



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

G. B. MASEFIELD*

AGRICULTURAL CHANGE IN UGANDA: 1945-1960†

In tracing the development of African agriculture since World War II, Uganda provides excellent material for a case-study, for she in many ways represents a norm. Not exceptionally rich or poor, not remarkably backward or advanced, her economy displayed a classic dependence on export crops but her borders still included remote areas which had hardly emerged from subsistence farming. Her climate and ecology have something in common with both east and west Africa. Non-African plantations were a factor in the economy, but not a sufficiently large one to distort the natural development of African agriculture. The statistical and documentary material available is as satisfactory as can be expected from any African country; but here one special point must be noted. Uganda during the period 1945-60 was part of an East African customs union which included also Kenya and Tanganyika. Imports and exports in and out of this area as a whole are fully tabulated officially, and amongst the exports those which originated in Uganda are specified. But movements of commodities between the three territories are much less fully recorded (though such records as are available have been used in this report); and since Uganda exported much agricultural produce particularly to Kenya during this period, the student must beware of underestimating her production or wealth by ignoring these movements of commodities, which were not officially regarded as "exports."

A study of agricultural change since 1945 must begin with a brief picture of conditions then prevailing. It is logical to start with the human population. The 1948 census showed that 99.2 per cent of Uganda's population were of African race. Ethnically, the country falls into two clear sections. The southern half is almost entirely inhabited by Bantu tribes, with a small Hamitic element which included the cattle-keeping Bahima people of Ankole.¹ In the kingdom of Buganda, and in the districts of Bunyoro, Toro, and Ankole (see Map 1), the

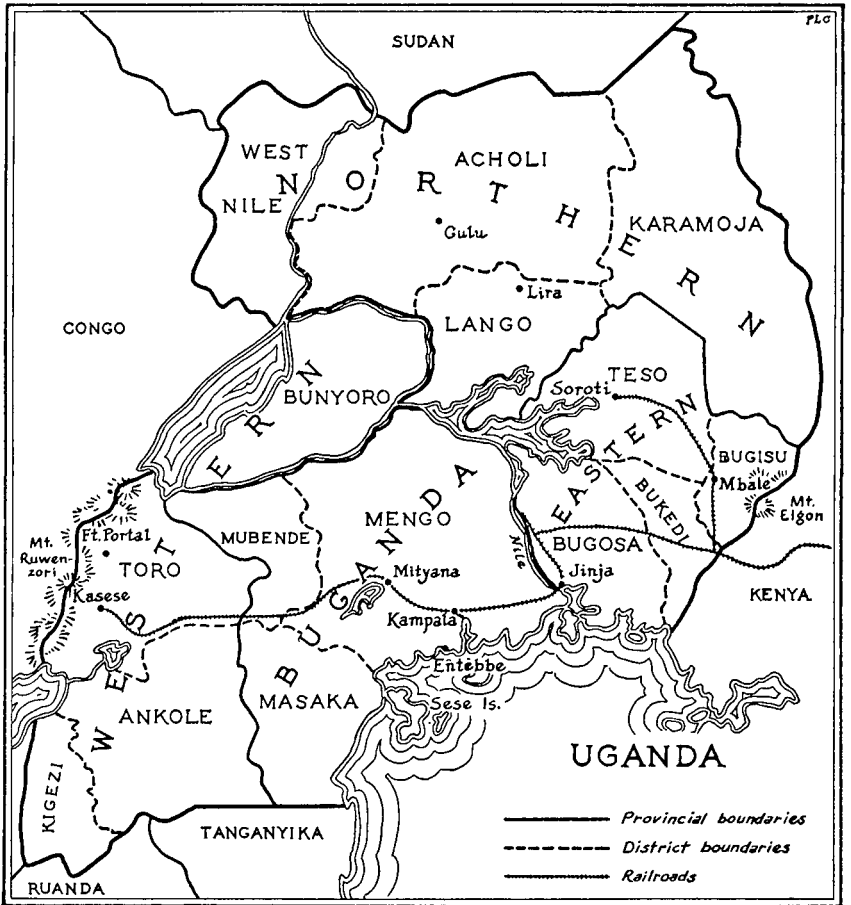
* Mr. Masefield is a member of the Department of Agriculture, Oxford University, and was formerly Provincial Agricultural Officer, Uganda.

† This is the first of a series of studies of agricultural achievement in the countries of tropical Africa during the fifteen years following the end of World War II.

Grateful acknowledgement is made to Carnegie Corporation of New York for a grant to the Food Research Institute of funds which made these studies possible. The Corporation is not, however, the publisher or proprietor of this publication and is not to be understood as approving by virtue of its grant any of the statements made or views expressed herein.

Grateful acknowledgement is also made to the Director of Agriculture, Uganda, in 1961, and to his staff for their ready helpfulness in providing information sought for the compilation of this report. Thanks are also due many other official and nonofficial persons of all races in Uganda for similar assistance.

¹ The terminology which is commonly used in referring to the Bantu areas of Uganda may be



MAP 1

people owe allegiance to hereditary monarchs, whose position has been safeguarded by agreements with the British government. The most important of these monarchs is the Kabaka of Buganda, and his local parliament is known as the Lukiiko. These Bantu peoples are individualist farmers, each man and wife looking after their farm with the help of their children and sometimes of hired labor.

In the Northern Province and part of the Eastern Province, the tribes are of Nilotic or Nilo-Hamitic stock with languages unrelated to the Bantu. They have no hereditary chiefs, and are more prone to engage in communal labor for the joint development of their farm land.

Of the small non-African population of 41,000 in 1948, the great majority were Asians (mostly Indians). These were primarily traders who have done

a little strange to the reader who is not familiar with it. The prefix Bu- denotes the area inhabited by a tribe, e.g., Buganda, Busoga, Bunyoro. Other common prefixes are Mu- for a member of the tribe, Ba- for a number of members, Lu- for the language. Thus, a Muganda lives, like other Baganda, in Buganda, speaks Luganda, and follows Nganda customs; his way of life may also be referred to as the Kiganda one. An extra syllable is put in for the inhabitants of Ruanda, who are called Banyaruanda.

much to develop the economy of the country and, at this date, still carried on the great bulk of its trade and secondary industry. The small European community (estimated at 2583 in 1945) consisted mainly of government officials, missionaries, businessmen, and their dependents.

A short account of the ethnology and history of Uganda is included in Thomas and Scott (14); the most recent general history of the country is that by Ing-ham (7).

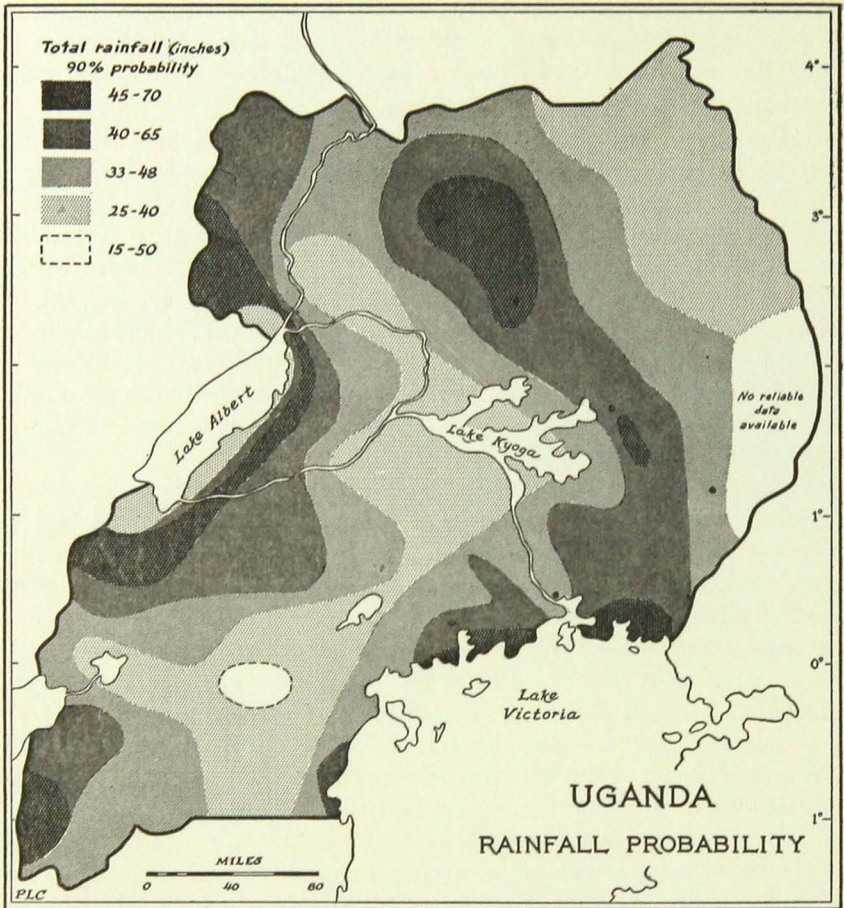
Although Uganda lies astride the Equator, temperatures are modified by the fact that nearly the whole of the country is at an altitude of between 3,000 and 5,000 feet above sea level. At Kampala, in the center of the country, the mean annual temperature is 69°F, with a mean daily maximum of 79° and minimum of 63°. At Gulu, in the hotter north, the corresponding figures are 74°, 85°, and 65°. Cultivation is carried up to about 7,000 feet in small mountainous areas on Mts. Elgon and Ruwenzori and in Kigezi district, but frost is not encountered until higher altitudes than these.

A useful short account of the rainfall of Uganda has been published by Henderson (6). As is common in the tropics, rainfall tends to a very high variability between one year and another; for example, Henderson shows that at Entebbe, with a mean annual rainfall of 61.3 inches, extremes of 89.0 inches in one year and 39.3 in another have been recorded. For this reason, simple figures of average annual rainfall are no very safe guide for the agriculturist; and the modern tendency is rather to draw maps showing, for any area, the probability of attaining a stated minimum rainfall in some definite proportion of years. Such a map for Uganda is reproduced here (Map 2). It shows that there are two main areas of low rainfall, in the northeast and in the south center. These include the two main pastoral regions of Uganda: Karamoja district and another area comprising eastern Ankole and western Masaka, in which two areas alone the keeping of cattle is economically more important than the growing of crops.

The annual distribution of rainfall is everywhere of a bimodal nature. The dry periods intervening between these two rainy seasons are not severe in the southern half of the country, where perennial crops flourish and it is normally possible to grow two crops a year of annual plants. In the northern half (roughly north of Lake Kyoga) the dry season from November to March is more severe and prolonged, and taking two crops unless they are very short-term ones is a risky business.

The general climatic picture of Uganda, compared with that of most African countries, is exceptionally favorable to agriculture.

The topography of central Uganda is that of a deeply dissected peneplain, which changes to steeper country in the southwest and to more gentle undulations in the north. Thus there is almost everywhere a catenary sequence of soils. The typical catena consists of shallow skeletal soils on the summits, deeper loams on the hill-slopes, and alluvial soils in the swampy valleys. Of these members of the catena, the hill-slope soils are by far the most important in area and for agricultural purposes. Over most of Buganda, much of the adjoining Toro and Bunyoro districts, and round the shore of Lake Victoria through Busoga to the Kenya border, these hill-slope soils over rocks of the Basement Complex are deep, fertile, red clay loams. They provide one of the largest continuous areas of really



MAP 2

Based on a map compiled by H. L. Manning, drawn and photolithographed by Survey Land and Mines Department, Uganda. Reproduced by permission of Director of Lands and Surveys, Uganda.

good soils in Africa. In the southwestern districts, on Karagwe-Ankolean rocks, the soils are more brown than red but are only a little less fertile. In the northern half of the country, the hill-slope soils are markedly lighter and more grey or brown in color; such high yields of crops cannot be expected in these areas as in the southern half. Amongst soil types of minor extent, the rich volcanic soils of Mount Elgon, the foothills of Ruwenzori, and a small part of Kigezi district are noteworthy.

A survey of the whole of the country's soils has been undertaken in recent years and an excellent account published by the Uganda Department of Agriculture (*Memoirs of the Research Division: Series 1—Soils*, Nos. 1-6, 1959-60).

So much of the country is or has been under shifting cultivation or grazing that relatively little purely natural vegetation survives. The extent of closed forest, largely in forest reserves, has been estimated at the low figure of only 2.3 per cent of the land area of Uganda (14). Although the forest areas are small, the remaining uncultivated land is mostly covered by savanna, a community of

trees and grasses in which the trees vary in density from open woodland to scattered specimens. In the districts fringing Lake Victoria, the dominant grass is the tall elephant grass (*Pennisetum purpureum*); elsewhere for the most part shorter grasses predominate. There are numerous special vegetation types of smaller extent, which include the papyrus swamps, some treeless grasslands in Ankole, and the scrub-covered steppe of the arid Karamoja district. A survey of the vegetation of Uganda has been carried out by the Department of Agriculture, and its publication, in similar form to the soil survey, was nearly complete in 1961 (*Memoirs of the Research Division: Series 2—Vegetation*, Nos. 1-4 and 6, 1959-60).

Uganda has its fair share of big-game animals, whose chief economic importance in modern times is as a tourist attraction, particularly in the two great National Parks, the Queen Elizabeth and the Murchison Falls, which were proclaimed in 1952.

"Hunting, which once was among the chief activities of the male native, is now to be ranked among his holiday amusements," said Thomas and Scott in 1935 (14). Since that date, although this "holiday" activity includes poaching from the game reserves, the importance of hunting has been still further reduced by the spread of cultivation and herding, the delimitation of further reserves, and the shooting-out of game in tsetse-control operations. Only in one or two more thinly populated districts, such as Acholi, does game meat form even a small part of the diet.

Animals are, however, important for the destruction caused to crops. The damage done by elephants is the most spectacular, and up to 1,000 of these animals a year have to be shot in control operations. But in aggregate the loss of crops caused by smaller animals—monkeys, squirrels, cane rats, porcupines, and various birds—is more important. In 1945, the game laws had to be amended to protect the leopard from indiscriminate hunting, because it exerts some natural control over wild pigs which were becoming an increasing menace to crops.

HISTORY OF AGRICULTURAL DEVELOPMENT

The British protectorate over Uganda was proclaimed in 1893, though it was another twenty years before the last of the districts lying within the present boundaries were actually administered. In the early years of British administration, ivory was the chief export; but with the coming of the railway in 1902 from the coast to Kisumu, whence lake steamers connected with Uganda, the export of more bulky commodities became possible. In 1904, cotton of the American Upland type was introduced, and it rapidly became the main export of the country, bringing a modest prosperity which was envied by many other African countries. Defects in the marketing and ginning of cotton which gradually became apparent caused the passage in 1926, and later, of legislation, under which the industry was rather rigidly controlled. Marketing was confined to a prescribed season, buying had to be done within defined zones to avoid mixture of varieties, and the erection and operation of gins² were controlled under license. Some gins, redundant because of the excessive number built, became "silent" and were used only as buying posts and not for ginning.

² In Uganda, following British usage, what in the United States is called a gin is called a ginnery.

Worried at the country's dependence on a single export product, the Uganda government did much to try to encourage other agricultural exports. The growing of Robusta coffee in Buganda was stimulated by issues of coffee seedlings from nurseries which in the 1930's reached about a million seedlings a year and began to provide an appreciable export income. At higher altitudes on Mt. Elgon, the Arabica coffee industry was organized as the Bugisu Coffee Scheme, whose presiding Boards consisted chiefly of government officials but were intended eventually to be transmuted into a co-operative organization. Similarly the tobacco industry, principally in Bunyoro, was fostered by the provision of government nurseries, instruction, compensation for hail damage, and a packing factory; and this became a third, though small, prop to the economy. Hides and skins were almost the only export derived from livestock. Small and fluctuating exports of crops such as peanuts, other pulses, and sesame represented mainly the surplus available in years of good food crop harvests.

By 1945, about one-quarter of Uganda's cultivated land was under export crops. The remaining three-quarters were devoted to food crops, whose production was little changed since the advent of British administration except that plowing with oxen had been inculcated and quite widely adopted in the Eastern and Northern Provinces. The chief food crop in the southern, Bantu, areas of well-distributed rainfall was the plantain or cooking banana; in the harsher north it was finger millet (*Eleusine coracana*). In both areas subsidiary food crops included sorghum, sweet potatoes, manioc (cassava), peanuts, and beans.

Non-African agricultural development has been a minor factor in Uganda. It is doubtful if there have ever been more than 100 European or Asian owners of agricultural estates. Nevertheless these were important to the economy as being in 1945 the sole producers of sugar, tea, rubber, and sisal for local consumption or export. Tea appeared to have a particularly bright economic future, and the sugar production from two large Indian estates sufficed for local needs and some export.

The general economic picture in 1939 was one of free competition except where the government had found it empirically necessary (as in the case of cotton marketing) to impose controls. Thus to protect coffee quality, from 1936 inspection and grading had been imposed on African-grown exports, and curing had been limited to licensed factories. Since 1906, hardly any new land had been allowed by government to pass into the hands of non-Africans. The acreage of tea that could be planted was in 1945 still restricted by Uganda's adherence to the international tea agreements. Land tenure remained in general governed by native customary law, undisturbed by the fact that the Protectorate government had designated all unalienated land as Crown Land, and with a single great exception in Buganda. Here, under the terms of the Uganda Agreement of 1900, about half the land of the kingdom had been granted in private ownership to leading Baganda notabilities. These areas, known as "mailo" land, have since been fragmented by sale into much smaller parcels; but many Baganda are still large landowners, often with rent-paying tenants on their estates.

During World War II, an exceptional situation arose in which practically all agricultural produce was either subject to government control in its marketing or purchased directly by the government through its Department of Supplies.

These marketing systems will be considered later in relation to the year 1945.

A comprehensive account of Uganda agriculture just before World War II is given in Tothill (15), and a short history of agriculture in Uganda has been written by Wrigley (28).

ORGANIZATION OF PRODUCTION

At this early stage in our inquiry we are faced, as we shall be repeatedly, by the inadequacy of the statistics. This is not due to the inefficiency of the Uganda government, which indeed has taken far more trouble than many tropical governments in this respect, but to the impossibility of obtaining reliable data about a peasant agriculture of tiny farms with the staff and funds that could be afforded.

Area Farmed

The Department of Agriculture publishes each year with its annual report an estimate of acreage planted to crops. This estimate is prepared on two systems. Outside Buganda, chiefs' monthly returns of the number of plots planted to each crop are multiplied by a mean plot size for that crop determined by sample measurements. In Buganda, a mean crop acreage per taxpayer is determined annually by sample measurements and multiplied by the Buganda government's return of taxpayers. Both methods are admittedly inaccurate. Even in the case of the cotton estimate, over which the greatest care is taken, sample checks by the Department itself have shown the estimates to be at times as much as 60 per cent in error in districts outside Buganda. An investigation into the accuracy of these statistics has been published (19); and revised crop acreage estimates for 1945 to 1956 which superseded earlier official figures were also computed (22). In any case, what these figures show is the acreage *planted to crops* and not the total *land used*. Since double cropping is practiced, as noted above, in much of the Protectorate, many of the acres planted to maize may appear again as acres planted to cotton later in the same year, and similarly with other crops. Acreages of crops grown on non-African estates are obtained by asking the proprietors to fill in an annual form, and there is no check on the accuracy of most of them. Finally, the heads under which crops, or groups of crops, are listed in these tables have varied over the years.

Nevertheless, with all their defects, these tables are the only annual estimate we have of crop plantings, and, for what they are worth, the figures for 1945 and 1960 are given in Table 1.⁸ This table shows an apparent increase in acreage planted to crops from 6,085,600 to 8,588,900 acres between these dates, or an increase of 41.1 per cent.

What is more easily established, because it is open to visual observation, is the location of all this new cultivation. It developed in three main ways. The first was by infilling between old-established cultivation in the more populous

⁸ The revised acreage figures in the publication mentioned earlier (22) have not been used in this table because (a) they do not cover all crops and do not have a heading for "other crops," so that no total can be derived from them; (b) though there is strong internal evidence that they do not include acreages grown by non-Africans, this is nowhere stated in the publication, so that their coverage is doubtful; (c) the figures for 1945 in this publication are stated to be less reliable than the others. However, the discrepancy with Table 1 is small (0.05 per cent on finger millet, 0.04 per cent on plantains, 0.5 per cent on cotton).

TABLE 1.—ESTIMATE OF ACREAGE UNDER CROPS IN UGANDA, 1945 AND 1960*
(Thousand acres)

Crop	1945	1960	Crop	1945	1960
Food crops:			Cash crops:		
Finger millet	1,090.5	1,161.8	Cotton	1,153.0	1,516.2
Plantains	836.7	1,545.9	Coffee (<i>Robusta</i>) . .	138.1	528.0
Sweet potatoes . . .	482.8	598.7	Coffee (<i>Arabica</i>) . .	17.2	37.9
Manioc	476.7	605.8	Soybeans	33.9	5.1
Sorghum	390.8	678.3	Sugar cane	32.0	37.0
Beans	373.9	583.1 ^a	Chillies	17.4	...
Peanuts	356.9	427.7	Sisal	9.4	6.0
Sesame	242.3	243.6	Tobacco	8.0	10.9
Maize	157.7	349.3	Rubber	7.6	...
Pigeon peas	126.4	181.1	Tea	4.5	16.8
Rice	62.3	4.4	Flax	1.5	—
Field peas	31.5	30.6	Pyrethrum	1.3	—
Potatoes	1.5	11.3	Cocoa . . . . .	...	.1
Wheat	1.2	...	Miscellaneous	29.3	...
Onions	1.0	3.3	All crops	6,085.6	8,588.9
Bulrush millet . . .	...	6.0			

* Data from Uganda Protectorate, Dept. Agr., *Annual Report . . . 1945-46*, and 1960, pp. 36, 45.

^a Including cowpeas and gram.

districts; and the extent to which many districts filled up with farms in this period, reaching an extreme in parts of Bugisu and Mengo, was striking to the eye. It must be supposed that this previously uncultivated land had been left so either because it was relatively inconveniently situated, e.g., far from water or a road, or was on less fertile soil. For these reasons it must be concluded that production from these new farms was likely to require more labor or to show lower yields than from the old ones.

The second process was a wholesale movement of population into large areas previously left unfarmed because of lower rainfall or poorer soils (the two usually go together in Uganda) than the old settled areas. Here, too, it must be expected that the national average of crop yields would be decreased by the inclusion of these inferior areas. This process has typically gone on in western and northern Buganda, where there was still much uncultivated country in 1945.

The third process has been dependent on special government activity. It includes the resettlement of farmers from overcrowded and exhausted areas in Kigezi on new areas in that district and in Ankole and Toro, an operation which began during World War II. By the end of 1949, 14,000 people had been resettled, and the process went on steadily with a variation between about 1,000 and 4,000 settlers a year. In the South Busoga resettlement area, 1,587 families had been established by 1960; and in the Kigumba resettlement scheme in Bunyoro, 360 holdings were occupied, largely by Kenya people, by the same date. More important than any of these schemes was the near elimination by insecticides of the "mbwa" fly (*Simulium damnosum*) in the Nile River which had previously kept some very fertile riparian areas in Buganda and Busoga unpopu-

lated. The result of this work was very heavy settlement from about 1952 and large new production in Bugerere county of Buganda and Bugabula county of Busoga. All the areas referred to in this paragraph were more productive than those from which most of the settlers came, and were thus a factor tending to raise national average yields of crops.

Livestock Population

The livestock census figures published in each annual report of the Veterinary Department⁴ are again admittedly inexact and will tend to be an underestimate because of the well-known tendency of African stockowners to conceal their animals from enumerators or to understate their numbers. The figures for 1945 and 1959, the latest year for which a report is available at the time of writing, are given in Table 2.

TABLE 2.—LIVESTOCK NUMBERS IN UGANDA, 1945 AND 1959*

Animals	1945	1959	Per cent increase or decrease
Cattle	2,293,740	3,590,335	+56.5
Sheep	995,321	959,324	-3.6
Goats	2,143,533	2,764,635	+29.0
Pigs	23,158	15,668	-32.3

* Data from Uganda Protectorate, Veterinary Dept., *Annual Report, 1945*, and Dept. Veterinary Services and Animal Industry, *Annual Report, 1959*.

From this table it will be seen that cattle have increased by a larger percentage than crop acreages; the increase in goats is somewhat smaller. Sheep numbers have slightly declined, probably because they are the domestic animals least esteemed by Uganda stockowners, who, as the pressure on pasture land increased, would be least inclined to devote valuable grazing to sheep. The decline in the number of pigs is probably due to the 1945 figure representing a peak population in Buganda at the end of the war when meat was acutely short and the demand for it greatly increased by returned soldiers who had acquired a taste for meat from army rations. Poultry figures are not available, but visual observation suggests that during this period they increased by at least the same ratio as the human population. This development would have been helped by the increasing numbers of purebred poultry distributed by the Veterinary Department, which in 1959 issued 22,210 Rhode Island Red and Australorp day-old chicks from Entebbe, together with 5,400 other birds; in the same year 23,500 day-old chicks were imported from the United Kingdom.

Apart from these poultry, there was little change in the types of animals kept during these years. A few grade cattle with exotic blood were introduced immediately after the war, and a larger number from 1957, by commercial enterprises; and by 1960 one or two African stockowners were beginning to purchase grade Guernseys or Jerseys from Kenya. By this year the Veterinary Department

⁴ Department of Veterinary Services and Animal Industry from 1952; the designation "Veterinary Department" has been retained in this report for consistency and brevity.

itself had decided to encourage limited keeping of Jersey crosses on tick-free farms, and its artificial-insemination service which began in 1959 had Jersey semen on offer.

The ever-increasing numbers of cattle and goats during this period were, of course, owing to the extension of cultivation, kept on an ever-decreasing area of pasture. By 1960, pressure on grazing land had not yet become acute, though an increased worm burden in cattle which was noticed in some districts may perhaps be attributed to it.

As regards changes in the location of the cattle populations mentioned, the chief factor was reclamation of land infested by the tsetse fly. For some ten years before 1945, this fly had been spreading into some of the best grazing lands of Uganda. Between 1947 (when it was established) and 1960, the Tsetse Control Department succeeded in freeing about 6,000 square miles in Buganda and the Northern Province, with a resultant resurgence of cattle in these areas which may be exemplified by a single instance: Buruli county in Buganda held 144 cattle in 1945 and 46,000 in 1961.

Farm Organization Practices

Traditionally, the farming system of the Uganda peasant has involved an alternation of cropping periods on any piece of land with resting periods under a regenerating natural cover. As population density has increased, the proportion of land that could be left to rest has naturally declined—in a few congested areas almost to the vanishing point. In this respect the period 1945–60 is only one part of a long progression. In one small area in Teso which was subject to intensive agricultural surveys in 1937 and 1953 (26, p. 182), the ratio of resting to cropped land had dropped between these two dates from 1.5 to 1.2. These figures may be very typical of the fairly densely populated districts. But for the country as a whole, the annual reports of the Agricultural Department give a ratio of available to cultivated land of 7.0 in 1952 and 6.8 in 1960. Within the cropping period, rotations in Uganda have always been irregular, but either cotton or a cereal was usually taken as an opening crop. Between 1945 and 1960 the use of cotton as an opening crop declined, owing to the successful propaganda of the Agricultural Department for earlier planting of cotton, which left less time to break the ground before this crop was planted.

The size of farms is said to have declined during this period in some densely populated districts, but it is difficult to obtain adequate data to assess this. In the Teso surveys mentioned, the area of crops planted per family fell from 9.3 acres in 1937 to 7.8 in 1953.

A tractor-hire program operated by the Agricultural Department from 1948 (4, p. 281) made only a slow impact. In 1957, when it was well established, 6,172 acres were mechanically cultivated by the service, but in 1960 the total was only 5,739 acres. On the other hand, the number of ox-drawn plows increased very considerably. No complete figures are available, but in 1960 there were 83,707 plows in the whole country; in Lango district, there were 5,722 in 1947 and 14,484 in 1960; in the Teso area quoted above (26), the percentage of arable land opened

by plow was 70.7 in 1937 and 95.0 in 1953. Fencing of grazing land was just beginning to make some headway at the end of the period. In 1957, a few fenced paddocks were reported to have been made by Africans in Buganda and Lango, and more people were encouraged to do so by the Farm Planning Unit of the Agricultural Department which started work in that year. In 1960, perhaps 100 farmers in Buganda had fenced paddocks.

The most outstanding progress in agricultural practice between 1945 and 1960 was undoubtedly in soil conservation. Here two main methods were used: in the perennial crop areas around Lake Victoria, "bunds" (narrow-base terraces) planted with *Paspalum* grass, and in the drier areas of the country, buffer strips of grass left uncleared between cultivated plots. The Deputy Agricultural Adviser at the Colonial Office stated in 1950 that he considered the work in Kigezi to be "the most spectacular work on soil conservation anywhere in the British Empire." In 1952, the Agricultural Department was able to report that "in Buganda, it is now unusual to find holdings which are not provided with some form of erosion control." These measures were still far from perfect in 1960; but in the preceding fifteen years, soil erosion in Uganda had been reduced from a major menace to quite a minor threat.

The position of estate production, as compared with peasant farms, changed in two respects during these years. First, there were in 1945 only a handful of Africans, all in Buganda, who could be described as coming into the class of estate producers. But in 1960, the annual report of the Department of Agriculture classified 4,582 acres, or 15 per cent, of the estate acreage of coffee as being on African-owned estates. Africans operating on this scale were almost all in Buganda, though in the same year an African in Teso farmed 350 acres by tractor, and in Bugisu a group of Africans had set up a company which ran a wheat farm with tractors, drills, and combine harvesters. The second tendency was for non-African estates to change hands. A number of European planters during these years sold out to Asians; but more important was the trend for individual planters of either race to sell out to companies which operated a large number of estates. The government, too, became indirectly an owner of agricultural estates. In 1952 the Uganda Development Corporation Ltd., which it had set up purchased a large group of estates in Buganda which were being sold by a British firm, Buchanan's. The motives for this transaction are somewhat obscure, but it would appear that the government wished to take the opportunity of bringing this large block of land back into national ownership rather than let it continue in alien hands.

During this period estate owners continued to recruit their labor as they could, from local or immigrant workers, the activities of recruiters being under the control of the Labour Department. Many African farmers continued to employ immigrant laborers, especially Banyarua in Buganda; Wrigley estimated that perhaps nearly half the income received by Baganda farmers was paid out to hired labor (28). An increasing number of Kenya immigrants sought employment in the Eastern Province. Within the peasant family itself, there were signs that the old distinction of work between the sexes was beginning to break down, and in the Eastern Province women could be found plowing and men weeding,

which was a reversal of the old order of things. Some small farmers, to an increasing extent, were undertaking a "task" or "ticket" of work (also locally known as "leja-leja") for part of the day on the farms of wealthier neighbors. In the Northern Province, the old system of a group of some fifteen to twenty neighbors joining together for communal work in opening land, harvesting, and sometimes in weeding their plots is described as continuing in full force in Lango and Acholi districts by Parsons (10). As plows became commoner, this system was supplemented by a practice of those who owned no plow hiring from those who did, at a cost of about Sh. 40/- per acre.

A point to be noted is the loss of juvenile labor from farms as more children attended school. This was particularly felt in the herding of cattle, which by 1960 were on some farms not taken out to graze until 11:00 A.M. when an adult man had finished fieldwork, and of goats, many more of which were tethered, rather than herded, in 1960 than in 1945.

Purchased Current Inputs

The articles most universally bought by African cultivators are hoes. In 1945, by which date almost all hoes were imported rather than locally made, 702,592 hoes to a value of £66,911 were imported; in the same year imports of "shovels, spades, axes, and matchets" (not all for agricultural use) were worth £6,224 (17). In later years these items were differently classified in the trade reports; but in 1959 the total import of "agricultural hand tools and implements" was worth £197,000 (24).

Animal feedstuffs were little bought during this period in Uganda. In 1945, a few African milk producers around Kampala had already been persuaded by veterinary officers to buy oil cake (peanut and sesame) from local mills; by 1960, they had advanced to the purchase of compounded feedstuffs from Kenya. By this latter date, a considerable number of poultry-keepers were also buying grain to feed their birds. Veterinary drugs to the value of £33,154 were purchased by stockowners in 1959 from African local governments under schemes supervised by the Veterinary Department.

Expenditure on seed was also minimal, though many peasants had the deplorable habit of overselling their crops at harvest and then having to buy seed back from traders at enhanced prices at planting time. Cotton seed was distributed free by the government, its cost being allowed for in the price structure of the industry. Maize seed was imported by the government from Kenya for distribution to growers in each year from 1945 to 1949.

Imports of fertilizers from overseas are not separately stated in the trade figures for earlier years, but in 1955 they amounted to 4,000 tons worth £102,000, and in 1959 to 9,407 tons worth £250,000. Imports from Kenya were insignificant, amounting to only £80 in 1960. These fertilizers were almost entirely used on non-African estates, the sugar estates being the largest single users (the one in Buganda was stated to have spent about £150,000 on fertilizers in 1960). The use of fertilizers by African farmers was negligible.

There was, however, some use made by Africans of two other kinds of manure. Township-waste compost had been distributed from Kampala for some

years before 1945; in 1948 this practice was extended to Entebbe, and 1,700 tons were distributed from the two places, but the scheme had been dropped by 1960. Distribution of coffee husks from the curing works, which were used as a mulch by farmers, had begun during World War II. At first, the husks were given free to encourage their use; later the recipient had to pay enough to cover the cost of transport. In 1948, 2,300 tons were distributed, and the quantity grew with the coffee crop, but annual figures are not available. A certain amount of sewage sludge from the Kampala sewage works was sold to the sugar estates. In parts of the country, farmyard manure had, by 1960, acquired a saleable value—a development in which Uganda was behind some other African countries.

An interesting new feature, though still on a small scale, was the purchase of insecticides by African farmers. From 1956 they were encouraged to buy knapsack sprayers and insecticide for spraying cotton, and from 1957 dieldrin for the control of the banana weevil. In 1958, in Teso 1,157 sprayers and 3,109 cans of insecticide were sold (9). The government became a major purchaser of bactericide when it was decided to dress cotton seed against black-arm disease before planting. In 1951, this was done in Teso, and by 1956 the practice had been extended to all cotton zones.

Purchases of fuel for agricultural production were limited to supplies for the few tractors in the country, whose numbers will be discussed later. Growers of fire-cured tobacco collected their own firewood for curing purposes. However, the agricultural processing industries of cotton ginning and coffee curing were large consumers of fuel. By 1945, many gins had already gone over from burning firewood or cottonseed to fuel oil, and starting in 1954, when hydroelectric power became available from the Owen Falls dam, many were electrified as the power lines were extended.

Capital Inputs

Neither irrigation nor drainage absorbed capital from African farmers. In 1949, following the visit of an irrigation expert from Aden, four Aden Arabs were engaged by the government to start experimental irrigation in Karamoja, but this and some other experiments remained on a small scale. The country's two sugar estates obtained a large part of their increase in yield during this period from the adoption of overhead irrigation; this was pioneered by the estate in Busoga, which was estimated to have spent £500,000 on this work by the end of 1961. Work on swamp drainage, begun before 1945, was carried on in certain districts by government; in 1958, for example, the Water Development Department carried out an active program in Kigezi. The annual reports on the government accounts show statements between 1945 and 1951 of a total of £12,050 received from the United Kingdom's Colonial Development and Welfare Fund for swamp drainage.

Rural water supplies were a continuing item in government expenditure and were also supported by Colonial Development and Welfare funds. In 1947, it was reported that 200 reservoirs and 700 boreholes had been made during the previous ten years, and this work proceeded in subsequent years. In 1954, a grant from the African Development Fund of £500,000 over five years for rural water

supplies quickened the pace of provision. By 1958 there were 2,700 boreholes, and in that year ten dams and 54 valley tanks were completed. Fisheries may not be considered as part of agriculture, but it should be noted that, while fish ponds were unknown in 1945, over 4,500 had been constructed by 1960 and these were mostly stocked with *Tilapia*, of which free supplies of fry could be obtained from a government fish farm near Entebbe.

Surveying of farms continued on "mailo" land in Buganda, where the original backlog of work has never quite been overtaken, owing to continuous subdivision of these lands by sale; this was largely an expense that fell on the private individual.

Expenditure on agricultural machinery was of small importance and is difficult to estimate. Imports of tractors, not separately designated in the trade figures for 1945, were 82 in 1948 and 92 in 1960, but these figures include non-agricultural tractors; of those that were used for farming, most were on the non-African estates. In 1960, there were 38 tractors owned by African farmers in the whole country, the largest numbers being in Acholi and Buganda. Imports of other agricultural machinery and implements, classified under various heads but including plows, amounted to a value of £11,370 in 1945 (17) and £86,521 in 1960 (1).

It is necessary to consider separately how far capital was brought into Uganda agriculture from extranational sources during this period. The considerable expansion in production by non-African estates was probably generally financed by them from profits, and it seems unlikely that they brought more capital into the country than they sent out of it. The Protectorate accounts show amounts apparently of over £1 million received from Colonial Development and Welfare funds during the years 1945-60 inclusive for purposes more or less related to agriculture (other than the swamp drainage and rural water supplies already mentioned). The headings include: cattle dips, tsetse control and reclamation, insecticide research, unspecified agriculture, co-operation, unspecified veterinary and *Stomoxys* research. However, many of these annual figures represent re-appropriation of money not used in previous years, and it is difficult to arrive at a true total. Not all this money was spent for agricultural purposes, e.g., in the fields of insecticide research and co-operative development. Little of it was actually applied to production. Some was used to pay Uganda's contribution to interterritorial research organizations such as the Colonial Pesticides Research Unit and the East African Tsetse and Trypanosomiasis Research Organization; some of the money for unspecified agriculture was used in the establishment of district farm institutes. Finally, it must be remembered that, as against these receipts, Uganda was herself making other external payments for agricultural purposes, such as contributions to research institutions, contributions for locust control in Africa generally, and a small annual contribution to the Imperial College of Tropical Agriculture in Trinidad. It must, however, be concluded that, on the whole, Uganda received less from Colonial Development and Welfare funds for agricultural purposes than the average for British colonial territories of her size and population. This was probably because her agriculture at

this period was regarded as more than usually prosperous for a tropical country and she was thus considered to be less in need of help.

It may be for the same reason that Uganda, unlike many other tropical countries, received little or no help for her agriculture from international sources during this period. Neither FAO, the World Bank, nor (except for some small research grants) philanthropic foundations came into the picture; nor did United States money until in 1953 the Mutual Security Administration allotted £100,000 to Uganda for African credit purposes, of which only 30 per cent was to be used for agriculture.

AGRICULTURAL PRODUCTIVITY

Only for two or three crops can even a rough estimate be made of how yields per acre changed during the period since World War II. The first of these is cotton. Here a number of factors tended toward an increase in yield. A wholly new system of seed replacement was adopted during these years; instead of new waves of seed in districts at irregular intervals, annual replacement was achieved in the area growing BP52 cotton by 1954, and later in the S47 area. Already, between 1947 and 1950, the purity to variety in Buganda was reported to have been raised from 75 to 90 per cent. These new waves of seed were derived from multi-line strains bred at the Empire Cotton Growing Corporation's experiment station at Namulonge, and were estimated to give an annual increment of yield of 2.5 to 3.0 per cent. At the same time, the average ginning outturn went up between 1945 and 1960 from about 30 to 33 per cent. The planting of S47 seed in 1951 over the whole of the Northern and Eastern Provinces except Busoga was held largely responsible for a 60 per cent increase in yield in that year. The effect of dressing seed with a copper bactericide is shown in a report in 1954 that in an area where seed had been dressed for five years, the incidence of black-arm disease had been reduced from about 53 to 4 per cent. Finally, spraying with insecticide, earlier planting, and somewhat closer spacing all helped to raise potential yields.

As against these tendencies, overcropping probably led to greater soil exhaustion as the length of the resting period dropped with increasing population. Soil erosion continued, though on a much smaller scale than before. The extension of cotton cultivation to new areas of poorer soils and lower rainfall has already been mentioned. Over the whole period, cotton acreage decreased greatly in Buganda, an area of generally good soil, and increased in all the other provinces, whose soils were for the most part poorer.

Table 3 gives the official figures of national cotton yields for each year from 1945 to 1960. It does not disclose any steady tendency either to rise or to decline in yield, and it would be reasonable to conclude that the trends making for increase or decrease were very nearly in balance.

In the case of coffee, the records of acreage and exports show an apparent production of 2.5 cwt. of clean coffee per acre in 1945, and 4.1 cwt. in 1960. This is easily explicable, since in 1945 when prices were rising a much larger proportion of the acreage was young coffee not yet in full bearing than in 1960 when prices were dropping; furthermore, in 1945 some 10 per cent of the able-

TABLE 3.—YIELD OF SEED COTTON PER ACRE, UGANDA AVERAGE, 1945-60*

Season	Pounds	Season	Pounds
1944/45	337	1952/53	290
1945/46	265	1953/54	325
1946/47	247	1954/55	227
1947/48	218	1955/56	305
1948/49	333	1956/57	313
1949/50	282	1957/58	288
1950/51	301	1958/59	263
1951/52	332	1959/60	300

* Data from Uganda Protectorate, Dept. Agr., *Annual Report*, successive issues.

bodied males of the country were serving with the armed forces or in non-productive war work, and this undoubtedly told on the standard of cultivation of all crops. However, there was an undoubted real rise in yield per acre between these years, and this must largely be attributed to the improvement of standards of tree pruning from 1945 to 1960, in both Buganda and Bugisu.

A third crop for which we can make some assessment, though exact figures are not available, is sugar cane on the two large non-African estates. Their increasing expenditure on irrigation and fertilizers has already been mentioned, and there were also other technical advances; for example, in 1957 heat treatment of setts for ratoon-stunting disease is stated to have increased yield by 36 per cent. There is no doubt that there was a very great increase in yields, which by 1960 probably averaged about 50 tons of cane per acre. By contrast another estate-grown product for which figures are available, tea, showed little change in yield over the period.

No other crops provide sufficient data for a proper assessment of yield, but in general it is probable that the position is the same as for cotton—improvements in technique were about in balance with poorer conditions, and over-all yields appeared to change little during the period. If we reflect that the most crowded rural areas in Bugisu were by 1960 carrying a population of over 1,000 to the square mile, and that these people were still obtaining much the same amount of food and income that they had been used to, the achievement must be reckoned a considerable one.

Output per man-day is still more difficult to assess. One way to estimate it is to divide the population into the acreage of crops planted. For this purpose, 1945 is an unsuitable year because of wartime factors mentioned earlier and because the population estimate for that year is very unreliable since no census had been taken since 1931. It is best to compare the years 1948 and 1959, in both of which a complete population census was taken. In 1948, a total population of 4,958,520 appears to have grown 1.31 acres of crops per head, and in 1959 a population of 6,536,616 (an increase of 31.8 per cent) grew 1.35 acres per head—if anything, a slight increase in productivity.

Some figures that are available for the labor requirements of various crops, in man-days per acre at different dates, are given in Table 4. Insofar as they

reveal any trend, it is toward an increase in productivity. They also show that ox plowing has, for most crops at all dates, been more productive than hand labor; and it is probably the increased use of the plow that has been responsible for any increase of output such as is suggested in the previous paragraph.

TABLE 4.—LABOR REQUIREMENTS FOR PRODUCTION OF CROPS IN UGANDA, SPECIFIED YEARS, 1949-60*
(Man-days per acre)

Item	1949		1950		1960	
	Ngetta	Uganda av.	Serere	Buganda	Teso	Serere
Crop:						
Finger millet	72	72	...	...	48	35
Sorghum	...	...	25	...	21	27
Maize	56	80	...	74	...	...
Peanuts	90	108	69	159	59	104
Beans	...	80	...	...	...	...
Cowpeas	...	...	...	...	33	...
Cotton	93	122	81	110	91	88
Sesame	60	75	...	...	...	...
Sweet potatoes	...	115	59	68	...	...
Manioc	...	100	...	116	...	...
Coffee	...	100	...	...	...	...
Method:	Hand, some ox work	Mainly hand work	Some ox work	Hand	Ox plowing	Hand

* Data for 1949 by G. B. Maschfield, for Ngetta from *The Uganda Farmer* (London, 1949), p. 155, for the Uganda average from *A Handbook of Tropical Agriculture* (Oxford, 1949), p. 22; for 1950 from Gr. Brit., Col. Off., *Report of a Survey of Problems in the Mechanization of Native Agriculture in Tropical African Colonies* (1950), p. 100; for 1960 from H. Doggett, *Food Crop Production in Uganda* (unpublished, Seventh Annual Meeting of the Uganda Agricultural Association, 1960).

The general opinion of agricultural officers during these years was that in farm families in Uganda a man worked an average for the year of about three hours per working day, and a woman much more, but not wholly on farmwork. They considered that there was no noticeable change in output during the period; and the same general opinion was expressed by employers of estate labor, who expected to get about 25 hours' work per week from a laborer (12). These apparently low figures are mitigated by the fact that both farmers and laborers often undertook "leja-leja" work outside their regular work.

Composition of Output

Table 5 shows the chief overseas agricultural exports of Uganda in the years 1945 and 1960. Though this does not provide a perfect picture of production (e.g., in 1960 far more sugar and tobacco were exported to Kenya than in 1945), it illustrates the general increase that has taken place in export crops. By far the most important item in this increase is the enormous expansion of coffee production, while cotton has more than held its position.

The only available measure of total agricultural production, including food crops, is in figures given in the estimates of the gross domestic product of Uganda

TABLE 5.—PRINCIPAL AGRICULTURAL EXPORTS OF UGANDA (EXCLUDING EXPORTS TO KENYA AND TANGANYIKA), 1945 AND 1960*
(Long tons)

Commodity	1945	1960
Cereals, including flour	2,259	5,048
Pulses, including flour	2,712	3,336
Oilseeds:		
Castor beans	171	1,684
Cottonseed	34,094	39
Peanuts	—	356
Sesame	—	9,507
Soybeans .....	...^a	443
Sunflower seed	—	292
Animal feedstuffs:		
Cottonseed cake	661	71,643
Other oilseed cake	60	—
Bran, etc.	—	118
Coffee, raw, hulled	19,675	115,879
Tea	908	3,861
Sugar, raw	11,067	—
Chillies	470	201
Tobacco, unmanufactured	11,761	86
Cotton, raw	47,224	58,933
Sisal, fiber and tow	998	621
Rubber	578	—
Hides	1,052	3,196
Skins .....	...^b	764

* Data from Colony and Protectorate of Kenya and Uganda Protectorate, *Annual Trade Report of Kenya and Uganda, 1946* (Nairobi, 1947); and Br. E. Afr., E. Afr. High Commis., E. Afr. Customs and Excise Dept., *Annual Trade Report of Kenya, Uganda and Tanganyika for . . . 1960* (Mombasa, 1961).

^a Not separately reported in 1945—possibly included with pulses.

^b Reported in number of skins 475,068; compared with 1,177,251 in 1959, according to the *Annual Report of the Veterinary Dept.*

in 1954–59 (26). The value of the gross domestic product from agriculture at factor cost for these years is given as follows (in thousand pounds sterling):

1954	84,903
1955	88,792
1956	85,262
1957	88,253
1958	87,192
1959	87,138

These figures suggest little change in output during these years; but a real increase is hidden by a decline in money value. During this period, prices were dropping not only on world markets but internally in Uganda; the "Index of Actual Prices in African Markets" (December 1956 = 100) stood at 93 in December 1957 as compared with 157 in 1953. There is no doubt at all that, as with export crops, the total output of food crops greatly increased between 1945 and 1960, for the steadily increasing population continued to enjoy much the same level of food consumption.

Tables 1 and 5, already given, show the changes in acreage and in exports of crops in the terminal years 1945 and 1960. It remains to trace more closely the fluctuations in production of major items in the intervening years. This is done in Table 6.

There is no evidence that the relative importance of subsistence to cash crops varied appreciably during this period. Cotton production, after a low spell in the immediate postwar years when other crops were more attractively priced, remained relatively constant and certainly showed no signs of increasing in proportion to the increase of population. The outstanding feature of the period is the phenomenal increase in the production of coffee, which replaced cotton as Uganda's most valuable export in 1955 and all subsequent years except 1956. The income of cultivators from coffee exceeded that from cotton in Buganda in 1953 and in Uganda as a whole in 1959. This was mainly due to African-grown Robusta coffee in Buganda. Tobacco, which in 1945 was mainly grown in Bunyoro, was during the subsequent decade either introduced or extended in other districts including Mubende, West Nile, Acholi, and Lango. The sudden drop in tobacco production in 1960 was due to realization that overproduction had been reached. Peanuts, sesame, and pulses sold represent the surplus available over subsistence requirements in good years, and hence fluctuated widely; the only item in this class grown almost solely for sale was soya beans, originally a crop for wartime requirements, whose sales fell from 4,309 tons in 1945 to 169 in 1952. Tea acreage increased significantly after Uganda withdrew from the

TABLE 6.—“PRODUCTION” OF SPECIFIED COMMODITIES IN UGANDA, 1945-60*
(Long tons, except bales for cotton^a)

Year	Cotton lint P ^a	Coffee, clean E	Tobacco cured S ^b	Peanuts shelled S	Sesames	Beans, pulses S ^c	Tea manufactured P
1945	272,000	19,675	1,152	...	2,390	...	1,344
1946	227,000	30,520	1,031	3,800	676	15,900	1,714
1947	231,000	20,683	1,246	9,151	349	6,012	1,725
1948	170,000	37,804	2,501	9,824	225	10,824	1,606
1949	391,000	23,898	1,945	8,738	290	8,500	1,500
1950	339,000	31,868	1,878	18,071	650	9,870	1,849
1951	346,000	43,628	1,527	18,198	316	5,076	1,918
1952	380,000	39,425	1,433	10,816	157	2,394	1,712
1953	320,000	35,679	1,474	...	...	...	2,140
1954	398,000	34,647	1,376	...	...	...	2,797
1955	300,000	74,442	1,827	...	...	...	3,108
1956	364,000	61,646	1,810	14,000 ^d	...	...	3,037
1957	372,000	84,029	2,486	13,700 ^d	...	...	3,583
1958	351,000	78,692	2,881	16,300 ^d	...	...	3,692
1959	401,000	88,406	2,998	9,000 ^d	...	...	4,354
1960	360,000	116,818	1,620	11,000 ^d	...	...	4,593

* Estimates of production (P) for cotton and tea; production represented by exports overseas (E) for coffee, and by sales (S) for all other commodities. Data from Uganda Protectorate, Dept. Agr., *Annual Report*, various issues.

^a Bales of 400 pounds, officially rounded. Data reported for crop years are here entered under the second year, e.g., 1944/45 under 1945.

^b Green leaf tobacco for flue-curing converted to cured equivalent at one-eighth where necessary.

^c Mixed beans, soybean, gram, field peas, and pigeon peas.

^d Estimated.

restrictive international agreement in 1947, and production more than tripled in the 16 years shown in Table 6. Sugar production increased from 46,031 tons in the year 1945-46 to 91,117 tons in 1960. This was achieved by the two estates' developing their last reserves of acreage, by more intensive production and, in the last year or two of this period, by their beginning to buy in cane which had been grown for them on other neighboring non-African estates.

The three crops that were chiefly divided between export and local markets were tea, tobacco, and sugar. In the case of tea, 69 per cent of the crop was exported overseas in 1945, and 84 per cent of the much larger production in 1960. Overseas exports of unmanufactured tobacco leaf ran at about 10 per cent of the crop in both 1945 and 1960; but in the latter year there was a much larger export of leaf to Kenya, owing to the fact that an amalgamation of manufacturing firms had led to transfer of a cigarette-making business from Kampala to Nairobi. Sugar exports overseas were, in 1945, 11,067 tons and in 1960, nil; but in 1960, 30,877 tons were exported to Kenya.

Cotton lint was wholly exported until the first textile factory in Uganda began operations in 1956. By 1960 this factory was absorbing nearly 20,000 bales of cotton a year. Exports of oilseeds, and especially of cottonseed, declined as more oil mills were established in the country. In the year 1947 alone, 13 new oil mills were added to the 15 existing ones; by 1950 it was considered that there were too many, and restriction was imposed on them by government. Thus overseas exports of cottonseed, which in 1945 amounted to 34,094 tons, were in 1960 only 39 tons.

Many minor crops waxed and waned during this period in response to fluctuating prices and profitability. Uganda's small production of pyrethrum ceased in 1952, of flax in 1956, and of tobacco for nicotine extraction (which is included in the tobacco figures in Table 6) in 1953. Chillies enjoyed a minor boom in the immediate postwar years, with sales of 1,623 tons in 1947. Exports of castor seed reached 11,575 tons in 1952, and of shea-butter nuts (collected from wild trees) 1,827 tons in 1949; 200,000 pounds of dried papain were made in 1948. An export of wattle bark from Kigezi was developed; it had to be suspended in 1949 owing to overcutting of trees, but in the following year 530 tons were exported, though exports ceased a few years later. Sunflower seed was a small newcomer to the list of exports.

Livestock sales during this period increased in a greater ratio than livestock numbers. This is apparent if the figures for hides and skins (which are a fair index of slaughterings) in Table 5 are compared with the livestock numbers in Table 2. The tendency was assisted by an increase in cattle markets, encouraged by the Veterinary Department. A particularly important factor was the development of cattle supplies from Karamoja to Kampala; this was started in 1949, when 6,800 cattle were sent, and in 1952 this number had grown to 7,800. In Teso, the greatest single cattle-producing district, figures collected for the years 1956-1959 show that in each year the income derived by the producers from cattle sales was approximately equal to that from cotton sales. In fact, so keen were the inhabitants of this district and Lango to sell cattle that in order to prevent undue depletion of herds, an order was in force from 1944 for some years prohibiting export from these districts of all but male and barren female stock.

MARKETING INSTITUTIONS AND FACILITIES

Local markets for the exchange of agricultural produce between African producers and consumers remained throughout this period under the control of the Native Authorities, or, as they were known in the later years, African local governments. The only exceptions were in the large towns, where they were under the charge of the municipal authorities. In the case of cattle markets, the Veterinary Department always helped and advised the local authorities in their establishment. Small market dues were payable by sellers in these markets to the African local government. In all these respects, few changes were made during the period, though the total number of markets was somewhat increased and installations were improved at some municipal markets.

There was little change over the period as a whole in the proportion of production marketed, except in those areas supplying foodstuffs to the towns and especially to Kampala. Here, the growing of food crops turned increasingly from a matter of subsistence to a commercial business. The publication on the gross domestic product of Uganda, already referred to (18), estimates that sales of produce to the urban population in 1954 and 1959 were as shown in Table 7.

The great export crops have each had their own marketing systems, and each must be considered separately. Legislation for many years before 1945 had ensured that cotton could be sold by growers only to licensed buyers either at gins or at gazetted buying centers where the cotton gins had warehouses that were subject to inspection, and where rules had to be observed as to buying hours, display of prices, and types of weighing machine. Buying was limited to a defined season and to certain days of the week. This system remained in essence unchanged during the period so far as primary buying was concerned. During the course of World War II the government itself became the sole buyer

TABLE 7.—SALES OF UGANDA PRODUCE TO THE URBAN AND NON-AFRICAN POPULATION, 1954 AND 1959*

Item	1954	1959
A. To Urban Africans		
<i>Thousand long tons</i>		
Maize	26.0	20.0
Peanuts	1.4	1.5
Beans	1.5	1.7
Plantains	42.4	46.4
Manioc	1.1	1.2
Sweet potatoes	6.1	6.6
Vegetables	0.9	1.0
<i>Thousand gallons</i>		
Milk	249	273
B. To Non-African Households		
<i>Thousand pounds sterling</i>		
Vegetables and fruit	901	1,332
Eggs and poultry	166	254
Milk	219	310

* Data from Uganda Protectorate, E. Afr. Stat. Dept., *The Gross Domestic Product of Uganda 1954-1959* (April 1961), pp. 11-14.

of the crop, employing the ginner as its agents; and since then the purchase price to the grower has been a fixed one at any given time. For African-grown coffee, the system was not dissimilar, with buying at licensed stores and again fixed prices throughout the period under one form or another of public control.

Tobacco marketing was controlled under successive Produce Marketing Ordinances; buyers had to obtain licenses to purchase in specified areas, and hence the government in effect controlled the area in which the crop could be grown. In earlier years, a number of firms were purchasers; but by 1960 amalgamation of firms had led to the position where only one was applying for licenses. Tobacco buying had thus, though not by the intention of government, become a monopoly. However, the price at which this firm purchased still had to be approved by the government.

For most of the minor cash crops, the position had been reached, during World War II, that the government itself had, through its Department of Supplies, become the ultimate buyer. Primary buying was controlled under the Defence (Controlled Produce) Regulations, which made it necessary for buyers to obtain a permit and supply monthly returns of produce bought. Prices were fixed and published from time to time by the government. This system continued for some time after the war; but matters were put on a new basis by the Produce Marketing Ordinance in 1953. In this Ordinance, government availed itself of powers, from time to time, to bring any produce under the Ordinance, to fix prices, to declare buying seasons, and so on. Produce that came under the Ordinance during 1953 included sesame, peanuts, maize, beans, tobacco, and wattle bark.

Maize was rather a special case. Large-scale growing of maize had been suddenly introduced into Uganda as a wartime emergency to meet the needs of Kenya and Tanganyika. Primary buying and storage had been placed mainly in the hands of the ginning companies because they had the only organization sufficiently large and widespread to handle a crop of such bulk (573,749 bags were marketed in 1946). However, from 1953, with the crop declining in importance, buying licenses were issued to ordinary produce dealers.

Produce buying in 1945 had been almost entirely in the hands of Asian traders; but, as in general shopkeeping, Africans obtained a small but increasing share of the trade in succeeding years. This was particularly remarked on in the hide and skin trade. The tendency was accentuated by the boycott of Asian traders in Buganda in 1959, which caused many Indians to withdraw from remote trading centers.

Dissemination of Market Information

Wherever prices were fixed by government or other public bodies, notifications of any change were published in the official *Uganda Gazette*, which meant that they reached administrative and agricultural officers before they became operative. Press releases and broadcasts were also used by the government to give notice of price changes. News of such changes quickly got round among producers by word of mouth, and government officers on tour satisfied themselves that buyers were offering the correct prices.

By 1960, rather more elaborate arrangements were in force to notify growers

and buyers of prices. A minimum cotton price was declared at planting time, and the actual price for each of the two varieties grown was fixed some time before the buying season began. Changes in the coffee price were made at times of year when little coffee was coming to market. In May 1960, the Agricultural Department started publication of a monthly market bulletin in English and Swahili, which gave an indication to growers and buyers of ruling prices for all the kinds of produce for which prices were not fixed (by 1960, this meant for everything except cotton, coffee, and tobacco). This bulletin also included an estimate of probable prices for the following month. In the same year, the Department posted Marketing Officers to three of the four provinces. Their duties included getting in touch with local traders and trade associations and advising them what the ruling prices were, and, in the case of minor produce, where they could dispose of the crop to wholesalers.

Transportation

Both railways and roads were extended and improved after World War II. The chief railway extension was from Kampala to Kasese in Toro, which was opened as far as Mityana in 1953 and to Kasese in 1956. Though primarily an ore-carrying line to serve the new copper mine at Kilembe, this extension was stated in 1956 to be "already carrying substantial quantities of agricultural produce and general cargo and coffee." In 1960 construction began of a railway extension from Soroti to Lira in the Northern Province, and work also began on shortening the main line in Busoga, which was estimated to reduce by about 50 miles the haul to the port of Mombasa through which most Uganda exports passed. In the same year, a new steamer was placed on the Lake Victoria services through which much of the produce of Masaka and Ankole was evacuated.

Roads were improved in both quantity and quality. Extensions in the two National Parks served tourism rather than agriculture; but extensions useful for produce evacuation were made in parts of Bugisu, Kigezi, and the Sese Islands which had had no roads before. For the first time in Uganda, roads outside the towns were paved, particularly those main roads which radiated from Kampala to the chief upcountry centers. Many of these roads were also shortened, since steeper gradients than those originally admissible for the use of ox- or handcarts could now be accepted.

Apart from these developments opening up new areas to a slight extent as regards agriculture, it does not appear that there was much change in the distance commodities moved. The exception was the provision of foodstuffs for the few large towns, which because of their increasing populations had to draw on an ever wider area. Satisfactory figures for the town populations are not available from the 1948 census, owing to lack of definition of town boundaries; but Kampala at that time had a population of roughly 58,000. At the 1959 census, the populations of the four largest towns were: Kampala, 123,320; Jinja, 29,741; Mbale, 13,569; Entebbe, 10,941. Kampala drew an increased supply of foodstuffs from Bugerere county, which had been cleared of the "mbwa" fly, and of cattle from Karamoja. The mountain area of Bugisu was beginning to supply large quantities of plantains to Busoga during dry weather. A supply of fresh vegetables to Kampala from the high-altitude district of Kigezi, organized and en-

couraged by government, first began on a large scale in 1952, but competition with Kenya supplies limited its expansion.

In fact, Buganda generally and Kampala in particular continued, and perhaps to an increasing extent, to draw on Kenya for supplies. In 1958 Buganda imported 22,890 goats from Kenya, and 50,000 poultry carcasses in the year and an average of 5,000 dozen eggs per week came to Kampala from Kenya; in 1960 Kampala imported about 6,000 gallons of fresh milk daily from Kenya (11). In 1952, a total of 4,660 Kenya cattle were sent to Kampala and 4,480 to Jinja.

THE MARKETING CHAIN

The marketing chain begins with primary buying. Many kinds of produce were bought at licensed warehouses, for which licenses were issued only if the storage facilities were approved. At the end of the war in 1945, many of these warehouses were in very poor condition, but were gradually improved or replaced in subsequent years. In 1950 a total of 467 prefabricated metal storage bins warehouses were imported for this purpose.

Beyond the stage of primary buying, it is necessary to consider the different crops separately. The next stage in the movement of cotton is into the gin. The new Cotton Ordinance of 1952 required gin owners to rehabilitate unsatisfactory gins within three years, and from this period date many improvements such as the use of doffer rollers, pneumatic conveyors, and screw conveyors for seed, as well as better storage capacity. In the same year, the government compulsorily acquired 33 redundant and uneconomic gins for elimination.

During World War II, the Uganda government had found itself compelled by a breakdown of overseas buying to become the sole purchaser of the cotton crop, using the gin companies as its buying agents on commission and the previous exporters as export agents under the name of the Cotton Exporters' Group. Part of the crop was at that time sold under a guarantee to the United Kingdom Ministry of Supply; but in the 1947/48 season, local auctions were held for the first time in Kampala to dispose of some of the crop. In 1949, a Lint Marketing Board was set up to take over the functions of government in respect to cotton marketing (21). At that time the beginners became the agents of the Board on terms recommended by a special price-fixing committee and confirmed by the Governor in Council. With some slight alterations as time went on, the Board was, in 1960, required by law to purchase cotton lint and seed from ginneries and to sell or export them. Prices to both growers and ginneries were fixed by the government after considering the report of a Lint Cotton Price Committee.

The history of marketing of African-grown coffee is very similar to that of cotton. During the war years, a Coffee Control was set up which purchased the crop from the curing works and exported it under bulk contracts to the Ministry of Food in the United Kingdom. In 1953 a Coffee Industry Board was set up to take over buying and exports; in 1959 it became the Coffee Marketing Board. Its functions were very similar to those of the Lint Marketing Board, with which it shared offices and staff. In 1954 the first local auctions of the crop took place in Kampala, and in 1958 the whole of both the cotton and coffee crops was for the first time sold at these local auctions. The impact of the international coffee agreement, due to world overproduction of coffee in the late 1950's, was felt in

Uganda only at the very end of the period. In 1960, at the behest of the international control, the Coffee Marketing Board withheld from sale about 140,000 bags, or six per cent, of the available coffee.

A separate note is necessary about the marketing chain for Bugisu Arabica coffee. In 1940 the Bugishu Coffee Marketing Co. Ltd. was formed to take over the buying and processing of the crop under the control of the Board of the Bugishu⁵ Coffee Scheme. At this time much of the crop was bought as fresh cherry from the grower and pulped at pulping stations erected by the Scheme, while a proportion from the remoter areas was bought as "native-prepared parchment." As time went on, however, more and more of the crop was hand-pulped by the growers before sale, until 1957 when this was found to cause a serious decline in quality with disastrous effects upon price. Policy was therefore reversed in 1958 (23) with a program for renewed construction of mechanical pulperies to be owned by primary co-operative societies of growers. Meanwhile in 1954, four coffee and one cotton co-operative unions in Bugisu had formed the Bugisu Co-operative Union Ltd., which took over the collection and sale of coffee from the Bugisu Coffee Scheme. In 1959 a modern coffee mill for the further treatment of the crop for export was erected at Mbale and its ownership vested in the Bugisu Co-operative Union.

Tobacco installations beyond the primary marketing stage included in 1945 a government-owned packing factory at Masindi, and cigarette factories at Kampala and Jinja that exported much of their production to neighboring territories. By 1960, the Kampala factory had ceased manufacture, since the owning company had transferred this business to Nairobi, but it was retained for the redrying of purchased leaf.

For most of the minor kinds of African-grown produce, apart from quantities sold in local markets for domestic consumption, the government again became the sole buyer during the war years and for some time after. This purchasing was done through the Department of Supplies, a wartime creation, which never physically took possession of the produce but dealt with it in a series of book transactions. Traders holding permits were the primary buyers at fixed prices. They re-sold the produce to wholesalers acting as government agents, who stored it in their warehouses at Kampala or other large centers until the Department of Supplies gave them an order for delivery to the armed forces or for civilian use and paid them for it. Maize was the most important produce dealt with up to 1954, in which year 57,890 tons were exported to Kenya and Tanganyika; but in 1955 this figure sank to 675 tons, and thereafter the crop lost importance. For this crop, as has been stated earlier, special arrangements were made for the use of gins for buying and storing. But in 1953 great difficulty was experienced in handling purchases, which amounted to about a million bags in Buganda. During the course of the 1950's all these kinds of produce were gradually released from controls and returned to free marketing.

Special wartime controls were set up in Buganda and some other areas for the marketing of eggs and fruit, which were in very inadequate supply for the demand. The Director of Agriculture, as Controller, employed local firms to

⁵ "Bugishu" is the earlier official spelling of the name which in later years was spelled "Bugisu."

purchase these commodities and store them in depots, whence they were sold to customers placed on a priority list which was headed by the hospitals. Nevertheless, much black-marketing took place. These controls continued for some time after the end of World War II.

Cash crops produced on non-African estates come into a different category from any considered so far. Apart from wartime direction of strategic commodities such as rubber, the marketing of tea, sugar, sisal, papain, and vanilla was in general left free to the producers. Coffee grown and processed on non-African estates was left to find its own market without government intervention, and in later years this facility was extended to associations of Africans who grew and cured their own crop, so that by 1961 some 40 per cent of the Uganda coffee crop was being disposed of by these means and only 60 per cent by the Coffee Marketing Board.

In 1950 the wartime Hide Exporters' Group was dissolved and the marketing of hides and skins freed from price controls. The result was an increase in prices of 200 per cent between May and December. Primary buying remained controlled for licenses, approval of premises, keeping of records, and inspection by the Veterinary Department for quality under the Hides and Skins Trade Ordinances of 1939 and 1951. Exporters also had to be licensed.

Certain changes in primary buying practice for cotton took place between 1945 and 1960. These included the spreading out of all seed cotton for inspection before buying, the delivery of seed cotton by sellers in burlap squares rather than in sacks, and the giving to sellers of a ticket immediately after their cotton was weighed so that they could check its value before receiving payment. These measures were partly aimed at quality improvement, including the elimination of plantain fiber as an impurity in cotton sold. But they are also claimed to have reduced, though they did not eliminate, the amount of cheating that went on between buyers and sellers but was practiced chiefly by the former.

Other regulatory changes during the period referred more to export marketing than to primary buying. The crude and uninformative grading of Uganda cotton for export was replaced by the Lint Marketing Board with a system of nine new grades. The Board also introduced a badly needed premium for quality in the price it paid to ginners for lint. On similar lines the Coffee Industry Board, which had taken over the grading of coffee for export (formerly done by the Agricultural Department) in 1955, introduced a new system of five grades of coffee in 1956. Here also a quality incentive was paid to coffee curers.

The Kampala Produce Exchange was opened in 1954 as a result of recommendations by the Uganda Chamber of Commerce. Its object was to assist wholesale dealers in the exchange of produce, for which it provided a standard contract. In 1958 there were 1,156 contracts involving 81,000 tons of produce registered with the Exchange.

OFFICIAL PRICE POLICIES

The price policies of the government during this period can be traced through a series of historical stages. The first dates from the war and immediate postwar years, when the government itself was the purchaser of almost all produce sold and had complete control of prices. At this time, price differentials were the

main instrument used to induce cultivators to grow crops urgently needed for the emergency demands of the period, and to prevent excess production of less needed commodities. Thus the price of cotton, which was not in urgent demand, was held relatively low; while to meet sudden demands for such products as maize or soybeans, the price could be set as high as was thought necessary to produce the amount required.

There were other reasons at this time for keeping down the prices paid to growers for their two main cash crops, cotton and coffee, for which world prices were rising fast in the early postwar years. The two reasons which were officially stated on numerous occasions were (a) the need to prevent inflation, which was particularly feared because of the shortage of consumer goods for sale at this time; and (b) the desirability of building up price stabilization funds against an anticipated fall in world prices. This restraint on prices was understood and resented by growers to the extent that it was cited as one cause of the riots in Buganda in 1949.

Because during these years producers were paid less than ruling world prices for cotton and coffee, considerable surplus funds were accumulated, at first by the government and in later years by the Boards responsible for marketing these crops. In 1948, when these funds stood at £10,550,000, it was officially announced that £3,925,000 of this amount would be retained as a Price Assistance Fund and the rest spent on development. In 1955, the assets of the Price Assistance Funds were as follows (in pounds sterling):

Coffee Price Assistance Fund	7,797,379
Coffee Industry Price Assistance Fund	3,262,997
Cotton Price Assistance Fund	15,327,158

The second period in price policy, around the early 1950's, was one in which the government sought and gradually achieved the return of the marketing of all kinds of minor produce to a free economic system. But for the three chief African-grown cash crops—cotton, coffee, and tobacco—the benefits of a seasonally fixed price which had been enjoyed for a decade seemed too good to be foregone. Government and people appear to have concurred in this feeling, for no serious voice was raised in favor of a return to free price movements; and it was in this atmosphere that the marketing boards for cotton and coffee were devised as a means of securing the desired end.

The third period, the late 1950's, was one in which world prices for cotton and coffee did actually show the expected fall, and in consequence the Price Assistance Funds began to be drawn upon to cushion the effect to producers. The balances remaining in these funds in July 1960 were as follows (in pounds sterling):

Coffee Price Assistance Fund	8,999,810
Cotton Price Assistance Fund	10,971,695

A constant feature of the government's price-fixing policy, from the war years onward, had been the declaration of a uniform price for any commodity over a wide area—sometimes a district or province, sometimes an even larger region such as the two different varietal areas for cotton. By thus averaging transport costs, the producers living nearer to a railroad were, in effect, made to subsidize

those who farmed farther away. The agricultural effect of this policy was wholly good. It spread the pressure of cropping over the whole countryside and avoided the overcropping and exhaustion, only too evident in the past, of land near to lines of communication.

One other minor but instructive incident of price policy in this period is worth recording. In 1958 the Buganda government, apparently without any legal sanction, introduced a controlled maximum price of Sh. 1/50 per pound for meat of any kind in markets in Buganda. This measure seems to have done as much harm as good to the people of Buganda. It acted as a disincentive to producers of meat, and especially perhaps of pork for which up to Sh. 4/- per pound could be obtained for Kenya supplies sold through shops in Kampala. And in at least some cases it induced large institutions in Buganda to place contracts for meat outside Buganda because local supplies were no longer forthcoming at the controlled price.

INCENTIVES TO CHANGE

The extent to which crop production changed in response to changing demand was limited by the fact that prices for the chief cash crops were fixed by government and not by the free play of supply and demand. Nevertheless the extent to which the demand could affect production is shown in the great fluctuation in sales of some minor crops already described. The effect of rises in price was undoubtedly also potent in increasing cattle sales over the period as a whole. Thus in 1950 it was reported that cattle prices in all districts had more than doubled since 1944; but from 1957 to 1960 the cattle prices were falling.

The availability and wages of labor, and the possibility of alternative economic employment, are also points to be considered. The wages of rural labor in Uganda were not controlled during this period, but a statutory minimum wage of Sh. 33/- per month was enforced in Kampala and Jinja from 1950. By 1960, the level of wages in these places had risen to Sh. 80/- per month. The annual reports of the Labour Department estimate an average wage for unskilled labor on non-African plantations of Sh. 14/- per month in 1945, and Sh. 31/- to 48/- (according to province) in 1958. Verbal information given by Baganda was that in 1960 they were paying Sh. 35/- to 40/- per month to Banyaruanda farm laborers for a "task" of only about two hours per day. Many of these men were, however, working two or three "tasks" or "tickets" a day, usually for different employers; it was common for them to work an evening shift, not for cash, but for their day's food.

Baganda farmers grumbled in both 1945 and 1960 that farm labor was difficult to get, but there is no evidence that this shortage was acute, and good employers seem to have had little real difficulty in attracting men. Partial counts by the Labour Department at the main entry points only on Uganda's international frontiers showed that 104,689 laborers entered Uganda from Ruanda, the Belgian Congo, and the Sudan, in 1945, while 40,176 left; and that 79,340 entered and 78,853 left in 1958. Immigrant labor from Kenya and Tanganyika were not recorded, but their number in the later years of the period certainly exceeded that in 1945.

As regards the pull of nonagricultural employment, industrialization was

slowly increasing in Uganda during these years. The Labour Department's "Enumeration of African Employees," which does not include labor employed by African farmers or by very small employers, gives a total of 158,557 in 1950 and 228,889 in 1960. However, much of the increased demand for labor was met by immigrants. At the textile factory near Jinja, for example, Tanganyikans came second only to natives of the West Nile district among employees grouped by origins in 1960.

From all these considerations, it does not seem that labor conditions changed to any extent that would substantially affect agricultural production during the period under review.

Consumer goods, an important incentive to agricultural production, were in very short supply in early postwar years, and it is believed that much money at this time was simply hoarded by African cultivators. The increasing availability of goods coincided with a rise in crop prices, especially marked during the Korean war, and standards of living rose rapidly. It is probable that during this period the desire to keep up with one's neighbors was a potent incentive to production. In some outlying districts such as West Nile, Karamoja, and Kigezi, many people in 1945 were still going naked or wearing only skins; by 1960, the use of clothes was much more widespread. In the more sophisticated areas, the use of footwear became commonplace; and purchases by Africans of corrugated iron roofs, bicycles, European-type bread and beer, and even cars were no longer limited to a tiny wealthy class. Money was ardently desired to pay school fees for children. Thus during this period people in the remoter districts first felt a real desire for money on a large scale, while in the more developed areas they realized increasingly the benefits it could bring.

It must be remembered that, with falling crop prices in the later 1950's, greater production was needed for the cultivator to maintain the same income. It has been loosely said, but it is an approximation to the truth, that Uganda in 1960 produced twice the agricultural exports of 1950 but received only the same income from them.

Governmental Policies

Land tenure.—Following the recommendations of the East African Royal Commission of 1953-55, the Uganda government in 1958 embarked for the first time (outside the "mailo" lands) on the granting of registered land titles to Africans who were already occupying the land according to native custom. This beginning was made in Kigezi district; in 1959 the work was extended to Ankole, and in 1960 to Bugisu. By the end of 1960, a total of 6,287 such titles had been given and some owners had already begun to use these titles as security for obtaining loans from the African Credit and Savings Bank. But in several other districts the African local governments flatly refused to have anything to do with the scheme, and in these the Protectorate government did not press it. In 1955 the registration of land titles was decentralized with the establishment of four district Land Offices in Buganda.

While these were the main official changes in land-tenure policy, changes in practice which were taking place unofficially must not be overlooked. In several districts the customary system under which an African occupier enjoyed only

the usufruct of the land by tribal permission was gradually giving way to a conception of individual tenure under which land was bought and sold under thin disguises or even openly. In some areas, what purported to be contracts of sale were drawn up by laymen, not lawyers, and signed before witnesses. How these gradual changes took place, and how they were partly accepted into the unwritten customary law, has been traced in detail by Fleming (5) for the district of Busoga. By 1960, prices of land in such transactions and in the sale of "mailo" land in Buganda had reached very high figures in some areas. In some of the most crowded parts of Bugisu, prices as high as £100 per acre were mentioned by informants. In the immediate vicinity of Kampala, £300 per acre might be paid; but for Buganda as a whole, £5 an acre was probably an average price for ordinary agricultural land in 1960, as against perhaps £3 in 1945.

Fragmentation of agricultural holdings was not as acute a problem in Uganda as in some African countries, but did exist in the more densely populated districts such as Kigezi, Bugisu, Busoga, and parts of Buganda. A spot survey at Kisoro in Kigezi in 1958 showed that of three holdings selected at random one was made up of 32 separate parcels, one of 23, and one of 22. In such areas, where cultivation is really of the nature of horticulture and the fragments are close together, no great agricultural ills result. So little study has been given to the problem that it is impossible to say how far it intensified during the period.

Agricultural research.—A feature of the period was the establishment of interterritorial research organizations, to which Uganda contributed financially in various forms. These included the East African Agriculture and Forestry Research Organization, the East African Veterinary Research Organization, the Tea Research Institute of East Africa, the East African Tractor and Implement Testing Unit, and the Desert Locust Survey in Kenya; the Colonial Pesticides Research Unit in Tanganyika; the red locust control service in Northern Rhodesia; and the East African Tsetse and Trypanosomiasis Research Organization, whose headquarters were in Uganda itself. Facilities for agricultural research were greatly extended at Makerere College, which in 1949 became the University College of East Africa and greatly expanded its Faculties of Agriculture and of Veterinary Science. The main research station of the Empire Cotton Growing Corporation, established at Namulonge in Buganda in 1947, carried out work of immense benefit to the Uganda cotton crop.

The Uganda Department of Agriculture meanwhile maintained its old-established experimental stations as listed by Tothill (15) and added some minor ones; their work during the period has been summarized by Chenery (2). The Veterinary Department developed its facilities at Entebbe into an Animal Health Research Centre and a Livestock Experimental Station; an interesting piece of organizational research was its Land Use Investigational Unit set up in Ankole in 1958, in which an area was divided into ranches for occupation by hitherto wandering Bahima. Both departments increased the number of their research staff, and the Agricultural Department set up a separate Coffee Research Unit in 1956.

The impact of research results on farming practice is perhaps most clearly seen in cotton growing, where they originated the drive for earlier planting and

closer spacing. These practices, together with the cotton-breeding work, dressing of cottonseed, and the beginning of cotton spraying, were largely responsible for the increase or at least the maintenance of cotton output over the period. In food crops, the distribution of mosaic-resistant varieties of manioc and the selection of new strains of Muratha and K8 maize were important. A solution was discovered to the problem of "ekitu," a sterile millet-like weed that infested the finger millet crop, by the adoption of row-cropping. The greatly increased knowledge of cattle breeding and management for local conditions, gained from research, gave confidence to the farm planning officers who were concerned with the encouragement of mixed farming. The report of a specialist on possibilities of rice growing in Uganda (25) did not lead to any significant development.

Much of the research done during this period was, however, likely to pay off at a later date than 1960. In the 1950's, the rate of agricultural progress was still limited by the paucity of research during the depression of the 1930's and the war years of the 1940's.

Agricultural education and extension.—At the highest level of agricultural education, Makerere College passed in 1950 from issuing only an agricultural diploma to training men for the B.Sc. degree of London University. At a lower level, existing facilities for teaching agriculture in general schools and a few specialist ones were reinforced by the opening of two main Farm Institutes in 1957 and 1958, and of the first two of a projected series of district Farm Institutes in 1960. The former were intended for two-year courses, whose students were mostly absorbed by the Agricultural Department, and the latter for short courses for farmers. During the immediate postwar period, the Agricultural Department gave considerable help in training-courses for demobilized soldiers who wished to take up farming.

In agricultural extension work, Uganda in 1945 was one of the best-served African countries. Besides normal visits to farms by field staff, much use was made of the vernacular press, mobile cinemas, radio broadcasting, and other publicity media. A special development was the inclusion of agricultural items in the programs of "demonstration teams" which were organized in each Province by the Public Relations and Social Welfare Department. Agricultural competitions between small administrative units, begun before 1945, had been extended to all Provinces by 1958; in 1954, 11 radio sets were presented in Buganda as prizes in these competitions. The number of staff employed by the Agricultural Department on extension work increased considerably, as can be seen from the following figures for 1946 and 1960:

Staff employed on extension work	1946	1960
Agricultural Officers	22	27
European Agricultural Assistants ^a	3	0
Assistant Agricultural Officers ^a	58	53
Agricultural Instructors ^b	460 (approx.)	701
Development Officer	1	0
Field Officers ^a	0	42

^a Including "Senior" officers of these grades.

^b Later Agricultural Assistants.

Six of the Agricultural Officers were Africans in 1960, against none in 1946. In 1959, 18 Field Officers were appointed to intensify the production drive. Following the disappointing results obtained with coffee in Bugisu, four Field Officers had been specially appointed to the Bugisu Coffee Development Scheme by 1960. The Farm Planning Unit was established in 1957.

One of the most productive extension activities of the past, the distribution of coffee seedlings from nurseries in Buganda, was modified by making a charge for the seedlings instead of issuing them free. Issues were tapered off as over-production came in sight; in 1960, only 100,000 seedlings were issued, and these for filling gaps rather than extending the acreage.

Livestock Improvement Areas established by the Veterinary Department, numbering only two in 1946, but numerous by 1949, served for some years as focal points for cattle breeding, but by 1960 had been absorbed into the general extension work of the Department. A notable development was the teaching of African stockowners to spray cattle against ticks (3, p. 19); as early as 1956, over 120,000 cattle were so treated.

Extension work was not, however, without its difficulties in these years. The political events associated with the deportation of the Kabaka in 1953, his return in 1955, and the replacement of many chiefs in Buganda led to much frustration of the work in that kingdom, and anti-erosion bunds were actually destroyed at this time. Tax riots in Bukedi in 1960 had a similar bad effect.

Development schemes.—A ten-year development plan for Uganda drawn up by Dr. Worthington in 1946 (27) was adopted by the government. In spite of much publicity given to it, and the appointment of a special Development Commissioner in 1947 to carry it out, this plan did little that would not otherwise have been done for agricultural development. The plan was in fact remarkable for the small attention it paid to agriculture in a primarily agricultural country. Its chief recommendations in this respect were an increase in graduate agricultural staff, better crop storage, trials with agricultural machinery, assistance to market gardening near towns, expenditure on cottonseed multiplication, and a professorship of agriculture at Makerere. All these, except the market-gardening project, were carried out within the ten years.

More important was the Report of the Agricultural Productivity Committee, which was drawn up in 1954 as a supplement to the Development Council's report on "A Five-Year Capital Development Plan 1955-1960" (20). This outlined a basic agricultural policy, and its recommendations in fact foreshadow the main rural developments that took place in those five years and have here been described.

Within these general schemes, certain particular projects must be noted. The South Busoga development scheme was started in 1949, with a capital of £72,000 from the Protectorate government and £8,000 from the Busoga African local government. Its object was to provide, mainly by mechanical cultivation, increased food supplies for Jinja where it was anticipated that industrialization accompanying hydroelectric development would create a shortage. However, as early as 1951 it was conceded that "experience has now shown that normal local sources will supply ample food for Jinja." The Agricultural Productivity Committee noted in 1954 that the accumulated loss on this scheme was £63,000.

It was then replaced by a scheme for resettling African farmers on the land, but this in turn only prospered slowly.

The Bunyoro Agricultural Company was formed in 1950 with £40,000 capital from the government, £40,000 from two commercial firms, and land contributed by the Bunyoro government to the value of £20,000. Its objective was mechanized development, at first on an estate basis and later with settlement by Africans, which in fact began in 1952. The settlement scheme was taken over by the government in 1957, in which year 63 farmers were settled. The majority of these were Maragoli immigrants from Kenya, and this continued to be the case up to 1960, when 360 holdings were occupied.

Agricultural Enterprises Ltd., a subsidiary of the Uganda Development Corporation Ltd. established by government, was incorporated in 1955. Its general purpose was the stimulation of Uganda agriculture, but it had not had time by 1960 to show its full potential. Besides managing a group of estates in Buganda already mentioned, it formed subsidiaries (some with the participation of other interests) to develop various tea estates and in 1960 was planning for association with them of African outgrowers of tea. Another subsidiary developed the Bunyoro ranching scheme, which had been recommended by the Agricultural Productivity Committee to make use of land then recently freed from tsetse fly. Cattle-stocking was begun in 1956 with 500 cattle, but in 1960 (in which year the ranch was reinvaded by tsetse fly) it was stated that the project would take at least another six years to become viable (16).

Agricultural credit.—Before 1945, agricultural credit for Africans had been limited to a few small loans by Native Authorities to trained smallholders and to such credit as farmers could obtain from Asian shopkeepers. The latter, provided partly in cash and partly in goods, was mainly used for nonagricultural purposes, and ceased with the boycott of Asian traders in 1959.

The Uganda Credit and Savings Bank was established by ordinance in 1950; a good account of its early history is given by Spall (13, p. 176). It drew its funds from three sources. First, there was an initial capital grant by the government of £600,000. Second, in 1954 the government made the Bank its agent for an African Loans Fund of £150,000, which was specially designed to help Africans outside Buganda who had no security in land to offer. Third, in 1953 the sum of £100,000 was made available by the United Kingdom government out of money granted by the United States government through its Mutual Security Administration. Loans from this fund were hedged with tight restrictions; only 30 per cent was to be used for agriculture, none could be applied to cotton production or processing, and there were other conditions, with the result that borrowers did not take up this money. In 1958 the International Co-operation Administration, which had taken over administration of these funds, approved a relaxation of conditions, and the money quickly went out in loans. In 1959 the ICA gave another £30,000 to supplement the African Loans Fund; a further £50,000 was approved by the United States government and given in 1960.

These funds were applied by the Bank on a modern system of supervised credit. Inspectors were employed to assess the merits of an application before a loan was granted, and to follow up and advise on the use of the loan money. The largest part of the Bank's own loans in number, though not in amount,

were made for agricultural production. From the African Loans Fund the largest amount was for agriculture. From the Eastern Province it was reported that agricultural loans were most commonly in the range of £100 to £200 and were applied to the purchase of plows, oxen, weeders, and cotton sprayers, the loan being often given out in kind on the advice of the Agricultural Department. At the end of 1960 the number of bad debts and defaulters on repayment was quite small and considered satisfactory.

Agricultural co-operative societies.—Although in earlier years a number of praiseworthy, if somewhat amateur, efforts had been made by Africans, the real development of co-operative societies in Uganda dates from the Co-operative Societies Ordinance, 1946. Under this a Registrar of Co-operative Societies was appointed, and later a Department of Co-operative Development was established. The history of the movement to 1957 has been described by Kerr (8, p. 103).

It can fairly be claimed that the expansion of co-operatives by 1960 had been prodigious. In that year there were 1,590 producers' societies with 208,934 members, and 16 marketing unions with a membership of 1,468 primary societies. Of the seed cotton crop, 22.5 per cent derived from members of the societies, and 16 per cent of the crop was ginned by co-operatives; about 25 per cent of the coffee crop came from societies. The Busoga Co-operative Union started purchases of peanuts from members in 1960. The movement owned 15 cotton gins, 5 coffee-curing works, 2 estate coffee factories, and a number of coffee pulperies. The strong ambition of the co-operatives to enter the ginning business was first assisted by the Buganda government, which purchased a gin for leasing to the Uganda Growers' Co-operative Union in 1949. In 1952, the Protectorate government took legal powers for the compulsory acquisition of gins for transfer to co-operatives; if the latter could produce one-third of the purchase price, the remainder would be loaned by the government. Later, arrangements were made that if co-operatives supplied one-third of the capital to buy a gin or coffee-curing works, the rest would be lent by the Credit and Savings Bank under a government guarantee.

The co-operative movement would not have spread so fast if it had not brought advantages to its members. One of the greatest of these was the provision of warehouses to collect produce at many remote roadside places where there had previously been no traders to whom produce could be sold. These storage sheds did not have to be at gazetted markets, but had to be registered and built to approved specifications. But there were also grounds for criticism of the co-operatives. The standard of products from some of their cotton gins and coffee-curing works was low, though other co-operative gins showed that a high standard could be attained. There is no doubt that co-operatives illicitly bought much produce from nonmembers in some districts, while in others their members sold to outside buyers. In 1958, the serious decline in the quality of Bugisu coffee led to the appointment of a Commission of Inquiry into the Bugisu Co-operative Union Ltd., which resulted in the reorganization of the local coffee industry (23). The Department of Agriculture then took over improvement of the crop from the Bugisu Coffee Board.

Anti-famine measures.—No famine occurred in Uganda during this period, but there were several local food shortages. A critical situation in Buganda in

1946 was saved by the distribution for sale of "cassoya" meal, made by milling dried cassava and soybeans. In 1953, severe food scarcity in Masaka district was alleviated by sales of maize meal. In 1958, severe food shortages in the Northern and Eastern Provinces were relieved by sales of maize meal and a free issue in a small area of Bugisu. In 1950, when a rise in maize-marketing costs would have increased the price of maize meal to the consumer, the price was subsidized for one season by the government from profits it had made on sales of maize to the East African Cereals Pool.

The chief measure against famine in Uganda at this period was the local district bylaws that required cultivators to maintain granaries of finger millet or plots of root crops as a famine reserve. These arrangements antedated 1945, but there were some additions during the period; for example, a proclamation of 1947 under the Buganda Agricultural Law of 1946 required the maintenance by land occupiers of one-fourth acre of manioc. The degree to which these rules were enforced varied considerably from district to district. Thus, in Buganda manioc planting was not strictly enforced; in Teso, a granary of millet per homestead was not in fact compulsory but was informally enforced by the chiefs; in Bugosa the compulsory requirements included one-half acre of manioc, one-half acre of sweet potatoes, and a granary of millet, but only the two former were enforced and were often grown in communal plots.

One particular government measure stemmed from the general maize shortage in East Africa during the war and early postwar years, and especially from memories of the acute food shortage that Uganda had experienced in 1943. This was the erection at Jinja in 1951 of a grain storage silo to hold 12,800 tons of maize. However, it was not used by the government for its intended purpose for very long. In 1956, apparently deciding that the need for such national storage had passed, the government leased the silo on a hire-purchase basis to the Uganda Grain Milling Co. Ltd., who only used a fraction of its capacity to hold their own stocks of grain. The faulty original construction of this silo necessitated much subsequent work before it was satisfactory.

Taxes and subsidies.—Certain taxes on land and crops, payable in Buganda, were defined in the local Busulu and Envujo Law of 1927 and still remained in force in 1960. They can be briefly summarized by saying that an African tenant on an ordinary holding on "mailo" land paid to his landlord an annual rent of Sh. 10/–, of which, from 1933, Sh. 1/50 was land tax payable by the landlord to the Buganda government. "Envujo" was a traditional "tribute" paid by tenant to landlord on cash crops, which amounted for smallholders to a few shillings for any cotton or coffee grown and a tithe on any beer that was brewed. The rental system in Buganda had a slight deterrent effect on the fencing of pastures, since rent had to be paid on land which was fenced, while unenclosed grazing was free.

Market dues from sellers in African local markets appear to have varied little if at all during the period. Their relatively low rate is instanced by the dues recorded by Parsons (10) for West Nile markets in 1953: 2 cents of a shilling for sellers of small amounts of foodstuffs, 20 cents for sellers of chickens or sacks of manioc flour, 50 cents for sellers of goats or sheep, Sh. 1/– for sellers of cattle.

A cotton export tax was in force in Uganda from 1919 onwards, and from

1927 was on a sliding scale according to the current value of cotton lint. A similar graduated export tax on African-grown coffee was introduced in 1945. The rates of these taxes were varied from time to time between then and 1960, partly to accommodate new gradings and to extend the scales to prices hitherto unthought of. Their yield naturally varied greatly with the prices of the produce concerned. In 1946 it was £491,000 on cotton and £102,000 on coffee; but in 1952, the peak year for the two taxes together, it was £5,600,000 on cotton (plus £50,000 on cottonseed) and £1,700,000 on coffee. An export tax on hides and skins was imposed in 1950.

A special assessment was levied on tobacco before 1945 to pay for the facilities provided by the government to the industry. The rate was varied from time to time, standing at 3 cents per pound of cured leaf in 1946, and 6 cents in 1960. During the latter part of the period, this money was handed over by the Protectorate government to the African local governments in most of the districts concerned. An unofficial assessment was contributed from 1947 to 1952 by Kigezi Industries Ltd. on the Kigezi nicotine tobacco crop, which was not liable to the official assessment, in recognition of government assistance to the industry. A tea assessment was introduced in 1947 and used to provide Uganda's contribution to the Tea Research Institute of East Africa. It was payable to the Uganda Tea Board, a statutory body that deducted a small amount from the proceeds to pay for its own costs. The assessment was for a time levied on both acreage and production at varying rates. From 1952 to 1959 it was Sh. 2/50 per acre and Sh. 1/50 per 100 pounds of manufactured tea. But acreage determination became too difficult when African smallholders, mostly employees of the tea estates, began to produce green leaf for sale to the estate factories. From February 1960 therefore the assessment was limited to Sh. 2/- per 100 pounds of manufactured tea.

Direct Intervention in Production

A number of ways in which the government influenced agriculture have been recounted. But that these were not found sufficient is indicated by the fact that during the period the government felt itself compelled to use certain more direct measures, both legislative and financial.

The chosen legislative instruments were the bylaws of African local governments, whose provisions regarding famine reserves have already been mentioned. Rules made in 1947 under the Buganda Agricultural Law of 1946 prohibited the drying of coffee on the bare ground and imposed penalties on cultivators failing to obey a notice directing them as to soil conservation methods. Further rules of 1948 required the preparation of cotton plots one month before sowing and conformity with the prescribed seed-rate, spacing, and thinning.

These latter rules were, however, only one part of a much wider campaign undertaken in 1948 when it was felt that the economic situation made a great increase in cotton production essential. Rules were made under the Native Authority Ordinance giving local authorities power to issue orders enforcing proper standards of cotton cultivation. The result of these efforts ultimately crystallized in a spate of district agricultural bylaws which were promulgated by many, but not all, African local governments in 1951-52. In general, these

bylaws laid down details of cotton-planting dates, seed-rate, spacing, and thinning; methods of soil conservation, such as the leaving of grass strips of prescribed width between plots; and sometimes other matters, such as the destruction of diseased manioc in Teso.

These radical measures were still further reinforced in 1948 by a financial inducement. A payment was guaranteed to Native Authorities of Sh. 1/- per 100 pounds of seed cotton produced in their area, to be used for financing local development projects. It was claimed by the government that this was largely responsible for the more than doubling of the cotton crop between 1948 and 1949. This financial inducement was raised in 1949 to Sh. 1/25 per 100 pounds of seed cotton, and again in 1950 to Sh. 1/50, at which rate it was still being paid by the Lint Marketing Board to African local governments in 1960.

This series of bylaws must be of particular interest in the study of colonial agricultural history for two reasons. In the first place, they represent perhaps the last period in history in which a colonial government could obtain the passage of a more or less uniform series of measures, by indigenous authorities, by the use of moral pressure alone. Pressure certainly had to be used in some cases, as when the draft of the Buganda Agricultural Law of 1946 was referred back to the Resident by the Buganda government before it was ultimately passed in the Lukiiko by a somewhat slender majority. Second, these measures provide an instance, extremely rare anywhere in the world, of such intimate details of husbandry as crop-spacing and seed-rate being imposed on farmers by law.

CITATIONS

(A) General

Certain annual reports have been so constantly drawn upon for facts and figures that they have not been specifically referred to in the text. These include: *Annual Colonial Reports: Uganda Protectorate*; *Annual Reports* of the Uganda Department of Agriculture; *Annual Reports* of the Uganda Veterinary Department (later Department of Veterinary Services and Animal Industry).

Much use has also been made of the following annual reports: Game Department, Department of Co-operative Development, Uganda Credit and Savings Bank, Uganda Development Corporation Ltd.; and of Saben's *Commercial Directory and Handbook of Uganda*, especially the 1947/48 and 1960/61 editions.

(B) Particular

1 British East Africa, E. Afr. High Commis., E. Afr. Customs and Excise Dept., *Annual Trade Report of Kenya, Uganda and Tanganyika for . . . 1960* (Mombasa, 1961).

2 E. M. Chenery, *Uganda Protectorate Department of Agriculture: The Research Division* (Uganda, Dept. Agr., 1960).

3 H. C. Clifford, "Spraying of Cattle as a Method of Control of Cattle Ticks and Its Field Application in Ankole District of Uganda," *Trop. Agr.* (Trinidad), January 1954.

4 "Development of Mechanized Farming in Uganda," *Official Bulletin of the Uganda Protectorate*, March 1954 (reprinted in *Trop. Agr.*, October 1954).

5 J. T. Fleming, *Recent Developments in Customary Kisoga Land Tenure* (Entebbe, 1961).

6 J. P. Henderson, *Some Aspects of Climate in Uganda, with Special Reference to Rainfall* (East Afr. Meteorological Dept. Mem., Vol. II, No. 5, 1949).

7 Kenneth Ingham, *The Making of Modern Uganda* (London, 1958).

- 8 A. J. Kerr, "Agricultural Co-operation in Uganda," *Trop. Agr.*, April 1957.
- 9 D. J. Parsons, *Systems of Agriculture Practised in Uganda. No. 1: Introduction and Teso Systems* (Uganda Protectorate Dept. Agr., Mem. of the Res. Div., Ser. 3, 1960).
- 10 ———, *Ibid.*, No. 3: *The Northern Systems*.
- 11 ———, *Ibid.*, No. 2: *The Plantain-Robusta Coffee Systems*.
- 12 G. P. Saben, *Saben's Commercial Directory and Handbook of Uganda* (Kampala, 1960).
- 13 W. H. Spall, "A System of Provision of Credit for African Farmers in Uganda," *Trop. Agr.*, July 1956.
- 14 H. B. Thomas and Robert Scott, *Uganda* (London, 1935).
- 15 J. D. Tothill, ed., *Agriculture in Uganda* (London, 1940).
- 16 Uganda Development Corp., Ltd., *Annual Report and Accounts for the Year to 31st December 1960* (1961).
- 17 Uganda Protectorate, *Blue Book for 1945* (1947).
- 18 ———, *The Gross Domestic Product of Uganda 1954-1959* (1961).
- 19 ———, *Investigation into Acreage Statistics* (1959).
- 20 ———, *Report of the Agricultural Productivity Committee* (1954).
- 21 ———, *Report of the Uganda Cotton Industry Commission, 1948* (1948).
- 22 ———, *Revised Crop Acreage Estimates 1945-1956* (n.d.).
- 23 ———, *Sessional Paper No. 19 of 1958: Memorandum by Government on the Future Organisation of the Bugisu Coffee Industry* (1958).
- 24 ———, E. Afr. Stat. Dept., *1960 Statistical Abstract*.
- 25 G. Watts Padwick, *Rice in Uganda* (Imperial Chemical Industries, Ltd., 1954).
- 26 P. N. Wilson and J. M. Watson, "Two Surveys of Kasilang Erony, Teso, 1937 and 1953," *Uganda Journal*, Vol. 20, 1956.
- 27 E. B. Worthington, *A Development Plan for Uganda* (Entebbe, 1946).
- 28 C. C. Wrigley, *Crops and Wealth in Uganda; a Short Agrarian History* (E. Afr. Inst. Soc. Res., Kampala, 1959).