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DRAFT
ENVIRONMENTAL PROFILE
of
UGANDA

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THE UNITED STATES NATIONAL COMMITTEE FOR MAN AND THE BIOSPHERE



Department of State, IO/UCS

WASHINGTON, D. C. 20520

An Introductory Note on Draft Environmental Profiles:

The attached draft environmental report has been prepared under a contract between the U.S. Agency for International Development (AID), Office of Forestry, Environment, and Natural Resources (ST/FNR) and the U.S. Man and the Biosphere (MAB) Program. It is a preliminary review of information available in the United States on the status of the environment and the natural resources of the identified country and is one of a series of similar studies now underway on countries which receive U.S. bilateral assistance.

This report is the first step in a process to develop better information for the AID Mission, for host country officials, and others on the environmental situation in specific countries and begins to identify the most critical areas of concern. A more comprehensive study may be undertaken in each country by Regional Bureaus and/or AID Missions. These would involve local scientists in a more detailed examination of the actual situations as well as a better definition of issues, problems and priorities. Such "Phase II" studies would provide substance for the Agency's Country Development Strategy Statements as well as justifications for program initiatives in the areas of environment and natural resources.

Comments on the attached draft report would be welcomed by USMAB and ST/FNR and should be addressed to either:

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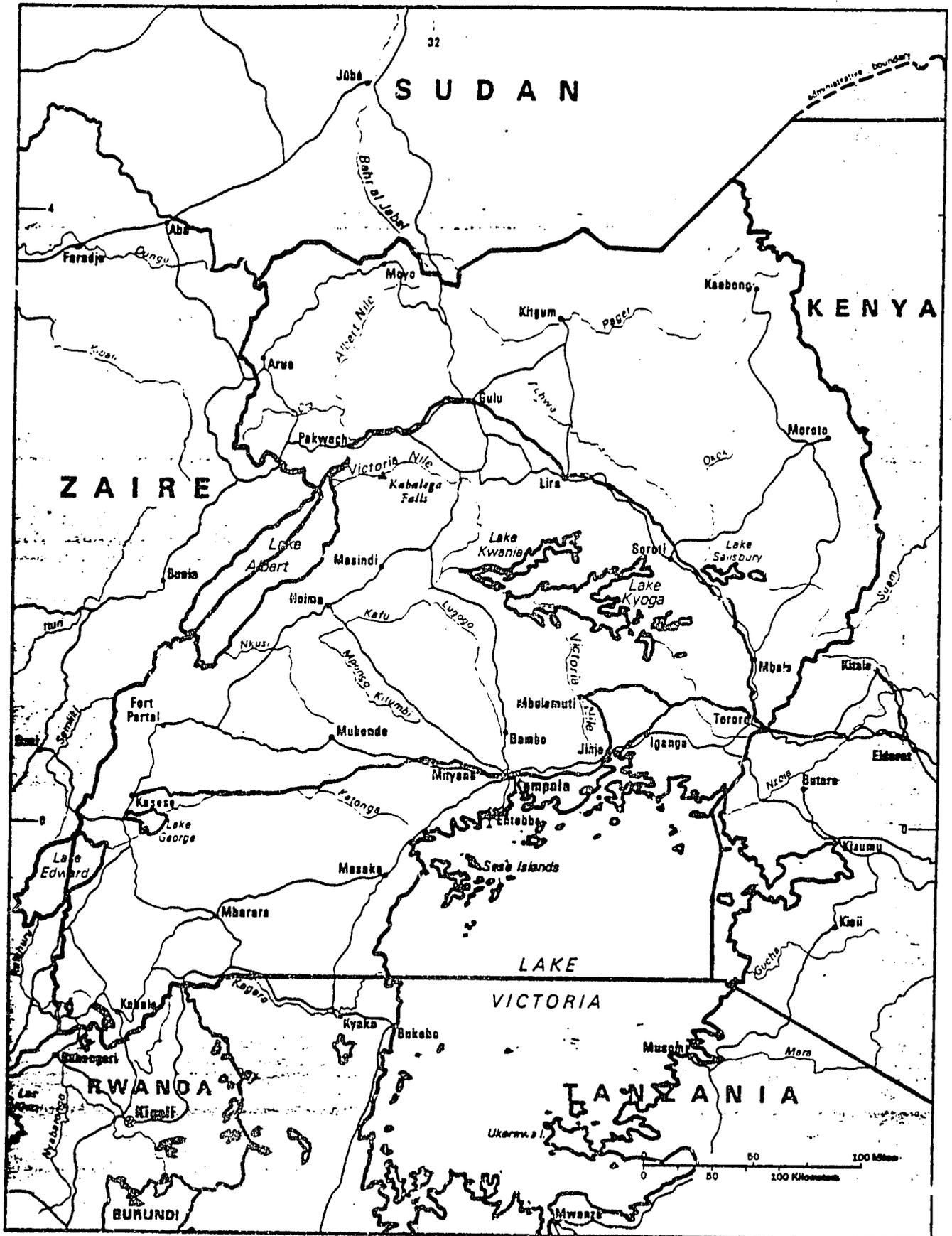
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Uganda



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Uganda

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SUMMARY

A landlocked nation of nearly 13 million inhabitants in the heart of East Africa, Uganda is emerging from a decade-long period of uncertainty and disorder which has had profound impact on the country's environment. Although it lies in one of Africa's most hospitable and least disaster-prone regions, Uganda has nevertheless experienced problems which threaten its human and animal populations, and its vegetative and physical resources.

The country is not well endowed with minerals or fossil fuels, but its extensive surface water resources combine with its topography to yield an enormous hydroelectric potential. This potential remains but partially exploited, however, and Uganda's economy continues to rely on the country's generally rich soil resources and its favorable climate. Agriculture thus continues as the principal activity and chief source of national income. Because of Uganda's continuing reliance on food, cash crop, and cattle production, industrialization has been limited. Hydroelectric facilities, factories, and processing plants are confined to the two chief urban zones: the Kampala-Entebbe metropolitan area; and the environs of Jinja by the source of the Victoria Nile. The country's main environmental concerns reflect the orientation of its economy. Large development schemes, therefore, are not the source of these concerns. Rather, the problems result from political and natural occurrences, and from human interference.

In decreasing order of importance, Uganda's principal environmental concerns include:

Environmental Management Problems and the Effects of Internal Disorder. From 1971 to the present Uganda has undergone a period of intense instability marked by three extraconstitutional changes of government--one of these facilitated by Tanzanian military intervention. Throughout this time, particularly during the 1970s, the country has been beset by maladministration, political and social repression, degeneration of infrastructure, decline in agricultural and industrial production, and consequent erosion of economic stability.

Because these phenomena have been so profound their consequences have affected virtually all aspects of Uganda's environment and aggravated all associated problems. Perhaps most fundamentally, the physical damage sustained by the nation's infrastructure has diminished Uganda's ability to respond to these problems and alleviate them. Critical transport facilities, once East Africa's most extensive and most efficient, were devastated; by 1979 only a fifth of the 1970 fleet of trucks remained. Railways, the other principal

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means of transportation, were similarly disabled by destruction of track, equipment, and maintenance facilities. These losses have impeded proper administration and hampered delivery of goods and services.

Political and military events during the late 1970s also impaired training of personnel for resource management, agricultural development, medical care, and technical research. The number of available physicians per capita, for example, declined by half between 1960 and 1977. In addition, the government isolated Uganda by not participating in regional and international scientific and economic exchanges. Simultaneously, by expelling most of its Asian population, the country lost much of its skilled manpower and investment capital.

Together, the effects of military activity and administrative policy have seriously reduced Uganda's ability to marshal the resources necessary to protect its environment. As a result resource management retains relatively low priority in the country's immediate plans. And, as the paragraphs below illustrate, the consequences of Uganda's recent upheaval have directly affected and exacerbated several of the nation's environmental problems.

Wildlife Extinction. Uganda's mountains, forests, lakeshores, swamps, river valleys, and grasslands together comprise one of the world's most important faunal repositories. The wildlife inhabiting Uganda has been noted for its volume and diversity, and for the presence of unique endemic species. Because of the high economic value of animal products such as ivory, horn, leather, feathers, and meat, poaching chronically has threatened the stability of certain mammalian, avian, and reptilian species. A decade of turmoil highlighted by six months of deliberate slaughter in 1979 has aggravated the situation further. During the Tanzanian invasion marauding soldiers destroyed thousands of large ungulates and hundreds of large cats in a single national park. The entire toll remains unestimated, but according to some observers it will require several generations to reverse the damage incurred.

Legislation intended to prevent such abuses exists and has been in force throughout the century. In the prevailing climate of neglect, disorder, and mismanagement however, statutes remained unenforceable and unenforced. New legislation attuned to current problems and requirements is needed, as is a commitment to administer and enforce such legislation.

Misuse of Land. As compared to its neighbors, and indeed to most African nations, Uganda has been endowed with ample fertile soil resources, a favorable climate for agriculture,

and plentiful forest land. In the past the country was self-sufficient in food production and exported certain cash crops such as coffee, tea, and tobacco. Over the past two decades, however, circumstances have altered. Overgrazing and deforestation have depleted Uganda's range and forest lands, and have begun to limit agricultural production.

Overgrazing occurs throughout Uganda, wherever cattle are reared, but is particularly serious in the dry northern regions at the southeastern edge of the Sahelian zone. Much of the population consists of pastoralists whose herds nearly have eliminated the area's once plentiful perennial grasses. These have been replaced by inedible or less nutritive species incapable of sustaining the large herds. This process has combined with extended drought to reduce available food for the populace. It is estimated that perhaps a quarter million persons--mostly children--in northern Uganda suffer from malnutrition.

Deforestation, a parallel phenomenon, has grown rapidly since 1960. By 1977 forested area had declined by two-thirds, from 32 percent to just 12 percent of Uganda's land area. This loss results from increased shifting cultivation caused by a shortage of farmland, and from growing demand for firewood, both occasioned by population pressure. Shifting cultivation, a customary practice that is not necessarily environmentally detrimental, has been undertaken with improper cycling and has depleted rich soils of their fertility. Cutting of trees for use as firewood, meanwhile, has caused erosion and destruction of faunal habitats. At present there exist few specific studies of overgrazing and deforestation in Uganda, and in light of the nation's organizational problems, the government remains powerless to reverse these trends.

Environmental Disease. As in most tropical countries, Uganda's population--both human and animal--suffers from numerous infections and environmentally related diseases. Trypanosomiasis, one of the continent's most destructive afflictions, is not as prevalent in Uganda as in most of tropical Africa; only five percent of the country (a million hectares) lies directly within the "tsetse belt." The disease nevertheless is common among cattle and hampers reproduction and milk productivity.

Uganda's extensive surface waters breed a number of parasite vectors, the most serious of which are malarial mosquitos and bilharzia (schistosomiasis)-carrying snails. Both diseases are rampant and the vectors have shown signs of resisting DDT and other organochlorine pesticides. Poor sanitation and lack of safe drinking water have additionally sustained the incidence of plague, filariasis, polio, typhus, leprosy, roundworm, hookworm, and venereal disease, all common

infections among Ugandans. The nation's plentiful fish resources, an important source of nutrition, also remain susceptible to parasitic infections.

Public health measures designed to limit the spread of these diseases and relieve their symptoms have been hampered by the notable reduction in the number of available medical personnel. Shortages of capital, medical supplies, treatment facilities, and in some instances, food, further impede the government's efforts to limit the effects of environmental disease.

Natural Disasters. Although Uganda is not situated in a particularly disaster-prone region, it is nonetheless affected by at least three important types of natural disasters: drought, earthquakes, and fire. Drought conditions are generally limited to the rain-deficient northern and eastern portions of the country. There, the effects of drought combine with poor range management techniques to destroy the natural vegetative cover. Earthquakes, unlike drought, affect the entire country which lies atop Africa's most tectonically active belt. Western portions of Uganda experience as many as 100 tremors each year, and no regions are entirely free of earthquakes. Although there have been no major earthquakes in nearly two decades, the threat exists and the government has no established relief program.

Spontaneous fires have become increasingly frequent over the past few decades. It is estimated that they presently constitute a greater danger to wildlife than poaching. Random fires have destroyed as much as a third of the grassland in a single year in some protected areas, and 53 percent of the grassland is struck at least once in three years. In addition to threatening wildlife directly, these fires destroy habitats, reduce grazing capacity, and minimize vegetative diversity.

Problems Caused by Urban Overpopulation. Internal chaos, external events, and rapid population increase have disturbed traditional settlement patterns in Uganda. Immigrants from neighboring countries and rural landless laborers have streamed toward Kampala and Jinja in search of employment. As a result, both centers have grown beyond their planned limits. Overcrowded ghettos lacking adequate sanitation, sewage disposal facilities, electricity, or safe drinking water have spawned incidences of disease and crime. These features of urban overcrowding have been exacerbated by the lack of proper administration and by inadequate urban planning.

1.0 Introduction

This draft environmental profile summarizes information available in the United States on the natural resources and environment of the Republic of Uganda. The report reviews the major environmental problems of Uganda and the impact of the development process upon resources and the environment. This draft report represents the first step in developing an environmental profile for use by the U.S. Agency for International Development (U.S. AID) and Uganda government officials. The next step in this process should be a field study to evaluate the information presented here, obtain additional information, and define the issues, problems, and priorities in greater detail. This entire process should help provide direction in future efforts to deal with the management, conservation, and rehabilitation of the environment and natural resources.

The information and interpretations in this report are preliminary and are not intended to attain the detail and accuracy required for development planning. The report represents a cooperative effort by the Man and the Biosphere (MAB) project staff of the Arid Lands Information Center (ALIC). The primary research, writing and analysis of the Uganda profile were done by Robert G. Varady, through the resources of ALIC and the University of Arizona library. The text was edited by Mercy A. Valencia. The cooperation of James Corson, AID/MAB Project Coordinator, and other AID personnel is gratefully acknowledged.

2.0 General Description

2.1 Geography and Climate

2.1.1 Boundaries and Administrative Divisions ^{1/}

The Republic of Uganda straddles the equator in East Africa, lying between 4°7' north and 1°30' south latitude, and between 29°33' and 35°20' east longitude. A landlocked nation roughly the size of Oregon, Uganda is no closer than 700 km from the Indian Ocean. Uganda's area is approximately 240,000 square km [236,037 according to FAO (1979) and Webster's (1972); 241,139 according to the Europa Yearbook (Anon. 1980) and USAID (1981a)]. About a sixth of that area (36,300 sq km according to FAO; 42,440 sq km according to Webster's, and 44,081 according to the latter sources) is comprised of lakes, the greatest of which is Lake Victoria, the world's third largest.

Uganda stretches some 525 km from north to south, and 480 km from east to west at its extremes. The 470 km northern border with the Sudan is not characterized by natural barriers, but the nation's other frontiers, though conceived by colonial administrators, conform to topographical features. To the west Uganda's border with the Democratic Republic of the Congo (Zaire) is formed by two lakes (Albert and Edward) and a mountain range. This mountainous southwestern corner of Uganda is contiguous with Rwanda and with Tanzania. Most of the frontier with Tanzania runs through the center of Lake Victoria. Eastward Kenya is the sole neighbor, sharing a 150 km border within Lake Victoria and a 700 km mountainous and highland frontier running northward.

According to Uganda's 1967 constitution and its derivative Local Administration Act of that same year, the country is divided into 18 districts as shown in Figure 1 (Morris and Read 1966). Listed alphabetically, these are: Acholi, Ankole, Bugisu, Bukedi, Bunyoro, Busoga, East Mengo,

¹ Sources: Anonymous. 1980
Herrick et al. 1969.
Kasfir. 1976.
Langlands. 1980.
Morris and Read. 1966.

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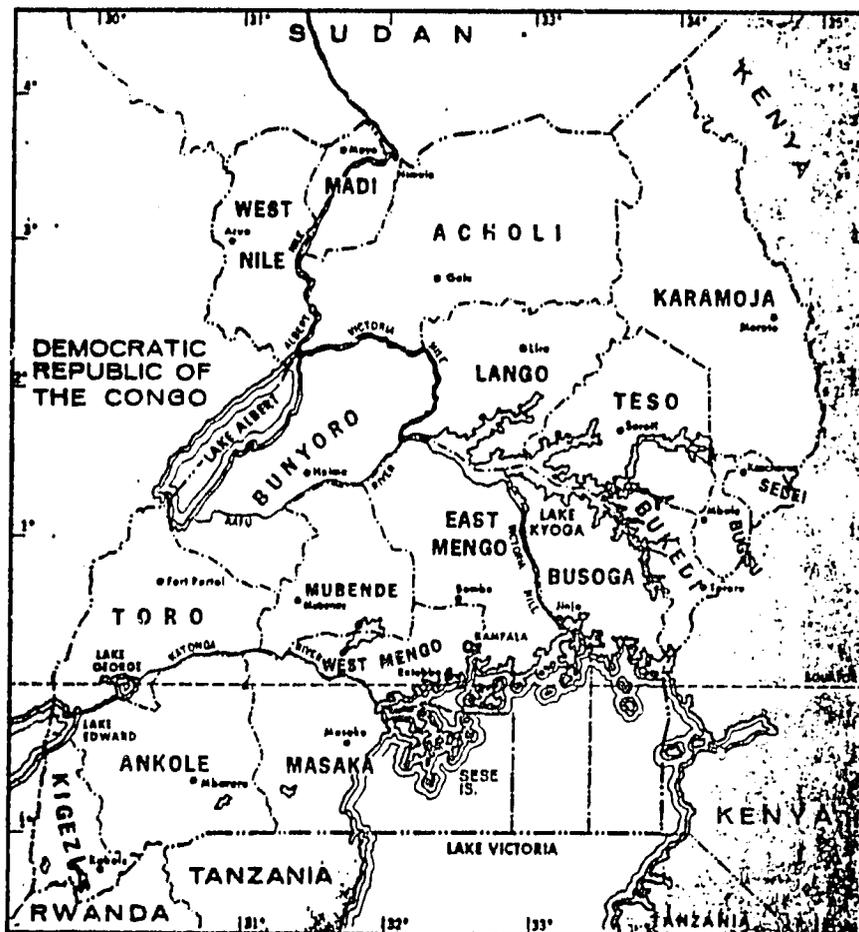


Figure 1. Administrative Units

Source: Herrick et al. 1969.

Karamoja, Kigezi, Lango, Madi, Masaka, Mubende, Sebei, Teso, Toro, West Mengo, and West Nile. Additionally, the cities of Kampala, Jinja, and Mbale are "designated urban centers" and are thus administered autonomously, even though the latter two serve as district headquarters. Kampala is the national capital.

2.1.2 Geographic Features ^{2/}

Uganda is one of Africa's most naturally bounded nations. It lies between the Central Rift and the Eastern Rift systems and north of the Lake Victoria basin. The entire country is situated atop the east-central African plateau whose average height in this region is between 800 m and 2,000 m, sloping gradually downward toward the Sudanese border. As the plateau meets the two rift systems, the land rises to form mountain ranges marked by elevated peaks.

The plateau is marked by the presence of a number of lakes which give rise to the region's major rivers: the Albert Nile, Kagera, Katonga, Nkusi, Okok, and Victoria Nile. The latter, originating at Jinja on the northern banks of Lake Victoria (1,133 m above sea level), flows via a series of falls into Lake Kyoga in the center of the country. As that lake merges with Lake Kwanja to the northwest a newly formed river, also called the Victoria Nile, flows through Murchison Falls into the northern end of Lake Albert (619 m in elevation). At the extreme northern tip of that lake, the Albert Nile (later the Bahr el Jebel, and then the White Nile) begins its journey toward the Mediterranean. The Uganda plateau, therefore, is generally considered to contain the source of the Nile River system.

Because the entire country lies on a plateau, it cannot be properly subdivided into natural geographic zones. All of the land area is highland, transected by the above rivers and a number of smaller ones, and interrupted by Lakes Kwanja, Kyoga, and Salisbury. The western

² Sources: Hance. 1977.
Herrick et al. 1969.
Johnston. 1902.
Pritchard. 1979.
USAID. 1981a.

mountains of the Central Rift include the Mufumbiro range on the Rwandan frontier and the 80 km long Kuwenzori range north of Lake Edward. Mt. Muhavura in the former range is 4,113 m above sea level, and Mt. Margherita (also known as Mt. Stanley) in the latter range reaches 5,119 m--the highest point in Uganda. In the north the plateau is at its lowest, averaging 900 m to 1,500 m in elevation. Just north of the border with Sudan the Imatong Mountains rise above the plateau, reaching 3,000 m. Along the Kenyan frontier the Eastern Rift includes several peaks above 3,000 m as well as Mt. Elgon, a 4,321 m volcano. Figure 2 outlines Uganda's topography.

2.1.3 Climate 3/

Because Uganda lies on the equator its climate should be typical of that of the rest of tropical Africa. To some extent this is true, for as in neighboring areas pressure and wind systems are important determinants of the climatic pattern. These winds, caused by solar radiation induce the region's seasons and control precipitation. Uganda's elevation, however, tends to reduce maximum temperatures throughout the year.

Air circulation over the African continent generally follows the pattern shown in Figure 3. The convective air movements result in the formation of the Intertropical Convergence Zone (ITCZ), a moving pressure front which tends to control seasonal weather. The amount of solar radiation over the country's surface varies seasonally and geographically, attaining maximum values during the winter and in the northwest of the country (Fig. 4).

2.1.3.1 Rainfall

The movement of the ITCZ and other fronts is the chief cause of the seasonality of Uganda's rainfall. Another major factor affecting precipitation is the country's topography. Thus, although there are two distinct rainy seasons--one in April and May, the other in October and

³ Sources: Atwoki. 1975
Balek. 1977.
Clark Univ. 1980.
Hance. 1977.
Herrick et al. 1969.
Ojo. 1974.
Potts. 1971.
USAID. 1981a.
Wernstedt. 1959?

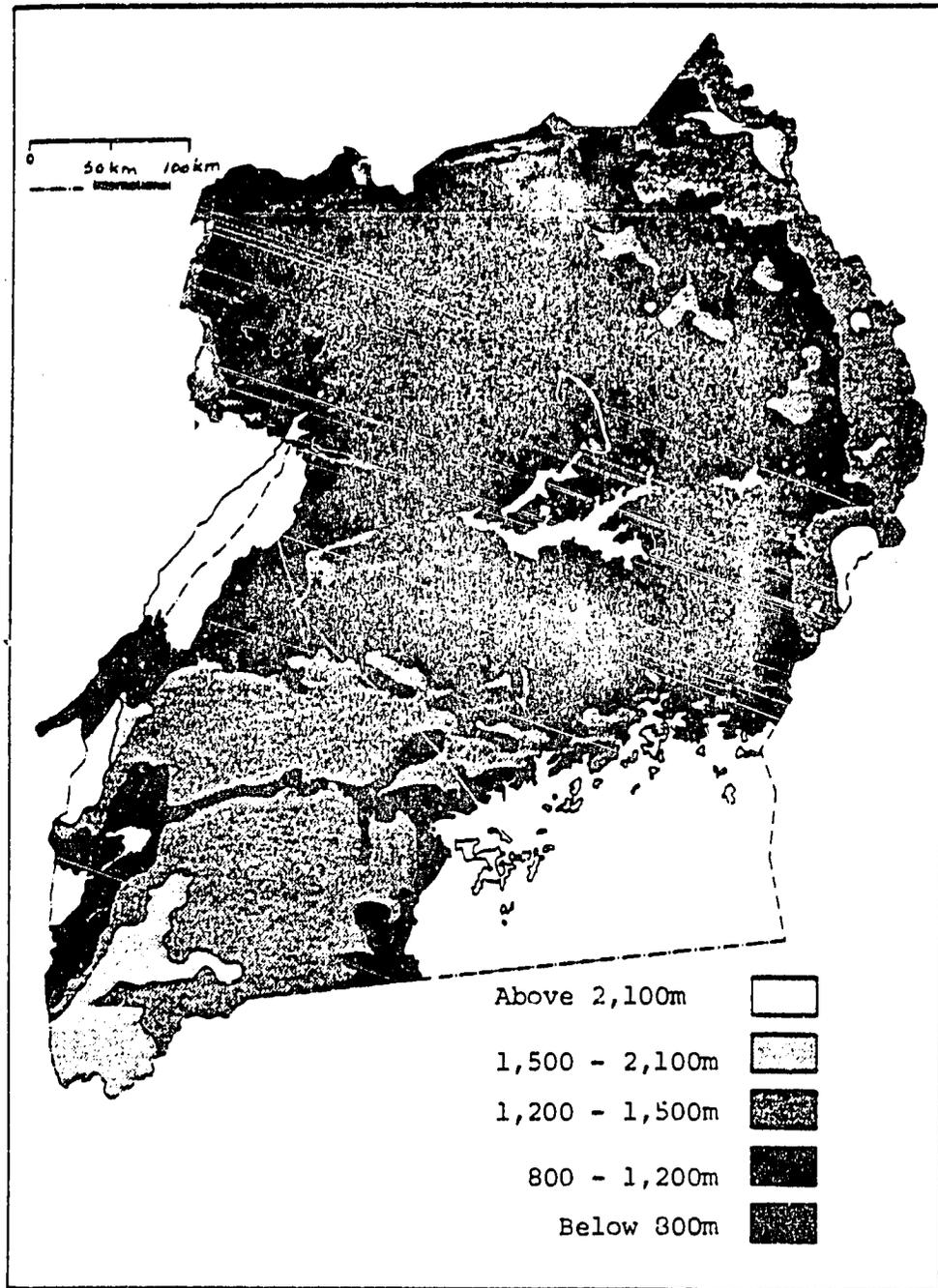
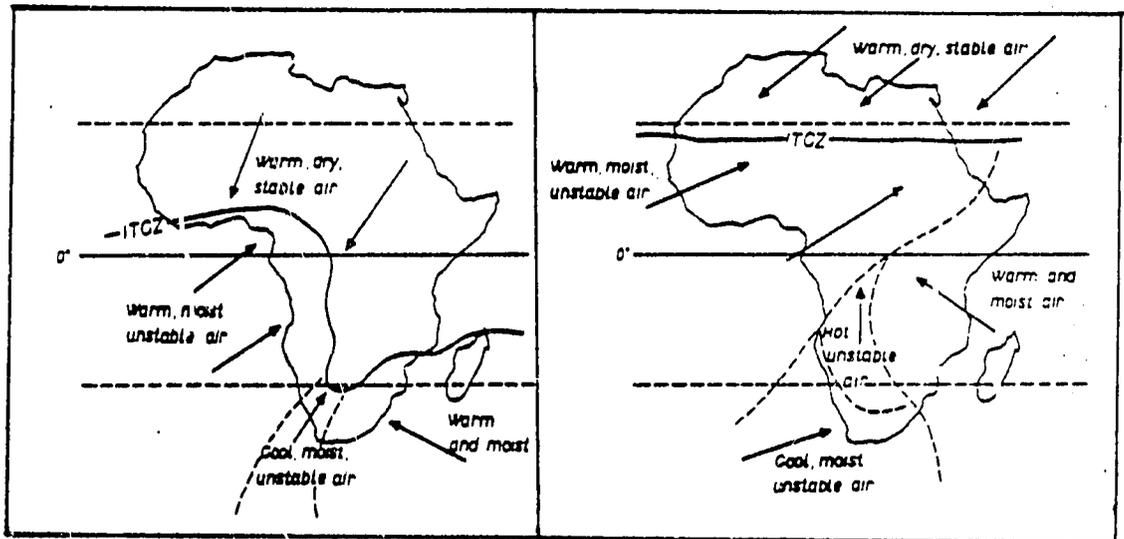


Figure 2. Elevation

*Lakes are also shown unshaded

Source: Clark University. 1980.



a. January

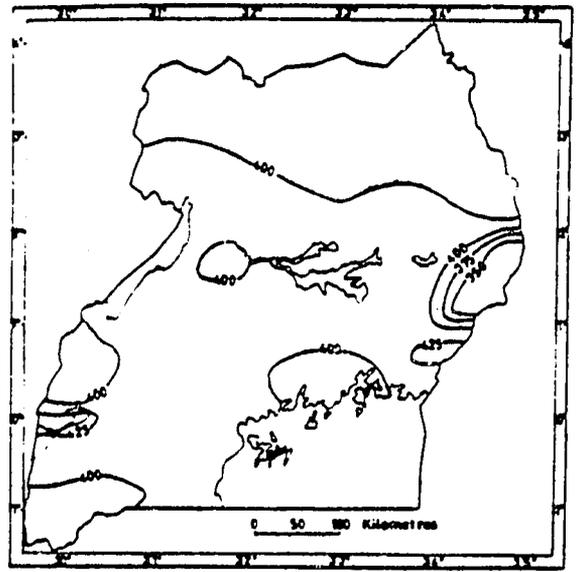
b. July

Figure 3. Air Currents

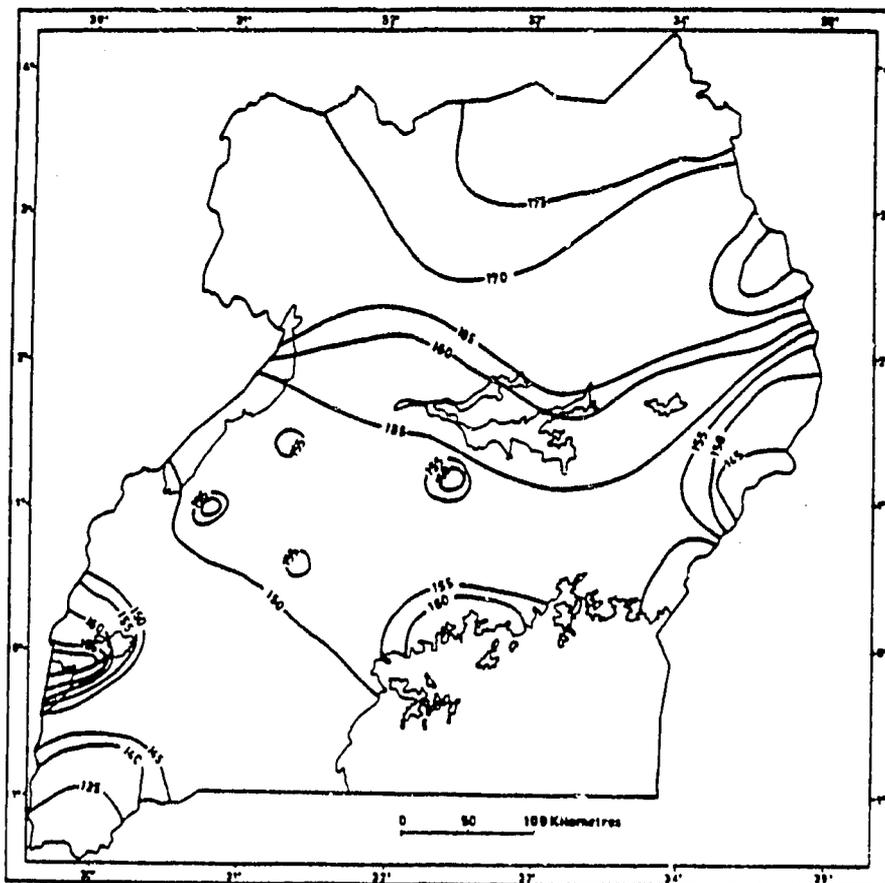
Source: Balek. 1977.



a. January (ly per day)



b. July (ly per day)



c. Annual (kly per year)

Figure 4. Solar Radiation

Source: Ojo. 19741

November the length and intensity of these seasons varies from one end of the country to the other. The southern half which is nearer to the Victoria basin is generally wetter, but the drier northern half of Uganda experiences less of a summer dry period.

More precisely, Uganda may be divided into six characteristic regions (F1 to F6), as shown in Figure 5. In the first zone (F1 in Fig. 5), the "Ankole-Masaka" region, there is a long midyear dry period from mid-May to mid-September (see Mbarara and Kakuto in Fig. 6). This region is generally dry--the median rainfall for any ten-day period is less than 30 mm. The second region ("Western Highlands") has a prominent rainy season from mid-August through early December and an extended dry period from May to August (see Ft. Portal and Kisomoro in Fig. 6). The "Buganda" rainfall region has two equally significant rainy seasons, but generally experiences erratic rainfall because the reliably wet seasons are short (see Kawanda and Namulonge in Fig. 6).

The rainfall patterns of the remaining three regions are characterized by the graphs in Figure 6 for: Gulu and Ngetta (F4); Adilang (F5); and Entebbe and Buyuma (F6).

Table 1a provides mean annual rainfall figures for the cities in Figure 6 and other selected stations.

The location of Uganda's isohyetal zones is shown in Figure 7. As the figure indicates the majority of the country's terrain receives more than 1,000 mm of rain per year. The nation's principal dry regions are in northeastern Karamoja and southwestern Ankole districts, a central area south of Lake Kyoga, and a small pocket just north of Lake Albert. The highest levels of precipitation are at the extreme elevations near Mt. Elgon and in the Central Rift mountains.

The country's rainfall characteristics determine the type of agriculture in the various regions. In this regard, total annual precipitation is less significant than the seasonal distribution of rainfall. In particular, the length of the dry season tends to dictate the types of land use practices. The scheme described in Figure 5, therefore, is an indicator of Uganda's agricultural patterns (see Section 2.3 for discussions of land use and cropping).

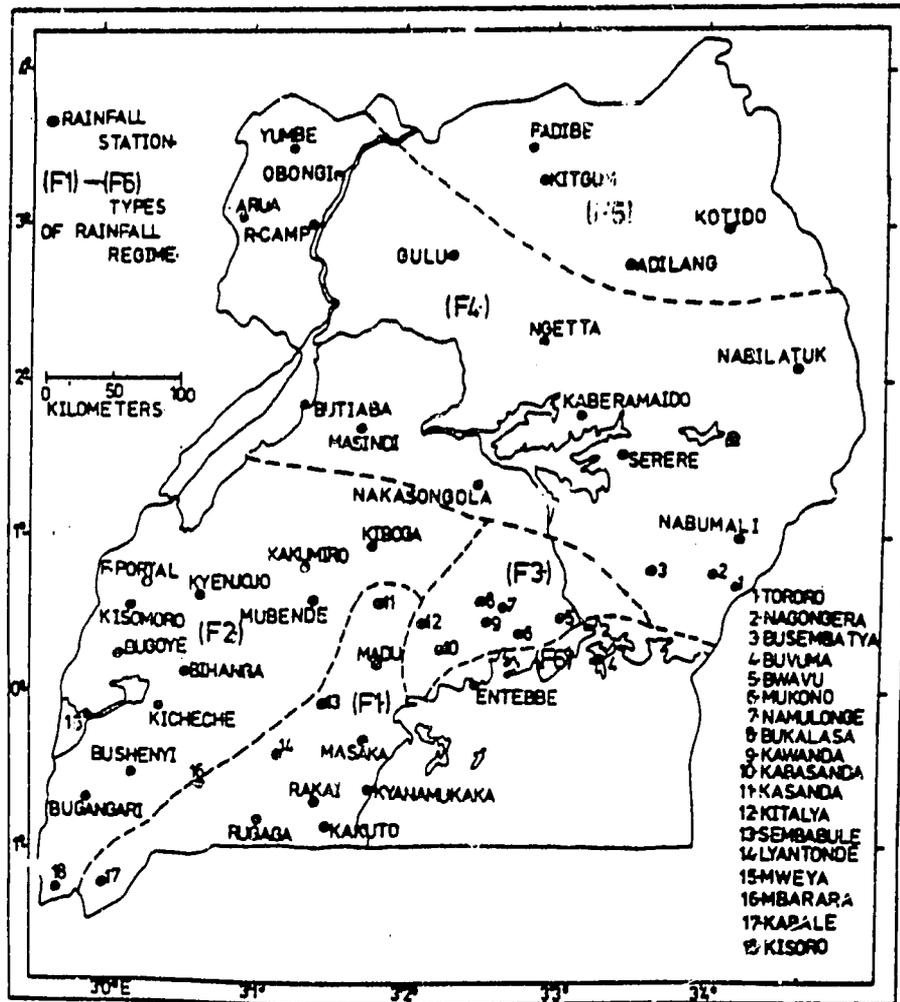
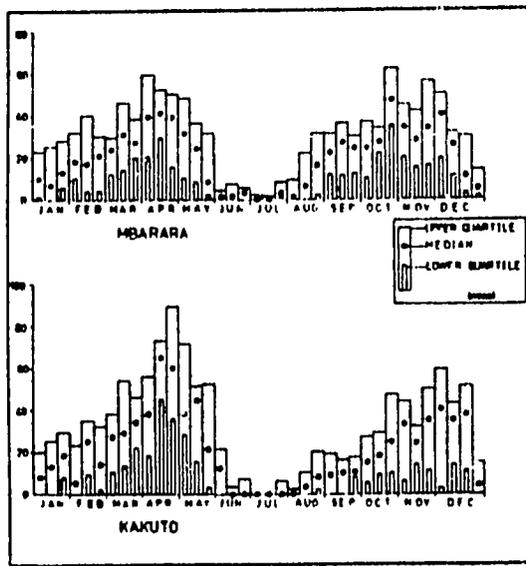
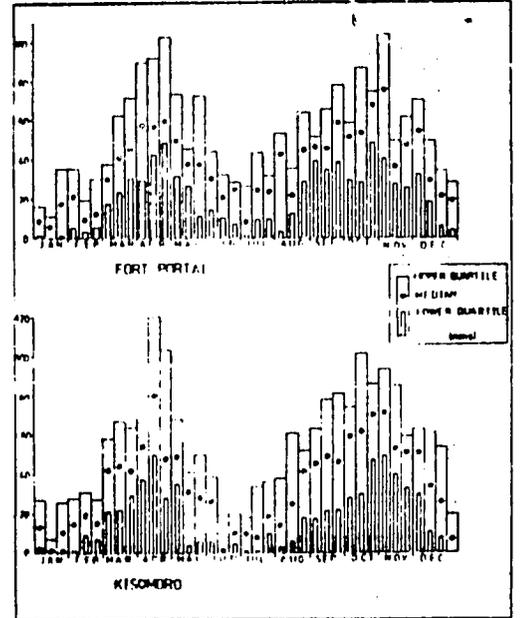


Figure 5. Rainfall Regions

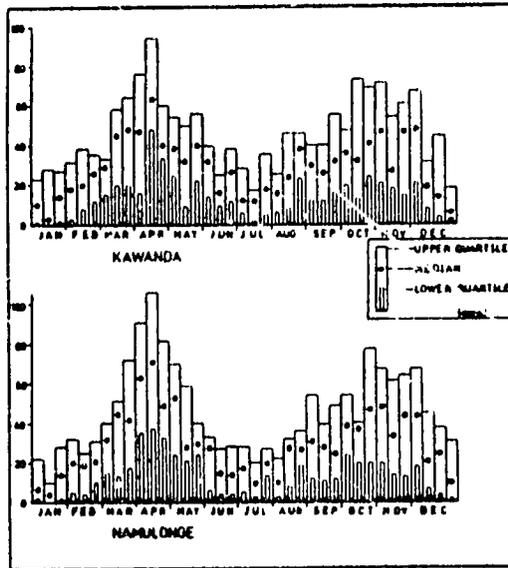
Source: Atwoki. 1975.



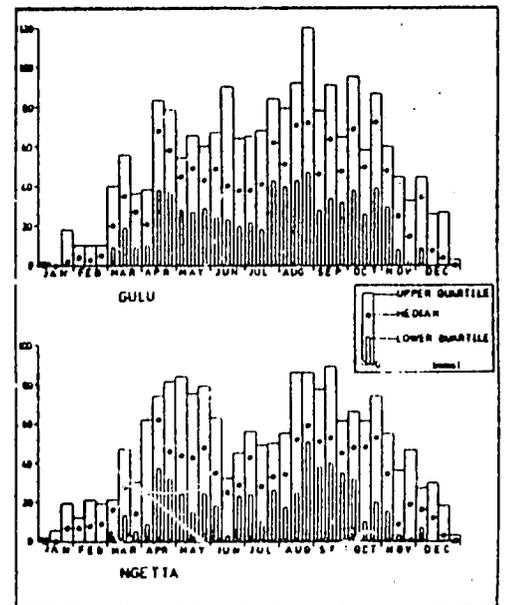
a. Region F1



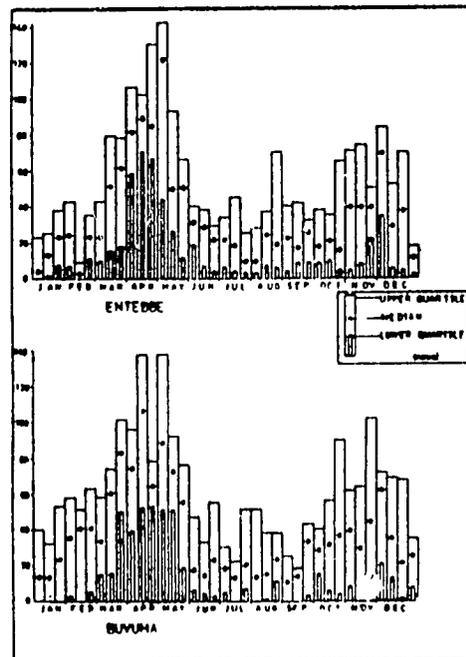
b. Region F2



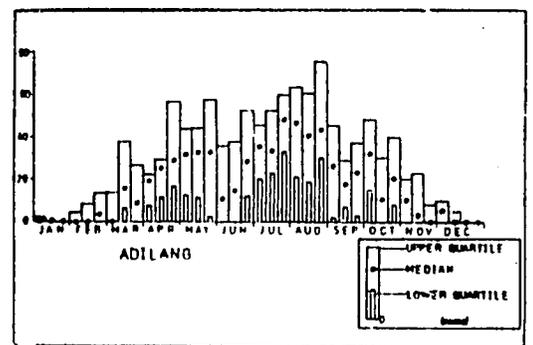
c. Region F3



d. Region F4



f. Region F6



e. Region F5

Figure 6. Rainfall Regimes for Selected Cities within Regions F1 to F6 of Figure 5

Table 1a. Mean Annual Precipitation at Selected Sites

Locale	Rainfall Region (according to Fig. 5)	Mean Annual Precipitation (mm)	Source
Masaka	F1	1,0831.1	a
Mbarara	F1	905.6	b
Bushenyi	F2	1,241.8	a
Fort Portal	F2	1,487.0	b
Mubende	F2	1,217.7	a
Mukono	F3	1,392.7	a
Namasagali	F3	1,184.9	a
Arua	F4	1,386.6	a
Gulu	F4	1,553.6	b
Masindi	F4	1,302.3	b
Tororo	F4	1,463.7	b
Adilang	F5	1,142.7	a
Kitgum	F5	1,266.2	a
Kotido	F5	685.8	a
Buvuma	F6	1,582.2	a
Entebbe	F6	1,623.8	b
Kampala	F6	1,173.5	a

a Wernstedt. 1959?

b USAID. 1981a.

Table 1b. Temperatures at Selected Sites

Location Elevation	Temperature (degrees Centigrade)	
	Mean Max	Mean Min
Arua 1,280 m.	28.3	17.2
Butiaba 621 m	29.3	22.0
Entebbe 1,146 m.	25.9	17.1
Gulu 1,106 m.	29.3	17.1
Holma 1,158 m.	28.5	16.7
Jinja 1,170 m.	28.3	17.3
Kabale 1,871 m.	23.2	10.1
Kampala 1,312 m.	26.7	17.3
Kawanda 1,196 m.	27.3	15.9
Kitgum 937 m.	31.8	17.3
Mosaka 1,313 m.	25.7	15.9
Mbale 1,220 m.	29.3	16.2
Mbarara 1,443 m.	26.3	14.6
Moroto 1,524 m.	29.2	15.8
Mubende 1,553 m.	25.3	16.0
Serere 1,139 m.	30.0	18.0
Tororo 1,226 m.	28.8	16.3

Source: USAID. 1981a.

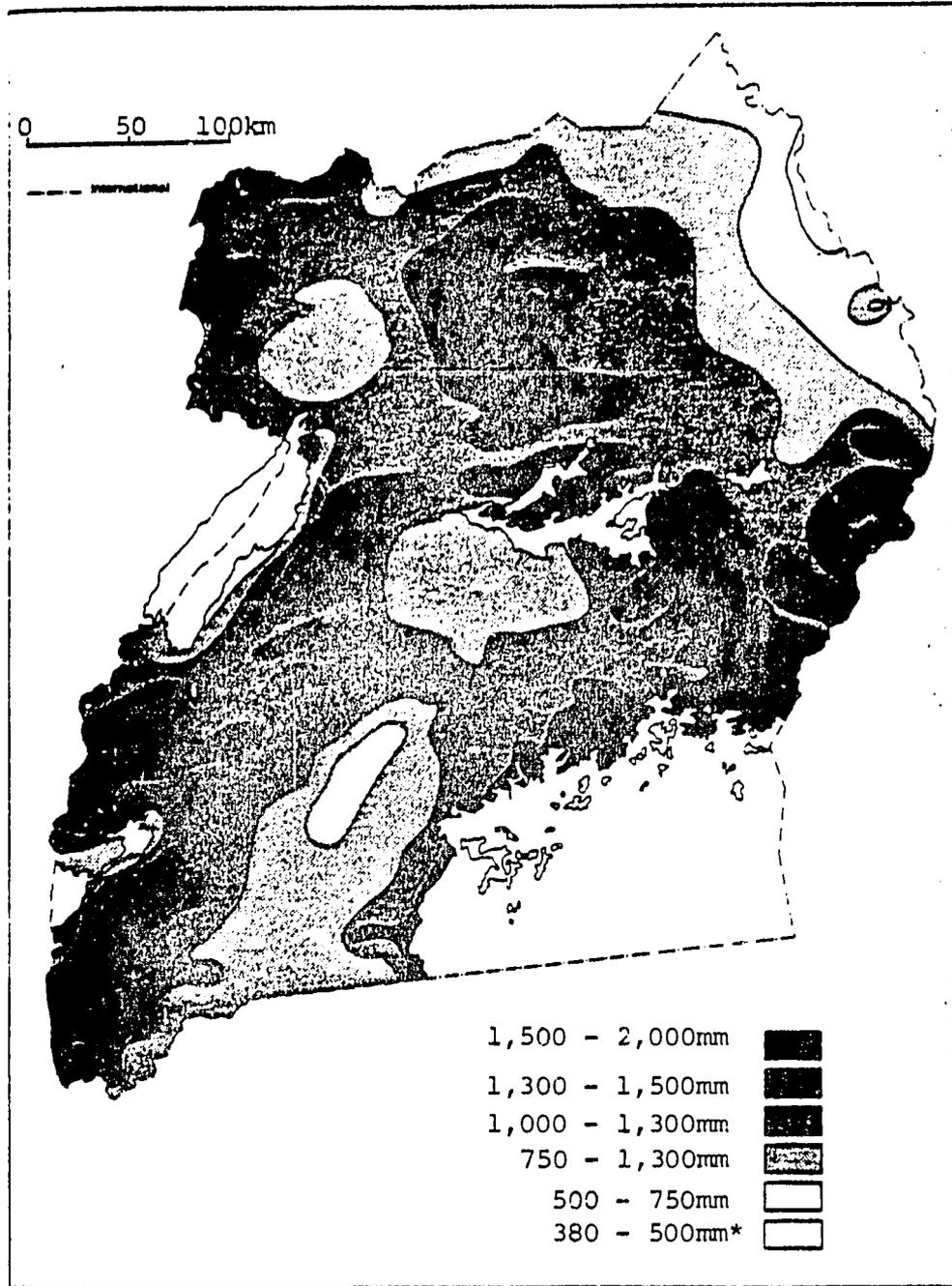


Figure 7. Isohyetal Zones

*Lakes also shown unshaded

Source: Clark University. 1980.

2.1.3.2 Temperature

In tropical Africa there is typically little temperature variation throughout the year. Uganda, because of its elevation, experiences a tropical highland savanna climate. A cool dry season with occasional frost and a hot dry season are interspersed with warm rainy seasons. Table 1b lists average maximum and minimum temperatures at selected sites.

2.2 Population

2.2.1 Historical and Cultural Background ^{4/}

Like nearly all modern African nations, Uganda is a recently created entity, having become independent in 1962. At that time the country was crafted from a collection of disparate and competing cultural and political entities. Although it is a relatively small and seemingly integral geographical unit, Uganda is not a product of spontaneous indigenous historical forces. Instead, Uganda, like all of its neighbors, was shaped by three quarters of a century of European colonial occupation.

Despite the natural barriers along its eastern, southern, and western sides, the region has hosted continual migrations and invasions. Because of these millenia of cultural and ethnic interchange it is not possible to identify any "original" inhabitants. Rather, the groups presently residing in the area represent accretions of northern, central, and southern African peoples. To some degree, distinctions have been preserved and particularly significant cultural differences remain between the Nilotic, Nilo-Hamitic, and Sudanic communities of the northern districts, and the various Bantu groups populating the rest of Uganda.

The precise origins of the present resident communities are obscure, as are the circumstances surrounding their entry into the region. The first reliable records, comprised of

⁴ Sources: Barber. 1968. Karugire. 1980.
Clark Univ. 1980. Lonsdale. 1980.
Gukiina. 1972. May. 1980.
Herrick et al. 1969. Roden. 1974.

archaeological evidence and reconstructions of clan histories from oral traditions, do not yet date earlier than the fifteenth century, A.D. By then Nilotic and Sudanic peoples had already entered the plateau and the northern Victoria basin. By 1500 both the Banyoro and the Baganda--each descended from a common Babito family--had founded local kingdoms (Karugire 1980). The centuries which followed were marked by rivalry between Bunyoro and Buganda, and with other neighboring states. By the seventeenth century the region was marked by competition for territory and political supremacy. By then Bunyoro and Buganda shared the area north of Lake Victoria with Nkore, Rwanda, Acholi, Paimol, Toro and other states (Fig. 8).

Nineteenth century European explorers seeking the source of the Nile found the region south of the Victoria Nile dominated by Bunyoro and Buganda. Each of these states had by then evolved elaborate procedures designed to administer their agricultural economies. In Buganda centralized rule by a hereditary sovereign, the Kabaka, was supplemented by an official council, or Lukiko. The territory, moreover, was administered in units called sazas, each controlled by an appointed chief. At this same time Buganda's economic base was expanding as Arab merchants, already ensconced along the eastern coast, moved westward seeking ivory. Both Buganda and Bunyoro cooperated with the Arabs and benefited from the commerce in ivory and from the slave trade.

British ventures in the region began indirectly. The first visitors were adventurers and scientists. Although they kindled interest in the highlands that gave birth to the Nile, their impact was not lasting. Later events downstream, in Egypt, proved of greater importance as the English came to view the hinterlands as extensions of their European intrigues. Missionary interest in unconverted Black Africans combined with desire for profit accelerated English involvement. The activities of the Church Missionary Society, beginning in 1877, and the Imperial British East Africa Company, chartered in 1890 to operate in Uganda, increased Great Britain's involvement in the region. By 1893 that involvement had become so direct that the Company's mandate was revoked and replaced by official British protection. The following year Great Britain formally declared its establishment of a Uganda Protectorate over a

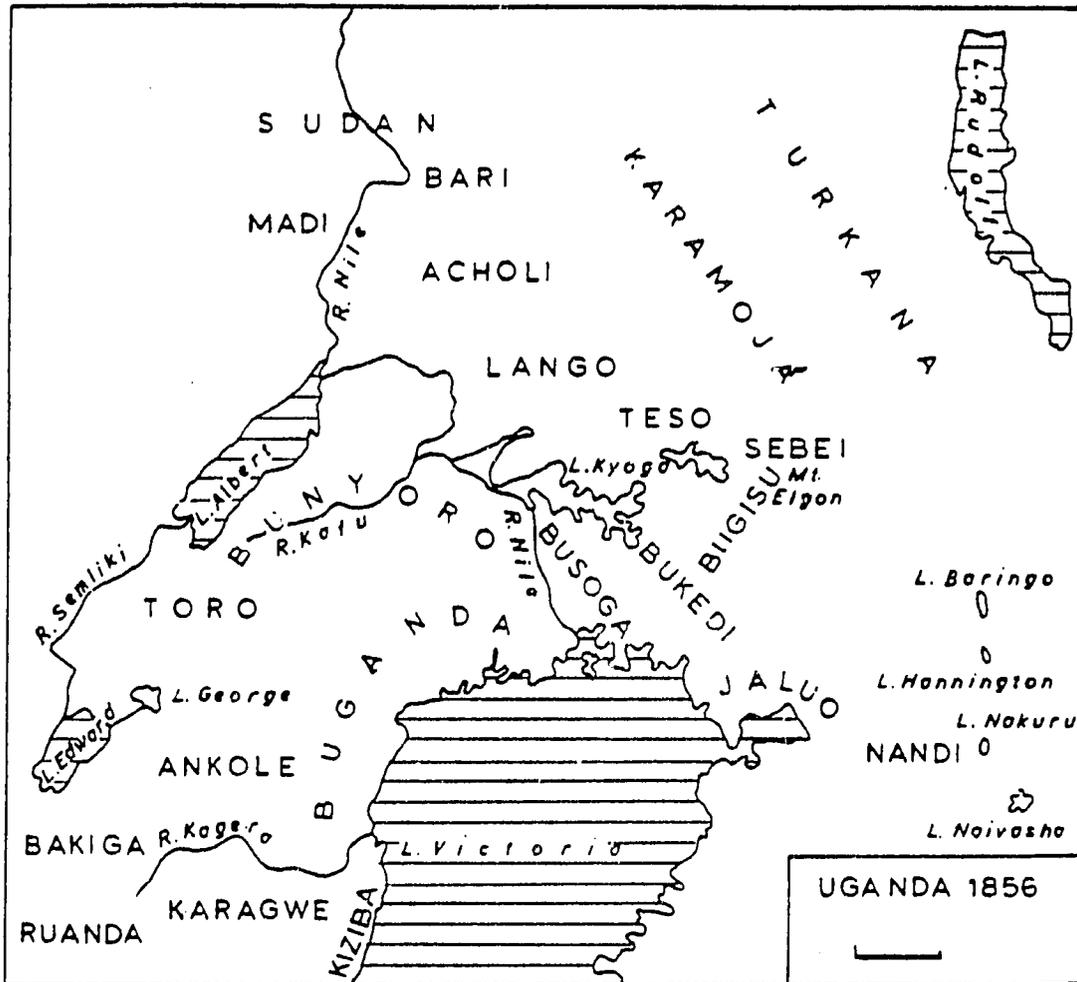


Figure 8. Uganda Region Prior to British Administration, c.1856

Source: Bakwesegha. 1974.

region including not only Buganda and Bunyoro, but over most of the adjacent states to the north. Within two years Ankole, Busoga, Busongora, Kitagwenda, Koki, Kyaka, Nyakabimba, and Toro had all been merged into the Protectorate. Although Buganda, Bunyoro and some of the other kingdoms were permitted to retain some degree of autonomy, overall administration was reorganized. The Protectorate was divided into six provinces: Uganda Province, corresponding to the Kingdom of Buganda; Western Province, including Bunyoro and Ankole; Central Province to the west of Uganda Province; and Nile, Rudolf and Eastern Provinces to the north and east (Fig. 9).

Soon after the establishment of the Protectorate the 1900 Buganda Agreement redefined administrative and revenue collection procedures in that province. The *sazas* were retained, but taxes were redistributed so that not only chiefs, but the central government profited from them. In addition to assigning land to favored chiefs in exchange for political allegiance, the British Crown appropriated "public lands" such as forests, swamp, and fallow land. Similar administrative and land tenure arrangements were implemented elsewhere in the Protectorate.

After periodic changes in land, revenue, and administrative policy, the Protectorate was gradually steered toward autonomy. The process accelerated after the Second World War, a period which witnessed the formation and consolidation of a number of indigenous political movements and parties. After prolonged preparations, Uganda obtained its independence in October 1962. A previously prepared constitution was adopted in March of that year.

2.2.2 Ethnicity and Language ^{5/}

As Section 2.2.1 has already indicated, Uganda is a multiethnic society. The Protectorate formed during the 1890s was created, not to mirror existing cultural and political associations, but to serve British colonial interests. As a result the ensuing confederation of which modern Uganda

⁵ Sources: Bakwesegha. 1974. Kasfir. 1976.
Clark Univ. 1980. Ladefoged et al. 1972.
Herrick et al. 1969. Scotton. 1972.

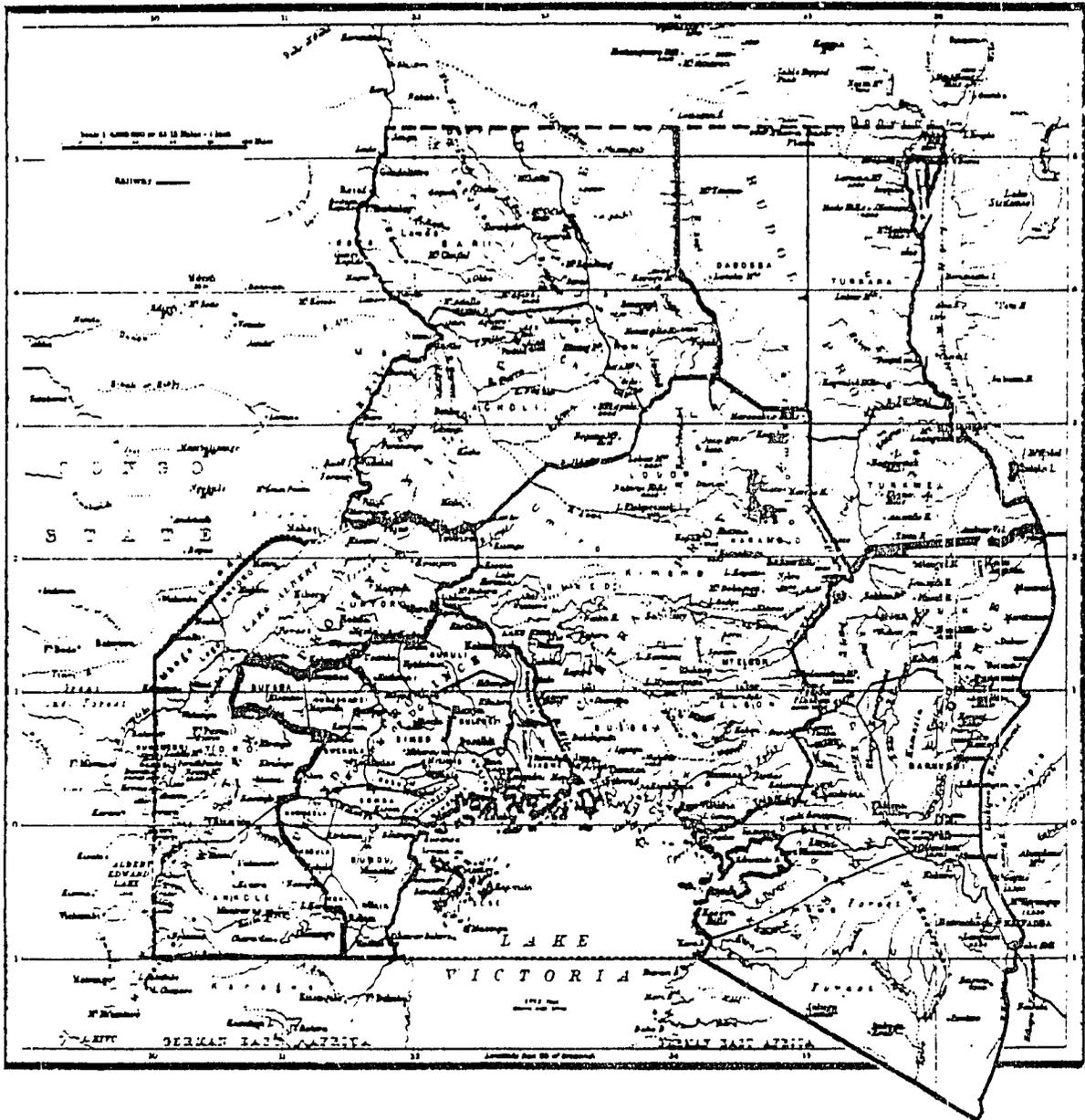


Figure 9. Administrative Units within the Protectorate, 1902

Source: Johnston. 1902.

is the heir encompasses several distinct socioreligious and linguistic communities. These groups vary from the politically sophisticated Baganda and Banyoro of the south to the loosely organized Karamojong pastoralists of the northeast. In all there are perhaps 40 ethnolinguistic groups residing within Uganda's borders.

These communities are generally assigned to four distinct linguistic families whose distribution reflects the settlement patterns of the speakers of these languages. In the north, Nilotic (or Western Nilotic), Nilo-Amharic (or Nilo-Hamitic or Eastern Nilotic), and and Sudanic languages are spoken by Acholi and Lango; Karamojong, Pokot, Heso, Kumam, Sebei, and Gisu; and Lugbara and Madi, respectively (Fig. 10). The more densely populated regions south of the Victoria Nile and Lake Kyoga are inhabited by speakers of the Bantu languages. While languages within one of four groupings sometimes can be understood by neighboring communities, intergroup languages are generally not mutually intelligible.

The societies represented by the four linguistic groups differ from each other not only in their means of communication, but in cultural and religious tradition, predominant livelihood, relative economic development, and participation in modern political institutions. The Bantu-speaking Baganda, in their own estimation, have been accustomed to being rulers. Although they are akin to the neighboring Banyoro, centuries of rivalry culminated by political supremacy have caused the Baganda to view themselves as the rightful elite. This status was initially legitimized when the Kabaka became Uganda's first president after independence in 1962. As a group, however, the Baganda have remained skeptical of the confederation. Although members of the community have dominated educational, intellectual, and governmental circles, they have frequently resisted integration with the nation's other ethnic groups. Table 2 shows the distribution of higher educational and governmental positions among Uganda's various communities.

Table 2 demonstrates vividly the inequitable distribution of educational and administrative positions among the various ethnic groups. Bantu-speakers as a whole remain overrepresented, though the figures show a gradual decline in these positions. Lugbara-speakers (the Baganda)

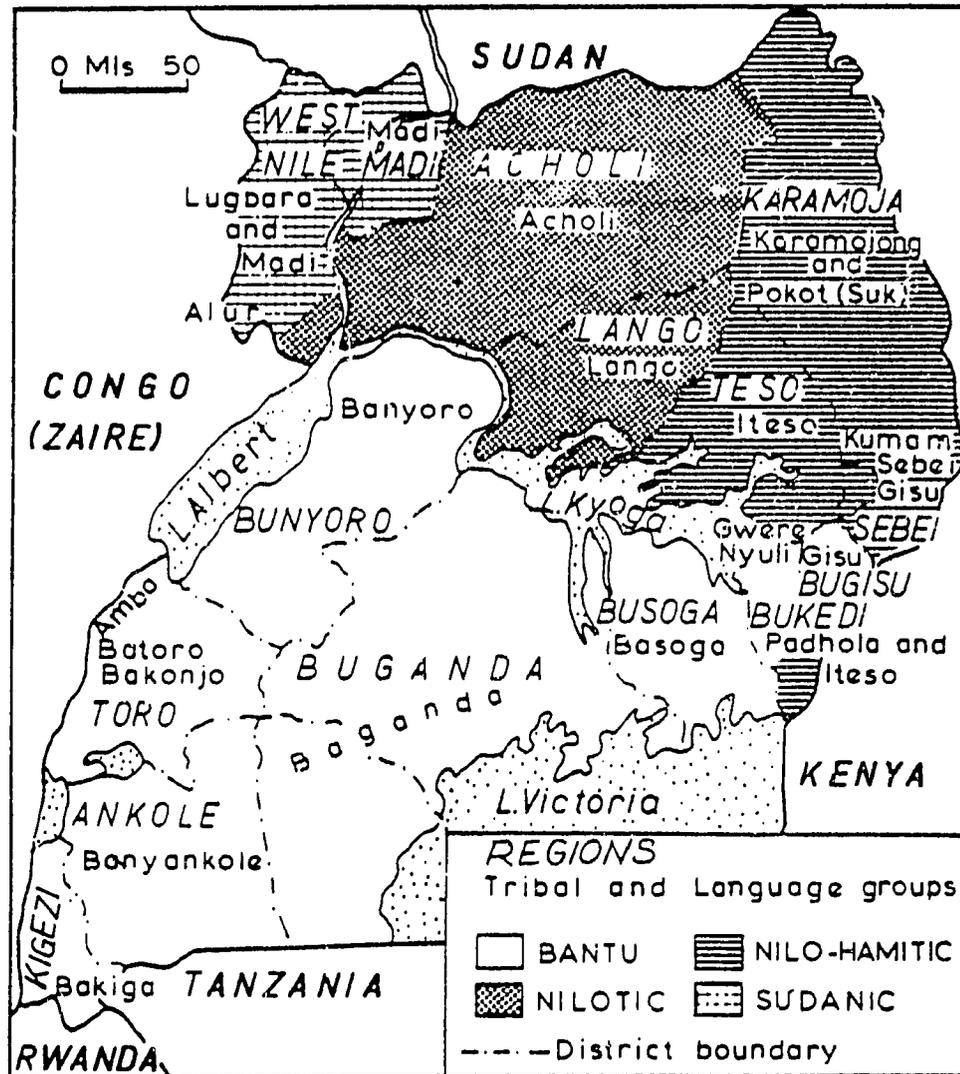


Figure 10. Ethnolinguistic Communities

Source: Bakwesegha. 1974.

Table 2. Ethnic Distribution in Higher Education
at Makerere University) and among Higher
Public Service Employees

Ethnolinguistic census unit	Percent of population 1959	Percent of Makerere students		Percent of higher public service employees	
		1959-60	1968-69	1959	1967
Bantu	65.7	81.5	72.9	81.5	73.9
Baganda	16.3	46.6	33.6	40.7	35.6
Banyankole	8.1	6.1	6.2	0.0	6.8
Basoga	7.8	6.1	6.4	7.4	3.4
Bakiga/Bahororo	7.1	6.4	6.9	3.7	4.7
Banyarwanda	5.9	1.8	2.9	11.1	4.4
Bagisu	5.1	3.6	2.9	0.0	2.7
Batoro	3.2	1.8	4.1	7.4	7.1
Banyoro	2.9	3.6	4.5	7.4	5.1
Bagwere	1.7	2.1	1.9	0.0	0.3
Bakonjo	1.7	0.7	0.3	0.0	0.3
Banyole	1.4	1.4	0.8	3.7	1.4
Samia	0.7	0.7	1.9	0.0	2.4
Nilotic	14.5	9.3	13.6	11.1	13.2
Langi	5.6	1.8	5.2	3.7	4.1
Acholi	4.4	4.3	5.4	7.4	4.4
Japadhola	1.6	1.4	1.6	0.0	4.1
Jonam	0.4	1.4	0.5	0.0	0.0
Nilo-Hamitic	12.7	7.8	9.2	3.7	11.2
Iteso	8.1	6.1	7.8	3.7	8.1
Karamojong	2.0	0.4	0.2	0.0	0.7
Kumam	1.0	1.4	0.7	0.0	0.7
Kakwa	0.6	0.0	0.3	0.0	1.4
Sebei	0.6	0.0	0.1	0.0	0.3
Sudanic	5.0	1.4	4.3	3.7	1.7
Lugbara	3.7	0.4	2.2	0.0	1.4
Alur	1.9	0.4	1.4	0.0	0.7
Madi	1.2	0.7	1.9	3.7	0.3
Other ^a	<u>7.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total ^b	100.0	100.0	100.0	100.0	100.0

^a Includes Engwe, Baamba, Bakenyi, Labwor, Lendu, Luo, Rundi, and Suk.

^b Errors due to rounding.

Source: Kasfir. 1976.

illustrate this trend even more clearly; although comprising only one sixth of Uganda's population, they occupy approximately a third of the elite positions. The general decline of these figures evident in Bantu-speakers is more apparent among Baganda (Table 2). By contrast Nilotic and Nilo-Hamitic language speakers have increased their participation in the fields surveyed in Table 2.

The variety of languages spoken in Uganda constitutes a serious barrier to administration and to intercommunal cooperative efforts. Although nearly two-thirds of the population speak Bantu languages, Luganda is the single most prevalent language and is spoken by just 16 percent of Ugandans. Official attempts to impose it as a national language have met strong resistance not only by non-Bantu speakers, but by rival Bantu-speaking communities such as the Banyoro, Batoro, and Basoga peoples. Similar moves to institute Swahili as a lingua franca have failed on two accounts. First, the language is not endemic to any part of Uganda and is thus viewed as an alien tongue. And second, because of Swahili's previous association with trading classes, it is perceived by influential Baganda and other intellectuals as an "inferior" language. Therefore, although a substantial number of Ugandans are fluent in Swahili, or can at least understand it, it is unlikely to be adopted as a national language. Instead, English, which has served that purpose since independence, is likely to continue as the official means of communication and mode of higher education (Scotton 1972).

Language difference and ethnic variety are not the only factors which separate Ugandans. Until the mid-nineteenth century members of the various resident communities held indigenous religious beliefs springing from tribal and clan lore and affecting concerns for natural phenomena and physical surroundings. The first outsiders who penetrated the region's centuries-long insularity were Arab merchants. Although they brought Islam, evidence tends to confirm that these persons were more interested in securing profits than in converting the populace (Karugire 1980). The arrival of European explorers, many of strong religious conviction, brought the earliest concerted foreign attempts to introduce Christianity. In 1877 the Church Missionary Society (CMS), a British Anglican organization, sent its first contingency to the area. Within two years a French group, the Roman Catholic

White Fathers, sent its own missionaries (Pirouet 1968). Both societies met with notable early successes interspersed with setbacks. In short the two orders competed for converts by appealing to different communities. In doing so, they exacerbated existing societal antagonisms. Nevertheless, their activities continued, accelerating two related processes: the advent of other European Christian orders, and the kindling of Islamic interest in converting influential residents.

The principal result of these activities is that by 1970 fewer than a third of Ugandans practice indigenous religions. Sixty-three percent are Christians--75 percent in Buganda--approximately equally divided among Catholics (33 percent) and Protestants (30 percent). The remaining five to six percent of the population are Muslims (Anon. 1980). Many professed Ugandan Christians and Muslims, particularly those who reside in the hinterlands, have adapted these religions to conform to traditional local beliefs.

2.2.3 Population Size, Growth, and Distribution ^{6/}

The January 1980 census enumerated Uganda's population at 12.6 million (U.S. Dept. Commerce 1981); USAID (1981a) estimates that the population is considerably greater, having reached 13.2 million in mid-1979. In 1980, 12 percent of the population was urban, a substantially higher proportion than in previous years (5.2 percent in 1960 and 8 percent in 1970). Although the urban population growth rate is more than twice that of the general population (7 percent per annum vs. 3 percent), the vast majority of Ugandans still reside in villages and small towns.

Kampala, the capital, has experienced the greatest growth over the past two decades. The present population of more than 500,000 (World Bank 1981) is five times the 1955 figure (O'Connor 1978), a total already inflated by heavy internal migration

⁶ Sources: Anon. 1980.
Clark Univ. 1980.
Kiapi. 1977.
Langlands. 1971.
O'Connor. 1978.

Taber. 1970.
USAID. 1981a.
USAID. 1981b.
World Bank. 1981.

after independence. Kampala's population growth, as Figure 11 shows, has been matched by a large increase in the city's size. Jinja, an emerging industrial center near Owens Falls Dam, is the nation's second largest city with more than 100,000 residents. The only other city of note is Mbale whose 1970 population was 23,500. Figure 12 shows the distribution of settlements.

Because the Victoria basin is one of Africa's high population belts, it is not surprising that density generally decreases as one moves northward, away from Lake Victoria (Figs. 13a and 13b). The average density is approximately 66 persons per square kilometer, but it varies considerably from fewer than ten persons per square km in the dry zones, to nearly 750 inhabitants per square km in several non-urban locales (World Bank 1981; Langlands 1971). Figures 14a and 14b show county-by-county changes in population distribution between 1959 and 1969. Figure 15 identifies those counties (Toro, Ankole, Bunyoro, and Mubende Districts, in particular) which sustained the fastest population growth during that decade. More recent data are unavailable, so there is no means of ascertaining current demographic trends.

Estimated populations of Uganda's districts in 1976 are shown in Table 3.

Typical of developing countries, the average age is young--between 14 and 15 in 1969 (Table 4)--and growing younger as the population continues to increase at three percent per annum. By the end of the century Uganda is expected to have 24 million residents. The country's population, moreover, has become increasingly male; in 1969 there were 103.9 males per 100 females. This trend has been visible throughout the century; in 1911 there were fewer males (82.6 to 100) than females (Clark Univ. 1980). Much of this variation in the male to female ratio is due to high levels of migration, both into and out of the country.

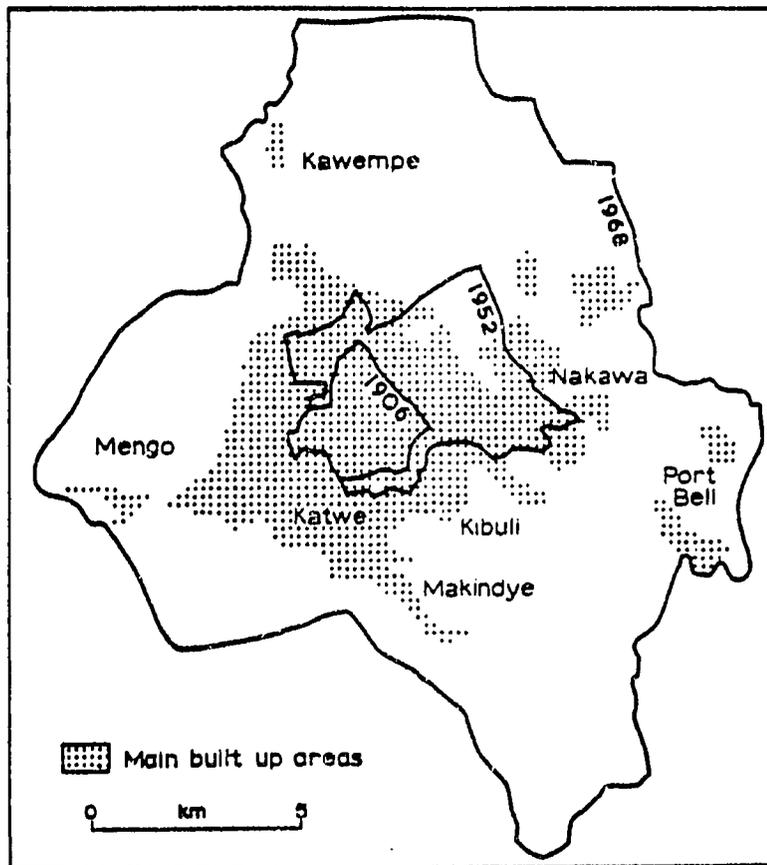


Figure 11. Kampala City Limits: 1906, 1952, and 1968

Source: O'Connor. 1978.

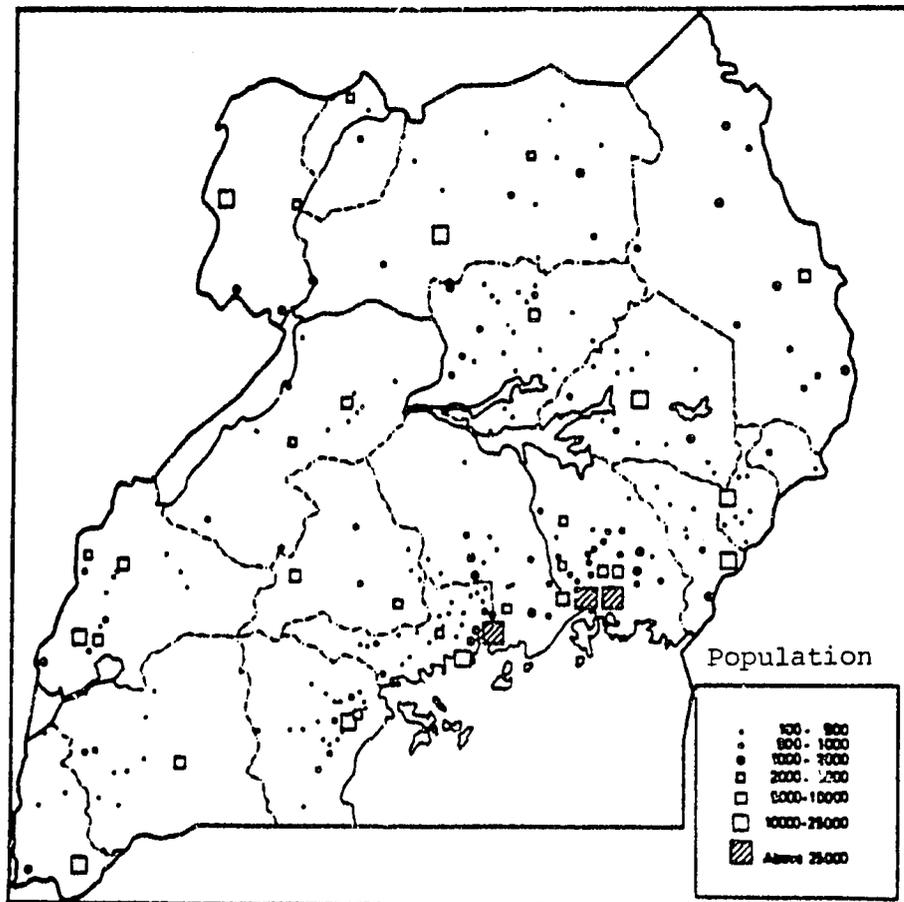
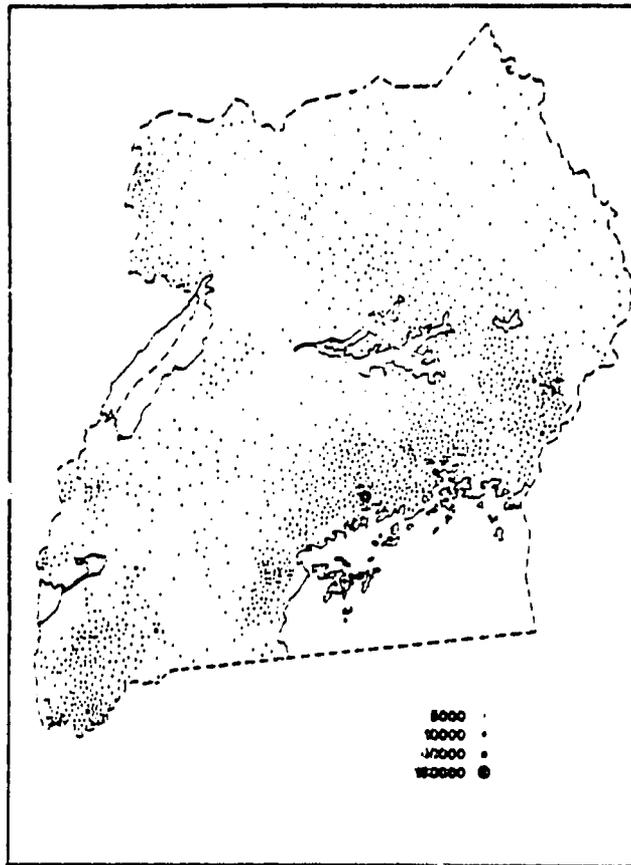
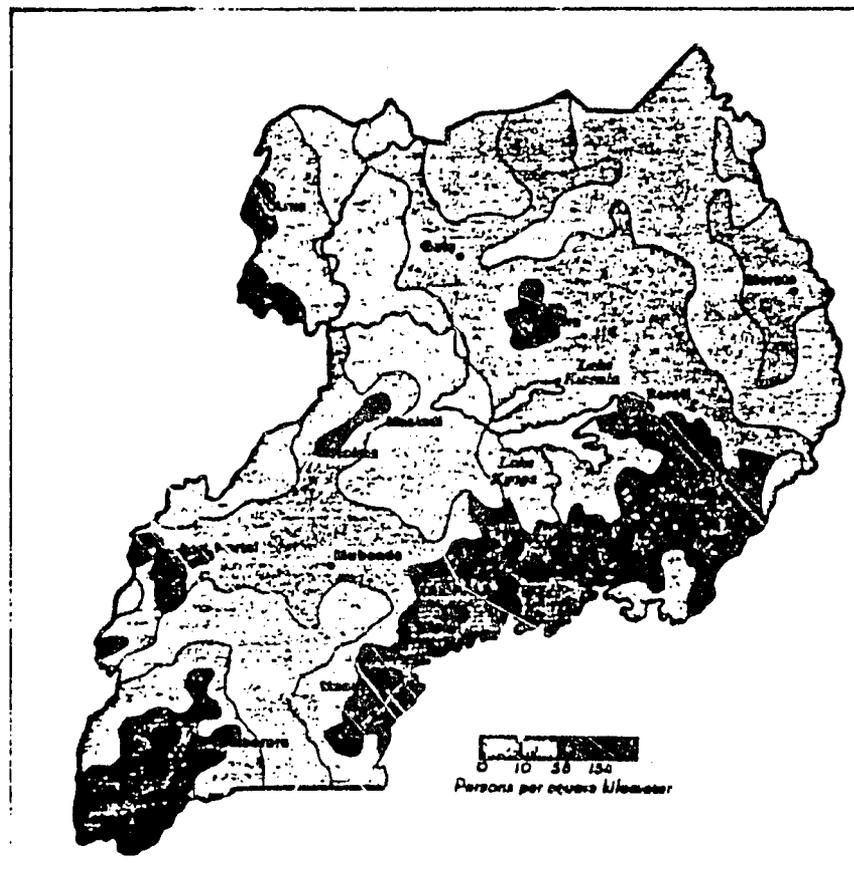


Figure 12. Distribution of Settlements, 1969

Source: Langlands. 1971.



a. Population Distribution



b. Population Density

Figure 13. Population Distribution and Density

Source: Clark University. 1980.

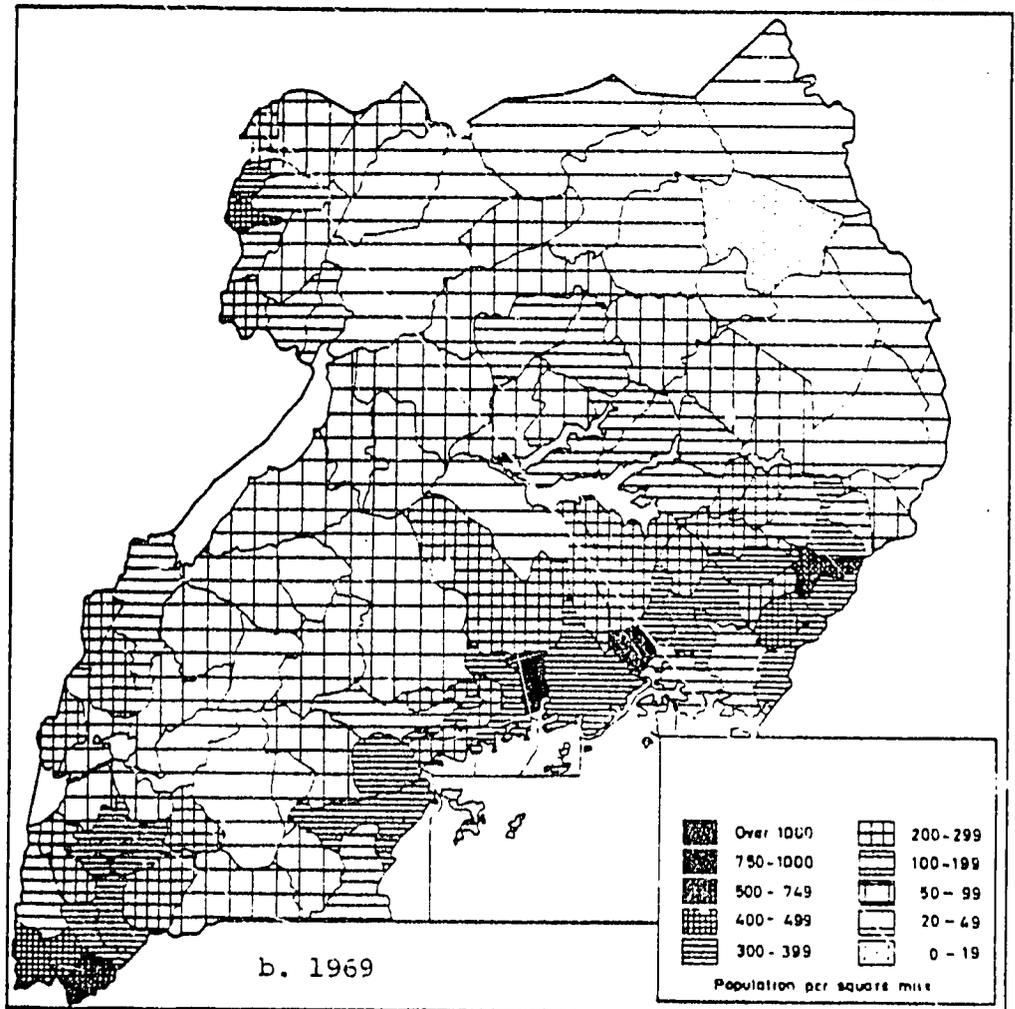
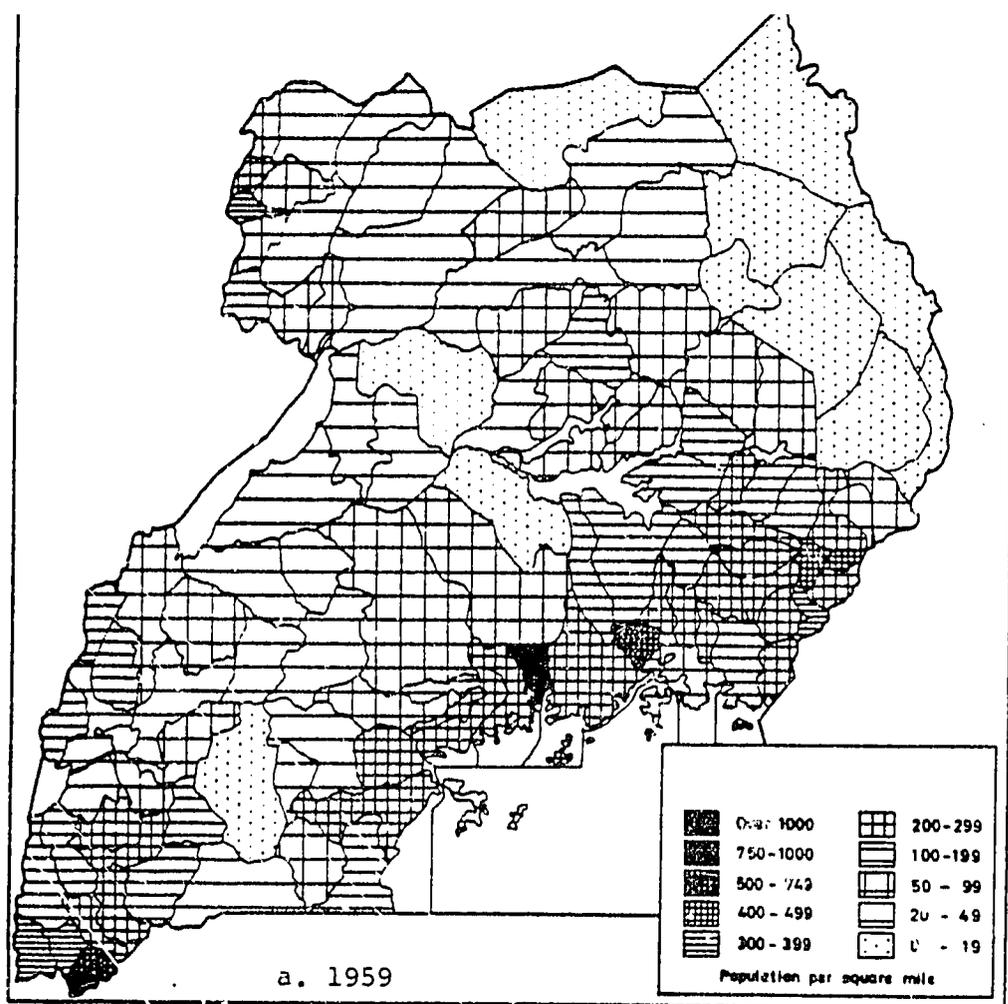


Figure 14. Population Density by County, 1959 and 1969

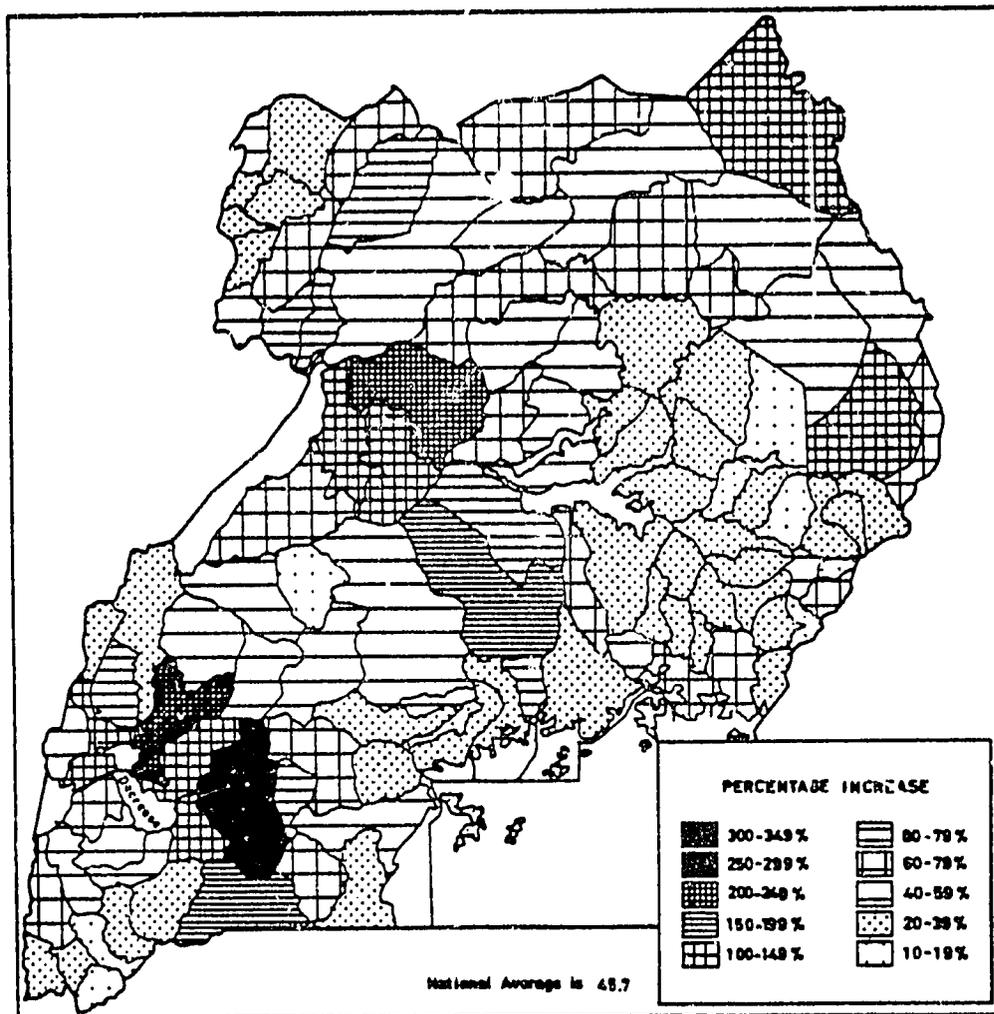


Figure 15. Changes in Population Density by County, 1959 to 1969

Source: Langlands. 1971.

Table 3. Population by District, 1976

District	Population	District	Population
Acholi	463,840	Lango	504,320
Ankole	861,150	Madi	89,980
Bugisu	397,890	Masaka	640,600
Bukedi	527,090	Mubende	330,700
Bunyoro	351,900	Sebei	64,460
Busoga	896,880	Teso	570,630
East Mengo	851,580	Toro	571,510
Karamoja	284,070	West Mengo	513,800
Rigezi	647,990	West Nile	573,760

Source: USAID. 1981a.

Table 4. Population by Age Group, 1969

Age group	Population (millions)	Cumulative percentage of total
0-4	1.84	19.3
5-9	1.47	15.4
10-14	1.10	11.5
15-19	0.83	8.7
20-34	2.06	21.6
35-49	1.21	12.7
50-64	0.66	6.9
65+	0.37	3.9
Total reported	9.54	100.0

Source: Kiapi. 1977.

2.2.4 Migration ^{7/}

Perhaps because of its favorable location and agreeable climate the region has always attracted immigrants. In the nineteenth century Arabs and Europeans began settling in Uganda, but their numbers were never large. The 1948 census enumerated 1,500 of the former and 3,500 of the latter. More significant, especially economically, was the influx of Indian laborers brought by the British to build railroads and to work on plantations. By the turn of the century nearly 12,000 indentured workers had been shipped to Mombasa to construct the Uganda Railway (Ramchandani 1976). Although only a quarter of these laborers remained, subsequent immigration and population increases raised the total number of Indians to more than 18,000 by 1941, and to 35,200 by 1948. In 1972 the number of Asians (persons of Indian or Pakistani origin) has risen to approximately 74,000. They constituted a stable element of the Ugandan population and contributed substantially to the nation's commerce, industry, and infrastructure. That year all Asians residing in Uganda without Ugandan citizenship (about two-thirds of them) were expelled, depriving the country of substantial human resources.

Other nationalities who have emigrated to Uganda during the twentieth century have been residents of neighboring countries. In most cases these people left their homes to escape political and social turmoil, and to earn wages in relatively prosperous Uganda. Events in Sudan, Zaire, and Rwanda in the 1960s caused heavy emigration into the country. Cities in districts along the western borders served as settlement stations and populations there grew rapidly. In three counties in Ankole, Toro, and Bunyoro Districts, population more than tripled between 1959 and 1969. In 11 additional counties, the population doubled. In all there were more than 150,000 African refugees in Uganda in 1967. By 1981 the number was down to 118,000 persons, approximately one percent of the total population. The total number of permanent

⁷ Sources: Herrick et al. 1969. Melady and Melady. 1976.
Hirst. 1975. Ramchandani. 1976.
ICJ. 1977. USAID. 1981a.
Langlands. 1971.

resident alien Africans--mostly Rwanda and Rundi workers--has been considerably higher, however. The 1959 census identified nearly 700,000 such persons (10.4 percent of the total population).

Internal migration, too, has had an important impact upon the country's development. Urbanization, as has been noted, is relatively pronounced. As industry has been expanding around Kampala and Jinja, rural workers have been streaming to these centers in search of employment. And, because land in the southern portion of the country is generally more productive, landless laborers from the north have been leaving their villages to work on large farms and estates.

2.2.5 Health and Nutrition ^{8/}

According to a number of indicators, Uganda's public health situation has shown signs of improvement over the past two decades. Life expectancy, just 44 years in 1960, is now estimated at 54 years. Additionally, infant mortality and the child death rate have declined during that period--the former, from 159 to 136 per 1,000, and the latter from 29 to 16 per 1,000 (World Bank 1981; USAID 1981a). In each of these areas Uganda ranks high among "low-income countries." Analogous statistics for neighboring Sudan, Zaire, Rwanda, Burundi, and Tanzania are all notably inferior; only Kenya compares favorably.

These figures, however, mask certain other features of Uganda's public health. According to USAID (1981a), the country has experienced serious difficulties in preventing disease, providing medical care, supplying safe drinking water, and obtaining necessary drugs. Internal upheaval throughout the 1970s, the expulsion of many

⁸ Sources:

Cleave. 1968.	USAID. 1981b.
Herrick et al. 1969.	U.S. Dept. Commerce. 1981.
Kiapi. 1977.	Van den Berghe and Lambrecht. 1963.
Kurian. 1978.	Van der Leeden. 1975.
May and McClellan. 1970.	Welbourn. 1968.
Tolba. 1979.	World Bank. 1981.
USAID. 1981a.	

trained foreign medical personnel, and the physical destruction caused by the 1979 invasion and coup d'etat have combined to produce a marked decline in health services since 1971.

Perhaps the most pronounced indication of this decline is the reduction in the number of physicians in Uganda. In 1970 there were 1,650 practicing doctors, by 1979 there were but 620 (USAID 1981a). Uganda is one of the few nations to have undergone a decrease in the number of physicians per population--there was one to each 14,060 residents in 1960, compared to one to 27,600 persons in 1977 (World Bank 1981). The figures for nursing personnel do not reveal this pattern. The 2,432 nurses serve an average of 4,300 persons, an improvement from the 9,500 persons served in 1960. The number of dentists and pharmacists, however, is strikingly low; in 1974 (before the most recent turmoil) there were but 19 of the former and 28 of the latter. In 1974 there were 241 hospitals having 15,700 beds, but three-quarters of the beds were in the 46 government-run and 26 missionary-operated hospitals. Figure 16 shows the distribution of health facilities.

Since the 1979 government change the nation has been particularly anxious to improve its public health outlook. In order to remedy the above shortages of qualified personnel, medical facilities, and supplies, the government has sought foreign credits and assistance. The Ministry of Health has initiated training programs at the Makerere University Faculty of Medicine and at two other institutions. Efforts have also been made to encourage the return of exiled Ugandan medical personnel.

Although Uganda's climate is generally less conducive to disease than the climate of other tropical African countries, there are nevertheless many serious infectious diseases. The most prevalent of these--gastrointestinal disorders such as cholera and dysentery; respiratory infections such as tuberculosis; parasitic infections such as bilharzia (schistosomiasis), malaria, sleeping sickness (trypanosomiasis), filariasis, roundworm, and hookworm; and other microorganismic infections such as poliomyelitis, typhus, and leprosy--are transmitted through poor sanitation and unclean water. Table 5 shows Uganda's access to safe drinking water (1975) and sewage disposal (1970).

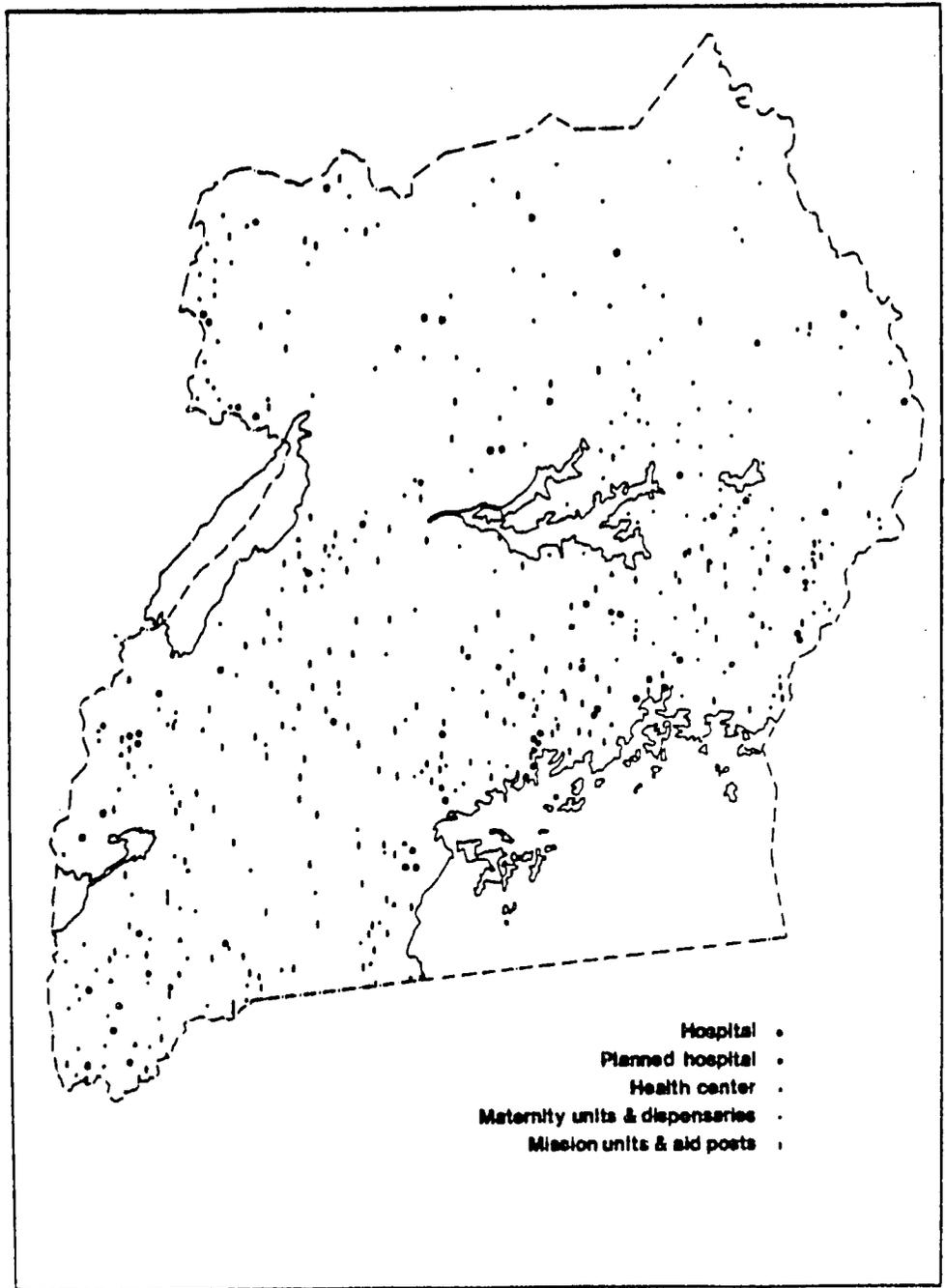


Figure 16. Health Facilities

Source: Clark University. 1980.

Table 5. Access to Safe Water and Sewage Facilities

		(Percent of population)		
		1970		1975
Access to safe water -	total	22.0		35.0
	rural	17.0		29.0
	urban	88.0		100.0
Access to sewage -	total	76.0	87.0 ^a	94.0
	rural	76.0	87.0 ^a	95.0
	urban	84.0	85.0 ^a	82.0

^a According to World Health Organization (WHO) figures, cited in Van der Leeden (1975). All other data are from USAID. 1981b.

Other common diseases in Uganda are transmitted from person to person, as venereal disease and measles; from animals, as rabies and typhus; or are induced by malnutrition and vitamin deficiency, as in kwashiorkor, pellagra, beriberi, marasmus, goiter and vitamin C deficiency caused respiratory ailments.

Nutritional disease is, in fact, more prevalent than would be expected, considering Uganda's rich soil resources, favorable climate, and moderately sized population. Protein and vitamin deficiency, rather than low caloric intake (the average value of 2,110 calories per day in 1977 was 91 percent of the minimum requirement; World Bank 1981), is the most serious nutritional problem, especially in rural areas. Although diet varies considerably from one district to another, according to cultural preference and agricultural availability, overreliance on starchy plantains and manioc appears to be the chief aspect of dietary imbalance. Increases in cash cropping have also contributed to chronic shortages of edible crops. Both animal and plant protein tend to be in short supply, particularly during winter. In the cities the main causes of undernutrition and malnutrition are shortages of cash and problems in distributing and marketing food products (May and McClellan 1970). In 1981 malnutrition remained the primary cause of mortality among children (USAID 1981a).

2.3 Land Use

2.3.1 General Features ^{9/}

Determination of the exact areas of land and water in Uganda, as Section 2.1.1 has noted, is subject to significant variation. Not surprisingly the government's own assessment of Uganda's total area according to its Lands and Surveys Department, is the highest, including 197,058 square km (19.71 million ha) of land and 44,081 square km (4.41 million ha) of inland water (Anon. 1980). FAO's estimate of the total area (236,037 sq km, or 23.60 million ha) conforms with the figure in Webster's New Geographical Dictionary, and is probably the most accurate figure. The amount of inland water included in FAO's tabulations (3.63 million ha), however, is considerably lower than the areas shown in other sources. Because FAO's land area (19.97 million ha) is higher than even the Ugandan government assessment, it is likely that FAO has included swamplands which other sources have treated as water. Table 6 summarizes Uganda's land use according to FAO.

Several trends are apparent from Table 6. First, since 1961 there have been notable increases in the amounts of land considered arable (17.2 percent higher) and suitable for permanent cropping (53.5 percent higher). Secondly, while the amount of pastureland has remained constant, forests and woodlands have been eliminated at a rapid rate, particularly up to 1972. Between 1961 and 1972 these lands declined by two-thirds. Simultaneously, the amount of land classified by FAO as "other" (see note "e" of Table 6) has increased at a comparable rate--more than doubling from 2.98 million ha in 1961-65 to 6.67 million ha in 1977. The decrease in forests and woodlands was 1.11 million ha larger than the corresponding increase in "other" lands. This (1.11 million ha) is precisely the additional amount of land brought under cultivation (Row 1 of Table 6). It is thus apparent that forested land has been converted primarily to wasteland, and secondarily to farmland or to developed land. There appears to

⁹ Sources: Anonymous. 1980.
FAO. 1979.
Herrick et al. 1969.
USAID. 1981a.

Table 6. Land Use, 1961 to 1977

Row	Land type	Area							
		1961-65		1967		1972		1977	
		Million of ha	Percentage						
1.	Arable and under permanent crop	4.43	(18.8)	4.89	(20.7)	5.10	(21.6)	5.54	(23.5)
2.	Arable land ^a	3.43	(14.5)	3.77	(16.0)	3.85	(16.3)	4.02	(17.0)
3.	Land under permanent crop ^b	0.99	(4.2)	1.12	(4.7)	1.25	(5.3)	1.52	(6.4)
4.	Permanent meadows and pastures ^c	5.00	(21.2)	5.00	(21.2)	5.00	(21.2)	5.00	(21.2)
5.	Forests and woodlands ^d	7.56	(32.0)	5.50	(23.3)	2.76	(11.7)	2.76	(11.7)
6.	Other lands ^e	2.98	(12.6)	4.58	(19.4)	7.11	(30.1)	6.67	(28.3)
7.	Total land area	19.97	(84.6)	19.97	(84.6)	19.97	(84.6)	19.97	(84.6)
8.	Inland water	3.63	(15.4)	3.63	(15.4)	3.63	(15.4)	3.63	(15.4)
9.	Total area	23.60	(100.0)	23.60	(100.0)	23.60	(100.0)	23.60	(100.0)

^a Land under temporary crops, temporary meadows, vegetable gardens, and fallow land.

^b Lands that do not need to be replanted after harvest; excludes timber lands.

^c Lands used for forage or left as wild prairie for more than five years.

^d Includes deforested land which is scheduled to be reforested.

^e Unused but potentially productive land, and barren land, parks, roads, built-on land, and all other terrain not previously included.

Source: FAO. 1979.

have been some reversal of this process during the past decade. Table 6 shows that deforestation stopped between 1972 and 1977, and that during that period there was a small decline in the amount of land termed "other."

According to statistics provided by the Ugandan government's Ministry of Agriculture, the magnitude and rate of deforestation between 1961 and 1972 is even more striking than the FAO figures indicate. The government estimates that during that period forested land declined from 8.71 million ha to 1.54 million ha--the former figure higher than that given by FAO, and the latter lower. The amount of forest land lost according to this view was 7.17 million ha, or 82.3 percent of the original amount. Similarly, the government lists "other" land as increasing from 1.61 to 7.77 million ha, also a larger change than according to FAO figures. But as with the FAO data in Table 6, the Ministry of Agriculture figures indicate a halt in deforestation and a decline in the amount of land classed as "other" (Clark Univ. 1980).

2.3.2 Land Tenure ^{10/}

The patterns of land holding in Uganda reflect a number of the changes introduced by British administration in the 1900 Uganda Agreement. Prior to that accord there were essentially four types of lands: in Buganda, clan holdings (obutaka), client chiefs' land (obutongole), individual holdings (obwesengeze), and peasant holdings (ebibanja). Elsewhere in the region local dynamic customary systems determined ownership and management practices.

In Buganda the 1900 settlement divided the private estate of the Kabaka among the royal family, the chiefs, and a number of small landholders. Although the agreement envisioned granting freehold (mailo) titles to perhaps 1,000 persons, by 1909 there were 3,700 grantees, and by 1926, 10,000 such persons (Mamdani 1976). The remaining

¹⁰Sources: Bowden and Moris. 1969. Kato. 1971.
Brock. 1969. Kurian. 1978.
Clark Univ. 1971. Kururagire. 1969.
Herrick et al. 1969. USAID. 1980.
Karugire. 1980.

territory, a large majority of the total area, was assigned to the British Crown.

Outside Buganda local "aristocracies" were identified or created and similar measures were adopted. Separate agreements were negotiated with Toro and Ankole, and the general provisions of these treaties were applied to the rest of the Protectorate (Johnston 1902).

In 1955, after six decades of colonial rule, the Land Tenure Proposals of the Report of the East African Royal Commission stated that "customary tenure cannot satisfactorily meet the circumstance of land shortage and the demands for land for certain forms of economic use" (cited in Brock 1969). Convinced throughout their rule of the correctness of that dictum, the British sought to limit the amount of privately-held and communally-held land.

Upon independence the newly-created Uganda Land Commission continued colonial land tenure policy. Under the 1962 Public Lands Act, 86 percent of Uganda's land was considered public (formerly "Crown"). Ninety percent of the privately-held land was in Buganda and was owned by freeholders under the mailo system. Much of this mailo land has been in the form of large coffee and sugar plantations. These landholders, cultivating cash crops, have tended to adopt "progressive" farming techniques (Bowden and Moris 1969). Their willingness to innovate and the demand of their products on the world market have allowed these landowners to prosper over the past several decades.

The majority of private landholders, however, are farmers who with their families cultivate an average of less than two hectares, sometimes on plots that are not contiguous. Although some produce cash crops, most of their production is for local consumption. These growers are typically far from transportation facilities and have no access to agricultural credit. Their productivity, therefore, remains low and they are generally classed as rural poor (USAID 1980).

2.3.3 Agricultural Practices 11/

In those regions where cultivation is possible, the typical farming unit is the family. There is no current accurate estimate of the number of small farmholders, but in 1969 there were approximately 1.2 million such units. Generally, farming is accomplished with minimal mechanization. Instead the family members contribute most of the labor necessary to operate the farm. On such plots, subsistence farming is most common. The types of crops selected depend upon tradition, soil and climatic conditions, and market values.

Intercropping, or mixed cropping, is more popular than pure stand cropping. This mode of cultivation is, in fact, typical of traditional East African agricultural systems (Leakey 1971). Although much of Uganda's existing cropland remains fertile, population pressure has been forcing families to adopt techniques of shifting cultivation in order to clear forest stands and grasslands for farming. This phenomenon is illustrated by the data of Table 6.

Cash cropping was introduced in the early twentieth century and now accounts for a substantial portion of total production. But because of limited farm labor resources at certain times of the year--particularly in the relatively dry main short grass zone of northern and eastern Uganda--cash crops are neglected in order to tend to subsistence food crops. This has reduced the yields of cash crops (Okai 1972).

2.3.4 Crops 12/

As Table 6 indicates, approximately a quarter of Uganda's area is under cultivation. Considering, however, that nearly three-quarters of the surface area receives sufficient precipitation for intensive agriculture, this figure is not

¹¹Sources: Clark Univ. 1980. Leakey. 1971.
Herrick et al. 1969. Okai. 1972.

¹²Sources: Clark Univ. 1980. Uchendu and Anthony.
1975.
FAO. 1979. USAID. 1980.
Mackenzie. 1970. USDA. 1980.
Smith. 1970.

especially high. With forests and woodlands having been reduced by two-thirds, most of the cleared land nevertheless has remained unsuitable for planting. Tsetse fly infestation affects perhaps 30 percent of the total land area and is particularly rampant on newly cleared terrain.

In spite of obstacles to extending cultivation, Uganda remains a predominantly agricultural nation. Eighty-three percent of the labor force is engaged in the agricultural sector which contributes 55 percent of the GDP (up from 52 percent in 1960; World Bank 1981). Agricultural products account for approximately 85 percent of the country's export earnings (Kurian 1978).

In those areas of Uganda where cultivation is the chief livelihood three systems of agriculture can be identified: northern; montane; and banana and robusta coffee (Clark Univ. 1980).

Northern Systems. Within the short grass zone north of the Victoria Nile (corresponding to regions F4 and F5 in Fig. 5 and excluding Karamoja), the characteristic agricultural system includes cultivation of both cash crops and low grade food crops. Among the former, cotton and tobacco are most common; of the latter, millet and sorghum, sesame and sunflower seeds, and pigeon peas are typical. Little of the cultivation is perennial on account of the lengthy dry season. During the 1970s production of both cotton and tobacco fell substantially, and farmers increasingly have been turning to food crops. Inadequate rainfall and mite infestation in recent years have created food shortages within this region.

Montane Systems. These agricultural systems occur in all of the areas above 2,000 meters in elevation. Bananas are the principal food crop in these zones, while arabica coffee and tea are the important cash crops. Arabica, a more valuable variety than robusta, Uganda's other coffee crop, is grown along the slopes of Mt. Elgon in the east. In 1970 it accounted for six percent of the nation's coffee production, and nine percent of export earnings. The Bugisu Cooperative Union is responsible for distributing and marketing the crop.

Tea, the other important cash crop produced in montane systems is cultivated either on private or government-owned estates, or by small outgrowers

organized within the Uganda Tea Growers Corporation. Average plots cultivated by some 11,000 outgrowers are 1.6 ha. Tea production suffered greatly during the instability of the 1970s. Banana production, in the montane regions and elsewhere, on the other hand, increased during this time span.

Banana and Robusta Coffee Systems. Robusta variety coffee is grown mainly in southern and western Uganda, in the Buganda region and in Busoga, Bukedi, Bunyoro and Toro Districts. Nearly all of the robusta coffee is cultivated by smallholders. Frequently, coffee is planted in conjunction with bananas, beans or sweet potatoes. Occasionally cotton, millet, or sugarcane are grown instead of coffee in this system.

Table 7 shows Uganda's geographical crop distribution. Figure 17 illustrates the suitability of five selected crops to rainfed agriculture and Figure 18 shows the location of major cotton and coffee producing areas. Table 8 lists the amounts of land devoted to Uganda's main agricultural products, and Table 9 gives the total quantities produced.

Table 8 reveals that less land is being devoted to cash cropping than in the past. The two major products in this class, coffee and cotton, each have been allocated less land over the past decade. Coffee planting has declined by 14 percent, and cotton planting by 39 percent. Among food crops, cereals--particularly maize and sorghum--have become somewhat more popular. Millet planting has decreased by a quarter. Superior grains such as rice and wheat are not cultivated in any great quantities. Roots and tubers, especially cassava and potatoes, and pulses have experienced notable increases in cultivation.

Expectedly, Table 9 indicates many of the same trends, but several new features emerge. The increase in pulse production, for example, has not kept pace with the increased acreage devoted to these crops. The same is true of roots and tubers, and most notably, of high yielding cassava. According to FAO, its planted area grew by 30 percent while its production actually declined. It should be noted, however, that the data are extremely unreliable. The Europa Yearbook for 1980 shows cassava production reaching 4,000 metric tons in 1976 (compared to 1,100 listed in the 1979 FAO Production Yearbook).

Table 7. Crop Production by Agroecological Zone

Agro-ecological Zones	Major Cash earning Activities	Food Activities with good cash-earning Potential	Subsistence food Activities	Location by Administrative District
I. High effective rainfall, high altitudes	Arabica coffee Tea Pyrethrum temperate fruits	European potatoes Temperate vegetables, Dairy cattle, Bananas	Sweet potatoes Wheat Peas	S. Kigazi W. Ankole Upper Rwenzori) ⁺ Toro) Bugisu) [*] Sebei)
II. High effective rainfall, middle altitudes	Robusta coffee Tea Spice crops Cocos	Bananas Field beans Soya beans Dairy cattle Maize	Sweet potatoes	Masaka Mubende C. & S. Bunyoro E. Mengo)central W. Mengo) & south W. Busoga
III. Medium rainfall, middle altitudes	Cotton Tobacco Cashew Groundnuts Maize Sunflower	Sorghum Sim-sim Field beans Beef cattle Dairy cattle	Finger millet Cassava Cow-peas Goats	N. Kigazi Lower Rwenzori W&E Bunyoro N. Buganda Acholi, Lango, Teso, Bukedi, E. Busoga
IV. Lower rainfall, middle altitudes	Beef Cattle	Sorghum Goats	Cassava Pigeon peas	Karomoja N.E. Teso
V. Areas with high insolation, middle altitudes	Sugar Rice Tropical fruits High value vegetables	Dairy cattle Poultry Pigs		Central & northern areas

⁺ Same district

^{*} Mt. Elgon area

Source: Clark University. 1980.

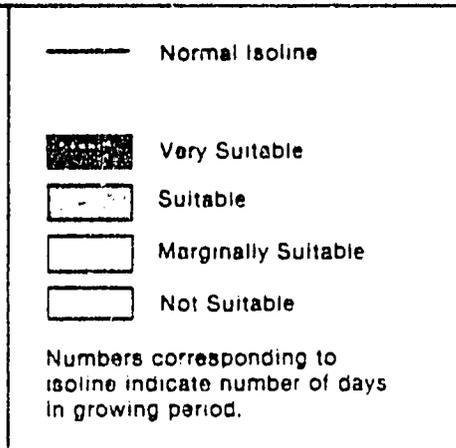
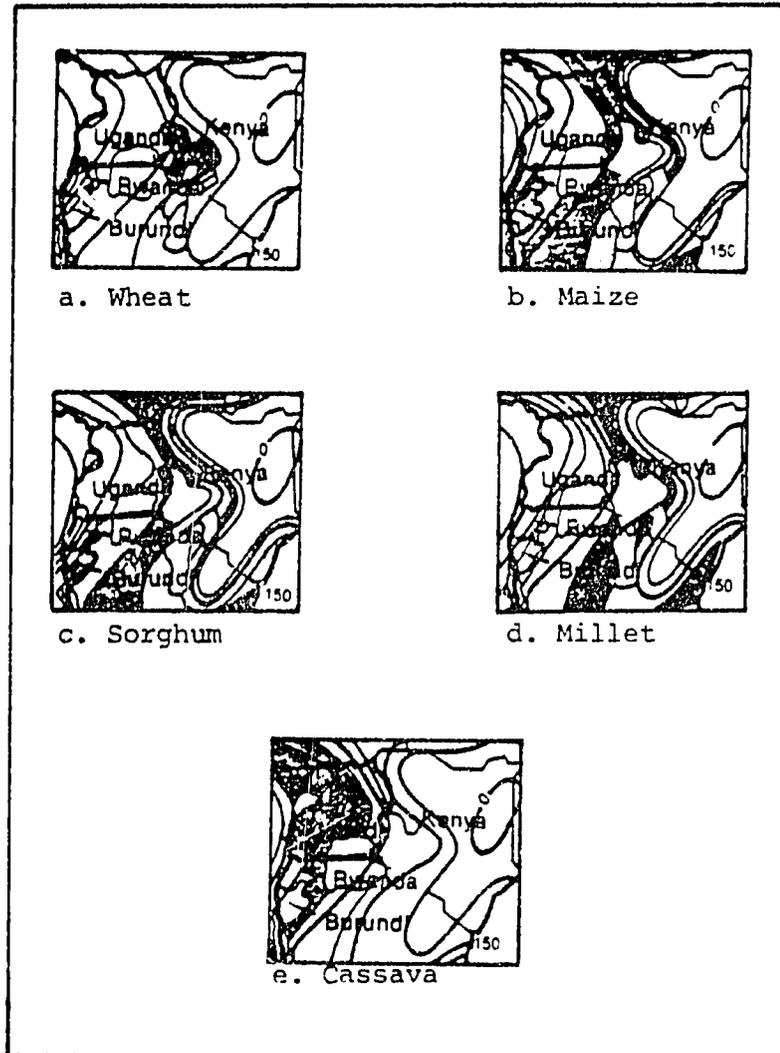


Figure 17. Suitability of Rainfed Agriculture to Selected Crops

Source: Christensen et al. 1981.

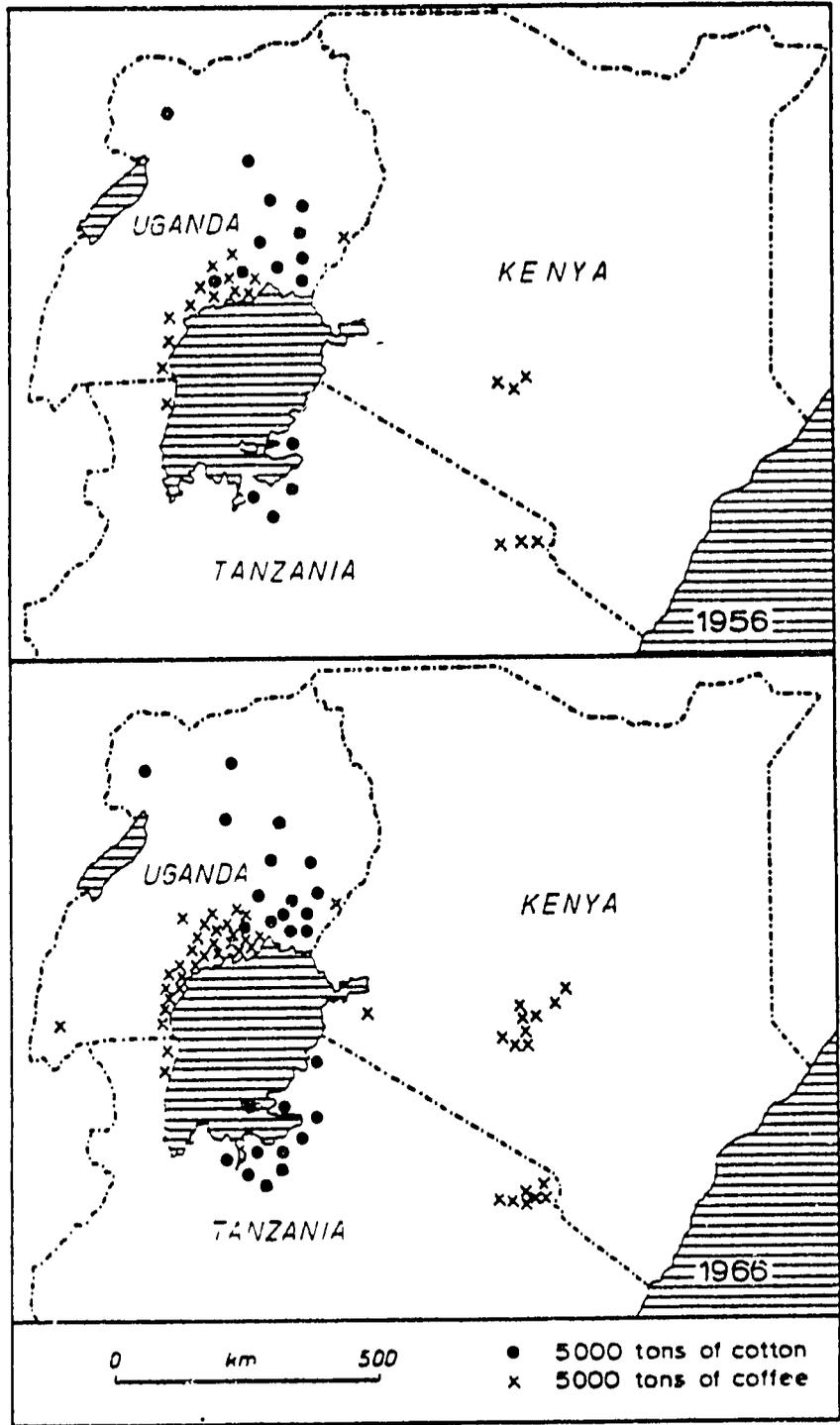


Figure 18. Cotton and Coffee Producing Areas, 1956 and 1966

Source: O'Connor. 1978.

Table 8. Area Devoted to Crops, 1969 to 1978

Crop	Area harvested (1,000 ha)		
	Average 1969-71	1976	1978
Cereals	1,401	1,381	1,483
Wheat	3	5	10
Rice	16	24	23
Maize	343	526	550
Millet	739	498	550
Sorghum	299	327	350
Roots and tubers	427	543	544
Potatoes	17	48	45
Sweet potatoes	133	135	139
Cassava	277	360	360
Pulses	443	640	585
Dry beans	263	435	356
Dry peas	21	28	30
Chick peas	4	4	4
Soybeans	4	8	6
Groundnuts	263	213	250
Castor beans	4	2	2
Seeds			
Sunflower	3	3	3
Sesame seeds	84	113	140
Cash crops			
Sugarcane	31	29	34
Coffee	261	223	224
Cacao	2	5	5
Tea	17	21	17
Tobacco	7	5	6
Cotton	923	497	567

Note: There are several crops such as banana for which figures are unavailable.

Source: FAO. 1979.

Table 9. Production of Crops

Crop	Amount produced (1,000 metric tons)					
	Average	Average	1973	1976	1978	1979
	1961-65	1969-71				
Cereals		1,512		1,598	1,700	
Wheat		6		9	15	
Rice		11		18	16	
Maize	216	420	419	632	660	500
Millet	444	737	651	449	489	400
Sorghum	276	337	416	490	520	400
Roots and tubers		1,898		2,051	2,104	
Potatoes		147		301	330	
Sweet potatoes	967	693	900	650	674	670
Cassava	1,164	1,058	1,250	1,100	1,100	1,100
Pulses		262		303	276	
Dry beans	192	155	240	217	175	181
Dry peas						
Chick peas		2		2	2	
Soybeans		4		6	5	
Groundnuts	182	207	215	198	208	215
Castor beans	2	2	2	1	1	1
Seeds						
Sunflower seeds		1	1		1	
Sesame seeds	33	21	38	40	50	45
Cottonseed	131	173	101	49	40	25
Vegetables and melons		211		251	263	
Vegetables	70		85			257
Fruits						
Tomatoes		5		7	7	
Bananas	240	314	310	340	360	360
Plantains		2,650		3,010	3,150	
Cash crops						
Sugarcane		1,667		563	600	
Raw sugar	122	154	75	20	16	12
Coffee	154	261	213	223	224	111
Tea	7	18	20	15	10	8
Tobacco	2	5	3	3	7	3
Cotton and Cotton lint		337		100	81	

Sources: FAO (1979) for 1969-71, 1976, and 1978.
 USDA (1980) for 1961-65, 1973, and 1979.

A third source, the USAID East Africa Regional Profile (1981) states production of cassava as 3,000 tons. There is no obvious way to reconcile these figures.

2.3.5 Rangeland and Livestock ^{13/}

The northeastern region of Uganda, corresponding to all of Karamoja and much of Acholi Districts, is largely semiarid rangeland best suited for cattle raising (Fig. 19). The communities residing in these areas--the Karamojong, Dodoth, Jie, and Suk--accordingly have developed lifestyles and livelihoods adapted to these surroundings. As subsistence pastoralists, these people raise and manage herds and flocks, moving according to availability of forage and water. Table 10 lists the cattle populations of the counties in Karamoja District in 1963.

Table 10 shows the variation in cattle ownership tendencies among the communities inhabiting the various counties. Cattle rearing is most prevalent among the Jie and least pronounced among the Labwor. In some cases, particularly among more settled communities, agriculture supplements livestock raising. The Labwor, for example, inhabit a region with adequate rainfall and consequently cultivate a considerable amount of land. Cotton is best suited to the conditions there, and about 8,000 ha of it are planted annually in Karamoja District.

In southwestern Ankole District, although rainfall is higher, there is also emphasis on stock raising. The Bahima communities residing there are almost exclusively pastoralists and consider cattle ownership as the principal measure of wealth and status. In other parts of Uganda where cultivation is prevalent, livestock raising offers an attractive means to supplement family income. When farming families lack the ability or resources to raise cattle, they frequently hire experienced Bahima workers to manage their herds. Figure 19 illustrates the extensiveness of pastoral and sedentary cattle rearing.

¹³Sources: Abercrombie. 1974. Herrick et al. 1969.
Allanson and Phipps. 1971. Merinar. 1973.
Anonymous. 1980. Murray. 1970.
Clark Univ. 1980. USAID. 1980.
FAO. 196?

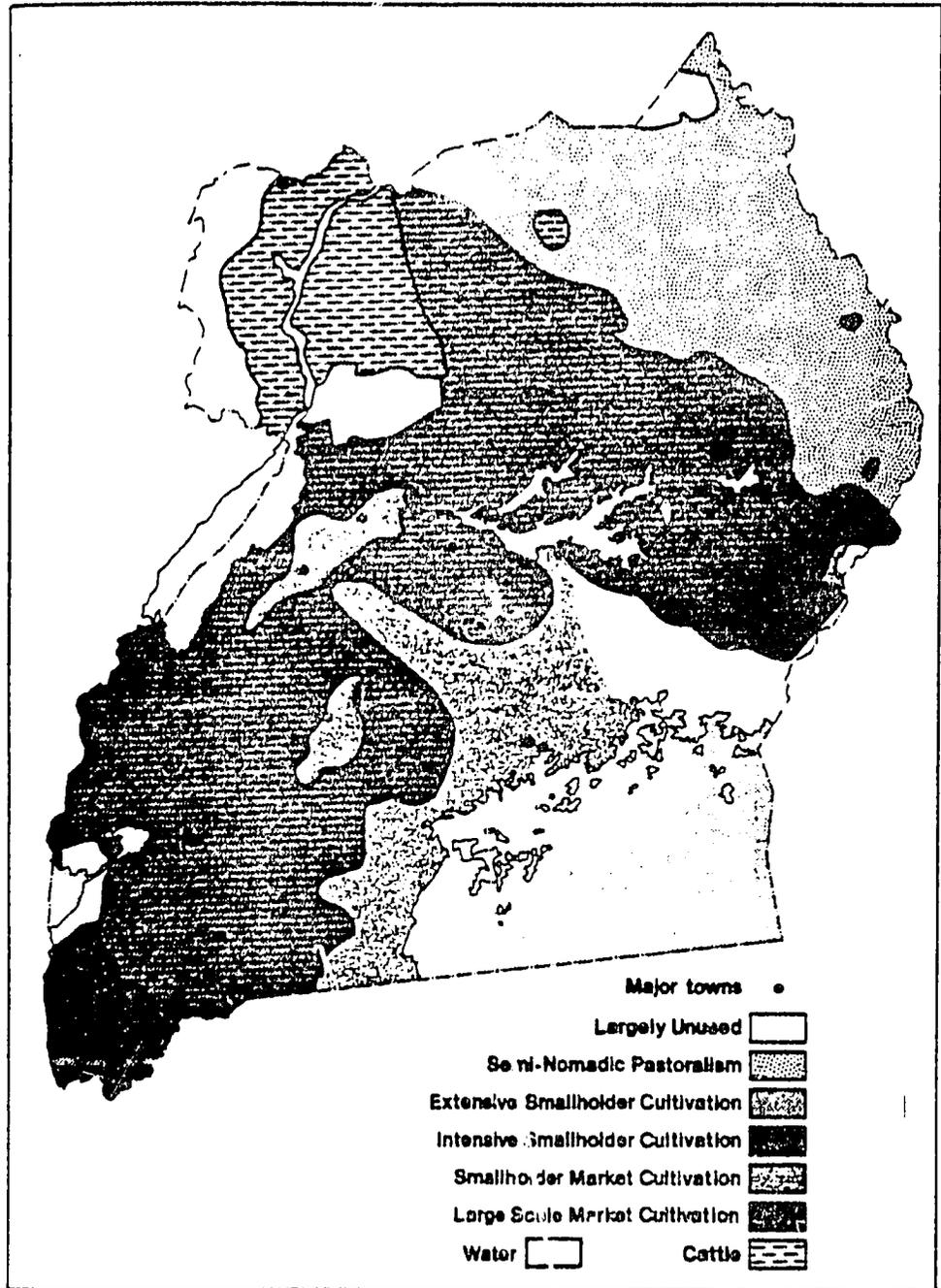


Figure 19. Agricultural Land Use

Source: Clark University. 1980.

Table 10. Cattle Population of Karamoja District, 1963

County	Area (sq km)	Population	No. of cattle	Average no. of cattle per person	Cattle density per sq km	No. of ha per head
Bokora	5,025	36,176	90,770	3.6	18.1	5.5
Dodoth	7,058	32,206	104,893	3.2	14.9	6.7
Jie	4,652	23,254	129,694	5.6	27.9	3.6
Labwor	1,492	10,280	11,145	1.1	7.5	13.3
Matheniko	3,608	19,792	34,590	1.7	9.6	10.4
Pian	4,248	27,316	128,317	3.3	30.2	3.3
Ure	5,558	23,366	104,462	4.4	18.8	5.3
Total	31,639	172,390	603,871	3.5	19.1	5.2

Source: Clark Univ. 1980.

Table 11 lists the livestock population of Uganda between 1966 and 1978. According to the tabulation, the numbers of cattle and pigs have increased markedly since the late 1960s while the goat and sheep population has remained stable. The size of livestock herds and flocks is limited by animal infections and by inefficient management techniques. Cattle ranches did not exist until the 1950s and their implementation remains limited. A number of large ranches were opened between 1966 and 1970, but together they accommodated fewer than 100,000 head of cattle (less than three percent of the nation's herd).

Table 11. Livestock Population, 1966 to 1978

Livestock	Number (1,000 head)					
	1966 ^a	Average 1969-71 ^b	1975 ^c	1976 ^b	1977 ^b	1978 ^b
Cattle	3,700	3,987	4,765	4,880	4,963	5,321
Goats	1,900	1,822	2,111	2,111	2,263	2,144
Sheep	784	799	1,081	1,081	1,072	1,068
Pigs	n.a.	57	180	180	156	220
Asses	n.a.	17	16	16	16	16

^a Herrick et al. 1969.

^b FAO. 1979.

^c Anonymous. 1980.

Dairy farms are more prevalent than cattle ranches. The Dairy Industry Corporation was set up in 1967 to handle marketing, and by 1970 there were nearly 400 dairy farms having 10,000 cows. The Veterinary Training Institute at Entebbe has conducted research programs aimed at raising milk production by improving techniques of pasture management, feeding policies, breeding, milking, and disease control (Merinar 1973). Production of milk and meat products is given in Table 12.

Table 12. Dairy and Meat Production, 1962 to 1978

Product	Production (1,000 metric tons)				
	1962 ^a	Average 1969-71 ^b	1976 ^b	1977 ^b	1978 ^b
Milk					
Cow	139	230	203	285	381
Goat	13	n.a.	n.a.	n.a.	n.a.
Meat					
Beef and veal	44	68	82	88	90
Mutton and lamb	3	4	5	5	5
Goat	10	7	7	10	9
Pork	1	3	8	7	10

^a FAO. 1967

^b FAO. 1979.

3.0 Environmental Resources and Policy

3.1 Geology, Soils, and Mineral and Energy Resources

3.1.1 Geologic Formations ^{14/}

Uganda lies within a geologic zone known as the inter-Rift valley zone, a region delineated by the Western and Eastern Rifts (Fig. 20). The faulting which created these rifts occurred during different periods, but the landforms as they now appear were established during the Plio-Pleistocene period. The Eastern Rift is the younger of the two, having been formed by volcanic action between Lake Rudolf in Kenya to Lake Manyara in Tanzania to the south. Figure 21 shows the major landforms occurring in the inter-Rift valley zone.

Most of the inter-Rift valley zone, and therefore most of Uganda, lies on a Precambrian basement complex--rock formations numbered 5 through 16 on Figure 22. This complex is composed of a granitized basement complex (numbers 12 to 16) made up of orthogneiss, granite, migmatite, amphibolite, and ultrabasic and basic rocks. In addition, a number of related systems consisting of sandstones, shales, quartzites, schists, phyllites, and tillites are included in the lithology of Precambrian origin. Newer rocks of the Paleozoic, Tertiary, Mesozoic, and Cainozoic (Cenozoic) periods are found along river banks, lake shores, and volcano slopes. Figure 23 illustrates Precambrian tectonic formation in southwestern Uganda.

The Ugandan portion of the inter-Rift zone is marked by two major features. First, it forms part of the Lake Victoria basin, and secondly, it comprises the southernmost part of the Nile river system. The Nile dates from the Eocene period, 65 million years ago. It has always originated in the lake region in the vicinity of present Uganda. Lake Victoria, a depression lake which is now acknowledged as the principal source of the river, is very shallow (its maximum depth is only 80 m) but was once much larger and deeper. The lake attained its present size about 3,700 years ago.

¹⁴Sources: Baker. 1971.
FAO-UNESCO. 1977.
d'Hoore. 1964.
Job. 1969.
Lowe. 1952.

McFarlane. 1972.
Pallister. 1971.
Pritchard. 1979.
Walker. 1968.

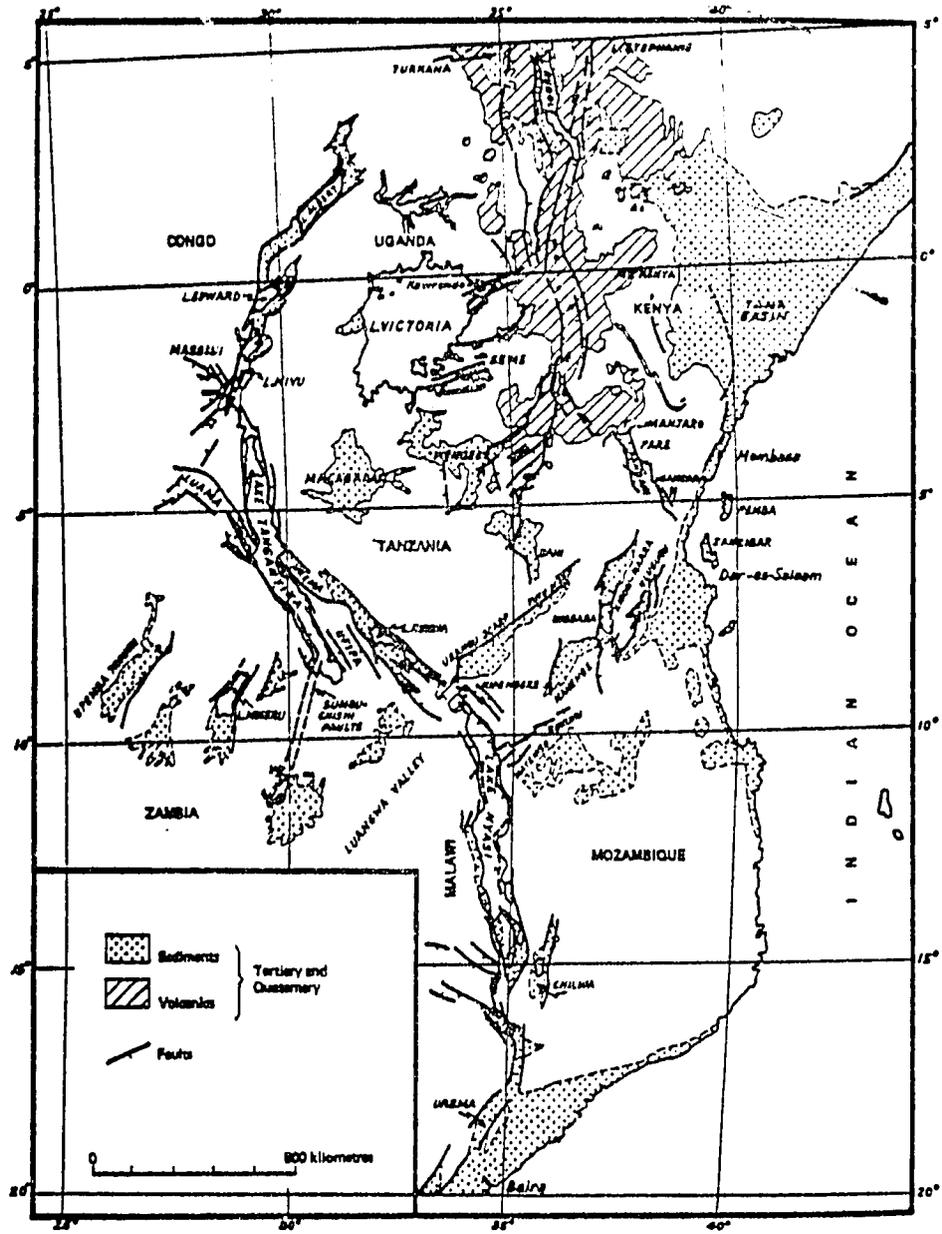


Figure 20. African Rift System

Source: Baker. 1971.

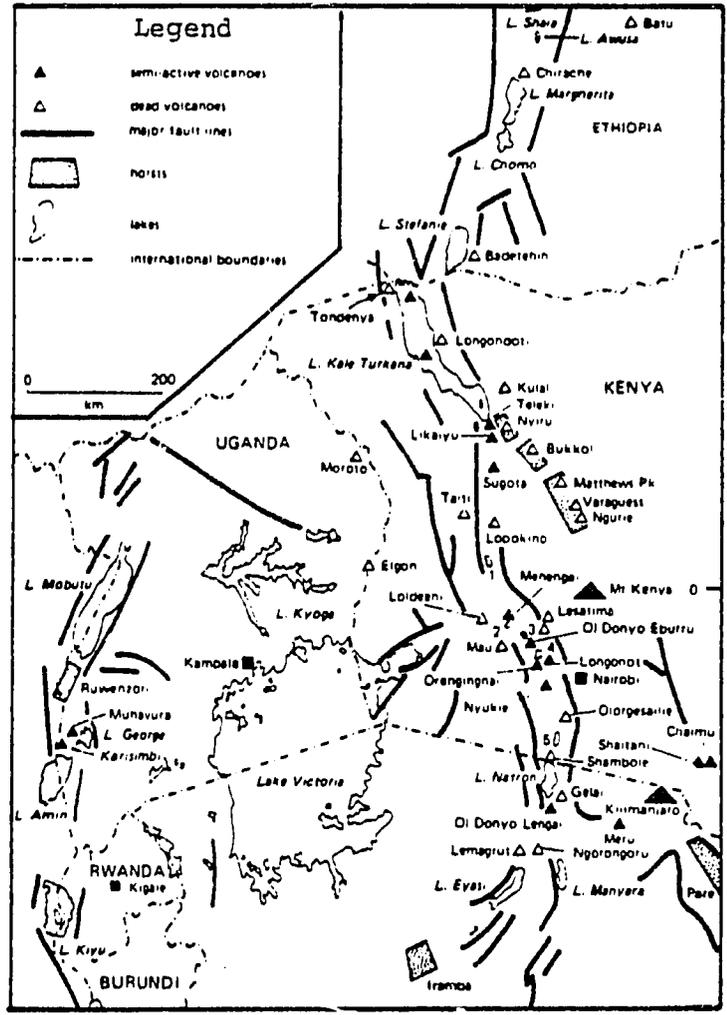


Figure 21. Landforms Associated with the Inter-Rift Valley Zone

Source: Pritchard. 1979.

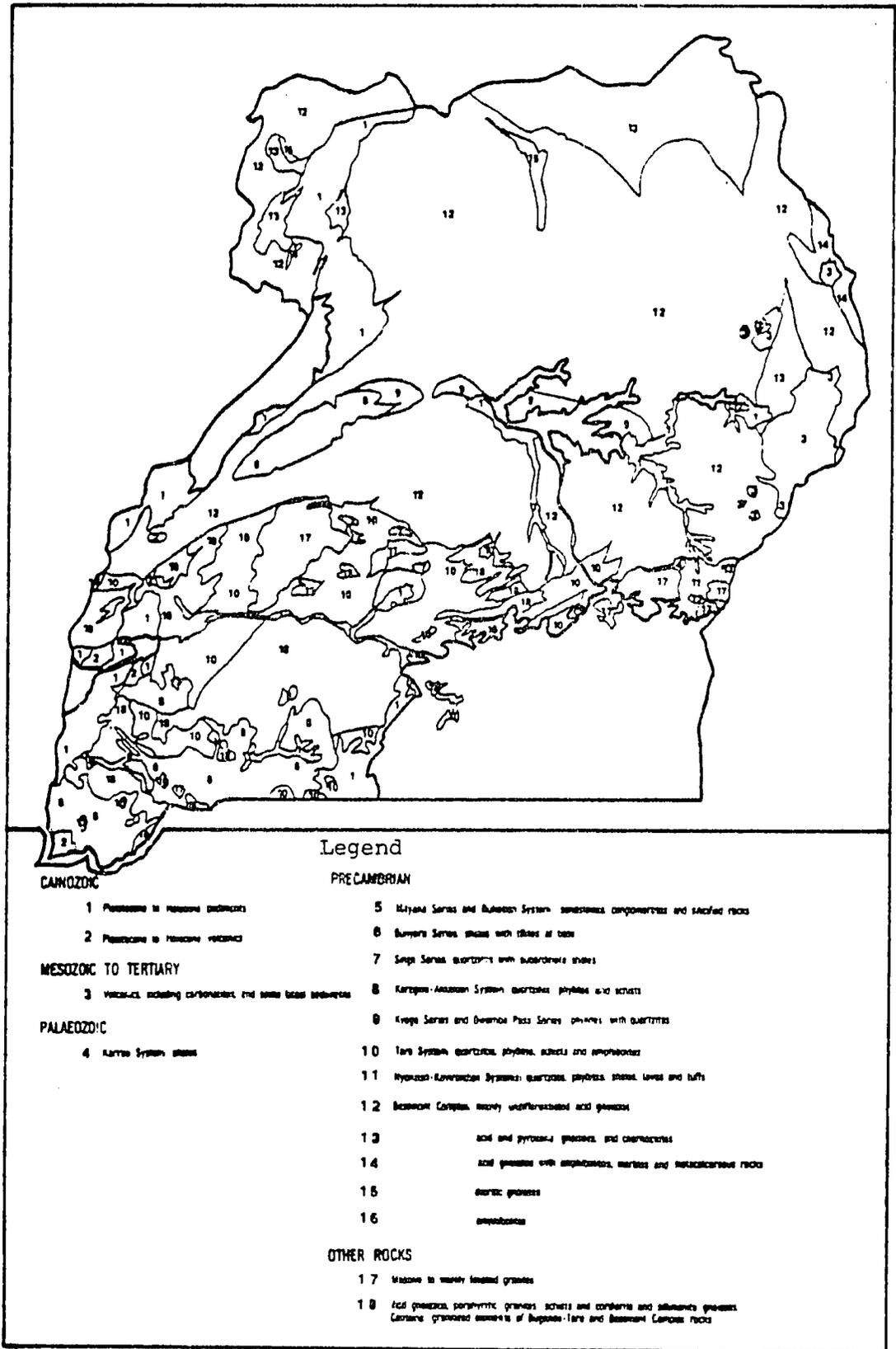


Figure 22. Lithology

Source: Adapted from Geological Survey of Uganda. 1961.

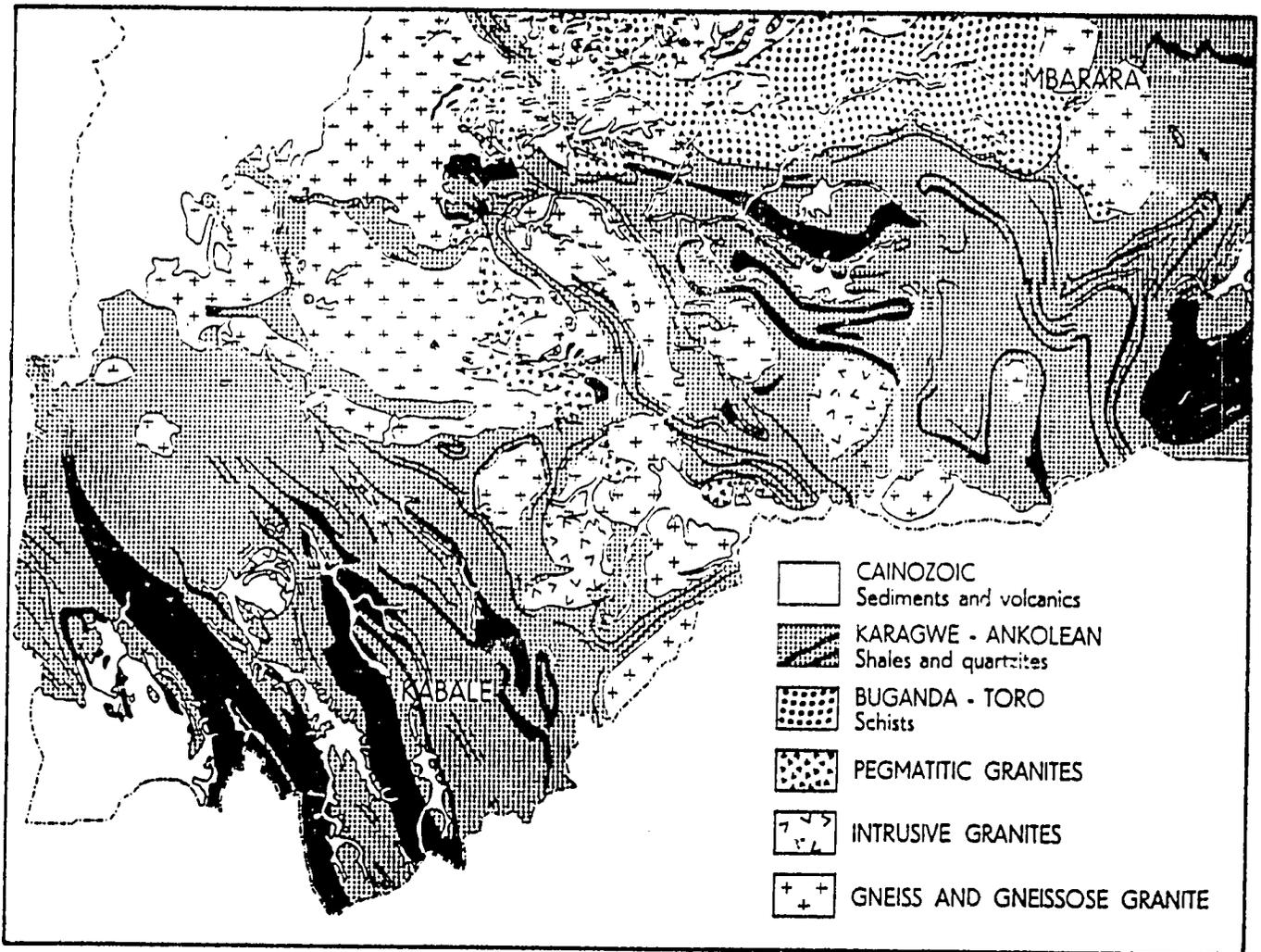


Figure 23. Tectonic Formation of the Karagwe-Ankolean Fold Belt

Source: Pallister. 1971.

3.1.2 Soils ^{15/}

Figure 24, based on the FAO-UNESCO Soil Map of Africa (1977), shows that most of Uganda's soils are Acrisols and Ferralsols (numbers 1, 3, 4, and 5 on Fig. 24). Ferric Acrisols, found mostly in the southwestern part of the country have a coarse or medium texture and generally support subsistence agriculture and cattle-raising. Many of the Acrisols lie beneath savannas.

The Ferralsols which occur throughout Uganda are not very absorptive and therefore are typically desaturated. Orthic and Humic Ferralsols are the most common soils and lie under savanna and forest cover. They are cultivated with subsistence crops such as cassava, maize, sorghum, sweet potato, and banana. Coffee can be planted on these soils, but mineral deficiencies often develop. Humic Ferralsols can support mixed agriculture and livestock raising--the latter use predominates above 2,000 m. Orthic Ferralsols are suitable for coffee and tea plantations, but tend to be nutrient deficient and require regular fertilization. Plinthic and Rhodic Ferralsols are found exclusively in the northeast, under dry savanna. The former are not useful for agriculture, but the latter are conducive to shifting cultivation, subsistence farming, cash cropping and cattle rearing. In Uganda, however, most Rhodic Ferralsols occur in regions inhabited by herdsmen rather than cultivators, so their agricultural potential remains largely untapped.

Gleysols, Lithosols, and Luvisols are found interspersed with the former soils throughout the north and northeast. Hydromorphic Gleysols frequently occur in swamp and papyrus marshes and are easily waterlogged. With proper drainage and fertilization, Gleysols are adaptable to banana growing and intensive agriculture. Lithosols are found along the northern and eastern borders on top of basic rocks, especially on steep slopes. Although the soils themselves are potentially fertile, their use in agriculture is limited by the mountainous terrain and the rocky substratum

¹⁵Sources: FAO. 1978.
FAO-UNESCO. 1977
d'Hoore. 1964.
Pidgeon. 1972.

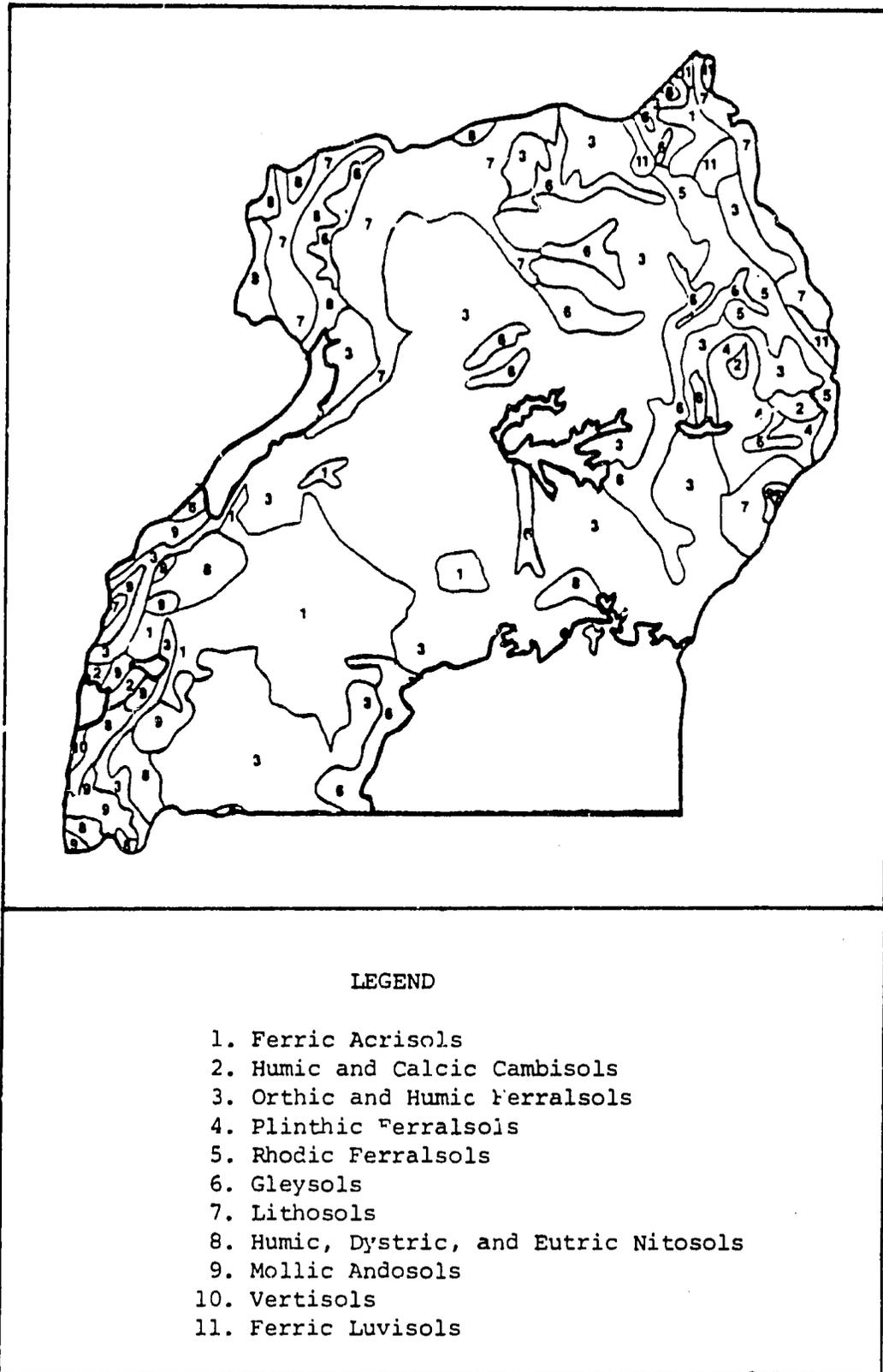


Figure 24. Soils

Source: Adapted from FAO-UNESCO. 1977.

on which they lie. Lithosols may be planted with cacao or coffee, but generally they are unsuitable for cultivation. Ferric Luvisols occur alternately with Lithosols. They are typically poor in organic content, well saturated with cations, and severely weathered. In some areas they can support limited cultivation, but in the dry mountainous savanna regions of Karamoja where they occur, they are best suited to livestock raising.

Southwestern Uganda which is characterized by the high volcanic mountain ranges of the Western Rift is principally covered with Andosols, Cambisols, Nitosols, and Vertisols. Mollic Andosols are found in the areas below 1,800 m; above that elevation, the soils become humic. Although the steep terrain subjects these soils to erosion, they are considerably fertile and can support vegetables, legumes, bananas, coffee and livestock. Humic and Calcic Cambisols are relatively rare, occurring only in small patches north of Lake Edward. They are either covered with savanna or are farmed with inferior grains, cassava, and legumes. Cambisols also occur in spots of northeastern Uganda. Humic, Dystric, and Eutric Nitosols are among the dominant soils of the southwestern region. They have a low mineral reserve, but are more fertile than Ferralsols. Nitosols are good soils for coffee, tea and food crops, and can also support ranching and dairy farming. Vertisols, the last type of Ugandan soil, are rare, confined to a small region south of Lake Edward along the border with Zaire. They are unsuited to most cultivation, although with treatment and irrigation, they can be adapted for cotton, sorghum, and groundnuts.

3.1.3 Mineral Resources ^{16/}

Uganda, as Figure 25 indicates, is not extensively endowed with mineral resources. Only the western region bordering on Zaire, the southwestern corner, and the western part of Bugisu District have significant known reserves. Not unexpectedly, therefore, mining and quarrying have

¹⁶Sources: Anonymous. 1980. Kurian. 1978.
Clark Univ. 1980 Morse. 1981.
Clarke. 1976. O'Connor. 1978.
Fawcett. 1973. Seers et al. 1979.
Herrick et al. 1969. Wilson. 1970a.

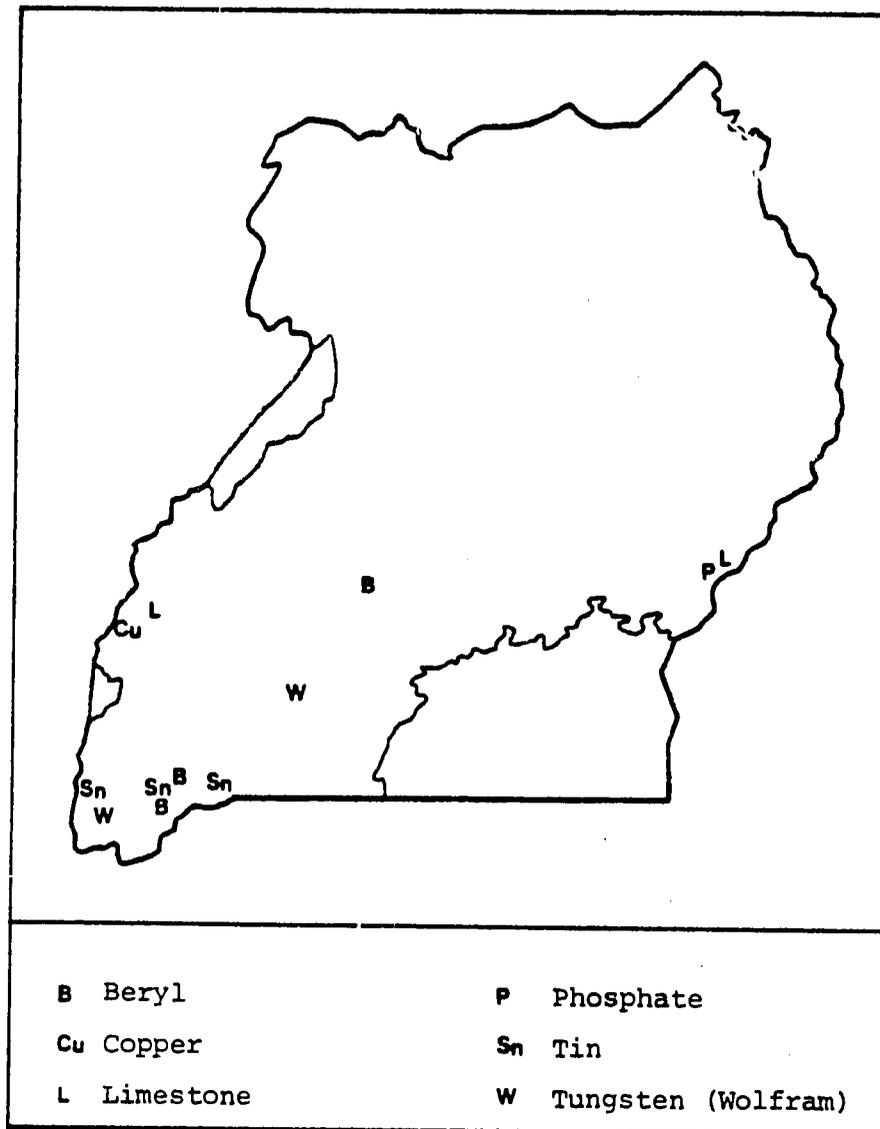


Figure 25. Major Mineral Deposits, 1970

Source: Adapted from Map 78258 11-70, available from USGPO.

contributed but a small amount to Uganda's GDP. During the 1960s the figure stood at approximately 1.7 percent; it declined to less than one percent of the GDP in 1974, and to an even lower 0.3 to 0.4 percent by 1977 (Table 13; Herrick et al. 1969). In some African countries, by contrast, mining accounts for a third to half of the GDP (O'Connor 1978). In the late 1960s, prior to the subsequent marked decline in mineral output, the sector employed about 6,500 persons, or just 0.2 percent of the labor force.

Table 13. Mining Contributions to the GDP, 1966 to 1977

Year	GDP (millions of Uganda shillings)	Mining sector (millions of Uganda shillings)	Mining, as percentage of GDP
1966	6,568	104	1.6
1968	7,218	110	1.5
1970	8,069	119	1.5
1972	8,355	100	1.2
1974	8,439	69	0.8
1976	8,082	40	0.5
1977	8,975	34	0.4
1977 ^a	7,524	21	0.3

^a Anonymous. 1980.

Source: USAID (1981b), except where noted.

By all accounts, copper is the most important mineral occurring in Uganda. A copper mine was opened at Kilembe, in the Ruwenzori foothills in 1948. In 1956 a new 333 km railway line connected the mine to Kampala, and before long production reached 15,000 tons annually. But after peaking at 18,000 tons in 1964, production has declined steadily since to 8,500 tons in 1975, 4,000 tons in 1977, and half of that by 1979 (Table 14). Mining was severely disrupted during the political troubles of the 1970s, but in addition, the reserves at Kilembe are very limited and may be nearly exhausted (O'Connor 1978; Kurian 1978). The Kilembe facilities, however, are also rich in cobaltiferous pyrite, with approximately two million tons stockpiled there (Morse 1981).

Table 14. Mineral Production, 1961 to 1979

Mineral	Output (metric tons unless otherwise specified)								
	1961 ^a	1963 ^a	1965 ^a	1967 ^a	1975 ^b	1976 ^c	1977 ^c	1978 ^c	1979 ^c
Beryl concentrate (beryllium), gross weight	1,015	374	189	310	d	54	45	d	--
Bismuth, mine output, metal content (kg)	d	d	d	d	d	5,000	3,000	1,000	5,000
Columbium and tantalum, gross weight (kg)	d	d	d	d	d	2,100	2,100	2,058	2,260
Copper, mine output, metal content	13,163	15,960	16,870	14,392	8,500	7,000	4,000	1,300	2,100
Fertilizer material, phosphatic apatite	d	d	d	d	4,892	15,000	5,000	5,000	5,000
Iron and steel, crude steel	d	d	d	d	d	12,000	15,000	15,000	--
Lime, hydrated and quicklime	d	d	d	d	d	20,000	20,000	25,000	28,000
Salt, evaporated	d	d	d	d	d	500	500	500	500
Tin, mine output, metal content	46	233	266	157	82	120	120	120	60
Tungsten, mine output, metal content	115	2	41	130	87	110	110	110	55

^a Herrick et al. 1969.

^b Anon. 1980.

^c Morse. 1981.

^d Not available.

In the past Uganda exported copper in return for significant amounts of foreign currency. In 1967 copper was the country's third largest earner of foreign exchange (after coffee and cotton), contributing 110 million Uganda shillings (approximately US\$ 15 million), nine percent of total earnings. By the mid-1970s sharply declined production, lowered world demand, and disrepair of production and transport facilities had combined to reduce copper export earnings to two-thirds of the 1967 level. By 1977 export earnings dropped further to 22.9 million Uganda shillings (US\$ 3.13 million), just 0.5 percent of the nation's foreign currency earnings.

Uganda possesses two well-stocked phosphate deposits in the east, near Tororo (Fig. 25). Proven reserves are estimated at 180 million tons (Kurian 1978). Exploitation to date has been limited to approximately 5,000 tons per year, but lack of transportation, not availability, has limited production. A fertilizer factory processes the phosphatic apatite for local use exclusively. From 1975 to 1977 fertilizer production fell from four million tons to 1.2 million tons (Anon. 1980).

Tin and tungsten (wolfram) are two other valuable mineral commodities. Deposits are in the southwest, in conjunction with modest reserves of beryl, tantalum-columbium, bismuth, and lithium. In the 1960s both tin and tungsten brought in sizable revenues. In addition, there is evidence that Karamoja District is rich in mineral resources. Asbestos, chalcedony, clay, gneiss and marble, ilmenite, iron ore, quartzite, and talc all occur and some have been exploited for centuries (Wilson 1970a). In the 1960s both tin and tungsten brought revenues from export sales. In 1967 the two metals earned the same amount as copper. Current export figures are unavailable, but production of these minerals has been erratic over the past two decades (Table 14).

The only other minerals available in substantial quantities are limestone and salt. The former is quarried near Tororo and Kasese, and elsewhere. The lime derived from these sources is used in manufacturing cement and other building materials, and for concentrating copper. Salt is obtained by evaporation of lakes and brine wells. Katwe, on the northern shore of Lake Edward, is an important source of brine which has been a traditional

economic asset to the Batoro and Bakonjo residents (Fawcett 1973).

3.1.4 Energy Resources 17

By most standards, Uganda ranks low in energy consumption. Its 1979 level of approximately 39 kg of coal equivalent per capita per annum was Africa's seventh lowest rate of consumption (World Bank 1981). This rate, furthermore, has been declining since the early 1970s when it reached a maximum (USAID 1981b). The drop in energy usage is due primarily to a precipitous decrease in industrial demand. In 1969, 72 percent of the energy produced was consumed by the industrial sector; by 1978 the figure was only 48 percent. Accordingly, energy production, which had risen modestly between 1960 and 1974, has been falling by an average of nearly one percent per year since then (World Bank 1981). The drop in production is manifested by an analogous decline in the contribution of energy to the GDP. In 1974, 1.29 percent of the GDP (97 million Uganda shilling¹⁷) was attributable to the energy sector; in 1977, the figure was 1.22 percent, or 92 million shillings (Anon. 1980).

Uganda is endowed with plentiful hydroelectric resources arising from a combination of numerous rivers and steep elevation changes. For that reason, the nation relies almost exclusively on hydroelectricity for its energy needs. The overwhelming proportion of this energy, in fact, is produced by a single facility--the Owen Falls Dam along the Victoria Nile, northwest of Jinja. When under construction between 1948 and 1954, it was Africa's largest and most impressive engineering project and it remains East Africa's prime source of electricity. The hydroelectric station at Owens Falls was completed in 1958, at a time when domestic demand for energy stood at just 10 MW. For that reason, the project was envisioned principally to draw industrial investments and to earn foreign currency. A 1958 agreement provided 30 MW of inexpensive electricity per year to neighboring Kenya.

¹⁷Sources: Anonymous. 1980. McGrew. 1981.
Clark Univ. 1980. O'Connor. 1978.
Hance. 1977. Seers et al. 1979.
Herrick et al. 1969. USAID. 1980.
Kurian. 1978. USAID. 1981a.

Domestically, industries are well supplied with electricity, but only some 100,000 households are directly served. Most of these homes are in the vicinity of Entebbe, Kampala, and Jinja. Nearly all of this electricity (97.4 percent) is supplied by the Owens Falls facility whose generating capacity is currently 150 MW.

Although present energy output exceeds the nation's requirements, Uganda's hydroelectric potential barely has been tapped. At least six additional downriver sites for dams along the Nile could provide more than 1,700 MW per year. One such dam at Murchison Falls, east of the Nile's entry into Lake Albert, was planned in the late 1960s, but the project has not proceeded.

Although electricity supplies most urban and industrial energy, much of the countryside relies upon solid fuel for heating and cooking, and imported oil continues to power Uganda's motorized vehicles. Together, firewood and oil provide more than 90 percent of the country's power. Traditional use of firewood is so extensive that, despite favorable natural replacement rates, felling of trees seriously has reduced Uganda's timber resources. In dry northeastern Acholi and Karamoja Districts, solid fuels are now in very short supply.

Petroleum is not presently produced anywhere in Uganda. There has been international interest in the graben around Lake Albert, but to date there has been no exploration (McGrew 1981). All of the oil necessary therefore must be imported and must pass through Kenya, increasing transit costs. Petroleum supply is thus an acute problem (Clark Univ. 1980). Natural gas is not domestically available, so it is not used in Uganda.

3.1.5 Administration, Policy, and Planning ^{18/}

Since 1949 Uganda's natural resources have had some degree of statutory protection. The Mining

¹⁸Sources: Anonymous. 1980.
Clarke. 1976.
Gitelson. 1975.
Johnson and Johnson. 1977.
Morris and Read. 1966.

Regulations of that year and the Mining Ordinance Act (Cap. 129, Amendments 1953 and 1958) control exploitation of Uganda's mineral wealth. According to these laws, all subterranean resources including oils are possessed and controlled by the state.

After independence Uganda's mineral resources were placed under the jurisdiction of a Ministry of Mineral and Water Resources. This executive body subsequently was reorganized and renamed the Ministry of Lands and Natural Resources. Actual administration of matters relating to mining is accomplished through a subsidiary officer, the Commissioner of Geological Survey and Mines. Through this agency, the government licenses prospecting, issues temporary leases for mining, and exacts royalties on all materials obtained. Actual enforcement of these regulations is delegated to local administrators. These officers are empowered to mediate disputes, levy fines for statutory violations, and institute legal proceedings. Aspects of mining and resource exploitation relating to planning, capitalization, industrial development, shipping, exporting, and labor are overseen by the Ministries of Planning and Economic Development, Finance, Industry, Transport, Commerce, and Labour, respectively.

Hydroelectric energy resources are administered through Uganda's Ministry of Power, Posts and Telecommunications. Actual control of the Owens Falls and Mabale Hydroelectric Stations and diesel stations at Adjumani, Arua, Koboko, and Moyo is achieved through the Uganda Electricity Board (UEB). Established by the British in 1947, the UEB took over the Ugandan operations of the East African Power and Lighting Company, the nation's supplier of electricity.

The administrative mechanisms outlined above technically have been in place throughout the 1970s. From 1971 to April 1979, however, Uganda's legal system was suspended. During that chaotic period many government functions remained unfulfilled and administration was erratic and arbitrary. In addition, many of the infrastructural facilities were damaged, destroyed, or otherwise rendered inoperative. It is unlikely that under such conditions, statutory regulations governing mining and power generation systematically were enforced. The situation since 1979 remains uncertain in this regard and there is

no available information concerning current government efforts to reinstate control over these operations.

3.2 Water Resources

3.2.1 Surface Water ^{19/}

3.2.1.1 Rivers

Uganda is well supplied with surface water resources from the region's numerous rivers and lakes. The drainage system of the country is dominated by the Nile River system and its sources, Lakes Victoria, Albert, Edward, and George (Figs. 26 and 27). Except for the Victoria Nile (upper and lower branches), the Albert Nile, the Semliki, the Kafu, and the Katonga Rivers and their immediate tributaries, most of Uganda's streams are either sluggish or do not flow year-round.

The areas to the southwest of the branches of the Victoria Nile and Lake Kyoga are especially well-drained and few spots are further than 20 km from streambeds or lakefronts. Northeast of the Nile, in Uganda's arid zone, only the Moroto (or Aswa) and the streams emanating from Mt. Elgon are perennial. As Figure 26 indicates, there are numerous permanent swamps totaling 5,000 square km; the largest is Lake Kyoga Swamp. The Nile itself, because it is channeled through a sharply descending valley, flows through several major cataracts. The most notable of these are Bujagali (or Owen) Falls, Karuma Falls, and Murchison Falls.

Although the Nile River is noted for its flooding capability, this feature characterizes the river only considerably downstream, from the confluence of the White and Blue Niles. Further south, particularly in the Uganda highlands where it emanates, the Nile flows very evenly year-round. It shows little perceptible variation throughout the year, its flow never exceeding 1,000 cubic meters per second (cumecs), less than an eighth of

¹⁹Sources: Balek. 1977. Rzóska. 1974.
Dixon. 1971. Van der Leeden. 1975.
Herrick et al. 1969. Viner. 1975a.
Pritchard. 1979.

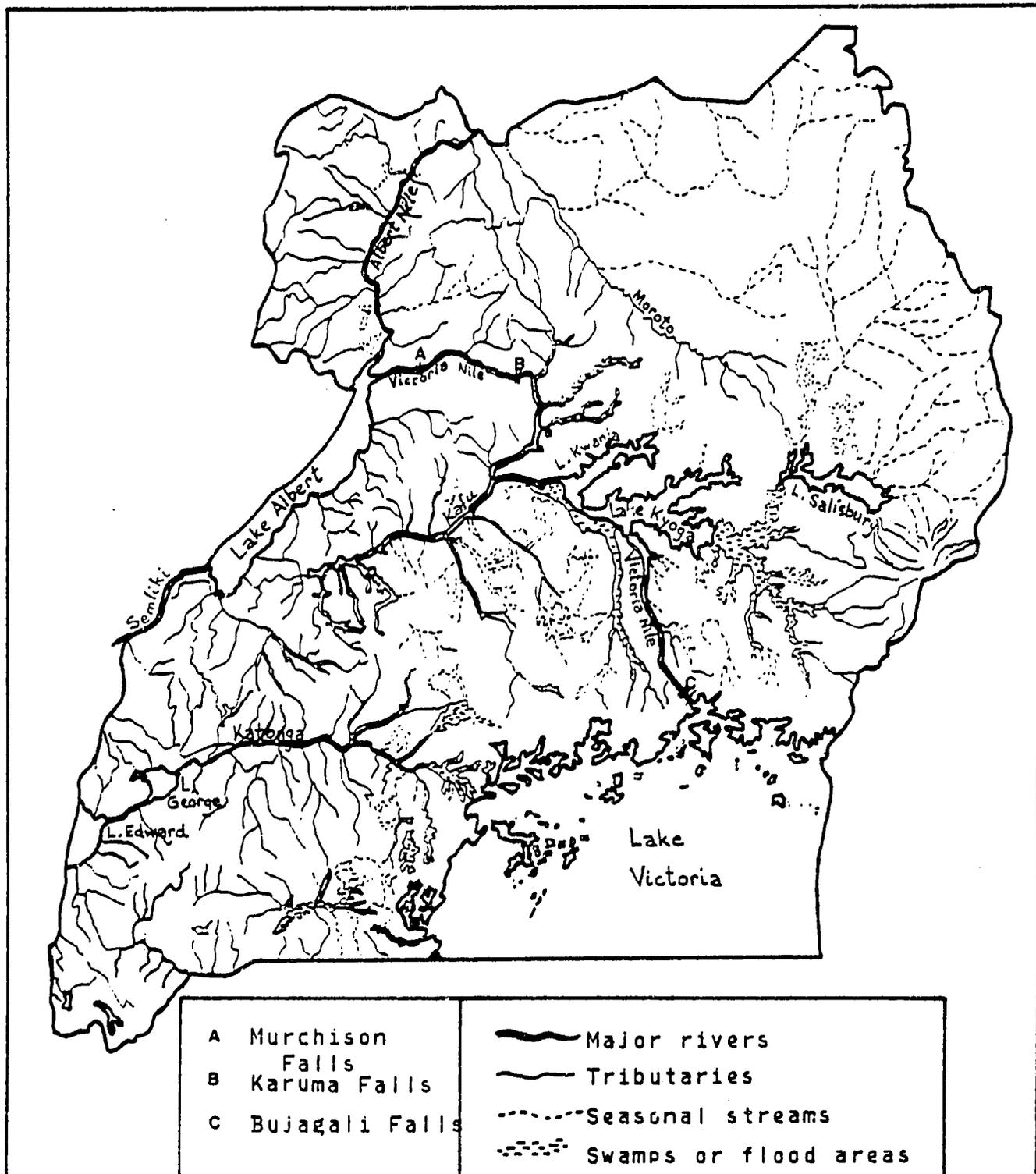


Figure 26. Drainage System

Source: Adapted from Bartholomew (1956).

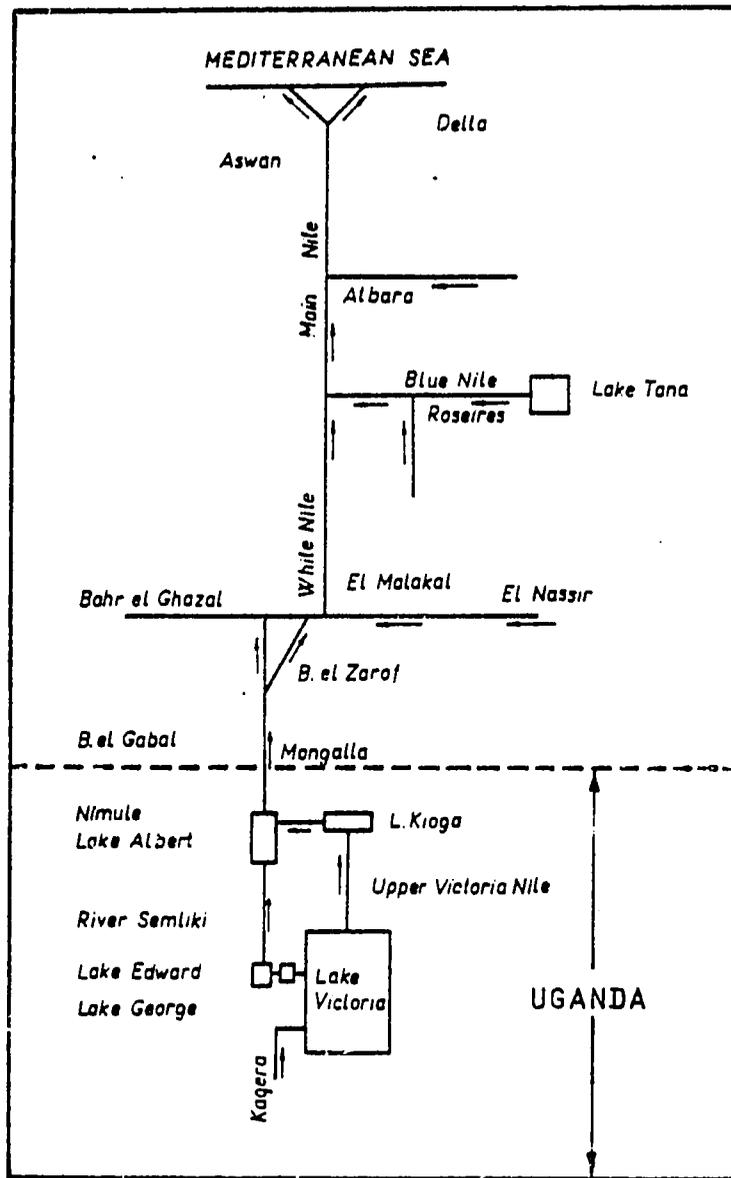


Figure 27. Schematic Representation of the Nile Drainage System

Source: Balek. 1977.

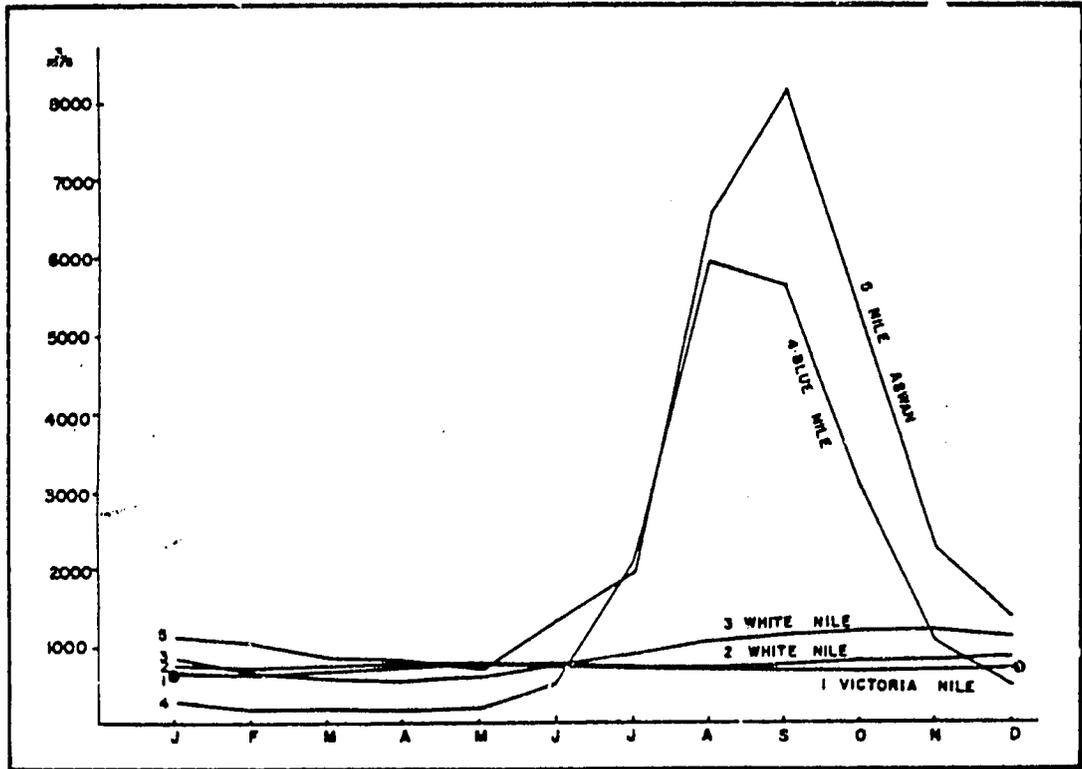


Figure 28. Flood Regime of the Nile

Source: Balek. 1977.

Table 15. Water Balance Characteristics of the Nile System

River	Location	Dr. area	Precipitation	Runoff	Evapo-transpiration	Runoff coef.	Water yield	Mean annual discharge
Unit		km ²	mm	mm	mm	%	l/s/km ²	m ³ /s
Victoria Nile Semliki	Ripon Falls above confluence with Victoria Nile	269,000	1302	81	1221	0.06	2.6	699
Albert Nile	below Albert Lake	22,500	1395	88	1307	0.06	2.8	63
Interbasin	Albert Lake-Mongalla	281,500	1309	85	1224	0.06	2.7	762
White Nile	Mongalla	184,500	1228	20	1208	0.02	0.6	111
Interbasin	Mongalla-Sobat	466,000	1277	60	1217	0.03	1.9	874
White Nile	above Sobat	438,800	900	-38	938	-	-1.2	-511
Sobat	mouth	904,800	1094	12	1082	0.01	0.4	362
White Nile	below Sobat	187,200	1081	71	1010	0.07	2.3	431
Interbasin	Sohat-Blue Nile	1092,000	1091	22	1061	0.02	0.7	793
White Nile	above Blue Nile	343,000	500	0	500	0.00	0.0	0
Blue Nile	confluence with W. Nile	1435,000	710	16	694	0.02	0.5	793
Nile	below confluence with Blue Nile	324,530	1082	158	924	0.15	5.0	1727
Interbasin	confluence-Aswan	1759,530	778	43	735	0.06	1.4	2420
Nile	Aswan	79,470	1080	97	983	0.09	3.0	244
Interbasin	Aswan-mouth	1839,000	790	45	745	0.06	1.4	2664
Nile	mouth	1042,000	7	-18	25	-	-0.6	71
		2881,000	506	28	479	0.06	0.9	2593

Source: Balek. 1977.

its maximum flow in September at Aswan in Egypt (Fig. 28). As Table 15 points out, the average flow of Victoria Nile is 699 cumecs, and that of the Albert Nile, 762 cumecs.

3.2.1.2 Lakes

East Africa's inter-Rift zone is marked by a number of large lakes, of which Lake Victoria is the largest. In area (66,400 sq km), Lake Victoria ranks as the world's third largest lake. It is a shallow lake, however, its maximum depth being only 80 m, and its average depth just 40 m. Slightly less than half of the lake lies within Ugandan territory, the remainder belonging to Tanzania and Kenya. Of the remaining lakes, Lake Albert is the largest (5,300 sq km), followed by Lake Kyoga (1,800 sq km).

The region's lakes are interconnected through the river network and so serve both as drainage basins and as sources for those rivers. A north-south divide west of the Victoria Nile separates Uganda into two zones. East of this line, the rivers flow through Lakes Victoria and Kyoga; west of it the streams drain into Lakes Albert, George, and Edward. For all of the lakes except Victoria, annual inflow exceeds outflow, the difference being accounted for by evaporation (Table 16). Lake Victoria, because it gives rise to the Victoria Nile, has a greater outflow than inflow--with precipitation supplying the balance.

Table 16. Lake Water Balance

Lake	Area (sq km)	Inflow (mm)	Precipitation (mm)	Outflow (mm)	Evaporation (mm)	Salinity (parts per million)
Victoria	66,400	241	1,476	316	1,401	65
Albert	5,300	4,717	868	4,151	1,434	480
Kyoga	1,800	3,825	1,270	3,127	1,968	200
Edward	915	880	1,360	800	1,440	600

Source: Balek. 1977.

3.2.2 Groundwater ^{20/}

Most of the bedrock underlying Uganda's surface, as Section 3.1.1 has indicated, is granitic or otherwise nonporous. Only within a narrow strip along the western border and in a small sector west of Lake Victoria is the basement complex sufficiently porous to support aquifers (Fig. 29). Consequently, as UNDESA's 1973 survey has pointed out, Uganda possesses very sparse groundwater resources.

Except within swamps and along lakeshores, the water table is quite deep, between 30 to 100 m beneath the surface. Nevertheless, boreholes are relatively common and some 4,500 have been drilled into the fracture zones of the basement complex. Although the boreholes produce five to 40 cubic meters (5,000 to 40,000 liters) per day (UNDESA 1973), the water is relatively saline, containing 300 to 900 parts per million. As a result, it is frequently strange-tasting and rural residents, accustomed to drinking pure rainwater, do not tolerate it (Mukanga 1971). Water obtained from boreholes is thus more appropriate for other uses such as washing, cooking, or irrigating.

Because Karamoja District is particularly dry and water deficient, there have been extended studies by the government and UNDP aimed at surveying and tapping groundwater resources.

3.2.3 Irrigation ^{21/}

Very little current information exists indicating the level of irrigation in Uganda. Supplementary watering techniques were not indigenous to the region and the colonial government assigned low priority to irrigation. Prior to the 1950s, apart from some localized uses of perennial water sources during times of drought, there were no large-scale irrigation schemes.

²⁰Sources: Balek. 1977.
Mukanga. 1971.
UNDESA. 1973.

²¹Sources: Avua. 1968. Herrick et al. 1969.
Carruthers. 1970. Uchendu and Anthony. 1975.
Hall. 1968. USDA. 1981.

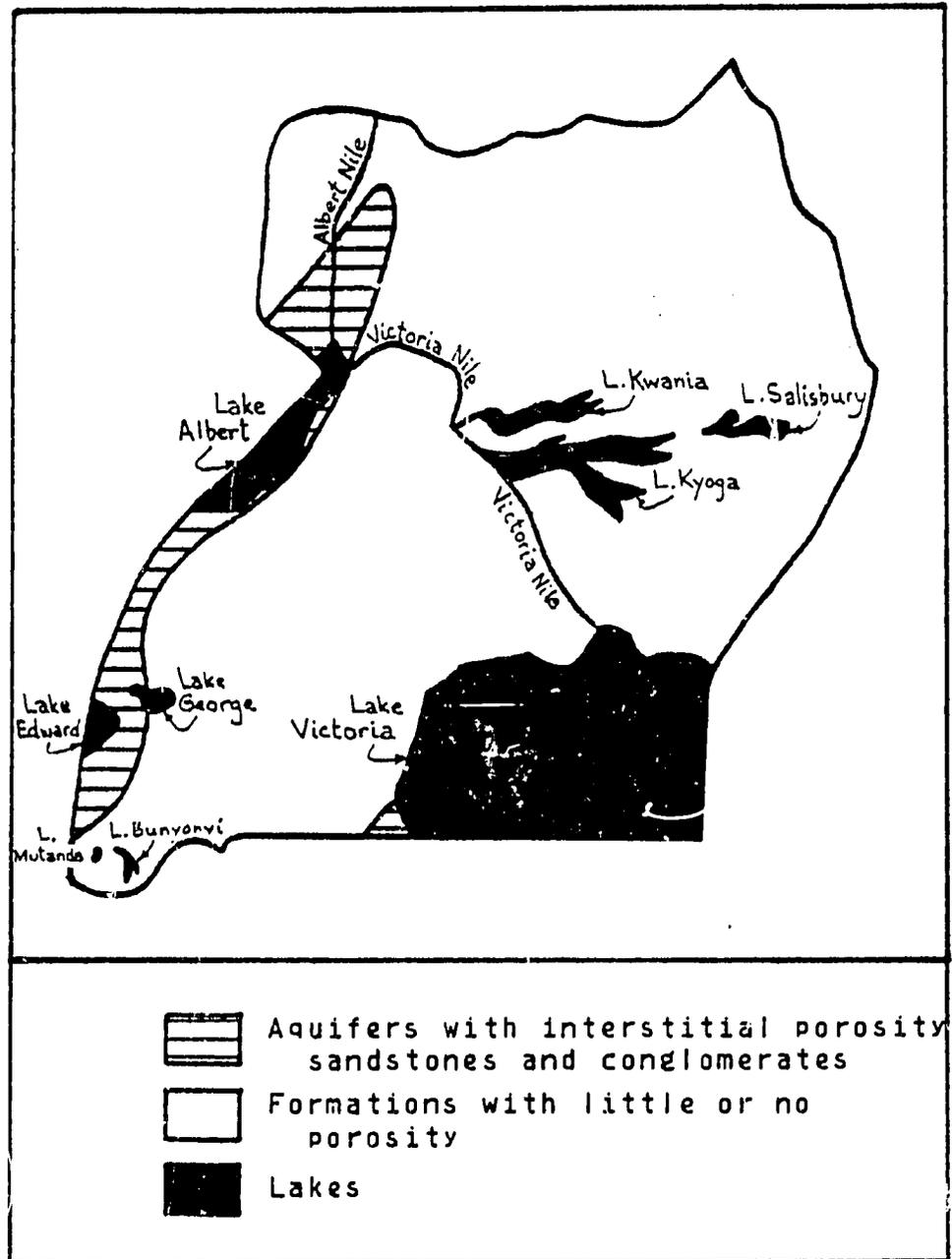


Figure 29. Aquifers

Source: Adapted from UNDESA (1973).

The first government project was instituted in Karamoja District, but it never exceeded 18 ha and could hardly be termed successful. In 1957 two other schemes were undertaken in western Ankole and Toro Districts. Both experiments failed, however, and each station was closed in 1963. In 1960 the country's most important irrigation scheme, the Mubuku project on the Lake George Flats, was begun. The Uganda Development Corporation believed the region had an irrigation potential of some 4,800 ha, and set out to develop 400 ha, an area that proved too large. In 1969, after nearly a decade, only 160 ha had been developed with mixed results. The land was used primarily to grow fodder such as lucerne and forage maize.

On sugar estates in Busoga and elsewhere near the Lake Victoria shore, private growers instituted sprinkler irrigation in the late 1950s. Although yields increased and the systems proved marginally profitable, the overall benefit to the agricultural sector was termed low.

In the period immediately preceding the 1971 coup, the government hoped to extend irrigation to as much as 200,000 ha of land. The Owen Falls Dam which increased the storage capacity of Lake Victoria by 200 billion (2×10^{11}) cubic meters (Hance 1977), and Uganda's situation at the head of the Nile network were viewed as key elements of the envisioned expansion. Figure 30 shows the areas considered to have significant potential for irrigation. By contrast, Table 17 and Figure 31 indicate that only a minuscule portion--4,400 ha, or just 2.2 percent--of this potential had been developed in 1969. At that time, 90 percent of the nation's irrigation had been implemented by private growers (Table 17).

Because of Uganda's political difficulties since the early 1970s, it is unlikely that the country has achieved measurable progress in realizing its earlier goals for irrigation. Instead, the absence of data suggests that there may actually be less land under irrigation now than in 1970.

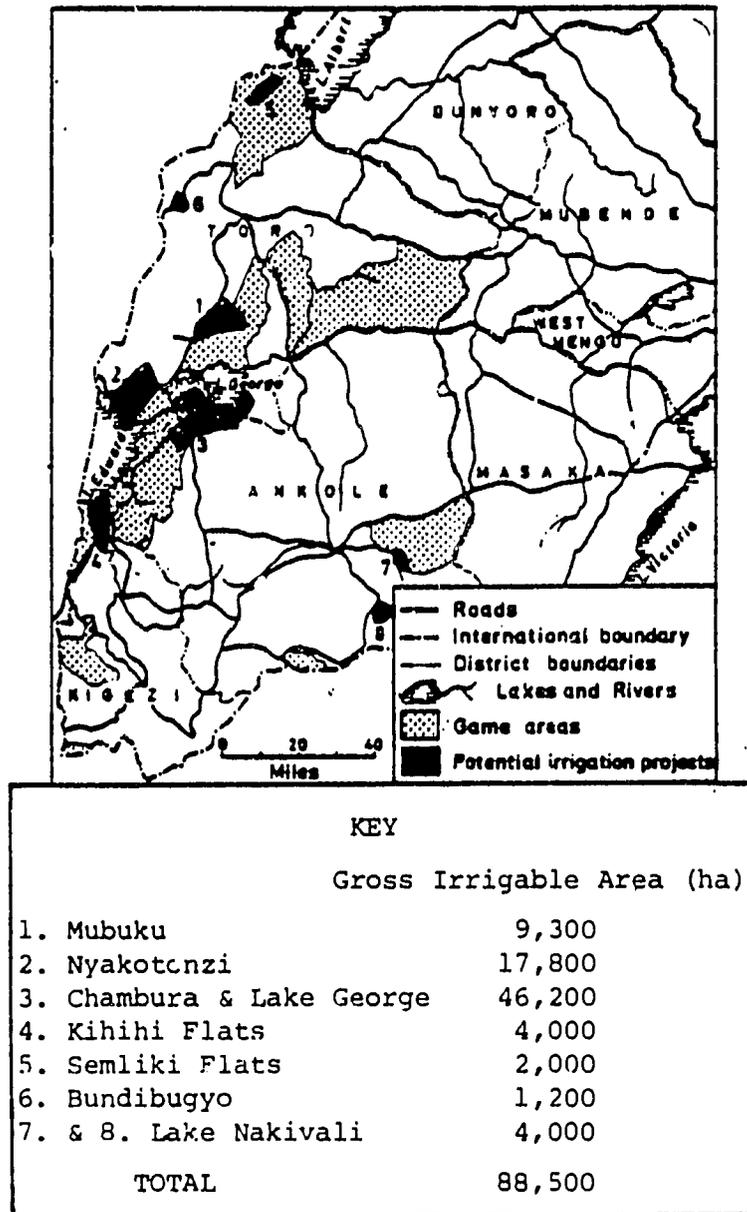


Figure 30. Irrigation Potential, 1970

Source: Carruthers. 1970.

Table 17. Irrigation Projects, 1969

Project	Actual irrigated area, 1969 (hectares)	Area under construction, 1969 (hectares)	Planned addition (hectares)	Type of irrigation	Main crop
Public					
Agoro	6		202	Furrow	Sweet potato
Atera	66	61	77	Furrow	Mixed
Jinja Prison Farm	20			Sprinkler	Mixed
Kibumba	61		486	Flood	Rice
Kigii			304	Sprinkler	Citrus
Labori	66	28		Sprinkler	Mixed
Mubuku	187	155	3,176	Furrow-sprklr.	Mixed
Namalan	20			Furrow	Mixed
Odina			61	Sprinkler	Citrus
Ongon		40		Sprinkler	Citrus
Research establishments	20			Sprklr.-furrow	Mixed

Subtotal (Public)	446	284	4,306		

Private					
Crane Estates	32			Sprinkler	Vegetables
K.K. Estates	20			Sprinkler	Vegetables
Kakira	3,440			Sprinkler	Sugar
Kigonda-Butema			200-500	Flood	Rice
Kivuvu	101			Sprinkler	Sugar
Lugazi	202			Sprinkler	Sugar
Sango Bay	81			Sprinkler	Sugar
Other Estates	81			Sprinkler	Vegetables, tea, sugar

Subtotal (Private)	3,957		200-500		

Total	4,403	284	4,506-4,806		

Source: Carruthers. 1970.

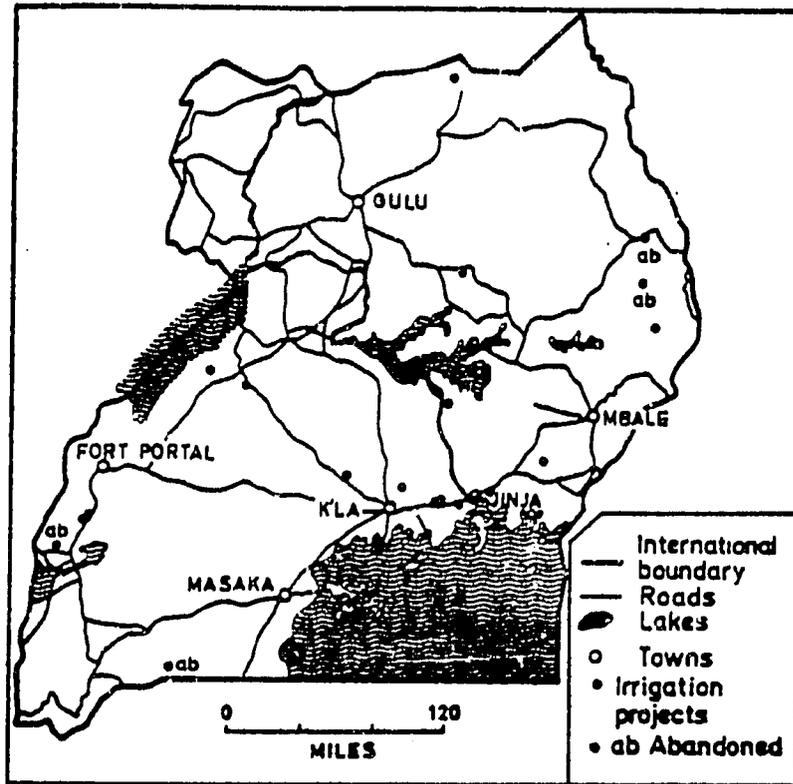


Figure 31. Irrigation Projects

Source: Carruthers. 1970.

3.3 Vegetation

3.3.1 Natural Forests ^{22/}

Figure 32 shows Uganda's main vegetative zones. In its broad outline, the map resembles an analogous one produced by Johnston in 1902 in his classic gazetteer, The Uganda Protectorate. But although forested areas represented by the letter "A" in Figure 32 are situated where they were eighty years ago, those regions now include savannas and cultivated areas, where once there was exclusively tropical forest. Much of the remainder of the country, now as in 1902, consists of various gradations of savannas--wooded, shrubbed, and grassy.

According to Holdridge's (1967) scheme for classifying natural life zones, Uganda is covered by just three types of vegetation: moist and dry forest, and thorn woodland (Fig. 33). In the wettest areas, where annual precipitation is between 1,000 and 2,000 mm the natural cover is moist forest. At present it is estimated that approximately 7,500 square km (750,000 ha), or a quarter of Uganda's forested area (see Table 6) is moist forest (Myers 1980). Dry forest is the expected vegetation in regions having 500 to 1,000 mm of rainfall. Finally, in the few isolated pockets receiving less than 500 mm of precipitation per annum (Fig. 7), thorn steppe or thorn woodland is the natural cover.

Moist Forest. These forest covers are found predominantly in Kigezi and western Ankole, in the southwest and in the Buganda region. In the latter location, in the Mabira area north of Lake Victoria, more than 31,000 ha of moist semideciduous forest remains. This is the zone of maximum rainfall within Uganda and soils there are generally fertile. The forest is dominated by Celtis spp. and Holoptelea spp., with percentage composition varying substantially according to location. Other natural species include Combretum

-
- ²²Sources: Earl. 1971. Kingdon. 1971.
Edroma. 1973b. Lye. 1970.
Hamilton. 1969. Myers. 1980.
Herrick et al. 1969. Ross et al. 1976.
Karani. 1972. Synnott. 1971.

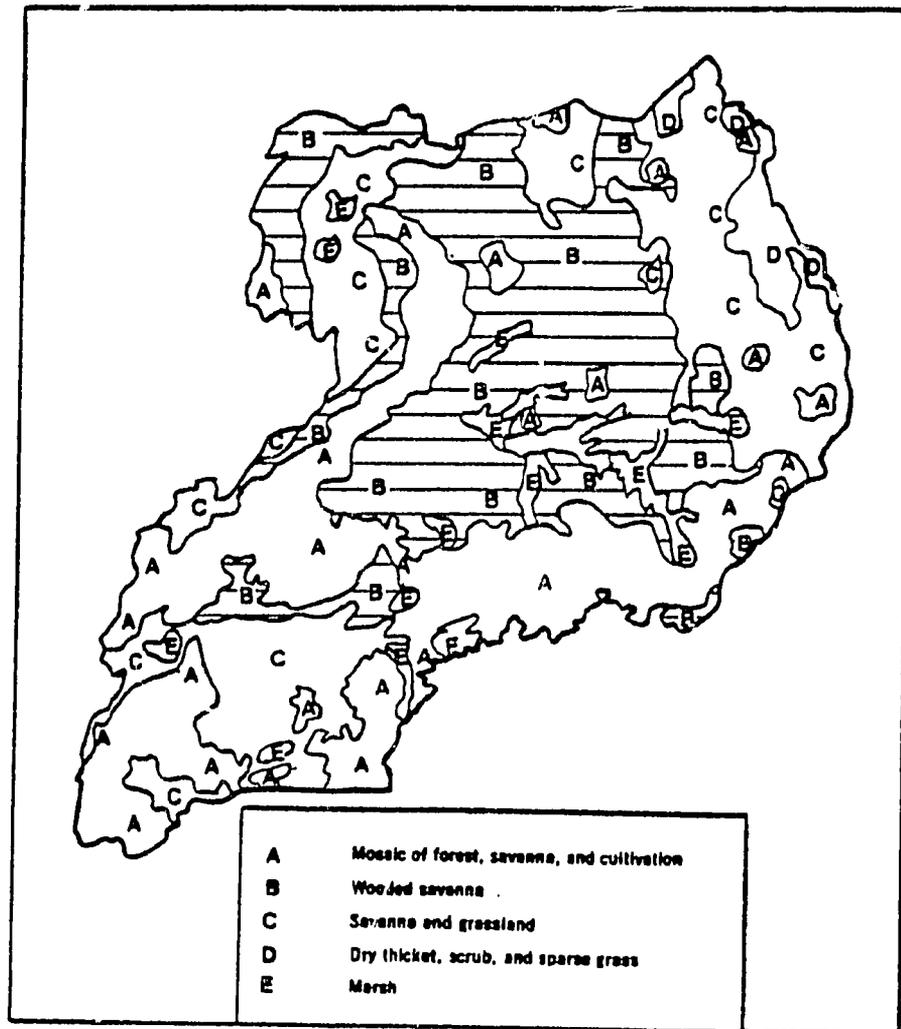


Figure 32. Vegetation

Source: Adapted from Map 78258 11-70 available from USGPO (1970).

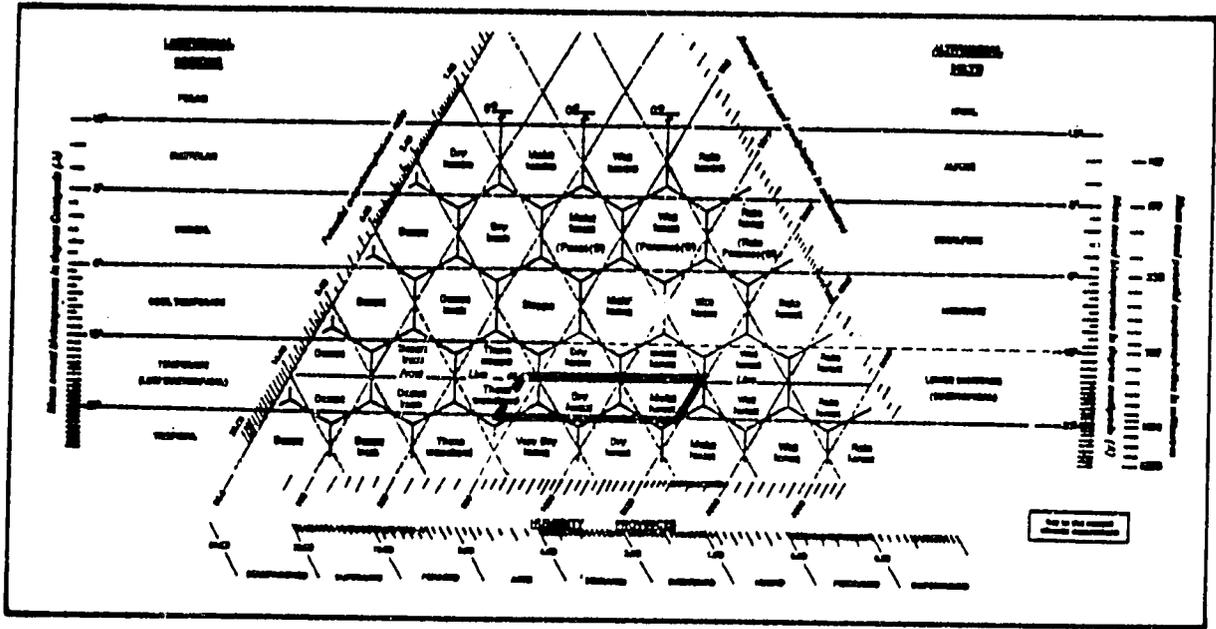


Figure 33. Holdridge's Scheme for Natural Life Zones

Source: Rosayro. 1974.

spp. and Terminalia spp. Mahoganies (Entandrophragma spp.), Elgon olive (Olea sp.), Mvule, and more than 20 other species of economically valuable timbers occur there. The Mabira forest is also used for plantations, sustaining rubber and tea particularly well (Earl 1971).

In western Ankole, Cynometra alexandri (muhindi) dominates older vegetative communities, but the greatest number of large trees is Parinari excelsa. Among younger trees the most common species are Albizia spp., Celtis duratii, Markhamia spp., Sapium spp., Diospyros spp., and Croton macrostachyus. Appendix II, Table 1 provides a detailed listing of forest vegetation in West Ankole.

Southwestern Kigezi District, by the border with Zaire and Rwanda, is another region characterized by moist forest. The region contains impenetrable forest, Echuya forest, and Mafuga forest (Fig. 34). Vegetation in the impenetrable forest is listed in Appendix III, Tables 2 and 3. Echuya forests feature mountain bamboo, Arundinaria alpina, small shrubs (Impatiens spp., Panicum sp., Parochetis communis, Piper capense, Rhamnus prinoides, and Rubus sp.), ferns (Asplenium friesiorum and Dryopteris kilmensis). Typical trees are: Bersama abyssinica, Erythrococca sp., Macalanga kilimandscharica, Maesa lanceolata, Myrica salicifolia, Neoboutonia macrocalyx, Nuxia sp., Polyscias fulva, and Rytigynia sp. Mafuga forests, which occur at high elevations (1,800 to 2,500 m) are described in Appendix III, Table 4 (Hamilton 1969).

Dry Forest and Wooded Savanna. Uganda contains several types of dry forest, covering about half of its forested land. In the northwestern corner of the country Isoberlinia doka woodlands are the easternmost extension of typical West African forests. Other woodlands are characterized by Terminalia spp., occasionally mixed with colonizing species such as Sapium ellipticum and Phyllanthus spp. These forests are found throughout the western borderlands along the Rift, and in the Murchison Falls National Park area.

In the drier areas of the northeast and south, where precipitation is between 800 and 1,200 mm, typical woodlands are known as miombo, or Brachystegia, woodlands. Tsetse flies have traditionally thrived in miombo areas and their presence has helped preserve the forests from extensive human habitation.

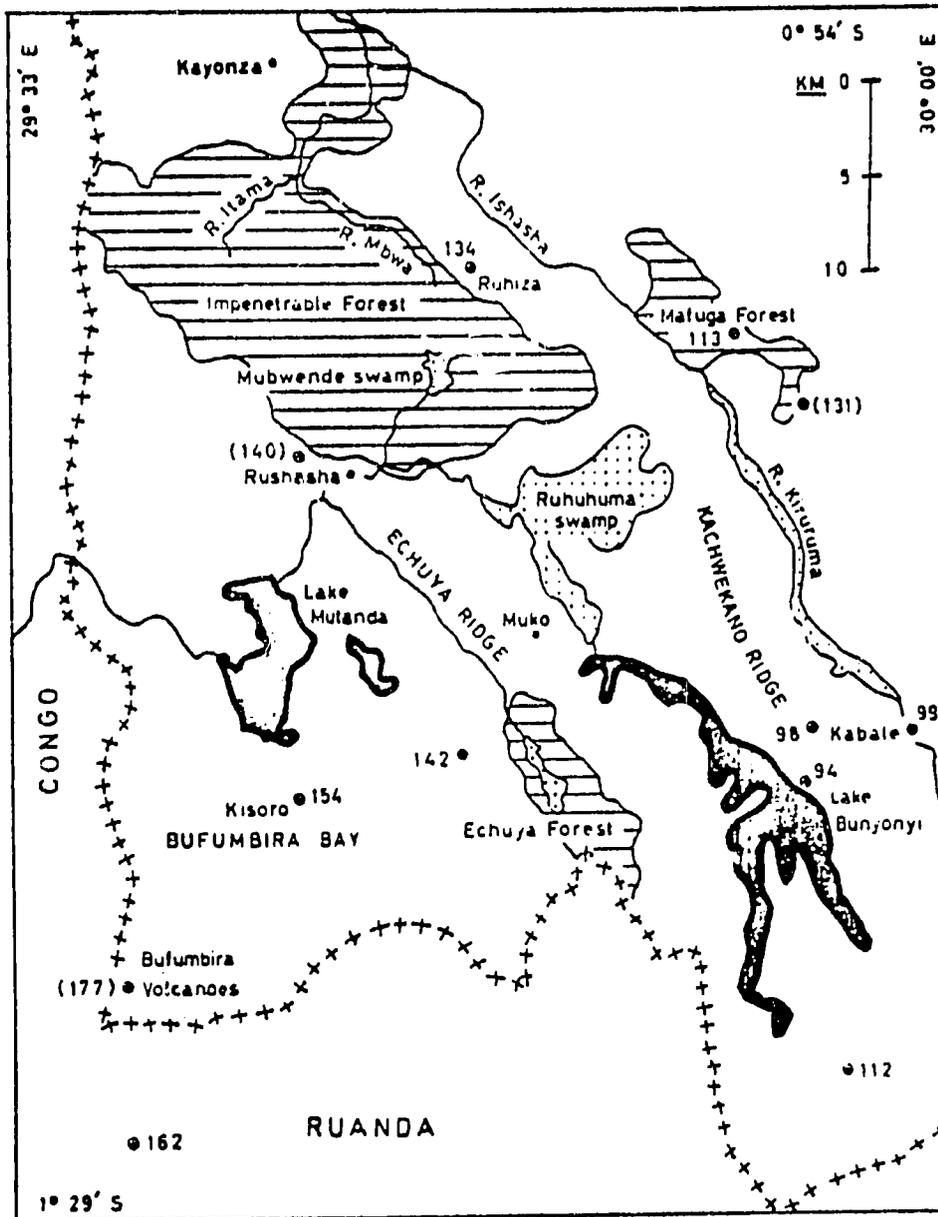


Figure 34. Forests of Southwest Kigezi

Source: Hamilton. 1969.

Of Uganda's dry forest cover, savannas comprise the largest area. The dominant trees are generally broad-leaved fire-tolerant Combretum spp. These grow in association with Terminalia spp., Acacia spp., Albizzia spp., and Butyrospermum spp. Acacias of various types--A. royumae and A. Tortilis spirocarpa, particularly--produce edible pods that are nutritious foods for local ungulates and other mammals.

3.3.2 Range and Grasslands 23/

As Table 6 indicates, a substantial portion (21.2 percent) of Uganda's land cover consists of permanent meadows and pastures. Most of this terrain, as well as land which is considered savanna, is covered with grasses. The complexity of Figure 35 gives some indication of the diversity of Uganda's grass cover. The majority of these grassland areas were created through a combination of grazing, forest fires, and soil factors. Consequently elimination of ungulates and fires would cause these grasslands to revert to dry forest.

The most common grasses, as Figure 35 shows, are Hyparrhenia, Pennisetum, Themeda, and Setaria--all of them associated with savanna vegetation such as Brachystegia. Other grasses found less abundantly in Uganda are Cenchrus, Chloris, and Exothea. Of these Cenchrus, Pennisetum, Setaria, and Themeda are the most suitable for grazing. Table 18 shows the availability and grazing quality of Uganda's grasses. The IUCN Plant Red Data Book (1978b) lists no endangered vegetative species in Uganda.

3.3.3 Forest Exploitation 24/

Uganda's forests are exploited both for commercial and household use. By far the largest use for trees is as fuelwood, which typically accounts for

²³Sources: Kingdon. 1971a.
Rattray. 1968.
Ross et. al. 1976.

²⁴Sources: Anonymous. 1980.
Clark Univ. 1980.
Kurian. 1978.
O'Connor. 1978.

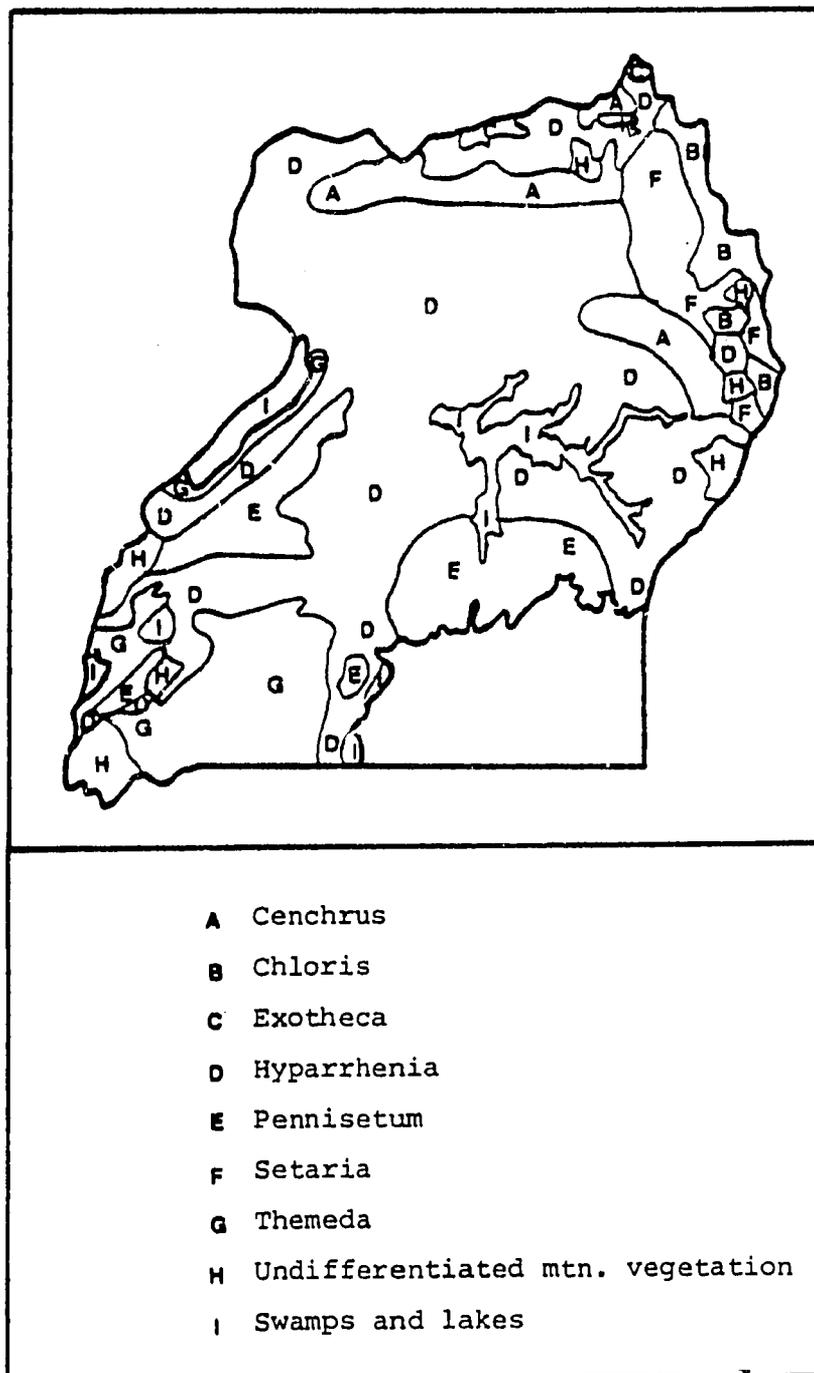


Figure 35. Grasses

Source: Rattray. 1968.

Table 18. Grasses and Grazing Quality

Grass type	Species found in Uganda	Altitude at which found (m)	Grazing quality for forage
<u>Cenchrus</u>	<u>C. ciliaris</u>	760 - 1,220	Palatable, good.
<u>Chloris</u>	<u>C. roxburghiana</u>	450 - 1,200	Good, but grazing capacity reduced by association with dense bush.
<u>Exothea</u>	<u>E. abyssinica</u>	1,400 - 2,700	Good grazing only during growing season; unpalatable and of no food value during rest of year.
<u>Hyparrhenia</u>	<u>H. rufa</u> <u>H. filipendula</u>	600 - 1,500	Good grazing when young and short; insufficient in protein after maturity.
<u>Pennisetum</u>	<u>P. purpureum</u>	1,200 - 1,500	Highly productive, underexploited.
<u>Setaria</u>	<u>S. incrassata</u>	1,000 - 1,400	Palatable.
<u>Themeda</u>	<u>T. trianda</u>	1,200 - 1,800	Palatability varies, but among the best in Africa.

Source: Rattray. 1968.

about 92 percent of felled lumber (Table 19). The remaining lumber supplies are employed industrially and commercially to manufacture railway sleepers, furniture, plywood, construction timber, and pulp. In all, some 30 to 40 species of timber are exploited. The most common are mahogany (Etandrophragma excelsum), clive (Olea hochstetteri and O. africana Mill.), muhindi (Cynometra alexandri), musizi (Maesopsis emini), mvule (Chlorophora excelsa), satinwood (Chloroxylon swietana), and nongo. The best-stocked and most exploited forests are: Budongo, north of Lake Albert; Kibale in Toro District, south of Lake Albert; Kalinzu in Ankole District; Mabira, near Lake Victoria; and forests on the slopes of Mount Elgon and the Ruwenzori Range.

Table 19. Timber Felling, 1956 to 1977

Type of Use	Volume of timber felled (1,000 cubic meters)				
	1956	1973	1975	1976	1977
For industrial, commercial, and household use	750 ^a	1,100 ^a	989	997	997
For fuelwood	n.a.	n.a.	13,600	13,600	13,600
Total	n.a.	n.a.	14,589	14,597	14,597

^a From O'Connor (1978).

Source: Anonymous. 1980.

3.3.4 Administration, Policy, and Planning 25/

Government protection of Uganda's forest resources dates to the late colonial period. In 1948 a series of regulations collectively titled The Forest Act set aside reserves, dictated the terms for exploitation of resources, and controlled hunting and game. In 1962 immediately upon independence, Uganda adopted the Public Lands Act which reaffirmed the government's possession of former Crown lands.

The highest level of administration for the nation's forests is the Ministry of Agriculture and Forestry. Actual control over forestry is exercised by the Chief Conservator of Forests, who is the head of the Forest Department. This officer issues licenses for timber felling and other removals, livestock grazing, and residence on forest lands. It is also this administrator's responsibility to enforce all standing regulations regarding forests and to oversee afforestation projects. Appendix II lists forestry and land tenure legislation.

The Forest Department, situated at Entebbe, additionally conducts research on timber utilization, forest entomology, silviculture, pathology, and utilization. Other research on forestry is accomplished at the Department of Forestry within the Faculty of Agriculture at Makerere University. When the Department was created in 1970, it became Uganda's first forestry training institution (Zümer 1971).

Forest management and fire prevention techniques are taught at the Forest Ranger School at Nyabyeya, the oldest such facility in East Africa. The school has been supported by grants from NORAD (the Norwegian Agency for International Development) and by teaching assistance from Norway (Zümer 1971).

²⁵Sources: Anonymous. 1980.
Herrick et al. 1969.
Johnson and Johnson. 1977.
Morris and Read. 1966.

3.4 Faunal Resources, Exploitation, and Conservation Measures

According to Jonathan Kingdon in his 1973 presidential address to the Uganda Society, Uganda is one of Africa's --indeed the world's--zoogeographically most important areas. Its situation astride several major ecological zones provides it with an extremely diverse fauna for such a relatively small region. There are several forests, moreover, which offer habitats to species not found elsewhere. Some of these forests, at the time of Kingdon's observation, possessed the world's greatest concentration of vertebrate species.

Already in 1973 Kingdon and other ecologists expressed concern for the future of Uganda's rich fauna. Agriculture, mining, industrialization, lumbering, and inadequate administration were endangering certain species while reducing the numbers of others. A worsening economy through the 1970s coupled with relatively benign policies toward wildlife preservation further threatened Uganda's animals. The April 1979 Tanzanian invasion of southwestern Uganda led to perhaps the most concentrated destruction of large mammals the region had ever experienced. One estimate by a researcher who witnessed the event placed the number of animals killed at 14,000 within a three-and-a-half month period. The slaughter included some 6,000 hippopotami; 5,000 Uganda kob; 2,000 buffaloes; 400 topi; 100 elephants; and 70 lions (Van Orsdol 1979). In light of this destruction, an examination of Uganda's faunal resources and public conservation measures is particularly relevant to a study of the nation's environment.

3.4.1 Mammalian Fauna 26

An indication of the wealth of Uganda's mammalian fauna is provided by the following observation

²⁶Sources:

- | | |
|-----------------------------------|------------------------------|
| Anman. 1970. | Jarvis. 1974. |
| Brahmachary. 1969. | Kingdon. 1971b. |
| Brahmachary. 1972. | Kingdon. 1973. |
| Eltringham. 1977. | Lock. 1977. |
| Eltringham and Din. 1977. | MacPherson. 1974. |
| Eltringham and
Woodford. 1973. | Myers. 1971. |
| Fisher. 1972. | Myers. 1976. |
| Grimsdell and Field. 1976. | Petersen and Casebeer. 1971. |
| Haltenorth and Diller. 1980. | Ross et al. 1976. |
| IUCN. 1975. | Ross-Macdonald. 1971. |
| IUCN. 1978a. | Van Orsdol. 1979. |
| | Wyatt and Eltringham. 1974. |

made by Kingdon: "the total number of mammal species that may be found in Uganda's forests alone exceeds the number of species found over the whole of Europe" (Kingdon 1973). Approximately 100 species inhabit Ugandan forests--particularly the Bwindi-Kayonza, Semliki, Ruwenzori, Kibale, and Malambigambo forests--and numerous other species reside in the nation's savannas. The world distribution of at least fifteen mammal species is presently restricted to Uganda (Table 20).

Table 20. Mammal Species found only in Uganda, 1973

<u>Order</u>	<u>Species</u>
<u>Primate</u>	<u>Galago inustus</u> <u>Cercopithecus l'hoesti</u>
<u>Insectivora</u>	<u>Micropotamogale ruwenzori</u> <u>Scutisorex somereni</u> <u>Paracrocidura sp.</u>
<u>Chiroptera</u>	<u>Rhinolophus ruwenzori</u>
<u>Rodentia</u>	<u>Funisciurus carruthersi</u> <u>Funisciurus alexandri</u> <u>Heliosciurus ruwenzori</u> <u>Hylomyscus denniae</u> <u>Lophuromys venustus</u> <u>Delanymys brooksi</u>
<u>Carnivora</u>	<u>Genetta victoriae</u> <u>Osbornictis sp.</u> <u>Hylarnus harrisoni</u>

Source: Kingdon. 1973.

Perhaps the most numerous mammals in Uganda are ungulates. The Ruwenzori Mountains region, with up to 17,500 kg of biomass per square kilometer, is among the world's best terrain for supporting ungulates (Myers 1971). Ruwenzori National Park (formerly Queen Elizabeth National Park), even after its 1979 depletion, contains a rich collection of even-toed and odd-toed ungulates. Among the most common animals present are hippopotami (Hippopotamus amphibius), deer (Cervidae), giraffes (Giraffidae), ruminants (Bovidae), asses and zebras (Equidae), and rhinoceri (Rhinocerotidae).

In Ruwenzori National Park alone (Fig. 36), a 1971-72 survey (Eltringham and Din 1977) found more than 12,000 kob (Kobus kob); nearly 5,000 topi (Damaliscus lunatus); 4,500 waterbuck (Kobus ellipsiprymnus and K. defasa ugandae); and 1,530 warthogs (Phacochoerus aethiopicus). At about the same time (1968-69) an aerial survey enumerated 165 herds and 1,100 bulls of buffalo (Syncerus caffer), a total of nearly 18,000 buffalo, making that animal the most prevalent ungulate in the park (Eltringham and Woodford 1973). After the 1979 destruction of wildlife in the park, an estimated 16,000 buffalo remain in Ruwenzori (Van Orsdol 1979). The ungulate population also includes some 8,000 hippopotamus (Hippopotamus amphibius), bushbuck (Tragelaphus scriptus), and giant forest hog (Hylochoerus meinertzhageni).

In Kidepo National Park in the extreme northeast of Uganda (Fig. 36), aerial counts from 1967 to 1972 found between 800 to 2,300 buffalo (Syncerus caffer); 1,700 to 2,400 hartebeeste (Alcelaphus busephalus jacksonii); 200 to 700 giraffe (Giraffa camelopardalis); 450 to 800 zebra (Equus burchelli); 300 to 900 gazelle (Gazella granti brighti); and 45 to 1,000 eland (Taurotragus oryx pattersonianus). Other ungulates in Kidepo National Park (Ross-MacDonald 1971) are: black rhinoceros (Diceros bicornis), waterbuck, roan antelope (Hippotragus equinus), greater kudu (Tragelaphus strepciceros), and lesser kudu (T. imberbis).

Uganda's third national park, Kabulega Falls National Park (formerly Murchison Falls National Park; Fig. 36) is also well supplied with ungulate species. The most common are buffalo, giraffe, hippopotamus, oribi (Ourebia ourebi), kob, black rhinoceros, white rhinoceros (Ceratotherium simum), and numerous species of buck (Ross-Macdonald 1971).

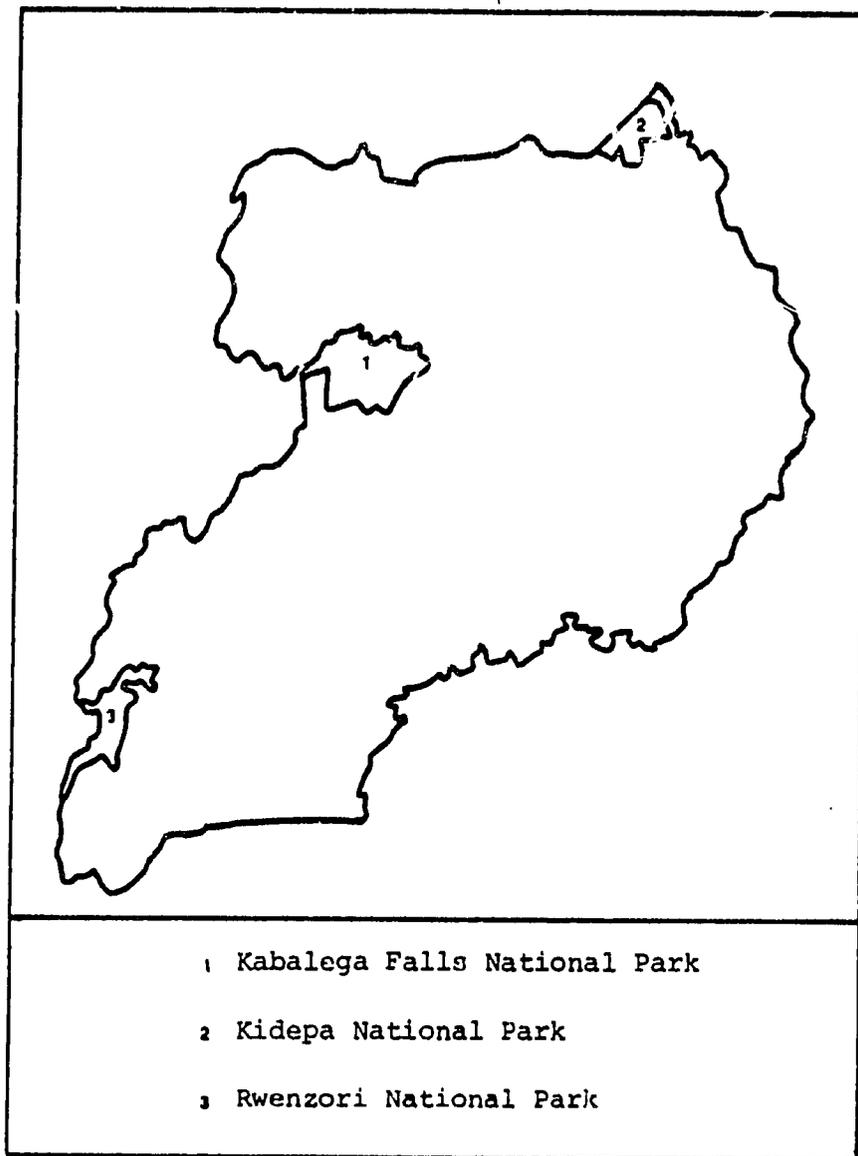


Figure 36. National Parks

Source: Adapted from Map 78258 11-70, available from USGPO (1970).

Common non-ungulate mammals are elephants (Proboscidea), anteaters (Pholidota), rodents (Rodentia), carnivores (Carnivora), insectivores (Insectivora), and primates. Elephants (Loxodonta africana) have been plentiful at all three national parks, and especially at Kabalega Falls National Park where one estimate placed their numbers at 12,000 (Ross-Macdonald 1971); and Ruwenzori National Park, the site of the 1979 Tanzanian invasion and animal decimation. Through the late 1960s and into the early 1970s observers expressed concern over the apparent increase in the number of elephants in the park to an ecologically unstable total. Recorded densities ranging from one elephant per square kilometer to four times that level were among Africa's highest, surpassed only in Tanzania's Lake Manyara National Park (Eltringham 1977; Wyatt and Eltringham 1974). At the observed average rate (1.43 elephants per sq km), Ruwenzori National Park may have accommodated as many as 3,200 to 4,000 elephants in 1970 (Myers 1971).

Within a decade Uganda's elephant "oversupply" has reversed. Until about 1970 environmental damage caused by elephant overgrazing was considered quite serious. Large elephant populations within protected areas threatened to reduce tree cover and thus increase the risk of fire. Partly as a result of overgrazing Terminalia woodland, elephants have diminished the food supply of their own habitat. This deforestation has also led to a reduction of tree cover and to a corresponding rise in calf mortality due to sunstroke. Poaching and indiscriminate killing of elephants have combined with the above factors to threaten the species' survival. In 1971 herds were just two-thirds of their size 25 years earlier (Myers 1971). By all accounts, the rate of decimation has been increasing. In 1973 alone, according to one report, Uganda's elephant population was halved (MacPherson 1974). At that rate, the species could be eliminated within Uganda before the end of the century.

Among other large mammals, primates and carnivores are the most prominent. Uganda possesses one of the world's most varied primate populations. The animals range from the extremely rare mountain gorilla (Gorilla gorilla) found at the Mount Muhavura (Kigezi) Gorilla Sanctuary, to several common species of monkeys. Table 21 lists Uganda's resident primates; Figure 37 shows their geographical distribution.

Table 21. Primate Species

Species	Common Name
PONGIDAE	
<u>Pan troglodytes</u>	Chimpanzee
CERCOPIITHECIDAE	
<u>Colobus abyssinicus</u>	Colobus
<u>Papio cynocephalus anubis</u>	Baboon
<u>Cercocebus albigena johnstoni</u>	Black mangabey
<u>Cercopithecus aethiops tantalus</u>	Vervet monkey
<u>Cercopithecus aethiops arenarius</u>	Vervet monkey
<u>Cercopithecus ascanius schmidti</u>	Redtail monkey
<u>Cercopithecus l'hoesti</u>	Mountain monkey
<u>Cercopithecus mitis stuhlmanni</u>	Blue monkey
<u>Cercopithecus mitis moloneyi</u>	Blue monkey
<u>Cercopithecus neglectus</u>	Brazza's monkey
<u>Cercopithecus patas</u>	Patas monkey
LORISIDAE	
<u>Perodicticus potto</u>	Potto
PROSIMII	
<u>Galago crassicaudatus</u>	Greater galago
<u>Galago demidorii</u>	Pigmy galago
<u>Galago senegalensis</u>	Bushbaby

Source: Kingdon. 1971a.

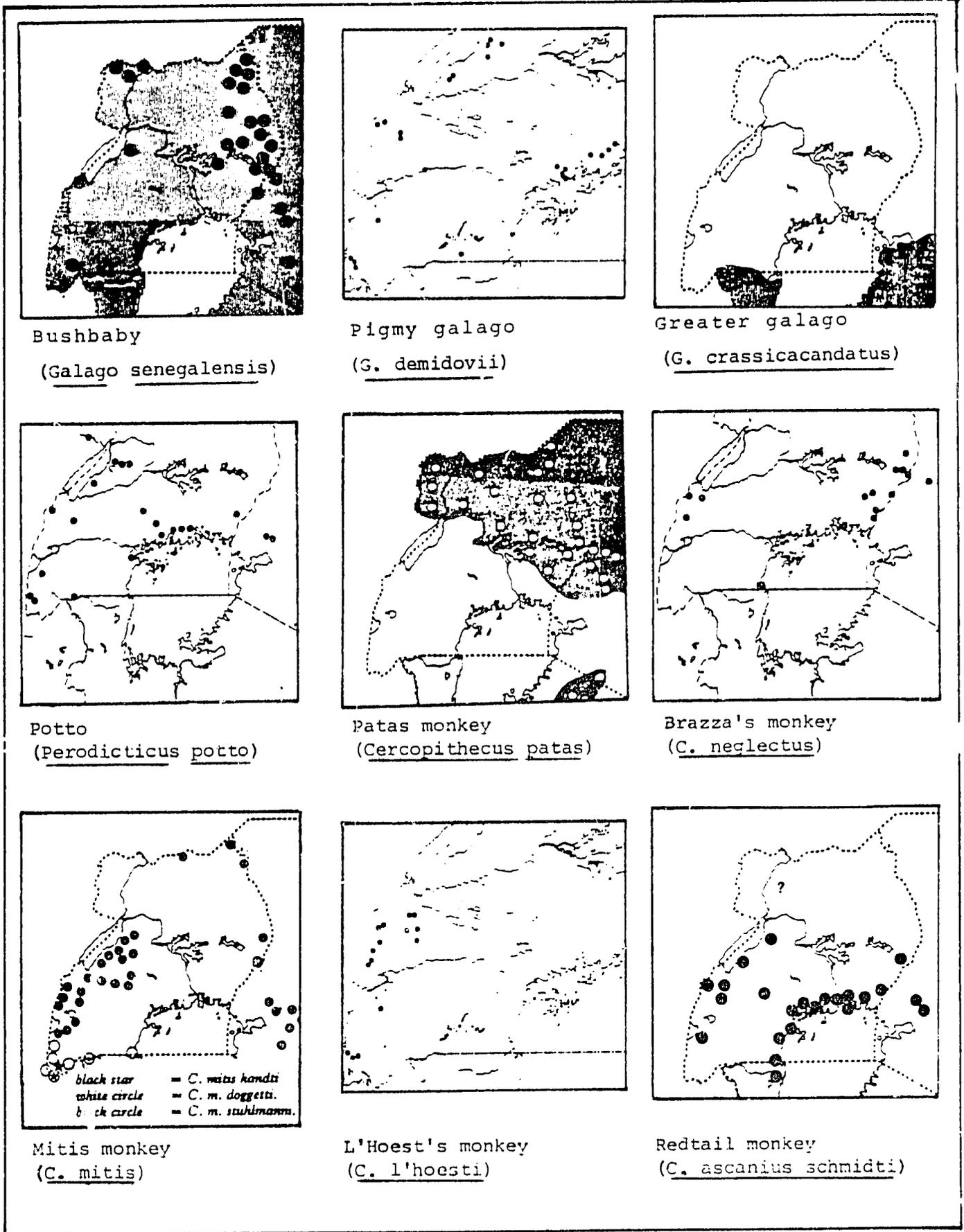


Figure 37. Distribution of Primates

Source: Adapted from Kingdon. (1971).

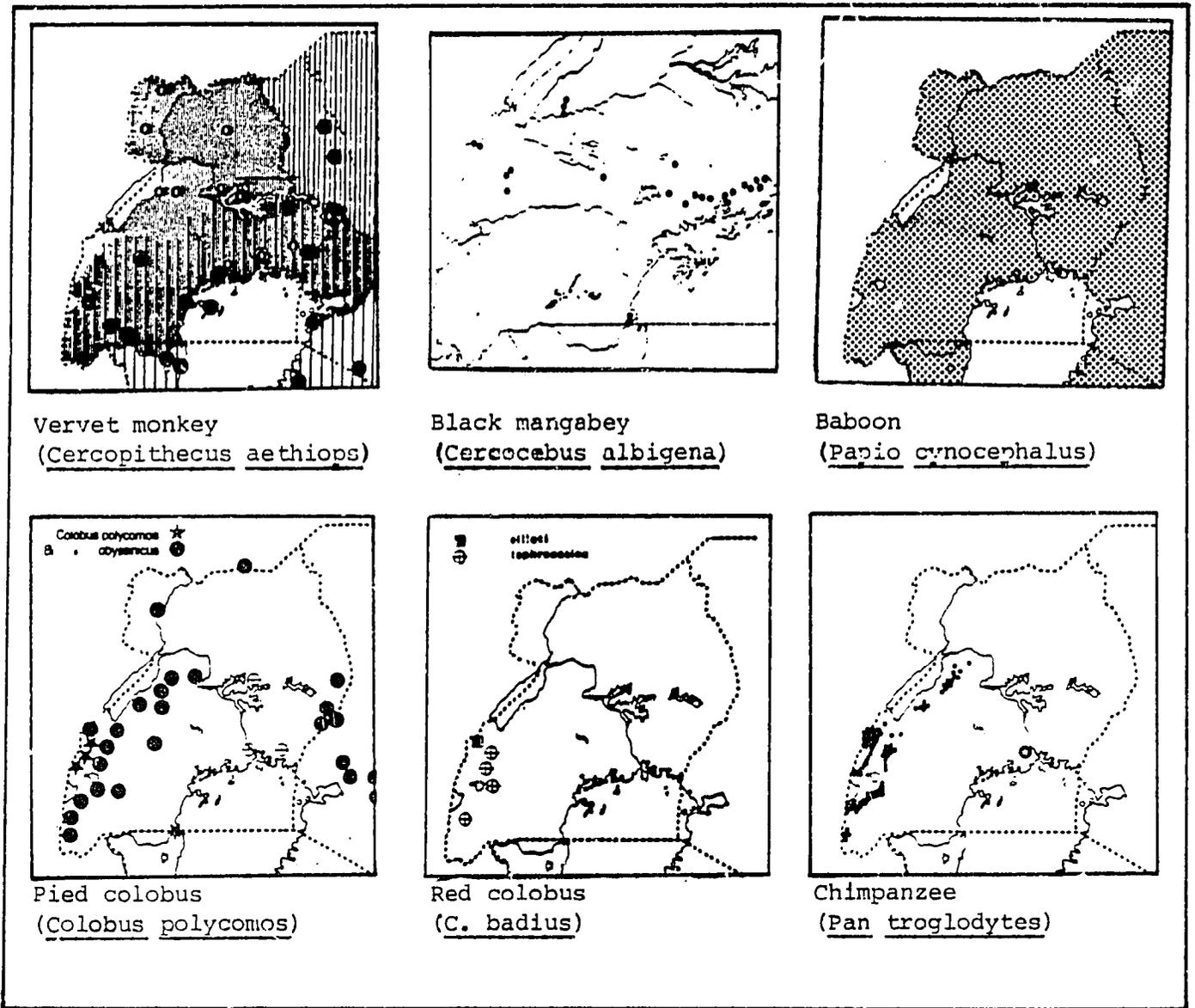


Figure 37. Distribution of Primates, continued

When Johnston compiled his gazetteer of Uganda in 1902, the region abounded with nearly thirty species of carnivores including large cats such as lion (Felis leo) and leopard (F. pardus), small cats (Felinae), and canines (Canidae). Appendix IV, Table 5 lists the species identified at the turn of the century. Many of these species have survived the intervening eighty years of development, human encroachment, and natural phenomena. But several such as the leopard and cheetah are in danger of elimination (IUCN 1978). In spite of its threatened status, the leopard has proven a persistent survivor, existing even within the densely populated Lake Victoria region and occurring in the less dense northern areas of Uganda (Myers 1976). Although lions have not been officially listed as endangered, there is reason to believe that their numbers have been reduced substantially over the past decade (Van Orsdol 1979). Other carnivorous predators such as hyaena (Hyaena hyaena and Crocuta crocuta), jackal (Canis adustus, C. mesomelas, and C. aureus), weasel (Poecilogale albinucha), polecat (Ictonyx striata), genet (Genetta genetta and G. tigrina), honey badger (Mellivora capensis), civet (Viverra civetta and Nandinia binotata), and mongoose (Herpestes ichneumon, H. sanguineus, H. paludinosus, Mungos mungo, Ichneumia albicauda and Helogale undulata) are widespread and apparently plentiful (Haltenorth and Diller 1980).

Table 22 lists mammalian species considered endangered by the International Union for Conservation of Nature and Natural Resources (IUCN). The U.S. Fish and Wildlife Service includes only the Northern white rhinoceros on its list of endangered species (FWS 1981a,b).

3.4.2 Avifauna ^{27/}

As in the case of mammals, Uganda possesses one of the world's richest avifauna--both with regard to numbers of species and numbers of birds. Ruwenzori National Park has 543 species of birds (IUCN 1981), and two forest reserves, Bwindi-

²⁷Sources: Arman. 1971. Mackworth-Praed and
 Banage. 1969. Grant. 1980.
 Hall. 1968. Pomeroy. 1973.
 IUCN. 1971. Snow. 1978.
 IUCN. 1977. Thiollay. 1978.
 Kingdon. 1973. Williams. 1964.

Table 22. Endangered Mammalian Species

Scientific name	Common name
<u>Pan troglodytes</u>	Chimpanzee
<u>Gorilla gorilla</u>	Gorilla
<u>Gorilla gorilla beringei</u>	Mountain gorilla
<u>Lycaon pictus</u>	African wild dog
<u>Panthera pardus</u>	Leopard
<u>Acinonyx jubatus</u>	Cheetah
<u>Loxodonta africana</u>	African elephant
<u>Ceratotherium simum cottoni</u>	Northern square-lipped, or Northern white, rhinoceros
<u>Diceros bicornis</u>	Black rhinoceros

Source: IUCN. 1978a.

Kayonza and Bwamba, have recorded 284 and 380 species of birds, respectively, within their confines. Johnston's 1902 text lists 771 species within 69 families and 36 orders (Appendix IV, Table 6). And again, as with mammals, numerous species exist only in Uganda and adjacent regions in eastern Zaire. Table 23 lists those species and others whose distribution is limited to East Africa.

The diversity of Uganda's avifauna continues to the present. Among the 48 non-Passerine families listed by D.W. Snow in his 1978 African Atlas of Speciation, 46 are represented in Uganda. Passeriformes, too, are well represented, with approximately 20 families found in the country.

Uganda's national parks and game reserves provide the best habitats for much of the local avifauna, particularly for the longer less mobile species such as ostrich, stork, and pelican. Table 24 lists the noteworthy birds found in the nation's major protected areas, and Appendix IV, Table 7 lists Falconiformes occurring in Uganda's national parks.

In addition to preserving a varied endemic avifauna, Uganda also accommodates numerous migratory species. Table 25 lists some of the notable birds that spend part of the year in Uganda.

Table 23. Bird Species found only in Uganda
and East Africa

a. Species found only in Uganda

Columba albinucha
Apiopelia simplex
Francolinus nobilis
Ruwenzoronnis johnstoni
Caprimulgus ruwenzorii
Halcyon badius
Tockus hartlaubi
Campethera nivosa
Pseudocalyptomena graueri
Erythrorpiza leucosticta
Alethe polio phrys
Dessonornis anomala
Lioptilus rufocinctus

Bradypterus graueri
Cisticola carruthersi
Aparis ruwenzori
Hemistesia neumanni
Graueria vittata
Melaenornis ardesiaca
Batis diops
Barus fasciiventer
Nectarinia regia
Nectarinia pupureiventris
Ploceus flavipes
Nesocharis ansorgei
Chrytospiza jacksoni

b. Species found only in Uganda and elsewhere in East Africa

Francolinus nahani
Pternistes rufopictus
Agapornis swinderiana
Melittophagus mulleri
Melittophagus gularis
Byconistes sharpii
Tropicranus albocristatus
Indicator maculatus
Campethera caroli

Pitta reichenowi
Campaphaga oriolina
Chlorocichla laetissima
Melaenotus lagdeni
Turdus fischeri
Turdus camaranoensis
Chloropeta gracilirostri
Phylloscopus budongoensis

Table 24. Noteworthy Birds found in Protected Areas

Scientific name	Common name
Ruwenzori National Park	
<u>Phalacrocorax carbo patricki</u>	Palaeartic cormorant
<u>Leptoptilos crumeniferus</u>	Marabou stork
<u>Balaeniceps rex</u>	Whale-headed stork
<u>Ephippiorhynchus senegalensis</u>	Saddle-billed stork
<u>Chlidonias leucoptera</u>	White-winged black tern
<u>Alcedo quadribrachys</u>	Shining blue kingfisher
<u>Halcyon malimbicus</u>	Blue-breasted kingfisher
<u>H. badius</u>	Chocolate-backed kingfisher
<u>Corythornis cristata</u>	Malachite kingfisher
<u>Melittophagus gularis</u>	Black bee-eater
<u>Cinnyris bouvieri</u>	Orange-tufted sunbird
<u>Actophilornis africanus</u>	Jacana
<u>Indicator spp.</u>	Honey guides
Kabalega National Park	
<u>E. senegalensis</u>	Saddle-billed stork
<u>B. rex</u>	Whale-headed stork
<u>L. crumeniferus</u>	Marabou stork
<u>Ardea goliath</u>	Goliath heron
Kidepo National Park	
<u>Struthio camelus rothschildi</u>	Ostrich
<u>Poliohierax semitorquatus</u>	Pygmy falcon
<u>Chelictinia riocourii</u>	Swallow-tailed kite
<u>Aquila verreauxii</u>	Verreaux's eagle
<u>Ptilopachus petrosus</u>	Stone partridge
<u>Ardeotis kori</u>	Kori bustard
<u>Bucorvus abyssinicus</u>	Ground hornbill
<u>Macrodipteryx longipennis</u>	Standard-wing nightjar
<u>Apalis karamojae</u>	Karamoja warbler
<u>Rhinocorax rhipidurus</u>	Fan-tailed raven
<u>Ptilostomus afer</u>	Piapiac
<u>Rhinopomastus minor</u>	Abyssinian scimitar bill
<u>Oriolus auratus</u>	Golden oriole
<u>Chalcomitra senegalensis</u>	Scarlet-chested sunbird
<u>Psittacula krameri</u>	Rose-ringed parakeet
<u>Excalfactoria andersoni</u>	Blue quail

Table 24. Continued

Scientific name	Common name
Toro Game Reserve	
<u>Circaetus cinereus</u>	Brown harrier eagle
<u>C. cinerascens</u>	Banded harrier eagle
<u>Rostratula benghalensis</u>	Painted snipe
<u>Columba albinucha</u>	White-naped pigeon
<u>Bycanistes albotibialis</u>	White-thighed hornbill
<u>Cereatogymna atrata</u>	Black-wattled hornbill
<u>Tockus fasciatus</u>	Pied hornbill
<u>Buccanodon duchaillui</u>	Yellow-spotted barbet
<u>Coliuspasser hartlaubi</u>	Marsh widow bird
Gorilla Game Reserve	
<u>Ruwenzorornis johnstoni</u>	Ruwenzori turaco
<u>Trachylaemus purpuratus</u>	Yellow-billed barbet
<u>Malacocincla pyrrhopterus</u>	Mountain illadopsis
<u>Apalis</u> spp.	Apalis
<u>Laniarius lunderi</u>	Lunder's bush shrike
<u>Cryptospiza</u> spp.	Crimson-wing

Sources: IUCN. 1971.
 IUCN. 1977.
 Pomeroy. 1973.

Table 25. Prominent Migratory Birds of Uganda

Scientific name	Common name
<u>Mesophoyx intermedius</u>	Yellow-billed egret
<u>Egretta garzetta</u>	Little egret
<u>Bubulcus ibis</u>	Buff-backed heron, or cattle egret
<u>Sphenorynchus abdimii</u>	Abdim's, or white-bellied stork
<u>Anastomus lamelligerus</u>	Open-billed stork
<u>Ephippiorhynchus senegalensis</u>	Saddle-bill stork
<u>Ciconia bugra</u>	European black stork
<u>Threskiornis aethiopicus</u>	Sacred ibis
<u>Sarkidiornis melanotos</u>	Knob-billed goose
<u>Milvus migrans</u>	African black kite
<u>Circus aeruginosus</u>	European marsh harrier
<u>Hoplopterus spinosus</u>	Spurwing plover
<u>Himantopus himantopus</u>	Black-winged stilt
<u>Chlidonias leucoptera</u>	White-winged black tern
<u>Eremialector quadricinctus</u>	Four-banded sandgrouse
<u>Halcyon senegalensis</u>	Woodland kingfisher
<u>Mellitophagus bullocki</u>	Red-throated bee-eater

Sources: Uganda National Parks. 1976a, 1976b, 1977a, 1977b.
Williams. 1974.

Comparisons of current surveys of the bird population with the 1902 listing in Johnston suggest that few, if any, species have disappeared. The IUCN listing in the Red Data Book confirms this observation; only one species, the African lammergeyer (Gypaetus barbatus meridionalis), is considered endangered. The U.S. Fish and Wildlife Service, in its inventory of threatened species includes no Ugandan birds (FWS 1980a,b).

3.4.3 Herpetofauna 28/

Uganda's forests, highlands, lakeshores, and swamps offer suitable habitats to large numbers of reptiles and amphibians. Among large reptiles, the Nile crocodile (Crocodylus niloticus) and the African slender-mouthed crocodile (C. cataphractus), and the python (Python seboe) are the most prominent. The most numerous reptilian species are chameleons (Chameleon spp.), lizards (Lacertidae and Varanidae), turtles and tortoises (Chelonia) and snakes (Ophidia). Among the latter, there are several poisonous species of vipers (Viperidae), adders (Bitis arietans, B. gabonica and B. nasicornis), and cobras (Naja spp.). Appendix IV, Table 8 lists Uganda's herpetofauna, as itemized in 1902.

Of these species, IUCN (1975) considers only the two endemic crocodiles (C. niloticus and C. cataphractus) to be in danger of extinction. The U.S. Fish and Wildlife Service (1980a and 1980b) lists no threatened reptiles in Uganda. It may be surmised, however, that as a result of insufficient protective legislation and administrative laxness, all reptiles possessing commercially valuable skins and shells are being eliminated. No additional information on the danger to reptiles was available for this report.

3.4.4 Aquatic Fauna 29/

Approximately a sixth of Uganda's total area consists of rivers, lakes, ponds, and swamps.

²⁸Sources: Johnston. 1902.
Matthews. 1968.
Whaler. 1971.

²⁹Sources: Burgis. 1971. Johnston. 1972.
Cadwallader and Stoneman. 1968. Paperna. 1972.
Gwahaba. 1973. Parker. 1971.

Consequently, the nation is rich in freshwater fish resources. All of the major lakes are well-stocked with exotic as well as common edible fish.

Among predatory species there are a number of piscivorous fish, including Bagrus dogmae, Clarias lazera, Haplochromis squampinnis, Hydrocymus forskahlii, and the "mamba" lung fish (Protopterus aethiopicus) which is abundant in Lake Victoria. The most common edible fish found in Uganda's waters are Nile perch (Latus niloticus and L. macrophthalmus), Tilapia nilotica, T. leucosticta, T. zillii, Alestes baremose, mpio (Citherinus citherus), and H. forskahlii. A. baremose, which flourishes in shallow waters less than 20 m deep, is the most abundant fish exploited in Lake Albert. It also occurs near the delta of the Nile in Lake Victoria. Latus spp. and T. nilotica both are found in Lake George and Lake Albert, while C. citherus are predominantly found in papyrus swamps near the Semliki River. Other abundant, though nonedible, fish are the "bubu" (Auchenoglanis occidentalis), guppies (Lebistes reticulatus), and Barbus amphigramma. Perhaps the most complete inventory of Uganda's endemic ichthyofauna remains the one provided by Johnston (1902); it appears as Table 9 of Appendix IV.

Several species of fish have been introduced in Uganda within the past decades as food sources and as agents of insect control. Lebistes reticulatus, an insectivorous species, was imported from the United States to combat mosquitos. Grass carp (Ctenopharyngodon idellus) and silver carp (Hypophthalmichthys molitrix) from Hong Kong, and Tilapia mossambica from Singapore are three recently imported commercial species (Paperna 1972).

The U.S. Fish and Wildlife Service does not list any Ugandan ichthyofaunal species as endangered.

3.4.5 Wildlife Exploitation and Fisheries

3.4.5.1 Commercial Use of Terrestrial Fauna ^{30/}

Ironically, perhaps the most serious threat to wildlife stems from Uganda's status as a

³⁰Sources: Edroma. 1973a. Milliken. 1981.
Fischer. 1972. Myers. 1971.
Kingdon. 1973. Myers. 1976.
Macpherson. 1974. Van Orsdol. 1979.

"biological millionaire," as Kingdon (1973) has termed the country. The diverse and plentiful fauna includes a number of mammalian, avian, and reptilian species whose products are of considerable commercial value. Although current sources (IUCN and FWS) do not list many endangered terrestrial fauna, increased exploitation in times of economic uncertainty suggest that in reality the number of species whose existence is threatened is considerably greater than those on the lists.

Because most of the animals possessing valuable products are officially protected by legislation, much of the commercial exploitation is considered poaching. While animals residing outside of designated national parks and game reserves are especially vulnerable to such activities, species within protected areas are also affected. Already in 1971, even before the unrest of the following decade, one in ten elephants in Kabalega National Park exhibited a spear or arrow wound.

Elephants, the largest land mammals, are perhaps the most noteworthy victims of poaching. The international demand for ivory had driven prices from US\$ 7 per kg in early 1973 to four times that by the end of the year. That same year alone, in their quest for tusks weighing an average of about 20 kg each, Uganda's poachers reportedly eliminated half of the country's elephant herd. Although the poachers receive only a quarter of the market value of the ivory they obtain, even that amount provides sufficient incentive to perpetuate the practice. The meat of the elephant, while it is not of prime concern for the poacher, is also marketable. Along with hippopotamus meat, more than 10 million kg were sold annually in the late 1960s, prior to the subsequent increase in poaching. During the Tanzanian invasion of 1979, elephants, hippos, lions, kob, topi, and buffalo were slaughtered wholesale by Tanzanian soldiers. While much of the killing was gratuitous, the soldiers profited from the slaughter by selling meat to local butchers and businessmen, and skins to traders. A hippo carcass, containing as much as 900 kg of meat, sold for up to US\$ 2,200 on the market. Lion skins fetched \$200 to \$1,300 each. According to an estimate by Karl Van Orsdol, who witnessed the 1979 events, the value of the 14,000 animals slaughtered in Ruwenzori National Park alone was about \$18 million, or an amount equivalent to four percent of Uganda's GNP.

Some of the valuable products derived from Ugandan mammals include the horns of rhinoceros and ungulates; the hides of zebra, antelope, leopard, cheetah, crocodile, and ostrich; the meat of elephant, hippo, rhino, buffalo, other large ungulates, game birds, snakes, and tortoises; and exotic feathers. These products are illegally exported to manufacturing centers elsewhere in Africa, Asia, and Europe. There they are made into luxury commodities such as handbags, shoes, coats, and capes. In Japan, where there are few restrictions on their sale, such items sell for a premium price. For example, in 1981 crocodile handbags sold for as much as US\$ 6,250; ostrich handbags, \$2,450; African leopard coats, \$72,000; and colobus monkey capes, \$6,000 (Milliken 1981).

Not all wildlife exploitation is illegal, however. In the late 1960s the Ugandan government devised a scheme intended to reconcile the economic value of certain species with what Kingdon (1973) has called the "supra-economic value of conservation." Through integrated land use planning, the wildlife reserves were to be used as open range ranches, "producing" marketable elephants, hippos, kob, hartebeest, and cattle. Such "cropping" was instituted by the Uganda Game Department on an experimental basis, and by 1971 the project yielded an estimated 11 million kg of meat per year along with additional income from legally sanctioned sales of hides, horns, and other animal products. After 1971, however, the budget and mandate of the Game Department underwent severe cutbacks and no further results of the envisioned scheme are available to this report.

3.4.5.2 Fisheries ^{31/}

Fish production is an important commercial activity in Uganda. In 1968 fishing, processing, and distribution employed some 20,000 persons, or 0.5 percent of the work force (Cadwallader and Stoneman 1968). Current figures are unavailable, but it is likely that the percentage of persons

³¹Sources: Anonymous. 1980.
Cadwallader and Stoneman. 1968.
Gwahaba. 1973.
Herrick et al. 1969.
Parker. 1971.

employed by the fishing industry has not greatly changed in the intervening years. Although fishing does not contribute significantly to the GDP--just four percent, together with forestry and hunting in 1977--it does provide much of the local income for lakeshore communities near Lakes Albert, Edward, George, Kyoga, and Victoria. In addition, fresh, sundried, and smoked fish are important sources of protein in a country where protein is otherwise scarce (see Section 2.2.5).

Tilapia spp., Nile perch (Lates niloticus spp.), Alestes baremose, and Hydrocymus forskahlii are the chief edible species and are present in abundance in all the large lakes. In addition, mpio (Citharinus citharinus) is an edible fish which flourishes in Uganda's many papyrus swamps. Much of the fishing is done from dugout and planked canoes, sometimes employing gill nets and purse seine nets.

Table 26 provides figures of the annual fish catch in Uganda between 1961 and 1977.

Table 26. Fish Catch, 1961 to 1977

Fish	Catch (1,000 metric tons, live weight)						
	1961	1967	1973	1974	1975	1976	1977
Tilapia	n.a.	n.a.	56.0	59.7	31.2	58.8	79.1
Nile perch	n.a.	n.a.	64.5	64.5	61.3	55.0	22.3
Other fish	n.a.	n.a.	49.0	43.3	45.5	38.6	77.2
Total catch	62.3	82.0	169.5	167.5	188.0	152.4	178.6

Source: Anon. 1980.

The sudden and precipitous 1977 drop in Nile perch tonnage accompanied by an even greater rise in the tonnage of Tilapia and other fish cast some doubt upon the accuracy of the data in Table 26.

3.4.6 Conservation: Legislation, Policy, and Administration ^{32/}

Soon after the establishment of the Protectorate before the turn of the century, British administrators recognized the necessity of restricting hunting in order to protect certain forms of wildlife. Accordingly, they enacted provisions limiting the killing of large game animals, rare cats, jackals, chimpanzees, colobus monkeys, and exotic birds. By 1902 the government had undertaken to regulate and license the sale of ostrich eggs, animal heads, horns, skins, feathers, and flesh; and it had begun to limit the export of elephant tusks.

In order to ensure further the survival of unusual terrestrial fauna, the administration designated specified areas as official game reserves. A specially appointed Commissioner, upon approval of the Secretary of State, was empowered to declare any other suitable territory to be a game reserve. In Appendix IV, Tables 1 to 3 list these early governmental regulations (Johnston 1902).

Two national parks were established prior to independence: Murchison Falls (now Kabalega) and Queen Elizabeth (now Ruwenzori) National Parks. A third area, Kidepo Valley, was so designated in March 1962. Together, the three parks cover 3.65 percent of Uganda's land territory (Tables 6 and 26). In addition, the three game reserves set aside before 1962 were supplemented by eleven others established after 1962. These cover an additional 3.8 percent of the nation's land. Twelve sanctuaries, eighteen "controlled hunting areas," and two "close season areas" take up another four million hectares. These last three types of areas, however, are not exclusively reserved for wildlife and vegetation. Table 27 lists Uganda's reserved areas; Figure 38 shows their approximate locations.

³²Sources:

- | | |
|----------------------------|------------------------------|
| Bendebule. 1969. | Morris and Read. 1966. |
| Herrick et al. 1969. | Myers. 1971. |
| IUCN. 1977. | Ouma. 1970. |
| Johnson and Johnson. 1977. | Ross-Macdonald. 1971. |
| Johnston. 1902. | Uganda National Parks. 1974. |
| Kingdon. 1973. | Wilson. 1973. |

Table 27. Reserved Areas

Reserved area	Date established	Area (ha)	Location
National Parks	--	<u>729,000</u>	--
Kabalega Falls	1952	384,000	N 1 ⁰ -59' to 2 ⁰ -33'; E 31 ⁰ -23' to 32 ⁰ -16'
Kidepo Valley	1962	125,000	N 3 ⁰ -45' to 4 ⁰ -10'; E 33 ⁰ 30' to 34 ⁰ -05'
Ruwenzori	1952	220,000	S 0 ⁰ -30' to N 0 ⁰ -15'; E 29 ⁰ -30' to 30 ⁰ -15'
Game Reserves	--	<u>933,380</u>	--
Ajay	1962	15,600	c. N 2 ⁰ -55'; E 31 ⁰ -25'
Aswa Lolim	n.a.	8,000 ^a	n.a.
Bokora Corridor	1964	203,360	N 2 ⁰ -7' to 2 ⁰ -45'; E 33 ⁰ -50' to 34 ⁰ -50'
Bugungu	1968	74,600	c. N 2 ⁰ -15'; E 31 ⁰ -30'
Gorilla	1964	8,800	c. S 1 ⁰ -30'; E 30 ⁰
Karuma	1964	71,270	c. N 1 ⁰ -50'; E 31 ⁰ -45'
Katonga	1964	20,660	c. N 0 ⁰ -20'; E 31 ⁰
Kibale Forest Corridor	1964	33,910	c. N 0 ⁰ -30'; E 30 ⁰ -20'
Kigezi	1952	32,830	c. S 0 ⁰ -30'; E 29 ⁰ -50'
Kyambura	1965	15,510	c. S 0 ⁰ -05'; E 30 ⁰ -15'
Lake Mburo	1964	53,580	c. N 1 ⁰ -15'; E 30 ⁰ -55'
Lumunga	n.a.	6,500 ^a	n.a.
Matheniko	1964	160,000	N 2 ⁰ -40' to 3 ⁰ -7'; E 34 ⁰ -10' to 34 ⁰ -50'
Pian-Upe	1964	228,710	
Toro	1906	54,850	c. N 1 ⁰ ; E 30 ⁰ -20'
Sanctuaries (12)	n.a.	<u>345,000</u>	n.a.
Controlled Hunting Areas (18)	n.a.	<u>3,630,400</u>	n.a.
Close Season Areas (2)	n.a.	<u>51,450</u>	n.a.
Total	--	5,744,230	--

^a From Johnson and Johnson (1977). All other data from IUCN (1977) and IUCN (1978).

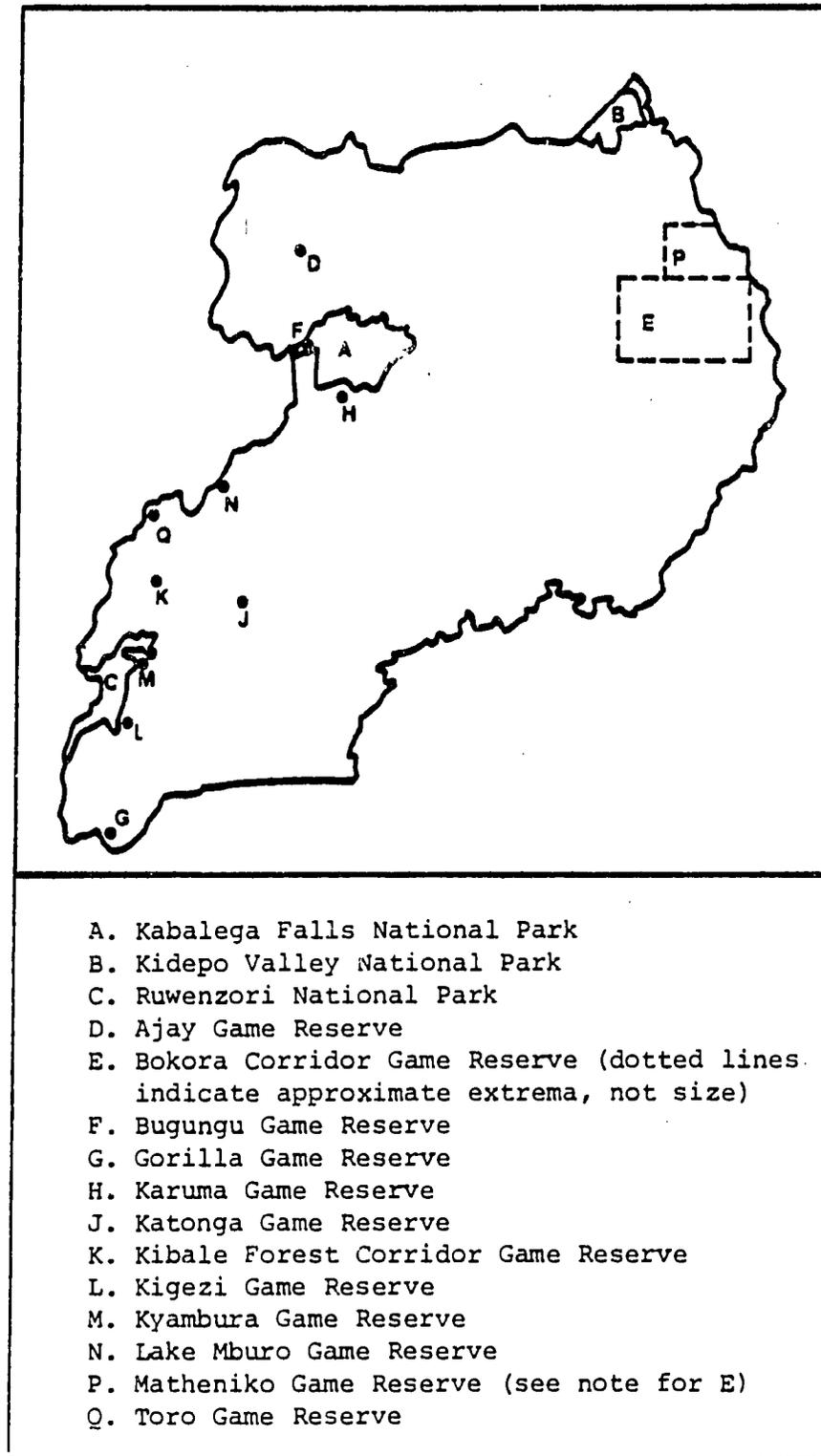


Figure 38. Reserved Areas

Source: IUCN. 1977.

The three national parks are controlled and managed by a Board of Trustees of Uganda National Parks. A chairman resides over a six-to-twelve member board which includes the Chief Conservator of Forests and the Chief Game Warden. Each national park is run by a park warden and staff. Overall responsibility for the management of these parks and other reserved areas is divided between four ministries: Animal Industries and Fisheries; Lands and Natural Resources; Agriculture and Forestry; and Tourism. The Uganda Development Corporation, a federal agency, sees to the economic exploitation aspects of resources within protected areas. One of its subsidiary organizations is the Uganda Fish Marketing Corporation.

Even before the uncertainty marking most of the 1970s, government wildlife policy was ambiguous. The administration clearly recognized the value of protecting Uganda's faunal resources because the animals possessed measurable economic value. Exploitation of animal products and development of tourism were thus restricted and regulated. But the government's creation of additional reserves led a number of observers to wonder whether Ugandan policy intended to confine wildlife entirely to large, isolated parks. Such a course, in the view of many ecologists, would doom numerous forms of wildlife whose natural habitats remain outside designated areas (Myers 1971; Baysinger 1980). Some knowledgeable persons have called instead for the creation of a "mosaic of small sanctuaries" evenly distributed throughout the country (Kingdon 1973). Such a scheme would guarantee the protection of most endemic species. The establishment of a central environmental department or ministry is another goal of interested conservationists. But although such ideas were first expressed more than a decade ago, their implementation has had to await a return to more stable administration and greater economic security.

4.0 Environmental Problems

4.1 Natural Phenomena

4.1.1 Physical and Climatic Problems ^{33/}

For the most part, Uganda is situated in a very favorable zone which exposes the country to few of the serious climatic extremes and natural disasters experienced by other African countries. The nation is not entirely free of such problems however, and they have been responsible for considerable loss of life and property and economic disruption. The most severe naturally caused environmental problems in Uganda are earthquakes, drought, and fire. The latter two phenomena especially, are generally aggravated by human action and by official inability to respond adequately to crisis situations.

4.1.1.1 Earthquakes

Potentially, perhaps the most serious cataclysmic threat is posed by the location of part of Uganda atop a seismically active region of the earth's crust. The two great rifts which envelop the nation were formed by tectonic tensions begun some 11 million years ago. Since that time faulting has continued to alter the landscape of the region. At one time the area was subject to eruptions of volcanoes situated along each side of the rift valley. Mt. Elgon in the east, and several peaks in the southwestern Mufumbiro Mountains are volcanoes that were active during the Tertiary and Quaternary periods. All are presently inactive.

Nevertheless, the regions surrounding these volcanoes remain seismically active. Portions of western Uganda experience an average of more than 100 annual earthquakes, most of them minor. The eastern extremes of the country record between 21 and 50, while the remaining central region experiences 11 to 20 tremors per year. As Figure 39 illustrates, Uganda lies within Africa's most

³³Sources: Amman. 1970.
Clark Univ. 1980.
Eltringham. 1976.
Lock. 1977.

Myers. 1971.
Pritchard. 1979.
USAID. 1981a.

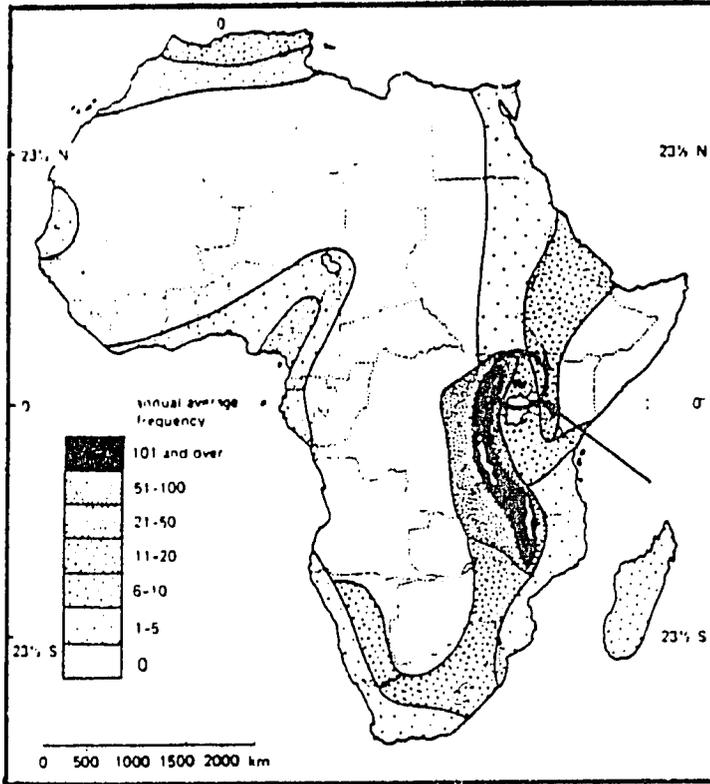


Figure 39. Frequency of Earthquakes

Source: Pritchard. 1979.

earthquake-prone belt (Pritchard 1979). The last earthquake of sizable proportion struck Bwamba County in 1966, affecting 60,000 residents and taking 104 lives (USAID 1981a).

4.1.1.2 Drought

Although earthquakes are perhaps Uganda's most dramatic and most frequent physically induced phenomena, they are not necessarily the most destructive or costly. Drought, which periodically affects much of northern Uganda, presents the foremost problem. Although much of Uganda is favored by adequate well-timed rainfall (see Section 2.1.3.1 and Fig. 5), Karamoja, West Nile, and parts of Acholi Districts are chronically drought-prone (Johnston 1902). Lying at the southeastern extreme of the dry Sahel belt, these regions support some agriculture and extensive grazing.

A recent (1980-81) drought in Karamoja affected a half million persons and took a serious toll on the cattle population. According to some estimates, more than a quarter million people are threatened with starvation caused by the lack of forage for local herds. While the fundamental cause of drought in these regions is the insufficiency of rainfall, there are secondary, human-induced causes as well. Pastoralism, which has contributed significantly to the land's inability to sustain rainfed vegetation, will be discussed under the heading of land use problems in Section 4.2 below. The effects of drought have been exacerbated additionally by inadequate infrastructure, poor administration, and war. These aspects will be treated in Section 4.5 which concerns environmental management problems.

4.1.1.3 Fire

With such a large proportion of Uganda's land cover consisting of grasses and shrubs (Section 3.3.2), it is not surprising that spontaneous fires cause substantial damage to the country's vegetation. Although the fires occur throughout the country's open woodlands and grasslands, their origin and effect has been studied within the national parks. Even prior to publication of the latest research findings in 1976 and 1977, Norman Myers (1971) observed that random fires were causing more damage to protected areas than poaching, the other leading threat to Uganda's genetic resources.

Indeed, in a 1976 article describing a series of controlled observations in Ruwenzori National Park between 1970 and 1973, S.K. Eltringham found that the amount of burnt grassland attained a peak of 32.7 percent of the total during the winter of 1970-71. He further estimated that 13.4 percent of the park was burned at least once a year, and that 55.3 percent of the land was struck by fire at least once within the three-year study period (Eltringham 1976). In Kabalega Falls National Park, a series of observations uncovered a similar pattern. Over a period of time the effects of these random fires tended to replace Terminalia glaucescens woodland with grassland containing Lonchocarpus laxiflorus. The resultant highly combustible grasslands in turn are more vulnerable to further destruction by fire (Lock 1977).

While controlled use of fire may be an effective park management technique, the spread of uncontrolled fires has begun posing serious danger to wildlife and vegetation in the parks. Wherever they have occurred the fires have disrupted normal animal breeding cycles, destroyed faunal habitats, eliminated sources of food, caused progressive degeneration of vegetative variety, and left the land scarred and unattractive. The findings of the above studies unfortunately do not examine the causes of these "random" and "uncontrolled" fires. Because such a diverse and well-stocked faunal and vegetative population has remained well into the twentieth century, it is difficult to believe that fires have been raging with similar frequency for centuries. Instead, it seems not unlikely that generations of human interference have contributed to the worsening fire hazard (Myers 1971).

There is little information indicating the danger of uncontrolled fire in areas outside the national parks. But if the findings there are any indication, there is reason to expect that fires pose a considerable threat to the Ugandan environment. This is especially so in wooded terrain used as grazing grounds by local populations. In these areas residents set fires in order to induce better grass growth and thus produce more forage for private herds (Myers 1971).

4.1.2 Vermin Infestation ^{34/}

Uganda is a hospitable breeding ground for numerous species of animal pests, of which insects are the most common and destructive. Although many of these species contribute to the ecological balance, they are generally regarded as pests because of the damage they cause to natural vegetation, agriculture, building structures, and human and animal health (environmental health is discussed separately in Section 4.1.3).

Although in some areas of Uganda the elephant is in danger of extinction, in other areas it occurs in sufficiently large numbers to cause serious environmental damage. When elephants reproduce uncontrolledly, their collective bulk creates several problems for the surrounding countryside. First, they trample large numbers of saplings and other growth. Second, they eat prodigious amounts of foliage and other greenery. And third, they dig up and ingest sodium and calcium rich rocks and soil. The large-scale removal of these minerals from soil has caused unusually high rates of destruction to trees suffering from deficiencies of calcium and sodium. Primarily for these reasons, there has been pressure on park officials to limit the number of elephants despite their rising scarcity in other locales. For congruent reasons, other large ungulates have caused similar damage to vegetation and habitats (de Vos 1975). Rodents, rabbits, and other small mammals also comprise a nuisance, reproducing rapidly and drastically modifying vegetative cover--particularly on rangeland.

Non-vertebrate pests--insects, mollusks, and worms--are the most pervasive and serious environmentally detrimental species. Among these, locusts have caused perhaps the most destruction. In the past, three types have invaded Uganda: desert locusts (Schistocerca gregaria), red locusts (Nomadacris septemfasciata), and migratory locusts. All three varieties, as well as common grasshoppers and crickets, occur periodically in enormous swarms and ingest whatever crops they

³⁴Sources: de Vos. 1975.
Edroma. 1977.
Lock. 1977.
Myers. 1971.

Smith. 1973.
JSAID. 1981a.
Weir. 1973.

encounter. Uganda has been spared the last few African locust invasions of 1967-69 and 1978-79. The last major infestations occurred between 1929 and 1934 (USAID 1981a).

Endemic insect pests include wood-eating white ants (termites), ants, African armyworms (Spodoptera exempta), spiders, and numerous varieties of infection-spreading organisms such as ticks, flies, and mosquitos. The effects of insect disease vectors are discussed in Section 4.1.3.

4.1.3 Human and Animal Disease ^{35/}

Section 2.2.5, which surveyed the state of public health in Uganda, indicated that the population is subject to several serious infectious diseases. These illnesses affect not only the human population, but the nation's wildlife and livestock as well. The most common environmental infections are transmitted by insect and snail vectors, while others are caused by waterborne and soilborne parasitic worms.

Trypanosomiasis, or sleeping sickness, may be Africa's best-known and most widespread disease. Caused by several varieties of tsetse fly (Glossina spp.), the infection is widespread within a ten million square km region known as the "fly belt," lying between 20° south and 12° north latitude (Fig. 40). Although parts of Uganda lie within this belt, the nation's topography and climate have limited the infested area to just five percent of the land surface (about one million ha). This region is primarily in the forests and swamps of central and western Uganda (Fig. 40).

Some ecologists have begun to realize that trypanosomiasis has provided a powerful natural barrier to exploitation and overuse of land. Although the disease has affected large segments of the human and animal population, in this view it has also preserved millions of square kilometers from destruction and maintained

³⁵sources: Clark Univ. 1980. Mukanga. 1971.
de Vos. 1975. Tolba. 1979.
Ford. 1975. USAID. 1979.
Lambrecht. 1966. USAID. 1981a.
May and McLellan. 1970. Wasserman et al. 1974.

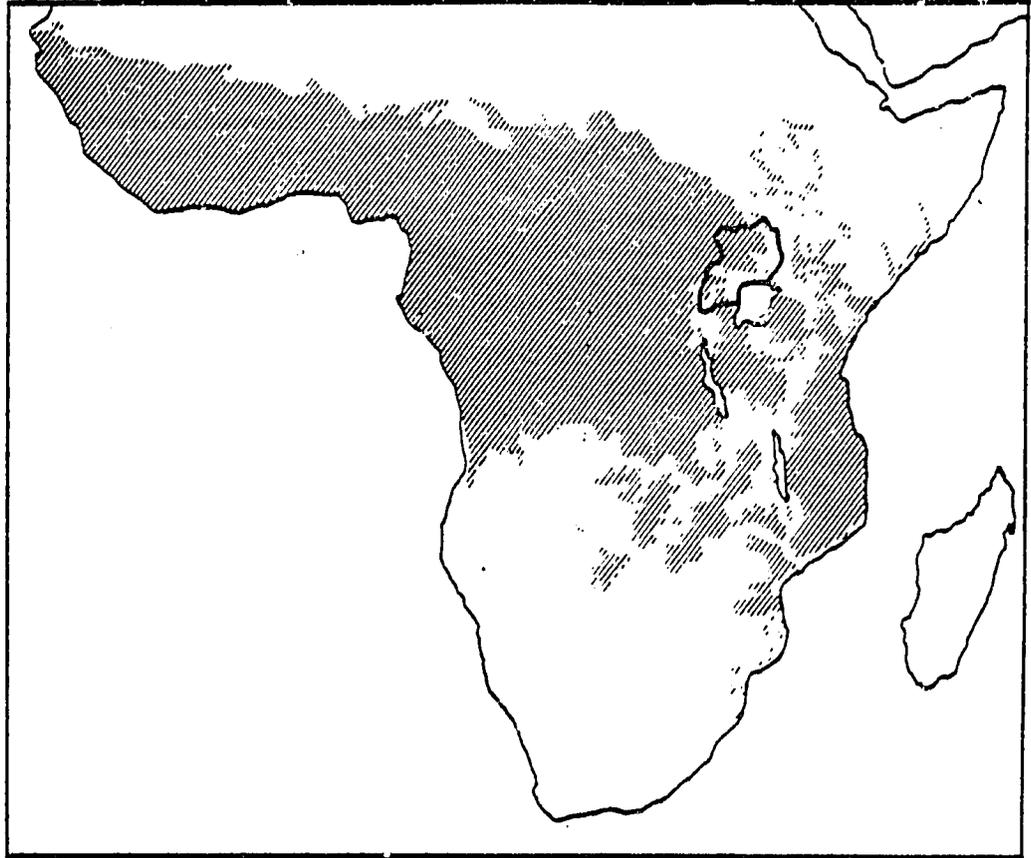


Figure 40. Tsetse Infested Areas of Africa

Source: Adapted from Ford (1975).

environmental equilibrium. Since the early days of European colonization, however, there have been attempts to rid these areas of tsetse flies in order to provide more land for habitation and development. And insofar as the disease reduces human productivity, inhibits livestock breeding, and limits food production, most independent African governments have continued colonial tsetse fly control measures.

Traditionally, in Uganda as elsewhere, these measures were limited to massive applications of insecticides. In the past, such efforts have proven expensive; in 1970 it was estimated that tsetse eradication cost the government an average of US\$ 5.50 per ha (Amman 1970). Additionally, traditional eradication programs have had limited effectiveness, and have proven environmentally detrimental. Recently, planners have considered ecologically more sound measures such as: the introduction of sterile male Glossina spp. into the population-at-large (de Vos 1975); destruction of habitats by burning bush and grasslands (USAID 1979); selective destruction of preferred host populations such as bushbuck, bushpig, kudu, and warthog (de Vos 1975); and innovative land use and animal husbandry policies which include wildlife ranching (Lambrecht 1966; Amman 1970).

Malaria is another prevalent insect-transmitted disease. The protozoan parasite which causes the illness is conveyed by a mosquito vector, Anopheles spp. Because these mosquitos are primarily waterborne, Uganda's large surface area of lakes, swamps and rivers provides a favorable breeding habitat. The disease--Uganda's second most prevalent after measles (USAID 1981a)--is thus very widespread, especially at the lower elevations and in the cities. To date the only method employed to combat malaria has been DDT application. As in other areas of the world where DDT has been employed, Uganda's Anopheles mosquitos are developing resistant strains, pointing to a need for other, more successful approaches to malaria control (Tolba 1979).

Although some DDT and other organochlorine insecticides (OCI) have been employed to control insect populations, not enough has been introduced to pose a serious threat to human health. A 1974 study (Wassermann et al.) showed that Ugandans' adipose tissue contained less OCI than that of other African populations.

A common parasitic disease transmitted by a waterborne organism is bilharzia, or schistosomiasis. The vector for this infection is a water snail whose presence is enhanced by irrigation and other large-scale water development projects. The disease is caused by several species of blood flukes, or flatworms. In Uganda the most prevalent are Schistosoma mansoni which affects humans, and S. bovia, S. matthed, and S. spindale, which are animal varieties of bilharzia. All control methods depend upon interruption of the life cycle of the fluke by draining swamps, eliminating excreta from water, controlling the vector with molluscicides, and reducing human and animal contact with infected water. To date the disease has not been effectively controlled in Uganda (Tolba 1979).

Another major infectious disease affecting Uganda's population is bubonic plague. The illness, transmitted by rat-borne ticks carrying the microorganism, constituted an epidemic in 1935, killing an estimated 2,000 residents. While there has been no recent outbreak of this magnitude, plague has yet to be eradicated. Filariasis, poliomyelitis, typhus, leprosy, roundworm, hookworm, and venereal disease are some of the other common human environmental illnesses present in Uganda. As Section 2.2.5 has indicated, the effects of these diseases are compounded by the inadequacy of health care facilities and a shortage of prophylactic and medicinal supplies. Wildlife, livestock, and fish all are affected by infectious disease. Livestock, as has been noted, are particularly susceptible to trypanosomiasis with the number of cattle consequently reduced substantially. According to one source (de Vos 1975), elimination of the tsetse threat could result in a doubling of the cattle population and substantial increases in meat and milk yields in existing livestock. In addition to trypanosomiasis, two other epidemic diseases continue to afflict Uganda's livestock: rinderpest and bovine pleuropneumonia.

Finally, much of the country's plentiful fish resources is affected by disease. One of the most common infections is Ichthyophthirius multifiliis, a pathogenic skin parasite. It causes high mortality on fish farms and in natural environments. In Uganda the parasite is particularly attracted to Tilapia spp., Barbus spp., guppies, cyprinodonts, and anabantid fish. Of these species, Tilapia are the most resistant to the infection (Paperna 1972).

4.2 Misuse of Land

4.2.1 Problems Caused by Pastoralism ^{36/}

Section 2.3.5 above has noted that much of northern Uganda and extensive portions of the remainder of the country are used for livestock grazing. In Karamoja and parts of Acholi Districts in particular, semi-nomadic pastoralism is the prevailing mode of existence for the resident population (Fig. 19). Partly because most of this region lies outside the principal trypanosomiasis zone, livestock population has grown rapidly over the past several decades, accounting for much of the nationwide increase in cattle population shown in Table 11.

The cumulative effects of grazing by these expanded herds have placed a heavy burden on the forage resources of the area. As herds have exceeded the carrying capacity of grasslands, they have reduced the ground cover through feeding and trampling, and have thereby encouraged irreversible erosion.

Karamoja District, the region most dependent on pastoral livestock raising, has experienced the greatest disruption to its ecosystem. It provides a vivid example of the effects of overgrazing. Perennial grasses have been killed and replaced by plants having lower nutrient requirements and therefore less nutritive value. Frequently, too, such plants are thorny, have unpalatable bark, and cannot be used for grazing. Figure 41 illustrates the process of overgrazing which has been occurring in Karamoja.

Although the destructive aspects of pastoralism have had measurable impact upon Uganda's range resources, there have been few if any studies directed at examining more closely the extent of devegetation caused by Ugandan livestock and other ungulates; nor have these problems been addressed sufficiently by the administration (USAID 1980).

³⁶Sources: Abercrombie. 1974.
de Vos. 1975.
USAID. 1979.
USAID. 1980.

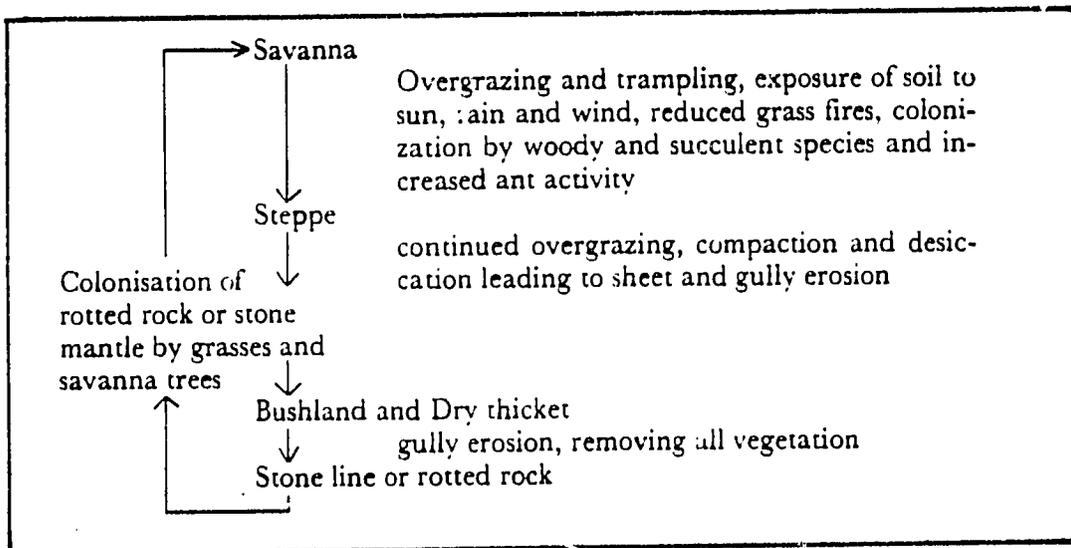


Figure 41. Overgrazing Cycle

Source: de Vos. 1975.

4.2.2 Deforestation and Erosion 37/

As Norman Myers pointed out in 1980, Uganda's moist forests are being disrupted by the country's growing population. The demand for firewood has led to increased exploitation--both legal and illegal--of Uganda's limited timber resources. During the past decade lax enforcement of statutory regulations on forest product use, and lack of control over marauding soldiers have added to the strain on Uganda's forests. The problem is serious in the center and the north, and particularly acute in the east (Clark Univ. 1980). Unfortunately, the rate of deforestation has yet to be measured by remote sensing or other accurate techniques. Table 6, however, provides some indication of the dimension of the problem. Between 1961 and 1977 forested area declined from 32 to 11.7 percent of Uganda's area.

But although the magnitude of the problem is difficult to assess, the combination of forest depletion and devegetation of rangelands is cause for serious concern regarding Uganda's soil resources. According to a 1980 Clark University study, erosion affects the dry regions of the north, northeast and southwest, and some of the humid areas in the vicinity of Lake Victoria. Particularly in the semiarid areas, erosion is accompanied by high rates of reservoir sedimentation.

4.2.3 Land Tenure Problems and Inadequate Agricultural Practices 38/

The British expressed dissatisfaction with the nature of local land tenure arrangements soon after their assumption of Uganda's administration. Partly in order to redefine and consolidate political power, and partly to eliminate what they perceived as inefficiency, British administrators superimposed an alien system of land ownership and management over existing patterns.

³⁷Sources: Clark Univ. 1980. Thomson. 1980.
de Vos. 1975. USAID. 1980.
Myers. 1980.

³⁸Sources: Brock. 1969. Okai. 1972.
Gershenberg. 1971. USAID. 1981c.
Morris and Read. 1966.

In regard to agricultural efficiency, colonial objections to endemic arrangements focused upon the following points: 1) lack of security for the farmer; 2) lack of incentive for conservation and improvement of resources; 3) failure to encourage agricultural credit and investment; and 4) tendency to cause fragmentation and poor utilization of land resources. Even after independence development experts leveled similar criticisms of traditional land tenure systems.

In opposition to this view, Irving Gershenberg (1971) has pointed out several positive features of customary land tenure. Land is not privately owned: in fact, only use of land is actually "owned." Therefore: 1) communities cannot be alienated from land without their consent; 2) each individual is assured of security of tenure; and 3) no community member is left without land. The cumulative impact of the security provided under these arrangements, according to this more sympathetic view, is to offer the farmer greater incentive to use the land efficiently.

Because these and other arguments for and against customary tenure are politically pregnant, it is not possible to arrive at an unbiased conclusion. It is sufficient to observe that while local tenure arrangements undoubtedly are imperfect, they often are uniquely suited to their environments and can thus compensate for inefficiency and other shortcomings. It is difficult to isolate specific features of customary land tenure that are environmentally damaging.

While any clear link between land tenure systems and environmental degradation remains elusive, there is a more apparent relationship between the latter and some of the indigenous agricultural practices. Table 6, which identifies land use patterns from 1961 to 1977, shows that there has been a noticeable increase (from 18.8 to 23.5 percent) in the amount of land under permanent crops. It appears from Table 6 that the additional farmland has been converted from forests and woodlands. The need for additional food production to sustain Uganda's growing population has thus increased human pressure on the nation's forests, already decimated as a result of the demand for firewood.

The primary mode by which forests have been converted to cropland is shifting cultivation,

traditionally one of East Africa's dominant forms of agriculture. While this technique is not intrinsically detrimental to the soil cover (it is naturally destructive of the vegetative cover), its proper application requires a sufficiently lengthy cycle of several years of cropping followed by many years of fallowing. As Erik Eckholm (1976) has pointed out, proper cycling is rarely implemented and soil fertility is not restored. Instead, the tropical soils degenerate, decompose, and begin to erode, thus forcing farmers to shift more rapidly to new plots of land. Modern techniques can, in some instances, alleviate the damage to soil. For example, it has been found that tilling long, narrow strips in cleared forest land minimizes erosion (de Vos 1975). But these and other conservation techniques often are costly and inefficient, and are not readily implemented.

Additional pressure on the land is exerted by inefficient farming practices. Most cultivators, for instance, find it difficult to retain sufficient labor during peak periods of the year. In part, this is due to inadequate and insufficient labor-saving farm equipment. Oxen, though plentiful, are not generally used in plowing. Furthermore, hoes, the traditional implements for tilling, have been in extremely short supply in Uganda. According to one recent estimate, at the height of the country's instability, there was a shortage of six million hoes (USAID 1981c). Antiquated farm management practices, lack of integration between farming and livestock rearing, and equipment shortages have combined to limit productivity and thereby increase pressure on previously forested land.

4.3 Wildlife Extinction ^{39/}

As summarized in USAID's 1979 report to the U.S. Congress, African wildlife serves three major purposes: 1) it contributes to each country's national heritage; 2) it attracts tourism, and thus foreign exchange; and 3) it can provide a valuable source of edible protein. Less tangibly, but perhaps as importantly, each nation's

³⁹Sources: Clark Univ. 1980.
de Vos. 1975.
Edroma. 1973.
Fisher. 1972.

Kingdon. 1973.
Myers. 1971.
Tolba. 1979.
USAID. 1979.

faunal resources constitute an irreplaceable genetic pool. Uganda, as Section 3.4 has suggested, has been particularly well endowed in faunal variety and population size. Perhaps no other African nation has been as fortuitously situated and as amply provided. For that reason, the problem of wildlife conservation is critical to the nation's environmental sustenance.

Yet, as Section 3.4 has documented, Uganda's longstanding legislative and administrative protective measures have proven incapable of eliminating the serious threats to the nation's wildlife. In spite of the creation and maintenance of three national parks and a sizable collection of game reserves, the past ten years have been collectively perhaps the most damaging to Ugandan fauna.

Poaching, a persistent problem in most of tropical Africa, has always claimed large numbers of economically valuable animals in Uganda. Rhino, hippo, buffalo, and especially elephant have been in greatest demand for their hides, flesh, and tusks. Throughout the 1970s population growth, economic hardship, maladministration, and inflated demand combined to increase the threat to these and other mammalian, bird, and reptile species. Tourism, which normally exerts indirect pressure on fauna by causing alterations in natural habitat, fell substantially during most of the decade. As it reemerges as a viable industry, it can be expected to enhance further the threat to wildlife.

Poaching, economic instability, administrative laxity, and population rise all contributed to the crisis facing Uganda's faunal resources. But a single episode has caused perhaps as much permanent damage--particularly to herds of large mammals--as the above factors combined. That event was the 1979 Tanzanian invasion and its immediate aftermath. For profit or gratuitously, soldiers eliminated thousands of large ungulates and hundreds of cats in Ruwenzori National Park alone (Van Orsdol 1979). Elsewhere, both retreating Ugandan troops and invading Tanzanians proceeded to deplete endemic herds. The final toll remains unestimated, but it is clear that the damage was serious and will require many generations' efforts to reverse. As Uganda's administration attempts to steer the country toward stability, it can only be hoped that the value of their remaining faunal resources will not be overlooked.

increased demand; it fell by US\$ 2.5 million from 1977-78 to 1978-79 (Anon. 1980). The manifestation of the effective deterioration in health care is most visible in the increased incidence of infant and child malnutrition, the leading cause of mortality within that age group. Already noted problems of agricultural efficiency, shortage of cropland, and lack of investment capital promise to worsen the food crisis and aggravate malnutrition among Uganda's children.

Increased urban population is the result of several factors. During the 1960s and 1970s Uganda drew a substantial number of immigrants--mostly male workers--from neighboring countries. In 1959 approximately ten percent of the population consisted of permanent resident alien Africans. Although the alien population was reduced in 1972 by Uganda's expulsion of some 50,000 Asians, political events in Zaire, Rwanda, Burundi, and Sudan likely have swelled the total number of immigrants. Many of these persons have settled in Kampala and Jinja. Table 28 shows the number of refugees entering the country between 1970 and 1975.

Internal migration, spurred by the shortage of farmland, lack of security, and industrial expansion along the coast of Lake Victoria, has created serious problems for urban planners. Figure 11 in Section 2.2.3 illustrates vividly the enormous growth of Kampala between 1952 and 1968. Since then the city's population has risen from 330,000 to more than a half million inhabitants. The incoming residents have settled the outer zones of the city in an uncontrolled manner.

The results of the recent settlement pattern have been predictable. The newer areas of the city are not supplied adequately with drinking water, sewage, electricity, paved streets, and other urban amenities. Consequently, these zones are characterized by unsafe and insufficient housing, poor sanitation, and consequent high incidence of infectious disease. Similar conditions prevail in Jinja, Uganda's second city and the center of its hydroelectric industry (Muwonge 1977; Hirst 1975).

In Kampala the water supply currently meets only half of the city's needs. Facilities have failed to keep up with population growth and have been beset by serious maintenance problems. According

Table 28. Refugees Entering Uganda, 1970 to 1975

YEAR	SUDANESE	RWANDESE	ZAIREANS	OTHERS	TOTAL
1970	72,000 (23,000)*	71,000 (37,000)	35,850 (850)	150	178,000
1972	59,400 (18,000)	72,000 (38,000)	34,300 (1,300)	100	165,000
1973	5,680 (80)	73,800 (38,800)	34,300 (1,300)	120	113,900
1974	0 (Nil)	78,040 (40,000)	34,390 (1,390)	98	112,528
1975	0 (Nil)	78,122 (40,082)	34,447 (1,447)	62	112,631

*Figures in brackets stand for refugees in organized settlements.

Source: Kiapi. 1977.

to a 1979 survey by the Commonwealth Fund for Technical Co-operation, neither the facility's filtration mechanism nor its chlorine injection system were functioning. The danger from waterborne infection was thus prevalent throughout the capital.

Sewage treatment in Kampala, according to the same report, was in equally serious disrepair. The sewerage plants there and in Entebbe and Jinja were all considered virtually nonoperational. Pumps and other equipment which functioned properly in 1970 were not in use in 1979. The report noted that raw effluent was flowing via the Nakivubo Channel into Lake Victoria, just three miles from the intake point of Kampala's water supply at Gaba (Seers et al. 1979).

Because new city residents are economically backward and generally disenfranchised, the government has done little to alleviate the problems of the urban environment. In fact, Uganda's strained budget allocated 27.2 percent less to housing and public buildings in 1978-79 than in 1976-77 (US\$ 11 million vs 15.1 million). It is perhaps noteworthy that during this same period prison expenditures rose from US\$ 15.4 million to 24.9 million, not an unrelated occurrence in light of the serious rise in crime in the newly-settled urban areas (Muwonge 1977; Anon. 1980).

4.4.2 Industrial Pollution ^{41/}

Although information concerning industrial pollution is scarce, most sources agree that it does not yet constitute a serious environmental problem. Industrial development in Uganda has yet to attain a sufficiently high level to cause concern.

Among existing industries whose growth may begin to pose potential problems are food and beverage processing (especially coffee); fertilizer, cement, and chemical production; mineral refining; and textile manufacturing. Table 29 lists the production of Uganda's major manufactured goods.

⁴¹Sources: de Vos. 1975.
USAID. 1979.
World Bank. 1980.

Table 29. Production of Manufactured Goods, 1970 to 1978

	1970	1971	1972	1973	1974	1975	1976	1977	1978 ^{1/}
Beverages (Waragi) ('000 liters)	564	598	729	910	814	859	543	526	408
Beer (million liters)	28	35	38	46	44	39	23	22	..
Cigarettes (billions)	2	2	2	2	2	2	2	2	..
Pipe tobacco (tons)	127	126	127	96	82	108	115	98	..
Cotton and rayon fabrics (million sq. meters)	50	46	48	38	36	34	39	36	25
Blankets ('000 pieces)	1,164	1,396	1,204	863	315	309	619	663	595
Soap ('000 tons)	13	14	14	6	5	4	3	1	1
Matches, small size ('000 cartons) ^{2/}	49	55	43	39	25	25	13	10	4
Matches, large size ('000 cartons) ^{3/}	-	4	7	5	5	6	4	-	1
Superphosphates ('000 tons)	25	24	23	19	14	4	2	1	-
Steel ingots ('000 tons)	24	27	22	14	12	8	8	9	3
Corrugated iron sheets ('000 tons)	12	14	13	5	4	1	1	2	2
Cement ('000 tons)	191	205	166	143	153	98	88	71	50
Paints (million liters)	2	2	2	1	2	1	-	1	1
Blister Copper ('000 tons)	17	16	14	9	9	8	5	2	2

^{1/} Preliminary^{2/} Cartons of 10 gross small-size matchboxes^{3/} Cartons of 200 large-size matchboxes

Source: World Bank. 1980.

At present there are no laws regulating industrial pollution (Johnson and Johnson 1977), and the government, preoccupied with other priorities, is unlikely to initiate such measures in the near future.

4.5 Environmental Management Problems and the Effects of Internal Disorder

4.5.1 Transportation and Communications Infrastructure ^{42/}

By comparison to most of its neighbors, Uganda is relatively well-covered by trunk roads (Fig. 42). There are just under 7,000 km of main roadway, of which 2,000 km are paved (Fig. 43), the remainder graded and drained (Clark Univ. 1980). In addition, the country is served by another 20,000 km of secondary, unsealed, ungraded roadway.

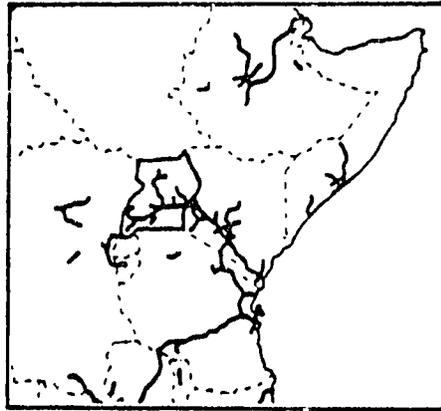


Figure 42. Trunk Roads in Eastern Africa

Source: O'Connor. 1978.

Similarly, the two railway lines which trisect Uganda provide adequate coverage (Fig. 43). Together the lines run about 1,300 km, connecting the eastern town of Tororo with the Kilembe copper mines near Kasese, and with the northwestern town

⁴²Sources: Anonymous. 1980.
Burgess. 1976.
Carroll. 1980.
Clark Univ. 1980.
Hazlewood. 1964.

O'Connor. 1978.
Seers et al. 1979.
USAID. 1981a.
World Bank. 1980.

of Pakwach. Prior to 1956 there were only some 550 km of track, extending from Tororo only as far as Kampala and Soroti. The Kilembe mine region was connected that year, and by 1964 the network had reached its present extent (O'Connor 1978).

Supplementing roads and railways are Uganda's more traditional waterways and limited modern air transport facilities. Steamships continue to carry wares and passengers across the major lakes and along navigable rivers. Entebbe airport, just south of the capital, is served by the Uganda Airlines Corporation and by international lines.

Together, the water, road, rail, and air transport systems serve four major related functions: 1) link Uganda to the East African coast, expediting international trade; 2) facilitate internal marketing of crops, minerals, and other commodities; 3) enhance distribution of services; and 4) permit administrative control.

Road, rail, and air traffic all increased markedly during the early 1970s. The quality of service, however, began a steady decline with the 1972 expulsion of Asians, who dominated the transport sector. General administrative inefficiency; low morale; poor technical training; and lack of materials, spare parts, labor and capital have contributed to disrupt Uganda's once efficient transportation infrastructure. All aspects of the system have been affected seriously, and the railways have been hampered further by the nullification of the East African common services agreement which facilitated trade between Uganda, Tanzania, and Kenya.

The situation with regard to transport and communication, already grave prior to 1979, sustained an even more damaging shock during the war. Vehicles were commandeered and subsequently destroyed. The nation's estimated 1,600 trucks in July 1979 represented just a fifth of the size of the 1970 fleet, and half as many as were on the roads prior to the fighting. Similarly, railroad tracks and rolling stock were destroyed or rendered inoperative, while stations were burned and looted. Comparable damage was done to the nation's telephone, telegraph, and radio transmission systems which were in a state of near total collapse by the summer of 1979 (Seers et al. 1979; USAID 1981a).

The transport bottlenecks thus created sharply reduced Uganda's internal and external trade. In turn, both goods and foreign exchange became far more scarce. The country's magendo, or black market, economy--always an official concern--extended to unprecedented levels.

By aggravating an already troublesome situation, the deterioration of the country's transportation facilities have thus augmented existing environmental problems. Shortages of produce, for example, exacerbate the undernourishment problem. Scarcity of capital inhibits investment in resource management programs while retarding maintenance of existing facilities. Inability to travel and communicate prevents administrators, researchers, and technicians from ameliorating problems already threatening the nation's resources. Until the transportation and communications networks are restored to their former level of efficiency, therefore, Uganda is not likely to remedy its chief environmental concerns.

4.5.2 Training Facilities and Administration ^{43/}

All of the recent problems affecting Uganda's transportation and communication infrastructure exist in regard to overall facilities and administration. At one time the Ugandan government attempted to fulfill its commitments to maintaining the country's environment and preserving its resources. A series of legislative measures sought to restrict use, tax revenue, and punish offenses relating to public lands and their products. Public research institutions, the state university and federal ministries sought to train a qualified cadre of physicians, technicians, scientists, enforcement officers, administrators, and policy makers.

While Uganda had not solved its environmental problems, it was beginning to achieve some successes in containing and managing them. The

⁴³Sources: Jiwani. 1973.
Seers et al. 1979.
USAID. 1979.
World Bank. 1980.
Zümer. 1971.

eight-year administration begun in 1971 reversed much of the progress of the preceding decades. Its policies encouraged ethnic struggles which: hampered effective management of natural resources; discouraged conservation measures on public lands; allowed government agencies and facilities to lapse into inefficiency and disrepair; damaged Uganda's trade balance by worsening relations with neighboring states; and isolated the nation's researchers by restricting freedom of information and participation in international conferences and fora.

As with transportation and communications, a tenuous situation reached crisis proportions during the 1979 war. The loss of life and property damage sustained depleted the country of its trained personnel; destroyed physical structures; damaged farmland and crops; created critical shortages of equipment, tools, parts, medicine, and essential food supplies; spread infectious disease; decimated the wildlife population; and undermined the discipline and organization of the entire economy.

Together these factors precluded any further advances in environmental training, research, planning, management, law enforcement, and legislation. Instead, the nation's entire natural resource setting was set back perhaps irreparably. It is too soon since these events, and information remains too scarce to determine the degree of improvement during the intervening thirty months. Since 1979 there has been another change in government and it is difficult to know the extent to which stability has been restored. The post-war governments have attempted to revitalize Uganda's economy, which in 1970 was one of the region's most viable. Insofar as magendo can be eliminated, infrastructure rebuilt, and investment encouraged, the environment will benefit directly. Until those goals can be partially achieved, environmental resource management will remain of secondary concern to the administration.

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Appendices

- I. Demographic and Economic Characteristics
- II. Land Tenure, Agriculture, and Forestry Legislation
- III. Vegetative Community Surveys
- IV. Wildlife Information
- V. Natural Resources Legislation
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Appendix I. Demographic and Economic Characteristics

Table 1. Vital Statistics

Table 2. Midyear Population Estimates and Average Annual
Period Growth Rates

Table 3. Economic Characteristics

Table 4. Economically Active Population, 1960 to 1970

Table 5. Employment, 1975 to 1978

Table 6. Annual Budget, 1977-78 to 1979-80

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Table 1. Vital Statistics

		Source
Total population (millions), 1979	12.8	b
Population density per sq km of land, 1979	64.1	b, c
Population density per sq km of cropland, 1979	231.0	b, c
Percentage of population in urban areas, 1980	12.0	b
Urban population growth rate (percent per year), 1970-80	7.0	b
Average annual population growth rate (percent), 1970-79	3.0	b
Crude birth rate per 1,000, 1979	45.0	b
Total fertility rate (percent), 1979	6.1	b
Crude death rate per 1,000, 1979	14.0	b
Life expectancy at birth, 1979	54.0	b
Infant mortality rate per 1,000 live births (0-1 year), 1979	136.0	a
Population per physician, 1977	27,600.0	b
Average daily caloric intake, 1977	2,110.0	b
Percentage adult literacy	n.a.	
Per capita share GNP (US\$), 1979	290.0	b

a USAID. 1981a.

b World Bank. 1981.

c Table 6.

Table 2. Midyear Population Estimates and Average Annual Period Growth Rates (population in thousands, rate in percent)

Year	Population	Year	Population	Period	Average annual growth rate
1950	5,522	1975	11,080	1950-55	2.7
1955	6,328	1976	11,383	1955-60	2.8
1960	7,286	1977	11,716	1960-65	2.9
1965	8,432	1978	12,061	1965-70	3.0
1970	9,806	1979	12,418	1970-75	2.4
1971	10,097	PROJECTED ESTIMATES		1975-80	2.9
1972	10,345	1980	12,806	1980-81	3.2
1973	10,534	1981	13,222		
1974	10,789				

NOTES: 1950-79 - Based on the 1969 and 1980 censuses and assumed population growth rates taking into consideration U.N. (1981) estimates for 1950 to 1970, the growth rates from the official projected estimates based on the 1969 census (Ministry of Finance, Planning and Economic Development, 1979, table 5.8), refugee movement during the period 1969 to 1980 (U.N.G.A., 1969 - 1980), and the irregular events which occurred in Uganda from 1971 to 1979.

1980-81 - Projected based on the 1980 census population and assumed trends in the rate of natural increase and refugee movement, taking into consideration the growth rates from the official population projections.

Source: U.S. Dept. Commerce. 1981.

Table 3. Economic Characteristics

Gross National Product (GNP)	
Total (millions of US\$), 1978	3,260a
Per capita (US\$), 1979	290
Gross Domestic Product (GDP), 1979	
Total (millions of US\$)	8,410
Agricultural sector, total (millions of US\$)	4,625
Agricultural sector, growth rate (1970-79)	0.8%
Industrial sector, total (millions of US\$)	589
Industrial sector, growth rate (1970-79)	-7.9%
Manufacturing subsector, total (millions of US\$)	505
Manufacturing subsector, growth rate (1970-79)	-5.0%
Services sector, total (millions of US\$)	3,196
Services sector, growth rate (1970-79)	0.1%
Structure of Labor Force	
Agriculture, 1979	83.0%
Industry, 1979	6.0%
Services, 1979	11.0%

^a World Bank. 1980.

Source: World Bank. 1981.

Table 4. Economically Active Population, 1960 and 1970

	1960			1970		
	Males	Females	Total	Males	Females	Total
Agriculture, etc.	1,925	1,082	3,008	2,353	1,310	3,663
Industry	111	12	122	176	20	196
Services	177	58	235	295	108	404
TOTAL	2,213	1,152	3,364	2,824	1,438	4,262

Source: Europa. 1980.

Table 5. Employment, 1975 to 1978

	1975	1976	1977	1978
Agriculture, forestry and fishing	70.9	78.2	76.6	81.1
Mining and quarrying	4.2	4.1	4.1	3.6
Manufacturing and electricity	58.6	54.0	51.9	51.7
Construction and water supply	48.2	45.5	46.9	48.9
Private commerce	13.6	18.5	12.8	18.3
Transport, storage and communications	13.0	13.1	12.4	10.0
Services*	162.8	152.0	158.1	158.2
TOTAL	371.3	365.4	362.8	371.8

* Including commerce of the public sector.

Source: Europa. 1980.

Table 6. Annual Budget, 1977-78 to 1979-80

REVENUE	1977/78*	1978/79*	1979/80*	EXPENDITURE	1977/78	1978/79*	1979/80*
Income tax	308.4	290.6	368.8	Office of the President	124.4	80.3	88.8
Selective income levy	5.0	10.6	12.0	Finance, planning and economic development	65.5	88.9	300.5
Export taxes	4,451.0	873.0	1,100.1	Agriculture and forestry	200.7	190.4	192.0
Customs duties	229.9	248.8	484.3	Animal resources	108.5	98.9	115.7
Excise duties	135.0	67.8	100.0	Land and natural resources	72.1	72.8	83.6
Transfer taxes	3.0	—	—	Education	735.4	806.8	947.7
Sales tax	1,101.3	872.0	1,252.5	Health	405.7	258.4	287.2
Service and production taxes and commercial transactions levy	24.0	29.9	23.5	Housing, public buildings and works	202.5	98.2	158.9
Fees and licences	43.0	75.8	77.2	Defence	833.5	799.4	482.5
Public sector investment contribution	—	554.5	730.0	Police	184.9	137.9	131.6
Miscellaneous receipts	264.3	132.6	156.6	Prisons	158.5	156.9	160.7
				Provincial administrations	159.5	141.5	225.6
TOTAL	6,568.2	3,152.6	4,305.0	TOTAL (incl. others)	3,592.2	3,444.6	3,755.8

* Estimates.

Note: These figures differ substantially from those published by Europa Publications in the Europa Year Book, 1980.

Source: Europa. 1980.

Appendix II. Land Tenure, Agriculture, and Forestry
Legislation, to 1977

Agricultural By-Laws (Bunyoro) (L.N. 84), 1960
Bugisu Coffee Act (Cap. 232), 1962
Cattle Grazing Act (Cap. 223)
Cattle Traders Act (Cap. 224)
Coffee Act (Cap. 230), 1963
Coffee Ordinance (No. 15), 1959
Coffee (Export Duty) Act (Cap. 181)
Cotton Act (Cap. 233), 1952
Cotton Price Assistance Fund (Special Provisions) Act (Cap. 235),
1959
Crown Lands Ordinance (No. 2), 1903
Crown Lands (Declaration) Ordinance (No. 3), 1922
Crown Lands (Compensation to Africans) Regulations, 1951
Crown Lands (Adjudication) Rules (L.N. 91), 1956; and (L.N. 258),
1959
Forest Act (CH 246), 1948
Forest Reserves (Declaration) Order, 1948
Forest Rules, 1948
Forest (Pest Control) Rules, 1948
Local Forest Reserves, 1948
Land Succession Law (Buganda), 1912 (1951 Revision)
Land Tax Law (Buganda), 1939
Landlord and Tenant Law (Buganda), 1937
Landlord and Tenant Law (Toro), 1937
National Park Ordinance (No. 3), 1952
Regulations of Importation of Plants Order (Inst. 163), 1964
Tea Act (Cap. 240), 1961
Town and Country Planning Ordinance, 1951
Towns Planning and Building Law, 1958

Sources: Johnson and Johnson. 1977.
Morris and Read. 1966.

Appendix III. Vegetative Community Surveys

- Table 1. Forest Vegetation in West Ankole District
- Table 2. Species Distribution in Impenetrable Forests of Kigezi District
- Table 3. Composition of Impenetrable Forests of Kigezi
- Table 4. Mafuga Forest Composition in Kigezi
- Table 5. Vegetation in Kigezi
- Table 6. Plants occurring in Uganda in 1902

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Table 1. Forest Vegetation in West Ankole District

Key to Locations of Species

K = Kalinzu

K-K = Kasyoha-Kitomi and Kakasi

M = North and South Maramagambo

ACANTHACEAE

- Acanthus arboreus* Forst. K, M, K-K
 Along forest margins and in openings through K and K-K, and long east and north of M. Abundant colonising shrub
- Brillantaisia nitens* Lindau. K
 Common shrub, 2-5 m., along roadsides in disturbed forest.
- Pseuderanthemum ludovicianum* (Burm.) Lindau. K-K
 Small straggling shrub under closed forest in northwest border of K-K, e.g. at river Ngoro. TJS. 290.
- Whitefieldia elongata* (Beau) C.B.Cl. M
 Woody plant under mature forest, found in South M, c. 3 km. from east end of Biteriko track. TJS. 350.

AGAVACEAE

- Dracaena fragrans* (L.) Ker-Gawl. K, M, K-K Ekigologolo (A,K).
 Small shrub, occasionally up to 8 m. or more, found under closed forest in all areas, usually in places with accessible ground-water.
- Dracaena steudneri* Schweinf. ex Engl. K, ?M
 Common on fringe of Kalinzu forest above lake Rutoto. Also possibly this sp. found at north end of North M by bat caves.

ALANGIACEAE

- Alangium chinense* (Lour.) Rehder K, K-K
 Recorded as occasional in Medium Quality *Maotopsis* Forest Type 1 - by Cahusac. Also collected in north K by Eggeling, and near lake Rutoto.

ANACARDIACEAE

- Lannea veluticarpa* Engl. M
 One reported seen in South M by Eggeling 1936. (W.P.)
- Pseudospondias microcarpa* (A. Rich.) Engl. K, M, K-K
 Found occasionally throughout forest area, often very large, usually beside streams or in valleys.
- Rhus natalensis* Berch. ex Krauss M
 Found occasionally in scrub and near rivers on west margin of M.
- Trichosecypha submontana* Van der Veken K. Omushaya (A).
 Occasional, but locally frequent, in some areas of mature forest in K., e.g. Cpt. 6 and 7.

ANNONACEAE

- Cleistopholis patens* (Benth.) Engl. & Diels. M
Large tree, 20 m. or more, dominant in area of swampy riverine forest north of M in Queen Elizabeth Park.
- Monodora angolensis* Welw. K
Rare understory tree or shrub, recorded in K (I.T.U.)
- Monodora myristic* (Gaerth) Dunal. K, K-K Omoho (A).
Forest tree found occasionally in mature forest in K, in the older areas of K-K e.g. above Kyabakara, almost always near streams or in valleys but occasionally on hillsides.
- Uvariadendron magnificum* Verdc. K-K
Small tree or large straggling bush mainly in valleys under mature forest. Found besides main track across river Ngoro and locally abundant east of Kyabakara. This forest area is the only known locality for this species.
- Uvariopsis congenita* Robyns & Ghesquiere M
Tree locally frequent beside lake Nyamsingiri in relatively young forest.

APOCYNACEAE

- Alstonia brunei* De Wild. K
Very rare, in mature forest areas. Has been found as large trees and as seedlings.
- Funtunia latifolia* (Stapf.) Stapf ex Schltr. K, K-K Munyamitunga (A),
Munyamagosi (K).
Widely distributed in K, and in mature forest mainly in the south west of K-K.
- Gabunia odoratissima* Stapf. K
Frequent understory shrub or small tree, growing with *T. holstii*. TJS. 355.
- Pleiocarpa pycnantha* (K. Schum.) Stapf. K Nyakatoma (A).
Frequent understory tree or shrub in mature forest, both in Parinari and in mixed types. TJS. 410.
- Rauvolfia oxyphylla* Stapf. K, M, K-K
Infrequent but widely distributed from the south of south M up to central K-K where it is seldom seen. Usually a shrub or small tree in relatively young or open areas sometimes beside swamps, but occasionally a large tree. TJS. 202 from beside swamp in South M identified as *R. caffra*, but probably *R. oxyphylla*.
- Rauvolfia vomitoria* Afz. M, K-K
Shrub or small tree in mixed forest in west M Also in forest associated with river Ngoro. TJS. 446.
- Saba* sp. M
Climber, reported by Osmaston in Nchwera valley, South M, (as *Landolphia* sp.) in W.P. *Saba florida* Bullock recorded at river Ishasha by J.M.L.
- Strophanthus prusii* Engl. & Pax. K-K
Climber. Single specimen collected in forest beside river Ngoro. TJS. 478.
- Tabernaemontana holstii* K. Schum. K, M, K-K Mubakampungu (A)
Kinyamagosi (K).
Frequent understory shrub or small tree, abundant under mature forest especially in K. Less common in drier areas of M and K-K where it is restricted to well established young forest and valleys. Seldom seen below 1050 m.
- Tabernaemontana usambarensis* K. Schum. M, K-K
Occasional understory shrub in lower, drier forests. Frequent in parts of North M and found under mixed relatively young forest in south and west South M and around Kyabakara. Usually below 1100 m.
- Voacanga obtusa* K. Schum. K-K, ?M
Small tree growing in the open usually near streams. Found near Kakasi and beside river Katerere. K-K. TJS. 333, 374. Reported growing in valley on east margin of South M.

ARALIACEAE

- Polyscias fulva* (Hiern.) Harms. K, M, K-K Mutagu, Mungu (A),
Mungwe, Omungu, Omurugi Webina (K).
Abundant in young forest, and on forest edges. Occasionally a large tree up to 25 m in mature forest in K. Rare in M and in low drier areas of K-K.
- Schefflera* sp. K, M.
Woody liane. Recorded in Nchwera valley, South M by Osmaston, (W.P.) and in K by Lock.

ASCLEPIADACEAE

- Dregea abyssinica* (Hochst) K. Schum. M
Woody climber to 6 m. or more. Common in drier parts of north and west M.
Sarcostemma viminalis (L.) R. Br. M
Leafless climber found in riverine scrub along west margin. Infrequent.

BEGONIACEAE

- Begonia emini* Warb. K
Woody plant, 1 m., collected in K young mixed forest east of Kirambi Glade.
TJS. 429.

BIGNONIACEAE

- Kigelia africana* (Lam) Benth. K, M, K-K *Omwejuzo* (K).
Found as small tree throughout forest area from the south of South M up to Kakasi. Usually in young mixed forest or openings or on forest edges. Rarely found in mature forest at relicts of previous openings.
Markhamia platycalyx Sprague K, M, K-K *Omushambya* (A), *Omusarvu* (K).
Abundant throughout forest area in mature first generation forest, and in young, mixed, or colonising forest, and in forest edges. Often found in mature forest in recent or old openings.
Spathodesa nilotica Seem K, M, K-K *Munyara* (A), *Ekiyurafura* (K).
Frequent throughout forest area, in similar habitats to *Markhamia*.
Stereospermum kunthianum Cham. K-K
Noted in savanna woodland north of K-K above lake George.

BOMBACACEAE

- Bombax buonopoxense* Hiern. M *African Kapok tree*.
One very large tree found beside Biteriko track on east boundary of South M.
The exotic Kapok tree, *Ceiba pentandra*, has been planted in a few places, mainly in Bunyaruguru county near roads.

BORAGINACEAE

- Cordia africana* Lam K, M, K-K *Muzugangoma* (A), *Omujugangoma* (K).
Occasional throughout forest area, usually in young, mixed or colonizing forest, or on forest edges. Sometimes found growing to large sizes among more mature forest, e.g. in South M fuel area, by North M bat caves, and in K. Also known as *C. abyssinica* R.Br.
Cordia millenii Bak.
Occasionally reported from all forest areas, but not confirmed and probably confused with large *C. africana*.
Cordia ovalis D.C. M
Found in scrub near river Kaizi, and beside river Nyamweru. Both localities close to Ishasha road in west border of M.

- Ehretia cymosa* Thonn. K *Omukobokobo* (A), *Omukobakoba*, *Otukambu* (K).
Found in open hillside forest in south K, probably occurring more widely in scrub, forest edges, and openings. TJS. 360.

BURSERACEAE

- Canarium schweinfurthii* Engl. K *Nyegya* (K).
Very rare, found as large tree in mature forest. Also noted beside stream below Biteriko, several km east of South M.

CANELLACEAE

- Warburgia ugandensis* Sprague K, M, K-K *Mwiha* (A).
Large trees occasional in old forest in K and K-K, more frequent in old mixed and *Cynometra* forest in east and central M. Young trees frequent in mixed and colonising forest in south and west M. Large trees frequently have bark stripped off for use as vermifuge.

CAPPARIDACEAE

- Capparis erythrocarpos* Isert. M
Noted by Osmaston in scrub on west margin of M. Not confirmed
Capparis fascicularis DC. M
Shrub, rare in forest, frequent on Ishasha river flats.
Capparis ?sepiaria L. M
Occasional shrub in scrub along west margin. (J.M.L.)
Capparis tomentosa Lam. M
Abundant along west margin. Characteristic of thickets and colonising scrub.
Euadenia eminens Hook. f. K, K-K

- Uncommon understory shrub. Found under mature forest in K in felling area and below Rubare ridge, also in K-K under young forest west of Bihanqa, on road alignment. TJS. 242, 342.
- Maerua duchesnei* (De Wild.) F. White. M, K-K
Understorey shrub or small tree. Found occasionally in west M mainly in valleys or riverine forests; also beside river Ngoro in K-K, on road to Kyabakara. TJS. 210, 380.
- Maerua edulis* (Gilg. & Bened.) De Wolf. M
Dwarf shrub in grassland along west margin. (J.M.L.)
- Maerua triphylla* A. Rich. M Memenwa (A).
Frequent in thickets west of M. (J.M.L.)
- Ritchiea albersii* Gilg. K
Large shrub, found in harvested mature forest. TJS. 346.
- CELASTRACEAE**
- Cassine aethiopica* Thunb. M, K, K-K Omusongati (K).
Noted by Osmaston in Ruhewa valley, on east margin of South M and collected from Ntungwe valley near Ishasha. (J.M.L.). Also collected on north side of Rubare ridge. (J.B. Ball).
- Hippocratea indica* Willd. M, K-K
Frequent climber in young forest in north and west M. Also collected in young forest near river Ngoro. K-K. TJS. 252.
- Maytenus ovatus* (Wight & Arn.) Loes. var. *argutus* (Leos.) Blakelock K-K
Small tree 7 m, collected near river Ngoro. K-K. TJS. 445
- Maytenus senegalensis* (Lam.) Exell. M Mubambanjobe (A).
Savanna bush or small tree along east border of South M.
- Maytenus undatus* (Thunb.) Blakelock. M
Understorey tree, frequent in young or colonising forest along west margin, but also under mature forest in central South M. TJS. 305.
- COMBRETACEAE**
- Combretum guinzii* Sond. K, M, K-K Murama (A).
Savanna tree on east and south margins of M, and in grassland and on hills, within and around K and K-K. Large rel.c tree, probably of this species, found in medium-aged forest at Rwensama fuel-cutting area, on hillside, in western South M.
- COMPOSITAE**
- Microglossa afzelii* O. Hoffm. M
Climber or scrambler collected in western South M. (J.M.L.)
- Microglossa densiflora* Hook. f. M
Small shrub collected in western M. (J.M.L.)
- Vernonia* spp. M, K-K, K
Small bushes found in colonising forest or regeneration. Noted by L. Nyamasingiri (*V. brachycalyx* O. Hoffm.).
- CONNARACEAE**
- Agelaea ugandensis* Schellenb. M, K
Noted in F.T.E.A. occurring at Bwambara, at south end of South M. Climber. Also collected in K. (TJS. 419).
- Connarus longistipitatus* Gilg. K
Noted in F.T.E.A. Climber.
- Jaundea pinnata* (Beauv.) Schellenb. K, M, K-K
Climber or small shrub, found throughout forest area in young and old forest. TJS. 231, 318.
- CONVOLVULACEAE**
- Stictocardia beraviensis* (Vatke) Hall. f. M
Climber with fine red flowers in mixed forest in west and north M, often in wetter places.
- CYATHEACEAE**
- Cyathea manniana* Hook. K, K-K Kinyaruba (A), Kigunju (K).
Locally abundant beside streams and rivers in mature forest.
- DICHAPELALACEAE**
- Tapura fucheri* Engl. M
Bush or multi-stemmed small tree in riverine scrub or forest. Recorded beside

river Ntungwe and river Nyamweru, near Ishasha road, and near river Nchwera at fuel-cutting area. (TJS. 212).

EBENACEAE

- Diospyros abyssinica* (Hiern.) F. White. K, M, K-K Omuhoko (A, K), Nserere (K).
Frequent throughout much of M with large old trees among the mature mixed forest in the east, and younger trees, often in apparently even-aged stands in the west. Also frequent in certain areas of mixed forest in north and west K-K. Occasional in many parts of K, particularly in hill forest.
- Euclea divinorum* Hiern. M Mitiki (A).
Reported in Rwensama area, in dense scrub west of South M. Possibly the same as *E. latidens*. (W.P.)
- Euclea latidens* Stapf. M
Frequent in scrub and woodland throughout west margin.

ERICACEAE

- Agauria salicifolia* (Comm. ex Lam) Hook f. ex Oliv. K Musegowa, Musengura (K).
Rare, in grassland or woodland on hills. Reported occasional on Nkombi Ridge (W.P.).
- Philippia benguelensis* (Engl.) Britten K, K-K
Omuhugye, Mugonja (A), Omuhugye, Munyabusisi (K)
Frequent in grassland and woodland on hills and ridges.

ERYTHROXYLACEAE

- Erythroxylum fischeri* Engl. M
Frequent in closed woodland along west margin. TJS. 211, 462.

EUPHORBIACEAE

- Acalypha* spp. M
Recorded by Eggeling and Lock in South M. *A. bipartita* Muel. Arg., and *A. villicaulis* Hochst. ex A. Rich. have been collected. (J.M.L.)
- Alchornea cordifolia* (Schum. & Thonn.) Muell. Arg. M
Found in swamp and lakeside around Ishasha. (J.M.L.)
- Alchornea hirtella* Benth forma *glabrata* (Prain.) Pax et K. Hoffm. K, M, K-K
Ekitigando (A), Ekigogwa, Orushogwa, (K).
Understorey shrub, occasional throughout forest area, especially on forest edge and in openings. TJS. 284, 353.
- Antidesma laciniatum* Muell. Arg. var. *membranaceum* Muell. Arg. M, K-K
Understorey tree, occasional in mature mixed forest in central and west South M Also collected in North Kitoro forest. TJS. 234
- Argomuellera macrophylla* Pax. M, K-K
Understorey shrub, frequent, in mature Cynometra forest including dwarf forest along river Kaizi. Also found under mature mixed forest east of Kyabakara. K-K
Recorded by Osmaston in these M habitats under the non-existent name of *A. schweinfurthii*.
- Bridelia brideliifolia* (Pax.) Fedde and *B. micrantha* (Hochst) Baill. K, K-K
Katata, Mujiji (A), Omuji, Omujimbo, Mubambantoni (K)
Frequent in savanna, and on edges of forest. TJS. 334. Relative distribution of the two species is uncertain.
- Croton macrostachyus* Del. K, M, K-K Omulangara (A), Murangara (K).
Frequent in grassland and bracken, on forest edge and colonising forest and is relatively mature forest of colonising species. In M noted only in extreme south (Bwambara) and north (Nyamasingiri).
- Croton megalocarpus* Hutch. K, K-K Mutugunda, (A), Omutakula, Omuyuni (A).
Occasional, locally abundant, in mature forest and in young forest of colonising species in K. Also occasional in the richest mature forest in K-K. TJS. 323.
- Drypetes bipindensis* (Pax.) Hutch. K
Small tree recorded in I.T.U. Eggeling 3628.
- Drypetes* sp. aff. *D. battiscombei* Hutch. K, K-K Mushabarara (A), Kakoba (K)
Very abundant large understorey tree, throughout mature areas of K.
Drypetes sp. probably this species, also frequent in mature areas of K-K.
- Drypetes* sp. aff. *D. leonensis* (Pax) & K. Hoffm. K Mushabarara (A)
Forest tree, collected in K.
- Elaeophorbia drupifera* (Thom. ex Schum. & Thonn.) Stapf. M
Noted in Ruhewa and Nchwera valleys in west, and in areas of mature mixed forest throughout central South M. This may be wrongly named.

- Erythrococcus bongensis* Pax. M
Abundant shrub in young forest and colonising scrub along west margin. TJS. 262.
- Euphorbia candelabrum* Trem. M Enkukuru (A).
Trees of all ages found in scrub and savanna along north and west margins, and old relicts found deeper in the young mixed forest.
- Euphorbia dawei* N.E.Br. M
Frequent tree in woodland and scrub along west margin; locally abundant especially along steep sides of river valleys.
- Macaranga kilimandscharica* Pax. K, K-K Omuburashasha, Omurara, Omusasa (K).
Abundant in K, mainly on forest edges and in young forest. Recorded as abundant in Medium Quality *Maesopsis* forest in K-K. (Cahusac, W.P.)
- Macaranga monandra* Muell. Arg. K, K-K Omurara, Omufuralura (K).
Frequent in certain areas of young forest in northeast K-K, along first part of road into forest from Bihanga, especially around grassy openings. Also collected in mature but relatively open forest in K.
- Macaranga pynaertii* De Wild. K-K
Recorded by J. Ball in poor forest in the central part of the northwest border of K-K. (W.P. Appx. 3). Not confirmed.
- Macaranga schweinfurthii* Pax. K, M, K-K Mukokoma (A).
Abundant along rivers and in swampy ground throughout forest area.
- Meisneria phyllanthoides* Baill. M
Dwarf shrub in mature forest dominated by *Cynometra*. J.M.L. 68/314
- Neoboutonia macrocalyx* Pax. K, K-K Kinyabuhere (A), Omwanya, Echanya (K).
Frequent in K especially around swampy areas. Recorded for similar habitat in K-K. TJS. 268A.
- Neoboutonia melleri* (Muell. Arg.) Prain M, K, K-K
A tree of valley bottoms and swampy areas. Collected around lake Nyamasingiri in M, and in valley in K. TJS. 214, 218, 475. Reported common in swamps in K-K. The relative distribution of these two *Neoboutonia* spp. is uncertain.
- Phyllanthus discoides* (Baill.) Muell. Arg. K, M, K-K
Muremampango (A), *Omukale*, *Omusingati*, *Omuhahara* (K).
Occasional small tree on forest edges and in young forest. Sometimes a large tree up to 30 m in mature forest on hillsides in K. Recorded in central and eastern areas of South M.
- Phyllanthus inflatus* Hutch. K, K-K
Small tree or shrub. Rare. Collected once under mature forest on north side of K-K near Kyabakara. TJS. 383. Recorded in K in I.T.U.
- Ricinodendron heudelotii* (Baill.) Pierre ex Pax. M
One tree reported by Egeling in South M. (W.P.)
- Sapium ellipticum* (Hochst.) Pax. K, M, K-K Musasa (A), Omusasa, Omushasha (K).
Abundant in young forest, colonising woodland, forest edges and in riverine forest throughout forest area. Seldom seen in north end of North M.
- Securinega virosa* (Wild.) Pax. & K. Hoffm. K, M, K-K Omuturika (A).
Abundant in young forest and colonising scrub around margins and in open areas within forests.
- Tetrorchidium didymostemon* (Baill.) Pax. & K. Hoffm. K, K-K Nyakahoko (A).
Frequent in medium-aged colonising and *Maesopsis* areas in K. TJS. 412. Noted from K-K new road alignment.
- Thecacoris lucida* (Pax.) Hutch. M
Occasional understory tree in mixed forest in central South M. TJS. 297, 349.
- Uapaca guineensis* Muell. Arg. M
Found along the east and central Nehwera valley. (W.P.)
- PLACOURTIACEAE**
- Caloncoba schweinfurthii* Gilg. K, K-K
One tree found in forest associated with river Ngoro, in K-K. Also collected in K by Hamilton. Rare.
- Casearia battiscombei* R.E. Fries. K
Small tree, collected at forest edge in Tea Estate, north K, TJS. 357. Rare.
- Casearia engleri* Gilg. K Omburaturu (K).
Medium sized tree, rare, in hillside forest. Found in Cpr. 8 with *Prunus*, *Maesopsis*. TJS. 293.
- Darylepis eggelingii* Gillett. K
Occasional understory shrub in mature hillside forest of *Prunus*, *Maesopsis* etc. TJS. 364.

- Dasyalepis leptophylla* Gilg. K Omukondo, Musalya (K).
Understorey shrub common in mature mixed forest in central and north K, but not noted in harvested areas of South K. TJS. 255, 428.
- Dovyalis abyssinica* Warb. K
Shrub 3 m. collected in Cpt. 6, K. TJS. 476.
- Dovyalis macrocalyx* (Oliv.) Warb. M, K-K
Frequent understorey shrub in mixed and colonising forest, in central and western M, TJS. 351. Also collected in Kakasi and near Kyabakara, K-K TJS. 390, 372.
- Dovyalis xanthocarpa* Bullock M, K-K
Frequent understorey shrub in young mixed forest in north and west M, usually in more open vegetation than *D. macrocalyx*. Also found on forest edge near river Ngoro, K-K.
- Flacourtia indica* (Burm. f.) Merris. K-K
Recorded by Eggeling on forest edge, 1936. Collected at lake Lutoto.
- Lindackeria bukobensis* Gilg. K
Small tree, found in felled and treated forest, Cpt. 3, K. TJS. 365 Uncommon.
- Lindackeria mildbraedii* Gilg. K, M, K-K
Frequent understorey tree or shrub in most of K. Also collected in mixed forest in central South M, and east of Lutoto in K-K. TJS. 257, 354, 298.
- Oncoba spinosa* Forak. M, K, K-K
Occasional shrubs or small tree, found in open, or on forest edge or under mature canopy. Collected at Kyabakara; *Oncoba* species recorded by Eggeling on forest edge in east of South M. Found in K along main forest road, TJS. 432, 371.
- Rawsonia ugandensis* Dawe et Sprague. K, M, K-K
Understorey shrub in mature forest, found in central South M. (J.M.L. 69/282.) Also noted in K. *Rawsonia* sp. collected near river Ngoro, K-K TJS. 441.
- GUTTIFERAE**
- Symphonia globulifera* Lf. K, K-K Musandaranda (A), Musisi (K).
Frequent large tree in mature forest, particularly in valleys and near watercourses. Often found with *Parinari*.
- HYPERICACEAE**
- Harungana madagascariensis* Poir. K, K-K Omulengero, Mulimango (K), Omutaha (A).
Frequent small tree in colonising forest and forest edges. TJS. 246.
- ICACINACEAE**
- Leptaulus holstii* (Engl.) Engl. K, K-K
Understorey shrub in mature forest south of sawmill, collected once in Cpt. 1. TJS. 341. Also collected in poor hillside forest south of Kyabakara, K-K TJS. 448. and near river Ngoro, TJS. 482.
- Raphiostylis beninensis* (Planch.) Benth. K-K
Straggling shrub, collected beside river Ngoro, TJS. 443.
- LABIATAE**
- Hoslundia opposita* Vahl. K, M, K-K Omunyamukasa (A).
Frequent shrub in young and colonising forest and around forest edges.
- Ocimum suave* Willd. M, K-K
Occasional shrub in young and colonising forest. TJS. 241 & 303.
- LAURACEAE**
- Beilschmeidia ugandensis* Rendle. K, K-K Mukarata (A)
Frequent forest tree in mature areas of K and occasional in K-K. Usually in wetter areas.
- Ocotea usambarensis* Engl. K Omwiha (K)
Very rare forest tree. One specimen found during 1952 enumerations.
- LEGUMINOSAE subf. CAESALPINIOIDEAE**
- Baikiaea insignis* Benth. subsp. *minor* (Oliv.) Leonard. M, K
Tree of valleys and streamsides. Reported common by Eggeling, and found in central Nchweru valley by Osmaston. Also grows near Ishasha road beside river Kaizi and Nyanweru. Recorded once in K.
- Baphiopsis parviflora* Bak. K, K-K
Small tree found beside river Ngoro, north of K-K, in patch of mature riverine forest with *Piptadeniastrum*, *Pterygota*. TJS. 444. Occasional in K.
- Cassia didymobotrya* Fres. K, M, K-K Omugabagaba (A).
Common in K and occasional in K-K. Understorey shrub in young forest, and in canopy openings. TJS. 472. Also in young forest at north end of North M.

- Cassia floribunda* Cav. K
Shrub in established colonising forest, and in gaps, forest edges and road-sides. Locally frequent in south. TJS. 322.
- Cassia occidentalis* L. M
Small partly woody plant, usually less than 1 m in scrub and grassland along west margin of M. TJS. 463.
- Cynometra alexandri* C. H. Wright. K, M, K-K Muhindi (A).
Dominant in most of the mature forest of M. Restricted to valleys in the west, where 'dwarf' forest reaches the Ishasha road along the rivers Kaizi and Nyamweru. Recorded in the west K, above the edge of the escarpment, and lake Lutoto. Also recorded in riverine forest beside river Ngoro, near K-K.
- Milbraediendron excelsum* Harms. M
Recorded by Eggeling in South M. (W.P.)
- LEGUMINOSAE subf. MIMOSOIDEAE**
- Acacia sisberiana* DC. M Mutiana (A).
Margins of M in north and west. Old relict trees, occurring in young forest of *Celtis*, *Diospyros*, etc.
- Albizia adianthifolia* (Schumach.) W.F. Wight. K, K-K Omurera (A).
Small tree of grassland and forest edge, on hillside in and around main forest. Not uncommon, especially around K-K and Kakasi forest.
- Albizia coriaria* (Welw. ex) Oliv. M, K-K Omurongo, Musisa (A),
Muyenzayenze (K).
Tree of wooded grassland and forest edge along east margin of South M and along northeast border of K-K; large old relicts are found among young forest in central and west M and in young forest patches between K-K and lake George.
- Albizia ferruginea* (Guil. et Perr.) Benth. M, ?K, ?K-K
Recorded in central Nchweera valley by Osmaston. Noted for either K or K-K by Eggeling 1936. Not collected or confirmed. Tree of closed forest.
- Albizia grandibracteata* Taub. K, M? K-K Omushebeya (A).
Found beside river Kaizi and Rwempuno, near main Ishasha road. Noted for K-K but uncertain. Collected by Cree in K. Tree of closed forest, riverine forest and wooded grassland.
- Albizia gummifera* (Gmel.) C. A. Smith. K, M, K-K Omushebeya (K),
Omulera, Mushebeya (A).
Occasional forest tree in K, and reported abundant in poor forest in north K-K by J. Ball. Recorded for central Nchweera valley, South M, by Osmaston. (W.P.)
- Albizia zygia* (DC.) MacBride M, K-K Omusebeya (A).
Reported in South M by Eggeling 1936, and K-K. by Dawe 1905, but not recorded for either area in I.T.U. Possibly wrongly identified.
- Entada pursaetha* DC. K-K
Woody climber in trees to 25m, growing on stream-sides. Found on river Kitomi at Kakasi mine and a short distance north of reserve. Also found beside river Ngoro in unreserved riverine forest. Pods up to 1.5 m long TJS 484.
- Newtonia buchananii* (Baker) Gilb. & Bout K, M, K-K Omukungu (K),
Mutole, Mutoyo (A).
Frequent in mature areas of K & K-K. Mature trees also found in east and south of South M, often apparently relicts, but not occurring in young western areas.
- Parkia filicoidea* (Welw. ex) Oliv. M, K-K Omusese (K).
Rare, usually near streams or in valleys. Saplings found near east boundary of South M near Biteriko track, and large trees at river Ishasha. Also near river Ngoro and Kitomi.
- Piptadeniastrum africanum* (Hook.f.) Brenan M, K-K
Rare. Often recorded in past years in mistake for *Newtonia*. Collected in central K, on track to Kitampungu Hill. Also beside river Ngoro and east of Kvabakara K-K. Always in mature mixed forest.
- Tetrapleura tetraptera* (Schumach. & Thonn.) Taub. K-K
Rare. Collected near Kakasi Mine, in Ankole. Forest tree.
- LEGUMINOSAE subf. PAPILIONOIDEAE**
- Abrus precatorius* L.
Climber, in mixed forest. Collected in central M and in *Diospyros*-forest near river Ngoro.

- Baphia wollastonii* Bak. f. M; K-K
Small tree found once in riverine patch of forest near Kyabakara, north of K-K. TJS. 187. Also found in mixed forest in central south M, e.g. at Rwensama fuel-cutting area. TJS, 296.
- Craibia brownii* Dunn. M
Found in 'dwarf' *Cynometra* forest. river Kaizi, by Osmaston. (W.P.)
- Erythrina abyssinica* Lam. K, M, K-K Ekiko, Emuko (A), Ebwiko (K).
Frequent in grassland and scrub. Relicts found occasionally in young forest, e.g. one found by Osmaston south of river Nchwera, and on certain forested hills in K. Not found on flats above lakes Edward and George. The bark is often stripped off for net-floats, and this may have eliminated the species from the lake-sides.
- Erythrina excelsa* Baker. M
Found along west Nchwera valley by Osmaston, and also observed in north M. (J.M.L.)
- Indigofera arrecta* Hochst. ex A. Rich. M
Partially woody plant, usually less than 1 m, in scrub and grassland along west margin.
- Kotschya africana* Endle K Ekibus-Kounzi (A).
Occasional shrub. Collected beside main forest road.
- Milletia dura* Dunn. M, K-K Murongo, Kiragara (A), Omutete, Omutate (K)
Frequent shrub or tree in young mixed forest in most areas of M. Seldom seen in *Cynometra* areas or in colonising scrub along west margin, but abundant coloniser at north end, even regenerating in open grassland. In K-K it is abundant in young and poor forest in north and east.
- Tephrosia* spp. K, M, K-K
Partially woody plants in colonising forest edges. Collected north of North M and on Rubare ridge.
- LILIACEAE**
- Asparagus racemosus* Will. M
Partly woody climber in western South M. (J.M.L. 69/49).
- LINACEAE**
- Hugonia platysepala* Oliv. M, K-K
Climber, collected in M. (J.M.L. 69/278). Also collected in mature mixed forest near river Ngoro, K-K; TJS. 458
- LOGANIACEAE**
- Anthocleista vogelii* Planch. and A. *grandiflora* Gilg. K, M, K-K Muzibaziba (K)
Frequent in and around swamps, streamsides, forest edges, and open areas within all forests. Both spp. present but distribution uncertain.
- Strychnos mitis* S. Moore M, ?K-K
Collected near lake Nyamungiri, TJS 220. *Strychnos* sp. aff. *S. mitis* noted by Hamilton along northwest border of K-K.
- MALPIGHIACEAE**
- Flabellariopsis acuminata* (Engl.) Wilczek. K
Collected by Eggeling, and by TJS, 411B. Climber or scrambling shrub.
- MALVACEAE**
- Abutilon* spp. M
Small yellow-flowered shrub, occasional in margin and open areas throughout western South M.
- Hibiscus* spp. K, M, K-K
Several spp. found in many habitats. *H. calyphyllus* frequent in western M.
- MELASTOMACEAE**
- Memecylon* sp. M
One reported in South M. by Eggeling in 1936. (W.P.)
- Sakaria laurentii* De Wild & Dur. K
Rare, noted on edge of forest outlier south of Cpt. 1 and in riverine outlier near Kyamahunga. TJS. 931.
- MELIACEAE**
- Carapa grandiflora* Sprague. K, K-K Mutongana (A), Omuruguya (K)
Abundant understorey tree in mature areas of K, often with *Parinari*. Much less common in K-K.
- Ekebergia* sp. K, M
Rare. Recorded from both forests, but species uncertain. (W.P.)

Entandrophragma excelsum (Dawe & Sprague) Sprague. K, K-K
Muyovu, Muhaki (A), Omushalya, Omuyovu (K).

Large deciduous tree, frequent in K, less common in K-K.

Entandrophragma spp. K, M, K-K

All or most of the species occur, especially in K-K; very rare in K, but exact identifications and distributions are uncertain

Lepidotrachelia volkensii Guerke. K

Very frequent understorey shrub or small tree in many areas of mature mixed forest. Less common in areas dominated by *Parinari*.

Lovoa swynnertonii Bak.f. K, ?M, K-K Mukusu (A), Mukumbo (K),

Rare throughout mature forest in K, but uncertain distribution in M, and K-K.

Lovoa trichilioides Harms. K-K

Collected near Kakasi mine, and known to occur elsewhere in K-K.

Trichilia dregeana Sand. K, K-K Omushaya (A).

Occasional forest tree in mature forest.

Trichilia prieuriana A. Juss. K, ?M

Noted by Osmaston in Nchwera valley, South M, also noted in K. (Working Plan) for mature *Parinari* forest. Not collected or confirmed. Doubtful.

Trichilia rubescens Oliv. K, K-K

Uncommon small understorey tree of mature mixed forest. Noted in stream valley in K-K east of Lutoto and on boundary above Kyabakara. TJS. 436.

Turraea robusta Guerke. M, K-K Omukarakara (K).

Frequent in young closed woodland, and older forest of colonising species in north and west M, and in scrub and thickets. Also found in young forest and edges around Kyabakara and river Ngoro, north west of K-K.

Turraea vogelioides Bagshawe et Bak.f. K, M, K-K

Uncommon but widely distributed in mature forest. Collected along road through South M, in north and south K, and in K-K above Lutoto. Usually less than 50 cm high. TJS. 431,435.

MELIANTHACEAE

Bersama abyssinica Fresen. subsp. *abyssinica* K, M, K-K Omuhingura (A), Omukaka (K).

Uncommon in forests. Collected beside rivers Ishasha and Ntungu, southwest of South M, in felling area of K, and in young woodland in Kakasi forest and north of Bihanga. TJS. 309.

MONIMIACEAE

Ymatos monospora (Harv.) Baill. K, M, K-K Omubarara (A), Onuhotora (K).

Occasional understorey shrub or small tree, in mature forest, usually under canopies of medium density. TJS. 411A.

MORACEAE

Antiaris toxicaria (Rumph. ex Pers.) Lesch. K, M, K-K Mumaka (A). Sometimes called *Mvuile*. Occasional large tree of mature mixed forest, widely distributed.

Sosquesia phoberos Baill. K, M, K-K Munyabweya (A), Omukumbwe (K).

Frequent understorey tree in mature mixed forest of K & K-K not often in *Parinari*-dominated forest. Two specimens reported seen in South M by Eggeing 1936. (W.P.)

Chlorophora excelsa (Welw.) Benth. et Hook. M Mvuile (A).

Two trees found (felled by pit-sawyers) in South M by J. M. Lock, 69/404, in relatively rich forest in valley near Biteriko track through the Reserve. This is the only confirmed record of this species growing wild in Ankole/Kigezi. Also reported near Bwambara.

Ficus spp. K, M, K-K

Found in all habitats. Several species present, but inadequate information is available about distribution.

Morus lactea (Sim) Mildbr. M, K-K

Rare. Recorded by Eggeing in South M 1936. Also found in mature mixed forest east of Kyabakara K-K.

Musanga leo-errerae Hauman J. Leon. K Omururura, Nhamagozi, Musogasoqa (A).

Frequent small tree of forest edges, road-sides and regenerating forest. This may be conspecific with *M. cecropioides* R.Br.

Myrianthus arboreus P. Beauv. K, M, K-K Kiruhura (A), Echuvu, Mufe (K).

Occasional small understorey tree, usually in valleys or wet places in young and old forest. In K-K, noted mainly in the younger forest of north and east. Noted by Osmaston in Nchwera valley, but uncommon in M. Collected by lake Rutoto. Possibly confused, or conspecific, with *M. holstii* Engl.

- Treculia africana* Decne. M, African breadfruit.
Rare. One tree noted by Eggeling in 1936, and one found beside river Ihasha by Lock
- MYRICACEAE**
- Myrica salicifolia* A. Rich. K
Shrub 3 m. found in open vegetation beside main forest road, Cpt. 4, K TJS, 470.
- MYRISTICACEAE**
- Pycnanthus angolensis* (Welw.) Warb. K, M, K-K
Occasional tree of valley forest or forest edge. Found also in mature mixed forest in K and K-K. Riverine examples are found at Kakasi mine, at stream crossing on track from Biteriko to South M, and in Ruhewa and east Nchwera valleys.
- MYRSINACEAE**
- Maesa lanceolata* Forsk. K, K-K Omuhanga (A, K), Muhangabagenyi (K).
Frequent shrub or small tree, of young or colonising forest and forest edges.
- MYRTACEAE**
- Eugenia bukobensis* Engl. M
Understorey tree in mature mixed forest collected once half way along Biteriko track, South M. TJS, 404.
- Syzigium guineense* (Wild.) DC. K, K-K Omusimangwa (A), Omugote (K).
Occasional forest tree usually in valleys of mixed forest.
- OCHNACEAE**
- Ochna bracteosa* Rob. et Law. M
Small straggling understorey shrub in mature forest. Collected in central South M along Biteriko track. TJS, 348.
- Ochna membranacea* Oliv. M
Occasional understorey shrub in mature mixed forest along Biteriko track, South M. TJS, 402
- Ochna* sp. cf. *O. holstii* Engl. K
Tree 10 m beside main forest road, in harvested and treated forest. TJS, 269. det. E.A.H.
- Ouratea hiernii* (Van Tiegh.) Exell. K, M, K-K Muryangabi (A), Bitigandwa (K).
Understorey shrub or tree, occasional in mixed forest and forest edges. Frequent in some areas along Biteriko track, South M, and near river Ngoro, K-K. TJS, 171. Reported as a large tree in K.
- OLACACEAE**
- Strombosia cheffleri* Engl. K, K-K Munyankono, Munyakasikuro (A), Omuhika (K).
Abundant large tree, typical of mixed forest in K. Also abundant in most of the mature forest areas in K-K.
- OLEACEAE**
- Jasminum dichotomum* Vahl. M
Frequent scrambling shrub in scrub, forest edge and young forest along west and south margin. Leaves in whorls of 3.
- Jasminum pauciflorum* Benth. K-K
Straggling climber beside track to Kyalakara in forest associated with river Ngoro. TJS, 191.
- Jasminum* sp. M
Rare scrambling shrub in same habitat as *J. dichotomum*. Leaves in opposite pairs. J.M.L. 69/111. K, K-K
- Linociera johnsonii* Baker. K, K-K
Understorey shrub or tree in mature forest. In K-K it is found in the mixed forest along the northwest. TJS, 362, 442.
- Olea mildbraedii* (Gilg. & Schellenb.) Knobl. K
Forest understorey shrub, collected by Eggeling at lake Lutoto and seen in K.
- Olea welwitschii* (Knobl.) Gilg. & Schellenb. K, M, K-K Omusoko (A), Omugando (K).
Forest tree usually in young or colonising forest. Occasional in K, but rarely seen in South M (one reported by Eggeling, 1936) or in K-K (one reported by Hinton in northwest border, 1968).
- Schreberia arborea* Chev. K-K, ? K, ? M
Tree of mixed forest, found in the vicinity of river Ngoro, K-K. Also reported in K and M but not confirmed.

- PALMAE**
Calamus deeratus Mann. et Wendl. M, Rattan Canoe.
 Climber or scrambler, in swamps and river valleys in mature forest.
Phoenix reclinata Jacq. K, M, K-K Ekikindu (A),
 Frequent along streams and swamps in and around forests. Rare in K.
Raphia monbuttorum Drude M Oluhivu (A), Kahungye (K);
 Rare. Found in central Nchwera valley, beside river. (Osmaston).
- PANDANACEAE**
Pandanus chiliocarpus Stapf. K-K
 Rare. Found in groups in stream beds in mature forest east of Kyabakara, near road alignment.
- PITTOSPORACEAE**
Pittosporum sp. M
 Recorded by Eggeling on forest edge of South M. (W.P.)
- POLYGALACEAE**
Carpolobia alba G. Don. M, K-K
 Understorey shrub, collected in M at east end of Biteriko track on forest edge, and in mixed forest 5 km from east end. TJS. 173, 422. Also collected in *Diospyros* forest near river Ngoro. K-K. TJS, 439,
Securidaca walwitschii Oliv. K
 Woody climber collected once in harvested forest TJS. 356.
- PROTEACEAE**
Faurea saligna Harv. K, K-K Mutaha (A), Omulanjera (K).
 Occasional large tree of mature forest, also small tree in grass, bracken and rocky hills on Rubare ridge and other hills.
Protea madiensis Oliv. K, K-K Omukoyoyo (A).
 Abundant shrub in grassland or scrubby bracken areas on Rubare ridge and other rocky hills.
- RANUNCULACEAE**
Clematis grandiflora DC. K
 Partly woody climber, collected beside main forest road (TJS. 358 & 483) and observed in several parts of the harvested area.
Clematis hirsuta Perr. & Guill. K
 Partly woody climber in forest margin of North M. (J.M.L.)
- RHAMNACEAE**
Helinus mystacinus (Ait.) E. Mey. M
 Scrambling shrub with tendrils. Rare, in scrubby forest in North M. (J.M.L., 659).
Lanidiscus mildbraedii Engl. M
 Abundant understorey tree in mature *Cynometra* and mixed areas. TJS, 424,
Maesopsis eminii Engl. K, M, K-K Muguruka (K) Musizi
 Frequent in young and medium aged mixed forest in most areas. Seldom found in old mature forest or in the lower drier areas of M or K-K.
- RHIZOPHORACEAE**
Casipourea congoensis DC. K
 Collected in forest by Hamilton.
Casipourea gummiflua Tul. var. *ugandensis* (Stapf.) J. Lewis. K
 Understorey tree collected in Cpt. 13 (J. Ball 156).
Casipourea ruwensorenensis (Engl.) Alston. M, K-K
 Occasional understorey tree in mixed forest towards the west of South M. Collected in the west Nchwera valley, and on flatter ground north and south. TJS. 405. Collected and confirmed from forest associated with river Ngoro, K-K.
- ROSACEAE**
Peruvia excelsa Sabine. K, K-K Mubura (A), Omushamba (K).
 Abundant large forest tree, dominant over much of K. and over large areas of west K-K. Not usually on the upper slopes of forested hills, achieving greater dominance in valleys.
Prunus africana (Hook.f.) Kalkm. K, K-K Mugote (A), Omumba, Omukumbo (K).
 Frequent large tree in mature forest in K, mainly on forested hillsides rich in *Maesopsis*. Occasional in K-K, e.g. in certain valleys in the west.
- RUSIACEAE**
Aidia micrantha (K. Schum.) F. White K, K-K
 Understorey shrub recorded (as *Randia lucidula* Hiern) in I.T.U. for Kasyoha forest. The var. *monju* (K.Krause) Petit has been collected in harvested forest Cpt. 11, K. TJS, 339.

- Aulacocalyx diervilloides* (K. Schum.) Petit. K
Understorey shrub or small tree in mature mixed forest. Recorded for K in W.P. and I.T.U. as *Heinsenia*.
- Belonophora glomerata* M.B. Moss. K
Occasional shrub in forest. (W.P.)
- Canthium captum* Bullock. M
Woody climber collected beside Biteriko track in central South M. TJS. 283.
- Canthium rubrocostatum* Robyns. K-K
Understorey tree 10 m collected once in mixed forest east of lake Rutoto. TJS. 434.
- Canthium schimperianum* A. Rich. M
Collected from scrub along Congo road, west margin of M. (J.M.L. 68/306).
- Canthium vulgare* (K. Schum.) Bullock. K, M, K-K *Mukyiragai* (A), *Mukyiraji* (K).
Occasional shrub in young forest and edges in many areas. Relatively frequent in some areas of K near Tea Estate.
- Cephaelis* sp. M
Small shrub collected in South M (J.M.L.)
- Chassalia* sp. aff. *C. afzelii* Hiern. K
Collected by Hamilton and Eggeling.
- Chassalia cristata* (Hiern) Bremek. M
Scrambling shrub collected in South M, (J.M.L. 69/346).
- Coffea eugenioides* S. Moore. K, M, K-K
Frequent understorey shrub, usually in medium-aged mixed forest. TJS. 266, 286, 340.
- Coffea excelsa* A. Chev. M
Recorded in west Nchwera valley in *Cynometra* forest by Osmaston. (W.P.)
- Craterispermum laurinum* Benth. K, M. *Omumyamwazi* (K).
Understorey shrub or small tree, abundant under mature *Parinari* forest in K and characteristic of that forest type. Also found in mature *Cynometra* forest in west Nchwera valley (Osmaston).
- Dictyandra arborescens* Hook.f. K, M, K-K
Frequent understorey shrub or small tree. Found mainly in medium aged mixed forest in all reserves, and on forest edges. TJS. 244, 292.
- Galiniera coffeoides* Del. K, K-K *Ekibara*, *Omuryanyongi* (K).
Bush or small tree, not usually more than 10 m high, found in colonising forest or young forest of colonising species. TJS. 316, 389.
- Lasianthus kilimandscharicus* K. Schum. K
Occasional understorey shrub. Collected in mixed forest in Cpt. 1. (TJS. 343.)
- Isactina platyphylla* Wernham. K
Shrub 3 m. collected in harvested and treated forest near K sawmill. TJS. 483B.
- Mitragyna rubrostipulata* (K. Schum.) Harv. K *Omuziko* (A), *Omuziko*, *Ngomera* (K).
Frequent tree beside rivers and swamps.
- Morinda lucida* Benth. K, M, K-K *Omuganzura* (A).
Tree to 15 m uncommon. Found in mature forest in K, in Sample Plot 2. Found in valley in M, near west end of Biteriko track and in Ishasha river flats, and in grassland and young forest around Kyabakara, north of K-K. TJS. 367.
- Morinda titanophylla* Petit. K-K
Lightly branching bush to 3 m collected in saturated valley bottom forest under canopy of young *Macaranga*, *Anthoclaista* etc., in young forest north of Bihanga. TJS. 317.
- Mussaenda arcuata* Poir. K
Climber. Occasional in mature forest along main forest road. TJS. 468.
- Mussaenda erythrophylla* Sch. et Thonn. M, K-K
Climber in mixed forest or open areas. Collected at east end of Biteriko track in South M, and also in forest associated with river Ngoro, and in K-K east of Kyabakara. TJS. 190.
- Oxyanthus formosus* Planch. vel sp. aff. K, M
Understorey shrub 3 m, rare. Collected along eastern end of Biteriko track South M. TJS. 420, 421. Also observed in central K, in mature mixed forest west of Kirambi grade.
- Oxyanthus speciosus* DC. K, M
Small understorey tree, occasional under mature forest in K, and under medium

- aged mixed forest along Biteriko track, central South M. TJS. 352, 399.
- Oxyanthus unilocularis* Hiern. K-K
Bush or small tree, under mature forest on north side of K-K forest, collected along new road alignment east of Kyabakara. TJS. 382.
- Pauridiantha butanguensis* (de Willd.) Brem. K
Understorey shrub. Collected in harvested forest in Cpt. 7, previously mature forest with *Parinari*, *Carapa*. TJS, 328.
- Pauridiantha callisarpoides* (Hiern.) Brem. K
Small tree noted in woodland or colonising forest with *Croton* spp., *Premna*, *Bridelia*. (W.P.)
- Pauridiantha holstii* (K. Schum.) Brem. K
Understorey shrub or small tree found in mature mixed forest. (W.P., I.T.U.)
- Pavetta* spp.
Numerous species present, but not enough collections have been made to show their distributions. The following have been identified by E.A.H.:
- P. albertina* S. Moore. M TJS. 237, 261.
P. asimilis Sond. M J.M.L.
P. insignis Brem. var *glabra* Brem. M TJS. 461. K Eggeling 3709.
P. oliverana Hiern. K-K TJS. 298, 440.
P. ternifolia (Hook. f.) Hiern. K TJS. 388.
- Psychotria* spp.
Numerous species present, but distribution uncertain. The following have been identified by E.A.H.:
- P. faucicola* K. Schum. M J.M.L. 68/319.
P. ?fractinervata Petit. M TJS. 400, 423.
P. lauracea (K. Schum.) Petit. M TJS. 215, K TJS. 256.
P. maculata S. Moore M TJS. 232.
P. nairobiensis Brem. M TJS. 302.
- Rothmannia longiflora* Salisb. M K-K
Understorey shrub, 5 m, under mature *Cynometra* forest, collected near east end of Biteriko track. TJS. 347. Also collected in mixed forest near river Ngoro, K-K, TJS. 453.
- Rothmannia urcelliformis* (Hiern) Bull. ex Robyns. K, M, K-K
Frequent understorey bush or small tree. Widely distributed in most forest types.
- Rytigynia beniensis* (De Willd.) Robyns. M, K-K
Frequent shrub in scrub and young forest along west margin of M, with colonising species characteristic of drier areas. Found also in woodland on rocky hillside south of Kyabakara. TJS. 447.
- Sabicea cf. calycina* M
Small climber collected in South M (J.M.L. 69/349).
- Tarenna graveolans* (S. Moore) Bremek. M, K-K
Colonising understorey shrub, up to 5 m, collected in young forest of colonising species north of Bihanga, and in old forest near river Ngoro on track to Kyabakara. Frequent in scrubby forest along west margin of M. TJS. 202.
- Tarenna pavettoides* (Harv.) Sim K, K-K
Understorey shrub or small tree in mature forest. Collected in east K and near river Ngoro. K-K. TJS. 287.
- Trycalysia* sp. K
Forest shrub. Collected by Eggeling and St. Clair-Thompson. Presumably rare.
- Uragoga ciliato-stipulata* De Willd. M
Dwarf understorey shrub, usually less than 1 m. Collected under mature colonising forest, South M. TJS. 306.
- Vangueria apiculata* K. Schum. M
Understorey shrub. Collected in medium age mixed forest at Rwensama fuel-cutting area. Occasional in that area. TJS. 304.
- RUTACEAE**
- Aeglopsis eggelingsi* M.R.F. Taylor K-K
Understorey shrub or small tree. Collected in mature mixed forest in vicinity

- of river Ngoro, beside track to Kyabakara. Occasional in that area. TJS. 291.
Balsamocitrus dawsoni Stapf. M, K-K
 Occasional shrub or tree, in mature or medium aged mixed forest. Found on western parts of South M and around river Ngoro and Kyabakara.
- Citropsis schweinfurthii* (Engl.) Swingle M, K-K
 Small understory shrub, found in similar habitat to *Balsamocitrus*. Collected in west Nchwera valley by Omatara, and seen elsewhere in M. Near river Ngoro, K-K, in mature mixed forest. TJS. 289.
- Claussena anisata* (Willd.) Hook.f. ex Benth. K, M, K-K. Mutanwa, Omutana (A & K)
 Frequent shrub in young or colonising forest in all areas.
- Fagara leptocaulis* (Guill. et Per.) Engl. K-K
 Shrub or straggling tree. Occasional in forest in vicinity of river Ngoro. TJS. 375. Also collected on edge of grassy patch in young forest north of Bihanga. TJS. 248.
- Fagara macrophylla* (Oliv.) Engl. K, K-K, ?M Mulemankobe (A), Omushaga (K).
 Frequent forest tree in young and mature forest in K, but seldom seen in K-K.
Fagara sp., possibly *F. macrophylla*, noted in South M, (W.P.)
- Fagara mildbraedii* Engl. K Mulemankobe (A).
 Rare forest tree collected in southern K.
- Fagara rubescens* (Flanch. ex Hook.f.) Engl. M, K
 Understorey shrub in medium-aged forest of colonising species in dry areas. Collected along Biteriko track, M, associated with *Diospyros*. Also noted in K. TJS. 300.
- Pagaropsis angolensis* (Engl.) Dale. K, M, K-K
 Occasional tree in mature mixed forest in K. Rare in K-K, and noted in Ruhewa valley and central Nchwera valley, South M. (W.P.)
- Teclea nobilis* Del. K, M, K-K ... Muzo (A, K)
 Understorey shrub or small tree, occasional throughout all forests, but not usually under the most dense canopies.
- Toddalia asiatica* (L.) Lam. M
 Scrambler in young forest along west margin, (J.M.L. 69/344).
- SALVADORACEAE**
Acima tetraacantha Lam. M
 Small woody plant in colonising scrub along west margin, and in grassland flats.
- SAPINDACEAE**
Allophylus dummeri Bak.f. M
 Shrub or small multistemmed tree in understorey of colonising forest, or established forest of colonising species. Collected at extreme north of North M, and extreme south of South M, and relatively frequent in parts of western South M. TJS. 223. 260.
- Allophylus* spp.
 Various species found but identification and distribution uncertain.
- Aphania senegalensis* (Juss. ex Poir.) Radlk. M Omukaka (A).
 Understorey shrub or tree, under and at edge of *Cynometra* forest. Collected at east end of Biteriko track. TJS. 174, 180.
- Blighia unifugata* Bak. M, K-K
 Occasional forest tree in mixed and riverine forest in central and west M, e.g. around Rwensama fuel area, where the bark is subject to elephant damage. Also collected in Kakasi (TJS. 392) but apparently rare.
- Cardiospermum grandiflorum* Schwartz. K, M, K-K
 Climber, in mixed forest often on edges. Noted beside tracks in north of North M, central K, and river Ngoro K-K.
- Deinbollia fulvo-tomentella* Bak.f. K-K
 Shrub, 3 m, collected once in the valley of river Kitomi, K-K. TJS. 393.
- Dodonia viscosa* (L.) Jacq. M, K, K-K Omushambya (A, K)
 Occasional but locally abundant shrub in grassland and forest edge in many areas. Found beside main road on west margin of M by river Kaizi. In K it occurs in patches of overgrown clearings within the main forest. Also along the southeast border of K-K.
- Lychnodiscus cerospermus* Radlk. M
 Understorey shrub or small straggling tree. Collected in patch of young mixed forest within *Cynometra* area in eastern South M. TJS. 229.

- Majidea fosteri* (Sprague.) Radlk. K, M, K-K
Occasional medium sized tree, in mixed forest patches within main *Cynometra* area. Collected in this habitat in east and central South M. TJS. 228. Seen once in mixed forest in central K. Collected by Hamilton along north border of K-K (Hamilton 670).
- Pancovia turbinata* Radlk. K Akalema (A).
Frequent understorey shrub or small tree in mature mixed forest.
- Paullinia pinnata* L. M
Occasional woody climber, in young or mature forest of colonising species.
- SAPOTACEAE**
- Afrosorsalitia cerasifera* (Welw.) Aubrev. K, K-K Sekoba (A).
Frequent tree in mixed forest in K, usually with colonising species e.g. *Maesopsis*. Not recorded in main area of K-K, but collected from one old tree in valley on east side of Kakasi Reserve, K-K. TJS. 278.
- Aningeria altissima* (A. Chev.) Aubr. et Pellegr. K, K-K Mutokye (A).
Occasional large tree in mature mixed forest.
- Chrysophyllum albidum* G. Don. K, M, K-K Mulyanyonyi, Omuhinguba (A), Omushayu (K).
Occasional tree in mature mixed forest in all reserves, locally frequent.
- Chrysophyllum gorungosanum* Engl. K, M, K-K
Occasional tree in mature mixed forest, but probably less extensive than *C. albidum*. Also known as *C. fulvum*.
- Manilkara dawei* (Stapf.) Chiov. K
Collected by Dawe in West Ankole Forest in 1905, but apparently not confirmed since then.
- Mimusops bagshawei* S. Moore K
Very rare tree, in mixed forest. Collected once in Cpt. 8. TJS. 385.
- SIMAROUBACEAE**
- Balanites wilsoniana* Dawo & Sprague. K, M, K-K
Occasional but local tree of mixed forest. Rare in K. Collected near K-K in forest in vicinity of river Ngoro. Reported abundant by Osmaston on sides of Nchwera valley, and collected in gulley within forest near Biteriko track. It apparently occurs in patches or valley-strips of relatively rich forest within areas where *Diospyros* is the main species.
- Harrisonia abyssinica* Oliv. K, M, K-K Omulange (K).
Frequent straggling shrub or small tree in forest edges, gaps, and in established colonising forest. Often found in young forest in western parts of South M. TJS. 267, 181.
- Klainedoxa gabonensis* Pierre. M
Recorded in Nchwera valley by Osmaston. (W.P.)
- Odyendea longipes* Sprague. K
Recorded as occasional in K, (W.P.)
- SOLANACEAE**
- Capricum* sp. M
Occasional small shrub, usually less than 1.5 m, in medium aged mixed forest in north and west M.
- Solanum dasyphyllum* Schum. & Thonn. M
Small very prickly shrub. (J.M.L.) Found in western South M.
- Solanum* spp. K, M, K-K Mutobotobo (A).
Widespread shrubs, mainly in colonising vegetation. Several spp. present *S. indicum* L. TJS. 415, and *S. aculeastrum* Dunal TJS. 247, collected in K.
- STERCULIACEAE**
- Cola gigantea* A. Chev. K, M, K-K Omujugangoma (A), Omulehe (K).
Forest tree, usually in valleys. Infrequent.
- Dombeya* spp. K. Omukarabo (A).
Small very prickly shrub. (J.M.L.) Found in western South M. vegetation in grassland, around south and east K.
- Dombeya kirki* Mast. K, M, K-K Mukole (A).
Forest tree, usually found in mature mixed forest in lower drier habitats. Found occasionally throughout South M, often with mature trees of *Diospyros* or colonising species. Also in forest associated with river Ngoro with *Diospyros*, and occasionally found deeper in K-K, east of Kyabakara. Rare in K. The

- bark suffers from elephant damage in west of South M. (Also known as *D. mukole* Sprague). TJS, 195.
- Leptonychia mildbraedii* Engl. K Nkomakoma (A)
Understorey shrub, occasional in forest. TJS. 427, 474.
- Pterygota mildbraedii* Engl. M, K-K Omwifa (K).
Large forest tree uncommon but locally frequent. In M found around bat caves at north end and in very large sizes among *Cynometra* at south end, and occasionally in mature forest in the eastern part of the Biteriko track and along river Ishasha. In K-K, frequent in mature mixed forest in vicinity of river Ngoro along track to Kyabakara.
- Sterculia dawei* Sprague K-K
Forest tree, rare. Collected near Kakasi Mine in Ankole, and also east of Kakasi Reserve in Toro. TJS. 277.
- THYMELAECEAE**
- Gnidia lampranthus* Gilg. K, K-K
Shrub or small multi-branched tree in grassland recorded as locally abundant on hills and ridges, and also collected near lake Lutoto. (W.P.)
- Peddiea fischeri* Engl. K, M Omushinya (K).
Occasional understorey shrub or small tree, in mature forest in K. Recorded in east Nchwera valley, by Osmaston, and found in mature forest of colonising species round fuel-cutting area and western parts of Biteriko track, South M. TJS. 324, 344.
- TILIACEAE**
- Glyphaea brevis* (Spreng.) Monachino. K-K
Small straggling tree, rare, in mature mixed forest. Collected in rich forest east of Kyabakara along new road alignment, also close to river Ngoro near track to Kyabakara. TJS. 381.
- Grewia similis* K. Schum. M
Frequent in scrub along west margin.
- Triumfetta macrophylla* K. Schum. ?K., ?K-K
Small shrub of forest edges, open areas, and bracken-land with colonising species. Recorded in K but uncertain.
- Triumfetta tomentosa* Boj. K
Shrub, 3 m, found abundant in open regenerating forest after harvesting and treatment, K. TJS. 438.
- ULMACEAE**
- Celtis durandii* Engl. K, M, K-K
Forest tree, usually 12-13 m., frequent in first generation forest. One of the dominant constituents in most of the young forest in Kitomi and Kakasi Reserves, and in the north of North M. Occasional in certain areas of K, associated with other colonisers. TJS. 414.
- Celtis mildbraedii* Engl. M
Noted (two trees) by Eggeling in South M in 1936 as *C. soyauxii*, and recorded as abundant along east end of river Nchwera by Osmaston. (W.P.)
- Celtis zenkeri* Engl. M
Noted (several) by Eggeling in South M in 1916. (W.P.)
- Chaetacme aristata* Planch. K, M, K-K
Shrub or straggling tree, infrequent, usually in scrub or forest edge. Found as small shrub on east edge of South M and tree 10 m at Kakasi Mine. TJS. 394.
- Holoptelea grandis* (Hutch.) Mildbr. M
In mature mixed forest or full-grown forest of colonising species in west of M, usually in or near valleys. Noted mainly in South M but also found in younger colonising forest at north of North M. Frequent in its valley habitats, not common elsewhere.
- Trema orientalis* (L.) Bl. K, M, K-K Omubengabakwa, Omugwampira (K).
Occasional small fast-growing tree, on edges and in expanding early stages of colonisation. TJS. 322.
- URTICACEAE**
- Boehmeria platyphylla* Don. var *ugandensis* Rendle. K
Understorey shrub, 6 m, collected in young forest along control road through Cpt. 1 Kalimu. TJS. 416.

- Urera cameroonensis* Wedd. M
Shrub found beside Biteriko track, South M.
- VERBENACEAE**
- Clerodendron angolense* Gurke K, K-K
Shrub, 3 m, collected in mature mixed forest east of Lutoto, K-K, and in harvested forest in K. TJS. 433, 485
- Clerodendron grandicalyx* E.A. Bruce. K
Rare, partially woody climber on forest edges. Collected beside main forest road, TJS, 359.
- Clerodendron melanocrater* Gurke. M
Rare climber in mature mixed forest, South M. (J.M.L.)
- Clerodendron myricoides* (Hochst.) R.Br. ex Vatke. M
Found near Biteriko ranger post, east margin of South M. (J.M.L.)
- Clerodendron rotundifolium* Oliv. M
Small woody plant to about 1 m in fringes of forest in west. (J.M.L.)
- Clerodendron triplinerve* Rolfe K-K
Scrambling climber collected in *Diospyros* - *Turraea* forest north of Kyabakara camp, north of K-K. TJS. 373.
- Duranta repens* L. M
Frequent straggling shrub in scrub along west margin.
- Premna angolensis* Gurke K, M, K-K Nkubwa, Omuhororo (M), Banyumunkira (K).
Frequent tree, usually small, in colonising and young forest, often with *Celtis durandii*, but more widely distributed. An important constituent of Kitomi, Kakasi and northernmost M young forest. Occasionally found as a large tree in apparently mature hillside forest in K.
- Vitex ambonensis* Gurke M
Recorded by Osmaston in central Nchwera valley, South M. (W.P.)
- VIOLACEAE**
- Rapanea ilicifolia* (Welw. ex Oliv.) Kuntze M
Recorded from central Nchwera valley by Osmaston. Collected and determined, occasional in central M along Biteriko track, under mature *Cynometra* forest. TJS. 425.
- Rinorea oblongifolia* (C.H. Wright) Chipp. K-K
Tree of 9 m, collected under mature mixed forest along new road alignment east of Kyabakara. TJS. 384.

Source: Synnott. 1971.

Table 2. Species Distribution in Impenetrable Forests of Kigezi District

Species	Species
<i>Albizia gummifera</i>	<i>Muraranga kilimandscharica</i>
<i>Alchornea</i> sp. ..	<i>Musanga cecroboides</i>
<i>Ariadinaria alpina</i> ..	<i>Misrianthus crinitus</i>
<i>Britschmeidia ugandensis</i>	<i>Mitrea salicyfolia</i> ..
<i>Bersama abyssinica</i> ..	<i>Nyoboutonia macrocalyx</i>
<i>Buzipueia phoberos</i> ..	<i>Nitelonia buchannanii</i>
<i>Carapa grandiflora</i> ..	<i>Ocotea usambarensis</i>
<i>Cassipourea</i> sp. ..	<i>Olea</i> sp. ..
<i>Chrysophyllum</i> spp. ..	<i>Olinia usambarensis</i>
<i>Croton macrostachys</i>	<i>Parinari excelsa</i> ..
<i>Dombeya</i> sp. ..	<i>Pittosporum spathicalyx</i>
<i>Drypetes</i> sp. ..	<i>Podocarpus milanjianus</i>
<i>Ekebergia rueppeliana</i>	<i>Polystichia fulva</i> ..
<i>Entandrophragma excelsum</i>	<i>Pygeum africanum</i> ..
<i>Fagara</i> spp. ..	<i>Rubraea rhododendroides</i>
<i>Fourea saligna</i> ..	<i>Sukersia laurentii</i> ..
<i>Ficalhoa laurifolia</i> ..	<i>Strombosia scheffleri</i>
<i>Glyphocia</i> sp. ..	<i>Symphonia globulifera</i>
<i>Guarea mayombensis</i>	<i>Syzgium guineense</i> ..
<i>Hagenia abyssinica</i> ..	<i>Tetrorchium dimastemon</i>
<i>Harungana madagascariensis</i>	<i>Vitex</i> sp. ..
<i>Ilex mitis</i> ..	<i>Xylocarpus mannipora</i>

Source: Hamilton. 1969.

Table 3. Composition of Impenetrable Forests of Kigezi

Species	Hilltops	Ridges	Slopes	Gullies	Valleys
<i>Macaranga kilimandscharica</i>	XXX	XX		XX	
<i>Fourea saligna</i>	X	XXX			
<i>Psychotria megistosticta</i>	X	XXX	X		
<i>Ritzymia</i> sp.	X	XX	X		
<i>Clusia subochroleuca</i>	X	XX			
<i>Olea hochstetteri</i>	XX	X	XXX		
<i>Olinia usambarensis</i>	X	XX	X		
<i>Allophylus macrobotrys</i>	X	X	XXX		
<i>Syzgium guineense</i>	X				
<i>Rubiaceae</i> indet.	X				
<i>Podocarpus milanjianus</i>		XX	X		
<i>Polystichia fulva</i>		XX		XXX	
<i>Maesa lanceolata</i>		XXX		XXX	
<i>Rubraea rhododendroides</i>		XX			
<i>Drypetes aff. gerrardii</i>		X	XXX		
<i>Xylocarpus mannipora</i>		X		X	
<i>Ficalhoa laurifolia</i>		X	X		
<i>Pittosporum spathicalyx</i>		X			
<i>Nitelonia undulata</i>		X			
<i>Hagenia abyssinica</i>		X			
<i>Cassipourea ruwensensis</i>		X	XXX	X	
<i>Chrysophyllum fulvum</i>			XXX		
<i>Nitelonia buchannanii</i>			X		XX
<i>Strombosia scheffleri</i>			X	XX	XX
<i>Fagara macrophylla</i>			X		X
<i>Ritchea albertii</i>			X		
<i>Nyoboutonia macrocalyx</i>				XXX	XX
<i>Dombeya goetzei</i>				XXX	
<i>Croton macrocalyx</i>				XX	XXX
<i>Pygeum africanum</i>				XX	XX
<i>Ekebergia rueppeliana</i>				X	
<i>Alangium chinense</i>				X	
<i>Vernonia</i> sp.				X	
<i>Conopharyngia holstii</i>					X
<i>Croton megalocarpus</i>					X
<i>Parinari excelsa</i>					X
<i>Symphonia globulifera</i>					XX

Key to symbols
 XXX = abundant; XX = common; X = present

Source: Hamilton. 1969.

Table 4. Mafuga Forest Composition in Kigezi

Mafuga, on the eastern side of the Ishasha valley is not a climax forest, being thought to be only about sixty years old. However, it is of particular interest because of the light it throws on forest regeneration and succession. Stretching from the Ishasha valley to Mafuga ridge, from 6 to 8,000 ft (1,830–2,450 m), the vegetation of Mafuga is variable and patchy with areas of grassland and woodland contained within the reserve. As in the Impenetrable Forest, the most convenient way to classify the vegetation is on a topographical basis.

In forests on the ridge at 8,000 ft (2,450 m) the commonest trees are *Macaranga kilimandscharica*, *Hagenia abyssinica*, *Rapanea rhododendroides*, *Agauria salicifolia*, *Polyscias fulva*, *Maesa lanceolata*, *Psychotria megistosticta*, *Pittosporum spathicalyx* and *Nuxia floribunda*. Forest dominated by *Agauria* are rather open, but otherwise they are closed and about 15 m tall. There is usually a very open shrubby layer containing *Xymalos monospora* and *Psychotria* sp., with numerous herbaceous species present on the forest floor, including *Asplenium friesianum*, *A. pseudoserria*, *Thalictrum rhynchocarpum*, *Droguetia iners* and *Peperomia* sp., but under *Agauria* the undergrowth is taller and consists of a dense tangle of *Rubus* sp., *Urtica massaica*, *Pteridium aquilinum* and grasses. Neither *Agauria* nor *Hagenia* regenerate beneath closed forests at Mafuga and an earlier stage of the succession on ridges is provided by patches of *Myrica salicifolia* and *Nuxia congesta*, woodland.

The hillslope vegetation is a complex mosaic of forests, woodlands and grass-covered areas. The commonest trees in forests on upper hillslopes are *Macaranga kilimandscharica*, *Polyscias fulva* and smaller *Xymalos monospora*, with less frequent *Maesa*, *Ficalha* and *Psychotria*, and, on lower slopes, *Albizia gummifera*, *Polyscias fulva* and *Pygeum africanum*, with smaller *Maesa* and *Allophylus macrobotrys*. The undergrowth is denser on the lower slopes, where it consists of a thick herbaceous tangle containing much *Phytolacca dodecandra*. In the lower slope forests, climbers such as *Acacia* sp., *Gouania longispicata* and *Clematis nimensis* are common. The patches of woodland and bracken-grassland contain abundant *Myrica salicifolia* as well as the trees *Hagenia abyssinica*, *Albizia gummifera*, *Agauria salicifolia*, *Erythrina abyssinica*, *Dombeya mukole* and *Croton oxypetalus*.

In the upper parts of gullies *Dombeya goetzenii* and *Cyathea manniana* grow over a dense shrub layer of Acanthaceae. In the lower parts *Polyscias*, *Albizia* and *Pygeum* are the most common trees, growing with *Alangium chinense*, *Pittosporum spathicalyx* and *Dombeya goetzenii* and there is a thick herbaceous tangle 0.5–1.5 m tall, with abundant *Urtica massaica*. In the more open gullies, the wild banana, *Ensete* sp., is abundant.

An enumeration carried out by the Forest Department (unpublished, 1947) showed that numerous seedlings and small trees of species now characteristic of the more mature forests of the Impenetrable are present under the tree canopy. The species recorded include *Podocarpus milanjanus*, *Entandrophragma excelsum*, *Chrysophyllum albidum*, *C. fulvum*, *Fagara macrophylla*, *Aningeria* sp., *Fagaropsis angolensis*, *Ekebergia rupeppeliana*, *Symphonia globulifera*, *Cassipourea ruwenzorensis* and *Strombosia scheffleri*. It is apparent that the present vegetation consists of several early stages in the regeneration of forest, ranging from *Pteridium*-grassland through woodland to secondary forest.

One of the commonest trees at Mafuga at the present time is *Albizia gummifera*. This species has an interesting distribution in the highland parts of western Uganda. It is common on the Ruwenzori at c. 7–8,000 ft (2,150–2,450 m) on hillslopes, but does not occur, at least commonly, in the Impenetrable Forest. It is, however, one of the most abundant trees in patches of secondary forest just outside that reserve near Rushasha, where it is associated with *Polyscias fulva*, *Carapa grandiflora*, *Maesa lanceolata*, *Croton macrostachys*, *Macaranga kilimandscharica*, *Schefflera* sp., *Alangium chinense* and *Neoboutonia macrocalyx*, all species found in the forest and *Trema guineensis*, *Nuxia* sp., *Hagenia abyssinica* and *Erythrina abyssinica*, species of woodland and early secondary forest. Its abundance on the Ruwenzori is probably due to the greater instability of soils of the very steep slopes.

Table 5. Vegetation in Kigezi

Scientific Name	Rukiga Name
<i>Acanthus arborneus</i> Forsk.	Ekitojo.
<i>Achyranthes aspera</i> Linn.	- Omuhurura.
<i>Aeguria salicifolia</i> (Comm. ex Lam.) Hook. f. ex Oliv.	- Omusegura.
<i>Alangium chinense</i> (Lour.) Rehder	Omukofe.
<i>Albizia gummifera</i> (J. F. Gmel.) C. I. Sm.	Omushelwa.
<i>Alchemilla ellenbeckii</i> Engl.	
<i>Allophylus macrobotrys</i> Gilg	- Omushusha.
<i>Andropogon abyssinicus</i> R. Br. ex Fresen.	Eyojwa.
<i>Aningeria udolfi-friederici</i> (Engl.) Rohyns et Gilbert	
<i>Anthoelista zambeziaca</i> Baker	
<i>Arundinaria alpina</i> K. Schum.	
<i>Asplenium friasiorum</i> C. Chr.	Omugano.
<i>A. pseudoserra</i> Domin.	
<i>Begonia meyeri-johannis</i> Engl.	
<i>Brilschmeidia ugandensis</i> Rondelet	
<i>Bersama abyssinica</i> Fresen.	- Omukaka.
<i>Bidens grantii</i> (Oliv.) Scherff.	- Ehongwa.
<i>B. pilosa</i> L.	- Enyabarashana.
<i>Brachystephanus africanus</i> S. Moore.	
<i>Carapa grandiflora</i> Sprague	- Omurugya.
<i>Cassipourea ruwensorensis</i> (Engl.) Alston	
<i>Celsia brevipedicellata</i> Engl.	
<i>Chassalia subochrea</i> (De Wild.) Rohyns	
<i>Chrysophyllum albidum</i> G. Don	--- Omuhavu.
<i>C. juluum</i> S. Moore	
<i>Clematis simensis</i> Fresen.	
<i>Clerodendrum johnstonii</i> Oliv.	
<i>Commelina benghalensis</i> L.	-- Eteja.
<i>Connopharyngia holstii</i> (Engl.) Stapf	- Kashaho.
<i>Conyza floribunda</i> H. B. K.	- Akaizire -Juba
<i>Crassocephalum montuosum</i> (S. Moore) Milne-Redhead	
<i>C. picridifolium</i> (DC.) S. Moore	- Eshununu.
<i>Croton macrostachys</i> Hochst. ex Del.	- Omurungura.
<i>C. megalocarpus</i> Hutch.	-- Omutakula.
<i>C. oxypetalus</i> Muell. Arg.	
<i>Culecisia scandens</i> P. Beauv.	
<i>Cupressus lusitanica</i> Mill.	
<i>Cussonia holstii</i> Harms.	
<i>Crathula uncinulata</i> (Shrad.) Schin.	- Omuna.
<i>Crathea manniana</i> Hook.	- Ekiqunju.
<i>Cymbopogon afronardus</i> Stapf	- Omuteje.
<i>Cynodon plectostachys</i> (K. Schum.) Pilger	- Orucwamba.
<i>Cyperus demidatus</i> L. f.	
<i>C. latifolius</i> Poir.	-- Ekisharara.
<i>C. nudicaulis</i> Poir.	
<i>C. papyrus</i> L.	-- Orufunjo.
<i>C. platycaulis</i> Bak. var. <i>lucentinigris</i> (K. Schum.) Kukenth.	-- Obusunu.
<i>Digitaria scalarum</i> (Schweinf.) Chiar.	-- Orumbugu.
<i>D. unguis</i> (A. Rich.) Stapf	
<i>Dipsacus pinnatifidus</i> A. Rich.	
<i>Diosotis canescens</i> (E. Mey. ex Grh.) Hook. f.	
<i>Dombeya goetzenii</i> K. Schum.	- Omukole
<i>D. makole</i> Sprague	
<i>Dodonaea viscosa</i> (L.) Jacq.	- Ekigorororo.
<i>Dracaena afro-montana</i> Mildbr.	-- Ekigororo
<i>Droguetia iners</i> (Forsk.) Schweinf.	
<i>Drosera madagascariensis</i> DC.	
<i>Dryopteris kilimensis</i> (Kuhn) O. Ktze.	
<i>Dryopteris gerrardii</i> Hutch.	
<i>Ekebergia rupestris</i> (Fresen.) A. Rich.	- Omufumba.
<i>Entandrapragma excelsum</i> (Dawe et Sprague) Sprague	- Omuyove.
<i>Fragaria olivacea</i> K. Schum.	
<i>E. tenuifolia</i> (A. Rich.) Steud.	
<i>Erica bequaertii</i> De Wild.	

Source: Hamilton. 1969.

<i>Eriocaulon schimperi</i> Korn	
<i>Eriosema montanum</i> Bak. f.	
<i>Erythrina abyssinica</i> Lam.	— Ekiko
<i>Exothea abyssinica</i> (A. Rich.) f. v. d. r. s.	
<i>Fagara macrophylla</i> (Oliv.) Engl.	— Omushaga, Omuremankobe
<i>Fagaropsis angolensis</i> (Engl.) Dale	
<i>Fanera saligna</i> Harv.	— Omurenjer
<i>Ficalhoa laurifolia</i> Hiern	
<i>Galiniera coffeoides</i> Del.	— Omuryanyonye.
<i>Gnaphalium luteo-album</i> L.	
<i>Gouania longispicata</i> Engl.	— Omufurura.
<i>Guarea mayombensis</i> Pellegrin	— Omuchuraga
<i>Guznera perperca</i> L.	
<i>Hagenia abyssinica</i> (Bruce) J. F. Gmel.	— Omujesi.
<i>Harungana madagascariensis</i> Lam.	— Omuriamanga.
<i>Helichrysum formosissimum</i> (Sch. Bip.) Sch. Bip.	
<i>Hydrocotyle sibthorpioides</i> Hook. f.	
<i>H. verticillata</i> Thunb.	
<i>Hyparrhenia cymbaria</i> (Linn.) Stapf	— <i>Hyparrhenia</i> = Emburara.
<i>H. diplandra</i> (Hack.) Stapf	
<i>H. filipendula</i> (Hack.) Stapf	
<i>H. lecontei</i> (Franch.) Stapf	
<i>H. pilgeriana</i> Hubbard	
<i>Hypericum lanceolatum</i> Lam.	
<i>H. poplidiifolium</i> A. Rich.	
<i>H. sciomum</i> Chiov.	
<i>Ilex mitis</i> (L.) Radlk.	
<i>Impatiens emini</i> Warb.	— Omunyabasi.
<i>Justicia usyorensis</i> S. Moore	
<i>Kalanchoe crenata</i> Haw.	— Ereka.
<i>Kniphofia thomsonii</i> Baker	
<i>Lantana camara</i> L.	— Omuhuuko.
<i>Lobelia giberroa</i> Hemsl.	— Entonvu.
<i>L. kuruensis</i> Engl.	
<i>Lythrum rotundifolium</i> Hochst.	
<i>Macaranga kilimandscharica</i> Pax	— Omusasa.
<i>Maesa lanceolata</i> Forst.	— Omuhanga.
<i>Marrubium imbricatum</i> C. B. Cl.	— Ekisharara.
<i>Markhamia plaiocalyx</i> (Bak.) Sprague	— Omushambya.
<i>Maytenis senegalensis</i> (Lam.) Exell	— Omushobe.
<i>M. undatus</i> (Thunb.) Blake	
<i>Melinis mirabilis</i> Bosc.	
<i>Mimulopsis solmsii</i> Shoenf.	
<i>Miscanthidium violaceum</i> (K. Schum.) Rolyns	— Omusharu.
<i>Mitragyna rubrostipulata</i> (K. Schum.) Harv.	— Omuziko.
<i>Musanga cecropioides</i> R. Br.	
<i>Myricanthus holstii</i> Engl.	— Echuvu, Mufe.
<i>Myrica kandiana</i> Engl.	
<i>M. salicifolia</i> Hochst. ex A. Rich.	— Omugyegye
<i>Neoboutonia macrocalyx</i> Pax	— Omwanya.
<i>Neotoma buchananii</i> (Baker) Gilb. et Bouf.	— Omukungu.
<i>Nuxia congesta</i> Fresen.	— Omubuzije.
<i>N. floribunda</i> Benth.	— Omumuli
<i>Ocotea usambarensis</i> Engl.	— Omwiha.
<i>Olea africana</i> Mill.	
<i>O. hochstetteri</i> Baker	— Omugando.
<i>O. welwitschii</i> (Knobl.) Gilg et Schellenb.	
<i>Olsomia usambarensis</i> Gilg	— Omubaba.
<i>Omunda regalis</i> L.	
<i>Parinsonia eckii</i> Mez	
<i>Parinari excelsa</i> Sabine	— Omushamba.
<i>Prochetia comocarpis</i> Buch.-Ham. ex G. Don.	
<i>Pennisetum clandestinum</i> Chiov.	— Omuchambe.
<i>P. mildbraedii</i> Mez	
<i>Pentas lanceolata</i> (Forsk.) K. Schum.	

<i>P. zanzibarica</i> (Klotzsch) Vata	
<i>Philippia bengualensis</i> (Engt.) Alm et Th. Fries Jr.	— Omuhungye.
<i>Phytolacca dodecandra</i> L'Herit.	— Omuhoko.
<i>Pinus patula</i> Schlecht. et Cham.	
<i>P. radiata</i> D. Don	
<i>Piper capense</i> L. f.	
<i>Pithecolobium spathicalyx</i> De Wild.	— Omushekera.
<i>Podocarpus milanjanus</i> Rendle	— Omufu.
<i>Polygala ruwenzoriensis</i> Chodat	— Omuserere.
<i>Polyscias fulva</i> (Hiern) Harms	— Omungu.
<i>Pyrenaria megistosticta</i> (S. Moore) Petit	— Omujingwa.
<i>Pteridium aquilinum</i> (Linn.) Kuhn.	— Ekishuru.
<i>Pycnostachys erici</i> — <i>roseii</i> R. E. Fries	— Ekisindokwa.
<i>Pyxurus mundtii</i> Nees	—
<i>P. nigricans</i> (Steud.) C.B. Cl.	
<i>Pygeum africanum</i> Hk. f.	— Omumba.
<i>Ranunculus multifidus</i> Forsk.	
<i>Rapanea pulchra</i> Gilg et Schellenb	
<i>R. rhododendroides</i> (Gilg) Mez	
<i>Rhamnus princoides</i> L'Herit.	
<i>Ritchias albertii</i> Gilg	— Eshesha.
<i>Rumex abyssinicus</i> Jacq.	— Omuka.
<i>R. bequaertii</i> De Wild.	— Nyinamuku.
<i>R. ussabaensis</i> (Dammer) Dammer	— Omufumbuga.
<i>Sakesia laurentii</i> Cogn. ex De Wild et Dur.	
<i>Scirpus inclinatus</i> (Del.) Aschers. et Schweinf. ex Reiss.	
<i>Sericostachys tomentosa</i> Loqr.	— Omuna.
<i>Setaria sphaeralata</i> Stapf et Hubbard	— Orutaratumbwa.
<i>Solanum aculeastrum</i> Dunal	— Omutugunda.
<i>Stachys aculeolata</i> Hook. f.	
<i>Strombosia schefleri</i> Engl.	— Omuhika.
<i>Symbionia globulifera</i> Linn. f.	— Omusisi.
<i>Syzygium cordatum</i> Hochst. ex Sond.	— Omukondo.
<i>S. guineense</i> (Wild.) D.C.	— Omugote.
<i>Tetrorchidium didymastemon</i> Pax et K. Hoffm.	— Omunyamaizi.
<i>Thalictrum rhynchocarpum</i> Dillon et A. Rich.	
<i>Thelypteris squamigera</i> (Schlecht.) Ching.	
<i>Trema guineensis</i> Ficalho	— Omugwampira.
<i>Typha australis</i> Schumacher.	— Omuhimbini.
<i>Urera hypselodendron</i> (Hochst.) Wedd.	— Omushe.
<i>Urtica massaiica</i> Mildbr.	— Ekichuragvenyi.
<i>Xymalos monospora</i> (Harv.) Bail.	— Omuhotora.
<i>Zehneria minutiflora</i> (Cogn.) C. Jeffrey	

Source: Hamilton. 1969.

Table 6. plants occurring in Uganda in 1902

PHANEROGAMS.

Ranunculaceæ.

- Clematis Thunbergii*, Steud. Madi, Speke & Grant; Ukidi, Speke & Grant.
C. grata, Wall. Uganda, Speke & Grant.
Ranunculus pubescens, Thunb. Ruwenzori, Doggett.

Anonaceæ.

- Annona senegalensis*, var. *latifolia*, Oliv. Unyoro and Madi, Speke & Grant.
Heulobus senegalensis, A. DC. Madi, Speke & Grant.
Chasmodon dependens, Hochst. Unyoro, Speke & Grant.

Nymphaeaceæ.

- Nymphaea stellata*, Willd. Congo Free State frontier, Doggett; Nile, 2° N.
 Speke & Grant; Uganda, very common, Wilson.
N. Lotus, L. Unyoro, Wilson; Nile, 2° N., Speke & Grant.

Cruciferae.

- Cardamine pratensis*, L. Ruwenzori, Doggett.
Arabis alpina, L. Ruwenzori, Doggett.
Fursetia stenoptera, Hochst. Baringo, Johnston.

Capparidaceæ.

- Clome diandra*, Hochst. Baringo, Johnston.
C. monophylla, L. Uganda, Wilson. T.L.S. xxix. t. 5, f. 1.
Gymnodropsis pentaphylla, L. Uganda, Wilson.
Caribonia decumbens, A. Brongn. Madi, Speke & Grant.
Boscia silicifolia, Oliv. Madi, Speke & Grant.
Capparis spinosa, L., forma. Baringo, Johnston.
C. tomentosa, Lam., var. Madi, Speke & Grant.
Cratogeomys religiosa, Forst. Madi, Speke & Grant.

Violaceæ.

- Viola abyssinica*, Steud. Nandi Forest, Johnston.

Bixaceæ.

- Cochlospermum niloticum*, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 7, f. 1.
Flacourtia sp. 3° 15' N., Speke & Grant.

Polygalaceæ.

- Polygala acicularis*, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 9, f. 1.
P. persicariifolia, DC. Unyoro, Speke & Grant; Baringo, Johnston. T.L.S. xxix.
 t. 8, f. 1.
Polygala sp. Ankole, Doggett.

Garyophyllaceæ.

- Polycarpa corymbosa*, var. *eflusa*, Oliv. Madi, Speke & Grant.

Portulacaceæ.

- Portulaca oleracea*, L. Unyoro, Speke & Grant.
Talinum cucifolium, Willd. Unyoro, Speke & Grant; Baringo, Johnston.

Hypericaceæ.

- Hypericum lanceolatum*, Lam. Ruwenzori, Doggett; Nandi, Johnston.
Pterospermum febrifugum, Spach, var. Uganda, Wilson.

Guttiferae.

- Symphonia* sp. Ruwenzori, Doggett.

Dipterocarpaceæ.

- Lophira alata*, Banks. Madi, Speke & Grant.

Malvaceæ.

- Sida cordifolia*, L. Unyoro, Speke & Grant; Uganda, Wilson.
S. rhombifolia, L. Unyoro Plateau, Speke & Grant.
S. schimperiana, Hochst. Uganda, Wilson.
S. spinosa, L. Unyoro, Speke & Grant.
Sida sp. Baringo, Johnston.
Wissadula rostrata, Planch. Uganda, Wilson.
Abutilon sp. Baringo, Johnston.
Urena lobata, L. Unyoro, Speke & Grant.
Pavonia kilimanulsharica, Gürke. Baringo, Johnston.
P. macrophylla, E. Mey. Uganda, Speke & Grant.
Hibiscus articulatus, Hochst. Ruwenzori, Scott-Elliot; Unyoro, Speke & Grant.
 T.L.S. xxix. t. 13, f. 1.
H. esculentus, L. Unyoro, Speke & Grant.
H. Grantii, Mast. Bukedi, Ugani, and Madi, Speke & Grant; Toro, Doggett.
 T.L.S. xxix. t. 12, f. 1.
H. laurifolius, Willd. Ruwenzori and Uganda, Scott-Elliot.
H. pauciflorus, Burm. Unyoro, Speke & Grant; Berkeley, Scott-Elliot.
H. physaloides, Guill. & Perr. Madi, Speke & Grant.
H. Sabdariffa, L. Unyoro, Speke & Grant.
H. vitifolius, L. Ruwenzori, Scott-Elliot.
Gossypium barbadense, L. 3° N., Speke & Grant.
Adansonia digitata, L. 2° N., Speke & Grant.
Eriodendron anfractuosum, DC. 2° N., Speke & Grant.

Sterculiaceæ.

- Sterculia cinerea*, A. Rich. Madi, Speke & Grant.
Dombeya Mastersii, Hook. f. Chiope, Speke & Grant.
D. multiflora, Planch. Madi, Speke & Grant.
D. reticulata, Mast. 3° N., Speke & Grant. T.L.S. xxix. t. 15, f. 1.
Melbania ferruginea, A. Rich. Madi, Speke & Grant. T.L.S. xxix. t. 16, f. 1.

Tillaceæ.

- Grewia asiatica*, L. Baringo, Johnston.
G. mollis, Juss. Toro, Doggett.
G. populifolia, Vahl, forma. Toro, Doggett.
Triumfetta annua, L. Unyoro, Speke & Grant.
Triumfetta sp., cf. *T. tomentosa*, Boj. Uganda, Wilson.
Corchorus olitorius, L. Uganda, Wilson.
C. trilobularis, L. Unyoro, Speke & Grant.

Zygophyllaceæ.

- Tribulus terrestris*, L. Baringo, Johnston.

Geraniaceæ.

- Geranium aculeatum*, Camb. Ruwenzori, Doggett.
G. sinense, Hochst. Nandi Plateau, Johnston.
Impatiens Ehl-ersii, Schweinf. ? Ruwenzori, Doggett.

UERANIACEÆ—(continued).

- Oxalis corniculata*, L., forma. Uganda, Wilson.
O. (Riophyton) sensitiva, L. Unyoro, Speke & Grant.

Simarubaceæ.

- Balanites aegyptiaca*, Del. Madi, Speke & Grant.
Harrisonia abyssinica, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 18, f. 1.

Ochraceæ.

- Celma* sp. 1. Madi, Speke & Grant.

Burseraceæ.

- Boswellia* sp. 1. Madi, Speke and Grant.
Balsamodendron africanum, var. *abyssinica*, Oliv. Ugani, Speke & Grant.

Meliaceæ.

- Trichilia emetica*, Vahl. Madi, Speke & Grant. T.L.S. xxix. t. 20, f. 1.
Khaya senegalensis, A. Juss. Madi, Speke & Grant.
Symplocos sp. 1. Madi, Speke & Grant.

Oleaceæ.

- Nimonia americana*, L. Madi, Speke & Grant.
Oplia acantacea, Roxb. Madi, Speke & Grant.

Celastraceæ.

- Celastrus senegalensis*, Lam. Madi, Speke & Grant; Uganda, Wilson.

Rhamnaceæ.

- Rhamnus* sp. 3 N., Speke & Grant.
Zizyphus jujuba, Lam. Madi, Speke & Grant.

Ampelidæ.

- Vitis aduncoides*, Steud. Unyoro, Speke & Grant.
V. cornifolia, Baker. Madi, Speke & Grant. T.L.S. xxix. t. 22, f. 1.
V. cyphoptala, Fres. Unyoro, Speke & Grant.
V. quadrangularis, L. Unyoro, Speke & Grant; Baringo, Johnston.

Sapindaceæ.

- Cardiospermum halicacabum*, L. Unyoro, Speke & Grant; Uganda, Wilson.
C. microcarpum, H. B. & K. Ruwenzori, Doggett.

Anacardiaceæ.

- Rhus glaucescens*, A. Rich. Madi, Speke & Grant; Uganda, Mau, and Nandi, Scott Elliot; var. *Schimperii*, Oliv. Baringo, Johnston.
Oleina frutescens, Hochst. Madi, Speke & Grant.
Schrocarpa Birrea, Hochst. Madi, Speke & Grant.
Bersania sp., cf. *B. abyssinica*, Fres. Ruwenzori, Doggett.

Leguminosæ.

- Crotalaria atrovirens*, Hochst. Kavirondo, Scott-Elliot.
C. calycina, Schrank. Unyoro, Speke & Grant.
C. cephalotes, Steud. Madi, Speke & Grant; Uganda, Wilson.
C. glauca, Willd. Unyoro, Speke & Grant.
C. hyssopifolia, Klotzsch. Mau, Scott-Elliot.
C. incana, L. Uganda, Wilson.
C. intermedia, Kotschy. 2° N., Speke & Grant.
C. laburnifolia, L. Ruwenzori, Scott-Elliot; Baringo, Johnston.
C. natalitia, Meisn. Ruwenzori and Uganda, Scott-Elliot.

LEGUMINOSÆ (continued).

- Crotalaria recta*, Steud. Uganda, Wilson.
C. spinosa, Hochst. Ankole, Lake Albert Edward, and Ruwenzori, Scott-Elliot.
C. striata, DC. Uganda, Wilson.
Parochetus communis, Ham. Ruwenzori, Doggett.
Trifolium africanum, Ser. 1 Nandi Plateau, Johnston.
T. subrotundum, Steud. Nandi Plateau, Johnston.
Indigofera arrecta, Hochst. Ruwenzori, Scott-Elliot.
I. capitata, Kotschy. Madi, Speke & Grant.
I. euleucophylla, Jacq. Uganda, Scott-Elliot.
I. hirsuta, L. Unyoro, Speke & Grant.
I. macrocarpa, Lope. Ruwenzori, Scott-Elliot.
I. pentaphylla, L. Madi, Speke & Grant; Lake Elementeita and Mau, Scott-Elliot.
I. secundiflora, Poir. Unyoro, Speke & Grant; Kavirondo, Scott-Elliot.
I. stenophylla, Guill. & Perr. Madi, Speke & Grant.
I. subulata, Vahl. Uganda, Scott-Elliot.
Tephrosia dichrocarpa, Steud. Ruwenzori, Doggett.
T. longipes. Uganda, Wilson.
T. polysperma, Baker. Uganda, Speke & Grant. T.L.S. xxix. t. 30, f. 1.
T. rigida, Baker. Madi, Speke & Grant.
T. villosa, Pers. Nandi, Scott-Elliot.
T. Vogelii, Hook. f. Ruwenzori and Uganda, Scott-Elliot; Unyoro, Speke & Grant. T.L.S. xxix. t. 31, f. 1.
Tephrosia spp. Uganda, Wilson.
Milletia sp. Ankole, Doggett.
Sesbania aegyptiaca, Pers. Madi, Speke & Grant.
S. pubescens, DC. Baringo, Johnston.
Astragalus venosus, Hochst. Uganda, Speke & Grant.
Hermipera Elaphrosylon, Guill. & Perr. Upper Nile, 3° to 8° N., Speke & Grant; shallow water of Lake Victoria Nyanza, Johnston.
Eschynomene indica, L. Unyoro, Speke & Grant.
Eschynomene sp. Ruwenzori, Doggett.
Arachis hypogaea, L. Cultivated to a small extent from 7° S. to 2° N., Speke & Grant.
Zornia diphylla, Pers. Uganda, Wilson; Unyoro, Speke & Grant.
Desmodium lasiocarpum, DC. Uganda and Ruwenzori, Scott-Elliot.
Desmodium spp. Uganda, Wilson.
Pseudarthria Hookeri, W. & A. Uganda, Wilson; Unyoro, Speke & Grant.
Pseudarthria sp. Uganda, Wilson.
Uvaria picta, Desv. Madi, Speke & Grant.
Abrus Schimperii, Hochst. Madi, Speke & Grant.
Glycine javanica, L. Uganda, Wilson.
Teramnus labialis, Spreng. Unyoro, Speke & Grant.
Canavalia ensiformis, DC. Chiope, Speke & Grant.
Vigna luteola, Benth. Kavirondo, Scott-Elliot.
V. nilotica, Hook. f. 2° N., Speke & Grant.
V. vexillata, Benth. Ruwenzori, Scott-Elliot.
Dolichos Lablab, L. Unyoro, Speke & Grant.
D. sturerooides, Baker. Toro, Doggett.
Dolichos sp. 1. Madi, Speke & Grant.
Cajanus indicus, Spreng. Unyoro, Speke & Grant.

LEGUMINOSÆ (continued).

- Rhynchosia Grantii*, Baker. Unyoro, Speke & Grant.
R. viscosa, DC. Uganda, Wilson; Unyoro, Speke & Grant.
Eriosema Elliottii, Baker f. Nandi, Scott-Elliott.
E. flemingoides, Baker. Madi, Speke & Grant. T.L.S. xxix. t. 31, f. 1.
E. parviflorum, E. Mey. Berkeley Bay, Victoria Nyanza, Scott-Elliott.
Dalbergia melanocylon, Guill. & Perr. Madi, Speke & Grant.
Loucheocarpus laeviflorus, Guill. & Perr. Madi, Speke & Grant.
Swartzia madagascariensis, Desv. Madi, Speke & Grant.
Cordyla africana, Lour. Six miles south of Gondokoro, Speke & Grant.
Parkinsonia aculeata, L. Gondokoro (introduced), Speke & Grant.
Cassia dilatipetiolata, Fres. Uganda, Wilson; Madi, Speke & Grant.
C. Kirkii, Oliv. Uganda, Wilson.
C. mimosoides, L. Unyoro, Speke & Grant.
C. Torii, L. Uganda, Wilson; Unyoro, Speke & Grant.
Bauhinia fuscoglossa, Kotschy. Baringo, Johnston.
B. reticulata, DC. Uganda, Wilson; Unyoro, Speke & Grant.
Detarium senegalense, Gmel. Madi, Speke & Grant.
Cynometra sp. Toro, Doggett.
Mimosa asperata, L. Madi, Speke & Grant.
Acacia Catechu, Willd. Madi, Speke & Grant.
A. leucophylla, Steud. Madi, Speke & Grant.
A. sicberiana, DC. Madi, Speke & Grant.
A. stenocarpa, Hochst. Madi, Speke & Grant.
Acacia sp. Uganda, Wilson.
Albizia rhombifolia, Benth. f. Madi, Speke & Grant.

Rosacæ.

- Rubus rigidus*, Sm. Nandi Forest, Johnston.
Rubus sp. Ruwenzori, Doggett.
Alchemilla sp. Near El Burgan, Johnston.
Alchemilla sp. Ruwenzori, Doggett.

Crassulacæ.

- Bryophyllum calycinum*, Salish. Madi, Speke & Grant.
Kalanchoe sp. Ravine, Johnston.
Kalanchoe sp. Baringo, Johnston.
Kalanchoe sp. Toro, Doggett.

Hamamelidacæ.

- Trichochadus malosanus*, Baker. Nandi Forest, Johnston.

Combretacæ.

- Terminalia macroptera*, Guill. & Perr. Madi, Speke and Grant.
Terminalia sp. Baringo, Johnston.
Aucocissus leiocarpus, Guill. & Perr. Bari country, 4° N., Speke & Grant.
Combretum capituliflorum, Fenzl. Madi, Speke & Grant. T.L.S. xxix. t. 38, f. 1.
C. collinum, Fres. Madi, Speke & Grant.
C. glutinosum, Guill. & Perr. Madi, Speke & Grant.
C. petitarum, A. Rich. Madi, Speke & Grant.
C. racemosum, P. Beauv. Lake Nyanbukere, Doggett.
C. reticulatum, Fres. Madi, Speke & Grant.

COMBRETACÆ (continued).

- Combretum* sp. Mau Plateau, Johnston.
Cucoucia paniculata, Laws. Baringo, Johnston.

Myrtacæ.

- Eugenia ouariensis*, P. Beauv. Madi, Speke & Grant.

Melastomacæ.

- Osbeckia* sp. Uganda, Wilson.
Dissotis petiolata, Hook. f. Madi, Speke & Grant.
Dissotis sp. Uganda, Wilson.

Lythracæ.

- Aesua cordata*, Hiern. Madi, Speke & Grant.
Lythrum rotundifolium, Hochst. Nandi Plateau, Johnston.
Ammania senegalensis, Lam. Madi, Speke & Grant.
Jussiaea diffusa, Forsk. Uganda, Wilson; Unyoro, Speke & Grant.
J. pilosa, H. B. & K. On the Nile, 1° N., Speke & Grant.
J. villosa, Lam. Bukedi and Madi, Speke & Grant.
Ladwigia parviflora, Roxb. Unyoro, Speke & Grant.
L. prostrata, Roxb. Uganda, Wilson.

Onagrariacæ.

- Epilobium hirsutum*, L. Ruwenzori, Scott-Elliott; Lake Naivasha, Johnston.
Trapa natans, L. Floating on the Nile at 2° N., shores of the Victoria Nyanza at the equator, and Katsyga River, Speke & Grant.

Cucurbitacæ.

- Lagenaria vulgaris*, Ser. Unyoro, Speke & Grant.
Momordica Morkorro, A. Rich. Ukidi, Speke & Grant.
Cucurbita maxima, Duch. Unyoro, Speke & Grant.
Bryonopsis laciniosa, Arn. Unyoro, Speke & Grant.
Melothria triangulata, Benth. Unyoro, Speke & Grant.

Begoniacæ.

- Begonia* sp. Ruwenzori, Doggett.

Umbelliferæ.

- Hydrocotyle natans*, Cyr. Unyoro, Speke & Grant.
Alpidea anantimbia, Eckl. & Zeyh. Kavirondo, Scott-Elliott, Johnston.
Trachypodium abyssinicum, Benth. & Hook. f. Nandi Plateau, Johnston.
Diplazium abyssinicum, Benth. & Hook. f. Uganda, Wilson; Madi, Speke & Grant.
Peweebanum fraxinifolium, Hiern. Madi, Speke & Grant. T.L.S. xxix. t. 42, f. 1.
P. Grantii, Kingston. Unyoro, Speke & Grant. T.L.S. xxix. t. 43, f. 1.
Anthriscus dissectus, C. H. Wright. Ruwenzori, Doggett.

Eubiaceæ.

- Sarcocephalus Russeggeri*, Kotschy. Madi, Speke & Grant.
Hymenodictyon sp. 1. Madi, Speke & Grant.
Crossopteryx kotschyana, Fenzl. Madi, Speke & Grant.
Pentas Ainsworthii, Scott-Elliott. Western Uganda, Doggett.
P. occidentalis, Benth. & Hook. f. Ruwenzori, Doggett.
P. quartiniana, Hook. f. Madi and Bukedi, Speke & Grant. T.L.S. xxix. t. 46, f. 1.
P. Thomsonii, Scott-Elliott. Nandi, Scott-Elliott, Johnston.

RUBIACEÆ—(continued).

- Pentax* sp. Toro, Doggett.
Pentax sp. Uganda, Wilson.
Vireta sp., cf. *V. multiflora*, Sm. Ankole, Doggett.
Otomeria mudiensis, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 47, f. 1.
Hedyotis sp. 1 Uganda, Wilson.
Odenanthe abyssinica, Hiern. Congo Forest, Doggett.
O. Hegnei, W. & A. Uganda, Speke & Grant.
Mussaenda erythrophylla, Sch. & Thonn. Ruwenzori, Doggett.
M. luteola, Del. Gani and Madi, Speke & Grant.
Randia dumetorum, Lam. 1 Madi, Speke & Grant.
Gardenia lutea, Fres. Madi, Speke & Grant.
G. Thunbergia, L. f. Uganda, Wilson.
Tricalysia sp. 1 Madi, Speke & Grant.
Plectranth venosa, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 49, f. 1.
Canthium sp. Baringo, Johnston.
Vangueria sp. 1 Madi, Speke & Grant.
Isora sp. 1 Madi, Speke & Grant.
Coffea arabica, L. Waichiru, near Lake Victoria Nyanza, Speke & Grant.
Rytidos sp. 1 Uganda, Wilson.
Anthospermum sp. Nandi Forest, Johnston.
Spermacoe ampliata, Oliv. Unyoro, Speke & Grant. T.L.S. xxix. t. 54, f. 1.
S. heliopsis, Oliv. 1 Ukidi, Speke & Grant.
S. kotschyana, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 53, f. 1.
S. spina nostigma, A. Rich. 1 Uganda, Wilson.
S. stricta, L. f. Bukedi Forest, Speke & Grant.
Mitracarpum senegalense, DC. Unyoro, Speke & Grant.
Rubia cordifolia, L. Uganda, Wilson; Mau, Johnston.

Dipsacæ.

- Seibesia Columbaria*, L. Nandi Plateau, Johnston.

Compositæ.

- Gutierrezia cordifolia*, Benth. Unyoro, Speke & Grant.
Bothriocline Schimperii, Oliv. & Hiern. Uganda, Wilson.
Vernonia ambigua, Kotschy & Peyr. Madi, Speke & Grant.
V. cinerea, Less. Uganda, Wilson.
V. Grantii, Oliv. Unyoro, Speke & Grant. T.L.S. xxix. t. 57, f. 1.
V. hymenolepis, A. Rich. Ruwenzori, Doggett.
V. Perrottetii, Sch. Bip. Madi, Speke & Grant.
V. pauciflora, Kotschy & Peyr. Uganda, Wilson; Madi, Speke & Grant.
V. purpurea, Sch. Bip. Madi, Speke & Grant.
V. thomsoniana, Oliv. & Hiern. Madi, Speke & Grant.
V. turbanata, Oliv. & Hiern. Madi, Speke & Grant.
V. violacea, Oliv. & Hiern. Uganda, Wilson; Madi, Speke & Grant.
Vernonia spp. Uganda, Wilson.
Vernonia sp. Western Ankole, Doggett.
Adenostemma viscosum, Forst., forma. Uganda, Wilson.
Ageratum conyzoides, L. Uganda, Wilson; Unyoro, Speke & Grant.
Filicia abyssinica, Sch. Bip. Mau Plateau, Johnston.
Erigeron Grantii, Oliv. & Hiern. Unyoro, Speke & Grant. T.L.S. xxix. t. 58, f. 1.
Congya wrightii, Ait. Unyoro, Speke & Grant.

COMPOSITÆ—(continued).

- Congya Newii*, Oliv. & Hiern. Nandi, Johnston.
Congya sp. Uganda, Wilson.
Tarchananthus camphoratus, L. Mau Plateau, Johnston.
Blumea lacera, DC. Uganda, Wilson; Unyoro, Speke & Grant.
Lagotis alata, Sch. Bip. Unyoro, Speke & Grant.
L. pteralonta, Sch. Bip. Unyoro, Speke & Grant.
Sphaeranthus cyathoides, O. Hoffm. Baringo, Johnston.
S. suaveolens, DC. Madi, Speke & Grant.
Helichrysum declinatum, Less. Nandi Plateau, Johnston.
H. elegantissimum, DC. Ruwenzori, Doggett.
H. unilatum, Less. Uganda, Wilson.
Helichrysum sp. Nandi, Johnston.
Helichrysum sp. Ankole, Doggett.
Athrixia rosmarinifolia, Oliv. & Hiern. Nandi Forest, Johnston.
Aurotoppus chiensis, Hook. & Arn. Madi, Speke & Grant. T.L.S. xxix. t. 64, f. B.
Siegesbeckia orientalis, L. Uganda, Wilson.
Aspilua Kotschyi, Benth. & Hook. f. Uganda, Speke & Grant, Wilson.
Aspilua sp. Uganda, Wilson.
Coreopsis Steppia, Steetz. Ruwenzori, Doggett.
Coreopsis sp. Nandi Plateau, Johnston.
Coreopsis sp. Mau, Scott-Elliott.
Coreopsis sp. Kavirondo, Scott-Elliott.
Coreopsis sp. Gani, Speke & Grant.
Chrysanthellum indicum, DC. Unyoro, Speke & Grant.
Chrysanthemum procumbens, Pers. Uganda, Wilson.
Gynura vitellina, Benth. Uganda, Wilson.
Emilia integrifolia, Baker. Mau, Scott-Elliott; Nandi Plateau, Johnston.
Notonia abyssinica, A. Rich. Uganda, Wilson.
X. Grantii, Oliv. & Hiern. Nandi, Johnston.
Senecio discifolia, Oliv. Uganda, Speke & Grant, Wilson.
S. Mannii, Hook. f. Kivata, Ruwenzori, Scott-Elliott; var., Nandi Forest, Johnston.
S. sarmentosa, O. Hoffm. Nandi Plateau, Johnston.
Senecio sp. Unyoro, Speke & Grant.
Senecio spp. Ruwenzori, Doggett.
Berkheya spekeana, Oliv. Uganda, Wilson; Unyoro and Madi, Speke & Grant. T.L.S. xxix. t. 66, f. 1.
Echinops amplexicaulis, Oliv. Uganda, Wilson.
E. longifolius, A. Rich. Madi, Speke & Grant.
Echinops sp. Toro, Doggett.
Gerbera lasiopus, Baker. Toro, Doggett; Nandi Plateau, Johnston.
G. piloselloides, Cass. Nandi, Scott-Elliott.
Sonchus oleraceus, L. Unyoro, Speke & Grant.

Campanulacæ.

- Lobelia Deckenii*, Hemsl. Ruwenzori, Doggett; Nandi Plateau, Johnston.
L. Giberron, Hemsl. Ruwenzori, Doggett.
L. Stuhlmanni, Schweinf. Ruwenzori, Doggett, Scott-Elliott.
Lobelia sp. Mau and Nandi Plateau, Johnston.

CAMPANULACEÆ (continued).

- Lobelia* sp. Nandi Plateau, Johnston.
- Cephalostigma* sp. Nandi Plateau, Johnston.
- Lightfootia abyssinica*, L. Ruwenzori and Kavirondo, Scott-Elliot.

Ericaceæ.

- Erica arborea*, L. Ruwenzori, Scott-Elliot, Doggett; Nandi Forest, Johnston.
- Philippia* sp. Ruwenzori, Doggett.

Myrsinaceæ.

- Embelia nilotica*, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 71, f. 1.

Sapotaceæ.

- Chrysophyllum* sp. Madi, Speke & Grant.
- Chrysophyllum* sp. 7° 5' S. to 3° 15' N., Speke & Grant.
- Mimusops Kummel*, Hochst. Madi, Speke & Grant.
- Butyrospermum Parkii*, Kotschy. (*Bassia Parkii*, G. Don. T.L.S. xxix. t. 73, f. 1. Madi, Speke & Grant.)

Ebenaceæ.

- Euclea Divinorum*, Hiern. Uganda, Wilson.

Oleaceæ.

- Jasminum abyssinicum*, R. Br. Mau, Scott-Elliot.
- J. floribundum*, R. Br. Naivasha, Johnston.
- Linociera nilotica*, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 117, f. 1.
- Olea chrysophylla*, Lam. Ruwenzori and Mau, Scott-Elliot; Nandi Forest, Johnston.

Apocynaceæ.

- Laudolphia florida*, Benth. Uganda, Wilson; Madi, Speke & Grant.
- Carissa* sp. Uganda, Wilson.
- Carissa* sp. Madi, 3° N., Speke & Grant.
- Adenium speciosum*, Fenzl. Bari country, Speke & Grant.

Asclepiadaceæ.

- Taraxacum apiculata*, Oliv. Madi and Gondokoro, Speke & Grant. T.L.S. xxix. t. 72, f. 1.
- Toxicarpus africanus*, Oliv. Unyoro, Speke & Grant. T.L.S. xxix. t. 118, f. A.
- Gomphocarpus fruticosus*, R. Br. Unyoro, Speke & Grant.
- G. physocarpus*, E. Mey. Uganda, Wilson; Madi, Speke & Grant.
- G. robustus*, A. Rich. Unyoro, Speke & Grant.
- Gomphocarpus* sp. Uganda, Wilson.
- Calotropis procera*, R. Br. 3° 15' N., Speke & Grant; Baringo, Johnston.
- Asclepias glaberrima*, Schltr. Baringo, Johnston.
- A. macrantha*, Hochst. Ruwenzori, Doggett.
- Asclepias* sp. Uganda, Wilson.
- Margaretta rosea*, Oliv. Uganda, Wilson; Unyoro, Speke & Grant. T.L.S. xxix. t. 76, f. 1.
- Marsdenia spissa*, S. Moore, var. Baringo, Johnston.
- Dermia extensa*, R. Br. 2° N., Speke and Grant.
- Leptadenia lancifolia*, Decsue. Madi, Speke & Grant.
- Brachystelma Johnstoni*, N. E. Br. Nandi, Johnston.

Loganiaceæ.

- Strychnos* sp. Madi and Unyoro, Speke & Grant.

Gentianaceæ.

- Belmontia grandis*, E. Moq. Ankole, Doggett.
- Favos* sp. Uganda, Wilson.
- Octopleura laschioides*, var. *compacta*, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 78, f. A.

Boraginaceæ.

- Coldenia procumbens*, L. Madi, Speke & Grant.
- Heliotropium zeylanicum*, Lam. Baringo and Naivasha, Johnston.
- Cynoglossum corruleum*, Hochst. Ruwenzori, Doggett; Nandi Plateau, Johnston.

Convolvulaceæ.

- Argyrea populifolia*, var. *africana*, Oliv. Chiope, Speke & Grant.
- Ipomoea Batatas*, Lam. "Cultivated all the way from Zanzibar to Egypt," Speke & Grant.
- I. capitata*, Choisy. Madi, 3° 15' N., Speke & Grant.
- I. commutophylla*, var. *angustifolia*, Oliv. 2° N., Speke & Grant.
- I. Grantii*, Oliv. Unyoro, Speke & Grant. T.L.S. xxix. t. 80, f. 1.
- I. involucrata*, P. Beauv. Unyoro, Speke & Grant.
- I. pinnata*, Hochst. Madi, Speke & Grant.
- I. sessiliflora*, Choisy 1. Uganda, Wilson.
- Hewittia bicolor*, W. & A. Unyoro, banks of the Nile, Speke & Grant.
- Convolvulus malvaceus*, Oliv. Chiope, 1° 40' N., Speke & Grant.
- Evolvulus alsinoides*, L. Unyoro, Speke & Grant; var., Uganda, Wilson.
- E. dichondroides*, Oliv. Uganda, Speke & Grant. T.L.S. xxix. t. 78, f. B.
- Cuscuta obtusiflora*, H. B. & K. Mau, Scott-Elliot; Nandi Forest, Johnston.
- Cuscuta* sp. Baringo, Johnston.

Solanaceæ.

- Solanum duplosinuatum*, Klotzsch. Unyoro, Speke & Grant.
- S. giganteum*, Jacq. Uganda, Wilson.
- S. hastifolium*, Hochst. Baringo, Johnston.
- S. nodiflorum*, Jacq. Uganda, Wilson.
- S. ruworiense*, C. H. Wright. Ruwenzori, Doggett.
- Physalis aquata*, Jacq. f. Unyoro, Speke & Grant.
- Physalis* sp. Uganda, Wilson.
- Capsicum conicum*, var. *orientale*, DC. Unyoro, Speke & Grant.
- Withania somnifera*, Dun. Uganda, Wilson; Madi, 3° 15' N., Speke & Grant.
- Nicotiana Tabacum*, L. "Cultivated from 7° S. to 4° N.," Speke & Grant.

Scrophulariaceæ.

- Herpestis floribunda*, R. Br. Madi, 3° 15' N., Speke & Grant.
- Dopatrium macranthum*, Oliv. Madi, 3° 15' N., Speke & Grant. T.L.S. xxix. t. 121, f. A.
- Vandellia lobeloides*, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 121, f. B.
- Bonnyia trichotoma*, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 122, f. B.
- Veronica africana*, Hook. f. Ruwenzori, Scott-Elliot; Nandi Plateau, Johnston.
- Striga Forbestii*, Benth. Uganda, Wilson.

SCROPHULARIACEÆ (continued).

- Striga hermonthica*, Benth. Unyoro, Speke & Grant.
Rhamphicarpa fistulosa, Benth. Madi, Speke & Grant.
R. Heuglinii, Hochst. Baringo, Johnston.
Rhamphicarpa sp. Uganda, Wilson.
Cycnium adonense, E. Mey. Uganda, Wilson; Madi, Speke & Grant; Nandi, Scott Elliot; var. *adscendens*, Oliv. Unyoro, Speke & Grant. T.L.S. xxix. t. 88, f. 1.
C. herzfeldianum, Engl. Buddu, Scott-Elliott.
Cycnium sp. Nandi, Johnston.
Sopubia lanata, Engl. Nandi, Scott-Elliott.
S. ramosa, Hochst. Ruwenzori, Scott-Elliott; Uganda, Wilson; Madi, Speke & Grant.

Lentibulariaceæ.

- Utricularia tuberosa*, Forsk. Nile, 2° N., Speke & Grant.
U. reflexa, Oliv. Unyoro, Speke & Grant.

Gesneraceæ.

- Streptocarpus caulescens*, Vatke. Ruwenzori, Doggett.

Bignoniaceæ.

- Stereospermum dentatum*, A. Rich. Madi, Speke & Grant.
Spathodea nilotica, Seem.
Spathodea sp. Unyoro, Speke & Grant.
Spathodea sp. Uganda, Wilson.
Spathodea sp. 1 Madi, 3° 15' N., Speke & Grant.
Kopelia pinnaata, DC. Madi, 3° N., Speke & Grant.

Acanthaceæ.

- Thunbergia sericea*, Burkill. Nandi, Scott-Elliott.
T. Gibsonii, S. Moore. Mau, Gibson; Nandi Plateau, Johnston.
T. alata, var. *viridata*, Burkill. Ruwenzori, Scott-Elliott.
Nelsonia campestris, R. Br. Ruwenzori and Uganda, Scott-Elliott.
Brilliantaisia Nymanorum, Burkill. Kavirondo, Scott-Elliott.
B. cicutricosa, Lindau. Ruwenzori, Stuhlmann.
B. patula, T. Anders. (*B. alata*, T. Anders. T.L.S. xxix. t. 121, f. 1). Uganda and Unyoro, Speke & Grant.
Mollera lobulata, S. Moore. East side of Lake Albert Edward Nyanza, Scott-Elliott.
Minulopsis spathulata, C. B. Cl. Mau, Scott-Elliott.
M. ruwenzoricæ, Lindau. Ruwenzori, Stuhlmann.
M. Elliottii, C. B. Cl. Ruwenzori, Scott-Elliott.
M. arborescens, C. B. Cl. Ruwenzori, Scott-Elliott.
Whitfieldia longifolia, T. Anders. Sese Islands, Lake Victoria Nyanza, Stuhlmann.
Dyschoriste depressa, Nees. Mau, Scott-Elliott.
D. rubicans, Nees. Uganda, Stuhlmann.
Dyschoriste sp. Baringo, Johnston.
Phylopsix longifolia, T. Thoms. East side of Lake Albert Edward, Scott-Elliott; Madi, Speke & Grant.
P. Poggeri, C. B. Cl. East side of Lake Albert Nyanza, Scott-Elliott.
Blepharis molluginifolia, Pers. Ruwenzori, Scott-Elliott.

ACANTHACEÆ—(continued).

- Acanthus arboræus*, Forek. Lake Victoria Nyanza, Stuhlmann; Uganda, Wilson; Nandi, Scott-Elliott.
A. eminens, C. B. Cl. Mau, Scott-Elliott; Nandi Forest, Johnston.
Crossandra nilotica, Oliv. Madi, Speke & Grant; Lake Rudolf, Donaldson Smith. T.L.S. xxix. t. 85, f. 1.
C. mucronata, Lindau. Lake Victoria Nyanza and east side of Albert Edward, Scott-Elliott.
C. subcaulis, C. B. Cl. Baringo, Johnston.
Lepidagathis ampliata, C. B. Cl. Kavirondo, Scott-Elliott.
L. diversa, C. B. Cl. (*L. mollis*, Oliv.). Madi, Speke & Grant.
L. andersoniana, Lindau. Uganda, Stuhlmann.
Axystasia Schimperii, T. Anders. Uganda, Scott-Elliott, var. *Grantii*, C. B. Cl. Unyoro, Speke & Grant.
Barleria Grantii, Oliv. Nile about 2° N., Speke & Grant. T.L.S. xxix. t. 127, f. 1.
B. vixidentata, C. B. Cl. Uganda, Wilson; Ruwenzori, Kavirondo, and Mau, Scott-Elliott.
B. Stuhlmannii, Lindau. Mau, Scott-Elliott.
B. micrantha, C. B. Cl. East side of Lake Albert Edward, Scott-Elliott.
Eranthemum subviscosum, C. B. Cl. Uganda, Stuhlmann.
E. ardisioides, C. B. Cl. Uganda, Scott-Elliott.
Monothecium glandulosum, Hochst. East side of Lake Albert Edward, Scott-Elliott.
Justicia flava, Vahl. East side of Albert Edward, Scott-Elliott; Uganda, Stuhlmann; Kavirondo, Scott-Elliott.
J. leikipiensis, S. Moore (*J. neglecta*, T. Anders.). Uganda, Wilson; Unyoro, Speke & Grant.
J. pinguior, C. B. Cl. Ruwenzori, Scott-Elliott, Doggett.
J. Whytei, S. Moore. Lake Naivasha, Scott-Elliott.
J. melampyrum, S. Moore. Ruwenzori, Scott-Elliott.
J. heterocarpa, T. Anders. Near Lake Elmenteita, Scott-Elliott.
J. anselliana, T. Anders. Madi, Speke & Grant; Nandi Plateau, Johnston; Kariandusi River, near Lake Elmenteita, Scott-Elliott; Kamasia, west of Lake Baringo, Gregory.
J. matammensis, Oliv. Buddu (Buganga), Scott-Elliott.
J. uncinulata, Oliv. Uganda, Stuhlmann; var. *tenuicaulis*, C. B. Cl. Kariandusi River, Mau, and near Lake Naivasha, Scott-Elliott.
Monechma hispidum, Hochst. (*Schwabea ciliaris*, Nees). Madi, Speke & Grant.
M. bracteatum, Hochst. (*Justicia debilis*, Vahl). Near Lake Baringo, Gregory.
M. scabrinerve, C. B. Cl. Near Lake Elmenteita, Scott-Elliott.
Iso glossa lactea, Lindau. Toro, Kivata, Scott-Elliott.
I. ruwenzoricæ, Lindau. Toro, Scott-Elliott.
I. substrobilina, C. B. Cl. Mau, Scott-Elliott.
I. rubescens, Lindau. Ruwenzori, Scott-Elliott.
Hypoestes triflora, Roem. & Sch. Ruwenzori, Scott-Elliott, Doggett; Nandi Plateau, Johnston.
H. verticillaris, R. Br. Toro, Scott-Elliott; Baringo, Johnston.
Dicliptera laxata, C. B. Cl. Kavirondo, Samia, Scott-Elliott.
D. nilotica, C. B. Cl. Madi, Speke & Grant.

Selaginaceæ.

- Hebenstreitia dentata*, L. Nandi Plateau, Johnston, Scott-Elliott.

Verbenaceæ.

- Lantana salvifolia*, Jacq. Uganda, Wilson; var. *ternifolia*, Baker. Toro, Doggett.
Lippia adensis, Hochst. Uganda, Wilson.
Verbena officinalis, Linn. Ruwenzori, Scott-Elliott.
Picnna sp. Ruwenzori, Doggett.
Clerodendron Johnstoni, Oliv. Ruwenzori, Scott-Elliott.
C. cordifolium, A. Rich. Unyoro and Madi, Speke & Grant.
C. rotundifolium, Oliv. Ruwenzori, Scott-Elliott. T.L.S. xxix. t. 89.
C. myricoides, R. Br. Toro, Doggett; Uganda, Scott-Elliott; Nandi Plateau, Johnston; var. *discolor*, Baker. Uganda, Wilson.
Viter simplicifolia, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 130, f. 1.
V. madiensis, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 131, f. 1.
V. Cicuskowskii, Kotschy & Peyr. Madi, Speke & Grant.
V. Fischeri, Gürke. Uganda, Scott-Elliott.

Labiatae.

- Ocimum citium*, Sims. Unyoro, Speke & Grant.
O. capitatum, Baker. Nandi Plateau, Johnston.
Geniosporum pilulosum, Baker. Uganda, Wilson.
G. affine, Gürke. Uganda, Stuhlmann.
Moschosma riparium, Hochst. Ruwenzori and Lake Nakuro, Scott-Elliott.
Aerosephalus cylindraceus, Oliv. Ruwenzori, Scott-Elliott; Unyoro, Speke & Grant. T.L.S. xxix. t. 132, f. 1.
A. curuleus, Oliv. Bukedi, Speke & Grant; Kavirondo, Scott-Elliott. T.L.S. xxix. t. 133, f. 1.
A. lilacinus, Oliv. Uganda, Wilson. T.L.S. xxix. t. 134.
Hoslundia opposita, var. *decumbens*, Baker. Uganda, Wilson.
Pycnostachys stenostachys, Baker. Unyoro, Speke & Grant.
P. deflexifolia, Baker. Near Lake Elmenteita, Scott-Elliott.
P. reticulata, Benth. Unyoro: Bukedi, Speke & Grant.
P. decussata, Baker. Kavirondo, Scott-Elliott.
P. nepetafolia, Baker. Kavirondo, Scott-Elliott.
P. Volkensii, Gürke. Ruwenzori, Stuhlmann.
P. ruwenzoriensis, Baker. Ruwenzori, Scott-Elliott.
P. oblongifolia, Baker. Toro, Scott-Elliott.
P. urticifolia, Hook. Ruwenzori, Scott-Elliott.
Erdanthus ambustus, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 136, f. B.
E. heliotropioides, Oliv. Unyoro, Speke & Grant; Kavirondo, Scott-Elliott. T.L.S. xxix. t. 82, f. 1.
Plectranthus stachyoides, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 81, f. 1.
P. ovatifolius, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 135, f. 1.
Plectranthus sp. Baringo, Johnston.
Coleus ruwenzoriensis, Baker. Ruwenzori, Scott-Elliott.
C. lanuginosus, Hochst. Unyoro, Speke & Grant.
C. barbatus, Benth. Uganda, Wilson.
C. latifolius, var. *madiensis*, Baker (*C. latifolius*, Oliv.). Madi, Speke & Grant.
Uyptis brevipes, Poit. Uganda, Scott-Elliott; Madi, Speke & Grant.
H. spicigera, Lam. Gani, Speke & Grant.
H. pectinata, Poit. Madi, Speke & Grant.

LABIATAE—(continued).

- Micromeria biflora*, Benth. Ruwenzori, Scott-Elliott; south of Lake Naivasha, Thomson.
Micromeria sp. Nandi Plateau, Johnston.
Leucas martinicensis, R. Br. Toro, Scott-Elliott.
L. glabrata, R. Br. Kamasia, Gregory.
L. calostachys, Oliv. Gani, Speke & Grant. T.L.S. xxix. t. 83.
Leucas sp. Nandi Forest, Johnston.
Leonotis nepetafolia, R. Br. Uganda, Wilson.
L. velutina, var. *rugosa*, Baker. Near Lake Naivasha, Scott-Elliott.
L. Elliottii, Baker. Mau Forest, Scott-Elliott.
Tinnea aethiopica, Kotschy & Peyr. Unyoro and Madi, Speke & Grant; Nandi, Scott-Elliott.

Plantaginaceæ.

- Plantago palmata*, Hook. f. Mau, Scott-Elliott.

Nyctaginaceæ.

- Boerhaavia diffusa*, Linn. Baringo, Johnston; var., Unyoro, Speke & Grant.

Illecebraceæ.

- Pollichia campestris*, Sol. Naivasha, Johnston.

Amaranthaceæ.

- Derrisgia celosioidea*, R. Br. Baringo, Johnston.
Celosia argentea, L. Uganda, Speke & Grant, Wilson.
C. trigyna, Linn. Uganda, Wilson; 2° N., Speke & Grant.
Celosia sp. Congo Forest, Doggett.
Digera arvensis, Forsk. Baringo, Johnston.
Amaranthus Blitum, Linn. 3° N., Speke & Grant.
Cyathula cylindrica, Moq. Above Elmenteita, Scott-Elliott.
C. prostrata, B. Uganda, Scott-Elliott.
Cyathula sp. Naivasha, Johnston.
Pupalia lappacea, Moq. Baringo, Johnston.
Psilotrichum sp. East side of Lake Albert Edward, Scott-Elliott.
Erua lanata, Juss. Uganda, Speke & Grant.
Achyranthes argentea, Lam. 1 Uganda, Wilson.

Chenopodiaceæ.

- Chenopodium album*, Linn. Uganda, Wilson; Unyoro, Speke & Grant.
C. Botrys, Linn. Uganda, Scott-Elliott.
C. opulifolium, Schrad. Labwa's, Scott-Elliott.
Chenopodium sp. Baringo, Johnston.

Phytolaccaceæ.

- Phytolacca abyssinica*, Hoffm. Uganda, Wilson.

Polygonaceæ.

- Polygonum barbatum*, Linn. Uganda, Wilson.
P. senegalense, Moq. Naivasha, Johnston.
P. tomentosum, Willd. Nile at 2° N., Speke & Grant.
Rumex abyssinicus, Jacq. Unyoro, 2° N., Speke & Grant.

Proteaceae.

Protea madiensis, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 92, f. 1.

Thymelaeaceae.

Arthrosolen latifolius, Oliv. West Toro, Doggett.

Arthrosolen sp. Uganda, Wilson.

Gnidia involucrata, var. *apiculata*, Oliv. Madi, Speke & Grant.

Loranthaceae.

Loranthus Fischeri, Engl. Mau Plateau, Johnston.

Euphorbiaceae.

Euphorbia Antiquorum, Linn. "Common over the whole route," Speke & Grant.

E. hochstetteriana, Pax. Mau, Scott-Elliott.

E. hypericifolia, Linn. Unyoro, Speke & Grant.

E. Stuhlmanni, Pax? Ruwenzori, Scott-Elliott.

E. Tirucalli, Linn. 1 7' S. to 3' 30' N., Speke & Grant.

Euphorbia sp. Nandi Forest, Johnston.

Synadenium Grantii, Hook. f. 3' 15' N., Speke & Grant.

Synadenium sp. West Ankole, Doggett.

Bridelia micrantha, Baill. Madi, Speke & Grant.

B. scleroneura, Muell. Arg. Madi, Speke & Grant.

Phyllanthus pseudonivari, Muell. Arg. 2' N., Speke & Grant.

Phyllanthus sp. 3' 15' N., Speke & Grant.

Phyllanthus spp. Uganda, Wilson.

Hymenocardia acida, Tulasne. Madi, Speke & Grant. T.L.S. xxix. t. 94, f. 1.

Jatropha sp. Madi, Speke & Grant.

Croton niloticus, Muell. Arg. Madi, Speke & Grant. T.L.S. xxix. t. 95, f. 1.

Acalypha williana, Muell. Arg. Unyoro, Speke & Grant. T.L.S. xxix. t. 96, f. 1.

A. villisulcis, Hochst. Uganda, Wilson.

Acalypha sp. Madi, Speke & Grant.

Ricinus communis, L. Unyoro, Speke & Grant.

Urticaceae.

Celtis integrifolia, Lam. Madi, Speke & Grant.

Ficus glumosa, Del. 1 Madi, Speke & Grant.

F. kotschyana, Miq. 1 Madi, Speke & Grant.

F. Sycamorus, Linn. "Along the whole route," Speke & Grant.

Ficus sp. 3' 15' N., Speke and Grant.

Ficus, sp. Madi, Speke & Grant.

Urtica dioca, Linn., var. Unyoro, Speke & Grant.

Fleurya astuans, Gaud. Congo Forest, Doggett.

Ceratophyllaceae.

Ceratophyllum sp. Unyoro, Speke & Grant.

Coniferae.

Juniperus procera, Hochst? Top of the Kedong Escarpment and forests north of Lake Naivasha, Selater.

Podocarpus falcatus, R. Br. Nandi and Ehlama Ravine, Johnston.

Podocarpus sp. Ruwenzori, Scott-Elliott.

Podocarpus sp. Ruwenzori, Doggett.

Cycadaceae.

Encephalartos sp. Toro, Doggett.

Hydrocharidaceae.

Hydrilla verticillata, Royle. Buddu, ex Engler.

Boottia abyssinica, Riell. Madi, Speke & Grant.

Orchidaceae.

Liparis ruwenzoriensis, Rolfe. Ruwenzori: Butagu, Scott-Elliott.

Endophia milanjanua, Rendle. West Ankole, Doggett.

Endophia sp. West Ankole, Doggett.

Endophia sp. Nandi, Johnston.

Lissochilus parvulus, Rendle. Kavirondo, Scott-Elliott.

L. gracilior, var. *angusta*, Rendle. East of Lake Albert Edward, Scott-Elliott.

L. validus, var. *minor*, Rendle. Uganda: Kampala, Scott-Elliott.

L. livingstonianus, Reichb. f. Uganda, Wilson.

L. cornigerus, Rendle. East side of Lake Albert Edward, Scott-Elliott; var. *minor*, Rendle. Buddu, Scott-Elliott.

L. meliocris, Rendle. Kavirondo: Samia, Scott-Elliott.

L. arcuarius, Lindl. East side of Lake Albert Edward, Scott-Elliott; Unyoro, Wilson.

L. Elliottii, Rendle. Ruwenzori: Ruimi River, Scott-Elliott.

L. ruwenzoriensis, Rendle. Ruwenzori, Scott-Elliott.

L. monticola, Rendle. Ruwenzori, Scott-Elliott.

L. succatus, Rendle. Nandi Hills, Scott-Elliott.

Pteroglossaspis ruwenzoriensis, Rolfe. Ruwenzori, Scott-Elliott.

Polystachya gracilentu, Kränzl. Ruwenzori, Stuhlmann.

P. nigrescens, Rendle. Ruwenzori: Ruimi and Butagu, Scott-Elliott.

P. simplex, Rendle. Ruwenzori: Ruimi, Scott-Elliott.

P. spatula, Kränzl. Ruwenzori, Stuhlmann.

P. Elliottii, Rendle. Ruwenzori, Scott-Elliott.

P. ruwenzoriensis, Rendle. Ruwenzori: Butagu, Scott-Elliott.

Polystachya sp. Ruwenzori, Doggett.

Angraecum Grantii, Batem. Madi, Speke & Grant.

A. Scottellii, Rendle. Ruwenzori and Butagu, Scott-Elliott.

Angraecum sp. Ankole, Doggett.

Listrostachys Virpida, Rolfe. Ruwenzori, Stuhlmann.

Epipactis africana, Rendle. Ruwenzori: Butagu, Scott-Elliott.

Drymeria acuminata, Rendle & Schlechter. Nandi Hills, Scott-Elliott.

Brachycorythis pubescens, Harv. No. th-east of Kariandusi, Gregory.

Habenaria Rendlei, Rolfe. Ruwenzori, Scott-Elliott.

H. tenuispica, Rendle. Ruwenzori: Butagu, Scott-Elliott.

H. praeiens, Rendle. Ruwenzori, Scott-Elliott.

H. ruwenzoriensis, Rendle. Ruwenzori: Ruimi, Scott-Elliott.

H. ingrata, Rendle. Ruwenzori, Scott-Elliott.

H. culicifera, Rendle. Ruwenzori, Scott-Elliott.

H. genyifera, Rendle. Ruwenzori: Ruimi, Scott-Elliott.

Cynorchis anacamptoides, Kränzl. Ruwenzori, Stuhlmann; Butagu, Scott-Elliott.

Satyrion sacculatum, Rolfe. Ruwenzori: Butagu, Scott-Elliott.

S. mystacinum, Kränzl. Ruwenzori, Stuhlmann.

S. niloticum, Rendle. Nandi Range, Scott-Elliott.

ORCHIDACEÆ (continued).

- Satyrium crassicaule*, Rendle. Ruwenzori: Ruimi and Butagu, Scott-Elliott.
- Dista crubescens*, Rendle. Ruwenzori, Scott-Elliott.
- D. Stairsii*, Kränzl. Ruwenzori, Doggett; Butagu, Stairs, Scott-Elliott.
- Disperis nemorosa*, Rendle. Ruwenzori: Ruimi, Scott-Elliott.

Scitamineæ.

- Costus afer*, Ker. Uganda, Scott-Elliott.
- Amomum angustifolium*, Sonn. Semliki Valley and western foot of Ruwenzori, Scott-Elliott.
- Danta ugandensis*, Schum. Uganda, Scott-Elliott.
- Musa Ensete*, Gmel. Uganda, Scott-Elliott; Madi, Speke & Grant.

Hæmodoraceæ.

- Sansiveria guineensis*, Willd. Madi, Speke & Grant; Baringo, Johnston.
- S. sulcata*, Boj. Naiyasha, Johnston.

Iridaceæ.

- Aristea mundensis*, Baker. Nandi Range, Scott-Elliott.
- Gladiolus quartinianns*, A. Rich. Ruwenzori, Doggett; Uganda, Wilson.

Amarylhidaceæ.

- Hypoxis villosa*, Linn. f. East side of Lake Albert Edward, and Ruwenzori, Scott-Elliott.
- Hemanthus multiflorus*, Martyn. Ruwenzori, Scott-Elliott.
- Crinum guceeflorum*, Salisb. Madi, Speke & Grant.
- Pancratium trianthum*, Herb. Baringo, Johnston.

Dioscoreaceæ.

- Dioscorea sativa*, L. Unyoro, Speke & Grant.

Liliaceæ.

- Smilax kraussiana*, Meisn. Speke & Grant. T.L.S. xxix. t. 106, f. 1.
- Asparagus Pauli-Guilielmi*, Solms. Uganda, Wilson; Madi, Speke & Grant. T.L.S. xxix. t. 105, f. 1.
- A. asiaticus*, Linn. East side of Lake Albert Edward, and Andorobo near Lake Nakuro, Scott-Elliott.
- A. africanus*, Lam. Ruwenzori and Uganda, Scott-Elliott, Doggett.
- A. racemosus*, Willd. Madi, Speke & Grant.
- A. fulcatu*, Linn. Berkeley Bay, Lake Victoria Nyanza, Scott-Elliott.
- Dracoma fragrans*, Gawl. Ruwenzori and Uganda, Scott-Elliott.
- D. reflexa*, var. *nitens*, Baker. Ruwenzori: Yeria Valley and Butagu Valley, Scott-Elliott.
- D. elliptica*, Thunb. & Dalm. Toro: Ruimi Valley, Scott-Elliott; Unyoro, Speke & Grant.
- Aloe abyssinica*, Lam. Unyoro, Speke & Grant.
- Aloe* sp. Baringo, Johnston.
- Bulbine asphodelioides*, R. & S. Baringo, Johnston.
- Athericum triflorum*, Ait. Uganda, Lugard.
- Chlorophytum blepharophyllum*, Schweinf. Ruwenzori, Doggett.
- Urginea micrantha*, Solms. Madi, Speke & Grant.
- U. nigritana*, Baker. Uganda: Kampala, Scott-Elliott.

LILIACEÆ—(continued).

- Ornithogalum Melleri*, Baker. Nandi, Johnston.
- Scilla indica*, Baker. Nandi, Johnston.
- S. mesta*, Baker. Nandi, Johnston.
- Scilla* sp. Ruwenzori, Doggett.
- Androcymbium melanthoides*, var. *striatum*, Baker. Between Lake Victoria Nyanza and Lake Baringo, Fischer.
- Gloriosa virescens*, Lindl. Ruwenzori, Doggett; Toro: Ruimi Valley, Scott-Elliott; Uganda, Wilson.

Pontederiaceæ.

- Heteranthera kotschyana*, Fenzl. Madi, Speke & Grant.
- Eicr ornat natus*, Selms (*Pontederia natus*, P. Beauv.). Madi, Speke & Grant.

Commelinaceæ.

- Pollia condensata*, C. B. Cl. Uganda, Scott-Elliott.
- Palisota Schweinfurthii*, C. B. Cl. Uganda: Kalungi, Scott-Elliott.
- Commelina nudiflora*, Linn. White Nile, Petherick.
- C. Sabatieri*, C. B. Cl. Sources of the White Nile, Sabatier.
- C. bengalensis*, Linn. Uganda: near Kampala, Scott-Elliott.
- C. madagascariica*, C. B. Cl. Ruwenzori: Kasagama, Scott-Elliott.
- C. capitata*, Benth. East side of Lake Albert Edward, Scott-Elliott.
- C. firma*, Rendle (*Cyanotis hirsuta*, Baker). Bakedi Forest, Speke & Grant.
- Commelina* sp. Baringo, Johnston.
- Anclema beniniense*, Kunth. Ruwenzori: Butagu Valley, Scott-Elliott.
- A. equisetiale*, Kunth. Baringo, Johnston.
- A. Smithii*, C. B. Cl. Lake Rudolf, Donaldson Smith.
- A. pelunculosum*, C. B. Cl. Uganda, Scott-Elliott, Wilson; Toro: Ruimi River, Scott-Elliott.
- Cyanotis longifolia*, Benth. Unyoro, ex K. Schumann.
- C. caespitosa*, Kotschy & Peyr. Nandi Hills, Scott-Elliott.
- C. somaliensis*, C. B. Cl. Ruwenzori, Scott-Elliott.
- Floscopa rivularis*, C. B. Cl. (*Lamproditlyros rivularis*, Hassk.). Ukidi, Speke & Grant.

Juncaceæ.

- Juncus Fontanessii*, J. Gay. Karia Ndusi, near Lake Elmenteita, Scott-Elliott.

Palmeæ.

- Phoenix reclinata*, Jacq. Uganda: Kampala, Scott-Elliott, Stuhlmann.
- Raphia Mombattorum*, Drude. Lakes Albert Edward and Albert Nyanza, ex Engler.
- Borassus flabellifer*, var. *æthiopianus*, Warb. "About the equator," Speke & Grant.
- Hyphaene thebaica*, Mart. Uganda, rare, Speke & Grant.

Araceæ.

- Arisæna ruwenzoricum*, N. E. Br. Toro: Kivata, Scott-Elliott.
- Colocasia Antiquorum*, Schott. Uganda and Unyoro, Speke & Grant.
- Calcearia scandens*, P. Beauv. Uganda, Scott-Elliott.

Lemnaceæ.

Lemna equinoctialis, Welw. Uganda: Manyonyo, Stuhlmann.

Alismaceæ.

Limnophyton obtusifolium, Miq. (*Sagittaria obtusifolia*, Linn.). Gondokoro, Speke & Grant. T.L.S. xxix. t. 102.

Naiadaceæ.

Aponogeton callisnerioides, Baker. Ukidi, Speke & Grant.
Potamogeton lucens, Linn. In the Nile, Speke & Grant.
Najas marina, var. *muricata*, Al. Br. In the Albert Nyanza, Stuhlmann.

Eriocauloneæ.

Eriocaulon sp. Uganda, Wilson.

Cyperaceæ.

Kyllinga erecta, Sch. & Thonn. Ruwenzori, Scott-Elliott.
K. spharacophala, Boeck. Unyoro, Speke & Grant.
K. melanosperma, Nees. Madi, Speke & Grant.
K. cylindrica, Nees. Ruwenzori, Scott-Elliott.
K. ruwenzoriensis, C. B. Cl. Ruwenzori: Kivata, Scott-Elliott.
K. albiceps, Rendle. Ruwenzori, Scott-Elliott.
Pycnos rhomboides, C. B. Cl. West Ankole, Doggett.
P. nigricans, C. B. Cl. Nandi, Scott-Elliott.
P. Mandii, Nees. Uganda, Stuhlmann.
P. globosus, var. *nilagrica*, C. B. Cl. Buddu, Scott-Elliott.
P. capillifolius, C. B. Cl. (*Cyperus flavescens*, T. Thoms.). Madi, Speke & Grant.
P. umbrosus, Nees. (*Cyperus nitidus*, Boeck.). Ruwenzori, Scott-Elliott.
P. tremulus, C. B. Cl. Uganda, Stuhlmann.
Cyperus compactus, Lam. Lake Albert Nyanza, Stuhlmann; Lake Victoria Nyanza, Scott-Elliott; Nandi, Scott-Elliott.
C. reduncus, Boeck. Unyoro, Speke & Grant.
C. difformis, Linn. Lake Albert Nyanza, Stuhlmann; Madi, Speke & Grant.
C. flavidus, Retz. (*C. Haspan*, Roth.). Unyoro, Speke & Grant.
C. tenuis, Boeck. (*C. Grantii*, Boeck.). Uganda, Scott-Elliott.
C. fischerianus, Schimp. Ruwenzori: Butagu, Scott-Elliott.
C. cuspidatus, Humb. & Kth. Madi, Speke & Grant.
C. decurrens, Steud. Ruwenzori, Scott-Elliott.
C. aristatus, Roth. Kamasia, Gregory.
C. distans, L. f. Ruwenzori, Scott-Elliott.
C. latifolius, Poir. Nandi Range, Scott-Elliott.
C. callistus, Ridley. Uganda, Wilson.
C. esculentus, L. Ruwenzori: Kivata, Scott-Elliott.
C. articulatus, L. East side of Lake Albert Edward, Scott-Elliott; Bannu, Johnston.
C. schweinfurthianus, Boeck. Semliki Valley, Scott-Elliott.
C. rotundus, L. Kamasia, Gregory; var. *spadiceus*, Boeck. Kamasia, Gregory.
C. rigidifolius, Steud. Marshes by Lake Nakuro, Scott-Elliott.
C. ibensis, K. Schum. Uganda, Wilson.

CYPERACEÆ—(continued).

Cyperus exaltatus, var. *dives*, C. B. Cl. Semliki Valley, Scott-Elliott; Buddu, Stuhlmann; Lake Baringo, Gregory, Johnston.
C. papyrus, L. Shallow borders of Lake Victoria Nyanza and banks of the Nile at 4° 56' N., Speke & Grant; var. *Antiquorum*, C. B. Cl. Naivasha, Johnston.
Mariscus coloratus, Nees. Kamasia, Gregory; var. *macrocephala*, C. B. Cl. Uganda, Stuhlmann.
M. vestitus, C. B. Cl. Mau, Scott-Elliott.
M. siberianus, Nees. Ruwenzori, Scott-Elliott; var. *evolutior*, C. B. Cl. Uganda, Stuhlmann.
M. macer, Kunth (*M. umbellatus*, Oliv., partly). Unyoro, Speke & Grant.
M. macrocarpus, Kunth (*M. umbellatus*, Oliv., partly). Uganda, Speke & Grant.
M. procerus, A. Rich. Lake Elmenteita, Scott-Elliott.
M. foliosus, C. B. Cl. Ruwenzori: Kivata, Scott-Elliott.
Courtoisia cyperoides, Nees. Malewa River, near Lake Naivasha, Gregory.
Eleocharis marginulata, Steud. Mau, Scott-Elliott.
Fimbristylis diphylla, Vahl. Ruwenzori: Kasagama, Scott-Elliott.
F. exilis, Roem. & Sch. Ruwenzori and Uganda, Scott-Elliott.
F. monostachya, Hassk. (*Abildgaardia monostachya*, Vahl. T.L.S. xxix. t. 100, f. A). Ruwenzori, Scott-Elliott; Unyoro, Speke & Grant.
Bulbostylis trichobasis, var. *uniseriata*, C. B. Cl. West Ankole, Doggett, Scott-Elliott.
B. atrosanguinea, C. B. Cl. Nandi, Scott-Elliott.
Scirpus setaceus, Linn. Ruwenzori: Butagu River, Scott-Elliott.
S. cubensis, Poepp. & Kth. (*Isodepis echnocephala*, Oliv. T.L.S. xxix. t. 107). Unyoro: banks of the Nile, Speke & Grant.
Fuirena stricta, Steud. Kavirondo, Scott-Elliott.
F. leptostachya, Oliv. Madi, Speke & Grant. T.L.S. xxix. t. 108, f. B.
F. umbellata, Roth. Madi, Speke & Grant.
Lipocarpus argentea, R. Br. Madi, Speke & Grant.
Carypha Eminii, C. B. Cl. Ruwenzori, Stuhlmann.
Scleria foliosa, var. *major*, Oliv. Unyoro, Speke & Grant.
S. racemosa, Poir., var. Madi, Speke & Grant. T.L.S. xxix. t. 111, f. 1.
S. glomerulata, Oliv. Madi, Speke & Grant, T.L.S. xxix. t. 110, f. B.
Dipacrum pygmaeum, Nees. Madi, Speke & Grant.
Carex ruwenzoriensis, K. Schum. Ruwenzori, Doggett.

Gramineæ.

Imperata arundinacea, Cyr. Semliki Valley and Toro, Doggett.
Saccharum spp. Ex Grant.
Pogonatherum sp.? Unyoro, Speke & Grant.
Manisuris granulata, Sw. Unyoro, Speke & Grant.
Fossia proceri, Wall. & Griff. Unyoro, Speke & Grant.
Andropogon cymbatrius, Linn., var. Gani, Speke & Grant.
A. finitimus, Hochst. From the equator to 2° N., Speke & Grant.
A. hirtus, Linn. By the Nile about 5° N., Speke & Grant.
Anthistiria sp.? 3° 10' N., Speke & Grant.
Perotis latifolia, Ait. Uganda, Speke & Grant.
Panicum brizanthum, var. *latifolium*, Oliv. Unyoro, Speke & Grant. T.L.S. xxix. t. 112, f. A.

GRAMINEÆ—(continued).

- Panicum elysanthum*, Steud. Unyoro, Speke & Grant.
P. Cras-Galli, Linn. Unyoro, Speke & Grant.
P. sanguinale, Linn. Uganda, Speke & Grant.
P. verticillatum, Linn. Unyoro, Speke & Grant.
Panicum (Echinochloa) sp. Baringo, Johnston.
Pennisetum Benthani, Steud. Madi, Speke & Grant.
Pennisetum sp. Baringo, Johnston.
Olyra latifolia, Linn. Toro, Doggett.
Sporobolus elongatus, R. Br. Uganda, Speke & Grant.
Cyrtodon Dactylon, Pers. 5° S. to 2° N., Speke & Grant.
Chloris compressa, DC. Uganda, Speke & Grant.
C. gayana, Kunth. Unyoro, Speke & Grant.
Eleanine coracina, Gærtn. "Cultivated everywhere," Speke & Grant.
Phragmites communis, Trin. Unyoro, and from 4° 55' N. northwards, Speke & Grant.
Eriopogon megastachya, Koch. Unyoro, Speke & Grant.
E. patens, Oliv. Unyoro, Speke & Grant. T.L.S. xxix. t. 113, f. 1.
Eriopogon sp. Nandi, Johnston.
Poa sp. Ruwenzori, Doggett.

CRYPTOGAMS.

Filices.

- Gleichenia dichotoma*, Hook. Uganda, Wilson.
Cyathea Dreyeri, Kunze. Uganda, Wilson.
Davallia elegans, Sw. Ruwenzori, Doggett; Uganda, Wilson.
Loucheixia pubescens, Willd. Uganda, Wilson.
Chelidanthus furinosa, Kaulf. Ruwenzori, Doggett.
C. multifida, Sw. Naivasha, Johnston.
Pellaea geraniifolia, Fée. Uganda, Wilson.
P. hastata, Link. Uganda, Wilson.
Pteris fimbriata, Thunb. Ruwenzori, Doggett.
P. incisa, Thunb. Uganda, Wilson.
P. quadriaurita, Retz. Uganda, Wilson.
Ceratopteris thalictroides, Brongn. 3° 15' N., Speke & Grant.
Asplenium amaranthum, C. H. Wright. Ruwenzori, Doggett.
A. furcatum, Thunb. Ruwenzori, Doggett; Uganda, Wilson (and 2 vars.); 3° 15' N. Speke & Grant.
A. longicauda, Hook. Uganda, Wilson.
A. nigripes, Bl. Uganda, Wilson.
A. rufifolium, Mett. Ruwenzori, Doggett.
Nephrodium Filix-Mas, Rich., var. Uganda, Wilson.
N. unitum, var. *propinquum*, Baker. 2° to 3° N., Speke & Grant.
N. Wilsoni, Baker. Uganda, Wilson.
Nephrolepis cordifolia, Presl. 3° 15' N., Speke & Grant.
Olaandra articulata, Cav. Uganda, Wilson.
Polypodium lycopodioides, Linn. Uganda, Wilson.
P. Phymatodes, L. Uganda, Wilson.
P. rigescens, Bory. Ruwenzori, Doggett.

Filices—(continued).

- Acrostichum punctulatum*, Sw. Uganda, Wilson.
Osmunda regalis, L. Nakuro, Johnston.
Lygodium scandens, Sw. Uganda, Wilson.

Lycopodiaceæ.

- Lycopodium dactyloides*, Baker. Ruwenzori, Doggett.

Selaginellaceæ.

- Selaginella rupestris*, Spring. Madi, Speke & Grant.

Musci.

- Bretelia Stuhlmanni*, Broth. Ruwenzori, Scott-Elliot, Stuhlmann, Doggett.
Polytrichum sp. Ruwenzori, Doggett.
Rhacocarpus Humboldtii, Lindb. Ruwenzori, Doggett.
Erskolium Hammingtoni, Mitt. "Lake Nyanza," Hammington.

Hepaticæ.

- Plagiochila sp.* Ruwenzori, Doggett.
Herberta juniperina, Spruce. Ruwenzori, Doggett.

Source: Johnston. 1902.

Appendix IV. Wildlife Information

- Table 1. Game Regulations and Licensing Procedures, 1902
- Table 2. Hunting Schedules, 1902
- Table 3. Hunting Schedules, 1937
- Table 4. Wildlife and Conservation Legislation, to 1977
- Table 5a. Ugandan Mammalian Fauna, 1902
5b. Mammals in Karamoja, 1973
- Table 6a. Ugandan Avifauna, 1902
6b. Birds in Karamoja, 1973
- Table 7. Falconiformes in National Parks, 1974-76
- Table 8. Ugandan Herpetofauna, 1902
- Table 9. Ugandan Ichthyofauna, 1902

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Table 1. Game Regulations and Licensing Procedures, 1902

Preservation of Game.

1. In these regulations :—

“ Hunt, kill, or capture ” means hunting, killing, or capturing by any method, and includes every attempt to kill or capture. “ Hunting ” includes molesting.

“ Game ” means any animal mentioned in any of the schedules.

“ Public officer ” means a European officer in the public service of the Uganda or East Africa Protectorates, or the superior establishment of the Uganda Railway.

“ Native ” means any native of Africa, not being of European or American race or parentage.

“ Settler ” means a person for the time being resident in the Protectorate not being a public officer or a native, and includes a trader.

“ Sportsman ” means a person who visits the Protectorate wholly or partly for sporting purposes, not being a public officer, or settler, or native.

“ Collector ” means the principal civil officer in charge of a district of the Protectorate.

General Provisions.

2. No person, unless he is authorised by a special licence in that behalf, shall hunt, kill, or capture any of the animals mentioned in the first schedule.

3. No person, unless he is so authorised by a special licence under these regulations, shall hunt, kill, or capture any animal of the kinds mentioned in the second schedule if the animal be (a) immature, or (b) a female accompanied by its young.

4. No person, unless he is authorised under these regulations, shall hunt, kill, or capture any animal mentioned in the third schedule.

5. The Commissioner may, if he thinks fit, by Proclamation, declare that the name of any species, variety, or sex of animal (whether beast or bird), not mentioned in any schedule hereto, shall be added to a particular schedule, or that the name of any species or variety mentioned or included in one schedule shall be transferred to another schedule, and, if he thinks fit, apply such declaration to the whole of the Protectorate or restrict it to any district or districts in which he thinks it expedient that the animal should be protected.

6. No person shall within the Protectorate sell, or purchase, or offer or expose for sale, any ostrich eggs, or any head, horns, skin, feathers, or flesh of any animal mentioned in any of the schedules, unless such ostrich or animal shall have been kept in a domesticated state, and no such person shall knowingly store, pack, convey, or export any part of any animal which he has reason to believe has been killed or captured in contravention of these regulations.

7. If any person attempts to sell or otherwise transfer within the Protectorate, or to export from the Protectorate, any female elephant's tusk or any male elephant's tusk weighing less than 11 lbs., or any pieces of ivory which, in the opinion of the Court, formed part of a female elephant's tusk or of a male elephant's tusk under 11 lbs. in weight, he shall be guilty of an offence against these regulations, and the tusks or parts of a tusk shall be confiscated by the authorities of the Protectorate.

8. No person shall use any poison, or, without a special licence, any dynamite or other explosive for the killing or taking of any fish.

9. Where it appears to the Commissioner that any method used for killing or capturing animals or fish is unduly destructive, he may, by Proclamation, prohibit such method or prescribe the conditions under which any method may be used, and if any person uses any method so prohibited, or uses any method otherwise than according to the conditions so prescribed, he shall be liable to the same penalties as for a breach of these regulations.

10. Save as provided by these regulations, or by any Proclamation under these regulations, any person may hunt, kill, or capture any animal not mentioned in any of the schedules, or any fish.

Game Reserves.

11. The area described in the fifth schedule hereto are hereby declared to be game reserves.

The Commissioner, with the approval of the Secretary of State, may, by Proclamation, declare any other portion of the Protectorate to be a game reserve, and may define or alter the limits of any game reserve, and these regulations shall apply to every such game reserve.

Save as provided in the regulations or by any such Proclamation, any person who, unless he is authorised by a special licence, hunts, kills, or captures any animal whatever in a game reserve, or is found within a game reserve under circumstances showing that he was unlawfully in pursuit of any animal, shall be guilty of a breach of these regulations.

Licences to Europeans, etc.

12. The following licences may be granted by the Commissioner, collector, or such person or persons as may be authorised by the Commissioner, that is to say:—

- (1) A sportsman's licence;
- (2) A public officer's licence; and
- (3) A settler's licence.

The following fees shall be paid for licences, that is to say, for a sportsman's licence 750 rupees, and for a public officer's or a settler's licence 150 rupees.

Every licence shall be in force for one year only from the date of issue; provided that a public officer's licence may be granted for a single period of fourteen consecutive days in one year on payment of a fee of 30 rupees.

Every licence shall bear in full the name of the person to whom it is granted, the date of issue, the period of its duration, and the signature of the Commissioner, collector, or other person authorised to grant licences.

The applicant for a licence may be required to give security by bond or deposit, not exceeding 2,000 rupees, for his compliance with these regulations, and with the additional conditions (if any) contained in his licence.

A licence is not transferable.

Every licence must be produced when called for by any officer of the Protectorate Government, or by any officer of the Uganda Railway specially authorised for the purpose in writing by the Commissioner.

In granting licences under these regulations a collector, or any person authorised to grant licences, shall observe any general or particular instructions of the Commissioner.

13. A sportsman's licence and a public officer's licence, respectively, authorise the holder to hunt, kill, or capture animals of any of the species mentioned in the third

schedule, but unless the licence otherwise provides, not more than the number of each species fixed by the second column of that schedule.

The holder of a sportsman's or public officer's licence granted under these regulations may, by the licence, be authorised to kill or capture additional animals of any such species on payment of such additional fees as may be prescribed by the Commissioner.

14. A settler's licence authorises the holder to hunt, kill, or capture animals of the species and to the number mentioned in the fourth schedule only.

15. A public officer's licence shall not be granted except to a public officer, and a settler's licence shall not be granted except to a settler; but a sportsman's licence may be granted to a settler.

16. When a licence similar to a public officer's licence under these regulations has been granted in the East Africa Protectorate, that licence shall authorise the holder to hunt, kill, or capture game in the Uganda Protectorate, in all respects as if the licence had been granted in the Uganda Protectorate, provided that such licence shall be first endorsed by a collector or other authorised officer of the Uganda Protectorate. Provided, also, that any authority to kill or capture additional animals, or any animals not permitted under the corresponding Uganda licence, shall be void.

17. Where it appears proper to the Commissioner for scientific or administrative reasons, he may grant a special licence to any person to kill or capture animals of any one or more species mentioned in any of the schedules, or to kill, hunt, or capture, in a game reserve specified, beasts or birds of prey, or other animals whose presence is detrimental to the purposes of the game reserve, or, in particular cases, to kill or capture, as the case may be, in a game reserve, an animal or animals of any one or more species mentioned in the schedules.

A special licence shall be subject to such conditions as to fees and security (if any), number, sex, and age of specimens, district and season for hunting, and other matters as the Commissioner may prescribe, and in the Uganda Railway zone, whether included in a game reserve or not, it shall be lawful to kill or capture any least of prey.

Where the collector, or assistant collector, or other European officer of the Protectorate Government, in a district comprising a game reserve, is the holder of a public officer's licence, the Commissioner may grant a special licence authorising the officer to hunt, kill, or capture, in the game reserve, such animals as may be allowed by his public officer's licence.

Save as aforesaid, the holder of a special licence shall be subject to the general provisions of these regulations, and to the provisions relating to holders of licences.

18. Every licence-holder shall keep a register of the animals killed or captured by him in the form specified in the seventh schedule.

The register shall be submitted as often as convenient, but not less frequently than once in three months, to the nearest collector or assistant collector, who shall counter-sign the entries up to date.

Any person authorised to grant licences may at any time call upon any licence-holder to produce his register for inspection.

Every person holding a sportsman's licence shall likewise before leaving the Protectorate submit his register to the Deputy Commissioner.

If any holder of a licence fails to keep his register truly, he shall be guilty of an offence against these regulations.

19. The Commissioner may revoke any licence when he is satisfied that the holder has been guilty of a breach of these regulations, or of his licence, or has connived

with any other person in any such breach, or that in any matters in relation thereto he has acted otherwise than in good faith.

20. The Commissioner may at his discretion direct that a licence under these regulations shall be refused to any applicant.

21. Any person whose licence has been lost or destroyed may obtain a fresh licence for the remainder of his term on payment of a fee not exceeding one-fifth of the fee paid for the licence so lost or destroyed.

22. Any licence granted under these regulations does not entitle the holder to hunt, kill, or capture any animal, or to trespass upon private property without the consent of the owner or occupier.

23. Any person who, after having killed or captured animals to the number and of the species authorised by his licence, proceeds to hunt, kill, or capture any animals which he is not authorised to kill or capture, shall be guilty of a breach of these regulations and punishable accordingly.

24. Persons in the employment of holders of licences may, without licence, assist such holders of licences in hunting animals, but shall not use firearms.

The holder of a sportsman's or public officer's licence while engaged in hunting animals mentioned in the schedules shall not be accompanied by more than one person provided with a settler's or native's licence.

In any case of a breach of this Regulation, the licence of every licence-holder concerned in the breach shall be liable to forfeiture, and such licence-holder shall be guilty of an offence.

25. The Commissioner, or any person authorised by him in that behalf, may at his discretion require any person importing firearms or ammunition that may be used by such person for the purposes of killing game or other animals to take out a settler's licence under these regulations, and may refuse to allow the firearms or ammunition to be taken from the public warehouse until such licence is taken out. Save as aforesaid, nothing in these regulations shall affect the regulations of the Uganda Firearms Regulations, 1896.

Legal Procedure.

28. Where any public officer of the East Africa Protectorate thinks it expedient for the purposes of verifying the register of a licence-holder, or suspects that any person has been guilty of a breach of these regulations, he may inspect and search, or authorise any subordinate officer to inspect and search, any baggage, packages, waggons, tents, building, or caravan belonging to or under the control of such person, or his agent, and if the officer finds any heads, tusks, skins, or other remains of animals appearing to have been killed, or any live animals appearing to have been captured, in contravention of these regulations, he shall seize and take the same before a magistrate to be dealt with according to law.

29. Any person who hunts, kills, or captures any animal in contravention of these regulations, or otherwise commits any breach of these regulations, shall, on conviction, be liable to a fine which may extend to 1,000 rupees, and, where the offence relates to more animals than two, to a fine in respect of each animal which may extend to 500 rupees, and in either case to imprisonment which may extend to two months, with or without a fine.

In all cases of conviction, any heads, horns, tusks, skins, or other remains of animals found in the possession of the offender, or his agent, and all live animals captured in contravention of these regulations, shall be liable to forfeiture.

If the person convicted is the holder of a licence, his licence may be revoked by the Court.

30. Where in any proceeding under these regulations any fine is imposed, the Court may award any sum or sums not exceeding half the total fine to any informer or informers.

Source: Johnston, 1902, pp. 415 - 418.

Table 2. Hunting Schedules, 1902

FIRST SCHEDULE.

Animals not to be hunted, killed, or captured by any person, except under Special Licence.

1. Okapi
2. Giraffe.
3. Mountain or Grevy's Zebra.
4. Wild Ass.
5. White-bearded, brindled, or any other species of Gnu (*Connochates*).
6. Eland (*Taurotragus*).
7. Buffalo.
8. Speke's Tragelaph (*Limnotragus spekei*).
9. Elephant (female or young).
10. Ostrich (female or young).
11. Secretary-bird.
12. Vulture (any species).
13. Owls (any species).
14. White-headed Stork (*Halvaceps vex*).
15. Saddle-billed Stork (*Ephippiorhynchus senegalensis*).
16. Crowned Crane (*Balecarica*).
17. Marabou Stork (*Leptoptilus*).
18. Egrets or White Herons.

SECOND SCHEDULE.

Animals, the females of which are not to be hunted, killed, or captured when accompanied by their young, and the young of which are not to be hunted, killed, or captured, except under Special Licence.

1. Rhinoceros.
2. Zebra (other than the Mountain Zebra).
3. Chevrotain (*Dorcatherium*).
4. All Antelopes or Gazelles not mentioned in the first schedule.

* These schedules may contain the names of some species or varieties not found, or only occasionally found, in Uganda.

THIRD SCHEDULE.

Animals, limited numbers of which may be killed or captured under a Sportsman's or Public Officer's Licence.

Kind.	Number allowed.
1. Elephant (male)	2
2. Rhinoceros	2
3. Hippopotamus	10
4. Zebras (other than the Mountain Zebra)	2
5. Antelopes and Gazelles—	
Class A—	
Oryx (Kemsbuck or Beisa)	2
Hippotragus (Sable or Roan)	2
Strepsiceros (Kudu)	2
6. Colobi and other fur-Monkeys	2
7. Aard Varks (<i>Orycteropus</i>)	2
8. Serval	10
9. Cheetah (<i>Cynelurus</i>)	2
10. Aard Wolf (<i>Proteles</i>)	2
11. Smaller Monkeys, of each species	2
12. Ostrich (male only)	2
13. Antelopes and Gazelles	
Class B—	
Any species other than those in Class A	10
14. Chevrotains (<i>Dorcatherium</i>)	10
15. Wild Pig, of each species	10
16. Smaller Cats	10
17. Jackal	10
18. Chimpanzee	1

FOURTH SCHEDULE.

Animals, limited numbers of which may be killed or captured under a Settler's Licence.

Kind.	Number of Animals allowed.
1. Hippopotamus.	10
2. (i.) Wart-hog (<i>Phacochorus</i>).	10
(ii.) Bush-pig (<i>Potamo charrus charropotamus</i>)	10
(iii.) Sennar Swine (<i>Sus senutrensis</i>)	10
3. The following Antelopes and Gazelles only:—	
(i.) Grant's Gazelle	5 animals in all in any calendar month, made up of animals of a single species or of several.
(ii.) Thomson's Gazelle	
(iii.) Hartbeest (<i>Bubalis and Damaliscus</i>)	
(iv.) Impula (<i>Epycerus</i>)	
(v.) Reedbuck (<i>Cervicapra</i>)	
(vi.) Duiker (<i>Cephalophus</i>)	
(vii.) Klipspringer (<i>Oreotragus</i>)	
(viii.) Steinhuck (<i>Raphiceros</i>)	
(ix.) Waterbuck (<i>Cobus</i>)	
(x.) Bushbuck (<i>Tragelaphus</i>)	
4. Serval and smaller cats; jackal: of each kind	10

Table 3. Hunting Schedules, 1937

SPECIAL LICENCES.

	£	s.	d.
Two elephants	10	0	0
Three elephants	20	0	0
One bull giraffe	15	0	0
One black rhinoceros	5	0	0

Special licences can only be issued to the holders of (Full) licences, and expire on the same date as the licences by virtue of which they are granted.

The privilege of a "Resident's" licence is extended to any Commissioned Officer of His Majesty's Army, Navy or Air Force on the Active List.

Animals which may be Killed or Captured by the Holder of a Fourteen-day Licence*

Buffalo	Unlimited	Uganda Kob	4
Lelwel Hartebeest	2	Grant's Gazelle	2
Topi	2	Oryx	1
Red (Forest) Duiker	4	Harnessed Bushbuck	2
Blue Duiker	4	Common Bushbuck	10
Common Duiker	6	Situtunga	2
Klipspringer	1	Zebra	2
Onibi	3	Hippopotamus	1
Dik-dik	5	Impala	1
Reedbuck	4	Any of the birds mentioned in the Fifth Schedule.	
Waterbuck	1		

Birds which may be killed or captured by the holder of a Bird Licence.
Number unlimited.

All species Duck, Geese, Teal, Button Quails, Francolins, Bare-throated Francolins, Quails, Stone Partridge, Guineafowls, Forest Guineafowl, Vulturine Guineafowl, Cranes, B. stards, Snipe, and Sand Grouse.†

Animals which may be Killed or Captured by the Holder of a Full Licence.‡

Blue Monkey	4	Grant's Gazelle	4
Cheetah	1	Oryx	2
Buffalo	Unlimited	Roan Antelope	1
Lelwel Hartebeest	10	Harnessed Bushbuck	6
Topi	4	Giant Bushbuck	1
Red (Forest) Duiker	10	Common Bushbuck	20
Blue Duiker	10	Situtunga	4
Common Duiker	10	Lesser Kudu	2
Klipspringer	2	Greater Kudu	1
Onibi	8	Eland	1
Dik-dik	10	Giant Eland	1
Reedbuck	10	Giant (Forest) Hog	2
Mountain Reedbuck	2	Hippopotamus	4
Waterbuck	4	Zebra	6
Uganda Kob	10	Any of the birds mentioned in the Fifth Schedule.	
Impala	1		

* Subject to the reservations specified in the First and Fourth Schedules to the Game Ordinance.

† Subject to the reservations in force on Lake Bunyonyi.

‡ Subject to the reservations specified in the First and Third Schedules to the Game Ordinance.

Source: Anon. 1937, p.179.

Table 4. Wildlife and Conservation Legislation, to 1977

Animal Diseases Act (Cap. 218),
Animals Prevention of Cruelty Ordinance, 1957
Export of Live Animals and Trophies Rules, 1956
Fish and Crocodiles Act (Cap. 228), 1960; Amended, 1965
Fishing Rules, 1951
Game (Preservation and Control) Act (Cap. 226), 1959
Hide and Skin Trade Act (Cap. 225)
Hide and Skin Trade Ordinance, 1951
Hide and Skin Trade Ord., Regions Declaration (Notice Stat. Inst. No.
208), 1964
Hides and Skin Export Duty Order, 1964
National Parks Act (Cap. 227)
National Park Ordinance (No. 3), 1952

Sources: Johnson and Johnson. 1977.
Morris and Read. 1966.

	PRIMATES.	Authority.
<i>Homo sapiens ethiops</i> (Hamites; Pygmy, Bantu, Nilotic, and Masai Negroes).		
<i>Anthropopithecus troglodytes schweinfurthi</i> , (Gigl.)		Johnston, Neumann.
<i>Papio doquerra</i> , Puch.		Smith, Johnston, Neumann.
<i>Cercopithecus aterrimus</i> , Oud.		Neumann, Johnston.
<i>Colobus nutschiei</i> , Neum.		Johnston, Neumann.
<i>C. abyssinicus poliurus</i> , Thos.		Donaldson Smith.
<i>C. ruwenzorii</i> , Thos.		Johnston.
<i>C. rufoimitratus</i> , Pet.		Johnston.
<i>Cercopithecus rufoviridis centralis</i> , Neum.		Johnston, Neumann.
<i>C. schmidti</i> , Matsch.		Matschie, Jackson, Johnston.
<i>C. stuhlmanni</i> , Matsch.		Matschie, Scott-Elliot, Johnston.
<i>C. bourtoniini</i> , (Gigl.)		Donaldson Smith.
<i>C. neglectus</i> , Schleg.		Smith, Neumann.
<i>C. otoolucius</i>		Delmé Radcliffe.
<i>Galago demidoffi</i> , Fisch.		Johnston.
[<i>Periodicticus potto</i>]		Whyte, Johnston.
	CHEIROPTERA.	
<i>Epomophorus schoensis</i> , Rüpp.		Johnston.
<i>E. minor</i> , Dobs.		Jackson, Ansorge.
<i>E. pusillus</i> , Pet.		Newmann.
<i>Rousettus stramineus</i> , Geoff.		
<i>R. collaris</i> , Ill.		
<i>Rhinolophus hildebrandti</i> , Pet.		Jackson.
<i>Hypsignathus capfer</i> , Cuv.		Jackson, Johnston, Betton.
<i>Megaderma frons</i> , L.		Johnston, Neumann.
<i>Nycterus hispidus</i> , Schiel.		Neumann.
<i>N. thebaicus</i> , Geoff.		Ansorge.
<i>Pipistrellus nanus</i> , Pet.		Elliot, Ansorge.
<i>P. kuhlii fuscatus</i> , Thos.		Johnston.
<i>Glauconycteris variegatus</i> , Tomes		Jackson.
<i>Scotophilus nigrita</i> , Schr.		Jackson.
<i>Vespertilio cruijanius</i> , Pet.		Jackson.
<i>Taphozous mauritanicus</i> , Geoff.		Elliot, Ansorge.
<i>Nyctinomus lobatus</i> , Thos.		Jackson.
	INSECTIVORA.	
<i>Rhynchocyon stuhlmanni</i> , Matsch.		Stuhlmann.
<i>Macroscelides pulcher</i> , Thos.		Delamere, Johnston.
<i>Crocidura helenborgi</i> , Sund.		Jackson.
<i>C. doriana</i> , Dobs.		Ansorge.
<i>Chrysochloris stuhlmanni</i> , Matsch.		Stuhlmann.
<i>Erinaceus albiventris</i> , Wagn.		Johnston, Neumann.
	CARNIVORA.	
<i>Felis leo</i> , Linn.		Johnston.
<i>F. pardus</i> , Linn.		Johnston.
<i>F. serval</i> , Schiel.		Neumann, Johnston.
<i>F. servalina</i> , Og.		Neumann, Johnston.
<i>F. caligata</i> , Temm.		Neumann.
<i>F. cypria</i>		Johnston.
<i>Cynelurus guttatus</i> , Herrn.		Johnston.
<i>Proteles cristatus</i>		Johnston, Doggett.
<i>Hyaena cirrata</i> , Erxl.		Johnston.
<i>Viverra civetta</i> , L.		Johnston.
<i>Genetta victoriae</i> , Thos.		Johnston.
<i>G. parvina</i> , Geoff.		Neumann.
<i>Nandinia binotata</i> , Gray		Johnston, Neumann.
<i>Herpestes capfer</i> , Gm.		Jackson, Johnston, Neumann.
<i>H. arvicilis</i> , Rüpp.		Neumann.
<i>H. gutta</i> , Erxl.		Jackson.
<i>H. albiventer</i> , Cuv.		Johnston, Neumann.
<i>Helogale undulata</i> , Pet.		Rev. F. C. Smith, Neumann.
<i>Canis adustus</i> , Sund.		Jackson, Johnston, Neumann.
<i>C. mesomelas</i> , Schr.		Betton.
[<i>C. sinensis?</i>]		Johnston.
<i>Otocyon megalotis</i> , Desm.		Betton.
<i>Lycion pictus</i> , Temm.		Betton.
<i>Lutra capensis</i> , Schinz.		Neumann.
<i>L. maculicollis</i> , Licht.		Neumann.
[<i>Proclipsale albiventer</i>]		Johnston.
[<i>Mellivora mel</i>]		Johnston.

RODENTIA.

	Authority.
<i>Anomalurus jacksoni</i> , De Wint.	Jackson, Neumann.
<i>Sciurus calliurus</i> , Buchh.	Jackson.
<i>S. multicolor</i> , Rüpp.	Emin, Donaldson Smith, Neumann.
<i>S. rufobrachiuatus</i> , Waterh.	Jackson, Scott-Elliott.
<i>Funisciurus böhmi</i> , Reichen.	Jackson, Ansorge, Neumann.
<i>F. jacksoni</i> , De Wint.	Jackson.
<i>F. ochraceus</i> , Huet.	
<i>Xerus erythropus</i> , Geoff.	Ansorge.
<i>X. rutilus</i> , Critzschm.	Ansorge, Neumann.
<i>Graphiurus murinus</i> , Desm.	Jackson.
<i>G. parvus</i> , True.	Jackson.
<i>G. smithii</i> , Thos.	Rev. F. C. Smith.
<i>Crictomys gambianus</i> , Waterh.	Johnston.
<i>Gerbillus (Tatus) sp.</i>	Neumann.
<i>Otomys jacksoni</i> , Thos.	Jackson.
<i>Dendromys sp.</i>	Ansorge, Johnston, Neumann.
<i>Arvicanthus abyssinicus</i> , Rüpp.	Jackson, Johnston, Neumann.
<i>A. massaicus</i> , Pagenst.	Jackson, Ansorge.
<i>A. pumilio diminutus</i> , Thos.	Jackson.
<i>Mus hypoxanthus</i> , Puch.	Jackson, Ansorge.
<i>M. arborarius</i> , Pet.	Johnston.
<i>M. ugandae</i> , De Wint.	Jackson, Ansorge, Neumann.
<i>M. jacksoni</i> , De Wint.	Jackson.
<i>M. hildebrandti</i> , Pet.	Ansorge.
<i>Leggadu minutoides</i> , Smith.	Johnston, Neumann.
<i>L. musculoides</i> , Temm.	Ansorge.
<i>Dasymys bentleye</i> , Thos.	Jackson.
<i>Lophuromys ansorgei</i> , De Wint.	Ansorge.
<i>L. flavopunctatus</i> , Thos.	Jackson, Ansorge.
<i>Lophiomys smithii</i> , Rhoads.	Jackson.
<i>Tachyoryctis splendens ibeanus</i> , Thos.	Ansorge, Neumann.
<i>Pedetes caffer</i> , Pall.	Johnston, Neumann.
<i>Thryonomys swinderemianus</i> , Temm.	Donaldson Smith.
<i>T. gregorianus</i> , Thos.	Jackson.
<i>Hystrix galeata</i> , Thos.	Johnston.
[<i>Lepus</i> , sp. inc.]	Johnston.*

UNGULATA.

<i>Elephas africanus</i> , Blum.	
<i>Diceros bicornis</i> , Linn.	
<i>Equus burchelli böhmi</i> , Matsch.	Johnston, Neumann.
<i>Procavia jacksoni</i> , Thos.	Jackson.
<i>P. brucei</i> , Gray.	Neumann.
<i>P. crasshuysii</i> , Thos.	Johnston.
<i>P. marnoti</i> , Thos.	Johnston.
<i>Hippopotamus amphibius</i> , Linn.	

* Hares of perhaps three species are common throughout Uganda, but no specimens have yet been identified.—H. H. J.

	Authority.
<i>Phacochœrus æthiopicus</i> , Sund.	Johnston.
[<i>Potamochoerus chæropotamus</i>]	Johnston.
[<i>P. penicillatus</i>]	Johnston.
<i>Giraffa camelopardalis</i> , Linn.	Johnston, Neumann.
<i>Okapia johnstoni</i> , Sclat.	Johnston.
<i>Bubalis æquinoctialis</i> , Blyth (<i>centralis</i> , Gray)	Neumann.
<i>Bubalis jacksoni</i> , Thos.	Jackson, Johnston, Neumann.
<i>B. cokei</i> , Günth.	Johnston.
<i>Damaliscus jimela</i> , Matsch.	Jackson, Neumann.
<i>D. tiang</i> , Hengl.	Johnston.
<i>Cephalophus johnstoni</i> , Thos.	Johnston.
<i>C. rubilus</i> , Thos.	Johnston.
<i>C. æquatorialis</i> , Matsch.	Scott-Elliot, Jackson, Johnston.
<i>C. grimmii</i> , Linn.	Jackson, Johnston.
<i>C. abyssinicus</i> , Rüpp.	Neumann.
<i>Oreotragus oreotragus</i> , Zimm.	
<i>Ourebia montana</i> , Rüpp.	Jackson Johnston.
<i>O. haggardi</i> , Thos.	Donaldson Smith.
<i>Raphiceros neumanni</i> , Matsch.	Jackson, Johnston.
<i>Muloque kirkii</i> , Günth.	Jackson, Neumann.
<i>Cobus defassu</i> , Rüpp.	Jackson, Johnston, Neumann.
<i>C. thomasi</i> , Scl.	Lugard, Scott-Elliot, Jackson, Johnston.
<i>C. leucotis</i>	Delmé Radcliffe, E. N. Buxton.
<i>Cervicapra arundinum</i> , Bodd.	Neumann.
<i>C. redunca wardi</i> , Thos.	Jackson, Johnston.
<i>C. fulvornifula chandleri</i> , Rothsch.	Donaldson Smith.
<i>Oryx beisa</i>	Harold Baker, Doggett (Baringo).
<i>Hippotragus equinus</i>	Johnston.
<i>H. bakeri</i>	Johnston, Delmé Radcliffe.
<i>Epyceros melampus</i> , Licht.	Lugard, Jackson, Johnston.
<i>Gazella grantii</i> , Brooke	Jackson, Johnston, Betton.
<i>G. grantii notata</i> , Thos.	A. H. Neumann, Ferguson.
<i>G. grantii brightii</i> , Thos.	Bright, Ferguson, Donaldson Smith.
<i>G. thomsoni</i> , Günth.	Jackson, Neumann.
<i>Tragelaphus decuda</i> , Rüpp.	Neumann.
<i>T. scriptus</i> , Pall.	Neumann.
<i>T. scriptus bor</i> , Hengl.	Donaldson Smith.
<i>T. euryceros</i>	F. W. Isaac.
<i>Limnotragus spekei</i> , Scl.	Speke, Jackson, Johnston, Neu- mann.
<i>Taurotragus oryx livingstonei</i> , Scl.	Jackson.
<i>Strepsiceros kulu</i>	Doggett, Johnston.
[<i>Bos caffer</i>]	Johnston, Jackson.
[<i>Bos pumilus</i>]	Johnston
[<i>Bos æquinoctialis</i>]	Johnston

EDENTATA.

<i>Manis tricuspis</i> , Raf.	Jackson, Johnston.
<i>Orycteropus afer</i> , Pall.	Johnston.

Source: Johnston. 1902.

Table 5b. Mammals in Karamoja, 1973

Common Name	Scientific Name
Patas Monkeys	... <i>Erythrocebus patas</i>
Baboon	... <i>Papio anubis furax</i>
Grey black-faced grivet monkey (misnamed the vervet)	... <i>Cercopithecus aethiops</i>
Temminck's lesser ground pangolin	... <i>Manis temminckii</i>
African Ant-bear	... <i>Orycteropus afer</i>
East African Hare	... <i>Lepus capensis</i>
East African Crested Porcupine	... <i>Hystrix galeata</i>
Pallid ground squirrel	... <i>Xerus erythropus</i>
Side-striped Jackal	... <i>Canis adustus</i>
African Givet	... <i>Civettictis civetta</i>
Bush Genet	... <i>Genetta tigrina</i>
East African White-tailed Mongoose	... <i>Ichneumia albicauda</i>
Striped Hyena	... <i>Hyena hyena</i>
Spotted Hyena	... <i>Crocuta crocuta</i>
Aard-Wolf	... <i>Proteles cristatus</i>
Caracal	... <i>Felis caracal</i>
Serval	... <i>Felis serval</i>
Lion	... <i>Panthera leo</i>
Leopard	... <i>Panthera pardus</i>
Cheetah	... <i>Acinonyx jubatus</i>
Ant-bear (Aard-Vark)	... <i>Orycteropus afer</i>
African Elephant	... <i>Loxodonta africana</i>
Hyrax	... <i>Procavia capensis</i>
Black Rhinoceros	... <i>Diceros bicornis</i>
African Bush Pig	... <i>Potamochoerus porcus</i>
Giant Forest Hog	... <i>Hylchoerus</i>
Wart-Hog	... <i>Phacochoerus</i>
Uganda Giraffe	... <i>Giraffe camelopardalis</i>
Black Buffalo	... <i>Syncerus caffer</i>
East African Eland	... <i>Taurotragus oryx</i>
Greater Kudu	... <i>Strepsiceros strepsiceros</i>
Lesser Kudu	... <i>Strepsiceros imberbis</i>
Harnessed Bushbuck	... <i>Tragelaphus scriptus hor</i>
Bush Duiker	... <i>Sylvicapra grimmia</i>
Yellow-Backed Duiker	... <i>Cephalophus sylvicurtis</i>
Chandler's Mountain Reedbuck	... <i>Redunca fulvorufula</i>
Beisa Oryx	... <i>Oryx beisa</i>
Jackson's Hartbeest	... <i>Alcelaphus buselaphus</i>
Topi	... <i>Damaliscus karrigum</i>
Uganda Oribi	... <i>Ourebia ourebi</i>
Klipspringer	... <i>Oreotragus oreotragus</i>
Long-Snouted Dikdik	... <i>Thynchotragus kirki</i>
Bright's Gazelle (Grant's)	... <i>Gazella granti brightii</i>
Imraha	... <i>Aepyceros melampus</i>

Source: Wilson. 1973.

ORDER I. STRUTHIONIFORMES.

FAMILY STRUTHIONIDÆ.

1. *Struthio massaicus*, Neum.
2. *S. camelus*, Linn. [The North African ostrich extends southward to Karamojo and even to near Baringo, judging from two live specimens seen by me in the possession of an Arab caravan, and one killed by Doggett near Baringo.—H. H. J.]

ORDER II. GALLIFORMES.

Sub-order Phasiani.

FAMILY PHASIANIDÆ.

3. *Francoelinus hubbardi*, Grant.
4. *F. streptophorus*, Grant.
5. *F. granti*, Hartl.
6. *F. kikuyuensis*, Grant.
7. *F. elgonensis*, Grant.
8. *F. clappertoni*, Childr.
9. *F. gedgei*, Grant.
10. *F. icterorhynchus*, Hengl.
11. *F. hildebrandti*, Cab.
12. *F. schuetti*, Cab.
13. *F. jacksoni*, Grant.
14. *Pternistes cranchi* (Leach)
15. *P. rufopictus*, Reichen.
16. *Coturnix coturnix* (Linn.).
17. *C. delegorguei*, Deleg.
18. *Excalfactoria adamsi* (Verr.).
19. *Ptilopachys fuscus* (Vicill.).
20. *P. florencie*, Grant.

FAMILY NUMIDIDÆ.

21. *Numida reichenowi*, Grant.
22. *N. ansorgei*, Hartert.
23. *N. intermedia*, Neum.
24. *N. ptilorhyncha*, Licht.
25. *Guttera pucherani* (Hartl.).

ORDER III. HEMIPODII.

FAMILY TURNICIDÆ.

26. *Turnix lepuratus* (Smith).

ORDER IV. PTEROCLIDIDIFORMES.

FAMILY PTEROCLIDIDÆ.

27. *Pteroclidurus crustus* (Temm.).
28. *Pteroclis lichtensteini*, Temm.
29. *P. quadricinctus*, Temm.

ORDER V. COLUMBIFORMES.

FAMILY TRERONIDÆ.

30. *Vinago waldia* (Gm.).
31. *V. multirostris*, Swains.

FAMILY COLUMBIDÆ.

32. *Columba guinea*, Linn.
33. *C. longirostris*, Reichen.
34. *C. arquatrix*, Temm.
35. *Turturana sharpei*, Salvad.

FAMILY PERISTERIDÆ.

36. *Turtur lugens* (Rüpp.).
37. *Streptopelia semitorquata* (Rüpp.).
38. *S. damarensis* (Finsch & Hartl.).
39. *S. ambigua* (Boenge).
40. *Stigmatopelia senegalensis* (Linn.).
41. *Emu capensis* (Linn.).
42. *Tympanistris tympanistris* (Temm. & Kuip.).
43. *Chalcopelia afra* (Linn.).

ORDER VII. RALLIFORMES.

FAMILY RALLIDÆ.

44. *Crocopsis erygia* (Peters).
45. *Cyx cyx* (Linn.).
46. *Limnocorax nigra* (Gm.).
47. *Zapornia parva* (Scop.).
48. *Sarothrura pulchra* (J. E. Gray).
49. *Gallinula chloropus* (Linn.).
50. *Porphyrio alleni* (Thomps.).
51. *Porphyrio porphyrio* (Linn.).
52. *Fulica cristata*, Gm.

ORDER VIII. PODICEPIDIFORMES.

FAMILY PODICEPIDIDÆ.

- 53. *Lophoathyia cristata* (Linn.).
- 54. *Podiceps capensis*, Salvad.

ORDER XIV. LARIFORMES.

FAMILY LARIDÆ.

- 55. *Hydrochelidon leucoptera* (Meism. & Schinz).
- 56. *H. nigra* (Linn.).
- 57. *Gelochelidon anglica* (Mont.).
- 58. *Rhyachops flavirostris*, Vieill.
- 59. *Larus fuscus*, Linn.
- 60. *L. cirrhocephalus*, Vieill.

ORDER XV. CHARADRIIFORMES.

FAMILY CHARADRIIDÆ.

- 61. *Deilippia crassirostris* (De Fil.).
- 62. *Lobivanellus senegalensis* (Linn.).
- 63. *L. lateralis* (Smith).
- 64. *Hoplopterus spinosus* (Linn.).
- 65. *Stephanibyx coronata* (Bodd.).
- 66. *S. inornatus* (Swains.).
- 67. *Ochthodromus asiaticus* (Pall.).
- 68. *Oxyechus tricoloris* (Vieill.).
- 69. *Egialitis hirticoda* (Linn.).
- 70. *E. dubia* (Scop.).
- 71. *E. venusta* (Fisch. & Reichen.).
- 72. *E. varia* (Vieill.).
- 73. *Himantopus himantopus* (Linn.).
- 74. *Totanus stagnatilis*, Bechst.
- 75. *Helodromus ochropus* (Linn.).
- 76. *Tringoides hypoleucus* (Linn.).
- 77. *Glottis nebularius* (Gunn.).
- 78. *Rhyacophilus glireola* (Gm.).
- 79. *Pavonella pugnax* (Linn.).
- 80. *Calidris arenaria* (Linn.).
- 81. *Limnites minuta* (Leisl.).
- 82. *Ancylochilus subarquatus* (Güld.).
- 83. *Gallinago major* (Gm.).
- 84. *G. nigripennis*, Bp.
- 85. *Rostratula capensis* (Linn.).

FAMILY PARRIDÆ.

- 86. *Actophilus africanus* (Gm.).
- 87. *Microparra capensis* (Smith).

FAMILY CURSORIDÆ.

- 88. *Ortyxclus meiffeni*, Vieill.
- 89. *Pluvianus aegyptius* (Linn.).

FAMILY GLAREOLIDÆ.

- 90. *Glareola pratineola* (Linn.).
- 91. *Galactochrysa emini* (Shelley).
- 92. *G. nuchalis* (Gray).

FAMILY EDICNEMIDÆ.

- 93. *Edicnemus senegalensis*, Swains.
- 94. *E. vermiculatus*, Cab.
- 95. *E. capensis*, Licht.
- 96. *E. affinis*, Rüpp.

FAMILY OTIDIDÆ.

- 97. *Lissotis lovti*, Grant.
- 98. *L. hartlaubii* (Hengl.).
- 99. *Trachelotis canicollis* (Reichen.).

ORDER XVIII. ARDEIFORMES.

FAMILY IBIDIDÆ.

- 100. *Ibis aethiopica* (Lath.).
- 101. *Hagalahia hagidash* (Lath.).
- 102. *Plegadis falcinellus* (Linn.).

FAMILY PLATALEIDÆ.

- 103. *Platalca minor*, Temm. & Schl.

FAMILY CICONIDÆ.

- 104. *Pseudotantalus ibis* (Linn.).
- 105. *Ablimia ablimi* (Licht.).
- 106. *Disoia episcopus* (Bodd.).
- 107. *Ciconia ciconia* (Linn.).
- 108. *Anastomus lamelligerus*, Temm.
- 109. *Ephippiorhynchus senegalensis* (Shaw).
- 110. *Leptoptilus crumeniferus* (Less.).

FAMILY SCOPIDÆ.

- 111. *Scopus umbretta*, Gm.

FAMILY BALANICIPITIDÆ.

- 112. *Balaniceps rex*, Gould.

ORDER XXVI. ACCIPITRIFORMES.

FAMILY SERPENTARIIDÆ.

145. *Serpentarius serpentarius* (Müll.).

FAMILY VULTURIDÆ.

146. *Pseudogyps africanus* (Salvad.).
147. *Lophogyps occipitalis* (Burch.).
148. *Neophron percnopterus* (Linn.).
149. *Necrosyptex monachus* (Temm.).

FAMILY FALCONIDÆ.

150. *Polyboroides typicus*, Smith.
151. *Circus pygargus* (Linn.).
152. *C. aruginosus* (Linn.).
153. *Melierax polyzonus* (Rüpp.).
154. *M. gabar* (Daud.).
155. *M. niger* (Vicill.).
156. *Astur tachiro* (Daud.).
157. *A. unduliventer* (Rüpp.).
158. *A. sphenurus* (Rüpp.).
159. *A. polyzonoides* (Smith).
160. *Accipiter melanoleucus*, Smith.
161. *Buteo augur*, Rüpp.
162. *B. auguralis*, Salvad.
163. *B. desertorum* (Daud.).
164. *Aquila rapax* (Temm.).
165. *A. ushlerbergi*, Sundev.
166. *Eutalmiæus spilogastra* (Bp.).
167. *Spizaetus coronatus* (Linn.).
168. *Lophoætes occipitalis* (Daud.).
169. *Asturinda monogrammica* (Temm.).
170. *Circæus cinerascens*, Müll.
171. *C. cinereus*, Vicill.
172. *Buteo rufipennis* (Sundev.).
173. *Helotarsus caudatus* (Daud.).
174. *Haliaætes vocifer* (Daud.).
175. *Milvus ægyptius* (Gm.).
176. *M. korschum* (Gm.).
177. *Elanus caeruleus* (Desp.).
178. *Machærhamphus anderssoni* (Gurney).
179. *Baza emini*, Reichen.
180. *Poliobiera semitorquatus* (Smith).
181. *Falco tanypterus*, Schl.
182. *F. subbuteo*, Linn.
183. *F. cuvieri*, Smith.
184. *F. rufigollis*, Swains.
185. *Cerychæis tinunculus* (Linn.).
186. *C. alopec* (Heugl.).
187. *C. naumanni* (Fleischl.).
188. *Dissodactes ardesiacus* (Bonn. & Vicill.).

FAMILY ARDEIDÆ.

113. *Pyrhærosdiaz purpurea* (Linn.).
114. *Ardea goliath*, Cretzschm.
115. *A. melanocephala*, Vig. & Childr.
116. *Mesophox brachyrhyncha* (Brehm).
117. *Herodias alba* (Linn.).
118. *Melanophox ardesiaca* (Wagl.).
119. *Garzetta sarzetta* (Linn.).
120. *Butorides atricapilla* (Afzel.).
121. *Erythrocenus ardesiaca* (Sundev.).
122. *Bubulcus lucidus* (Rafin.).
123. *Ardeola ralloides* (Scop.).
124. *Arletta payesi* (Hartl.).
125. *Ardeirallus sturmi* (Wagl.).

ORDER XIX. PHENICOPTERIFORMES.

FAMILY PHENICOPTERIDÆ.

126. *Phenicopterus roseus*, Pall.
127. *Pheniconotis minor* (C Geoffr.).

ORDER XXI. ANSERIFORMES.

FAMILY ANATIDÆ.

128. *Læctropterus gambensis* (Linn.).
129. *Sarcidiorhis melanonota* (Penn.).
130. *Nettion auritus* (Bodl.).
131. *Cyanochen cyanopterus* (Rüpp.).
132. *Dendrocygna vidua* (Linn.).
133. *D. fulva* (Gm.).
134. *Alopochen ægyptiaca* (Linn.).
135. *Anas undulata*, Dubois.
136. *Nettion punctatum* (Burch.).
137. *N. capense* (Gm.).
138. *Pareilonetta erythrorhyncha* (Gm.).
139. *Erismatum maccos* (Smith).

ORDER XXIV. PELECANIFORMES.

FAMILY PHALACROCORACIDÆ.

140. *Phalacrocorax lucidus* (Licht.).
141. *P. lugubris*, Reichen.
142. *P. africanus* (Gm.).

FAMILY PLOTIDÆ.

143. *Plotus rufus*, Daud.

FAMILY PELICANIDÆ.

144. *Pelecanus rufescens*, Gm.

ORDER XXVIII. PSITTACIFORMES.

FAMILY PSITTACIDÆ.

189. *Perocephalus missiricus*, Fischer & Reichen.
 190. *P. meyeri*, Cretzsch.
 191. *P. saturatus*, Sharpe.
 192. *Psittacus erithacus*, Linn.
 193. *Palaeornis docilis* (Vieill.).
 194. *Agapornis pullaria* (Linn.).
 195. *A. fischeri*, Reichen.
 196. *A. personata*, Reichen.

ORDER XXVII. STRIGIFORMES.

FAMILY BUBONIDÆ.

197. *Asio nisus* (Daud.).
 198. *Bubo maculosus* (Vieill.).
 199. *B. cinereus*, Guér.
 200. *B. lacteus* (Temm.).
 201. *Scops capensis*, Smith.
 202. *S. uganda* (Neum.).
 203. *S. leucotis* (Temm.).
 204. *Syrnium neohole*, Sharpe.
 205. *Glaucidium perlatum* (Vieill.).
 206. *G. castaneum* (Reichen.).
 207. *Strix maculata*, Brehm.

ORDER XXIX. CORACIIFORMES.

FAMILY CORACIDÆ.

208. *Coracias abyssinicus*, Bodd.
 209. *C. narius*, Daud.
 210. *Eurystomus rufobuccalis*, Reichen.

FAMILY ALCEDINIDÆ.

211. *Ceryle rudis* (Linn.).
 212. *C. sharpei*, Gould.
 213. *Corythornis cyanostigma* (Rüpp.).
 214. *Ispidina pista* (Bodd.).
 215. *Halcyon senegalensis* (Linn.).
 216. *H. cyanoleucus* (Vieill.).
 217. *H. semicervuleus* (Forsk.).
 218. *H. chelicutensis* (Stanl.).

FAMILY BUCEROTIDÆ.

219. *Bucorax capfer*, Boenge.
 220. *Ceratogymna atrata* (Temm.).
 221. *Lophoceros fasciata* (Shaw).

222. *Lophoceros nasutus* (Linn.).
 223. *L. epirhinus* (Sundev.).
 224. *L. erythrorhynchus* (Temm.).
 225. *L. melanoleucus* (Licht.).
 226. *L. jacksoni*, Grant.
 227. *Bycanistes subquadratus*, Cab.

FAMILY UPUPIDÆ.

228. *Upupa epops*, Linn.
 229. *U. africana*, Bechst.

FAMILY IRRISORIDÆ.

230. *Irrisor erythrorhynchus* (Lath.).
 231. *I. jacksoni*, Sharpe.
 232. *Scoptelus notatus*, Salvin.
 233. *Rhinopomastus cabanisi* (De Fil.).

FAMILY MEROPIDÆ.

234. *Melittophagus cyanocephalus*, Cab.
 235. *M. variegatus* (Vieill.).
 236. *M. oreobates*, Sharpe.
 237. *M. frenatus* (Hartl.).
 238. *Merops apiaster*, Linn.
 239. *M. persicus*, Pall.
 240. *M. superciliosus*, Linn.
 241. *M. nubicus*, Gm.
 242. *M. albicollis*, Vieill.

FAMILY CAPRIMULOIDÆ.

243. *Scotorix climacurus* (Vieill.).
 244. *Cosmetornis verillarius* (Gould).
 245. *Caprimulgus fossi*, Hartl.
 246. *C. clarus*, Reichen.
 247. *C. inornatus*, Heugl.
 248. *C. psidiocephalus*, Rüpp.
 249. *C. europæus*, Linn.
 250. *C. donaldsoni*, Sharpe.

FAMILY CYPSEIDÆ.

251. *Cypselus equatorialis* (Müll.).
 252. *C. nianse* (Reichen.).
 253. *C. shelleyi*, Salvad.
 254. *C. streubeli* (Hartl.).
 255. *C. affinis* (J. E. Gray).
 256. *Tachornis parvus* (Licht.).

FAMILY COLIIDÆ.

257. *Colius leucotis*, Rüpp.
 258. *C. berlepschi*, Hartert.
 259. *C. affinis*, Shelley.

FAMILY TROGONIDÆ.

260. *Haplosiderma nigrina* (Steph.).
261. *Heterotrogon vittatum* (Shelley).

ORDER XXX. COCCYGES.

FAMILY MUSOPHAGIDÆ.

262. *Turdicus leucolophus*, Hengl.
263. *T. hastulabi* (Fischer & Reichen).
264. *Gallirix johnstoni*, Sharpe.
265. *Musoplagia rossie*, Gould.
266. *Corythoeca cristata* (Vieill.).
267. *Schizorhis leucogaster*, Rüpp.
268. *S. zanzara*, Rüpp.
269. *Gymnoschizorhis leopoldi* (Shelley).

FAMILY CUCULIDÆ.

270. *Coccytes glandarius* (Linn.).
271. *C. jacobinus* (Bodd.).
272. *C. cyffer* (Licht.).
273. *Pachycoccyx validus* (Reichen.).
274. *Cuculus gularis*, Steph.
275. *C. canorus*, Linn.
276. *C. heuglini*, Cab.
277. *C. solitarius*, Steph.
278. *C. gabonensis*, Lafr.
279. *C. clamosus*, Lath.
280. *Metallocoecyx smaragdineus* (Swains.).
281. *Chrysococcyx klausi* (Steph.).
282. *C. cupreus* (Bodd.).
283. *Centropus fischeri*, Reichen.
284. *C. monachus*, Rüpp.
285. *C. superciliosus*, Hempr. & Ehr.
286. *Centhochares intermedius*, Sharpe.

ORDER XXXII. SCANSORES.

FAMILY INDICATORIDÆ.

287. *Indicator indicator* (Gm.).
288. *I. variegatus*, Less.
289. *I. minor*, Steph.
290. *I. pygmaeus*, Reichen.
291. *I. exilis* (Cass.).
292. *I. emini*, Shelley.

FAMILY CAPITONIDÆ.

293. *Erythrobecco rolleti* (De Fil.).
294. *Lybius a-quatorialis* (Shelley).
295. *L. leucocephalus* (De Fil.).

296. *Lybius abyssinicus* (Lath.).
297. *L. rubrifacies* (Reichen.).
298. *Tricholemma ansorgei*, Shelley.
299. *T. lachrymosum*, Cab.
300. *T. stigmatothorax*, Cab.
301. *T. diadenatum* (Hengl.).
302. *T. massaicum* (Reichen.).
303. *Gymnobucco cinereiceps*, Sharpe.
304. *Barbatula uganda*, Reichen.
305. *B. centralis*, Reichen.
306. *B. jacksoni*, Sharpe.
307. *B. leucoloma*, J. & E. Verr.
308. *B. leucomystax*, Sharpe.
309. *B. stellata* (Jard. & Fraser).
310. *Trachyphonus versicolor*, Hartl.
311. *T. arnaudi* (Des Murs).
312. *Trachyphonus elgonensis* (Sharpe).

FAMILY PICIDÆ.

313. *Camptothera nubica* (Gm.).
314. *C. wumani*, Reichen.
315. *C. balia*, Hengl.
316. *C. maculosa* (Valenc.).
317. *C. pennista* (Reichen.).
318. *C. tanioloma* (Reichen. & Neum.).
319. *Dendropicus hartlaubii*, Mall.
320. *D. nyansa* (Neum.).
321. *D. tropicalis*, Reichen.
322. *D. parvicolanus*, Reichen.
323. *D. lafresnoyi*, Mall.
324. *D. sharpei*, Oust.
325. *Thripicus schornsis*, Rüpp.
326. *Jynxipicus obsoletus* (Wagl.).
327. *J. ingens*, Hartert.
328. *Mesopicus centralis*, Reichen.
329. *Jynx ruficollis*, Wagl.

ORDER XXXVI. PASSEBIFORMES.

FAMILY HIRUNINIDÆ.

330. *Clivicola riparia* (Linn.).
331. *C. cineta* (Bodd.).
332. *C. minor* (Cab.).
333. *Ptyonoprogne rufigula* (Fischer & Reichen.).
334. *Hirunda rustica*, Linn.
335. *H. arcticincta*, Sharpe.
336. *H. athiopica*, Blauf.
337. *H. griseopyga*, Sundev.
338. *H. puella*, Temm. & Schl.

339. *Hirunda emini*, Reichen.
 340. *H. gordonii*, Jard.
 341. *H. senegalensis*, Linn.
 342. *H. montiviv*, Hartl.
 343. *Psalidoprocne orientalis*, Reichen.
 344. *P. albiceps*, Selater.

FAMILY MUSCICAPIDÆ.

345. *Alcedo murina*, Fischer & Reichen.
 346. *A. pumila*, Reichen.
 347. *Muscicapa griseola*, Linn.
 348. *M. infulata*, Hartl.
 349. *M. toruensis*, Hartert.
 350. *Pedilohypochus stuhlmanni*, Reichen.
 351. *Dioptrornis fischeri*, Reichen.
 352. *Melanornis pumilana* (Staud.).
 353. *M. tropicoides*, Cab.
 354. *Bradyornis grisea*, Reichen.
 355. *B. pallida* (Müll.).
 356. *B. subularis*, Sharpe.
 357. *B. pumila*, Sharpe.
 358. *B. minor*, Heugl.
 359. *Stizorhina fraseri* (Strickl.).
 360. *Empidonax karivondensis* (Neum.).
 361. *Hylota flavigastera*, Swains.
 362. *Poponotichla orientalis*, Fischer & Reichen.
 363. *P. intensa*, Sharpe.
 364. *Lioptilus abyssinicus* (Rüpp.).
 365. *Parisona plumbeum* (Hartl.).
 366. *P. jacksoni*, Sharpe.
 367. *Chloropeta massaiica*, Fischer & Reichen.
 368. *Batis senegalensis* (Linn.).
 369. *B. orientalis* (Heugl.).
 370. *Platystira albifrons*, Sharpe.
 371. *P. cyana* (Müll.).
 372. *P. jacksoni*, Sharpe.
 373. *Bias musicus* (Vieill.).
 374. *Megabias atrialatus* (Cass.).
 375. *Smithornis capensis* (Smith).
 376. *Artomyias fuliginosa*, J. & E. Verr.
 377. *Trochocercus albanolatus*, Sharpe.
 378. *Terpsiphone cristata* (Cm.)
 379. *T. rufiventris* (Swains.).
 380. *T. emini*, Reichen.
 381. *Elminia teresiti*, Antin.
 382. *Cryptolopha mackenziana*, Sharpe.

FAMILY CAMPOPHAGIDÆ.

383. *Graucalus purus*, Sharpe.
 384. *G. pectoralis*, Jard. & Sell.

385. *Campophaga phoenicea* (Lath.).
 386. *C. hartlaubii* (Salvadi.).
 387. *C. quisqualina* (Finsch).

FAMILY PYCNOTIDÆ.

388. *Criniger verreauxi*, Sharpe.
 389. *C. cabanisi*, Sharpe.
 390. *Bleda pallidigula* (Sharpe).
 391. *B. flavigula* (Cab.).
 392. *B. shelleyi* (Neum.).
 393. *B. kakumegae* (Sharpe).
 394. *B. kikuyuensis* (Sharpe).
 395. *B. orientalis* (Hartl.).
 396. *Andropodus latissimus*, Sharpe.
 397. *Eurillas virens* (Cass.).
 398. *E. eugeniis* (Reichen.).
 399. *Stelgidillas gracilirostris* (Strickl.).
 400. *S. gracilis* (Cab.).
 401. *Phyllostrophus strepitans*, Reichen.
 402. *P. rufescens*, Hartl.
 403. *P. placidus*, Shelley.
 404. *Pycnonotus minor*, Heugl.
 405. *P. dalsoni*, Sharpe.
 406. *P. lagardi*, Gurney.

FAMILY TIMELIDÆ.

407. *Arqya rubiginosa*, Rüpp.
 408. *A. rufula*, Heugl.
 409. *A. amaurura*, Pelz.
 410. *Turdinus jacksoni*, Sharpe.
 411. *Ptyrticus turdinus*, Hartl.
 412. *Crateropus plebeius*, Rüpp.
 413. *C. burtoni*, Sharpe.
 414. *C. sharpei*, Reichen.
 415. *C. tenebrosus*, Hartl.

FAMILY TURRIDÆ.

416. *Coccyzusa piaggia* (Bonr.).
 417. *Turdus pelios*, Bp.
 418. *T. laeyeri*, Cab.
 419. *Merula elgonensis*, Sharpe.
 420. *Cichladusa guttata*, Heugl.
 421. *Cossypha iodama*, Reichen.
 422. *C. natalensis*, Smith.
 423. *C. podioptera*, Reichen.
 424. *C. subrufescens*, Boenge.
 425. *C. heuglini*, Hartl.
 426. *C. melanomela* (Cab.).
 427. *C. verticalis*, Hartl.
 428. *Erythrocygia ruficauda*, Sharpe.

429. *Erythropygia hartlaubi*, Reichen.
 430. *Callene pyrrhoptera*, Reichen. & Neum.
 431. *Thamnolea subrufipennis*, Reichen.
 432. *T. leucillanti* (Reichen.).
 433. *T. sharpei*, Sharpe.
 434. *Pentholera clericalis*, Hartl.
 435. *P. bicucis*, Hartl.
 436. *Pinarochroa hypospolia*, Shelley.
 437. *Pratincola rubicola* (Linn.).
 438. *P. emma*, Hartl.
 439. *P. acillaris*, Shelley.
 440. *P. rubetra* (Linn.)
 441. *Monticola rufocinerea* (Rüpp.).
 442. *Ruticilla phaniceus* (Linn.).
 443. *Mymecocichla cryptoleuca*, Sharpe.
 444. *Saxicola arvensis* (Linn.).
 445. *S. isabellina* (Rüpp.).
 446. *S. jelskanka* (Lepesch.).
 447. *S. schalowi*, Sharpe.
 448. *S. falckensterii*, Cab.
 449. *Campicola albonotata* (Neum.).

FAMILY SYLVHIDÆ.

150. *Luscinia philomela* (Bechst.).
 151. *Sylvia hortensis*, Bechst.
 152. *S. atricapilla* (Linn.).
 153. *Phylloscopus trochilus* (Linn.).
 154. *Hypolais pallida* (Hempr. & Ehr.).
 155. *Acrocephalus phragmitis* (Bechst.).
 156. *A. turdoides* (Meyer).
 157. *A. palustris* (Bechst.).
 158. *A. streperus* (Vieill.).
 159. *A. baticatus* (Vieill.).
 160. *Bradypterus cinnamomeus* (Rüpp.).
 161. *Schaniicola apicalis* (Cab.).
 162. *Calamocichla leptorhyncha* (Fischer & Reichen.).
 163. *C. jacksoni*, Neum.
 164. *Calamonastes simplex* (Cab.).
 165. *Eminia lepida*, Hartl.
 166. *Apalis pulchra*, Sharpe.
 167. *A. porphyrolaema* (Reichen. & Neum.).
 168. *Euprimus cinereus*, Sharpe.
 169. *E. golzi* (Fischer & Reichen.).
 170. *E. aequatorialis*, Neum.
 171. *Dryobromus jacksoni*, Sharpe.
 172. *Drymocichla incana*, Hartl.
 173. *Phyllolais pulchella* (Cretzschm.).
 174. *Sylvietta brachyura* (Laf.).
 175. *S. jacksoni*, Sharpe.
 176. *S. leucophrys*, Sharpe.

477. *Sylvietta baraka*, Jackson.
 478. *Eremomela griseoflawa* (Hengl.)
 479. *E. hypoxantha*, Pelz.
 480. *E. elegans* (Hengl.).
 481. *E. flavitorquata* (Hartl.).
 482. *Camavoptera breviculata* (Cretzschm.).
 483. *C. griseoviridis* (Müll.).
 484. *Hylia prasina* (Cass.).
 485. *Prinia mystacea*, Rüpp.
 486. *Burnesia reichenowi*, Hartl.
 487. *B. melanops*, Reichen. & Neum.
 488. *Orthotomus erythropterus* (Jard.).
 489. *Melocichla mentalis* (Fraser).
 490. *M. orientalis*, Sharpe.
 491. *Cisticola emini*, Reichen.
 492. *C. lateralis* (Fraser).
 493. *C. cinereus* (Hengl.).
 494. *C. erythropis* (Hartl.).
 495. *C. fischeri*, Reichen.
 496. *C. rufa* (Fraser).
 497. *C. ferruginea* (Hartl.).
 498. *C. hartlaubi*, Sharpe.
 499. *C. cisticola* (Tenn.).
 500. *C. terrestris* (Smith).
 501. *C. hindei*, Sharpe.
 502. *C. tinniens* (Licht.).
 503. *C. nuchalis*, Reichen.
 504. *C. ambigua*, Sharpe.
 505. *C. strangei* (Fraser).
 506. *C. lugubris* (Rüpp.).
 507. *C. subruficapilla* (Smith).
 508. *C. cheniana* (Smith).
 509. *C. prinoides*, Neum.
 510. *C. hunteri*, Shelley.
 511. *C. chabbi*, Sharpe.

FAMILY PRIONOPIDÆ.

512. *Prionops cristatus*, Rüpp.
 513. *P. poliophilus*, Fischer & Reichen.
 514. *Sigmodus gracilius* (Cab.).
 515. *Eurocephalus ruepelli*, Bp.

FAMILY LANIIDÆ.

516. *Corvinella affinis*, Hengl.
 517. *Lanius humeralis*, Standl.
 518. *L. excubitorius*, Des Murs.
 519. *L. caudatus*, Cab.
 520. *L. mackinnoni*, Sharpe.
 521. *L. minor*, Gm.
 522. *L. dorsalis*, Cab.
 523. *L. antinori*, Salvad.

524. *Lanius parvulus*, Brehm.
 525. *L. gubernator*, Hartl.
 526. *L. isabellinus*, Hempr.
 527. *Nilans afer* (Lath.).
 528. *N. nigritemporalis*, Reichen.
 529. *Linarius lachleri*, Reichen.
 530. *L. aethiopicus* (Gm.).
 531. *L. major*, Hartl.
 532. *L. nigerrimus* (Reichen.).
 533. *L. fanebris* (Hartl.).
 534. *Dryscopus naldensis*, Sharpe.
 535. *D. jacksoni*, Sharpe.
 536. *D. cinerascens*, Hartl.
 537. *D. malzacii*, Heugl.
 538. *D. nyansa*, Neum.
 539. *D. sahelicus*, Neum.
 540. *Antichromus minutus* (Hartl.).
 541. *Telephonus senegalus* (Linn.).
 542. *T. blanfordi*, Sharpe.
 543. *T. minor*, Reichen.
 544. *T. cunini*, Reichen.
 545. *Malacomotus blanchoti* (Steph.).
 546. *M. doherdyi*, Rothsch.
 547. *M. sulphuriceps* (Less.).
 548. *Nicator chloris* (Less.).

FAMILY PARIDÆ.

549. *Parus leucopterus*, Swains.
 550. *P. nigricinereus*, Jackson.
 551. *P. berrake*, Jackson.
 552. *P. albiventris*, Shelley.
 553. *Anthoscopus parvulus* (Heugl.).
 554. *A. musculus* (Hartl.).

FAMILY NECTARINIIDÆ.

555. *Hedylipna platyrus* (Vicill.).
 556. *Drepanorhynchus reichenowi*, Sharpe.
 557. *Nectarinia unguicularis*, Sharpe.
 558. *N. timensis*, Shelley.
 559. *N. pulchella* (Linn.).
 560. *Cinnyris cuprea* (Shaw).
 561. *C. superbus* (Shaw).
 562. *C. erythrocerus* (Heugl.).
 563. *C. sahelicus*, Reichen.
 564. *C. fulkensteini*, Fischer & Reichen.
 565. *C. ansorgei*, Hartert.
 566. *C. chloropygia* (Jard.).
 567. *C. mediocris*, Shelley.
 568. *C. orphoastrea*, Reichen.
 569. *C. reichenowi*, Sharpe.
 570. *Chalcomitra acik* (Antinori).

571. *Chalcomitra equatoralis* (Reichen.).
 572. *C. inaristata* (Hartert).
 573. *C. hunteri* (Shelley).
 574. *C. kirki* (Shelley).
 575. *C. kalekrentli* (Cub.).
 576. *C. doggetti* (Sharpe).
 577. *C. angolensis* (Less.).
 578. *Cyanomitra obscura* (Jard.).
 579. *C. rayazzii* (Salvad.).
 580. *C. cyanolama* (Jard.).
 581. *C. verticalis* (Lath.).
 582. *C. viridisplendens* (Reichen.).
 583. *Anthothreptes orientalis* (Hartl.).
 584. *A. hypoleila* (Jard.).
 585. *A. tephroleuca* (Jard. & Fraser).

FAMILY ZOSTEROPIDÆ.

586. *Zosterops senegalensis*, Bp.
 587. *Z. kikuyuensis*, Sharpe.
 588. *Z. stuhlmanni*, Reichen.
 589. *Z. jacksoni*, Neum.

FAMILY CERTHIDÆ.

590. *Salpornis salvadorii* (Bocage).

FAMILY MOTACILLIDÆ.

591. *Motacilla vidua*, Sundev.
 592. *M. alba*, Linn.
 593. *M. capensis*, Linn.
 594. *M. melanope*, Pall.
 595. *M. campestris*, Pall.
 596. *M. flava*, Linn.
 597. *M. cinereicapilla*, Savi.
 598. *M. feldeggii*, Michx.
 599. *Anthus trivialis* (Linn.).
 600. *A. latistriatus*, Jackson.
 601. *A. gouldi*, Fraser.
 602. *A. nicholsoni*, Sharpe.
 603. *A. rufulus*, Vicill.
 604. *A. cervinus* (Pall.).
 605. *Macronyx cirreus* (Vicill.).
 606. *M. wintoni*, Sharpe.

FAMILY ALAUDIDÆ.

607. *Mirafra athi*, Hartert.
 608. *M. fischeri*, Reichen.
 609. *M. apiata* (Vicill.).
 610. *M. bucolica*, Hartl.
 611. *Heliocorys modesta* (Heugl.).
 612. *Tephrocorys cinerea* (Gm.).
 613. *Pyrrhuloxia leucotis* (Snaul.).
 614. *P. signata*, Gust.

FAMILY FRINGILLIDÆ.

615. *Emberiza flaviventris* (Vieill.).
 616. *E. orientalis*, Shelley.
 617. *Fringillaria tahapisi* (Smith).
 618. *F. septemstriata* (Rüpp.).
 619. *F. saturator*, Sharpe.
 620. *Chrysomitris melanops* (Heugl.).
 621. *Petronia pyrgita* (Heugl.).
 622. *Passer ruficinctus*, Fischer & Reichen.
 623. *P. shelleyi*, Sharpe.
 624. *P. uganda*, Reichen.
 625. *P. gongonensis*, Oust.
 626. *Sorella emini*, Hartl.
 627. *Polioptila reichardi*, Reichen.
 628. *Serinus flavivirens* (Blanf.).
 629. *S. sharpei*, Neum.
 630. *S. flaviventris* (Swains.).
 631. *S. imberbis* (Cab.).
 632. *S. icterus* (Bonn. & Vieill.).
 633. *S. barbatus* (Heugl.).
 634. *S. capistratus* (Finsch).
 635. *S. affinis* (Reichm.).
 636. *S. albifrons* (Sharpe).
 637. *S. leucopygius* (Sundev.).
 638. *S. reichenowi*, Salvad.
 639. *S. angolensis* (Gm.).
 640. *S. dorsostriatus* (Reichen.).

FAMILY PLOCEIDÆ.

641. *Vidua principalis* (Gm.).
 642. *Steganura paradisa* (Linn.).
 643. *Chera prognus* (Bodd.).
 644. *Penthetria ardens* (Bodd.).
 645. *P. eques* (Hartl.).
 646. *Penthetriopsis macrurus* (Gm.).
 647. *P. soror* (Reichen.).
 648. *P. humeralis*, Sharpe.
 649. *Drepanoptes jacksoni*, Sharpe.
 650. *Urobrachya pharnicea* (Heugl.).
 651. *U. affinis*, Cab.
 652. *U. traversi*, Salvad.
 653. *Pyromelana flammeiceps* (Swains.).
 654. *P. nigrifrons*, Böhm.
 655. *P. ansorgei*, Hartert.
 656. *P. franciscana* (Linn.).
 657. *P. diademata* (Fischer & Reichen.).
 658. *P. xanthomelana* (Rüpp.).
 659. *P. taha* (Smith).
 660. *P. ludoensis* (Reichen.).
 661. *Ploceipasser melanorhynchus*, Rüpp.

662. *Ploceipasser superciliosus* (Cretzschm.).
 663. *P. donaldsoni*, Sharpe.
 664. *Philaterus armatus* (Bp.).
 665. *P. dorsalis* (Reichen.).
 666. *Pyrenestes coccineus*, Cass.
 667. *Quelea erythropus* (Hartl.).
 668. *Q. cardinalis* (Hartl.).
 669. *Q. arthiopica* (Sundev.).
 670. *Q. quelea* (Linn.).
 671. *Spermestes stigmatophorus*, Reichen.
 672. *S. cucullata*, Swains.
 673. *S. scutata*, Heugl.
 674. *Ortygospiza polyzona* (Temm.).
 675. *O. atricollis* (Vieill.).
 676. *Lagonosticta montei* (Hartl.).
 677. *L. minina* (Vieill.).
 678. *L. brunneiceps*, Sharpe.
 679. *L. polymota*, Shelley.
 680. *L. rara* (Antin.).
 681. *L. rhodoptera*, Heugl.
 682. *Amulina fasciata*, Swains.
 683. *Zonogasteris mella* (Linn.).
 684. *Z. sulawensis*, Sharpe.
 685. *Pytelia pharnicoptera*, Swains.
 686. *P. afra* (Gm.).
 687. *P. ansorgei*, Hartert.
 688. *P. schlegelii*, Sharpe.
 689. *Coccyzygia kilimensis*, Sharpe.
 690. *Hypochara ultramarina* (Gm.).
 691. *H. purpurascens*, Reichen.
 692. *Nigrita schistacea*, Sharpe.
 693. *N. sparsinguttata*, Reichen.
 694. *N. dohertyi*, Hartert.
 695. *Sporoginthus subflavus* (Vieill.).
 696. *Uroloncha caniceps* (Reichen.).
 697. *Estrilda astrild* (Linn.).
 698. *E. minor* (Cab.).
 699. *E. cinerea* (Vieill.).
 700. *E. rhodopygia*, Sundev.
 701. *E. paludicola*, Heugl.
 702. *E. roseicrista*, Reichen.
 703. *E. erythronota* (Vieill.).
 704. *E. nonnuda*, Hartl.
 705. *E. pharniceis*, Swains.
 706. *Granatina ianthinogastra*, Reichen.
 707. *Sporopipes frontalis* (Daud.).
 708. *Icteryopsis pelzelni* (Hartl.).
 709. *Anoplectes melanotis* (Laf.).
 710. *Heterophantes nigricollis* (Vieill.).
 711. *H. melanoranthus* (Cab.).
 712. *H. reichenowi*, Fischer.

713. *Heterhyphantus stuhlmanni*, Reichen.
 714. *H. emini* (Hartl.).
 715. *H. stephanofhorus*, Sharpe.
 716. *H. melanogastra*, Sharpe.
 717. *Sycobrotus nandensis*, Jackson.
 718. *S. insignis*, Sharpe.
 719. *Sitagra luteola* (Licht.).
 720. *S. crocata* (Hartl.).
 721. *Hypotaenidia castanops* (Shelley).
 722. *H. camburui*, Sharpe.
 723. *H. abyssinicus* (Gm.).
 724. *H. bohndorffi* (Reichen.).
 725. *H. fisheri* (Reichen.).
 726. *H. dimidiata*, Antin. & Salvad.
 727. *H. jacksoni* (Shelley).
 728. *H. vittilinus* (Licht.).
 729. *H. tenuipterus* (Reichen.).
 730. *H. heuglini* (Reichen.).
 731. *H. pachyrhynchus* (Reichen.).
 732. *H. anomalus* (Reichen.).
 733. *Cinnamopteryx rubiginosa* (Rüpp.).
 734. *Melanopteryx nigerrima* (Vieill.).
 735. *Mulimbus rubricollis* (Swains.).
 736. *Spermospiza rubricapilla*, Shelley.
 737. *Amblyospiza capitata* (Bp.).
 738. *A. melanota* (Heugl.).
 739. *Dinemellia dinemelli* (Rüpp.).
 740. *Troglodytes albirostris* (Vieill.).
 741. *T. scintus*, Salvad.

FAMILY DICRUROIDÆ.

742. *Buchunga assimilis* (Bochst.)

FAMILY ORIOLIDÆ.

743. *Oriolus galbula*, Linn.
 744. *O. auratus*, Vieill.
 745. *O. notatus*, Peters.
 746. *O. rolleti*, Salvad.
 747. *O. laureatus*, Licht.

FAMILY STURNIDÆ.

748. *Perisornis carunculatus* (Gm.).
 749. *Pholidanges leucogaster* (Gm.).
 750. *P. verreauxi*, Bocage.
 751. *P. sharpei*, Jackson.
 752. *Galopsar salvadori*, Sharpe.
 753. *Lamprotonix breviculatus*, Sharpe.
 754. *Amydrus elgonensis*, Sharpe.
 755. *A. morio* (Linn.).
 756. *Stilbopsar stuhlmanni* (Reichen.).
 757. *Lamprocolius splendidus* (Vieill.).

758. *Lamprocolius glaucovirens*, Elliot.
 759. *L. purpureus* (Müll.).
 760. *L. chalybeus* (Ehr.).
 761. *L. chloropterus* (Swains.).
 762. *L. chalcurus* (Nordm.).
 763. *Spreo superbus* (Rüpp.).
 764. *Buphaga africana*, Linn.
 765. *B. erythrorhyncha*, Stanl.

FAMILY CORVIDÆ.

766. *Cryptorhina afra* (Linn.).
 767. *Corvus scapularis*, Dand.
 768. *C. edithæ*, Lord Phillips.
 769. *Rhinocorax affinis* (Rüpp.).
 770. *Heterocorax capensis* (Licht.).
 771. *Corvultur albicollis* (Lath.).



A BRACE OF WHALE-HEADED STORKS

Table 6b. Birds in Karamoja, 1973

Common Name	Scientific Name
Ostrich	<i>Struthio camelus</i>
Secretary Bird	<i>Sagittarius serpentarius</i>
Egyptian Vulture	<i>Neophron percnopterus</i>
Lammergeyer	<i>Cypaetus barbatus</i>
Lanner Falcon	<i>Falco biarmicus</i>
Fox Kestrel	<i>Falco tinnunculus</i>
Greater Kestrel	<i>Falco rupicoloides</i>
Tawny Eagle	<i>Aquila rapax</i>
Martial Eagle	<i>Polemaetus bellcosus</i>
Long-Crested Hawk Eagle	<i>Lophoaelus eccipitalis</i>
Lizard Buzzard	<i>Kaupifalco monogrammicus</i>
Black-Chested Harrier Eagle	<i>Circaetus pectoralis</i>
Bateleur	<i>Terathopius ecaudatus</i>
Shikra	<i>Accipiter badius</i>
Pale Chanting Goshawk	<i>Melierax poliopterus</i>
Hildebrandt's Francolin	<i>Francolinus hildebrandti</i>
Scaly Francolin	<i>Francolinus squamatus</i>
Chestnut-Naped Francolin	<i>Francolinus castaneicollis</i>
Yellow-Necked Spurfowl	<i>Pternistis leucoscepus</i>
Vulturine Guinea-Fowl	<i>Acryllium vulturinum</i>
Kori Bustard	<i>Ardeotis kori</i>
White-Bellied Bustard	<i>Eupodotis senegalensis</i>
Black-Bellied Bustard	<i>Lissotis melanogaster</i>
Hartlaub's Bustard	<i>L. hartlaubii</i>
Spotted Stone Curlew	<i>Burhinus capensis</i>
Crowned Lapwing	<i>Stephanibyx coronatus</i>
Spurwing Plover	<i>Hoplopterus spinosus</i>
Black-Headed Plover	<i>Sarcophorus tectus</i>
Quail Plover	<i>Oryxelos meiffrenii</i>
Pink-Crested Dove	<i>Streptopelia lugens</i>
Ring-Necked Dove	<i>S. capicola</i>
Laughing Dove	<i>S. senegalensis</i>
Namaqua Dove	<i>Oena capensis</i>
Emerald-Spotted Wood Dove	<i>Turtur chalcospilos</i>
White-Crested Turaco	<i>Tauraco leucolophus</i>
Ross's Turaco	<i>Musophaga rossae</i>
White-Bellied Go-Away Bird	<i>Corythaeoides leucogaster</i>
Lilac Breasted Roller	<i>Coracia caudata</i>
Rufous-Crowned Roller	<i>C. naevia</i>
Pygmy Kingfisher	<i>Ispidina picta</i>
Swallow-Tailed Bee-Eater	<i>Dicrocercus hirundinens</i>
Red-Billed Hornbill	<i>Tockus erythrorhynchus</i>
Jackson's Hornbill	<i>T. jacksonii</i>
Crowned Hornbill	<i>T. alboterminatus</i>
Abyssinian Ground Hornbill	<i>Bucorvus abyssinicus</i>
Senegal Hoopoe	<i>Upupa epops</i>
Green Wood Hoopoe	<i>Phoeniculus purpureus</i>
Red and Yellow Barbet	<i>Trachyphonus erythrocephalus</i>
Black-Throated Honey Guide	<i>Indicator indicator</i>
Cardinal Woodpecker	<i>Dendropicos fuscescens</i>
Mottled Swift	<i>Apus aequatorialis</i>
Isabelline Wheateater	<i>Oenanthe isabellina</i>
White-Shouldered Cliff Chat	<i>Thamnolea cinnamomeiventris</i>
Uganda Swallow	<i>Hirundo rustica</i>
Curly-Crested Helmet Shrike	<i>Prionops plumata</i>
Fan-Tailed Raven	<i>Rhinocorax rhithidurus</i>
Rupell's Long-Tailed Starling	<i>Lamprotornis puropterus</i>
Redwing Starling	<i>Onychognanthus morio</i>
Superb Starling	<i>Spreo superbus</i>
Malachite Sunbird	<i>Nectarinia famosa</i>
Tacaze Sunbird	<i>N. tacaze</i>
Variable Sunbird	<i>Cinnyris venustus</i>
Mariqua Sunbird	<i>C. mariquensis</i>
Amethyst Sunbird	<i>Chalcomitra amethystina</i>
White-Headed Buffalo Weaver	<i>Dinemella dinemelli</i>
Somali Golden-Breasted Bunting	<i>Emberiza polioptera</i>

Source: Wilson. 1973.

Table 7. Falconiformes in National Parks, 1974-76

a. Raptors

<i>Aegyptius tracheliotus</i> - R
<i>Trionocephs occipitalis</i> - R
<i>Gyps ruppelli</i> - R
<i>Gyps africanus</i> - R
<i>Necrosyrtes monachus</i> - R
<i>Circus macrourus</i> - P
<i>Circus pygargus</i> - P
<i>Circus aeruginosus</i> - P
<i>Circus ranivorus</i> - R
<i>Polyboroides typus</i> - R
<i>Terathopus caudatus</i> - R
<i>Circus beaudouini</i> - A
<i>Circus pectoralis</i> - R
<i>Circus cinereus</i> - R
<i>Circus cinerascens</i> - R
<i>Accipiter hadius</i> - A
<i>Melierax canorus</i> - R
<i>Melierax metabates</i> - R
<i>Melierax gabar</i> - R
<i>Kaupifalco monogrammicus</i> - R
<i>Buteo rufipennis</i> - A
<i>Buteo rufosus</i> - R
<i>Buteo buteo</i> - P
<i>Lophoetus occipitalis</i> - R
<i>Polemaetus bellicosus</i> - R
<i>Hieroetus spilogaster</i> - R
<i>Aquila rapax</i> - R
<i>Aquila nipalensis</i> - P
<i>Aquila pomarina</i> - P
<i>Aquila clanga</i> - P
<i>Aquila wahlbergi</i> - A
<i>Haliaeetus vocifer</i> - R
<i>Milvus migrans</i> - A(P)
<i>Elanus caeruleus</i> - R
<i>Pandion haliaetus</i> - P
<i>Falco peregrinus</i> - R(P)
<i>Falco subbuteo</i> - P
<i>Falco ardoziaceus</i> - R
<i>Falco naumanni</i> - P
<i>Falco tinnunculus</i> - R(P)
<i>Sagittarius serpentarius</i> - R

Key

R = Resident species

A = African migrant species

P = Palearctic migrant species

Source: Thiollay. 1978, pp. 147-48.

Figure 7b. Species of Falconiformes Observed Only Once

Species	Rwenzori	Kabalega	Kilepo
<i>Neophron percnopterus</i> - R(P)			February
<i>Gypaetus barbatus</i> - R			+
<i>Circus gallicus</i> - P			February
<i>Accipiter melanoleucus</i> - R	+		February
<i>Accipiter tachiro</i> - R			+
<i>Accipiter nisus</i> - P			+
<i>Accipiter inornatus</i> - R	+	+	August
<i>Accipiter ovampensis</i> - A?		July	
<i>Buteo vulturnus</i> - P	February		
<i>Buteo auguralis</i> - A		February	
<i>Buteo oreophilus</i> - R	+		+
<i>Hieraaetus pennatus</i> - P	+		
<i>Hieraaetus dubius</i> - R	February		+
<i>Aquila verreauxi</i> - R			+
<i>Pernis apivorus</i> - P	+		
<i>Aviceda cuculoides</i> - R	July		
<i>Chelictinia riocauri</i> - A			+
<i>Macheirhamphus alcinus</i> - R	+	February	
<i>Polihierax semitorquatus</i> - A			August
<i>Falco biarmicus</i> - R	+	+	February
<i>Falco cherrug</i> - P			+
<i>Falco cuvieri</i> - R	+	+	+
<i>Falco concolor</i> - A	+	+	August
<i>Falco chicquera</i> - R	+	February	+
<i>Falco dickinsoni</i> - R	+		
<i>Falco rupicoloides</i> - R			+
<i>Falco alopex</i> - R			August

Key

R, A, P as above

+ = Species observed at other times

February = February 1976

July = July 1974

Source: Thiollay. 1978.

Table 8. Ugandan Herpetofauna, 1902

	REPTILIA.
	CHELONIA.
	Cryptodira.
	TESTUDINIDÆ.
1. <i>Testudo pardalis</i> , Bell.	
2. <i>Cingris belliana</i> , Gray.	
	Pleurodira.
	PELOMEDUSIDÆ.
3. <i>Pelomedusa galeata</i> , Schoepff.	
4. <i>Sternothermus sinuatus</i> , Smith.	
	EMYDOSAURIA.
	CROCODYLIDÆ.
5. <i>Crocodilus niloticus</i> , Laur.	
	SQUAMATA.
	Lacertilia.
	GECKONIDÆ.
6. <i>Hemidactylus brookei</i> , Gray.	
7. <i>Lycopactylus picturatus</i> , Pters.	
	AGAMIDÆ.
8. <i>Agama colonorum</i> , Daud.	
9. <i>A. plumiceps</i> , Pters.	
10. <i>A. atricollis</i> , Smith.	
11. <i>A. gregorii</i> , Gtur.	
	CHAMÆSAURIDÆ.
12. <i>Chamaesaura annectens</i> , Blgr.	
13. <i>C. tenuior</i> , Gtur.	
	VARANIDÆ.
14. <i>Varanus ocellatus</i> , Rüpp.	
15. <i>V. niloticus</i> , L.	
	LACERTIDÆ.
16. <i>Lacerta jacksoni</i> , Blgr.	
17. <i>Nucras tessellata</i> , Smith.	
18. <i>Eremias spekii</i> , Gtur.	

19. <i>Mabuia maculilabris</i> , Gray.
20. <i>M. megalura</i> , Pters.
21. <i>M. varia</i> , Pters.
22. <i>M. striata</i> , Pters.
23. <i>Lygosoma sundevalli</i> , Smith.
24. <i>L. modestum</i> , Gtur.
25. <i>Ablepharus waldbergi</i> , Smith.

SCINCIDÆ.

	ANELYTROPIDÆ.
26. <i>Feylinia curviro</i> , Gray.	
	RHIPTOGLOSSA.
	CHAMELEONTIDÆ.
27. <i>Chamaeleon laticarpus</i> , Gray.	
28. <i>C. dilepis</i> , Leach.	
29. <i>C. biteniatus</i> , Fisch.	
30. <i>C. dliotti</i> , Gtur.	
31. <i>C. kolweni</i> , Stdr.	
32. <i>C. sphaeropholis</i> , Reichen.	
33. <i>C. xenorhinus</i> , Blgr.	
34. <i>C. jacksoni</i> , Blgr.	
35. <i>C. johnstoni</i> , Blgr.	
36. <i>Rhampholeon kersteni</i> , Pters.	

OPHIDIA.

	TYPHLOPIDÆ.
37. <i>Typhlops punctatus</i> , Leach.	
	GLAUCONIDÆ.
38. <i>Glauconia ercini</i> , Blgr.	

BOIDÆ.

39. <i>Python seba</i> , L.	
	COLUBRIDÆ.
40. <i>Tropidonotus olivaceus</i> , Pters.	
41. <i>Bothrophthalmus lineatus</i> , Pters.	
42. <i>Boodon lineatus</i> , Pters.	
43. <i>Lycophilidium capense</i> , Smith.	
44. <i>Chlorophis emini</i> , Gtur.	
45. <i>C. hoplogaster</i> , Gtur.	
46. <i>C. irregularis</i> , Leach.	
47. <i>Philothamnus semivariegatus</i> , Smith.	
48. <i>Rhamnophis jacksoni</i> , Gtur.	
49. <i>Coronella semiornata</i> , Pters.	
50. <i>Scaphiophis albopunctatus</i> , Pters.	
51. <i>Homalosoma lutrix</i> , L.	
52. <i>Fragia smithii</i> , Leach.	
53. <i>G. tholloni</i> , Mocq.	

54. *Dasyplettis scabra*, L.
 55. *Dipsadomorphes blandingii*, Hallow.
 56. *Leptodiya hobombosia*, Laur.
 57. *Trimerorhinus tritermiatus*, Gtnr.
 58. *Psemmophis sibilans*, L.
 59. *P. punctulatus*, D. & B.
 60. *Thelotornis kirilaudii*, Hallow.
 61. *Colamulaps unicolor*, Rhdt.
 62. *Elapichis guentheri*, Boenge.
 63. *Acia melanoleuca*, Hallow.
 64. *Dendraspis jamezoni*, Traill.

VIPERIDÆ.

65. *Causus rhombatus*, Licht.
 66. *Bitis arictans*, L.
 67. *B. gabonica*, D. & B.
 68. *Atheris squamiger*, Hallow.
 69. *Atractaspis irregularis*, Rhdt.
 70. *A. aterrima*, Gtnr.

BATRACHIA.

Ecaudata.

AGLOSSA.

DACTYLETHRIDÆ.

1. *Xenopus muelleri*, Pts.

PIANEROGLOSSA.

BOFONIDÆ.

2. *Bufo regularis*, Reuss.

ENGYSTOMATIDÆ.

3. *Breviceps verrucosus*, Rüpp.

RANIDÆ.

4. *Rana delalandii*, D. & B.
 5. *R. mascarenensis*, D. & B.
 6. *R. stenocephala*, Blgr.
 7. *R. nutti*, Blgr.
 8. *Chiromantis xerampelina*, Pts.
 9. *Rappia cinctiventris*, Cope.
 10. *R. marmorata*, Rüpp.
 11. *Megalicalus fomasinii*, Bianc.
 12. *Cassina senegalensis*, D. & B.

Table 9. Ugandan Ichthyofauna, 1902

FISCES.		
CROSSOPTERYGII.		
	POLYPTERIDÆ.	
1.	<i>Polypterus senegalus</i> , Cuv.	
DIPNOI.		
	LEPIDOSIRENIDÆ.	
2.	<i>Protopterus aethiopicus</i> , Heck.	
Teleostei.		
MALACOPTERYGII.		
	MORMYRIDÆ.	
3.	<i>Gnathonemus longirostris</i> , Hilgand.	
4.	<i>Mormyrus kannume</i> , Forsk.	
OSTARIOPHYSI.		
	CHARACINIDÆ.	
5.	<i>Hydrocyon forskalii</i> , Cuv.	
6.	<i>Alestes baremose</i> , Joann.	
7.	<i>A. nurse</i> , Rüpp.	
8.	<i>Distichodus niloticus</i> , Linn.	
9.	<i>Citharinus geoffroyi</i> , Cuv.	
	CYPRINIDÆ.	
10.	<i>Labeo forskalii</i> , Rüpp.	
11.	<i>L. victorinus</i> , Blgr.	
12.	<i>L. rupestris</i> , Pfeff.	
13.	<i>Discognathus johnstoni</i> , Blgr.	
14.	<i>Bairdichthys victorinus</i> , Blgr.	
15.	<i>B. jayusonii</i> , Blgr.	
16.	<i>B. pygmaeocheri</i> , Fisch.	
17.	<i>B. lyoni</i> , Forsk.	
18.	<i>B. titraspilus</i> , Pfeff.	
19.	<i>B. altus</i> , Pfeff.	
20.	<i>B. paludinosus</i> , Pfeff.	
21.	<i>B. trimaculatus</i> , Prs.	
22.	<i>Neobola botteyi</i> , Vincig.	
		SILURIDÆ.
23.	<i>Clarius lazera</i> , C. & V.	
24.	<i>C. moorii</i> , Blgr.	
25.	<i>Schilbe dispila</i> , Gthr.	
26.	<i>S. emini</i> , Hilgand.	
27.	<i>Auchenoglanis biscutatus</i> , Geoffr.	
28.	<i>Synodontis zambesensis</i> , Prs.	
29.	<i>S. afro-fischeri</i> , Hilgand.	
30.	<i>S. citernii</i> , Vincig.	
31.	<i>Mochoxus niloticus</i> , Joann.	
32.	<i>Malopterurus electricus</i> , Gm.	
		HAPLOMI.
		CYPRINOIDONTIDÆ.
33.	<i>Haplochilus atypicus</i> , Pfeff.	
34.	<i>Fundulus toniopygus</i> , Hilgand.	
		PERCISOSES.
		OPHOCEPHALIDÆ.
35.	<i>Ophiocephalus obscurus</i> , Gthr.	
		ANABANTIDÆ.
36.	<i>Anabas petherici</i> , Gthr.	
		ACANTHOPTERYGII.
		SERRANIDÆ.
37.	<i>Lates niloticus</i> , Linn.	
		CICHLIDÆ.
38.	<i>Paratilapia longirostris</i> , Hilgand.	
39.	<i>P. cavifrons</i> , Hilgand.	
40.	<i>P. retrodens</i> , Hilgand.	
41.	<i>P. serranus</i> , Pfeff.	
42.	<i>Tilapia nilotica</i> , Linn.	
43.	<i>T. zillii</i> , Gerv.	
44.	<i>T. nuchisquamulata</i> , Hilgand.	
45.	<i>Petrochromis awlersoni</i> , Blgr.	

Source: Johnston. 1902, pp. 447-49.

Appendix V. Natural Resources Legislation

Statute	Source
1. June 6, 1972 Atomic Energy Decree, No. 12.	a
<p>"JUNE 6, 1972 ATOMIC ENERGY DECREE, NO. 12." LAWS OF UGANDA - DECREES 1972</p> <p>TO PROVIDE FOR THE CONTROL OF ATOMIC ENERGY AND RADIOACTIVE MATERIALS IN UGANDA, THIS DECREE CREATES THE ATOMIC ENERGY CONTROL BOARD AND SPECIFIES ITS STRUCTURE AND FUNCTIONS. MEMBERSHIP OF THE BOARD CONSISTS OF THE ATOMIC ENERGY CONTROLLER AS CHAIRMAN, THE CHIEF RADIATION SAFETY OFFICER AS SECRETARY, AND 13 OTHER PERSONS APPOINTED BY THE PRIME MINISTER UPON THE NOMINATIONS OF THE CABINET. THE ADMINISTRATIVE AND ORGANIZATIONAL STRUCTURES OF THE BOARD ARE SET FORTH, OPERATIONAL PROCEDURES ARE DEFINED, AND, IN PARTICULAR, THE DUTIES AND POWERS OF THE CHIEF RADIATION SAFETY OFFICER AND THE RADIOISOTOPE ADVISORY COMMITTEE ARE DESCRIBED. THE MAJOR RESPONSIBILITY OF THE BOARD IS TO MAKE RECOMMENDATIONS TO THE PRIME MINISTER CONCERNING NUCLEAR ENERGY DEVELOPMENT AND THE ATTENDANT SAFETY PRECAUTIONS. IN ADDITION, THE DECREE ESTABLISHES A SYSTEM FOR LICENSING USERS OF RADIOACTIVE MATERIAL, DEFINES THE RESPONSIBILITIES OF LICENSE HOLDERS, CREATES A RADIATION PROTECTION SERVICE, AND PRESCRIBES PENALTIES AGAINST CONTRAVENORS OF THE DECREE.</p>	
2. December 16, 1972 National Water and Sewerage Corporation Decree, No. 34.	a
<p>"DECEMBER 16, 1972 NATIONAL WATER AND SEWERAGE CORPORATION DECREE, NO. 34." LAWS OF UGANDA - DECREES</p> <p>THIS DECREE ESTABLISHES AND DELINEATES THE ATTRIBUTES OF THE NATIONAL WATER AND SEWERAGE CORPORATION OF UGANDA. THE OBJECTIVES OF THE CORPORATION ARE TO DEVELOP AND OPERATE WATER AND SEWERAGE SERVICES IN ANY SPECIFIED AREA OF UGANDA ON A NATIONAL AND SELF-SUPPORTING BASIS. THE CORPORATION IS DESIGNATED AS THE NATIONAL WATER AUTHORITY REFERRED TO IN THE WATERWORKS ACT, AND IN PERFORMING ITS FUNCTIONS, IT IS TO EXERCISE CONTROL AND AUTHORITY IN ALL AREAS PERTAINING TO THE PROVISION OF WATER SUPPLIES AND SEWERAGE FACILITIES. ADMINISTRATIVE AND ORGANIZATIONAL STRUCTURES OF THE CORPORATION ARE SET FORTH, OPERATIONAL PROCEDURES ARE DEFINED, AND THE OTHER ATTRIBUTES PERTAINING TO THE RULES, REGULATIONS, STAFFING AND FINANCIAL PROVISIONS OF THE CORPORATION ARE SPECIFIED IN THE DECREE.</p>	
3. Land Ordinance No. 21 of 1966; Public Lands Ordinance, 1962.	b
4. Soil Conservation (non-African land) Ordinance, 1958.	b
5. The Mining Ordinance (Cap. 129), Amdts. 1953, 1958. The Mining Regulations 1949.	b
6. Mining Act (Cap. 248).	c
7. The Electricity Ordinance 1961; Electricity Rules.	b
8. Gas (Amdt.) Rules Stat. Inst. No. 211, 1964.	b
9. Electricity Act (Cap. 135).	c

- a EPA. 1977.
b Johnson and Johnson. 1977.
c Morris and Read. 1966.

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Appendix VI. Selected Recent Foreign Assistance Projects

Agency	Year	Nature of Assistance	Amount (U.S. \$)
USAID	1980	Food transportation	208,000
USAID	1980	Medical supplies	465,290
USAID	1980	Airlift of maize from Ethiopia	138,000
USAID	1980	Grant to U.N. High Commission for Refugees (UNHCR)	2,500,000
USAID	1980	Grant to CAPE	360,000
USAID	1980	Food distribution	13,953,000
U.S. Dept. of State	1980	Grant to UNHCR	1,000,000
IUCN/CNPPA	1980	Project No. 1765*	n.a.
IUCN/CNPPA	1980	Project No. 1915*	n.a.
IUCN/CNPPA	1980	Project No. 1942*	n.a.

* Project No. 1765: Protection of forest reserves. This project combines two earlier projects to conserve the Bwindi and Kibale Forest Reserves. It includes provision of vehicles for patrols, support for boundary demarcation, and botanical surveys.

Project No. 1915: National Parks Law Enforcement. In order to quickly provide support to Uganda to prevent the collapse of the once-outstanding system of protected areas, this project will provide for the repair of existing equipment and provision of new equipment as well as rehabilitation of ranger posts. It is hoped that further support will be provided to bring the protected areas back to their previous effectiveness.

Project No. 1942: Conservation of wildlife and wildlife habitats in Uganda. This project has two main goals: to work towards the rehabilitation of Uganda's conservation areas by establishing what action is needed and by advising the Ugandan Authorities and international authorities accordingly; and to carry out a programme of conservation-oriented research on the effects of the destruction of wildlife and wildlife habitats. It includes provision of a vehicle and is expected to lead to further action by IUCN/WWF.

Source: IUCN. 1981.
USAID. 1981a.

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Appendix VII. Organizations and Agencies relating
to the Environment

Table 1. Domestic Organizations and Agencies

Table 2. Regional and International Organizations and
Agencies

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Table 1. Domestic Organizations and Agencies ^a

Central Ministries

Agriculture and Forestry (Kampala)
Forest Dept. (Entebbe)
Animal Industries and Fisheries
Fisheries Dept. (Entebbe)
Health
Lands and Natural Resources
Dept. of Lands and Surveys
Geological Survey and Mines Dept.
Water Development Dept. (Entebbe)
Planning and Economic Development
Power and Telecommunications
Tourism and Wildlife
Game Dept.
Transport

Other Public Sector Organizations

Agriculture and Livestock Development Fund
Coffee Marketing Board
Family Planning Association of Uganda
Makerere University
Dept. of Agricultural Engineering
Dept. of Crop Science
Faculty of Technology
Uganda Development Corporation
Uganda Fish Marketing Corporation
Uganda Institute of Ecology (Lake Katwe)
Uganda Museum
Uganda National Parks
Uganda Society
Uganda Tea Authority
Uganda Tourism Development Corporation

Cooperative Associations

Bugisu Co-operative Union
Bwavumpologoma Growers' Co-operative Union
East Mengo Growers' Co-operative Union
Masaka District Co-operative Union
Mubende District Co-operative Union
Wamala Growers' Co-operative Union
West Mengo Growers' Cooperative Union

^a All situated in Kampala, unless otherwise noted.

Sources: Anonymous. 1980. Bergquist et al. 1978. Johnson and Johnson. 1977. Trzyna and Coan. 1976. UNEP 1979.

Table 2. Regional and International Organizations and Agencies

Organizations

African Development Bank
African Postal Union
Association of African Central Banks
Association of African Universities
Conference of East and Central African States
Desert Locust Control Organization for Eastern Africa
East African Airways Corporation
East African Community
East African Cargo Handling Services Ltd.
East African Development Bank
East African Examinations Council
East African External Telecommunications Company Ltd.
East African Harbours Corporation
East African Posts and Telecommunications Corporation
East African Railways Corporation
Eastern African National Shipping Line
Inter-African Coffee Organization
Inter-University Committee for East Africa
International Coffee Organization
Organisation Internationale contre le Criquet Migrateur Africain
Organization of African Unity
Trans-African Highway Co-ordinating Committee

Source: UNECA. 1972.

Appendix VIII. Acronyms Employed in this Report

CMS	Church Missionary Society
CNPPA	Commission on National Parks and Protected Areas (IUCN)
EAGR	East African Geographical Review
EAJRD	East African Journal of Rural Development
EAJWJ	East African Wildlife Journal
EPA	Environmental Protection Agency (U.S.)
FWS	Fish and Wildlife Service (U.S.)
ICJ	International Commission of Jurists
ITCZ	Intertropical Convergence Zone
IUCN	International Union for Conservation of Nature and Natural Resources
NORAD	Norwegian Agency for International Development
VEB	Uganda Electricity Board
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commission for Refugees
USDA	U.S. Department of Agriculture
WHO	World Health Organization (United Nations)

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IX. Selected Bibliography

1. Demography, Economy, Geography, History, and General Reference
2. Agriculture and Land Use
3. Water Resources
4. Geology, Soils, and Mineral Resources
5. Energy Resources
6. Vegetative Resources and Management
7. Faunal Resources and Management
8. Pollution, Disease, and Environmental Problems
9. General Conservation, Legislation, and Planning

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