditions under which land might be transferred to European settlers in fee simple title and prescribed the specific areas that would be tribal lands or land for European settlement.

When Kenya came under the jurisdiction of the British Colonial Office in 1905, the African population consisted of nomadic pastoral tribes and agricultural tribes. The Turkana, Samburu, and other seminomadic, predominantly livestock-owning tribes in the large arid zones in the vast Northern Territory lived off their animals and roamed the sweeping savannahs from north of Marsabit to

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Mombasa. The Masai, also a seminomadic livestock-owning tribe, inhabited the large, arid area in the southern and southeastern areas of Kenya and adjacent areas in Tanzania. The agricultural tribes, or subsistence farmers, lived mainly in the forested uplands, cultivating tiny patches of sorghum and millet, sweetpotatoes, beans, and bananas, and pasturing animals on their burned-over forest clearings. For the nomadic livestock tribes, and some of the African farmers, wealth meant owning large numbers of cattle, sheep, and goats. Members of farming tribes which did not own livestock might buy or barter cattle for a bride's price or other needs from nomadic tribes or from farming tribes that owned cattle.

During the early 1900's, the African population did not increase significantly, primarily because of heated intertribal warfare, pestilence, drought, famine, and diseases.[1] Here and there were densely populated towns, but Kenya's hinterland had the appearance of a sparsely inhabited country. From this setting grew the impression that much of the land—including most of the potentially rich Highlands area—belonged to nobody. The Kikuyu, the largest tribe, had control over some land in the Highlands but had earlier abandoned substantial parts of the area.

Settlement of the Highlands proceeded slowly and on a small scale. By 1953, there were only about 3,000 European farms, with a population of approximately 10,000, on about 10,000 square miles. Although a substantial percentage of the land is agriculturally desirable, being suitable for plantation crops, corn production, and cattle ranching, a large amount of it has not been farmed to this day, and on most farms there is still a substantial amount of unimproved land.

The British colonization period, spanning more than 75 years up to 1963, was characterized by economic development based on an estate-type agricultural economy. Emphasis was on cash crop production for overseas markets. Colonists built railways and encouraged clustered villages and development along them. They also developed to some extent an agricultural research and development program and compiled valuable data on land use, geography, soils, hydrology, and livestock farming. Europeans introduced most of the major cash crops now grown in Kenya—coffee, tea, sisal, and pyrethrum—and experimented with many others. They also introduced commercial livestock production. Although cash crops were grown primarily on land farmed by non-Africans, the colonists encouraged the Africans to also produce such crops, with a view toward the export trade. Under British direction, economic progress was steady. World War II brought about urgent demand for Kenya's sisal, coffee, and tea, as well as foodstuffs. The tempo of economic life in Kenya accelerated.

Then from October 1952 to December 1956, the Mau Mau insurrection held sway, keeping Kenya in a state of emergency. The rebellion was stifled, but the underlying idea of independence from Britain intensified, culminating in full recognition and elevation of Kenya to the status of a member of the British Commonwealth when independence was given on December 12, 1963.

The Mau Mau movement also had far-reaching implications for the agricultural development of Kenya. Of the contributing causes of the Mau Mau revolt, the following are the most pertinent: (1) The unequal spatial distribution of physical resources in the country; (2) the cultural frustrations of the African tribes; and (3) the everwidening impact of the European "occupation" in the Highlands. The Mau Mau movement's specific goals were to push forward a restructuring of the existing pattern of land use and settlement, consolidation of fragmented plots of African farms, African ownership of land with a title, introduction of agricultural development schemes, and formulation of 5-year development plans. Pursuit of these goals was the underlying force which ultimately set the stage for an independent Kenya.

Kenya After Independence

After its May 1963 elections victory, the majority political party—the Kenya African National Union (KANU)—formed a new government headed by Jomo Kenyatta, and Kenya began full self-government. Several months later, KANU made certain modifications in the constitution which strengthened the central Government's powers over the police and the civil service. Thus modified, the document became the constitution for Kenya after it achieved independence. The constitution estab-

[1] For example, human sleeping sickness. Andrew Kamarck, reporting on its toll, writes that: "Stanley, on his pathblazing march across the continent in 1887-88, brought with him human sleeping sickness from east to west. This, transmitted by the tsetse fly, killed about 250,000 people around the shores of Lake Victoria in 1900-1905. In order to stop the epidemic, the lake shore had to be abandoned. One area in particular [Bunyoro District], known because of its fertility as the paradise of Uganda, was abandoned to the tsetse fly and is still deserted: it has not been possible to reclaim it successfully from the fly and repopulate it." Andrew M. Kamarck, The Economics of African Development, Praeger Publishers, New York, 1971, p. 14.

lished a quasi-federal system under which regional and local governments had considerable powers. This allowance of local governmental powers reflected the small tribes' fears of domination by the Kikuyu and Luo, Kenya's two largest tribes.

Independent Kenya has a dual agricultural economy, consisting of African subsistence and smallholder farms, and European commercial farms. This economy, and the substantial changes that it has undergone since 1960, will be treated following background sections on Kenya's geography and population.

GEOGRAPHY

Land

Kenya straddles the Equator on the east coast of Africa (fig. 1). It is flanked on the north by Ethiopia and Sudan, on the south by Tanzania, on the west by Uganda and Lake Victoria, and on the east by the Somali Republic and the Indian Ocean. Its total area is 225,000 square miles, including over 5,000 square miles of water. A little over four-fifths the size of Texas, Kenya has a population of 11.5 million, equivalent to that of Texas. The entire national economic production, both agricultural and industrial, is centered in the southern two-fifths of the country, which also has about 85 percent of the population.

Kenya is a land of striking geographical and climatic diversity. It has uninhabitable volcanic desert, forests, fertile valleys, and typical farmland. Less than a quarter of the country is actually or potentially productive agriculturally. More than three-fourths of the land, primarily the northern area of over 100,000 square miles, is desert or semidesert.

The great Rift Valley, one of the world's more remarkable geographical phenomena, is a long, jagged escarpment running north and south through the middle of the Highlands into Ethiopia and ending in the Jordan River Valley in Jordan. Varying in width from about 30 to 80 miles, its floor ranges in altitude from 1,500 feet in the Lake Rudolf area to over 7,000 feet at Lake Naivasha, farther south, and drops off to 2,000 feet near the Tanzanian border. The Aberdare Range, which runs parallel to the trough of the Rift Valley, forms its eastern border; the Mau Escarpment, rising to approximately 10,000 feet, bounds it on the west. East of the Rift Valley, on the fringes of the Abedare Range, soars Mount Kenya, 17,058 feet high and Africa's highest mountain after Mount Kilimanjaro.

The varied and involved topography of the Highlands, ranging from elevated plain or forest to valley or mountain, results in a wide variety of climatic, ecological, and settlement patterns, with marked changes occurring in relatively short distances. The Highlands area contains much of Kenya's most productive soils, some of its most densely populated districts, and the major agricultural area. Rainfall there is usually reliable and adequate, and temperature ranges are conducive to culture of coffee and tea. The tsetse fly, infesting the coastal area and low-lying areas surrounding the Highlands, is generally absent at higher elevations.

Approximately two-thirds of Kenya consists of flat to undulating rolling plains and plateaus. The arid, low-lying plains along the coast and the eastern border with the Somali Republic rise gradually to high, sweeping plateaus and savannahs toward the west and north (fig. 1). In parts of the north and in the eastern part of the southern border with Tanzania are scattered groups of rounded to flat-topped hills.

The streams flowing into the Indian Ocean are mostly perennial but are shallow, sluggish, and meandering, with low, sandy banks. The only large rivers are the Tana and the Galana (called the Athi in its upper course), both originating in the Highlands far to the west. The Tana provides possibilities for irrigation. On the extensive dry plains and plateaus of the north and the northeast, there are widely spaced rivers and intermittent streams. Dry most of the year, the streams can become torrents for a few hours following infrequent but heavy rains. In the southwest, numerous short, swift, perennial streams flow into Lake Victoria. They drain down from hills and mountains and plains in narrow valleys or gorges, and rapids and waterfalls are common, the most striking waterfall being Thomson's Falls at the edge of the Rift Valley Escarpment.

Climate

Since Kenya straddles the Equator, differences of climate are caused mainly by variations in altitude. Seasonal changes in temperatures in Kenya are only slight, much less than changes from day to night. (Table 1 shows monthly and annual average temperatures.) The mean temperature along the coast (for example, the Mombasa and Malindi areas) is over

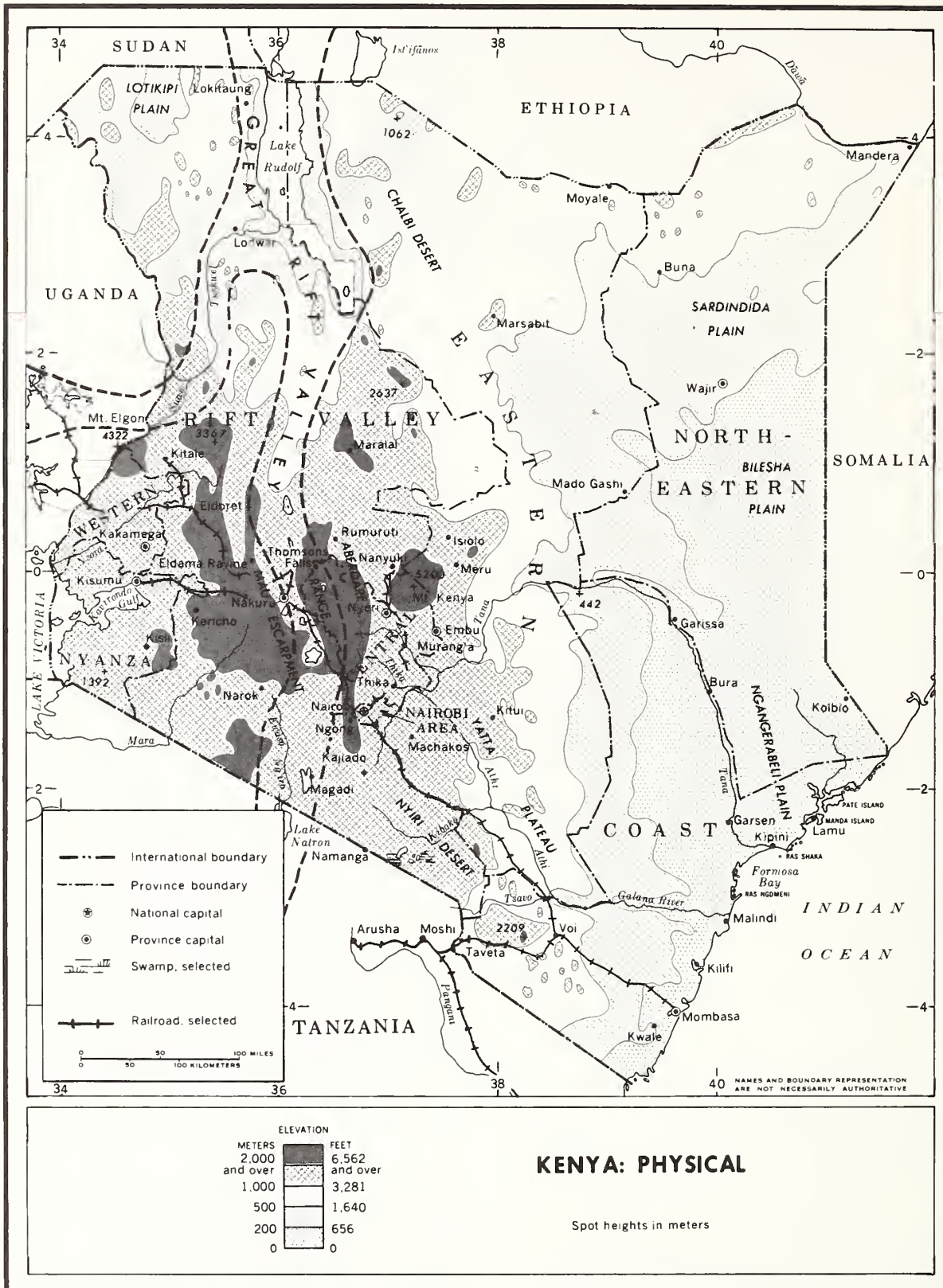

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Figure 1

Table 1—Monthly and annual average temperatures at selected stations, Kenya

Station	Years of record	Elevation	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
		Feet	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*	*Degrees Fahrenheit*
Eldoret	8	7,050	62.9	64.1	64.5	64.6	63.1	61.1	60.1	60.1	60.9	62.7	63.1	62.3	62.5
Garissa	23	600	83.9	85.5	87.1	86.4	84.3	81.3	79.8	80.4	81.8	84.1	84.7	83.7	83.6
Kericho	50	6,500	66.3	66.1	65.1	64.5	62.8	62.7	62.1	62.2	63.9	63.5	64.5	64.2	63.9
Kisumu	52	3,759	75.1	76.1	75.5	74.6	72.9	71.9	71.3	71.1	73.5	75.4	75.0	75.0	73.9
Kitale	21	6,200	66.9	67.8	67.9	68.1	65.7	64.3	63.1	63.1	64.1	65.3	65.3	65.5	65.6
Malindi	59	10	80.2	80.9	82.6	82.3	79.3	77.9	76.3	76.9	77.5	78.9	80.4	80.7	79.5
Mombasa	64	53	82.1	83.3	83.9	82.3	79.2	77.8	76.5	76.5	77.4	79.3	81.3	81.9	80.1
Nairobi	29	5,450	68.4	70.1	70.1	69.2	67.3	64.7	62.9	63.7	66.3	68.3	68.1	67.6	67.2
Nakuru	46	6,024	65.3	66.9	67.1	66.3	65.5	64.1	62.9	62.7	63.3	63.7	63.8	64.1	64.6
Nanyuki	15	6,389	61.5	62.5	63.2	62.9	62.1	61.3	59.9	59.9	60.9	61.1	60.9	60.3	61.4
Thika	25	4,900	66.7	68.3	69.8	69.7	68.3	65.5	62.8	64.2	66.6	69.1	68.4	66.9	67.2

Source: Annual Report, Great Britain East Africa High Commission, Meterological Department, Nairobi, 1969.

80°F., and the weather is hot and humid throughout most of the year. At about 6,500 feet, the mean temperature is about 55°F.; weather at higher altitudes is even cooler throughout the year.

In most of Kenya, precipitation is low (fig. 2) and unreliable from year to year in annual amount as well as in seasonal distribution. Except along the coast, the only areas with rainfall adequate for commercial agriculture are in the Highlands (Central and Rift Valley Provinces) and around Lake Victoria. In some mountainous areas, particularly around Mount Kenya, precipitation is over 80 inches a year. Much of the north and northeast receives less than 10 inches.

Over the greater part of the country, the rain falls in distinct seasons, which may vary considerably by regions. At Mombasa, on the coast, where rainfall averages 48 inches, over half of it occurs between April and July. In most of the eastern two-thirds of the country, including the area around the Aberdare Range and Mount Kenya, there are two rainy seasons—from March to May (the long rains) and from October to December (short rains). Failure of the long rains to materialize is especially critical and was a major factor in Kenya's two most recent droughts. Farther west in the Highlands, there is a single rainy season, from March to September. Around Lake Victoria, there is a large area with rainfall of 50 inches or more fairly evenly distributed throughout the year.

Agriculturally, Kenya can be divided into two zones, one above 4,000 feet and the other below that. Two-thirds of the country lies in the lower elevations. In these semiarid pastoral areas, where rainfall averages 10 to 25 inches a year, are four-fifths of the cattle. Above 4,000 feet, the rainfall increases from 25 inches up to 70 and 80 inches in some areas. This higher zone has generally good soils, a good climate, and four-fifths of the population. It contains the commercial farms that produce most of the cash export crops, wheat and corn, and commercial dairy products.

Soils

Kenya's soils form a mosaic of many types, depending on climate, topography, parent material, vegetation, and effects of weathering over time. Soil types range from Lateritic, among the most productive soils of the country, to Lithosols and Desert soils, which have no agricultural value in Kenya except for some grazing. Lateritic soils are widespread in Kenya and could produce good crop yields with the application of lime and phosphorus. Reddish-Brown Lateritic soils, which are very productive, occur on level and undulating areas of the Highlands. They are deep, well-drained soils of medium acidity and are friable, with good moisture-holding capacity. They are fairly well supplied with most plant nutrients except phosphorus and produce a wide variety of crops. Associated with Reddish-Brown Lateritic soils are some Red Latosols, which are more leached and have a lower supply of plant nutrients. Because crop yields on Red Latosols are relatively low, extensive areas where they occur are left in savannah grasses for grazing.

Latosols with laterite, Noncalcic Brown soils, and silty Regosols occur in the southwestern Highlands and also near the coast. Much of this land is used for grazing, particularly the areas with Regosols.

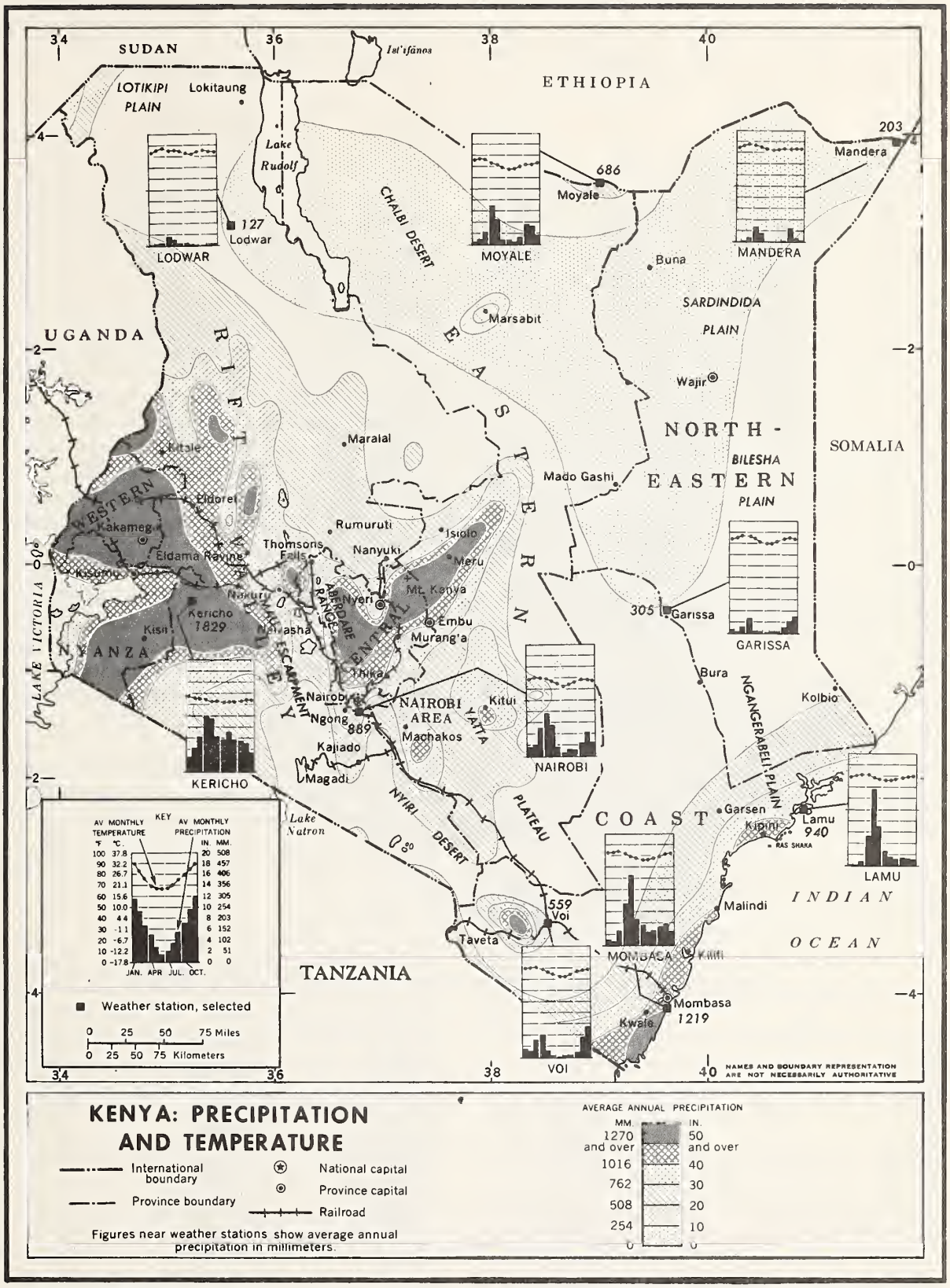
Grumusols are located primarily along parts of the Sudan border and in parts of the central section of Rift Valley Province. These soils are dark gray to nearly black clay loams having clayey, generally calcareous subsoils. They are difficult to work because they are sticky when wet and hard when dry. Grumusols on low-lying flat areas generally require drainage for successful crop production.

Reddish-Brown soils occur primarily in eastern Kenya and along the Tanzanian border. In southern Kenya, these soils are essentially dark red sandy loams. Toward the northeast, they become dark reddish-brown. Reddish-Brown soils support some dryland crops but are used mainly for grazing.

Alluvial and associated soils occur throughout Kenya in low-lying areas along the rivers. The largest areas are along the Tana and the Turkwel Rivers. Where moisture is adequate, these soils comprise some of the best cropland in the country. West of the Rift Valley, they are slightly acid and are loamy, and some places need drainage for crop production. East of the Rift Valley, they are mildly alkaline and loamy.

Red Desert soils of central and northern Kenya are dark reddish-brown sandy loams with a compact, calcareous sandy loam subsoil. Red Desert soils are unsuited for agriculture, primarily because they lack moisture, although they do provide some sparse grazing. Associated with Red Desert soils, especially in the northwest, are Lithosols (shallow, stony soils). Lithosols not in association with Red Desert soils cover a large percentage of northern Kenya. Many of the flat to undulating areas of Lithosols are also strewn with large volcanic boulders. Elsewhere, the areas of Lithosols are steep and barren.

Ando soils and Alpine Meadow soils occur on the ash-mantled mountains of southwestern Kenya and on their lower slopes. Ando soils are high in organic



KENYA: PRECIPITATION AND TEMPERATURE

International boundary
Province boundary
National capital
Province capital
Railroad

Figures near weather stations show average annual precipitation in millimeters.

AVERAGE ANNUAL PRECIPITATION

MM.	IN.
1270 and over	50 and over
1016	40
762	30
508	20
254	10
0	0

U.S. DEPARTMENT OF AGRICULTURE

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Figure 2

matter and are very permeable to roots and water. Because of the steep slope of the land where they occur, however, these soils are principally in forest reserves. Alpine Meadow soils, which occupy the highest elevations, have a dark peaty surface and a thin subsoil; rock outcroppings are numerous. Alpine Meadow soils have a patchy grass cover of little agricultural value.

THE PEOPLE

Kenya's population was an estimated 10.9 million in 1969 and is growing at a rapid 3.3 percent a year. Non-Africans represent approximately 2 percent of the total. This group consists primarily of Europeans, who numbered 40,593 (0.4 percent) in 1969; Asians, 139,037 (1.3 percent); and Arabs, 27,886 (0.2 percent).[2] A significant characteristic of Kenya's demographic makeup is that 50 percent of the population are under 16 years of age. There are about 49 people per square mile (app. table 1). Over 75 percent of the total population is dependent on agriculture. The rural population in Kenya has declined since 1960 because of accelerating migration from farm to city.

The great majority of Africans are farmers; most do some cash cropping in addition to subsistence farming. Asians are engaged mainly in marketing, distribution, and transportation. Most Europeans are in farming, business, the professions, and public services.

The principal tribes are Kikuyu (20 percent of Kenya's total population), Luo (14 percent), Luhya (13 percent), Kamba (11 percent), Kisii (6 percent), and Meru (5 percent) (table 2).

In 1960, about 45 percent of wage and salary earners were employed in the agricultural sector; in 1965, 35 percent; and in 1970, 29 percent—a decline of about one-third during the decade. The number of persons employed in nonagricultural occupations increased by about 36 percent from 1960 to 1970. The number employed in the public services sector increased nearly 54 percent, and the number in services, 67 percent. Manufacturing also showed substantial gains (17 percent) (table 3).

Kenya has a number of social problems with long-range economic implications, including unemployment, rapid population growth, housing shortages in urban areas, and the flight of people from rural areas to cities. Since independence, yearly capital expenditures on residential buildings, primarily in urban areas, have increased from $118,000 to $287,700 (1970), but housing remains a problem (app. table 2). The unemployment situation became so acute in 1970 that the Government negotiated a 1-year agreement with the Federation of Kenya Employers and the Central Organization of Trade Unions under which the Government and the employers increased their staffs by 10 percent while the unions made no new wage demands. But of the 230,000 people who registered for employment under the program, only 36,200 entered jobs.

During 1960-70, the number of towns with populations above 2,000 increased from 34 to 40. The urban population in 1969 was approximately 1.1 million, or 10 percent of the total.[3] The African urban population has increased substantially during the past 10

[2]Kenya Population Census, 1969, vol. 1. Statistics Division, Kenya Ministry of Finance and Economic Planning, Nairobi, Nov. 1970.

[3]Ibid.

Table 2—Sex and percentage distribution of Kenya's population by major tribe, 1969

Tribe	Male	Female	Total	Percent
Kikuyu	1,091,413	1,110,219	2,201,632	20.1
Luo	763,080	758,515	1,521,595	13.9
Luhya	723,071	730,231	1,453,302	13.3
Kamba	592,889	604,823	1,197,712	10.9
Kisii	356,730	344,949	701,679	6.4
Meru	276,325	277,931	554,256	5.1
Mijikenda	255,508	265,012	520,520	4.8
Kipsigis	237,578	233,881	471,459	4.3
Nandi	131,001	130,968	261,969	2.4
Turkana	107,249	95,928	203,177	1.9
Other tribes	838,086	805,828	1,643,914	15.0
Population Non-African	109,451	102,039	211,490	1.9
Total	5,482,381	5,460,324	10,942,705	100.0

Source: Kenya Population Census, 1969, Vol. 1. Statistics Division, Ministry of Finance and Economic Planning, Nairobi, 1970.

Table 3—Kenya's labor force by sector, 1960, 1965, and 1970[1]

Sector	1960		1965		1970	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Agriculture and forestry	271,800	44.5	202,400	34.9	183,700	28.5
Mining	5,000	0.8	2,300	0.4	2,900	0.4
Manufacturing	52,300	8.6	52,100	9.0	61,300	9.5
Construction	21,100	3.5	8,700	1.5	17,000	2.6
Transportation and communications	14,800	2.4	12,000	2.1	16,500	2.6
Commerce	39,100	6.4	46,500	8.0	39,800	6.2
Services	45,200	7.4	67,400	11.6	75,300	11.7
Public services[2]	161,400	26.4	188,200	32.5	248,000	38.5
Total	610,700	100.0	579,600	100.0	644,500	100.0

[1] Data are for wage and salary earners. [2] Includes workers in the Kenya Government, parastatal bodies, local government, EAC General Fund Services, railways and harbors, post and telecommunications, East African Airlines Corporation, and cargo and handling services.

Source: Economic Survey, 1971, Kenya Ministry of Finance and Economic Planning, Nairobi.

years. The four largest cities are Nairobi, 510,000 in 1969; Mombasa, 247,000; Nakuru, 47,000; and Kisumu, 33,000. Because of rapid population growth, these cities have required increases in personnel involved in administrative, social, and commercial services. A substantial part of future urban growth will probably come from an increase in the number of women and children in the towns as the African urban population becomes more and more permanent. For several years, there has been an influx of rural young men, many with a primary education but little in the way of urban skills. Stopgap measures are being used to absorb some of these unemployed, and long-range plans have been made to employ others. However, urban (or nonagricultural) employment opportunities are not likely to grow fast enough to absorb the increasing numbers of rural migrants.

Approximately 15,000 Europeans are employed in the professions or in business management positions in Kenya. Even the displacement of these people by Africans would take up only a small proportion of the thousands who are entering the job market each year. Therefore, it is the agricultural sector (and agribusiness) which must largely be relied on to provide jobs and reduce underemployment. Further, an increase in the number of trained farmers and farmworkers is essential to obtaining higher agricultural output and improvement in the quality of agricultural products.

EDUCATION

Kenya is increasingly emphasizing education, particularly at primary and secondary schools, teacher-training colleges, and technical schools. The 1970-74 Development Plan gives priority to expanding the number of schools at these four levels. From 1960 to 1970, particular emphasis was placed on expanding secondary schools; their number increased from 91 in 1960 to 850 in 1970 (table 4). The number of trained teachers in secondary schools has also increased dramatically—from 1,866 in 1965 to 33,945 in 1970 (app. table 3). The number of vocational trade schools in Kenya has declined; there were 18 in 1960, 21 in 1961, and 10 in 1970.

The literacy rate in Kenya is low—approximately 20 to 25 percent—but the number of children who receive some education has increased substantially in recent years. In 1960, about 800,000 children attended primary and secondary schools. By 1970, the number was over 1.5 million, up nearly 88 percent (table 5).

About 975 students were enrolled at the University of Nairobi in 1970, and 2,000 students at Kenya Polytechnic College, Nairobi. About 1,500 Kenyan students were enrolled at Makerere College in Kampala, Uganda.

About 500 students are enrolled in Egerton College, near Nakuru, Kenya. The college offers 3-year courses leading to diplomas in agriculture, animal husbandry, agricultural engineering, and range management, and 2-year diploma courses in dairy technology. In addition, a number of short courses are given, usually in connection with

Table 4—Primary, secondary, teacher-training, and trade schools in Kenya, 1960-70

Year	Primary[1]	Secondary[2]	Teacher-training	Trade	Total
	Number	*Number*	*Number*	*Number*	*Number*
1960	5,206	91	46	18	5,361
1961	5,725	105	45	21	5,896
1962	6,198	142	41	9	6,390
1963	6,058	151	37	7	6,253
1964	5,150	222	35	8	5,415
1965	5,078	336	33	8	5,455
1966	5,699	400	33	8	6,140
1967	5,959	542	[3]28	7	6,536
1968	6,135	601	28	11	6,775
1969	6,111	694	27	10	6,842
1970	6,116	850	27	10	7,003

[1] Beginning in 1963, primary and intermediate schools were amalgamated into full primary schools. [2] Secondary technical schools are included from 1964 onward. [3] The drop in number of schools is due to amalgamation of several schools.

Source: Statistical Abstract, Kenya Ministry of Economic Planning and Development, Nairobi, 1960-70.

Table 5—Students enrolled by type of school, Kenya, 1960-70

Year	Primary	Secondary[1]	Teacher-training	Trade	Total
	Number	*Number*	*Number*	*Number*	*Number*
1960	781,295	20,139	4,089	1,712	807,235
1961	870,448	22,167	3,897	2,094	898,606
1962	935,766	26,586	3,927	1,443	967,722
1963	891,553	30,120	4,119	1,202	926,994
1964	1,010,889	35,921	4,849	1,043	1,052,702
1965	1,014,719	47,976	5,355	1,247	1,069,297
1966	1,043,416	63,193	5,474	1,349	1,113,432
1967	1,133,179	88,779	5,904	1,479	1,229,341
1968	1,209,680	101,361	6,634	2,036	1,319,711
1969	1,282,297	115,246	7,194	2,344	1,407,081
1970	1,427,589	126,855	8,107	2,426	1,564,977

[1] Secondary technical schools are included from 1964.

Source: Statistical Abstract, Kenya Ministry of Economic Planning and Development, Nairobi, 1960-71.

inservice training programs for Government agricultural staff, who attend mostly in vacation periods. In recent years, the college has expanded very rapidly. During the 1970-74 Plan period, the capacity of the college will be increased to about 560 students, but major emphasis will be given to improving the facilities and the quality of teaching. Over the 5-year period, it is expected that about $1 million in Kenya Government development funds will be required for capital improvements at Egerton College.

The Animal Health and Industry Training Institute (AHITI) at Kabete trains Animal Health Assistants and staff for the Government's artificial insemination program. The present enrollment of 250 students at AHITI has placed considerable strain on the facilities available. Furthermore, to meet projected needs for staff trained in animal husbandry, enrollment at AHITI will be increased to 310 students during the Plan period. To provide for this increased number of students, extra teaching and residential facilities are being constructed at Kabete. In addition, a new unit of the institute is being constructed at the Livestock Improvement and Farmers' Training Center at Ngong. This unit will enable 30 students from AHITI to be resident at Ngong in rotation for a period of 3 months. These improvements will require the expenditure of about $280,000 of Kenya Government development funds over the Plan period.

The Embu Institute of Agriculture offers 1- and 2-year courses leading to a certificate in agriculture. The shorter courses are designed for upgrading

experienced junior staff of the Ministry of Agriculture. The institute can accomodate about 150 students and is designed to graduate a maximum of 70 students each year.

Lower level agricultural education is provided at a number of different centers, especially at Kenya's 29 Farmers' Training Centers, located in the major agricultural districts. These centers are an important part of the Government's programs aimed at teaching better farming methods to large numbers of farmers. During the Plan period, existing Farmers' Training Centers will be improved, and five new centers will be established in Taita, Baringo, Busia, Bungoma, and Kwale Districts. Two of the centers, Embu and Matuga, will be converted into the first District Development Centers. At these two centers, the scope of instruction will be broadened considerably to include not only conventional agricultural subjects but also a wide range of other courses. This will be a pilot project; if it is successful, other Farmers' Training Centers will be modeled along similar lines.

With the breakup of many large-scale farms and transfer of these lands into African smallholder ownership, smallholders in low-density schemes obtained as much as 40 acres. Thus, a need arose to establish a training program for these larger scale farmers. For this reason, a Large-Scale Farmers' Training Center has been established at Thomson's Falls, catering to about 100 students a year. This capacity is not sufficient to meet the requirements for this type of training, and an additional center will be established at Eldoret during the Plan period.

In addition to the major programs outlined above, several other agricultural training schemes will be expanded or implemented during the Plan period. These efforts include expanding the capacity of the Dairy Training School at Naivasha, establishing a sheep institute, and establishing Range Training Centers at Wajir and Narok. Training in farm mechanization will be continued at the Narosurra Mechanization Scheme.

In addition, increased emphasis will be given to agricultural training in secondary schools. In particular, under a program receiving financial assistance from the International Development Association of the World Bank, 75 agricultural workshops will be established in secondary schools throughout the country. The workshop and other agricultural courses in these schools are not designed to produce students who are qualified to pursue agricultural occupations. Rather, they are intended to teach the students to appreciate better the importance of agriculture to Kenya and to encourage more students to look to agriculture for their future occupations.

EVOLUTION OF LAND AND AGRICULTURAL POLICY

Land Use

The primary determinants of land use in Kenya are altitude, soil, and rainfall. Rainfall at altitudes below 4,000 feet is usually insufficient for highly productive agriculture. Generally, land with rainfall above 35 inches a year is classified as high potential; medium-potential land receives 25 to 35 inches; and low-potential land, less than 25 inches. Within these categories, land potential can be modified by soil type, drainage, and quality, and reliability of rainfall.

Approximately 50 percent of Kenya's total land area is barren steppe or desertland with sparse and poorly distributed rainfall and thin soil. Only about 13 percent of the land area can be considered as agricultural land, and less than half of that is cropland (table 6). By comparison, about half of the land in the continental United States is in farms, and about a fourth of this farmland is cropped. In 1970, the area cropped in Kenya was less than 10 million acres. Approximately 7 percent of the agricultural land area

Table 6—Land Use in Kenya, 1970

Use	Area	Percentage of total
	Million acres	*Percent*
Agricultural land:		
Cropland[1]	8.6	6.0
Permanent unwooded grassland	9.7	6.7
Total agricultural land	18.3	12.7
Nonagricultural land:		
Forest reserves	4.6	3.2
Game reserves	11.6	8.1
Other land	109.5	76.0
Total nonagricultural land	125.7	87.3
Total land area	144.0	100.0

[1] Includes land in field and tree crops, temporary meadows, and fallow.

Source: Statistical Abstract, Kenya Ministry of Economic Planning and Development, Nairobi, 1970.

is suitable for intensive grazing. Most of the commercial pastureland is in the Highlands and Rift Valley areas.

The remaining 87 percent of the land area is not used for agriculture, except for some nomadic shrub browsing and grazing of cattle on wooded grassland. This nonagricultural area included roughly 16 million acres (11 percent of the total land area) reserved by the Kenya Government for forests and game reserves. The area lacks farm-to-market roads and communication networks, contains wild animals, and has a prevalence of disease.

Most of the agricultural land in the country is in Nyanza, Central, and Western Provinces, central sections of Rift Valley Province, and the littoral area of Coast Province. The Northern Territory, including the entire North-Eastern Province and substantial sections of Rift Valley and Eastern Provinces, is a barren, waterless steppe underlain by volcanic rock and strewn with lava boulders. It is a region of poor soil, hot and dry climate, and sparse population. Its northern boundary is formed by a well-defined, rugged escarpment which marks the frontier with Ethiopia. Its southern edges, where it gradually blends into the central Highlands, become the Rendille Plains, an area of scrub and thornbush which has little value except as pasture for extensive herds of camels. This land is capable of supporting only nomadic livestock tribes. The southern half of the Northern Territory supports little more than wild game and small herds of cattle because of tsetse fly infestation and low and unreliable rainfall.

Kenya's variations in climate, altitude, and soils result in a cropping pattern that varies from high-altitude wheat, corn, pyrethrum, tea, and Arabica coffee (indigenous to Ethiopia) through the sisal and cotton of the medium altitudes to the coconuts and cashew nuts of the tropical coastal belt. This wide variation complicates the problem of farm planning and development and presents a wide range of agricultural research problems. Thus, there is a major need for qualified personnel to deal with problems of plant and animal breeding, selection of suitable varieties, maintenance of soil fertility, and pest control. Variations in population density, marketing facilities, tradition, and tribal customs have also had a part in determining Kenya's land use patterns and further complicate the country's agricultural development problems.

Land Tenure

African-held lands in Kenya come under complex, traditional land tenure laws that vary considerably among tribes. Under the customary law of some tribes who control large areas, their land is common property. The tribal chief assigns temporary use of land for crops to individual members of the tribe, but they cease to have any claim to the land once they discontinue its cultivation or move to another assigned area. Other tribes recognize individual rights to land and even permit outright sale of the land, though most of it is without registered title of ownership. Even within the same tribe, there may be differences in customs. For example, the Kikuyu tribe, the largest in Kenya, recognizes a form of outright family or individual ownership of land in some areas but in others has claimed common tribal ownership of agricultural land cleared from forests. All tribes traditionally have considered grazing land as communal property.[4]

Insecurity of land tenure has long been recognized as a severe handicap to African farming. Until the mid-1950's, when the Swynnerton Plan[4] became the basis of African land policy in Kenya, no African had complete security of land tenure or negotiable title to his farm. He thus had no acceptable collateral to offer against loans, and his rights to the land were frequently challenged. The Native Tenure Rules, passed in 1956, gave legislative sanction to native land tenure rights but did not provide for issuance of titles. The Land Registration (Special Areas) Ordinance, passed in 1959, made possible the issuance of titles to land. As a result, Africans now farm a small but growing percentage of land on which titles in fee simple have been issued.

The tenure of European and Asian farmers has in general been based on leaseholds. The 1902 Crown Land Ordinance provided for 99-year leases; some land was also given in freehold. In 1915, an ordinance created 999-year leases and gave the farmers who had the earlier leases an opportunity to change to these longer ones.

The African Land Development Organization[5]

The African Land Development Organization (ALDEV) was started in 1945 at the same time the Kenya Ten Year Development Plan for 1946-55 was being prepared. ALDEV's original goal concerned the settlement of African areas. Among the main

[4]The "Plan to Intensify the Development of African Agriculture in Kenya" was prepared by Roger Swynnerton for the Kenya Ministry of Agriculture in 1954. It is discussed on page 13.

[5]Most of the material in this section is from African Land Development in Kenya, 1946-62. Kenya Ministry of Agriculture, Animal Husbandry, and Water Resources, Nairobi, 1962.

purposes of ALDEV were coordinating activities between departments responsible for land use and development in African areas and directing technical services for surveys and projects (water, roads, buildings) in the more remote African areas. Changes in agricultural development and growth that took place during the 10-year development plan period resulted in conditioning, reclamation, and resettlement of existing African areas. This in turn led to soil and water conservation programs, the development of African areas through more intensive farming, and livestock management and grazing in arid areas. ALDEV administered loans to individual farmers for installation of water supplies and to factories engaged in processing farm products, and supervised grazing management schemes. However, ALDEV did very little regarding land tenure or farm management; these were areas for the Swynnerton Plan to cope with.

In 1957, ALDEV was reformed into the Land Development Board, a unit established as a permanent part of the Kenya Government under the 1955 Agriculture Ordinance, which covered all aspects of agriculture in Kenya.

Kenya's Swynnerton Plan[6]

The "Plan to Intensify the Development of African Agriculture in Kenya" was released in 1954. Named for its engineer, Roger J.M. Swynnerton, for many years Kenya's Director of Agriculture, the Plan aimed to improve African agriculture to the point where each farm would provide subsistence plus a minimum of about $280 a year cash income. A specific goal was to increase production efficiency so that growers could produce more surplus to sell to the nonfarm community and for export. Agricultural extension and research also got a boost from Plan funds. The Swynnerton Plan was the largest of the development schemes designed to intensify farming in African areas of high potential production, mainly in the Highlands.

Introduction of cash crops (coffee, tea, pyrethrum, and sisal) to new areas was one of the most important facets of the Swynnerton program. By 1962, African farmers were growing 40,000 acres of coffee, 4,000 acres of tea, and a significant acreage of pyrethrum. These three crops brought $28 million to Kenya's African farmers and contributed 20 percent of Kenya's 1962 export income. Subsistence crops, mostly corn and beans, were already established. Dairy production by Africans was extremely low during the early 1960's.

The Swynnerton Plan, as a whole, was successful. Most of the enterprises to which it gave birth have become self-supporting or have been absorbed by the general economy. Through the Swynnerton Plan alone, African purchasing power was increased substantially.

Land Transfer and Resettlement

In 1960, before Africans were first allowed to farm in the former Scheduled Areas, about 7.4 million acres of land were reserved for the exclusive use of Europeans. About 3.5 million acres of this land were in the mixed farming areas, while 3.9 million acres were used mostly for plantations producing coffee, tea, or sisal, or for ranching. Since the early 1960's, Kenya has given major emphasis to settlement of Africans on these former European farm areas primarily in the Highlands.

Several schemes for the transfer of European-held land to African ownership have been undertaken with financial assistance from the British Government, the Commonwealth Development Corporation, and the IBRD (International Bank for Reconstruction and Development; also called World Bank). The largest of these, financed mainly by the British Government, was the Million Acre Scheme for settlement in the Highlands (see next section).

Another project, financed mainly by the IBRD, the British Government, and the Commonwealth Development Corporation, was for low-density settlement on about 170,000 acres. This project aimed at providing annual incomes of about $240 per farmer, after subsistence and loan obligations. An additional project, financed by the British Government, provided for purchasing about 112,000 acres in the northwestern part of Central Province, to be farmed on a cooperative basis.

To establish values of the land going into resettlement, the British Government sent the Stamp Mission to Kenya in January 1965. The Mission recommended lower purchase prices for land and increased emphasis on land consolidation in the former European areas. For the Million Acre Scheme, the British Government supplied funds for the purchase of approximately 95,000 acres annually for 4 years. One-fifth of the funds was to be used for low-density settlement programs. Britain also supplied funds for other land purchases, financed development projects, including land consolidation, and provided technical assistance in the administration of the settlement schemes.

[6]See "Kenya's Swynnerton Plan," in Foreign Agriculture, Mar. 1962, pp. 12-14.

Under Kenya's land resettlement policy, African farmers must have come from the province in which they were to be settled. They had to be certified as landless to be eligible, but they had to be able to pay legal fees plus a downpayment of 10 percent of the price of the land and any capital improvements it contained. The remainder of the cost of the land, plus general development financing, was covered by loans to the farmers from Kenya's Agricultural Finance Corporation. The repayment period for development loans was 10 years. Thirty years was allowed for payment for the land.

The Million Acre Settlement Scheme

The Million Acre Settlement Scheme transferred approximately 1.2 million acres of land previously farmed by 930 Europeans to 35,000 African settler families, and gave them a larger share of Kenya's commercial agricultural production. The majority of the settlers were established on their farms during 1962-64. From 1966 to 1970, 400,000 acres of land were transferred at a rate of 100,000 acres annually.

Under this land transfer program—by far the most important one administered by Kenya's Ministry of Lands and Settlement and one of the most ambitious programs of its kind in Africa—emphasis was placed on developing the resettled land into productive farm enterprises and increasing total agricultural output. All of the land came from the approximately 7.4 million-acre European farming area, primarily in the Highlands.

The overall scheme consisted of 35 low-density schemes with an average farm size of 37 acres, 84 high-density schemes with an average farm size of 27 acres, and 16 large-scale cooperative farms or ranches. Most of the farms on the low-density schemes have target cash incomes of $280 per year. Target incomes on the high-density schemes vary from $70 to $196 per farm. The cooperative farms and ranches are run as large-scale units primarily because they are in areas where the land is considered unsuitable for small-scale farming.

By 1968, all of the low-density schemes had been started, and only five of the high-density schemes and three of the large-scale cooperative farms remained to be established. By the same date, almost $70 million had been spent on this program. Of this, roughly $27 million had been obtained from grants given by the British Government, $32 million from loans received from a variety of overseases sources, and about $10 million from Kenya Government funds. During 1970-72, $5.6 million in Plan funds was spent in completing the Million Acre Scheme.

Most of the products sold from settlement schemes are marketed through the settlers' cooperative societies.

Poor communications, especially poor roads, have affected the settlement schemes. The Government plans to make major improvements to the roads serving the settlement areas.

Effects of Land Resettlement

Africans have not acquired a substantial interest in either the ranches or the plantations as whole units. To purchase a ranch or a plantation as an intact unit normally requires a substantial investment, and very few individual Africans have been able to raise the necessary capital. Although they could obtain the capital more easily if they joined forces with others and formed a partnership, a company, or a cooperative society, the amount required by each individual would still be high. (Nonetheless, a few ranches or plantations have been acquired in this way.). An additional constraint is that most ranches and plantations have been judged not very suitable for subdivision into small-scale farms.

In contrast to the ranching and plantation areas, a high proportion of the land formerly in European large-scale mixed farms has been taken over by Africans. The main reasons are that farms in these areas were usually suitable for subdivision into small-scale farms, and that an intact mixed farm cost far less than a ranch or a plantation.

The most significant overall effect of land resettlement in Kenya has been a marked swing away from large farms and the entry of the African smallholder into the market economy. The following production patterns have occurred in the resettlement areas: (1) There has been an increase in pyrethrum production, much of it on land formerly used for wheat or barley. Smallholder production accounts for about 90 percent of the pyrethrum flowers marketed annually. (2) Tea production by smallholders has increased substantially over the past several years, and most of the future increase expected for Kenya's tea production will come from smallholdings. (3) Production of coffee on smallholder farms has increased substantially. About 40 percent of Kenya's total production comes from smallholders, and they should gain an even larger share in coming years. (4) The development of high-yielding varietal hybrids and synthetic varities of corn suitable for the resettlement areas has resulted in a very rapid increase in acreage planted

with improved seed, particularly by the smallholder. The long-term policy of the Government is to encourage further smallholder production of corn and to export surpluses. (5) Increased numbers of smallholders are growing cashew nuts, and production is rising. This is an attractive crop to smallholders—who grew nearly all of Kenya's cashews—because it yields a cash income as an uncultivated crop. (6) Smallholders are gradually entering the livestock and dairy sector, and some African farmers raise livestock commercially on farms in the Highlands, a small proportion of them using improved methods of livestock management. Livestock products are of increasing importance to smallholders, accounting for approximately 60 percent of their budgeted income. Milk and butterfat output from smallholder dairy farms has been increasing significantly. There are approximately 275,000 mature grade Zebu cows in the country, and half of these are on smallholder farms, particularly in the resettlement areas. (Although the total contribution of Zebu cows to commerical dairy production is small relative to the output from improved European breeds, the largest single center of commercial smallholder milk production (at Mariakani) is based on Zebu cattle).

AGRICULTURAL POLICY AND GOALS

The long-term goal of Kenya's agricultural policy is to expand agricultural production, primarily in the subsistence and smallholder sectors, in order to increase export earnings and reduce agricultural import requirements, increase per capita food supplies, and improve the level of living of the rural population. To achieve these goals, various programs are aimed at improving farm technology, marketing, and processing. Efforts are also being made to further diversify agricultural production and to find new foreign markets. To ensure maximum self-sufficiency, the Kenya Government supports prices of a few commodities and imposes foreign trade restrictions on certain agricultural exports.

A system of commodity and marketing boards is a basic element in Kenya's agricultural policy. A few boards have been consolidated but there are individual boards for the major export commodities and for wheat, corn, horticultural products, and meat and dairy products. (See p. 48 for a discussion of the various boards.)

Direct price support in Kenya is limited to wheat, corn, and barley, subject to the guaranteed minimum-return system. Retail prices of most staple food products, however, are subject to price controls aimed at preventing excessive increases in the cost of living.

Since the late 1940's, Kenya's long-term agricultural policies and goals have been directly related to its economic development plans, from the 10-year plan started in 1946 to the present 1970-74 Development Plan.

The commercial agricultural sector's growth rate during 1964-68 was 4.5 percent annually, compared with the planned goal of 6.2 percent (table 7). This shortfall is explained by the following events: Coffee production fell short of its expected level, because of the heavy incidence of Coffee Berry Disease—particularly during the 1967/68 season. Sisal acreage and production declined steadily during 1964-68, from 68,000 tons to 49,000, because of lower prices resulting from increased use of synthetic fibers. Cotton production did not meet expectations, because average yields were low as a result of heavy losses to insect infestation (which has not been controlled to date).

Kenya's output of cereals, tea, sugarcane, and livestock products increased during 1964-68. Plantings and acreages rose substantially during the period, and yields exceeded anticipated levels through technological changes, research, and use of improved varieties. Expansion of cereals, pineapples, sugarcane, and livestock and dairy products also contributed to the agricultural growth that did occur over 1964-68. In 1970, the commercial agricultural and livestock sector performance fell short by $13.7 million of reaching the proposed target for that year—$207.2 million.

Kenya's 1970-74 Development Plan budget represents a commitment to implement a large number of carefully selected development projects. Table 8 gives a summary of budget development expenditures for the Plan period. As shown in the table, planned Government development expenditures for the 5-year period total approximately $540 million.

The Kenyan Government has placed priorities on projects which do not readily lend themselves to private financing but which are essential to the development of the economy and the welfare of the people. This is reflected in the emphasis in the development budget on economic and social infrastructure.

Basic services—transport, water supplies, Government buildings, and airports—will absorb

Table 7 —Kenya's planned and actual 1970 economic performance and 1964-68 growth, by sectors in the monetary economy

Sector	1970 target	1970 actual	Growth rate, 1964-68	
			Target	Actual
	Million dollars[1]	*Million dollars*[1]	*Percent*	*Percent*
Commercial agriculture and livestock	207.2	193.5	6.2	4.5
Forestry	9.4	NA	10.2	7.7
Fishing	8.2	NA	22.6	7.6
Mining and quarrying	6.6	NA	8.2	-0.3
Manufacturing	150.2	149.1	8.0	5.7
Building and construction	52.3	45.3	18.3	10.8
Electricity and water	20.0	19.9	6.7	4.2
Transportation, storage, and communication	105.6	116.3	7.0	11.3
Wholesale and retail trade	131.1	134.8	6.0	6.6
Banking, insurance, and real estate	51.6	51.3	8.0	8.6
Dwellings	46.0	40.1	3.5	1.0
Other services	51.5	NA	7.5	9.9
Total enterprises	839.7	826.1	7.2	6.6
Domestic services	9.3	NA	2.0	6.0
General Government	180.6	NA	7.0	8.4
Total monetary production	1,029.6	1,040.9	7.2	6.9
Subsistence agriculture	NA	NA	NA	4.3
Other	NA	NA	NA	3.6
Nonmonetary production	301.1	316.0	3.2	4.2
Total GDP at factor cost	1,330.7	1,356.9	6.2	6.3

NA = not available or not applicable.
[1] At constant 1964 prices.

Source: Development Plan 1970-74, Republic of Kenya, 1969.

more than one-third of the planned development expenditures. Roads will account for $121 million. Social services are allocated more than one-quarter of the total.

The agricultural sector will receive a planned $111 million, or 20 percent of the total expenditure. Stress will be placed on agricultural development projects. This is in contrast to the two previous plans' emphasis on land resettlement.

The 1970-74 Plan was drawn against the background of the achievements and experiences of the 1966-70 Plan. Greater emphasis is being placed on rural development, improved income distribution, and creation of rural employment opportunities. Priorities are placed on raising health and education levels in rural areas. All these planned efforts are aimed at raising the general economic level of the rural economy. In addition, improved farming methods and management to increase crop production are planned, and a corresponding improvement in livestock production is envisaged. Progress in these areas should gradually bring about increased purchasing power which the Government hopes will spur further economic growth and lead to increased local production of processed goods, thus stimulating use of increased amounts of agricultural raw materials. From both an agricultural and an industrial point of view, production is stressed for commodities needed in the local economy and for commodities for which satisfactory markets exist abroad. For commodities which cannot compete internationally, the policy is to limit production to quantities needed for local consumption. The primary target for the agricultural sector is to expand agricultural production at a rate exceeding population growth.

Table 8—Kenya's 1970-74 Development Plan, budgeted expenditures by sector

Sector	Total	Share of total
	Million dollars	*Percent*
Agriculture:		
Agricultural development	49.4	
Land settlement and transfer	24.2	
Land adjudication	17.6	
Livestock development	12.7	
Irrigation	7.1	
Total	111.0	20.5
Natural resources:		
Forestry	16.6	
Fisheries	3.8	
Mines and geology	.9	
Total	21.3	4.0
Tourism:		
Tourism	7.5	
Game Department	1.8	
National Parks	.6	
Total	9.9	1.8
Manufacturing, commerce, and construction:		
Manufacturing	17.2	
Commerce	13.1	
National Construction Corporation Limited	1.4	
Total	31.7	5.9
Social services:		
Education	39.6	
Housing	41.7	
Health	41.3	
Local Authorities	12.6	
Information and broadcasting	5.0	
National Social Security Fund	---	
Social programs[1]	2.5	
Cultural programs[2]	1.5	
Labor	1.0	
Total	145.2	26.9
Rural development	7.0	1.3
Basic services:		
Roads	120.5	
East African Railways	---	
East African Harbours	---	
Government buildings	22.8	
Water supplies	22.3	
Airports	20.8	
Posts and telecommunications	---	
East African Airways	---	
Government press	.6	
Total	187.0	34.7
Internal security and defense:		
Police	8.9	
Defense	4.3	
Prisons	3.5	
Judiciary	1.4	
Other[3]	.6	
Total	18.7	3.5
Financial institutions:		
East African Development Bank	3.4	
National Bank of Kenya, Ltd	1.5	
Kenya National Assurance Company, Ltd	1.4	
Workers Investment Trust	.7	
State Reinsurance Corporation of Kenya	.6	
Total	7.6	1.4
Total budgeted expenditures	539.4	100.0

[1] Community development, social welfare, adult education, and National Youth Service. [2] Library services, museums, archives, theater, and sports. [3] Immigration, approved schools and remand homes, probation services, and Government chemist.

Source: Development Plan 1970-74. Republic of Kenya, 1969.

AGRICULTURAL PRACTICES AND TECHNOLOGY

Cropping Practices

Under the traditional cropping practice in Kenya—followed by some subsistence farmers—land in bush is cleared by cutting or burning, or both, and is cultivated for 3 or 4 years. It then is allowed to revert to bush, sometimes for a considerably longer period, before it is again burned off and cultivated. This is generally referred to as shifting cultivation or bush fallowing. This traditional system of cultivation, however, has been greatly altered by resettlement and the introduction of cash crops to the African farmers, plus by increases in the human and livestock population. For example, these developments have caused a reduction in the period of fallow. In the more densely populated areas, the period of fallow has been practically eliminated. On some of the farms which are following the advice of agricultural officers and extension agents who have prepared layouts for consolidated farms, grasses have

been introduced into the rotation to take the place of the longer period of recuperation allowed under the shifting cultivation system.[7]

African farmers' agricultural production has improved considerably in the past decade as a result of Government programs to modernize their farming practices. Nonetheless, these farmers remain near the low end of the scale regarding farming technology. Although considerable success has been achieved in developing high-yielding varieties of tea, coffee, and corn for production in Kenya, many Africans continue to use traditional cultural practices, resulting in low yields and soil depletion. The reluctance of many African farmers to take the steps that would bring about improvements and the usual shortage of capital or credit among subsistence and smallholder farmers will make technological advances difficult to realize on a scale that will substantially increase their agricultural production. And a shortage of well-trained African personnel will continue to be a major problem in the near future.

Irrigation

Kenya has an estimated 332,000 acres of potentially irrigable land (table 9). More than 70 percent of this land is located around the lower reaches of the Tana River. The remainder is in various parts of the country but primarily around Lake Victoria. Major constraints to irrigation development on these lands are high investment costs, difficult heavy soils which limit the choice of crops, and general inexperience with irrigation farming.

[7]John Phillips wrote in 1963 of the need for a move away from shifting cultivation in Africa. Kenya has succeeded in many of the areas discussed below. Phillips wrote:

Where human and livestock populations are increasing greatly in relation to the area of both so-called "virgin" and worked-over land, shifting cultivation can have only a limited future. It is imperative, therefore, that the administrations concerned should endeavor to evolve economic and psychologically acceptable alternative forms of tenure, based upon settlement. This implies the balanced interplay of community development and a desire for self help; agricultural and other relevant kinds of extension; cooperative societies and the provision of short-term credit; and improved storage, transportation and marketing.

A wiser use of fertilizers together with the paying of consistent attention to the simpler practices of conservation farming—both arable and pastoral—would permit of settlement replacing shifting cultivation. This is easily said but the leading of simple communities to accept and apply these conceptions presents one of the greatest educational challenges in Trans-Saharan Africa and wherever else shifting cultivation is still practised.

Source: Phillips, John. Shifting Cultivation. Reprinted from Proceedings and Papers of the International Union for the Conservation of Nature and Natural Resources 9th Technical Meeting. Nairobi, September 1963, p. 218.

Table 9—Kenya's irrigated area, 1971 and potential

Area	Irrigated	Potential
	Acres	*Acres*
Mwea	10,652	15,000
Ahero	3,264	30,000
Perkerra	1,441	2,000
Tana (Galole)	1,416	250,000
Bunyala	524	35,000
Total	17,297	332,000

Source: Unpublished material from the Kenya National Irrigation Board, Nairobi.

In 1971, a total of 17,297 acres of land was under irrigation on Kenya's five major irrigation schemes: Mwea, Ahero, Perkerra, Tana (Galole), and Bunyala. The Mwea project, concentrating on rice production, is the most successful. Its success is based primarily on close supervision and direction of sound husbandry and irrigation practices by a qualified extension staff. Futhermore, adequate incentives exist in the form of high average rice yields, which net farmers an average income of $390 per 5-acre farm.

The Ahero scheme is a pilot project in the Kano Plain area near Kisumu in Nyanza Province. Financed largely by the U.S. Agency for International Development (US/AID) and the Kenya Government, the project has been costly because it is located in a densely populated area and therefore requires heavy expenditure on resettlement and land consolidation. Difficult heavy soils limit the choice of crops in this project to rice and possibly cotton or sugarcane.

The Galole scheme on the lower Tana River concentrates on cotton. Problems with pest and weed control have resulted in large fluctuations in yields. In 1969/70, 1,126 tons of seed cotton worth $173,000 were produced on 1,322 acres. Any further expansion of the scheme will require substantial expenditure on infrastructure.

The Perkerra scheme is devoted primarily to onion production. In 1969/70, 2,735 tons worth $210,000 were produced.

Bunyala, the smallest project, is a new pilot rice scheme. It produced 1,067 tons valued at $72,800 in 1969/70.

These Government-controlled schemes—some of them initiated during the Mau Mau emergency to provide work for detainees—have had the very important result of demonstrating that African farmers with only dryland farming experience could adapt themselves to efficient intensive production under irrigation.

The 1970-74 Development Plan calls for Government expenditures of $7 million on irrigation schemes and processing facilities. The proposed breakdown of the planned development expenditures are: (1) Extension of Mwea scheme, $778,000; (2) construction of Mwea rice mill, $300,000; (3) development of Tana River pilot scheme, $1,270,000; (4) development of Ahero pilot scheme—Kano Plain area phase I, $288,000; phase II, $1,881,600; and phase III, $560,000; (5) construction of rice mills in Nyanza Province, $1,200,000; (6) development of Taveta pilot scheme, $319,200; (7) development of the Yala area, $184,000; and (8) construction of minor irrigation schemes, $218,400.

In addition to the Government-sponsored schemes, an unknown amount of land is irrigated by individual farmers from small streams or bore wells, primarily in coffee-growing areas. In areas of higher potential land use, such small-scale irrigation is prevalent enough to be readily noticeable. Although there is scope for considerable expansion of these individual irrigation projects, greater potential seems to be with the larger scale projects.

Farm Mechanization

Until recently, farm machinery was used primarily on Kenya's commercial European farms. The number of tractors used by Africans operating large farms has been increasing, but a shortage of maintenance and repair facilities, combined with a general lack of mechanical skills, has led to inefficient and costly operations. Furthermore, because there are limited facilities in Kenya for producing or assembling most agricultural machinery, the initial cost is quite high. Under present conditions, tractor cultivation is economically feasible on only a few large-scale farms, group farms, irrigation schemes, and experimental farms. However, use of tractors for opening up new lands is increasing among African smallholders.

Very little research on farm mechanization has been done in Kenya. To overcome this deficiency, a farm mechanization research center will be established at Nakuru during the 1970-74 Plan period. The research will be based at Nakuru, but much of the work will consist of running field trials of equipment under different conditions throughout Kenya. The mechanization center will work in close conjunction with other research stations.

The farm mechanization research program will have three major objectives. The first is to identify the most efficient methods of using the range of farm equipment presently available in Kenya. One problem here is that much of the equipment supply consists of relatively large tractors and cultivating equipment used in crop production on large-scale farms. Another problem is that the land in many areas is only marginal for crop production, given the low levels of rainfall and the present cultivation practices used. The Government believes that crops could be produced more successfully in many of these areas if cultivation techniques which involved much better soil and water conservation were developed. Thus, the second major aim of the farm mechanization research program will be to test alternative cultivation techniques with a view to reducing costs or improving soil moisture retention. The third objective of this program will be to test under field conditions a wide range of equipment which is not presently in use in the country but which is used successfully elsewhere and is thought to be suitable for Kenya's conditions. Particular emphasis will be given to testing equipment which might help to close the gap between the extremes of use of tractors and use of hand cultivation. This equipment will include improved ox-drawn cultivators, small two-wheeled tractors, and various aids to hand cultivation.

The share of total African acreage cultivated mechanically is growing but is undoubtedly still very small. Even the ox-drawn plow is not widely used in Kenya on African holdings. Ox-plowing is practiced extensively in Embu District in the Mwea irrigation scheme. And some ox-plowing is practiced in southwestern Kenya east of Lake Victoria, especially among the Kipsigis tribe of Kericho District. But in most areas of Kenya, African farmers use hand implements to cultivate their land as well as to harvest the crop. Many small farmers find it too expensive to keep oxen for farmwork because of the additional land required to produce feed and pasture which may not be readily available. Demonstration projects are conducted in some areas to encourage farmers to use cattle for plowing, but there are great differences in the emphasis given to this activity and in the responsiveness of the farmers. The hoe, rake, and machete continue to be the main tools for land clearing and cultivating on most small African shambas.

Fertilizer Use

Kenya's use of commercial fertilizer is limited but has increased substantially in recent years. Since 1963, the Government has granted a subsidy for

purchase of fertilizer, particularly for that used on corn. In addition, the Government has conducted considerable research on fertilizer use. Demonstration projects and irrigation schemes have also been important in promoting greater use of fertilizer, especially on cash crops. Recognizing the importance of fertilizer in increasing output, the Government allocated funds in its 1970-74 Development Plan for expanding the use of such demonstration projects and irrigation schemes.

Despite the foregoing, most of the fertilizer has been used on the large-scale farms and on high-value export crops. However, African farmers are becoming more aware of the importance of fertilizing crops, especially since most of their farms have little manure available for use on crops. One of the main problems facing African smallholders is a lack of transport and distribution services to bring small amounts of fertilizer to the hinterland.

Kenya depends entirely on imports for its chemical fertilizers, which have risen considerably in recent years (table 10). In 1960, only 10,800 tons of chemical fertilizer was used; however, by 1969, Kenya's consumption of fertilizer had reached a record 47,000 tons.

Table 10—Kenya's imports and consumption of chemical fertilizer in terms of plant nutrients, 1960-69[1]

Year beginning July 1	N	P_2O_5	K_2O	All fertilizer
	1,000 metric tons	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*
1960	3.6	6.1	1.1	10.8
1961	3.0	7.0	1.1	11.1
1962	3.5	7.5	1.1	12.1
1963	7.3	7.5	1.2	16.0
1964	10.3	8.1	.9	19.3
1965	13.0	9.9	.8	23.7
1966	11.8	16.6	2.3	30.7
1967	13.0	20.0	2.8	35.8
1968	15.0	20.0	3.0	38.0
1969[2]	18.0	20.0	9.0	47.0

[1] Consumption equals imports because Kenya imports all its fertilizer. [2] Estimate.

Source: Fertilizers, An Annual Review of World Production, Consumption and Trade, 1969. Food and Agriculture Organization of the U.N., Rome.

Pest Control

Kenya's commercial farmers make extensive use of pest and disease control measures where economically effective. The most extensive use of fungicides and insecticides is on coffee plantings, both European and African. Some African farmers spray their crops more readily than they use fertilizers. Coffee, in particular, is commonly sprayed. There has been some increase in spraying cotton and other cash crops in recent years.

Kenya has been subjected in the past to invasions of desert, migratory, and red locusts. There have been no serious invasions in recent years—partly as a result of international control measures. Kenya, Uganda, and Tanzania are members of the Desert Locust Control Organization for East Africa, within the framework of the Food and Agriculture Organization.

The Kenya and Tanzania Ministries of Agriculture have cooperated since the mid-1950's in the control of the Quelea (also known as the Sudan dioch), a grain-eating bird which has frequently done severe damage. In 1963, hundreds of acres of dense colonies in Tanzania, where the birds breed, were destroyed by aerial spraying with parathion; an estimated 45 to 50 million birds were destroyed. Kenya undertook further control measures (explosives and aerial spraying) which destroyed an additional 10 million birds, primarily along their migratory routes.

Imports and exports of agricultural products are inspected for insect infestation by the Government's Grading and Inspection Services at Mombasa. If infestation is found on products being imported, they are fumigated or denied entry. The Service also fumigates and issues phytosanitary certificates, if required, on products to be exported.

Kenya depends on imports for most of its supplies of pesticides and insecticides, except for pyrethrum and pyrethrum extract, of which it is a major exporter. Imports of insecticides, fungicides, disinfectants—including sheep and cattle dips—and similar preparations have increased substantially in recent years. Subsidies of 50 percent of the cost of the materials are provided by the Government for the purchase of insecticides and spray pumps to control insects attacking coffee.

AGRICULTURAL RESEARCH AND EXTENSION

Research

Although Kenya has developed an excellent research organization over the years, its efficiency is hampered by a shortage of qualified senior research personnel. A senior staff of only 70 is available for work in about 20 stations and substations, including the National Laboratory in Nairobi. About 20

percent of the staff are foreigners assigned to Kenya under various outside aid programs. Continuity of research work is jeopardized by the fluctuation in availability of such research personnel, many of whom spend only a few years in the country.

Extensive research work has been carried out by the Government and by international groups to determine the crop varieties best suited to Kenya's ecological and soil conditions, with the main emphasis placed on export crops. There are special research stations in Kenya for coffee, tea, sisal, and pyrethrum. To encourage Africans to expand their cash crop production, the Government distributes coffee seedlings and other planting materials. For many years, improved varieties have been developed or selected in Kenyan and other East African experiment stations.

Some of Kenya's research stations are closely linked to marketing or regulatory boards, through which the agricultural industry assumes a large measure of financial responsibility for the cost of research. In this way, the private sector contributes 90 to 100 percent of the cost of research in tea, coffee, and sisal and 40 to 50 percent of wheat and pyrethrum research costs. Such a high level of support from the private sector in a developing country is admirable, but greater Government support may be necessary under certain circumstances. In the case of coffee, for example, the industry has had to bear the increased expenditures on Coffee Berry Disease research at a time when both production and prices were low; thus, research costs exceed the Coffee Board's capacity to cover them. By 1972/73, the Board's coffee research budget is likely to be only $548,000, and Government support may be needed if the program is to continue.

During the 1970-74 Plan period, existing research programs on corn, wheat, rice, pyrethrum, sugar, coffee, tea, cotton, and horticultural crops will be expanded through increases in physical facilities and personnel numbers. Work will be intensified along present lines but will also be broadened in scope. For instance, in addition to the substantial ongoing research program on Coffee Berry Disease control, research on coffee breeding and selection and coffee quality will be expanded. Present research programs for developing better varieties of wheat, corn, and rice will be continued, but more emphasis will be given to agronomy trials with cereals to help identify the most efficient production techniques. New research projects concerned with potatoes, oilseeds, legumes, crop storage, irrigation, and seed certification will be initiated during the Plan period. These new programs are needed to fill gaps in Kenya's agricultural research and to permit diversification of agricultural production.

Extension Work

With Kenya's need for increased agricultural productivity and widespread adoption of improved farming methods, agricultural extension is one of the most important functions of the Ministry of Agriculture. It absorbs much of the Ministry's personnel and finances and during the current Plan period will receive even greater emphasis.

Until recently, the agricultural extension services were organized into a number of distinct, specialized divisions or departments, such as the Veterinary Department and the Department of Agriculture. Under this system, farmers were able to obtain advice from a range of specialists. However, the great majority of these specialists had concentrated on the largely technical problems of particular aspects of agricultural production and were not always well qualified to advise farmers on the most appropriate policies from the standpoint of the farm business as a whole. For example, extension workers advising farmers on the best methods of cotton production may have encouraged timely planting, for this leads to increased yields. However, in some situations, this may not have been the best advice, for time spent on cotton may have been better spent on some more profitable alternative enterprise. With a view to overcoming such problems, and recognizing that the extension worker needs to be able to take an overall view of a farm business before he can give the best advice, the Ministry of Agriculture is undertaking a major reorganization of the extension services. Instead of there being a number of specialized departments, each with a parallel organization in the field, a unified extension service is being created. Under this new system, the farmer will be served by one extension worker who can give advice on a wide range of agricultural subjects. Specialist staff will be employed, but they will be called in by the local extension worker only when he requires assistance. These generalist extension workers will need to have a good understanding of a broad range of technical agricultural matters plus some training in farm management. For this reason, it is intended that the inservice training program for extension staff will be expanded considerably, especially in farm management.

Various extension methods are used in Kenya. For example, workers visit individual farmers, maintain demonstration plots, conduct farm field

days, and distribute information by means of radio, films, and printed material. The Ministry of Agriculture intends that its current evaluation of the extension services will lead to a better understanding of the relative merits of these alternative methods. It expects that more emphasis will be given to methods which reach large numbers of farmers, for the extension staff cannot hope to visit all farmers individually, even with the increased staff and money which will be available during the Plan period. Moreover, the steadily improving levels of education and literacy among the rural population are conducive to effective extension through use of mass media.

CROP PRODUCTION

Tropical and temperate crops produced as cash crops for export are of major importance in Kenya's agricultural production (fig. 3). In 1970, agricultural and livestock products accounted for 56 percent of all export earnings. Coffee and tea are dominant in the country's trade and economy. Other important export crops are pyrethrum, sisal, cashew nuts, and pineapple. (Table 11 shows production of major crops for 1960-71 and app. table 4, the export value of major crops.) Food crops for urban markets and domestic use include corn, wheat, sorghum and millet, rice, sweetpotatoes, cassava, and beans. In recent years, substantially increased volumes of corn and wheat have entered the domestic, regional, and overseas markets. Barley, oats, rice, potatoes, and sugarcane are sold primarily for domestic consumption. Most of the remaining food crops enter the cash economy to only a minor extent. The 1971 index of agricultural production was 128, compared with the 1961-65 base of 100 (app. table 5). The major gainers were commercial crops for export—coffee, tea, and fruits and vegetables. Agricultural output and population increased at approximately the same average annual rate—3.3 percent—over the period 1961-65 to 1971.

Major Crops

Coffee

Coffee—the most important commercial crop in Kenya—is the major agricultural export and the major cash earner for thousands of smallholder farmers. In addition, the coffee industry provides wage employment for about 100,000 people.

Practically all of Kenya's coffee is Arabica, grown at elevations of 4,500 to 6,000 feet. The major Arabica regions are in the Mount Kenya-Nairobi-Thika areas, the area east of Lake Victoria, and the northern part of Western Province. Some Robusta coffee is grown in Western Province in the area north of Lake Victoria.

Since 1960, Kenyan production of coffee has increased substantially—from 34,000 tons (74 million pounds) in that year to a record 59,910 tons (132 million pounds) in 1970 (table 12). In 1971, production declined to 57,000 tons (125 million pounds). Production on smallholder farms increased from less than 1,000 tons in 1955 to approximately 25,000 tons in 1970, when it approached about 40 percent of total production. Kenya's coffee production should increase further as trees planted in recent years come into bearing. Production from small farms should gain a larger share of total production.

Kenya's increased coffee production is attributed to increased acreage rather than to increased yields. Yields of over 800 pounds per acre were prevalent 10 years ago, and after dipping to as low as 408 pounds in 1967 because of Coffee Berry Disease, they were 630 in 1970. The 10-year average yield for 1960-69 was 604 pounds per acre. This compares favorably with yields in other coffee-producing areas of the world.

Although acreage devoted to coffee trees went up sharply during 1960-66, the increased production discussed above came from trees planted before 1960, particularly those planted on smallholder farms in the late 1950's. In the early 1960's, there was only a small increase in acreage on the large coffee farms, but plantings on smallholder farms increased substantially. In a measure consistent with the problem of general over-supply of coffee on a world-wide basis, the Kenyan Government has prohibited the planting of new coffee trees since 1964 except when done to replace old trees. An estimated 60 percent of the trees on large farms in 1970 were old and in need of replacement.

All replacement trees are from seed of selected high-yielding varieties grown in special seed gardens organized and maintained by the Ministry of Agriculture. Regional nurseries, such as the Kabare Coffee Nursery, supply African farmers with seedlings, while the coffee plantations maintain their own nurseries.

Coffee tree seedlings are considered ready to go into their field positions soon after they are 15 months old, but even ones up to 30 months old are often used. Transplanting takes place during the rainy season—commonly in April. The planting

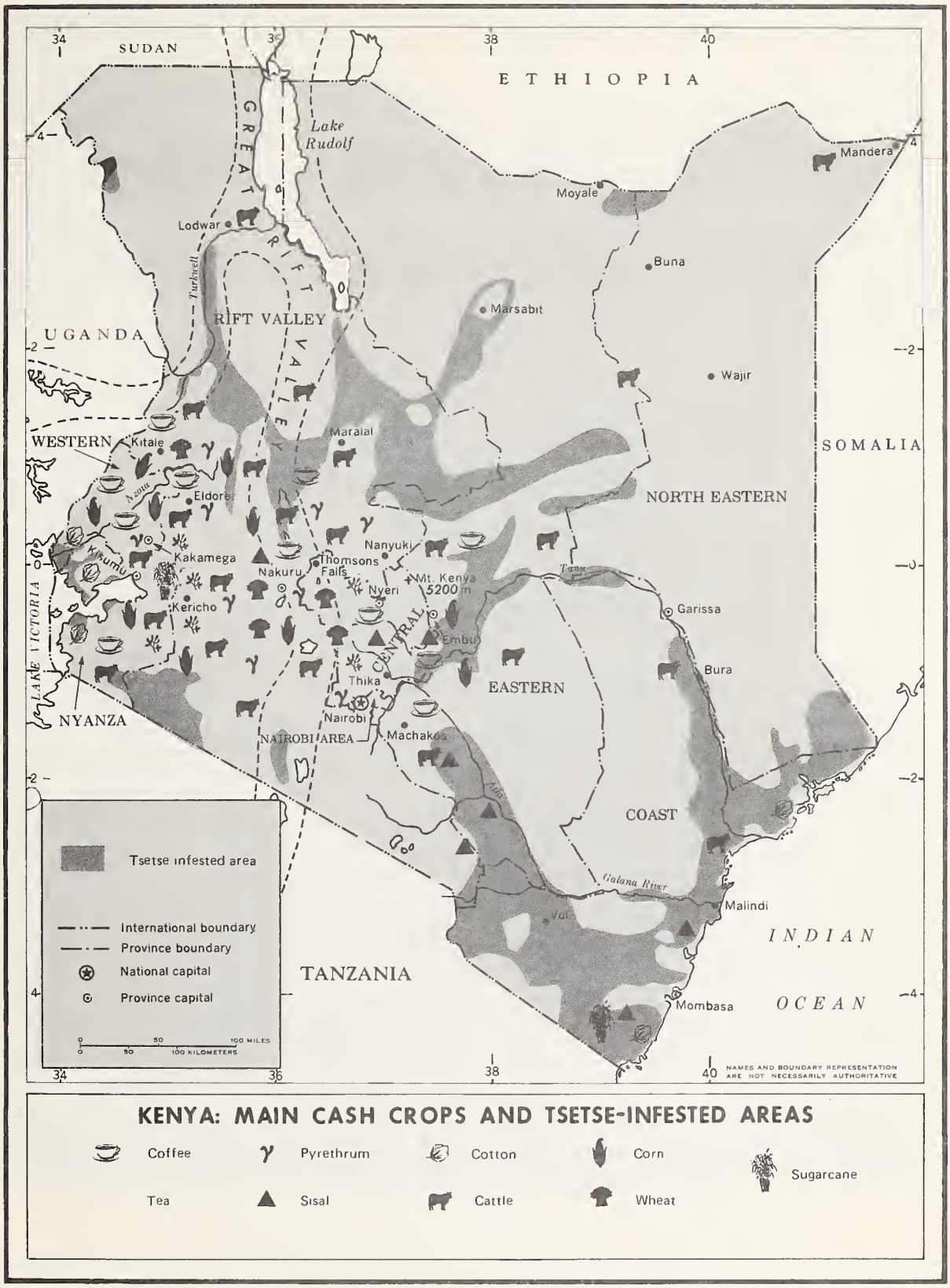

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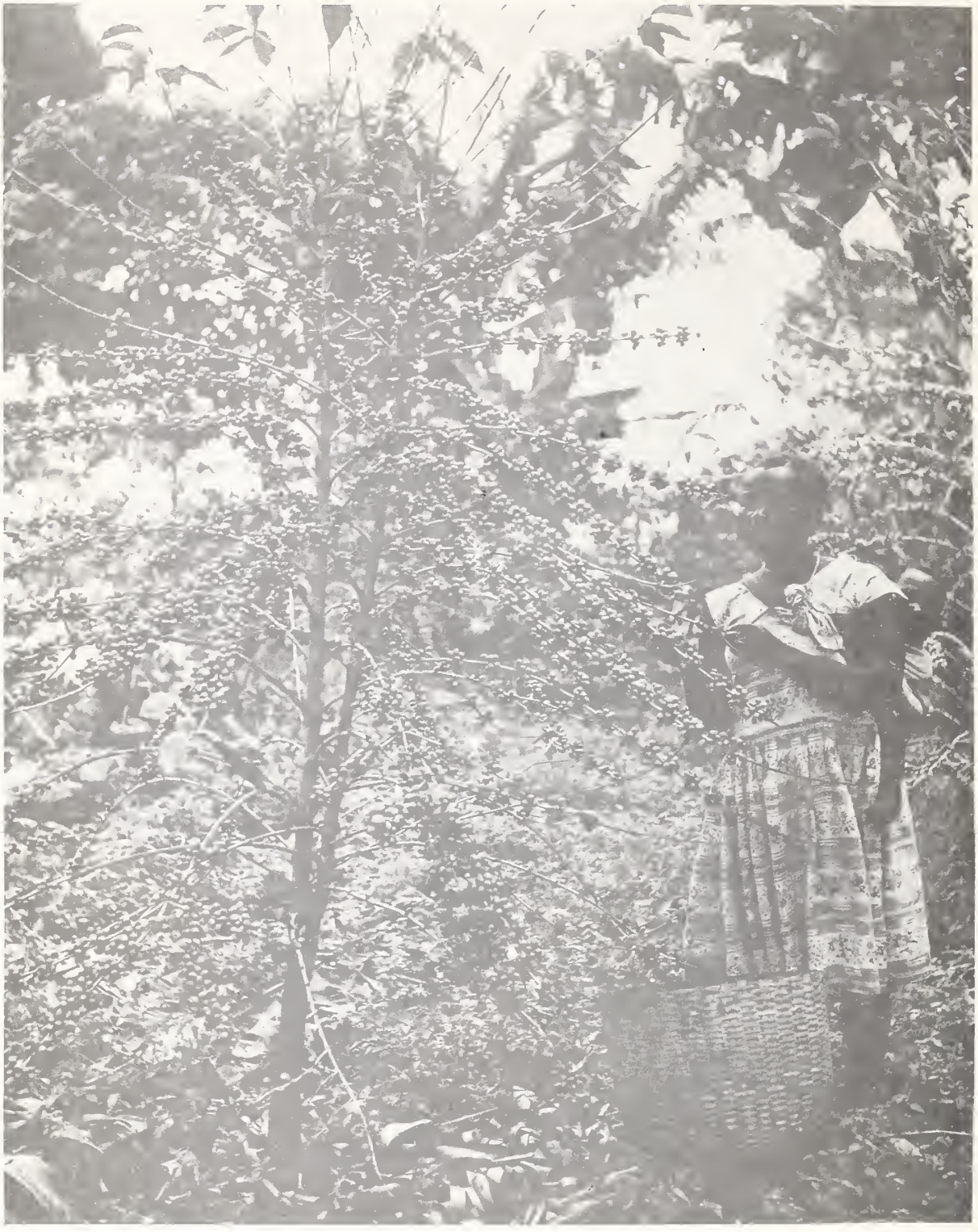
Figure 3



Wife of a smallholder near Nairobi picking Arabica coffee berries for export. Plantings on African smallholdings have increased substantially since 1960 and are a major cash earner for thousands of Africans in Kenya.

European-owned Arabica coffee plantation near Thika, in Central Province. Coffee is Kenya's major cash crop; exports valued at $62 million (54,000 tons) were shipped in 1970, with $11 million worth (9,900 tons) going to the United States.

holes are normally dug well in advance of the transplanting season and are frequently filled with topsoil and manure a few weeks before they receive the seedlings.

Kenya's coffee trees begin to bear when they are 3 to 4 years old and come into full bearing several years later. The average economic life for a Kenyan coffee tree is 30 to 40 years. The trees flower principally during January-March; generally, the main harvest begins in October and extends to April. There is a smaller harvest in July-August (app. table 6).

The major diseases attacking coffee trees in Kenya are Coffee Berry Disease (Colletotrichum coffeanum) and leaf rust (Hemileia vastatrix); the major insects are the sucking bug (Antestiopsis lineaticollis) and the Leucoptera.

Most of Kenya's coffee producers are members of cooperatives. Smallholder producers were members of about 170 cooperatives in 1970. These cooperatives are members of the Kenya Planters Cooperative Union, to which the large growers also belong.

The cooperatives are issued bulk licenses to produce, and they in turn apportion the licensed areas among their members. With help from the Ministry of Agriculture, the cooperatives supervise coffee production on the small farms. The Ministry supervises the planting and advises on such cultural practices as weeding, fertilizing, pruning, and spraying. In some areas, individual farmers do their own spraying; in others, it is done by teams organized by the cooperatives; and in still others, it is directly organized by the Ministry of Agriculture.

The Coffee Marketing Board is the statutory body in charge of coffee in Kenya. The board issues to the cooperatives the necessary licenses to produce. It purchases coffee from producers' cooperatives and from large growers who have permission to sell directly to the board. Coffee is sold by the board at weekly auctions to about 40 licensed merchant firms in Nairobi.

Kenya is a member of the International Coffee Agreement (ICA), under which it was allocated a total export quota of 44,818 tons for the coffee marketing year October 1971-September 1972. The ICA has 41 producing-country members and 21 consuming-country members. The agreement itself is an export quota type of arrangement, with price objectives established for the four major types of coffee but no fixed prices. The present ICA expires September 30, 1973. Coffee sales by Kenya to

Table 11—Production of selected agricultural commodities in Kenya, average 1961-65, annual 1960-71

Commodities	Average 1961-65	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
	1,000 metric tons	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*
Coffee	41	34	32	38	44	40	52	56	39	48	54	60	57
Tea	17	14	13	16	18	20	20	25	23	30	36	41	36
Sisal	65	64	64	59	71	68	64	57	52	50	50	44	43
Pyrethrum flowers, dried	8	7	9	11	8	5	6	8	10	11	7	6	10
Sugar, raw	39	37	33	35	54	40	31	51	64	103	125	125	138
Pineapples	17	12	14	16	16	18	20	25	30	35	35	35	44
Cotton	3	2	2	3	4	3	4	4	4	4	4	5	6
Oilseeds:													
Peanuts, in shell	5	2	4	4	5	4	9	9	11	13	15	13	13
Cottonseed	6	6	4	6	8	6	8	8	8	7	8	9	12
Sesame seed	2	2	2	2	2	2	2	3	3	3	3	1	1
Sunflower seed	2	2	2	1	2	1	3	3	3	2	4	2	2
Castor beans	5	4	3	4	7	5	5	7	4	3	4	3	3
Cashew nuts, in shell	6	6	6	3	6	5	9	10	12	12	18	14	22
Corn	1,360	1,200	1,500	1,400	1,300	1,300	1,300	1,400	1,600	1,600	1,400	1,500	1,300
Sorghum and millet	307	379	294	310	316	320	293	367	380	350	325	350	350
Wheat	122	109	84	120	130	144	133	180	243	226	216	220	180
Rice, paddy	19	11	14	18	24	18	23	22	30	30	34	34	34
Potatoes	193	194	194	195	190	190	195	195	195	195	200	218	200
Beans, dry	31	29	31	33	30	30	31	31	32	33	25	30	35
Vegetables	153	140	140	162	150	150	165	165	170	175	180	180	175

Source: Indices of Agricultural Production in Africa and the Near East, 1960-71, U.S. Dept. Agr., Econ. Res. Serv., ERS-Foreign 265, Apr. 1972.

Table 12—Area, yield, and production of coffee in Kenya, 1960-71

Year	Area	Average yield per acre	Production
	1,000 acres	*Pounds*	*1,000 pounds*
1960	87.4	848	74,075
1961	102.9	803	82,672
1962	118.0	712	83,995
1963	144.2	679	97,884
1964	202.2	432	87,302
1965	205.1	564	115,742
1966	210.9	586	123,678
1967	211.0	408	85,979
1968	210.0	504	105,821
1969	210.0	567	119,016
1970	210.0	630	132,276
1971	210.0	597	125,400

Source: FCOF Trade and Production Circulars, various issues, 1960-71. U.S. Dept. Agr., Foreign Agr. Service.

nonquota markets are expected to increase, especially to the USSR, the East European countries, and Japan. Domestic consumption of coffee should also increase; this is being encouraged by the Kenya Government.

Tea

Kenya, growing approximately 3 percent of the world's tea, is the largest producer in Africa. Tea plantings and production have increased substantially over the past decade, and tea is Kenya's second major agricultural foreign exchange earner. Tea production is vital in the Kenya Government's program to promote cash crop production by smallholders (app. table 7). The Kenya Tea Development Authority (KTDA) is directing the development of smallholder tea production. Tea is looked upon as a major vehicle for cash crop production, primarily

African tea pluckers harvesting leaves on a plantation in Kericho District, near Lake Victoria. Kenya's second most important export crop is grown largely on plantations, but smallholder tea acreage is expanding rapidly under the Kenya Tea Development Authority.

An aerial view of a tea plantation and factory in western Kenya. The typical "honeycomb" method of planting tea bushes interspersed with shade trees was used here. African workers' houses are at center left.

because the world outlook for tea is encouraging. Most of the future increase in Kenya's tea production will take place on smallholdings rather than on tea plantations. It has been demonstrated that smallholders in Kenya, given adequate training and supervision, can efficiently produce high-quality tea. The processing requirements of the crop, however, necessitate substantial capital investment in roads and factories, since freshly plucked tea leaves must be processed quickly or quality will decline. The KTDA has received considerable financial assistance from international organizations and West European governments and corporations to build up the necessary facilities.

Tea is grown primarily in Kericho, Kisii, Busia, Bungoma, Nandi, and Kiambu Districts in Nyanza and Western Provinces. It is also grown in small isolated areas in Central Province.

Over the past decade, Kenya's tea production has increased phenomenally, from 14,000 tons (30 million pounds) in 1960 to a record 41,077 tons (91 million pounds in 1970. This sharp increase is attributed to increased tea plantings and increased yields. In 1971, Kenya's production dropped to 36,290 tons (80 million pounds), reflecting the impact of drought early in the year.

Yields have increased in recent years because mature tea bushes have come into production. Also, higher yielding varieties of tea plants have been used. Yields are likely to further increase substantially as a result of recent research, particularly on vegetatively propagated materials. Over the past decade, tea yields have varied from a low of 635 pounds per acre (1961) to a record 910 pounds (1970) (table 13). The 1960-70 average was 771 pounds. This compares favorably with yields in other tea-producing areas of the world.

In 1970, Kenya sold 3,900 tons of tea, valued at $3.5 million, to the United States. World prices for tea improved during 1970, thus permitting higher payments to growers than had been anticipated. Japan has shown interest in importing tea from Kenya and in assisting in the green tea development program in Kenya during the 1970's.

Table 13—Area, yield, and production of tea in Kenya, average, 1955-59, annual 1960-71

Year	Area	Average yield per acre	Production
	Acres	*Pounds*	*1,000 pounds*
Average 1955-69	30,338	761	23,080
1960	39,380	771	30,371
1961	43,875	635	27,869
1962	49,156	737	36,217
1963	52,998	752	39,864
1964	56,986	783	44,622
1965	61,170	714	43,702
1966	67,555	830	56,038
1967	74,320	677	50,290
1968	82,929	791	65,614
1969	90,251	881	79,499
1970	99,527	910	90,558
1971	108,319	739	80,004

Source: Annual Bulletin of Statistics, International Tea Committee, London, 1960-71.

Pyrethrum

Kenya is the world's largest producer and exporter of pyrethrum and supplies about one-half of the world's output. Pyrethrum (Chrysanthemum cinerariaefolium) is a perennial plant marketed in the form of dried flowers or as an extract for use in making insecticides. It yields a crop the first year after sowing and in Kenya is planted and harvested throughout the year (app. table 6). In some other producing countries, only one crop a year can be harvested.

Production and exports of pyrethrum extract and flowers have fluctuated significantly since 1960 (table 14). Kenya produced approximately 9,900 tons (21.8 million pounds) of pyrethrum flowers in 1971. Pyrethrum is produced primarily in Central, Rift Valley, and Western Provinces.

Table 14—Production and exports of pyrethrum in Kenya, 1960-71

Year	Harvested production (flowers)[1]	Flower exports	Extract exports
	1,000 pounds	*1,000 pounds*	*1,000 pounds*
1960	14,560	7,018	582
1961	20,530	5,674	661
1962	24,098	3,407	832
1963	18,764	3,888	748
1964	11,617	2,073	624
1965	13,792	1,910	604
1966	17,362	2,999	708
1967	23,585	3,458	721
1968	24,772	3,973	807
1969	16,365	4,477	810
1970	13,238	3,281	584
1971	21,836	5,087	813

[1] Crop year ending Sept. 30 for 1966-71. All others, year ending June 30, except 1965, which covers July 1964-September 1965.

Sources: Pyrethrum Marketing Board of Kenya; and Annual Trade Reports of Kenya, Uganda, and Tanzania, 1960-71, East African Customs and Excise Dept., East African Community, Mombasa, Kenya.

Pyrethrum is one of Kenya's major agricultural raw materials and provides a cash crop for increasing numbers of African smallholders. Current acreage in pyrethrum is estimated at 70,000. Smallholder production accounts for about 90 percent of the pyrethrum flowers marketed annually. Average yield per acre is 400 pounds of dried pyrethrum flowers. In Kenya, pyrethrum is not a plantation crop but is grown by mixed farming on a rotation basis. There are over 40,000 African smallholder farmers producing pyrethrum and 100 pyrethrum cooperatives.

The Kenya Pyrethrum Board licenses production in accordance with the established quota. The board determines the annual quota, pools the output, appoints contractors for manufacturing the extract, markets pyrethrum products, and is in charge of research on pyrethrum production, processing, and marketing. The board operates on a financial pool basis out of Nakuru and distributes to growers any income in excess of expenditure. Payments of 62 cents per pound of dried flowers containing 1.5 percent pyrethrins are made to farmers by the board. The board is propagating high-content pyrethrum varieties and distributing them in vegetative form rather than in seed.

Growing restrictions on the use of chemical insecticides in many industrial countries because of their polluting effect plus a relatively safe use of pyrethrum have generated a substantial new demand for pyrethrum.[8] In response to revitalized demand for the extract, the board recently increased the dried pyrethrum flower price to farmers by 13 percent, to the current 62 cents.

To meet growing world demand for pyrethrum, the board has strengthened its field staff to improve communications and liaison with smallholders.

[8]This favorable situation for Kenya may suddenly change if a nonpolluting synthetic insecticide is developed.

African smallholders harvesting pyrethrum flowers in a field close by their huts, near Nakuru in Kenya's central Highlands. The flowers—marketed in dried and extract form for use in insecticides—are a major cash income source for the Highlands' African settlers.

Furthermore, an improved system of forecasting trends has been devised so that current quotas can be issued to growers on the basis of a whole crop cycle of 3 years. The former system was one of annual allocations.

During the 1970-74 Development Plan period, emphasis will be given to raising productivity by increasing the pyrethrins content of the flowers. Research and extension programs are being designed to identify and introduce to farmers varieties which will have a higher pyrethrins content.

Sisal

The importance of sisal in Kenya's economy has declined drastically during the past decade. Formerly the third largest agricultural export earner, it is now the sixth, earning only $5.1 million in foreign exchange in 1970. The world market outlook for sisal is tenuous since prices fluctuate substantially and synthetic fibers have gained a strong foothold on the fiber market. Kenya's production has trended downward since 1963, because of reduced acreage and yield. In 1971, production totaled about 43,000 tons, compared with an average of 67,000 tons during 1960-64 (table 15). Production reached a peak in 1963 with 71,000 tons. Sisal yields have varied from 387 to 532 pounds per acre since 1965. The average has been about 447 pounds.

Table 15—Area, yield, and production of sisal in Kenya, average 1960-64, annual 1965-71

Year	Area	Average yield per acre	Production
	1,000 acres	*Pounds*	*1,000 metric tons*
Average 1960-64 . .	265	555	67.0
1965	265	532	64.0
1966	269	467	57.0
1967	255	450	52.0
1968	250	432	49.0
1969	245	450	50.0
1970	245	396	44.0
1971	245	387	43.0

Source: FVF Trade and Production Circulars, various issues, 1960-71. U.S. Dept. Agr., Foreign Agr. Serv.

Sisal is a plantation crop produced primarily in Central, Eastern, Coast, and Rift Valley Provinces, in the drier, semiintensive farming areas not well suited for higher value cash crops.

The area in sisal, declining sharply in recent years, was only 245,000 acres in 1971. However, there has been a significant movement toward intensification

An African worker on a Coast Province sisal plantation bundles the machete-cut leaves to carry them to a nearby tramway for transport to the mill. Kenya's sisal acreage and output are declining because of lower prices resulting from increased use of synthetic fibers.

of the industry based on increased production. In 1963, 54 plantations, which included four factories processing sisal, produced Kenya's total output of 71,000 tons. In 1971, approximately 25 plantations produced 43,000 tons, a reduction of 54 percent in the number of plantations, but a drop of only 39 percent in production. The number of sisal plantations declined from 36 in 1967 to 31 in 1968, 28 in 1969, and 25 in 1971.

Lower prices resulting from increased use of synthetic fibers have been the major cause of declining sisal output. Sisal prices declined markedly starting in 1964 but rose sharply in 1972 as a result of temporarily reduced production throughout the world. On balance, the long-term outlook for sisal is not auspicious.

Sisal is planted throughout the year, as the plant is not so dependent on rainfall as are Kenya's other crops. After a maturing period of 4 to 6 years, the leaves are cut throughout most of the year. Decorticating of sisal requires heavy equipment and large amounts of water; this limits the geographical spread of potential production.

The Kenya Sisal Board engages in promotion activities and in production and market research. It is also responsible for promoting and guiding sisal development schemes. Production is not subject to licensing.

The main markets for Kenya's sisal during the past decade have been the United Kingdom, France, Japan, and Canada.

Corn

Corn is Kenya's principal food crop; it is grown to some extent throughout the arable areas. Commercial production, which is not a large part of total production, comes from large-scale and smallholder farms. A substantial volume of annual corn production is consumed by people living on the farms, with the remainder delivered to the Maize and Produce Marketing Board. Generally, enough corn can be produced in normal years to meet Kenya's requirements. Kenya plants 2.5 to 3 million acres of corn annually. Production ranges from 1.3 to 1.5 million tons. The 7-year average yield for 1965-71 was about 19 bushels per acre (table 16).

Adverse weather conditions, including drought, cause corn output to fluctuate. In 1971, unfavorable weather reduced corn output substantially. Consequently, corn price policy has reverted from export considerations to the domestic market supply problem. The corn support price has been raised to $4.90 per bag (200 pounds) to encourage farmers to sell to the Maize and Produce Board. The long-term policy is to encourage further smallholder corn production and to export surpluses. Research in breeding and agronomy is aimed at expansion of corn yields and output.

A breakthrough in corn production was made in 1966 when local corn-breeding stations, with headquarters at Kitale, Kenya, aided by the Rockefeller Foundation and by US/AID assistance programs, simultaneously developed high-yielding varietal hybrids and synthetic varieties of corn. This has resulted in a very rapid increase in acreage planted with improved seed, especially in the smallholder sector (table 17). As the use of improved seed continues to increase, coupled with better

Table 16—Area, yield, and production of corn in Kenya, average 1960-64, annual 1965-71

Year	Area	Production	Average yield per acre
	1,000 acres	*Million bushels*	*Bushels*
Average 1960-64 ..	2,743	51.2	18.7
1965	3,000	51.2	17.1
1966	3,000	55.1	18.4
1967	3,100	63.0	20.3
1968	3,000	60.7	20.2
1969	3,000	55.1	18.4
1970	3,000	60.0	20.0
1971	3,000	52.0	17.3

Source: FG Trade and Production Circulars, various issues, 1960-71. U.S. Dept. Agr., Foreign Agr. Serv. Prepared or estimated on the basis of official statistics of Kenya Government reports, reports of U.S. Agricultural Attache, and Foreign Service Officers, and results of office research and related information. Data are approximations based on the best information available.

Table 17—Acreage planted with improved seed corn on large-scale and smallholder farms in Kenya, 1964-71

Year	Area in large-scale farms	Area in smallholder farms	Total area
	Acres	*Acres*	*Acres*
1964	28,100	1,750	29,850
1965	54,700	20,050	74,750
1966	62,900	37,700	100,600
1967	137,100	115,250	252,350
1968	100,100	129,200	229,300
1969	115,000	145,000	260,000
1970	150,000	200,000	350,000
1971[1]	200,000	300,000	500,000

[1] Estimate.

Source: FG Trade and Production Circulars, various issues, 1964-71. U.S. Dept. Agr., Foreign Agr. Serv. Data are approximations based on the best information available from attache reports.

farming practices and increased use of fertilizer, corn production should continue upward. Year-to-year fluctuations in output should be reduced somewhat. The Government's goal is that Kenya will, in time, consistently have corn available for export and for expanded domestic use as a livestock feed and for processing.

Most of the corn grown is white and of the Muratha variety, a large-cobbed dent variety, having a growth period of 150 to 180 days (app. table 6). Nearly two-thirds of the corn area on smallholdings is planted at the beginning of the long spring rains; in some areas, however, the short-rains crop planted in the fall is the most important. Approximately three-fourths of the smallholder area in corn is intercropped, mainly with dry beans.

In 1970, the large-scale farm sector produced approximately 163,000 tons of hybrid corn. The Kenya Ministry of Agriculture places high priority on developing improved varietal hybrid seeds and expanding the use of extension and demonstration services that will increase output and lower production costs and domestic prices.

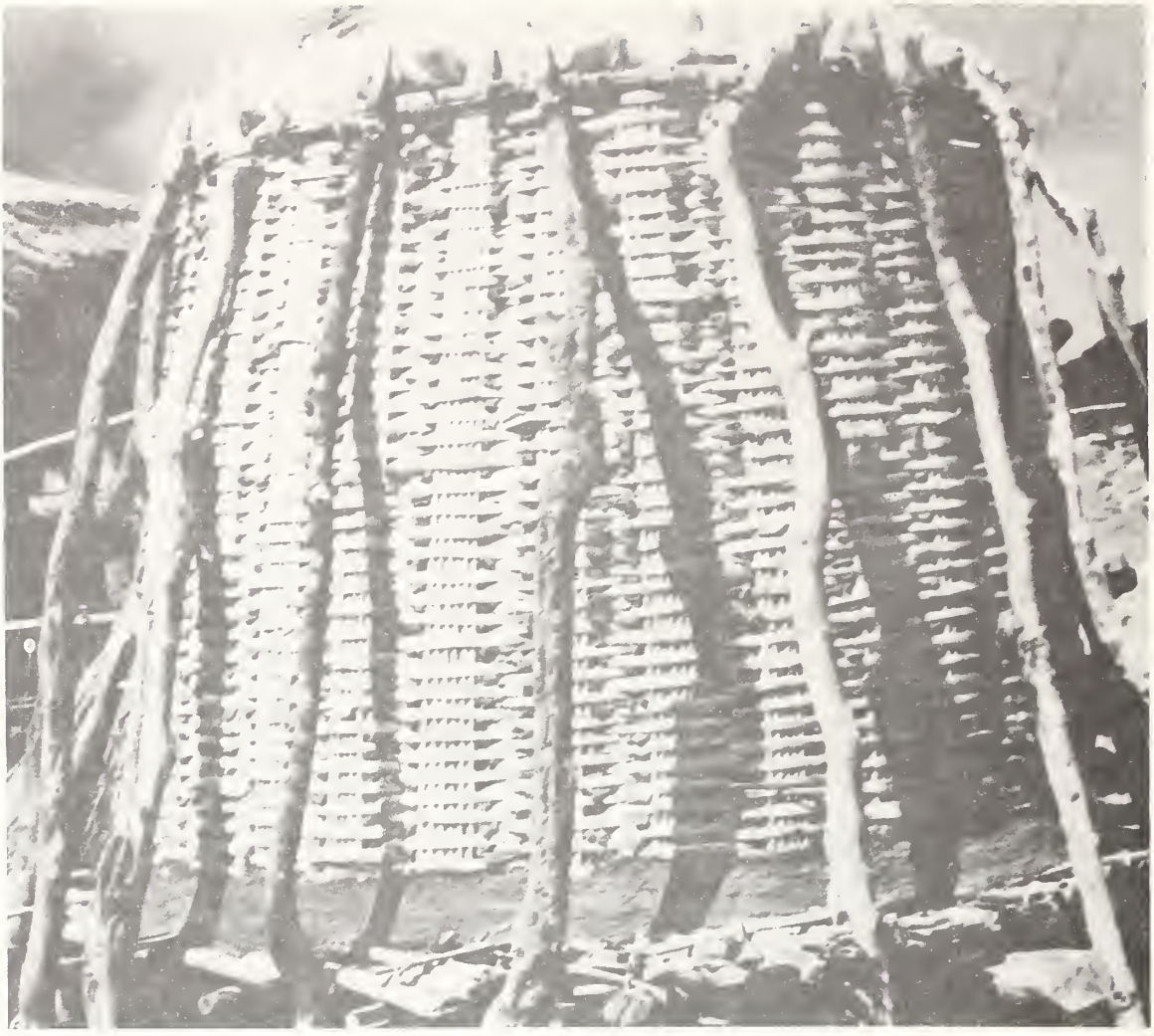
Corn entering the commercial market is sold to the Maize and Produce Board. The board's principal function is to ensure adequate supplies for domestic consumption. It has done this by establishing the producer price higher than the export price, storing surplus corn for deficit years, and importing corn when domestic supplies are inadequate. The board usually exports amounts that are in excess of its storage facilities. In the past, corn sold for export was sold at a loss, because the internal support price was higher than the world market price. The loss was charged to the producer the following year by imposition of a tax which in effect lowered the price he received for his crop.

The board is also responsible for providing a minimum financial return to all registered corn growers. Minimum qualifications for registration are at least 15 acres grown by a single farmer, a group of farmers on contiguous land, or the members of a cooperative society. As soon as a grower's registration is approved, he may apply through his local agricultural committee for an advance of up to approximately $10 an acre for planting and cultivation and $3 to $4 for harvesting; this is not given to the farmer but rather is paid to farm suppliers who have been approved by the Agricultural Committee. The farmer, in turn, gets the supplies he needs.

Many African smallholders, by adopting new or improved methods of corn and other grain storage, are increasing their supplies by as much as one-third to one-half. Among African subsistence farmers, facilities for onfarm storage of grains are generally inadequate. Storage facilities in Kenya range from traditionally built African structures to modern silos and warehouses. Construction is underway for the installation of a bulk handling system designed to reduce handling costs substantially. Rapid and

An inflated, plastic warehouse owned by Kenya's Maize and Produce Marketing Board and used for storage of corn for domestic, East African Community, and overseas markets. This portable warehouse, which can house 50,000 bags of corn, or 4,536 tons, is moisture-proof and can be fumigated.

(FAO photograph)



A typical woven-fiber bin used by Kenya's African farmers for storing corn for domestic use. The bin has a mud floor set on a platform of poles.

(FAO photograph)

economical movement of large quantities of corn from the major producing areas to Mombasa for export is anticipated.

Wheat

Wheat is grown and harvested almost entirely on large mechanized farms, mainly in Central and Rift Valley Provinces. It is planted during May-August and is harvested during November-February (app. table 6). Attempts have been made to develop wheat production on smallholder farms; approximately 2 percent of Kenya's total wheat production comes from these. Wheat is one of Kenya's major cereal export crops. Production in 1970 reached 8.1 million bushels. Despite wheat stem rust, production has been rising over the past decade as a result of the breeding program at Njoro. The increase in wheat production in Kenya is attributed primarily to increased acreage and improved seed. Wheat yields have varied from a low of 13.4 bushels per acre (1961) to a high of 23.5 (1967) (table 18). The average yield over the past decade has been about 18 bushels.

Wheat acreage nearly doubled from 1960 to 1971 (table 18). Substantial potential for wheat production exists in the Narok District of the Masailand area (fig. 1), where a possible 200,000 acres could be

Table 18—Area, production, and average yield per acre of wheat, Kenya, 1960-71

Year[1]	Area	Production	Average yield per acre
	1,000 acres	*Million bushels*	*Bushels*
1960	254	4.0	15.7
1961	231	3.1	13.4
1962	257	4.4	17.1
1963	292	4.8	16.4
1964	299	5.3	17.7
1965	324	4.9	15.1
1966	340	6.6	19.4
1967	374	8.8	23.5
1968	473	8.2	17.3
1969	406	7.7	19.0
1970	410	8.1	19.8
1971[2]	410	6.6	16.1

[1] Crop year beginning Nov. 1. [2] Estimate.

Source: East Africa Agriculture and Forestry Journal, Dec. 1970, vol. 36, p. 2.

planted. This area is now used primarily for nomadic grazing.

Marketing of wheat is handled by the Wheat Marketing Board. Like registered corn producers, wheat producers are guaranteed a minimum financial return per acre planted. Producer prices are set each year for specified acceptable grades of wheat, with a discount for wheat containing 10 percent or more of certain undesirable varieties. The board imposes a producer tax of 6 to 7 percent of the support price, depending on the grade of wheat produced, to get operating funds. These funds are used to support wheat breeding at the plant breeding station at Njoro; to contribute toward costs of rail transportation to enable Kenyan wheat to be priced at the mills in Dar es Salaam, Tanzania, at the same price as in Kenya; and to contribute toward marketing and storage costs.

Kenya exports wheat primarily to Uganda and Tanzania. In 1970, Uganda took $2.2 million worth and Tanzania $1.6 million.

Rice

Rice is grown primarily by Africans. The area served by the Mwea irrigation project (see irrigation section, p. 18) accounts for nine-tenths of Kenya's annual rice output. The area under irrigation in the Mwea scheme is 10,652 acres out of a national total of 12,165 acres of rice under irrigation (table 9). All the rice produced there is transplanted; the variety is Sindando, a medium-to-long slender grain variety which matures in approximately 6 months. One rice crop is grown each year. The long rainy season is the main period for rice growing. Rice harvesting takes place in December and January (app. table 6).

Kenya produced 34,000 tons of rice in 1971, the same as in 1970 but 15,000 tons above the 1961-65 average. Rice production has increased more than threefold since 1960 (table 11). Approximately two-thirds of the annual crop is sold for cash, mainly in local or nearby markets.

The outlook for increased rice production in Kenya is encouraging. If plans are carried out to increase the area under irrigation in the Mwea and other irrigation projects, production could be substantially increased, with a consequent possible surplus for export. The National Irrigation Board and the Mwea tenant farmers have completed a modern rice mill to handle current production and expected increases. Under the 1970-74 Development Plan, $778,000 has been allocated for extension of the Mwea project; $300,000 for construction of another mill at Mwea; nearly $1.3 million for the Tana River pilot rice project; and $1.2 million for rice mills to be constructed in Nyanza Province. (See pp. 18 and 19 for additional information on Kenya's irrigation schemes.)

Other Grains

Sorghum and millet, grown as subsistence crops, are the most important of the other grains produced. Total acreage of these crops is approximately 1.4 million—42 percent in sorghum, 33 percent in millet, and 25 percent in finger millet.

Two general types of millet are grown. In low-rainfall areas, the more rapidly maturing and drought-resistant type—ragimillet—is interplanted with sorghum, particularly when the earlier planted crop shows signs of failure. The second type—bullrush or cattail millet—is grown on the wet soils around Lake Victoria. Bullrush millet is of two types, one maturing in 3 to 4 months and the other in 6 to 7 months.

Although sorghum and millet are much less important than corn for the country as a whole, in some areas—such as parts of Nyanza and Western Provinces—they are major grains. During the past decade, sorghum and millet production has ranged from 293,000 to 380,000 tons (table 11). If new hybrid seeds are introduced, these grains may be used as livestock feed in the future. Millets are used in making the native beer, called pombe.

Barley is grown mainly in the large-farm sector and is used primarily for commercial beer production. On

the African smallholder farms, barley is used as feed for pigs. Production fluctuates widely from year to year, depending on rainfall distribution. During 1965-70, production averaged 12,000 tons. Export trade is negligible.

Oats production in 1965-70 averaged 10,000 tons. Negligible amounts are exported.

Oilseeds and Oil

Cottonseed and peanuts are Kenya's major oilseeds. Cottonseed production may increase substantially if plans to expand cotton growing are carried out. Castor beans, of less importance than cottonseed and peanuts, are produced mainly in the drier areas of Eastern Province. Most are collected from semiwild stands, because insect pests make production of cultivated stands uneconomical. The Government is conducting research on how best to overcome this problem. Other oil-bearing materials grown in Kenya are sesame seed and, on the coast, copra.

Research is being conducted on production possibilities of sunflower and soybeans. Sunflower appears to offer good potential as a cash crop, especially in dry areas. Soybean production has a future in the mechanized, large-scale farming sector.

Relatively small quantities of oilseeds are exported; most of Kenya's oilseed production (estimated to have averaged about 20,000 tons in recent years, excluding castor beans) is generally pressed for oil for domestic use. Imports of oilseeds as such are generally quite small. Most of Kenya's total supplies of vegetable oil are imported as oil; net imports of vegetable oil during the past several years averaged 20,000 tons, approximately half of which consisted of cottonseed oil from Uganda. Vegetable oil imports by Kenya probably will increase steadily over the next decade, and demand for vegetable oil should continue to increase by 7 to 10 percent annually. Kenyan oilseed processors have a preference for soybeans or peanuts for processing.

Sugarcane

Kenya's two major regions for growing sugarcane are east of Kisumu in Nyanza Province and the coastal region south of Mombasa on the Indian Ocean. Supplementary irrigation, selection of appropriate varieties, and control of smut are necessary for efficient production of sugarcane in Kenya. A substantial part of the sugarcane for centrifugal sugar is grown on plantations owned by the country's sugar factories. The remainder is supplied primarily by smallholders (table 19).

frican sugarcane cutters bundling the cane in Kisumu, Nyanza Province, for transport to the plantation's nearby processing factory. Kenya does not produce enough sugar for domestic needs; most imports come from Uganda.

Table 19—Sugarcane acreage in Kenya, 1967-71 and projections to 1974

Year	Large-scale farms	Smallholder farms	Total acreage
	Acres	*Acres*	*Acres*
1967	46,500	15,500	62,000
1968	51,500	20,700	72,200
1969	56,000	26,600	82,600
1970	59,500	31,100	90,600
1971	62,500	33,000	95,500
1972[1]	64,500	34,500	99,000
1973	64,500	35,500	100,000
1974	64,500	35,500	100,000

[1] 1972-74 data are projections.

Source: Kenya Ministry of Agriculture, Nairobi.

Kenya's raw sugar production has increased significantly over the past decade, rising from 37,000 tons in 1960 to a record 138,000 tons in 1971 (table 11). There is substantial potential for increasing sugarcane production in Kenya. An expansion in sugarcane acreage appears feasible. A requirement for increased yields is short-term credit availability, which producers would need to purchase fertilizers. If this credit problem can be solved, total sugar production may reach the Development Plan's target of 170,000 tons by 1974.

Kenya has four sugar factories—one each at Miwani, Muhoroni, and Chemilil in Nyanza Province, and one at Ramisi near Mombasa on the coast. The West German Government financed and constructed the factory at Muhoroni in 1966 and the one at Chemilil in 1968. A sugar factory under construction in the Mumias area is scheduled to be completed by 1973, with annual production of 44,000 tons planned for 1975.

Kenya imported 28,400 tons of sugar valued at $3.1 million in 1970. Of this, Uganda supplied 20,000 tons worth $2.2 million. Sugar consumption continued its upward trend in 1970; the rise is expected to continue during the 1970's at about 7 percent annually. Kenya is not likely to export refined sugar in the foreseeable future. However, the East African Community Secretariat is conducting a survey concerning the feasibility of making East Africa a net exporter of sugar.[9]

[9]Kenya, Uganda, and Tanzania are parties to the Commonwealth Sugar Agreement, signed in 1951. This is a long-term arrangement under which the United Kingdom obtains part of its sugar supply from certain Commonwealth countries. Parties to the Agreement are, on the one hand, the U.K. Ministry of Agriculture, Fisheries, and Food, and on the other, sugar interests in Australia, the West Indies, Guyana, Mauritius, Fiji, British Honduras, Kenya, Uganda, Tanzania, India, and Swaziland.

Horticultural Crops

Under Kenya's varied climatic and soil conditions, both temperate and tropical fruits and vegetables can be produced. The most important horticultural crops are pineapples for export and bananas for domestic consumption. Although Kenya produces a wide variety of fruits and vegetables for urban and hotel trade markets, export possibilities for fresh fruit are currently limited. In general, hauling distances are long and produce quality is not yet competitive with that of other producing countries. (Quality of the product is the prime requisite for success in exporting horticultural products.) However, the Kenya horticulture industry is growing rapidly and, as a result of general development in 1971, further increases in production and exports of both canned and fresh products can be expected.

Pineapples

In 1971, Kenya's pineapple production reached a record 44,000 tons (table 11). Except for a relatively small amount eaten fresh, most of the pineaple is canned.

Commercial pineapple production in Kenya requires about 3 years from planting to replanting; two crops are produced during this period. The first is harvested after about 21 months from the original plants (planted crop), the second about a year later from suckers (ratoon crop). Pineapple is planted during the fall to produce fruit two summers later.

Pineapple production increased moderately during 1962-68, when cannery intakes varied between 16,000 and 35,000 tons. During this period, the Government carried on a program to encourage smallholder production, but it suffered from a number of defects. Distribution of inputs was carried out without corresponding field extension work; the siting of expansion areas was frequently carried out without due regard to transport costs; there was competition from other cash crops; and there were problems with the quality of the fruit.

There is substantial potential for pineapple production in Kenya. Some of Kenya's pineapples are considered equal to Hawaiian, but the final canned product has not been uniform enough to compete effectively in the world market. In 1970, Kenya exported only 7,500 tons of canned pineapple, valued at $1.8 million. The United Kingdom is the major market for Kenya's pineapples.

One of Kenya's main pineapple canning firms—Kenya Canners Ltd.—plans to increase its capacity. And to increase the profitability of production for smallholders growing pineapples for

African women packing sliced pineapple for shipment to the United Kingdom. Kenya's raw pineapple production has expanded dramatically, from 12,000 tons in 1960 to 44,000 in 1971.

canning, plans have been developed to establish a cooperative scheme at Thika. Under this scheme, Kenya Canners would process the smallholders' output.

Cashew Nuts

Kenya's cashew production for 1971 reached a record 22,000 tons (in-shell basis). Production for the preceding 5 years averaged over 13,000 tons. Kenya's cashews are grown primarily by African smallholders, mostly in the humid southern part of Coast Province. As mentioned earlier, this is an attractive crop to the smallholder because it yields a cash income as an uncultivated crop. Prices paid Kenyan growers are reportedly the highest in the world. During the 1970 and 1971 seasons, grower prices remained relatively constant at approximately 7 cents per pound.

Kenya shares fifth place with Brazil among commercial cashew-producing nations. A substantial portion of Kenya's cashew nuts are exported unprocessed to India, where they are roasted and shelled by hand before delivery to the United States, Western Europe, and the Soviet Union. In 1970, Kenya exported 2,200 tons of unshelled cashew nuts, worth about $5 million, to India. In recent years, 900 to 1,100 tons have been processed in Kenya and exported in sealed tins to the United States. The United States is the world's leading cashew nut market, accounting for approximately 50 percent of world sales. The Soviet Union ranks second, importing 25 percent of the total. The remainder is equally divided among West European and other nations.

Cashew trees grow quickly and start producing nuts in their third year in the field. Kenya's improved plantings average about 530 pounds of nuts per acre, with yields as high as 1,500 pounds being obtained on experimental plots. Good yields can be obtained without fertilizers or manures and only a little pruning is necessary beneath the trees for nut collection and weed control.

Production is expected to double as nonbearing acreage matures and Government-sponsored planting programs are continued. As yields increase, it may become economically feasible to introduce mechanized shelling facilities in Kenya. Previously, production levels did not justify the large capital investment requirement—over $1 million per shelling

plant. A mechanical decorticator is currently being operated on an experimental basis at Kilifi, where there is also a manual processing plant.

While the kernel is the most important cashew nut product (used for dessert and confectionary purposes), the cashew nut shell liquid (CNSL) is also extremely valuable. The main components of CNSL are cardol, cardinol, and anacardic acid. All three are used in a number of industrial and pharmaceutical products including paints, plastics, and aircraft components.

Shelling of the raw nut is one of the greatest problems facing the cashew industry. Because CNSL is caustic, it blisters the skin of anyone coming into contact with it. In addition, unless it is carefully removed, it can contaminate the kernels.

On smallholder farms and on the few large-scale farms that grow cashews, the traditional method of processing is roasting in drums, which makes the shells sufficiently brittle for them to be cracked. If the nuts are roasted in drums, the valuable CNSL is destroyed; if they are roasted in a bath of CNSL, the liquid is extracted and retained. Baths of the nut liquid at temperatures of 356-365° F. are employed in the mechnical processing plant at Kilifi. During hand shelling at the other Kilifi plant, the nuts and the workers' hands are kept dusted with wood ash to prevent skin blistering and kernel contamination by any CNSL remaining on the shell.

Kenya's first commercial establishment in the cashew industry was a processing plant with exclusive license for handling the entire crop. This factory used the drum roast process until 1963, when it merged with another firm, and erected a CNSL extraction plant. However, laborers complained that the oil burned their hands when they handled the nuts. This led to high absenteeism, resulting in sharply lowered output; thus, the firm was forced to return to the drum roast process.

Raw nuts were first exported from Kenya during the 1955-56 market season, when production exceeded the capacity of the above-mentioned plant. Competition for available supplies between local processors and exporters of raw cashews was severe; exporters were able to pay a higher price for the nuts, and processors had difficulty in obtaining sufficient quantities to operate their plants at full capacity.

An inadequate supply of skilled labor and a lack of investment capital are the principal constraints to the development of Kenya's cashew processing industry. If Kenya realizes its goals of increased yields and development of a processing industry, a new source of cashew kernels will become available to the United States. Kenya has to compete with Mozambique—the world's largest producer—and with India and Tanzania, also much larger producers than Kenya. But demand for cashew nut kernels is expected to continue to grow in the United States, Western Europe, and Russia.

Other Crops

Tomatoes are grown in most parts of Kenya, but imports of tomato products are necessary. Plans call for an increase in tomato production and further development of the processing industry to enable the country to discontinue its imports. A cannery in Thika (Central Province) annually processes about 5,000 tons of vegetables, including beans, peas, tomatoes for juice, sweet corn, carrots, and mixed vegetables. Another vegetable processing plant is located at Naivasha, in Rift Valley Province.

Bananas are the principal fruit produced for domestic consumption. Other fruits include citrus fruit, mangoes, passion fruits, grapes, and strawberries, as well as some deciduous fruit such as apples, pears, and plums. Coconuts and macadamia nuts are also produced. Small quantities of coconuts, mangoes, and citrus fruits are exported. Strawberries are exported fresh to neighboring countries and by air to the United Kingdom. Plantings of passion fruit to be used for juice have been expanding, and a small export trade in this product exists. The 1970-74 Development Plan calls for expanding the production of a number of fruits and nuts including apples, pears, dates, macadamia nuts, and coconuts.

Tobacco

Kenya's production of tobacco is regulated by agreement with the other two East African countries, Uganda and Tanzania. Moreover, only very limited areas of Kenya are suitable for growing leaf tobacco. Small quantities of tobacco are produced in Central and Eastern Provinces. This tobacco consists of snuff tobacco for domestic consumption and flue-cured tobacco. Experiments with air-cured tobacco have been made in certain areas of Kenya, but there is not much likelihood of substantially increasing production at present. In all three East African countries, tobacco is marketed by the East African Tobacco Company, Ltd., which purchases the entire output to controlled prices. Most of Kenya's supplies of tobacco come from Uganda and Tanzania. The United States is the only other supplier of significant quantities. Kenya's total imports of unmanufactured tobacco in 1970 were 2,800 tons valued at about $4 million.

Cotton

Although not a major crop in Kenya as it is in the rest of East Africa, cotton is an important cash crop

in the smallholder sector. It is grown exclusively on African farms. The area planted to cotton in 1971 was estimated at 120,000 acres. Approximately two-thirds is in Nyanza and Western Provinces, most of the remainder is in Coast Province, and a small amount is in Eastern Province. Some Coast Province cotton is grown on irrigated land around the Tana River. However, most of Kenya's cotton is grown without irrigation. The area in unirrigated cotton could be expanded considerably. Some of the area which will become available under irrigation projects in the 1970-74 Development Plan may also be devoted to cotton.

Cotton lint production increased from 2,000 tons in 1960 to 6,000 tons in 1971 (table 11). Average yields are low—less than 250 pounds of seed cotton per acre—although yields of over 400 pounds are being achieved in some districts through improved farming and cultural methods. However, during the past few years, it has become clear that expectations for cotton production have been too optimistic, and resources have been used with little or no return in terms of rising output and better yields. Because of the very low yields, the economic benefits to farmers are not very attractive; hence they prefer to grow other crops.

The Cotton Lint and Seed Marketing Board, established in 1954, is responsible for the promotion of cotton production and for marketing.

Kenya has good facilities for cotton processing. The country's 10 cotton ginneries can handle as much as 20,000 tons of seed cotton in a 6-month ginning season. Although most of the cotton is exported, the amount consumed by the domestic textile industry has been increasing. As late as 1950, Kenya was entirely dependent on imports of textiles, but by 1970 it had 12 textile manufacturing plants in operation.

To achieve the Development Plan's 1974 target of 20,000 tons of seed cotton per year, Kenya will have to increase production by 14,000 tons by 1974. This increase will have to come mainly from an increase in average yield per acre, since returns to farmers are so low that there is little incentive to expand production—particularly when cotton competes with food crops for labor. It is important to Kenya's economy that cotton production be made more attractive. A concerted cotton production program would require an improved extension service and short-term credit for the purchase of necessary inputs. The present strength of the extension service operated by the Cotton Lint and Seed Marketing Board may be sufficient to accomplish the program if extension workers concentrate on assisting the more progressive cotton growers. It is estimated that each extension worker could supervise production of about 250 acres of cotton. Extension efforts would concentrate on proper planting and weeding techniques as well as input use. Farmer's short-term credit requirements under this "package program" would total approximately $600,000 annually. If cotton output is to be expanded, another requirement is an expanded research program, particularly on the development of varieties with a higher lint content than the present 32 percent.

LIVESTOCK PRODUCTION

Livestock and livestock products contribute about 15 percent of Kenya's total agricultural income. Livestock products—primarily meat and preparations, dairy products, and hides and skins—have accounted for approximately 14 percent of the value of total agricultural exports in recent years. Imports of livestock products consist chiefly of animal fats and nonfat dry milk.

In 1970, Kenya had about 7.9 million head of cattle, 7.6 million sheep, and 6.8 million goats (table 20). Approximately 70 percent of the cattle are East African Zebu types. In the dairy sector, Holstein, Jersey, Guernsey, and Ayrshire cattle are of increasing importance; about 2,000 head of these cattle and other exotic dairy stock are on large livestock farms and Government-operated ranches.

There is substantial room for improvement in livestock quality and productivity in Kenya. The

Table 20—Livestock numbers in Kenya, 1960-70

Year beginning August 1	Cattle	Sheep	Goats	Pigs
	Thou.	*Thou.*	*Thou.*	*Thou.*
1960	7,442	5,056	6,500	41
1961	7,386	5,004	6,400	35
1962	7,313	4,997	6,600	35
1963	7,336	4,928	6,200	37
1964	7,206	5,027	6,300	36
1965	7,740	7,000	6,400	31
1966	7,730	7,200	6,500	26
1967	7,750	7,300	6,600	29
1968	7,800	7,450	6,700	28
1969	7,850	7,500	6,800	27
1970[1]	7,900	7,550	6,800	27

[1] Estimated.

Source: Production Yearbooks, 1960-70, Food and Agriculture Organization of the U.N.

extensive grazing lands favor further development of an already substantial livestock and dairy industry. Development and effective utilization of livestock are of increasing importance as a means of diversifying agricultural production and adding protein to the diet of the people.

Kenya's livestock production varies considerably depending on whether it is carried out on large commercial ranches, on subsistence and smallholder farms, or by nomadic or seminomadic herdsmen. In the Highlands area of Eastern, Central, and Rift Valley Provinces, large-scale farmers raise livestock commercially on mixed farms or large ranches, using modern methods of livestock management (app. table 8). In the arable farming areas of southwestern Kenya and in Coast Province, African farmers raise livestock as well as crops. Few of them operate well-integrated crop-livestock farms, though climatic conditions in a large part of these areas would make this possible. Nomadic or seminomadic livestock raising is practiced by the Turkana, Samburu, and other nomadic tribes occupying the vast northern and northeastern areas of Kenya. These tribes have large numbers of cattle and some goats and sheep. Masai herdsmen are located in the southern and southwestern parts of Kenya.

Cattle

The predominant type of native cattle is the East African Zebu. These animals are characterized by their ability to withstand hardship and to reproduce under minimum rations. In general, they are undersized, of poor conformation, and of low meat and milk productivity. In western Kenya, the Zebu is short-horned and is commonly called Nandi. Boran cattle, predominant in northern Kenya, are large compared with other African types. Even so, the average live weight of a mature Boran seldom exceeds 450 to 500 kilograms at 3 years of age.

For many years, Kenya has carried out a program to improve African-owned cattle. Most of the cattle held by Africans are unimproved native breeds. In recent years, the Ministry of Agriculture's Department of Veterinary Services has crossed Nandi and other cattle with Sahiwal stock from India and Pakistan, and sold the improved animals as breeding stock to African farmers. The 1970-74 Development Plan calls for expanding the herd of Sahiwal cattle because of their milk potential and for distributing these animals in minimum and low rainfall areas where European breeds are not suitable.

Government livestock centers have held numerous courses to teach Africans to manage their livestock. African farmers, primarily in Central Province, have also benefited from the Government's promotion of artificial insemination of cattle. In general, African-owned cattle have not been integrated into a mixed farming system. Most of the African cattle sold commercially to abattoirs are driven to market along established cattle routes.

Sheep and Goats

Sheep and goat skins are an important source of income for many of Kenya's livestock producers. Sheep and goats are frequently herded together in semiarid areas, and the condition of the animals is generally poor. Large numbers of sheep and goats are in the most northern and northeastern areas and other similarly arid areas in Kenya.

There were 7.6 million sheep in Kenya in 1970. Through crossbreeding, there has been some progress in improving sheep quality. The large commercial farms in the Highlands stock Merinos and Corriedales, both wool breeds. European meat and wool breeds were first introduced to large ranches in the Highlands in the early 1900's, but with large losses of animals in the early days. Kenya is exporting small quantities of wool to world markets from the improved European wool breeds.

In 1970, there were 6.8 million goats in Kenya. The native goat, which is short haired, is relatively small but hardy, generally having to exist under conditions even more severe than those encountered by cattle and sheep. Goats often browse on shrubs and vegetation in areas where cattle and sheep can no longer be maintained. They are useful in controlling Kenya's bushland.

Other Livestock

Hogs

There were approximately 27,000 hogs in Kenya in 1970. Breeds raised commercially are the Large White and the Landrace, both excellent pork producers. They are raised primarily on large European farms. Attempts are being made to extend production to smallholder farms. In the past, Africans have seldom raised hogs or consumed meat from hogs.

The domestic market can absorb about half the products derived from hog slaughter, and the remainder is exported—mainly to Uganda, Tanzania, and Zambia. The industry has been going through a difficult phase for several years; deliveries to the established factories and licensed butchers have declined gradually, although some evidence

East African Zebu cattle moving over managed rangeland on a large, European-owned ranch in the Highlands. Kenya's large ranches and the growing number of African smallholder ranches are unable to meet all domestic demand for fresh beef and foreign demand for Kenyan canned beef.

A young herdsman of Masai-owned cattle moving the animals over communal grazing land in southern Kenya. Output of livestock products from nomadic tribes is substantially below potential because of overgrazing and inadequate breeding and disease controls.

suggests that unrecorded sales to small rural butchers have been rising. The basic problem affecting hog raising is the high cost of production, which is mainly due to the high cost of feed. This makes hog meat in any form a relatively expensive luxury compared with beef or mutton. Production costs are also too high to enable substantial exports to be built up—outside East Africa, these are sometimes made at a loss. Costs have risen particularly since 1965, when the prices of hog feed rose sharply following shortages of cereals for feed. However, cereals are now relatively cheap and are expected to remain so. Also, Kenya is making efforts to develop soybean production; if these are successful, a relatively cheap protein important for the production of hog feeds will become available.

Despite the above considerations, annual growth of only 2 percent is foreseen for hog production, and this will be conditional on the availability of cheap feed and the ability of the extension services to interest more farmers in hog production. A relatively strong extension unit is expected to be built up with Danish assistance, and the Kenya Government hopes that this unit will make an important contribution towards improvement in hog husbandry. Many smallholder producers are relatively new to hog farming, and the general standard of management is low. However, the growth of hog farming among smallholders in the Nyeri area during the last few years has demonstrated that hog production can be successfully established among these farmers. But large-scale producers will continue to account for the bulk of deliveries, particularly of the higher quality bacon.

Ninety percent of production is delivered to the Uplands Bacon Factory, which has a capacity about twice that of deliveries made to it. Nonetheless, additional investment in the factory is essential to give it greater flexibility, particularly to enable more canning to be undertaken. About $250,000 will be necessary for this, but this sum is not included in the 1970-74 budgeted development expenditures for livestock.

Crucial for the industry is continued enforcement of the very stringent regulations about foot and mouth disease in the areas surrounding the factory. Unless these are maintained, exports will be adversely affected because of disease control regulations in importing countries. Any serious drop in the level of exports would irreparably damage the industry as the domestic market is very small and factory unit costs of production would rise sharply if it produced only for the domestic market.

Poultry

Most poultry are on smallholder farms, and only a few eggs are produced for family consumption and for sale. Commercial poultry, mainly chickens, numbered about 300,000 in 1970.

The domestic market—which receives almost all production—is relatively small. Urban and rural consumption are growing and will probably continue to do so if prices of poultry products fall; for lower prices, cheaper feeds would have to be available and management capabilities improved. A modern hatchery has been established with the participation of the Agricultural Development Corporation to supply high quality layers and broilers to producers for the domestic market. It is also expected that a significant level of exports will be built up from this hatchery. Some producers have occasionally expressed the view that a single marketing organization for poultry would be desirable to help even out gluts and shortages in production.

Livestock Diseases

Rinderpest, East Coast fever, foot and mouth disease, and trypanosomiasis (carried by the tsetse fly) are the major livestock diseases in Kenya.

Rinderpest and East Coast fever cause losses occasionally, although in recent years reasonably good control has been maintained by vaccination at watering places along stock routes.

To control external parasites, dipping and spraying are carried on continuously throughout the year. However, to bring about more widespread adoption of these techniques by African herders, the Government must develop more effective and more economical means of bringing the necessary equipment to the hinterland.

There are 22 different species of tsetse flies (Glossina) within the tsetse fly belt in Africa, an area larger than the United States including Alaska. They can live in any type of vegetation from dense rain forest to dry thorn scrub. Trypanosomiasis of domestic animals prevents maintenance of draft animals needed for plowing and transport of agricultural commodities. In general, human trypanosomiasis—sleeping sickness—has been brought under relatively good control as a result of intensive efforts during the past few decades.

USDA and US/AID specialists in Eastern and Central Africa have recently been successful in developing a sterility method to control or eradicate tsetse flies. The major problem at the present time is the need for mass raising of the tsetse fly in captivity

by use of artificial membranes. A research station has recently been established at Tanga, Tanzania, to carry forward this work. In Kenya, the Department of Veterinary-Services participates in a program to reclaim large areas infested by the tsetse fly. This program is coordinated and sponsored by the East African Community.

Areas of high incidence to tsetse fly infestation in Kenya are in the vicinity of Lake Victoria and the Gulf of Kavirondo. The southern portion of the Lake Victoria area has been almost entirely cleared of infestation. Infested areas are also found in Coast, Eastern, and Rift Valley Provinces (fig. 3). In all of these areas, tsetse flies are vectors of bovine trypanosomiasis, a disease that makes livestock production impossible or extremely difficult, depending on the degree of infestation. In addition, parts of western Kenya are infested with tsetse flies which carry human sleeping sickness, making human settlement impossible and causing considerable suffering.

A substantial amount of financing is needed to eradicate tsetse fly infestation in Kenya so as to make additional large acreages available for settlement and farming. Continued control will necessitate the maintenance of boundary lines. The area requiring the closest attention over the next few years is along the border of Tanzania.

As a result of tsetse fly clearance programs in Kenya over the past 5 years, tsetse flies have been eradicated in the Busia District of Western Province. They have also been recently eradicated from the Luambwa Valley in southern Nyanza Province through conventional spraying by air. As a result, approximately 200,000 acres of land have become available for settlement and agricultural development there. A new tsetse fly eradication program is underway in the Elgeyo Marakwet District and in the Kerio Valley in Baringo District, Rift Valley Province. Approximately 300,000 acres of land in this area are infested with tsetse flies. Eradication will open up the area for human settlement and livestock production.

The Livestock-Wildlife Dilemma

Wild game and migrating unprotected animals can be reservoirs of trypanosomes, periodically reintroducing the tsetse fly to cleared areas. In addition, the bush vegetation which supports African game animals can be the habitat for tsetse flies. These two factors present a persistent dilemma to Kenya and other African countries—that of maintaining the valuable wildlife resource and at the same time developing the livestock sector and keeping the stock disease-free. A related problem concerns developing livestock on land in wildlife areas. Should the land be left to support the wild animals or should it be claimed for livestock operations?

Essentially, it is a problem of establishing priorities for individual areas. With proper management, the wildlife and livestock sectors can both be maintained in the country as a whole. Flora and fauna studies are needed to properly assess (1) the effects on vegetation of different grazing practices; (2) seasonality in movements of wildlife from area to area; and (3) wildlife cropping possibilities. Studies of pathological relationships between wildlife and livestock and economic studies of wildlife populations and the costs of alternative range development programs are fundamental to understanding the wildlife-livestock dilemma in Kenya and other sub-Saharan African countries.

Livestock Research

The major problem for veterinary research in Kenya, as in the other countries of East Africa, is disease control. Until certain diseases are controlled, external markets for the region's livestock and fresh animal products will be restricted. Research in animal disease control is also important to human beings since so many of the local animal diseases—such as trypanosomiasis, brucellosis, and rabies—also affect them.

Livestock research is conducted at the Kabete Veterinary Laboratory near Nairobi and at the Naivasha Experimental Station. Both are concerned primarily with applied research. More basic veterinary research is carried on by the long-established and well-known East African Veterinary Research Organization at Muguga. Some pasture and range research is also carried out by this organization. In addition to the regular staff, visiting livestock research specialists perform research at Muguga for short periods of time to study indigenous animal diseases and pests. The organization is operated and maintained by the East African Community with some assistance from the United Kingdom and the U.S. Agency for International Development.

Basic veterinary research is also performed at the Wellcome Foundation, near Kabete. In addition, this organization supervises distribution of foot and mouth disease vaccine throughout Kenya. The Wellcome Foundation is operated by the Kenya Government.

The Faculty of Veterinary Medicine, University of

Nairobi, Kabete, was established in the late 1960's. Financial and research assistance was given by veterinary colleges in the United States and the United Kingdom.

Most animal disease problems in Kenya are common to the three countries of East Africa. Because of the more advanced state of livestock and dairying in Kenya, more research work there will tend to cover diseases encountered in Uganda and Tanzania. However, the more research that can be conducted on a regional basis, the greater the economy of effort. Physical and operating facilities at Kabete, Kenya, though good, are crowded. Kabete could be used as a regional diagnostic institute which might also undertake short-term investigatory work and produce some biological controls for all of East Africa.

Kenya has an ongoing research program in processing animal products that is important for the country's economy since the current disease situation restricts the market for fresh products. There are large numbers of old cattle, sheep and goats, and even some wild game which could be converted near the point of origin into edible meat products However, further research on flavor, nutritive value, and utilization of livestock is needed.

Livestock Products

Meat

Kenya's meat production increased from 160,000 tons in 1960 to 215,000 tons in 1970. Beef accounts for 75 percent of total production. A substantial share of meat production is consumed by Kenya's farm families themselves or is sold or bartered locally. In particular, mutton and goat meat are produced mainly for home consumption. Poultry meat and pork represent a relatively insignificant share of total meat production. A considerable amount of game is consumed annually.

Exports of canned meat and meat preparations—primarily from the commercial sector—were valued at approximately $9 million in 1970. The major customer is the United Kingdom, which takes about half of Kenya's canned meat for export annually. Relatively low production costs give Kenya's canned meat exports a competitive advantage in world markets. The main meat products exported are canned corned beef, meat extract, and frozen beef. Carcass beef is sold primarily to Middle East countries.

A large share of cattle from the African sector do not meet the sanitary standards and quarantine regulations for carcass beef of most West European countries. In addition, because meat processors are handicapped by an inadequate and unstable supply of quality cattle for slaughter, it is difficult for the industry to meet planned slaughter schedules, to maintain efficient operation of the abattoirs, and to employ effective marketing procedures.

The Kenya Meat Commission (KMC) purchases, processes, and markets the bulk of Kenya's commercial meat products. However, only a relatively small proportion of the total cattle slaughtered go through the KMC or other officially inspected facilities during the slaughtering process. The commission operates four abattoirs. The largest is at Athi River, just southeast of Nairobi. Another is in Mombasa, and two smaller ones are in Nakuru and Eldoret in Rift Valley Province. An abattoir formerly maintained in Nairobi has been converted into a wholesale meat depot.

Dairy Products

Milk output—subsistence and commercial—has increased substantially since 1960, rising from an estimated 300,000 tons in that year to 350,000 tons in 1970. About half of the milk output is used for production of butterfat, one-fourth is delivered as fresh milk, and the remainder is used on the farm as food and feed. Commercial milk production increased from almost 69 million gallons in 1966 to 79 million gallons in 1970 (table 21).

The dairy industry was under the jurisdiction of the Kenya Dairy Board from 1960 to 1966; the board was then replaced by the Kenya Creameries Commission (similar to milk marketing boards in the United Kingdom). The commission is charged with supervision and control of the dairy industry and of dairy import and export trade. Kenya Cooperative Creameries, Ltd., a profit-making cooperative which owns nine creameries, acts as the commission's agent in handling, processing, and selling dairy products. It collects and supplies whole milk to distributors; manufacturers butter, ghee, and relatively small quantities of cheese (mainly cheddar), dried skim and whole milk, condensed milk, casein, and ice cream; and handles domestic and foreign sales of dairy products. Fresh milk is marketed commercially mainly to the Nairobi and Mombasa areas; however, dairy products have been shipped into Uganda.

Most of the African-owned dairy cattle in Kenya are Zebu cattle, which produce very little milk. Large-scale commercial dairy production depends primarily on a much higher yielding grade of cattle. Future development of dairying will depend largely on

Table 21—Kenya's commercial dairy production, 1966-70

Year	Whole milk	Milk used for manufacture of—						All milk
		Cheese	Butter	Ghee	Dried powdered milk	Other milk products	Total	
	Gallons	*Gallons*	*Gallons*	*Gallons*	*Gallons*	*Gallons*	*Gallons*	*Gallons*
1966	23,576,562	1,556,519	25,030,845	11,879,950	1,391,938	5,192,360	45,051,612	68,628,174
1967	25,777,668	1,398,014	26,114,227	4,120,338	2,166,499	5,930,993	39,730,071	65,507,739
1968	25,595,387	1,245,321	26,393,724	6,416,811	2,493,020	7,214,883	43,763,759	69,359,146
1969	26,986,004	1,213,092	23,317,670	6,456,173	3,040,390	7,902,003	41,929,328	68,915,332
1970	27,267,350	1,217,054	26,377,610	5,846,193	4,656,349	13,634,864	51,732,070	78,999,420

Source: Kenya Cooperative Creameries, Ltd., and Kenya Dairy Board, Nairobi.

increasing the number and productivity of animals of this grade. Improving the processing and marketing of dairy products is also vital to the growth of the industry.

Hides and Skins

Hides and skins have been a fairly important export of Kenya's livestock industry. The quantity exported fluctuates widely, depending on world prices and domestic slaughter rates. Hides are a major source of cash income for the majority of African cattle raisers.

Production of hides and skins increased from 22,000 tons in 1960 to 28,000 tons in 1970, when exports totaled 6,000 tons valued at about $4.9 million—about 3 percent of the value of all agricultural exports. Better preparation methods could raise the export value considerably. The Department of Veterinary Services and specialists of the East African Community have carried on training demonstrations in rural areas to improve grading, processing, and quality. Exports go mainly to the United Kingdom and other West European countries.

Livestock Management

Despite considerable improvement since 1960, Kenya's output of livestock products is substantially below its potential because of poor grazing management and inadequate breeding and disease controls in the African sector, mainly among nomadic herders. Because ownership of large numbers of livestock among the Masai, Turkana, and Samburu tribes brings prestige, provides a bride's price, and is a form of wealth, herds are not culled of old or poorer grade livestock. Nomadic livestock are privately owned but are grazed on a communal-grazing and open-land basis and allowed to run together and to breed freely. One herder, often a small boy, may take care of the stock of 10 owners; at the end of the day the cattle are returned to each farmer's boma (corral) near his home. There is often competition between groups for available water supplies and grazing. Herdsmen sometimes move their animals across borders to adjacent countries in periods of drought. Water for livestock, especially in the subsistence sector, is generally scarce, particularly during the dry season; few wells and ponds have been provided. In some areas, the number of livestock far exceeds the land's grazing capacity. Areas around water are overgrazed while other areas remain unused. Constant grazing precludes the recovery of natural grassland. Most cattle of the nomadic herdsmen suffer from a lack of salt, a luxury even for the average farmer's own use. Fences are rare, although thorny bushes are used as barriers.

On the large commercial farms, temporary or permanent meadows (grass leys) have provided good pasture for dairy cows. Beef cattle graze almost entirely on uncultivated meadows and rangelands. Feedstuffs used include corn and corn fodder and grain sorghum. In general, grazing areas on large farms have been well managed.

Provision of adequate water supplies to enable proper management of grazing in semiarid areas has been important in the Government's controlled-grazing projects. The Government's policy has been first to make use of existing surface water; second to augment this by means of dams, weirs, reservoirs, or tanks to make use of rainfall; and third to tap underground water supplies.

Provision of water for livestock is one of the means the Government uses to gain support for its grazing projects. To improve water supplies, the Government must first make sure that grazing projects will be acceptable to the population. Otherwise, larger supplies of water may simply result in increased

Dairy cattle grazing on a large, European-owned dairy farm in the Highlands. Kenya's commercial milk production jumped from 68.6 million gallons in 1966 to 79.0 million in 1970, partly because of Kenya's notable success in bringing African smallholders into the commercial dairy sector and partly because of use of improved breeds, such as Holstein, Jersey, Guernsey, and Ayrshire.

numbers of livestock and greater deterioration of grassland.

Under the Ministry of Agriculture, the Range Management Division's objective has been to improve grazing practices. It makes loans to grazing associations for general basic improvements, water development, dipping and loading facilities, and mechanical equipment, and it supplies technical and managerial assistance and advice. The division has also encouraged improved animal husbandry techniques. These include dipping to control tick-borne diseases, routine vaccination of cattle and sheep, artificial insemination, rotation of pastures, and provision of fodder crops against drought conditions.

FOOD CONSUMPTION

Food consumption in Kenya during 1964-66 averaged 2,216 calories daily (table 22). By 1975, it may reach 2,560 calories. Kenya is generally self-sufficient in food measured by caloric intake. Important food deficits are sugar and vegetable oils.

Cereals account for approximately three-fifths of the caloric intake, and starchy foods—sweetpotatoes, potatoes, cassava, and bananas—account for about one-eighth. Consumption of sugar, although relatively low, is at about the average for East Africa. Corn is the most important single food consumed in Kenya. Fresh fruits and vegetables are of minor significance, and consumption of fats and oils is also relatively small. Consumption of milk and meat (excluding poultry meat and pork) is relatively high.

Table 22—Kenya's food balance, 1964-66 average[1]

Product	Supply				Supply used for food		
	Production	Imports	Exports	Total	Total	Per capita	
						Per year	Per day
	1,000 metric tons	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*1,000 metric tons*	*Kilograms*	*Calories*
Wheat	137	10	40	107	66	7.0	70
Corn	1,242	88	3	1,327	979	104.5	1,031
Sorghum and millet	237	---	---	237	232	24.7	232
Rice, milled	11	3	2	12	12	1.3	13
Oats	1	---	---	1	---	---	---
Total cereals	1,628	101	45	1,684	1,289	137.5	1,346
Cassava	600	1	---	601	391	41.7	125
Sweetpotatoes	453	---	---	453	276	29.5	76
Potatoes	193	1	7	187	106	11.4	22
Pulses	270	12	10	272	222	23.7	221
Other vegetables	250	3	1	252	226	24.1	14
Bananas	283	---	---	284	256	27.3	53
Pineapples	27	---	7	20	11	1.2	1
Other fruits	35	1	---	---	32	3.4	4
Sugar	52	70	---	112	112	11.9	126
Meat[2]	203	---	16	187	187	20.0	107
Fish	20	1	---	21	19	2.1	6
Vegetable oils[3]	6	19	3	22	11	1.2	28
Milk[4]	610	2	19	593	330	35.2	70
Fats[5]	10	7	3	14	7	.7	[6]2,216

-- = none or negligible.

[1] Based on midyear 1965 population of 9,365,000. Excludes alcoholic beverages. Total "utilization" reflects extraction rates for grains as follows: wheat, 74 percent; corn, sorghum, and millet, 90 percent. Trade for corn includes grain equivalent of meal. Extraction rate for raw sugar is 94 percent. [2] Carcass weight. Beef, veal, mutton, lamb, and pork. [3] Oil equivalent of edible oil-bearing seeds including copra and palm kernels. [4] Cow, sheep, and goat milk. Production excludes the amount fed to young stock. Trade and consumption include the whole milk equivalent of imported canned, powdered, and dried milk. [5] Includes butter, animal fats, lard and shortening, tallow, and ghee. [6] Total caloric intake.

Source: Food and Agriculture Organization of the U.N., Rome.

Fish consumption is unusually low. Among Africans, tribal taboos keep production and consumption of eggs very low.

Demand for wheat flour and livestock products is rising and—with further economic development and urbanization, accompanied by rising incomes and levels of living—will further increase substantially. Kenya might have to import some additional food items to meet internal demands and also increasing demands in the tourist hotel trade.

AGRICULTURAL MARKETING

Commodity and Marketing Boards

Commodity and marketing boards are basic elements in Kenya's commercial agricultural structure and policy. There are special boards for the long-established major export commodities of coffee, tea, pyrethrum, and sisal, and for wheat, corn, horticultural products, canning crops, meat, and dairy products. The Cotton Lint and Seed Marketing Board and the Maize and Produce Marketing Board are responsible for marketing a large variety of crops which have no special marketing boards. All of these marketing boards are under the supervision of the Ministry of Cooperatives and Marketing. They have the power to set standards of quality for commercial products and to determine the price and control the flow of commodities to be marketed. (See table 23

for average price to producer for major crops in 1960-69.) Direct price support from marketing boards is limited to wheat, corn, and barley, subject to the guaranteed minimum-returns system. Agricultural products are sold through the marketing boards and also through the Kenya Meat Commission, the Kenya Farmer's Association, the Kenya Cooperative Creameries, and other cooperatives.

Table 23—Average price to producer for selected crops in Kenya, 1960-69

Crop	1960	1961	1962	1963	1964
	Dollars per metric ton	*Dollars per metric ton*	*Dollars per metric ton*	*Dollars per metric ton*	*Dollars per metric ton*
Wheat	57.62	73.02	73.02	74.55	73.18
Corn	50.40	54.67	44.70	45.98	50.66
Clean coffee	987.67	924.29	937.86	800.50	979.98
Pyrethrum extract[1]	57.57	47.98	39.06	39.82	44.71
Sisal	204.05	184.33	196.05	311.63	277.75
Tea	1,113.19	1,097.63	1,184.11	1,086.38	1,009.38
Seed cotton	134.26	158.60	154.54	151.20	151.20
	1965	1966	1967	1968	1969
	Dollars per metric ton	*Dollars per metric ton*	*Dollars per metric ton*	*Dollars per metric ton*	*Dollars per metric ton*
Wheat	72.78	75.71	78.79	78.76	72.38
Corn	49.74	56.10	49.26	43.12	43.12
Clean coffee	933.78	916.42	816.18	896.54	811.98
Pyrethrum extract[1]	53.15	58.21	55.56	48.22	49.00
Sisal	171.36	150.92	129.92	122.36	126.00
Tea	1,037.38	1,009.20	1,096.18	818.98	809.18
Seed cotton	145.60	133.00	133.00	137.20	137.20

[1] Dollars per kilogram.

Source: Statistical Abstract, Kenya Ministry of Economic Planning and Development, Nairobi, 1970.

Kenya National Farmers' Union

The Kenya National Farmers' Union is made up of about 5,000 smallholders, primarily African; farm laborers; and some large-scale European farmers. It also includes a number of the main agricultural cooperative and commodity boards, who are eligible for membership under a special classification—"Organized Agricultural Industry" members. The Farmers' Union also maintains a close liaison with the Agricultural Society of Kenya (formerly the Royal Agricultural Society of Kenya). The main function of this society is to sponsor several agricultural shows each year to promote agriculture.

A special section of the Farmers' Union represents the interests of farm laborers. The Farmers' Union meets regularly with the Tea Growers' Association, the Coffee Growers' Association, the Sisal Employers' Association, the Sugar Employers' Union, and other organizations that represent employers' interests.

Cooperatives

The first agricultural cooperative society's ordinance was passed in Kenya in 1931. Most of the cooperatives registered under it were formed by Europeans and Asians. In 1945, when a new ordinance was passed, only five African cooperatives were registered. Since then, many African cooperatives have been formed. By 1970, there were about 1,500 agricultural cooperatives in Kenya, of which a substantial percentage were African cooperatives. Other cooperatives in Kenya consist mainly of savings and loan, housing, and consumer cooperative societies.

The major agricultural cooperatives are the Kenyan Planters' Cooperative Union, Ltd. (coffee); the Kenya Farmers' Association, Ltd. (mainly grains); the Horticultural Cooperative Union, Ltd.; Kenya Cooperative Creameries, Ltd.; the Kenya Poultry Produce Cooperative Society, Ltd.; and the Nyanza Farmers' Cooperative Society, Ltd. (sugar).

All the agricultural cooperatives discussed above are under the supervision of the Ministry of Cooperatives and Marketing. Cooperatives in the African resettlement areas in the Highlands, however, are under the supervision of the Ministry of Lands and Settlement, although the Ministry of Cooperatives has provided personnel to assist in their development. The first cooperative in the resettlement areas was formed in October 1962. Sales of agricultural products from settlement scheme cooperatives increased from $1.7 million in 1964/65 to $6.9 million by 1969/70 (app. table 9).

The Ministry of Cooperatives and Marketing has undertaken a plan to consolidate the entire cooperative system of the country. All of the primary cooperatives within each district will be under the supervision of a single district union. The Kenya National Federation of Cooperatives, composed of representatives from each district union, has been formed at the national level.

To assist Kenya in the development of its cooperative system, US/AID has sent U.S. advisors to Kenya and has provided for the training of Kenyan cooperative officers. This training has taken place in Kenya as well as in other countries. A Government training program for cooperative staff members has been started at the Kenya Institute of Administration, to fill the gap left by the closing of the East Africa School of Cooperation. The Scandinavian countries have approved a project for providing financial support for building a national cooperatives training center in Kenya. Under the project, they will also furnish experts for planning and instructional purposes.

AGRICULTURAL CREDIT

Further Agricultural development in Kenya will require an adequate supply of agricultural credit, since the subsistence farmers have little or no cash surpluses available for investment. Most of the institutional credit for agriculture has been extended by commercial banks and by Kenya's Agriculture Finance Corporation (AFC), which makes loans only on the basis of secured loan mortgages. The banks have lent money mainly to European farmers, although in recent years they have assisted some smallholders. Commercial bank loans to farmers are usually for a maximum of 1 year, but at times may be for 3 to 5 years. Credit extended by the AFC consists primarily of long-term mortgage loans.

The AFC has been important in recent years in financing the shift from European to African farms in the Highlands area. Its capital has been furnished in part by the Kenyan and British Governments and the International Bank for Reconstruction and Development. Kenya and the United Kingdom will continue to provide capital until the AFC can generate sufficient funds of its own to finance its operations. Continuing the policy of recent years, the major portion of funds lent in the future will be to smallholders. The Kenyan Government has also made loans over the years, both long-term ones for agricultural development and short-term ones under the guaranteed minimum-returns system for certain crops.

A cooperative bank serves Kenya's cooperative system. In the past, Kenya's cooperatives have extended only limited credit, but since the establishment of the bank, they have substantially increased their loan operations. Some have made loans to their members for the purchase of farms and equipment.

There is little doubt that expansion of credit facilities in Kenya and education of African farmers in the proper use of credit would make a significant contribution to the country's agricultural development. However, there remains a problem that expanded credit alone cannot solve. Although African farmers need farming equipment, and credit to purchase it, the additional equipment they could use economically is somewhat limited. As is usual in underdeveloped countries, the ability to make effective use of capital is limited by the farmers' lack of technical knowledge and skills.

TRANSPORTATION SECTOR

In Kenya, as in a number of other African countries, many farms are isolated. Development of more farm-to-market roads is of prime importance to enable Kenya's small farmers to bring their products to local markets.

Products from Africans' farms are usually transported to local markets by means of head-load but sometimes by cart or by animals on the hoof. From the local market to processing and marketing centers, transportation is mainly by truck and rail. Some

products are trucked for long distances to the nearest railhead or processing center, particularly from Eastern, North-Eastern, and Coast Provinces. These provinces are served primarily by gravel and earth roads.

The greatest inadequacy in Kenya's transportation sector is a lack of paved roads. During the rainy seasons, many of the country's gravel and dirt roads in the heavily populated areas are impassable. Since 1960, there has been some improvement and increase in paved road mileage; however, the total did not increase substantially during 1965-69. Gravel and earth road mileage has declined somewhat. (Table 24 gives mileage of Kenya's main and feeder roads.)

Road construction has high priority in Kenya's 1970-74 Development Plan. Since 1960, the World Bank and its affiliate, the International Development Association (IDA), have loaned Kenya a total of 49.5 million for long-term road expansion and improvement. Long-term plans for road construction include contruction of 288 miles of feeder roads; 5 miles of primary paved roads; 268 miles of roads in sugarcane producing areas; and improvement of 366 miles of farm-to-market roads in new farm settlement areas, all to be financed from the World Bank and IDA loans. The construction of farm-to-market roads, perhaps more than any other single factor, will make it feasible for subsistence farmers to bring their produce from the bush to the local market place.

The major railroad in Kenya runs from the port of Mombasa through Nairobi, Nakuru, and Eldoret, and terminates at Kasese, Uganda—a distance of 1081 miles. A 131-mile line branches off just beyond Nakuru, in the Highlands, and runs to Kisumu, the main port for the steamer services on Lake Victoria. Several other branch lines serve other agricultural areas in the country.

Ports and Shipping

Mombasa is Kenya's principal port and handles practically all import and export traffic for both Kenya and Uganda. Deep-water general cargo quays at Mombasa can accommodate ships not exceeding 31 feet draught. For ocean-going vessels, there are nine deep-water berths with a depth of 32 feet below mean low-water spring tides. There are also extensive lighterage wharves for general cargo. The port at Mombasa, and all other principal East African ports, is managed by the East African Community.

Inland Waterways

Inland waterway services are operated by the East African Community on Lakes Victoria, Kioga, and Albert, and the Nile River. The Lake Victoria and Nile River services are operated in connection with the Tanzania Central Railway Line. Steamers from Kisumu serve Lake Victoria's principal ports—Musoma, Mwanza, and Bukoba in Tanzania, and Bukakata, Entebbe, and Port Bell in Uganda. With rail connections at Kisumu, Mwanza, and Port Bell, the services on Lake Victoria form an important link in the East African transport system both for internal communications and for imports and exports.[10]

Air Transportation

International airlines serving Kenya use the Nairobi International Airport. It can accommodate all types of aircraft operating in East Africa and is

[10]In addition to managing principal East African ports and operating inland waterway services, the EAC operates common railroad, airline, postal, and telecommunication services in Kenya, Uganda, and Tanzania.

Table 24—Kenya's mileage of roads, 1965-69

Type of road	1965	1966	1967	1968	1969
ıary paved	961	994	1,036	1,176	1,189
ındary paved	321	343	343	353	358
·tal paved	1,282	1,337	1,379	1,529	1,547
ary gravel and earth	2,912	2,980	2,868	2,652	2,653
ndary gravel and earth	6,340	6,359	6,283	6,184	6,157
ır roads and tracks	15,529	15,529	15,529	15,529	15,529
tal	26,063	26,205	26,059	25,894	25,886

urce: Statistical Abstract, Kenya Ministry of Finance and Economic Planning, Nairobi, 1970.

equipped with full night-landing facilities. Arrangements are being made to enable the airport to handle the most recent generation of large jet aircraft. The airport has modern terminal buildings for passengers and adequate facilities for handling freight. It is probably adequate for present demand. Air traffic to Kenya has increased steadily over the past decade, and Kenya should begin to realize even more of its vast tourism potential if its air transportation services increase along with expected increases in demand. In 1970, foreign exchange earnings from tourism were $52 million, and freight and insurance $28.6 million. (See section on tourism, below.)

TOURISM SECTOR

Kenya's cool climate in the central Highlands and its varied terrain are attractive to Europeans and North Americans. These features plus one of the greatest wild animal reserves in the world have made tourism an increasingly important major source of foreign exchange to Kenya and a significant source of new jobs. The 1970-74 Development Plan accordingly gives high priority to tourism. Total expenditures for development of the industry during 1970-74 will be about $40 million, of which $10 million will be financed through the Kenya Government development budget for tourism. The remainder will come from private overseas sources.

The Ministry of Tourism and Wildlife is the agency concerned with tourism development in Kenya. The Game Department and the Kenya National Parks have their own independent administrations but are responsible to the Ministry. The Kenya Tourist Development Corporation (KTDC) is the main channel through which public investment for promoting the industry passes. It is responsible to the Ministry of Tourism and Wildlife and requires Ministry of Finance approval for its projects. Despite substantial investments by the KTDC in recent years, the hotel industry is predominantly privately owned and operated; this is also the case with tour operating companies, safari outfitters, and air safari firms. It is the Government's policy that private investment in such activities should be continued and encouraged, and new hotels and safari lodges are being built, and facilities for package tours expanded by private concerns. The Government's direct investment aims particularly to eliminate bottlenecks and to provide economic infrastructure. Further Government objectives are maximization of national benefits from tourism and encouragement of local participation in the industry.

Tourists in Kenya spent an estimated $17.50 per day in 1968 or, during their average stay of 10 days, about $175. It is estimated that the total spent was more than $42 million. Approximately 75 percent of this was net foreign exchange earnings for Kenya. Gross domestic product (GDP) derived from the tourist industry in 1968 was about $25 million, or more than 2 percent of total GDP. By 1974, GDP derived from the tourism sector is expected to reach $62 million (table 25). Annual growth of 15 percent is projected for the tourist industry.

Table 25—Economic contribution of tourism in Kenya, 1968 and projected 1974

Year	GDP from the tourist industry	Gross foreign exchange earnings	Employment numbers[1]
	Million dollars	*Million dollars*	*Number*
1968	25	42	20,000
1974	62	102	40,000

[1] Includes employment indirectly created by tourism.

Source: Development Plan 1970-74, Republic of Kenya, 1969.

Tourism in Kenya created employment for about 20,000 people in hotels and other services (both Government and private), agriculture, airlines, construction, and other supportive activities in 1968. This represents three jobs for every 365 days spent by tourists in the country; by 1974, tourism will probably create an average of four jobs. Further investment in tourism will be one of the most efficient ways for Kenya to expand employment, foreign exchange earnings, and national income. Tourism has the potential for creating employment more rapidly than most other sectors because it is expected to grow rapidly and because it creates a demand for labor-intensive services. By 1974, an estimated 7,000 jobs will be indirectly created in the sectors supporting tourism—in particular, agriculture and distribution. Investment in building and construction for the tourist sector will provide an estimated 3,500 more jobs than in 1968. Total employment in the tourism sector is expected to be 40,000 by 1974.

Kenya depends heavily on foreign trade, exporting both agricultural and nonagricultural products and importing consumer and capital goods.

Because of its wide variety of agricultural and geographical conditions, Kenya can produce (and export) a wide range of agricultural and nonagricultural commodities; this has tempered the vulnerability of the country's export earnings to sudden changes in the market for any particular commodity. Also, it has compensated partly for the paucity of known mineral resources in Kenya. The value of Kenyan trade has increased substantially over the past decade. Kenya's total exports increased from $137 million in 1960 to a record $289 million in 1970 (app. table 10). Total imports also increased—from $272 million in 1960 to over $442 million in 1970 (fig. 4).

As a member of the British Commonwealth, Kenya enjoys preferential treatment for some products in a number of Commonwealth markets.[11] Kenya is expected to continue to enjoy preferences in the U.K. market even after Britain becomes a member of the European Community.

The closing of the Suez Canal in 1967 has disrupted Kenya's foreign trade but apparently not enough to cause any significant decline in exports or changes in trade patterns. Most exports have been rerouted around the Cape of Good Hope—a longer and costlier route—on larger freighters. The increased costs are being absorbed by Kenya's customers.

Kenya's industrial sector is expanding, and the country is increasing its imports of nonagricultural products such as manufactured goods, machinery, transportation equipment, building materials, fuels and lubricants, and chemicals. A major trend in Kenya's trade has been a reduction in agricultural and consumer goods imports and substitution of capital goods imports needed to accelerate the development of the industrial and agribusiness sectors. Of all imports in 1970, about 92 percent (by value) were nonagricultural. The United Kingdom and Japan are Kenya's major suppliers, providing $116 million (26 percent) and $42.5 million (10 percent), respectively, of Kenya's 1970 imports. The United States is third, shipping products worth $34

[11]For example, in the United Kingdom, East Africa receives a Commonwealth preferential rate on tobacco exports which is 18.5 cents less than the duty charged for tobacco coming in from non-Commonwealth countries.

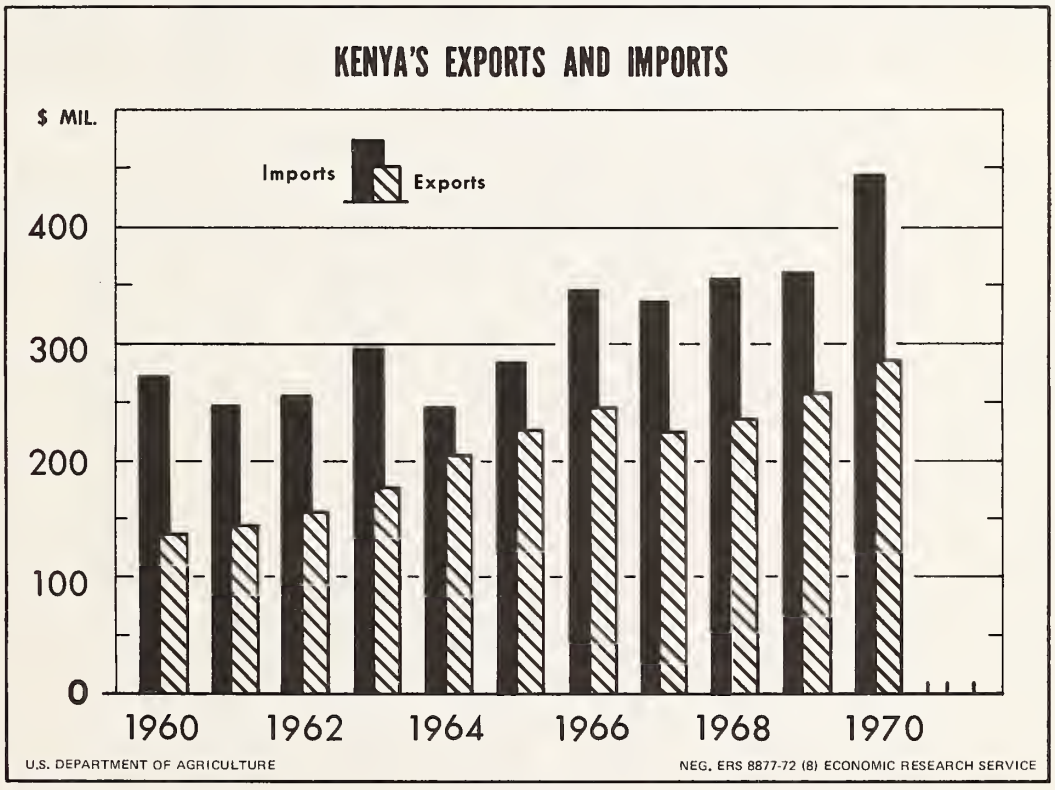


Figure 4

million in 1970 (8 percent of the total), and West Germany is fourth, with $31 million (7 percent). (See table 26).

Agricultural Exports

In 1960, Kenya's agricultural exports represented 75 percent of total exports by value, compared with 56 percent in 1970 (fig. 5). This decrease in their relative importance is an indication of the trend toward diversification and development of the nonagricultural sectors of the economy which Kenya has achieved over the past decade. Nonetheless, agricultural exports—valued at $103 million in 1960—reached a record high of $162 million in 1970 (table 27).

Uganda was Kenya's major customer in 1970, taking $46.8 million in commodities, both agricultural and nonagricultural. Other leading customers were the United Kingdom, $41.6 million (all agricultural); Tanzania, $41.3 million (agricultural and nonagricultural); the United States, $22.8 million (all but $2 million, agricultural); and West Germany, $19.1 million (all agricultural) (table 28).

Kenya's major agricultural export is coffee. It accounted for 38 percent of the total value of all agricultural exports in 1970; next were tea, 22 percent; livestock products, 14 percent; and fruits and vegetables, 7 percent. Together with cereals, sisal, and pyrethrum, these products supplied about 84 percent of all foreign exchange earnings from agriculture. The remaining exports consisted mainly of cashew nuts (3 percent) and animal feeds (2 percent) (app. table 11).

In 1960, sisal and pyrethrum were Kenya's third and fourth most valuable agricultural exports. By 1970, sisal had dropped to sixth and pyrethrum to seventh (fig. 5), largely because of competition from synthetics. Pyrethrum is at present in a favorable situation because concern over polluting effects of synthetic insecticides has caused revitalized demand for this product. However, as an export earner, pyrethrum faces the possibility of competition from improved, nonpolluting synthetics. Sisal faces a continuation of competition from synthetic fibers.

Agricultural Imports

In 1970, 8.5 percent of Kenya's imports were agricultural products, valued at $37.7 million (table 29). Vegetable oils accounted for 16 percent of the value; sugar, 13 percent; unmanufactured tobacco, 10 percent; and fruits and vegetables, 9 percent (app. table 11).

Uganda was Kenya's most important supplier of agricultural products in 1970, furnishing refined sugar, $2 million; unmanufactured tobacco, $1.5 million; oilseeds, $789,000; beer, $456,000; dried beans and peas, $284,000; and animal feeds, $253,000.

Table 26—Value and distribution of Kenya's imports by country of origin, 1967-70

Country of origin	1967		1968		1969		1970	
	Value	Share	Value	Share	Value	Share	Value	Share
	Million dollars	*Percent*	*Million dollars*	*Percent*	*Million dollars*	*Percent*	*Million dollars*	*Percent*
United Kingdom	98.0	29.2	101.1	28.4	102.1	28.3	116.1	26.2
Japan	16.3	4.9	22.3	6.3	26.2	7.3	42.5	9.6
United States	20.0	6.0	20.0	5.6	19.0	5.3	34.2	7.7
West Germany	29.6	8.8	25.5	7.2	26.8	7.4	31.4	7.1
Uganda	28.5	8.5	24.2	6.8	21.8	6.1	28.1	6.4
Iran	24.0	7.1	25.0	7.0	22.8	6.3	24.9	5.6
Italy	10.9	3.2	13.6	3.8	13.7	3.8	17.3	3.9
Tanzania	9.2	2.7	10.3	2.9	11.2	3.1	16.6	3.8
France	10.8	3.2	11.5	3.2	10.9	3.0	14.4	3.3
Netherlands	7.9	2.4	9.6	2.7	12.0	3.3	11.5	2.6
Saudi Arabia	3.8	1.1	7.6	2.1	9.0	2.5	11.2	2.5
India	8.9	2.6	8.0	2.2	8.3	2.3	8.7	2.0
Sweden	4.7	1.4	4.3	1.2	5.1	1.4	6.4	1.4
Hong Kong	3.6	1.1	5.3	1.5	4.3	1.2	5.8	1.3
Australia	3.8	1.1	4.8	1.4	6.0	1.7	5.3	1.2
Belgium	6.0	1.8	5.3	1.5	4.3	1.2	5.1	1.2
Other countries	50.1	14.9	57.5	16.2	57.1	15.8	62.9	14.2
Total	336.1	100.0	355.9	100.0	360.6	100.0	442.4	100.0

Source: Annual Trade Reports of Kenya, Uganda, and Tanzania, 1967-70. East African Customs and Excise Dept; East African Community, Mombasa, Kenya.

Table 27—Kenya's exports of selected agricultural products by country of destination, 1968-70

Commodity and country of destination	Quantity			Value			Share of total value of all exports		
	1968	1969	1970	1968	1969	1970	1968	1969	1970
	1,000 metric tons	*1,000 metric tons*	*1,000 metric tons*	*1,000 dollars*[1]	*1,000 dollars*[1]	*1,000 dollars*[1]	*Percent*	*Percent*	*Percent*
Coffee:	37.7	51.1	53.7	35,941	47,251	62,343	15.3	18.3	21.6
West Germany	12.7	18.8	13.4	13,923	19,219	16,374			
Sweden	4.5	5.9	7.5	4,230	5,530	9,032			
United States	5.8	6.8	9.9	4,121	5,175	10,747			
Netherlands	2.0	4.1	5.6	2,136	3,885	6,634			
United Kingdom	3.7	4.3	2.0	3,373	3,673	3,255			
Tea:	28.4	33.9	35.1	29.085	32,768	35,574	12.3	12.7	12.3
United Kingdom	17.2	22.0	25.1	18,570	22,346	25,233			
United States	3.6	5.2	3.9	3,290	4,239	3,467			
Canada	1.9	2.0	1.8	1,944	1,968	1,927			
Netherlands	1.2	1.2	2.0	1,257	1,075	1,937			
Fruits and vegetables:	NA	NA	NA	8,170	8,604	11,827	3.5	3.3	4.1
Edible nuts	8.5	9.3	2.4	1,869	2,031	4,543			
India	8.4	9.1	2.3	1,741	1,901	4,444			
United States	.1	.1	.1	128	111	85			
Canned pineapple	NA	8.0	7.5	NA	2,024	1,874			
United Kingdom	NA	5.1	4.0	NA	1,299	1,065			
Meat and preparations:	8.1	7.0	7.8	9,387	8,288	8,978	4.0	3.2	3.1
United Kingdom	3.6	3.1	3.0	4,858	4,062	4,040			
Libya	NA	.4	.4	NA	476	531			
Zambia	NA	.3	.3	NA	277	251			
Cereals & preparations:	338.8	234.4	88.0	19,035	14,888	7,696	8.1	5.8	2.7
Uganda	25.1	70.5	26.2	2,501	4,408	2,247			
Zambia	NA	51.0	1.7	NA	2,926	509			
United Kingdom	107.3	41.5	NA	4,914	2,250	NA			
Tanzania	29.3	7.1	17.8	2,449	1,018	1,569			
Sisal:	41.2	35.8	43.7	5,130	4,759	5,163	2.2	1.8	1.8
United Kingdom	4.6	3.6	6.0	552	471	666			
India	2.7	4.0	4.7	329	491	524			
Japan	4.1	2.9	4.0	518	387	461			
China (Mainland)	3.0	3.1	3.5	430	453	473			
Pyrethrum extract:	.4	.4	.3	7,012	6,227	4,896	3.0	2.4	1.7
United States	.1	.2	.1	1,934	2,296	1,504			
United Kingdom	.1	.1	.1	1,479	946	565			
Dairy products & eggs:	7.4	16.0	13.3	3,149	6,042	4,674	1.3	2.4	1.6
Uganda	.5	11.8	9.2	520	3,739	2,575			
Tanzania	2.9	2.9	.6	1,394	1,344	690			
Other agricultural exports				17,557	18,461	20,975	7.4	7.3	7.3
Total agricultural exports				134,466	147,468	162,126	57.1	57.2	56.2
Nonagricultural				101,094	110,441	126,432	42.9	42.8	43.8
Total exports				235,560	257,909	288,558	100.0	100.0	100.0

NA = not available.

[1] US $1 = 7.143 Kenya shillings. A Kenyan pound is valued at US $2.80.

Source: Annual Trade Reports of Kenya, Uganda, and Tanzania, 1968, 1969, 1970. East African Customs and Excise Dept., East African Community, Mombasa, Kenya.

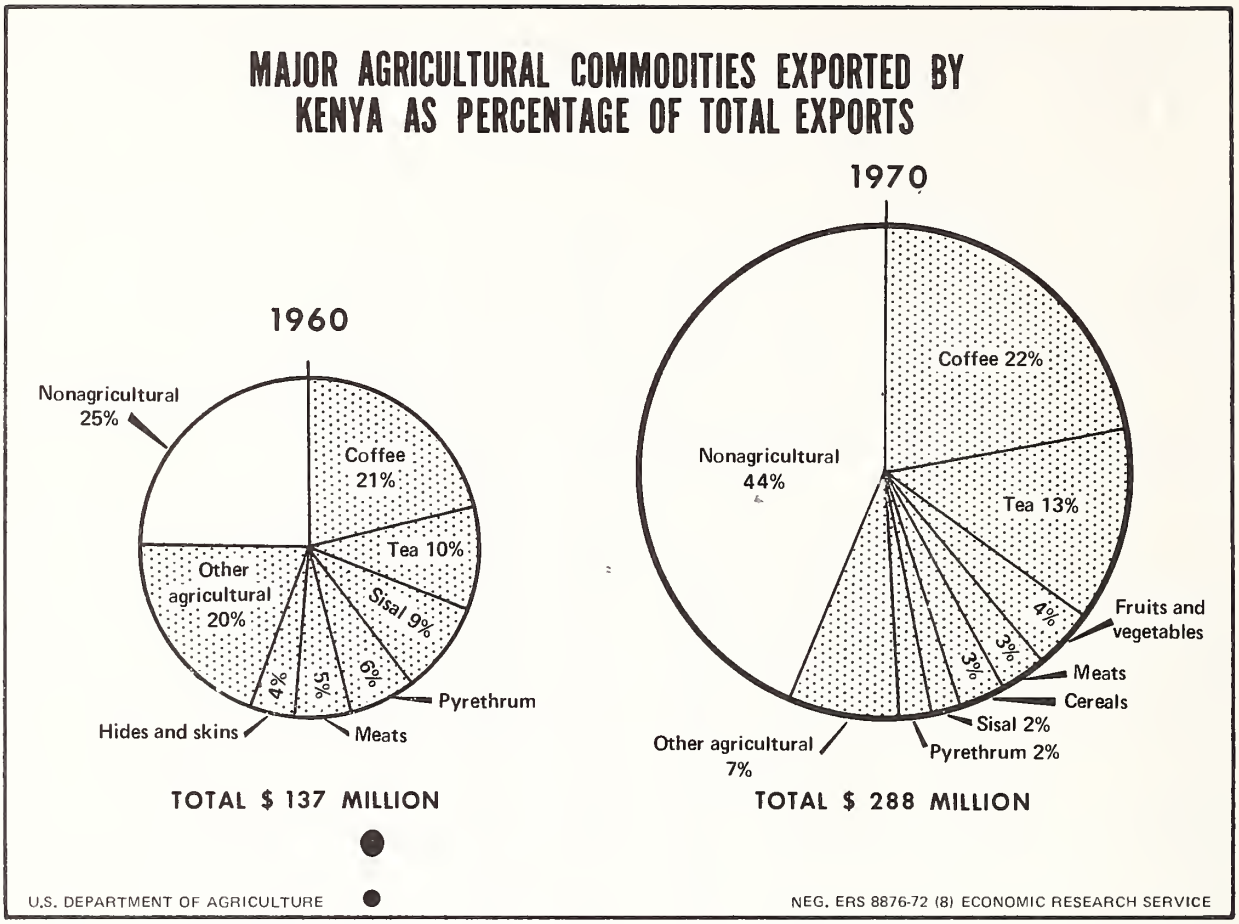


Figure 5

Table 28—Value and distribution of Kenya's exports by country of destination, 1967-70

Country of destination	1967		1968		1969		1970	
	Value	Share	Value	Share	Value	Share	Value	Share
	Million dollars	*Percent*	*Million dollars*	*Percent*	*Million dollars*	*Percent*	*Million dollars*	*Percent*
Uganda	41.4	18.5	37.1	15.7	44.6	17.3	46.8	16.2
United Kingdom	36.7	16.4	41.6	17.7	41.4	16.1	41.6	14.4
Tanzania	31.9	14.3	36.6	15.5	36.0	14.0	41.3	14.3
United States	10.1	4.5	11.3	4.8	14.0	5.4	17.8	6.2
West Germany	13.7	6.1	16.2	6.9	22.0	8.5	19.1	6.6
Netherlands	4.6	2.1	7.9	3.4	6.7	2.6	10.5	3.6
Sweden	5.9	2.6	4.6	2.0	6.0	2.3	9.5	3.3
India	3.5	1.6	4.1	1.7	4.1	1.6	7.7	2.7
Zambia	4.8	2.1	5.4	2.3	7.5	2.9	6.5	2.3
Finland	2.6	1.2	2.6	1.1	3.4	1.3	4.4	1.5
Italy	4.0	1.8	3.6	1.5	4.0	1.6	4.3	1.5
Japan	3.4	1.5	4.7	2.0	3.6	1.4	3.4	1.2
Rwanda	1.1	0.5	1.8	0.8	2.2	0.9	2.2	0.8
France	1.5	0.7	3.5	1.5	1.9	0.7	1.6	0.5
Other countries	58.4	26.1	54.6	23.1	60.5	22.2	71.9	21.6
Total	223.6	100.0	235.6	100.0	257.9	100.0	288.6	100.0

Source: Annual Trade Reports of Kenya, Uganda, and Tanzania, 1967-70, East African Customs and Excise Dept., East African Community, Mombasa, Kenya.

Table 29—Kenya's imports of selected agricultural commodities by country of origin, 1968-70

Commodity and country of origin	Quantity			Value			Share of total value of all imports		
	1968	1969	1970	1968	1969	1970	1968	1969	1970
	1,000 metric tons			*1,000 dollars*			*Percent*		
Vegetable oils, fixed:	16.3	27.9	17.7	5,287	5,876	6,071	1.5	1.6	1.4
Malaysia	6.6	12.7	7.4	1,289	2,490	2,013			
Netherlands	NA	3.3	NA	NA	810	NA			
Sugar, honey, syrup:	57.6	29.0	49.7	5,581	3,252	4,871	1.6	.9	1.1
Uganda	32.9	19.8	18.4	3,706	2,204	4,707			
Czechoslovakia	NA	5.5	NA	NA	517	NA			
Tobacco, unmfd.:	1.7	.8	2.8	1,923	923	3,810	.5	.3	.9
Tanzania	NA	.5	1.5	NA	455	2,037			
Uganda	1.5	.3	1.2	1,792	388	1,583			
Fruits and vegetables:	NA	11.2	NA	2,258	2,285	3,527	.6	.6	.8
Tanzania	5.0	8.2	10.5	529	805	1,267			
West Germany	NA	.1	NA	NA	161	213			
Australia	.8	.5	.6	281	119	200			
Cereals and preparations:	12.5	5.0	22.5	2,978	1,343	2,992	.8	.4	.7
United Kingdom	.1	2.2	2.4	234	394	627			
United States	3.6	.7	16.7	545	118	1,524			
Pakistan	2.9	.3	.5	946	109	129			
Tea and mate:	5.7	3.6	6.4	2,861	1,756	2,604	.8	.5	.6
Congo (Kinshasa)	3.8	3.1	4.0	1,605	1,407	1,601			
Tanzania	.4	.1	NA	312	97	NA			
Animal oils and fats:	5.4	8.4	7.4	939	1,551	2,002	.4	.4	.5
Australia	3.3	5.3	3.3	546	951	972			
New Zealand	1.6	2.4	3.1	272	430	695			
Margarine and shortening:	3.9	3.5	NA	2,062	1,725	1,588	.7	.6	.4
Uganda	2.7	2.3	NA	1,938	1,197	NA			
Tanzania	.2	1.1	NA	91	501	NA			
Dairy products:	1.6	1.9	2.6	540	533	1,433	.3	.4	.3
United States	1.1	1.5	1.1	284	317	756			
Australia	.3	.2	.7	146	142	156			
Alcoholic beverages:	1.7	1.2	1.7	863	756	1,301	.3	.2	.3
France	.2	.2	.2	248	477	265			
Uganda	NA	1.0	1.2	NA	NA	456			
Other agricultural imports				7,101	7,679	7,518	1.6	1.8	1.5
Total agricultural imports				32,393	27,679	37,717	9.1	7.7	8.5
Nonagricultural				323,504	332,880	404,717	90.9	92.3	91.5
Total imports				355,897	360,559	442,434	100.0	100.0	100.0

NA = not available.
[1] Less than 50 metric tons.

Source: Annual Trade Reports of Kenya, Uganda, and Tanzania, 1968, 1969, 1970. East African Customs and Excise Dept., East African Community, Mombasa, Kenya.

Substantial quantities of palm oil came from Malaysia, and hydrogenated fats and oils came from the Netherlands. Australia and New Zealand were the leading sources of Kenya's animal fats and oils (app. table 12).

Trade With the United States

The United States is Kenya's fourth best customer for farm exports, in 1970 taking $20.8 million worth (table 30). The United States annually buys substantial quantities of coffee, tea, and pyrethrum extract from Kenya. In 1970, U.S. agricultural imports included 10,400 tons of coffee valued at $11 million, 6,900 tons of tea at $5.7 million, and 90 tons of pyrethrum extract at $1.8 million.

Kenya's agricultural imports from the United States include dairy products, cereals and cereal preparations, vegetable oils, tallow, and livestock (beef and dairy cattle and poultry) for breeding purposes. In 1970, the value of U.S. agricultural shipments to Kenya was only $2.1 million (table 31). However, such imports probably could be increased substantially in the near future because Kenya has substantial need for all the items just named.

Total Kenyan imports from the United States were valued at $34.2 million in 1970, up from $13.9 million in 1960 (table 31). The major commodities from the United States have consistently been manufactured goods, machinery and transportation equipment, fuels and lubricants, and chemicals.

The outlook for continued growth of U.S. agricultural and nonagricultural sales to Kenya is promising. The broadening of Kenya's productive base and the gradually rising level of consumer purchasing power are creating a growing market. American products have a favorable reputation for quality in the country, and a wide range of consumer items has received good acceptance.

Trade Within the East African Community

In 1970, Kenya's EAC partners took over 30 percent of total Kenyan exports and supplied 10 percent of total imports. Tanzania and Uganda imported $38.6 million worth of Kenyan commodities in 1960 and $88.1 million in 1970 (table 32). Their exports to Kenya rose in value from an annual average of $14.1 million during 1957-59 to $44.7 million in 1970 (table 32). Kenya maintained a favorable balance of trade with its EAC trading partners throughout the decade. In 1966, Uganda and Tanzania imposed quantitative controls on imports from Kenya, causing Kenya's trade surplus to decline sharply from $53.2 million in 1966 to $35.6 million in 1967. But by 1970 it had recovered somewhat at $43.4 million.

Kenya's exports to Uganda and Tanzania include substantial quantities of cigarettes, clothing and footwear, wheat, corn (in normal years), processed food products, beverages, and cement. Kenya's imports from these two countries are mainly primary products for processing. Tanzania sends unmanufactured tobacco, pyrethrum flowers, beans, peas, oilseeds, and unrefined sugar. Uganda sends refined sugar, unmanufactured tobacco, oilseeds, cottonseed oil, beer, dried beans and peas, and animal feeds.

Agricultural Trade Policy

The overall objective of Kenya's trade policy is to improve foreign exchange earnings from both the agricultural and nonagricultural sectors. Trade within the East African Community[12]—the de facto customs union of Kenya, Tanzania, and Uganda—is relatively free of controls. Some internal trade barriers have been created recently, mainly in the form of EAC licensing requirements and transfer taxes on some manufactured food commodities and raw materials.

In general, the level of EAC duty rates on non-EAC countries' products is fairly high, and the revenue derived from import tariffs is an important source of Government income in the three member countries. Most imports are admitted under Open General License. However, each EAC country requires a specific import license for a number of commodities. A substantial part of the agricultural trade of the EAC countries is subject to Government regulation. This activity in the trading process differs according to the product or the organization of the country's marketing system.

Agricultural commodities shipped outside the EAC for which export licenses are required are sugar, rice, and livestock products. The export licenses, issued by each EAC country's Ministry of Commerce and Industry, are used to conserve domestic supplies of these commodities.

Kenya requires import licenses for many farm

[12]The East African Common Market (EACM), forerunner of the EAC, was established in 1917. The EAC is one of the oldest and least-known common markets in the world. It developed in 1917 from a free-trade agreement between Kenya and Uganda and has developed gradually over the last 50 years. At that time, they also amalgamated their customs authorities. Five years later, the two countries were joined by Tanzania in adopting a common external tariff. Free interchange of domestic products was inaugurated in 1923 and free movement of imported goods in 1927.

Table 30—U.S. imports of selected agricultural products from Kenya, by quantity and value, 1965-70

Commodity	1965		1966		1967		1968		1969		1970	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 metric tons	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*
Coffee	7.1	5,160	10.4	9,602	6.8	5,204	12.7	9,108	6.8	5,082	10.4	11,195
Tea	3.3	3,320	3.4	3,507	3.2	3,072	4.9	4,440	5.2	4,484	6.9	5,678
Fruits and vegetables	1.1	371	.6	177	1.3	386	1.6	533	1.1	391	1.5	131
Pyrethrum	.1	1,996	.2	3,400	.5	3,081	.1	2,841	1.2	2,607	.1	1,771
Sisal	1.0	285	2.0	276	1.0	173	2.0	217	1.8	188	1.1	108
Other agricultural	NA	636	NA	354	NA	167	NA	404	NA	212	NA	1,971
Total agricultural	NA	11,768	NA	17,316	NA	12,083	NA	17,543	NA	12,964	NA	20,854
Nonagricultural	NA	2,344	NA	4,946	NA	1,607	NA	2,015	NA	2,684	NA	1,968
Total imports	NA	14,112	NA	22,262	NA	13,690	NA	19,558	NA	15,648	NA	22,822

NA = not available.

Source: U.S. Foreign Trade, Imports, TSUSA Commodity by Country. U.S. Dept. Commerce, Social and Econ. Stat. Adm., Bureau of Census, calendar years, 1965-70.

Table 31—U.S. agricultural exports to Kenya, by quantity and value, 1965-70

Commodity	1965		1966		1967		1968		1969		1970	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 metric tons	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*	*1,000 metric tons*	*1,000 dollars*
Nonfat dry milk	.7	205	2.3	937	1.2	635	.2	102	.9	213	.7	481
Corn	115.7	5,905	2.0	6,139	(1)	27	(1)	34	(1)	13	14.3	1,083
Wheat	12.0	674	36.7	2,294	.7	70	1.5	135	.5	60	NA	NA
Miscellaneous food	NA	188	NA	127	NA	208	NA	124	NA	153	NA	178
Tobacco	.1	267	.1	234	(1)	65	(1)	69	(1)	80	.1	190
Tallow	.9	202	1.8	427	NA	0	NA	38	.3	63	.6	132
Other agricultural	NA	922	NA	1,088	NA	730	NA	669	NA	468	NA	29
Total agricultural	NA	8,363	NA	11,246	NA	1,735	NA	1,171	NA	1,050	NA	2,093
Nonagricultural	NA	14,986	NA	16,627	NA	18,218	NA	18,514	NA	17,981	NA	32,103
Total exports	NA	23,349	NA	27,873	NA	19,953	NA	19,685	NA	19,031	NA	34,196

NA = not available.

[1] Less than 50 metric tons.

Source: U.S. Foreign Trade, Exports, World Area by Commodity Groupings. U.S. Dept. Commerce, Social and Econ. Stat. Adm., Bureau of Census, calendar years 1965-70.

Table 32—Trade within the East African Community, average 1957-59, annual 1960-70

Country	Average 1957-59	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
	Million dollars	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*
Kenya:												
Exports to East African Community	33.2	38.6	44.6	48.4	55.4	72.4	82.3	84.4	73.2	107.4	80.5	88.1
To Uganda	16.6	17.3	19.7	20.4	26.4	35.2	42.9	47.2	41.4	54.1	44.6	46.8
To Tanzania	16.6	21.3	24.9	28.0	29.0	37.2	39.4	37.2	31.8	53.3	35.9	41.3
Imports from East African Community	14.1	19.5	19.6	20.6	25.7	31.8	32.8	31.2	37.6	34.5	33.0	44.7
From Uganda	9.3	14.3	14.4	15.1	17.5	20.3	20.0	20.5	28.4	24.2	21.8	28.1
From Tanzania	4.8	5.2	5.2	5.5	8.2	11.5	12.8	10.7	9.2	10.3	11.2	16.6
Balance with East African Community	19.1	19.1	25.0	27.8	29.7	40.6	49.5	53.2	35.6	72.9	47.6	43.4
Uganda:												
Exports to East African Community	14.7	18.7	19.2	19.8	23.1	27.0	27.3	29.2	35.3	29.9	26.6	33.7
To Kenya	9.3	14.3	14.4	15.1	17.5	20.3	20.0	20.5	28.4	24.2	21.8	28.1
To Tanzania	5.4	4.4	4.8	4.7	5.6	6.7	7.3	8.7	6.9	5.7	4.8	5.6
Imports from East African Community	18.3	18.6	20.8	21.6	27.8	38.1	46.7	49.6	43.5	56.5	47.9	50.8
From Kenya	16.6	17.3	19.7	20.4	26.4	35.2	42.9	47.2	41.4	54.1	44.6	46.8
From Tanzania	1.7	1.3	1.1	1.2	1.4	2.9	3.8	2.4	2.1	2.4	3.3	4.0
Balance with East African Community	-3.6	.1	-1.6	-1.8	-4.7	-11.1	-19.4	-20.4	-8.2	-26.6	-21.3	-17.1
Tanzania:												
Exports to East African Community	6.5	6.5	6.3	6.7	9.6	14.4	16.6	13.1	11.3	12.7	14.5	20.6
To Kenya	4.8	5.2	5.2	5.5	8.2	11.5	12.8	10.7	9.2	10.3	11.2	16.6
To Uganda	1.7	1.3	1.1	1.2	1.4	2.9	3.8	2.4	2.1	2.4	3.3	4.0
Imports from East African Community	22.0	25.7	29.7	32.7	34.6	43.9	46.7	45.9	38.7	59.0	40.8	46.9
From Kenya	16.6	21.3	24.9	28.0	29.0	37.2	39.4	37.2	32.1	53.3	35.9	41.3
From Uganda	5.4	4.4	4.8	4.7	5.6	6.7	7.3	8.7	6.6	5.7	4.9	5.6
Balance with East African Community	-15.5	-19.2	-23.4	-26.0	-25.0	-29.5	-30.1	-32.8	-27.4	-46.3	-26.3	-26.3

products. Agricultural products from Tanzania and Uganda that are subject to restriction are all grains except wheat, corn, meal, and flour; poultry and several kinds of processed meat; dairy products; citrus fruit, peas, onions, frozen fruits and vegetables, and several other kinds of processed fruits and vegetables; raw and refined sugar; oilcake; margarine and shortening; and other, minor products which would compete with the domestic food processing industry. All imports from European and Asiatic Communist countries and from Iran, Iraq, and Japan are subject to import licenses. Imports from the Republic of South Africa and Rhodesia are prohibited.

A trade association agreement signed on September 24, 1969, between the European Common Market (also called European Community) and the East African Community came into effect on January 1, 1971 (April 1 for EAC agricultural products subject to the European Common Agricultural Policy).[13] The trade agreement, which runs until January 1975, specified the elimination of EAC customs duty on 59 products imported into the EAC from the EC. (App. table 13 shows duties for the major products.) The customs duty, which ranges from 2 to 9 percent on the 59 products, will still apply to these products imported to the EAC from other suppliers. A revenue charge for entry to the EAC ranging from 10 to 68 percent will be applied to all EAC imports of these 59 products, even to those from the EC. For three commodities, annual quotas will be applied to EAC exports to the EC; coffee (56,000 tons), canned pineapple (2,000 tons), and cloves (120 tons).

Total EAC imports of these 59 products from the EC amounted to approximately $18 million in 1970, or 6.4 percent of total EC exports to the EAC. EAC imports of these 59 products from the United Kingdom were valued at about $20 million. EAC imports of these products from the United States were valued at approximately $4 million in 1970, or 6.2 percent of total U.S. sales to the EAC.

FOREIGN ECONOMIC AND AGRICULTURAL AID

The United Kingdom is Kenya's main source of external aid and technical assistance, although other countries, including the United States and West Germany, and public and international organizations have provided substantial funds for Kenya's economic development in recent years. Of the funds furnished by the United Kingdom during 1970, approximately $3.2 million were used for agricultural development. Kenya is to receive $27.4 million in capital aid from the United Kingdom during 1970-74. U.S. economic aid to Kenya, started in 1953, totaled $78.3 million by the end of 1970. Most of this aid was in the form of grants for technical assistance or food supplies under P.L. 480, Titles I and II (table 33).

The U.S. Agency for International Development is supporting, along with other donors, Kenya's rural development program—one of the key elements in the country's 1970-74 Development Plan. A major program objective is to stimulate change and economic progress in a much broader segment of the economy than in the past. A large part of US/AID assistance in fiscal year 1971—$2.1 million in technical assistance and $1.1 million in P.L. 480 commodities—was for expanding and diversifying agricultural production in Kenya. Attainment of these goals requires, among other things, identification of new crops and demonstration of their suitability to Kenyan conditions; improvement and expansion of credit and market facilities to bring increasing numbers of smallholders into the market economy; and development of cooperatives or other production and marketing organizations. US/AID assistance is also going toward development of range management schemes, training of agricultural technicians, support of applied research programs, and improvement of extension services and marketing services. There is also some direct US/AID capital assistance for production programs.

During 1953-70, Kenya received $130.4 million in assistance from international organizations: $34.7 million from the World Bank; $48.7 million from the International Development Association; $17.7 million from the International Finance Corporation; and $17.3 million from the United Nations Development Program-Special Fund (table 33).

In addition to directly furnishing foreign aid to Kenya, the United Kingdom and the United States have assisted the East African Community with funds to carry on its work, including agricultural

[13] Protocol No. 3, the most pertinent part of this agreement for purposes of this study, is reprinted as app. II, p. 77.

Table 33—Loans and grants to Kenya from the United States and from international organizations, 1953-70
(Year beginning July 1)

Source of funds	U.S. overseas loans and grants—net obligations and loan authorizations											Repayments and interest 1953-70	Total less repayments and interest
	Mutual Security Act period	Foreign Assistance Act period									Total 1953-1970		
	1953-61	1962	1963	1964	1965	1966	1967	1968	1969	1970			
	Million dollars	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*
OFFICIAL U.S. DEVELOPMENT ASSISTANCE													
AID and predecessor agencies, total	4.9	3.2	4.8	3.2	4.0	3.1	2.3	2.0	2.0	5.6	35.2	0.1	35.1
Loans	NA	NA	2.2	NA	0.6	0.1	0.3	0.3	-0.1	3.5	6.3	0.1	6.2
Grants	4.9	3.2	2.6	3.2	3.4	3.0	2.0	2.4	2.1	2.1	28.9	NA	28.9
Food for Peace, total	2.0	6.5	0.7	0.4	3.9	14.7	0.8	0.8	0.1	0.9	30.8	5.9	24.9
Title I, total	NA	NA	NA	NA	3.4	9.6	NA	NA	NA	NA	13.0	5.9	7.1
Repayable in U.S. dollars—loans	NA	NA	NA	NA	3.4	9.6	NA	NA	NA	NA	13.0	5.9	7.1
Title II, total	2.0	6.5	0.7	0.4	0.5	5.1	0.8	0.8	0.1	0.9	17.8	NA	17.8
Emergency relief, econ. devlpmt., and world food	1.4	6.3	0.5	NA	0.2	4.2	NA	0.1	NA	NA	12.7	NA	12.7
Voluntary relief agencies	0.6	0.2	0.2	0.4	0.3	0.9	0.8	0.7	0.1	0.9	5.1	NA	5.1
Peace Corps	NA	NA	NA	0.1	1.1	1.5	0.9	1.6	1.5	2.1	8.7	NA	8.7
Total official devlpmt. assistance	6.9	9.7	5.5	3.7	9.0	19.3	4.0	4.4	3.6	8.6	74.7	6.0	68.7
Loans	NA	NA	2.2	NA	4.0	9.7	0.4	-0.4	-0.1	3.5	19.3	6.0	13.3
Grants	6.9	9.7	3.3	3.7	5.0	9.6	3.6	4.8	3.7	5.1	55.4	NA	55.4
ASSISTANCE FROM INTERNATIONAL ORGANIZATIONS	6.2	7.0	0.4	2.8	12.3	2.8	24.2	17.5	7.0	50.2	130.4		
Int'l Bank for Reconstruction and Development	5.6	3.0	NA	NA	NA	NA	NA	NA	NA	26.1	34.7		
Int'l Finance Corporation	NA	NA	NA	NA	NA	NA	2.9	0.1	NA	14.7	17.7		
Int'l Development Association	NA	NA	NA	NA	10.3	NA	15.9	12.8	3.6	6.1	48.7		
African Development Bank	NA	NA	NA	NA	NA	NA	NA	2.3	NA	1.5	3.8		
U.N. Development Program-Special Fund	NA	3.2	NA	1.6	0.8	2.1	4.4	1.5	2.5	1.2	17.3		
U.N. Development Program-Technical Assistance[1]	0.2	0.1	0.2	0.3	0.4	0.3	0.4	0.5	0.5	0.4	3.3		
Other U.N.	0.4	0.7	0.2	0.9	0.8	0.4	0.6	0.3	0.4	0.2	4.9		

NA = not applicable or not available.
[1] Calendar year data.

Source: U.S. Dept. of State, Agency for International Devlpmt., Stat. and Repts. Div.

research and development projects. Kenya receives a substantial share of the benefits of the Community's research and other activities.

On January 20, 1970, the Swedish Government granted Kenya a loan of $2.9 million to help finance a nationwide rural water supply project. The project will involve piping water from wells, boreholes, springs, and rivers to villages, with concentration on areas in Eastern Province.

Rockefeller Foundation aid has been given to Kenya since 1955, particularly under the East African Maize Improvement Program. This aid has been directed toward developing varietal hybrid corn and improving wheat varieties, building on the work of the Rockefeller Foundation Mexican Center. The Foundation has also provided for technical consultation with Kenya and British experts in London, visits of technical staff members to Kenya, and some aid in foreign training for Kenyans, particularly in corn production. Through this aid, some Kenyans have received training in the Mexican Center.

BALANCE OF PAYMENTS

Kenya's balance of payments was a problem during the 1960's but was somewhat alleviated through foreign aid and investments, higher earnings from tourism, remuneration for the provision of administrative services to Uganda and Tanzania, and a substantial inflow of net private capital. In 1971, the balance of payments became a serious problem. Kenya has a continuing chronic trade deficit, which in 1971 totaled $129 million.

At the end of 1970, Kenya's net foreign exchange reserves had reached $235.2 million. Through exchange control regulations, Kenya has succeeded in curbing the flight of private capital and in attracting sufficient new investment capital to cover the deficits in the current account. Private capital outflow, arising from uncertainty about the fate of foreign investors in Kenya, has been satisfactorily arrested by the exchange controls introduced in 1965. Most of the $13 million net surplus from private capital movements arising from the nationalization of a number of Kenyan-owned assets in Tanzania contributed to the large increase in net private capital inflow. In 1968, for the first time, new money was brought into Kenya by the private sector over and above that provided by domestically reinvested profits. Foreign capital from public sources is readily available, though it fluctuates from year to year.

During 1971, Kenya made a decision to peg the Kenyan shilling to the U.S. dollar. (A comparable move was made by Tanzania and Uganda.) This monetary action, which is expected to result in greater stability in Kenya's foreign monetary transactions, made Kenya's imports more expensive and exports cheaper outside the dollar sphere of influence. A result may be an expanded level of exports relative to the level of imports.

LONG-RANGE OUTLOOK FOR AGRICULTURE

The agricultrual sector is, and has been, the dominant sector in the development of Kenya's economy. The majority of the population depends upon the production of crops and livestock as the primary means of subsistence and as the major or only source of personal income. The agricultural industry generates 35 to 40 percent of GDP annually. If account is taken of secondary and tertiary enterprises arising directly from agricultural production, the contribution of agriculture to Kenya's economy is even greater. The agricultural industry has also been the largest single source of wage employment and has contributed, either in raw or processed form, all but a few of the major export commodities.

In recent years, the relative position of the agricultural sector has declined to some extent. For example, the contribution of the industrial sector (manufacturing and construction) to GDP has exceeded that of the monetary agricultural sector (commercial agriculture, forestry, and fishing) since 1968. Also, the contribution of agriculture to wage employment has been declining steadily during the past several years, because of the (1) gradual decline of the large-farm sector during the past decade; (2) greater use of family labor on agricultural settlement schemes; (3) more efficient use of labor on commercial farms, particularly as a result of rising wage rates over the past decade; and (4) increase in the number of self-employed in settlement and smallholder schemes. In the face of this decline in wage employment in agriculture, however, because there is limited scope for increased employment opportunities outside the agricultural sector, the

majority of potential new workers in Kenya will probably have to be employed (or self-employed) in agriculture or in work generated by the agricultural sector. Growth of personal income in the agricultural sector will probably be the major determinant of the potential rate of growth of the manufacturing sector and the domestic-market-oriented service sector.

Thus, Kenya may accelerate its agricultural production as a requisite for economic growth. The past years have shown that as Kenya's agricultural sector increases its ability to provide a surplus over the needs of the traditional farm family, capital accumulation for industrial development becomes possible. The industrial sector, in turn, supplies materials and services for still more productive agriculture. In sum, the agricultural sector has initiated the kind of industrial development that characterizes the economic growth of a developing country such as Kenya. Further, as the agricultural sector has developed, the complexity of its own technology has grown. For example, soils have been modified by use of manure and fertilizer; water has been controlled; and improved hybrid seeds and livestock breeds have been developed for specific areas.

The long-term outlook for increased production of specialized agricultural products in Kenya is favorable. Increased crop production, particularly in the smallholder sector, should contribute substantially to growth of agricultural output during the 1970-74 Development Plan period. The Plan calls for Kenya's gross agricultural output to increase 6 to 7 percent annually during 1970-74. Specific goals are as follows: Coffee output, 70,000 tons by 1974; tea 45,750 tons; sisal 45,000 tons; wheat 230,000 tons; commercial corn production 610,000 tons; rice 40,600 tons; sugar 165,000 tons; seed cotton 20,000 tons; pyrethrum 11,000 tons; and cashew nuts 15,200 tons. Commercial livestock production is expected to increase substantially during the Plan period and throughout the 1970's as more smallholders enter the market economy. By 1974, the following value levels are expected for commercial livestock production: Cattle for slaughter $41 million; dairy products $26 million; hides and skins $2.5 million; pigs $1.9 million; and wool $1.7 million.

To achieve economic growth and development in the 1970's, Kenya may maintain and seek foreign markets for primary commodities, increase production of food for domestic and regional consumption, and increase manufacturing for the domestic and regional markets. Expansion in each direction will require substantial investment (including investment in training at almost all skill levels, including managerial and administrative); allocation of scarce capital resources among alternative uses that are the most profitable; and periodic appraisal of the country's natural and human resources. Agricultural and industrial production for export and production for the regional and domestic markets are still at a stage of development where substantial increases in productivity in all sectors are possible.

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Appendix table 1—Kenya's population by sex, area, and density for all provinces, 1969

Province	Male children	Male adults	Male	Female children	Female adults	Female	Total	Percent of total	Density per sq. mi.	Square miles
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Central Province	539,013	574,660	1,113,673	532,538	538,722	1,071,260	2,184,933	19.9	406	5,377
Coast Province	216,279	266,772	483,051	206,806	254,225	461,031	944,082	8.6	29	32,172
Eastern Province	495,354	428,321	923,675	481,550	502,076	983,626	1,907,301	17.4	31	61,830
Northeastern Province	67,043	66,685	133,728	54,812	57,217	112,029	245,757	2.2	5	48,890
Nyanza Province	564,858	482,395	1,047,253	539,920	534,872	1,074,792	2,122,045	19.5	435	4,876
Rift Valley Province	562,760	576,724	1,139,484	538,613	532,192	1,070,805	2,210,289	20.3	32	68,581
Western Province	366,867	274,650	641,517	360,096	326,685	686,781	1,328,298	12.1	416	3,195
Total	2,812,174	2,670,207	5,482,381	2,714,335	2,745,989	5,460,324	10,942,705	100.0	49	224,921

Source: Kenya Population Census, 1969, vol. 1. Statistics Division, Ministry of Finance and Economic Planning, Nairobi, 1970.

Appendix table 2—Public and private capital expenditures in Kenya, 1960-70

Type of capital expenditure	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970[1]
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Residential building	296	251	153	118	141	216	240	217	218.9	262.1	287.7
Nonresidential building	228	145	122	74	142	95	95	109	113.7	187.6	127.6
Mechanical equipment	606	539	459	398	486	702	653	753	634.2	700.8	752.8
Roads, dams, and water supplies	191	154	124	66	73	89	144	110	116.6	126.7	104.3
Fencing	90	67	45	31	41	47	63	66	60.2	99.2	75.0
Plantation developing	454	447	372	298	255	212	264	382	404.1	406.1	438.6
Other	131	140	101	70	60	93	97	128	107.7	115.6	116.6
Total	1,996	1,743	1,376	1,055	1,198	1,454	1,556	1,765	1,655.4	1,898.1	1,902.6

[1] Provisional.

Source: Statistics Division, Kenya Ministry of Finance and Planning, Nairobi.

Appendix table 3—Teachers in service, selected types of school, Kenya, 1965-70

Type of school	1965	1966	1967	1968	1969	1970
	Number	*Number*	*Number*	*Number*	*Number*	*Number*
Primary schools:						
Trained teachers	20,112	23,305	25,050	27,485	30,001	37,215
Untrained teachers	10,480	10,217	10,622	10,438	8,311	6,584
Secondary schools:[1]						
Trained teachers	1,866	2,160	2,470	2,743	3,271	3,951
Untrained teachers	628	844	1,583	1,902	1,996	1,912
Teacher training colleges:						
Trained teachers	366	400	424	468	522	587
Trade schools:						
Trained teachers	133	125	94	123	145	157
Untrained teachers	NA	NA	7	7	NA	NA
Total	33,585	37,051	40,250	43,166	44,246	50,406

NA = not available.
[1] Includes secondary technical schools.

Source: Statistical Abstract, Kenya Ministry of Economic Planning and Development, Nairobi, 1970.

Appendix table 4—Value of Kenya's major agricultural exports, 1960-70

Product	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Coffee	28,546	30,145	30,186	30,789	40,580	36,700	52,133	39,186	35,941	47,251	62,343
Tea	13,594	12,786	14,530	19,121	21,812	20,527	27,737	24,996	29,085	32,768	35,574
Pyrethrum	2,819	2,264	1,235	3,049	2,540	4,348	7,090	7,557	7,012	6,227	4,896
Sisal	12,789	11,737	12,105	21,090	16,847	10,968	8,652	6,695	5,130	4,759	5,163
Dairy products	4,944	4,006	5,968	5,399	5,496	5,352	8,947	5,284	3,149	6,042	4,674
Meat products[1]	6,028	7,624	9,133	10,288	7,040	7,922	9,359	8,000	9,387	8,288	8,987
Wheat	2,403	2,142	6,946	8,257	9,878	12,085	9,747	12,810	18,981	2,291	3,851
Corn	500	500	1,443	4,407	46	10	3	3,987	13,585	10,077	328
Pineapple	1,290	1,329	1,938	2,282	2,447	2,169	1,498	1,526	1,381	3,024	2,079
Vegetables[2]	1,724	1,128	943	2,825	2,729	2,769	3,062	2,297	4,557	3,855	4,466
Hides and skins	4,904	4,431	5,229	3,242	3,599	4,837	7,162	4,878	4,711	5,161	4,622

[1] Includes meat preparations. [2] Fresh, frozen, or preserved.

Source: Annual Trade Reports of Kenya, Uganda, and Tanzania, 1960-70. East African Customs and Excise Dept., East African Community, Mombasa, Kenya.

Appendix table 5—Indexes of Kenya's total and per capita agricultural production, average 1961-65, annual 1962-71

(1961-65 = 100)

Item	Average 1961-65	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971[1]
Crops	100	99	106	99	104	119	117	126	130	140	132
Total agriculture	100	98	104	101	104	115	116	123	125	133	128
Total food	100	101	103	101	99	111	122	124	121	125	121
Per capita agriculture	100	101	104	98	98	104	102	104	103	105	98
Per capita food	100	104	103	98	93	101	107	105	99	99	93
Index of population	100.0	96.6	99.8	103.1	106.6	110.1	113.9	117.8	121.8	126.1	130.3

[1] Preliminary.

Source: Indices of Agricultural Production in Africa and the Near East, 1962-71, U.S. Dept. Agr., Econ. Res. Serv., ERS-Foreign 265, Apr. 1972, p. 16.

Appendix table 6—Kenya cropping calendar

Commodity[1]	Planting season	Harvesting season
Beverages:		
Coffee (Arabica)	Mainly rainy seasons	October - March
Tea	do.	Throughout year[2]
Cereals and grains:		
Barley	April - May	November - March
Corn:		
Long rains crop	do.	October - February
Short rains crop	October - November	June
Millet	April - May	October - February
Oats	do.	November - January
Rice	do.	December - January
Sorghum	April - June	October - February
Wheat	May - August	November - January
Fibers:		
Cotton:		
Coastal Province	May - June	September
Lake areas and Nyanza Province	May - September	November
Sisal	Throughout year	Throughout year
Fruits:		
Bananas	do.	do.
Citrus	do.	do.
Mangoes	do.	do.
Oilseeds:		
Castorbeans	April - May	September - October
Peanuts	May - September	December - February
Sunflower seed	do.	do.
Miscellaneous crops:		
Pyrethrum	Throughout year	Throughout year
Wattle:		
Mainly in Central Province	do.	do.
Sugarcane	April - May	May - December[3]
Tobacco (two crops)	March - April September - October	July - August January - February
Vegetables:		
Beans and peas	Throughout year	Throughout year
Cassava (manioc)	May - June	January - February
Potatoes:		
Irish	April - June, October	Throughout year
Sweet	April - May	October - November

[1] In all provinces, there are 2 crop-growing seasons: (a) short rains, October-December; and (b) long rains, March-May. [2] Tea harvesting after 3 years from seed or cuttings. [3] Harvested from 12 to 18 months after planting.

Sources: Planting and Harvesting Seasons for Africa, U.S. Dept. Agr., Foreign Agr. Serv., FAS-M-90, July 1960. Reports from Kenya Ministry of Agriculture, Nairobi. Reports of the Food and Agriculture Organization of the U.N., Rome.

Appendix table 7—Development of smallholder tea production in Kenya, 1964/65-1969/70

Year	Total acreage at end of year	Number of growers at end of year
1964/65	12,684	22,343
1965/66	16,010	29,693
1966/67	20,816	32,599
1967/68	26,618	37,953
1968/69	33,134	42,596
1969/70	40,102	48,443

Source: Economic Survey, 1971. Kenya Ministry of Finance and Economic Planning, Nairobi.

Appendix table 8—Number of livestock on large commercial farms in Kenya, 1960-70

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970[1]
	1,000 head	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*	*1,000 head*
Dairy cattle:											
Cows	241.7	234.7	218.0	207.0	179.1	162.5	159.5	144.5	165.7	161.9	174.0
Heifers	163.4	151.2	131.3	119.0	101.2	92.8	92.9	89.1	102.3	96.5	103.2
Bulls and bull calves[2]	7.6	6.8	6.4	6.0	4.3	4.8	9.3	11.6	12.2	14.7	14.8
Total	412.7	392.7	355.7	332.0	284.6	260.1	261.7	245.2	280.2	273.1	292.0
Beef cattle:											
Cows	134.7	127.5	124.8	115.1	108.2	107.0	122.3	126.0	131.7	139.4	136.2
Bulls and bull calves	12.6	9.1	8.4	7.8	6.4	339.3	347.5	358.0	355.1	361.2	356.1
Other	419.6	412.5	396.8	357.8	336.5						
Total	566.9	549.1	530.0	480.7	451.1	446.3	469.8	484.0	486.8	500.6	492.3
Sheep	582.6	580.2	510.9	501.8	409.8	399.7	433.8	477.7	443.8	460.9	438.4
Pigs	50.5	41.4	34.5	35.4	36.6	36.6	38.7	25.6	28.8	32.2	27.0
Horses	4.6	4.1	2.7	2.7	2.4	NA	NA	NA	NA	NA	NA
Poultry	255.8	280.6	287.7	255.7	203.3	213.1	200.9	207.6	225.2	219.4	229.9

NA = not available.
[1] Provisional data. [2] Maintained for stud purposes only.

Source: Statistics Division, Kenya Ministry of Finance and Planning, Nairobi.

Appendix table 9—Sales of selected products from settlement schemes through cooperatives, Kenya, 1964/65-1969/70

Product	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Milk	797,600	1,188,214	1,453,231	1,829,688	1,785,577	2,860,824
Butterfat	184,590	266,498	296,142	273,893	210,182	105,294
Pyrethrum	307,779	1,190,963	2,231,275	3,093,062	1,301,964	1,248,394
Beef	163,430	149,321	105,778	177,495	288,840	300,698
Wheat and barley	90,216	87,349	190,711	128,621	28,431	48,516
Corn	17,354	94,369	269,724	469,655	487,502	435,246
Coffee	29,596	67,082	70,927	76,832	40,326	74,796
Sugarcane	NA	NA	238,818	522,161	728,616	1,706,516
Wool	27,118	91,120	91,697	100,066	137,967	73,970
Other products	98,339	124,015	43,960	120,568	99,184	57,344
Total	1,716,022	3,258,931	4,992,263	6,792,041	5,108,589	6,911,598

NA = not available.

Source: Economic Survey, 1971, Kenya Ministry of Finance and Economic Planning, Nairobi.

Appendix table 10—East African Community trade, 1950-70

Year	Exports				Imports			
	Kenya	Tanzania	Uganda	Total	Kenya	Tanzania	Uganda	Total
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
1950	58,064	69,076	92,186	219,326	95,418	78,234	46,993	220,645
1951	77,814	113,383	144,236	335,433	160,842	88,888	67,552	317,282
1952	84,471	134,274	138,622	357,367	178,131	117,452	74,428	370,011
1953	69,420	100,163	113,009	282,592	158,229	95,049	89,802	343,080
1954	72,992	104,452	134,715	312,159	183,813	105,891	79,586	369,290
1955	88,764	106,092	139,386	334,242	217,166	137,888	106,236	461,290
1956	106,290	131,296	125,645	363,231	248,210	110,214	59,709	418,133
1957	105,835	116,224	143,309	365,368	259,024	118,368	67,640	445,032
1958	118,229	124,067	144,574	386,870	230,782	105,469	64,688	400,939
1959	127,688	134,009	132,493	394,190	236,064	102,030	58,374	396,468
1960	137,092	160,099	135,191	432,382	271,505	108,375	58,897	438,777
1961	143,568	148,724	128,941	421,233	248,282	118,309	62,402	428,993
1962	154,652	150,168	125,128	429,948	255,512	116,996	63,250	435,758
1963	178,144	187,533	167,205	532,882	295,570	119,772	78,807	494,149
1964	204,385	210,679	207,417	622,481	246,257	167,094	129,945	543,296
1965	228,110	192,342	202,833	623,285	282,074	186,831	161,153	630,058
1966	246,947	234,512	213,844	695,303	345,854	225,829	169,763	741,446
1967	223,150	228,806	216,253	668,209	336,138	220,754	159,246	716,138
1968	235,560	234,691	213,219	683,470	355,897	224,348	162,211	742,456
1969	257,909	247,898	222,316	728,123	360,559	239,400	175,364	775,323
1970	288,558	257,075	264,263	809,896	442,434	318,391	322,269	1,083,094

Source: Annual Trade Reports of Tanzania, Uganda, and Kenya, 1950-70. East African Customs and Excise Dept., East African Community, Mombasa, Kenya.

Appendix table 11—Quantity and value of Kenya's agricultural exports by principal countries of destination, 1970

SITC number	Commodity and country	Quantity	Value
		1,000 metric tons	*1,000 dollars*
001	Live animals incl. poultry (1,000 head)	9.7	232
0011	Cattle (1,000 head)	.9	227
	Zambia	.2	103
	Bahrain	.5	96
01	Meat and meat prep.	7.8	8,978
011	Fresh meat	3.3	2,124
	Beef	1.8	1,792
	Libya	.4	531
	Hong Kong	.7	492
012	Dried, salted, smoked meat	.9	773
	Zambia	.3	251
	Hong Kong	.2	126
013	Preserved meat and meat prep.	3.6	6,081
0138	Canned beef	3.1	4,150
	United Kingdom	3.0	4,030
02	Dairy products and eggs	13.3	4,674
022	Milk and cream	10.0	2,176
	Uganda	8.4	1,739
023	Butter and ghee	2.1	2,182
	Uganda	.8	836
	Tanzania	.6	690
024	Cheese	.2	241
025	Eggs	1.0	75
04	Cereals and cereal prep.	88.0	7,696
041	Wheat	44.0	3,851
	Uganda	26.2	2,247
042	Rice	.6	101
044	Corn	4.7	328
046	Wheat flour	38.0	3,204
	Ethiopia	9.0	690
	Burundi	5.9	576
	Rwanda	4.9	464
048	Cereal preparations	.1	83
05	Fruits and vegetables	NA	11,827
051	Fresh fruits	NA	5,006
0517	Coconuts	1.7	127
0518	Cashews	2.4	4,543
	India	2.3	4,444
	United States	.1	85
0519	Pineapples	NA	154
	United Kingdom	NA	154
052	Dried fruit	.2	16
053	Preserved fruit and fruit prep.	9.8	2,339
0535	Pineapple juice	1.6	205
	United Kingdom	1.0	120
0539	Canned pineapple	7.5	1,874
	United Kingdom	4.0	1,065
	W. Germany	1.1	236
	Netherlands	.5	122
054	Fresh vegetables	NA	3,241
0541	White potatoes	2.0	195
0542	Beans, peas, lentils, dried	14.4	2,208
	Tanzania	3.2	475
	Uganda	1.6	298
	Denmark	1.7	244
055	Preserved vegetables and prep.	3.6	1,225
	United States	1.1	353
	United Kingdom	1.1	297
061	Sugar, molasses, syrup, honey	24.9	351
071	Coffee	53.7	62,343
0711	Arabica	53.7	62,325
	W. Germany	13.4	16,374
	United States	9.9	10,747
0711—Continued			
	Sweden	7.5	9,032
	Netherlands	5.6	6,634
	Finland	3.4	4,231
	United Kingdom	2.9	3,255
	Canada	2.5	2,819
	Italy	1.3	1,531
	U.S.S.R.	1.2	1,140
	Romania	1.0	917
	Norway	.7	804
	Yugoslavia	.7	791
	Belgium	.6	720
	Czechoslovakia	.5	541
074	Tea	35.1	35,574
	United Kingdom	25.1	25,233
	United States	3.9	3,467
	Netherlands	2.0	1,937
	Canada	1.8	1,927
	Tanzania	.9	1,169
	Ireland	1.2	1,122
	Australia	.3	250
	W. Germany	.2	226
075	Spices	.8	241
	United Kingdom	.1	60
081	Animal feeds	31.8	3,017
	Uganda	8.0	792
	Belgium	10.4	564
	Japan	8.1	405
	Tanzania	2.3	395
091	Margarine and shortening	2.9	1,818
	Tanzania	1.7	1,155
	Uganda	1.1	595
099	Miscellaneous food prep.	NA	119
111	Nonalcoholic beverages	.1	16
1123	Beer	2.0	948
	Tanzania	1.1	505
	Uganda	.7	361
121	Tobacco, unmanufactured	.3	313
	United Kingdom	.2	242
211	Hides and skins	6.0	4,622
	United Kingdom	1.0	944
	Italy	.9	865
	Spain	1.3	586
	United States	(1)	15
221	Oilseeds, nuts, kernels	9.0	1,583
	Netherlands	1.8	387
	United Kingdom	1.8	314
	United States	.2	29
26	Textile fibers, unmfd.	51.9	9,765
262	Sheep and lambs wool	1.7	1,052
	W. Germany	.8	414
	Czechoslovakia	.4	296
263	Cotton, raw	5.1	3,431
	Mainland China	1.8	1,260
	India	.7	508
	Australia	.4	292
	Yugoslavia	.5	292
	Japan	.5	289
	Thailand	.4	286

Continued

See footnotes at end of table.

Appendix table 11—Quantity and value of Kenya's agricultural exports by principal countries of destination, 1970—Continued

SITC number	Commodity and country	Quantity	Value
		1,000 metric tons	*1,000 dollars*
2654	Sisal fiber	44.3	5,221
	United Kingdom	6.0	666
	India	4.7	524
	Italy	4.4	478
	Mainland China	3.5	473
	Japan	4.0	461
	United States	.4	50
2658	Coir fiber	.8	60
291	Crude materials, animal orig.	NA	547
	Elephant ivory	(1)	362
	Hong Kong	(1)	137
	United States	(1)	44
292	Crude materials, veg. origin	NA	6,837
2924	Pyrethrum flowers and powder	1.5	1,160
	Thailand	.3	247
	Argentina	.2	181
2929	Pyrethrum extract	.3	4,896
	United States	.1	1,504
	Italy	(1)	711
	Australia	(1)	513
421-422	Vegetable oils, soft	1.4	447
	Uganda	1.0	326
431	Processed animal and vegetable oils and waxes	.1	92
5511	Essential oils	.1	79
5995	Albumins, casein, glues, starches	(1)	7

Commodity and country	Value
	1,000 dollars
Total agricultural exports	162,126
Total agricultural exports to United States	16,639
Total nonagricultural exports	126,432
Total exports	288,558
Uganda	46,754
United Kingdom	41,571
Tanzania	41,306
United States	22,822
West Germany	19,087
Netherlands	10,499
Sweden	9,496
India	7,657
Zambia	6,458
Canada	5,054
Finland	4,365
Italy	4,310
Japan	3,431
Congo (Kinshasa)	2,316
Rwanda	2,158
Ethiopia	2,121
Mauritius	2,035
Reunion	1,780
Belgium	1,775
China (Mainland)	1,733
Australia	1,732

NA=not available. SITC stands for Standard International Trade Classification.
[1] Less than 50 metric tons.

Source: Annual Trade Reports of Tanzania, Uganda and Kenya, 1970. East African Customs and Excise Dept., East African Community, Mombasa, Kenya.

Appendix table 12—Quantity and value of Kenya's agricultural imports by principal countries of origin, 1970

SITC number	Commodity and country	Quantity	Value
		1,000 metric tons	*1,000 dollars*
001	Live animals incl. poultry (number)	273,289	335
0011	Cattle (head)	92	128
	United States	56	89
0014	Poultry (number)	272,834	168
	United Kingdom	141,088	119
	United States	1,150	3
01	Meat & meat prep.	.4	314
	Tanzania	.2	142
02	Dairy products & eggs	2.6	1,433
022	Milk & cream	1.8	936
	United States	1.1	756
	Australia	.7	156
023	Butter	.8	463
	Tanzania	.5	243
	New Zealand	.3	220
024	Cheese	(1)	34
04	Cereals & cereal prep.	22.5	2,992
042	Rice	1.1	2.98
	United States	.5	154
	Pakistan	.5	129
044	Corn	14.4	1,089
	United States	14.3	1,083
046	Wheat flour or meal	2.1	279
	United States	1.7	207
0481	Prepared cereals (breakfast foods)	.4	212
	United States	.2	77
0482	Malt incl. flour	3.6	570
	United Kingdom	2.1	336
	Australia	1.5	229
0484	Baked goods	.1	104
	United Kingdom	.1	67
0488	Diet foods	.4	385
	United Kingdom	.2	224
	Belgium	.1	149
	United States	(1)	3

See footnotes at end of table.

Continued

Appendix table 12—Quantity and value of Kenya's agricultural imports by principal countries of origin, 1970—Continued

SITC number	Commodity and country	Quantity	Value
		1,000 metric tons	*1,000 dollars*
05	Fruits & vegetables	NA	3,527
051	Fresh fruits	NA	450
	Australia	.3	85
	Greece	NA	78
	United States	NA	38
052	Dried fruit	.2	74
053	Preserved fruits & prep.	.8	359
	Australia	.3	115
	United Kingdom	.1	69
054	Fresh vegetables	18.2	2,218
0542	Dried beans, peas, etc.	14.3	1,708
	Tanzania	10.5	1,267
	Uganda	2.4	284
0548	Hops	.1	292
055	Preserved vegetables & prep.	.8	426
	United States	.2	82
	Mainland China	.2	78
	Italy	.1	61
	United Kingdom	.1	45
061	Sugar, molasses, honey	40.7	4,871
0612	Sugar, refined	39.9	4,707
	Uganda	18.4	2,057
	Poland	12.4	1,612
	France	7.0	731
	Hong Kong	.8	155
071	Coffee extracts, essences & prep.	(1)	137
072	Cocoa powder	.4	260
	United Kingdom	.4	247
073	Chocolate & prep.	.3	366
	United Kingdom	.2	311
074	Tea and mate	6.4	2,604
075	Spices	.2	164
081	Animal feeds	7.0	601
	Uganda	4.6	253
091	Margarine & shortening	(1)	17
099	Miscellaneous food prep.	NA	1,571
0996	Leavening agents	NA	213
0999	Milk foods for infants	.5	476
	Netherlands	.4	367
111	Lemonade & other flavored waters	(1)	10
1121	Wines	.5	548
	France	.2	265
	Italy	.1	115
1123	Beer	1.7	753
	Uganda	1.2	456
121	Tobacco, unmfd	2.8	3,810
	Tanzania	1.5	2,037
	Uganda	1.2	1,583
211	Hides & skins	.3	355
	Ethiopia	.1	253
221	Oilseeds, nuts, kernels	10.9	900
	Uganda	10.0	789
2311	Natural rubber	1.4	663
	Malaysia	1.2	535
26	Textile fibers, unmfd	3.7	940
262	Wool & animal hair	.2	148
2631	Cotton, raw	.1	45
264	Jute	3.4	741
	Pakistan	2.3	537
	Thailand	1.1	204
291	Crude material of animal orig.	NA	92
292	Crude material of vegetable orig.	NA	825
2924	Plants, bulbs, seeds, etc.	NA	277
2929	Pyrethrum extract	(1)	180
411	Animal fats & oils	7.4	2,002
	Australia	3.3	972
	New Zealand	3.1	695
42	Vegetable oils, fixed	17.7	6,071
421	Soft oils	.6	291
4212	Soybean oil	.6	266
	United States	.6	258
422	Other fixed oils, hard	7.9	2,241
4222	Palm oil	6.8	1,825
	Malaysia	6.8	1,809
4223	Coconut (copra) oil	.6	205
4229	Fixed vegetable oils, n.e.s.	.1	68
	United States	.1	58
431	Animal or vegetable oils, processed, inedible	2.7	749
4313	Acid oils, fatty acids, & solid residues	2.7	715
	Netherlands	1.2	313
	W. Germany	.7	195
5511	Essential oils	(1)	190
	United Kingdom	(1)	136
	United States	(1)	5
5995	Albumins, casein, glues, starches	2.0	617
59951	Starches and inulin	.9	151
	Netherlands	.3	43
	United States	.1	30
59959	Prepared glues	.6	257
	United Kingdom	.2	95
	W. Germany	.2	92
	Total agricultural imports		37,717
	Total agricultural imports from United States		2,843
	Total nonagricultural imports		404,717
	Total imports		442,434
	United Kingdom		116,085
	Japan		42,549
	United States		34,196
	West Germany		31,351
	Uganda		28,135
	Iran		24,885
	Italy		17,319
	Tanzania		16,627
	France		14,387
	Netherlands		11,480
	Saudi Arabia		11,206
	India		8,691
	Sweden		6,401
	Hong Kong		5,769
	Australia		5,275
	Belgium		5,071
	Malaysia		3,463
	China (mainland)		3,395
	Finland		3,068
	Switzerland		3,054
	Israel		3,042
	Poland		3,020

NA = not available. n.e.s. = not elsewhere specified. SITC = Standard International Trade Classification.
[1] Less than 50 metric tons.

Source: Annual Trade Reports of Tanzania, Uganda and Kenya, 1970. East African Customs and Excise Dept., East African Community, Mombasa, Kenya.

Appendix table 13--Selected products scheduled under EAC-EC Arusha Agreement: A comparison of import values and duties charged for EC, U.S., and U.K. shipments to the EAC, 1970

Products	EAC imports from EC, 1970	EAC imports from U.S., 1970	EAC imports from UK, 1970	Total EAC world imports, 1970	Revenue charge for entry to EAC	EAC customs duties	
						MFN rate[1]	EC rate
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*Percent*	*Percent*	*Percent*
Malt & hops	494	---	507	2,085	16	7	Free
Confectionary products	192	83	1,225	1,752	45	6	Free
Baker's yeast	244	---	357	601	26	4	Free
Wines	1,351	---	56	1,774	66-2/3	NA	Free
Pharmaceutical products	2,872	1,746	6,132	13,515	Free	Free	Free
Building materials	47	20	285	403	26	8	Free
Film in rolls	216	72	695	1,020	27	3	Free
Cigarette paper	136	---	9	450	42	4	Free
Carpets	146	10	416	659	25	5	Free
Glass products	743	64	266	1,581	27	4	Free
Iron sheets & plates	---	---	2	4,570	12	3	Free
Iron or steel wire material	666	5	129	1,161	25	5	Free
Stoves	441	15	193	909	25	5	Free
Office equipment	1,669	774	1,177	4,433	26	4	Free
Motor vehicle parts	6,672	345	6,062	15,805	28-1/3	5	Free
Optical equipment	708	383	1,211	4,402	24	6	Free
Watches & clocks	85	1	53	875	18	2	Free
Musical instruments	48	9	49	154	25	5	Free
Tape recorders etc.	810	207	163	1,616	31	5	Free
Other products	710	252	1,232	22,629	35	2-1/2	Free
Total	18,250	3,986	20,219	80,394			

-- = negligible or none.

[1] Most favored nation (MFN) principle: The willingness of a country to grant the same favorable trade treatment to most countries that it grants to any 1 country. The United States and the United Kingdom are among those charged MFN rates by Kenya.

Source: Agreement establishing an association between the European Community and the United Republic of Tanzania, the Republic of Uganda, and the Republic of Kenya. *Annex*--Schedule of the products to which Article 3 of Protocol No. 3 to the Arusha Agreement applies. Sept. 24, 1969, in effect January 1, 1971, p41.

APPENDIX II

PROTOCOL NO. 3

From the Arusha Agreement, establishing an association between the European Economic Community and the United Republic of Tanzania, The Republic of Uganda, and The Republic of Kenya, signed in Arusha, Tanzania, September 24, 1969.

[The three parties] HAVE AGREED upon the following provisions, which are annexed to the Agreement:

ARTICLE 1

For the purpose of implementing the provisions of Article 3 of the Agreement, the Partner States of the East African Community shall, on the date of coming into force of the Agreement, eliminate all customs duties and charges having equivalent effect other than those which are necessary to meet their development needs or which are intended to contribute to their budgets.

ARTICLE 2

The development needs of the Partner States of the East African Community referred to in Article 1 above are those arising from:

- the implementation of economic development programmes aimed at raising the general standard of living in the country in question;
- the needs of their economic development, in particular where necessary to encourage the setting-up of branches of production for the purpose of raising the country's general standard of living;
- the needs to achieve equilibrium in their balance of payment and to alleviate such difficulties as arise in the main from their efforts to expand their domestic markets and from the instability of their terms of trade;
- the necessity to achieve a rapid and sustained growth of their country's receipts from exports.

ARTICLE 3

The Contracting Parties shall take note of the customs duties to be eliminated in accordance with the provisions of Article 1 above in respect of the products listed in the Schedule annexed to this Protocol.

ARTICLE 4

On the date of coming into force of the Agreement, the Partner States of the East African Community shall communicate to the Association Council their customs tariff as it stands after application of the foregoing provisions. At the request of the European Economic Community, there shall be consultations within the Association Council on this tariff.

ARTICLE 5

The Partner States of the East African Community shall notify the Association Council of any amendment to the tariff so established, in particular of any increase in customs duties or charges having equivalent effect made to meet their development

needs or which is intended to contribute to their budgets. At the request of the European Economic Community, there shall be consultations within the Association Council on these amendments.

ARTICLE 6

The advantages accorded to Member States vis-a-vis third countries in respect of the products listed in the Schedule annexed to this Protocol shall not be reduced during the life of the Agreement.

The Partner States of the East African Community may, however, make any adjustments in the Schedule of products annexed to this Protocol that are necessary to meet their development needs or are intended to contribute to their budgets, subject to prior consultation within the Association Council and provided that the overall volume of concessions and the balance of concessions among the Member States are maintained.

This notification shall be accompanied by information of an economic and/or financial nature whereby the necessity to make the contemplated changes in the Schedule can be assessed.

ARTICLE 7

At the request of the Partner States of the East African Community, there shall be consultations within the Association Council regarding the conditions of application of this Protocol.