A History of the Uganda Forest Department 1951-1965

G.Webster, OBE and H.A. Osmaston

Commonwealth Secretariat

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Contents

Plates

Foreword

De Tocqueville said that history is a gallery in which there are few originals and many copies. If the same can be said for forestry then 1951 to 1965 was a wholly original period in the history of the Uganda Forest Department. In many respects – enumeration and mapping of forests, development of silvicultural methods, regeneration of high forest and establishment of plantations – these 15 years were the high point of achievement of the Forest Department.

What made these years special? It was a time of relative stability and economic growth. Forest Department staff went about their business unhindered and, in contrast to much of the period since 1965, considerable funds were available over and above personal emoluments to invest in field operations. This stability and prosperity, when combined with the energies and talents of many committed individuals, fuelled a period of innovation and expansion.

Some of the difficulties and uncertainties described in this book are still faced by foresters in Uganda today. Encroachment and theft are persistent problems and demarcating boundaries to aide detection and control is as costly and logistically difficult today as it was 40 years ago. This book describes how a policy of devolution of local forest responsibilities was 'pursued steadily from 1952 onwards'. Uganda is today again considering devolution of authority for forest management and there is clearly merit in trying to learn from the experiences of 50 years ago.

This book is full of detail, from the cost of road construction to the results of research. That so much of it is recorded here is a credit both to the professionalism of the Forest Department and to the persistence of George Webster and Henry Osmaston in tracking it down. They experienced and shaped these exciting years and have told this story well.

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Preface

This is the third and much belated instalment of the history of the Uganda Forest Department.[1] The reason for the resumption in 1998, after so long a gap, was the centenary of the Department in that year; after consultation George Webster offered to bring the account forward to 1965, the year when he retired from the service. This offer was accepted by the Commissioner of Forests, Uganda.

The great bulk of the extraction, compiling and drafting of this history has been the work of George Webster, while Henry Osmaston's contribution has been mainly at the editorial and publication stages, including typesetting the whole text and the tables.

We had hoped that the history would be continued from 1965 by George Webster's successor as Chief Conservator of Forests, Martin Rukuba, but tragically he died in a motor accident in 1998, before he could be approached.

George Webster[2]
Henry Osmaston[3]

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1 The earlier instalments were *A History of the Uganda Forest Department, 1898–1929* by N.V. Brasnett (*Forest Department Bulletin* No 3, 1951) and *A History of the Uganda Forest Department, 1930–1950* by I.R. Dale (*Forest Department Bulletin* No 4, 1955).

2 George Webster was recruited to the Uganda Forest Department as Forester in 1937, after five years service in the UK Forestry Commission, and served continuously until his retirement in 1965, having been Chief Conservator of Forests for the previous three years.

3 Henry Osmaston served in the Uganda Forest Department from 1949 to 1963 in most districts of the country and also as WPO. He is currently advising the Uganda Forestry Department on natural forest management.

At the date of publication of this history, 2003, Webster and Osmaston are aged, respectively, 90 and 80, testimonies to the benefits of an outdoor life in Uganda.

Introduction

The two previous instalments of the *History of the Uganda Forest Department* traced its progress from its establishment in 1898 as half of the new Scientific & Forestry Department, with an expatriate staff of one and a half officers, in a Protectorate only reluctantly adopted by the British Government a few years before. During its first 30 years no clear forest policy was formulated and the poorly staffed and funded department concerned itself mainly with harvesting forest produce, concentrating on wild rubber collection, the pit-sawing of mahogany (*Khaya* and *Entandrophragma spp.*) in the Budongo Forest and of mvule (*Chlorophora = Milicia excelsa*) from the savanna and farmlands of Busoga, and the milling of podo (*Podocarpus spp.*) from the swamp forests of south Masaka, partly to meet the needs of the first world war. A start was also made on establishing fuel and pole plantations. However, adverse external reports by Troup and Nicholson drew attention to the failure to declare and demarcate existing natural forests as reserves and to prepare working plans, and the most active and enterprising officer, Dawe, resigned in frustration.

A new phase opened in 1929 with the appointment of Brasnett as Conservator, with new and vigorous colleagues, notably Eggeling. A Forest Policy received formal government approval; forest reservation was pressed ahead reaching a total of 6,317 sq miles (16,360 sq km, 7.9% of the land and swamp area of Uganda, i.e. excluding lakes) by 1950, including both major productive forests and some large protective mountain forests; working plans were prepared for some of the major forests; botanical and ecological studies were made in the natural forests and trials were made of techniques for their regeneration; and 20,000 acres (8,000 ha) of fuel and pole plantations were established. The second world war caused a temporary setback but by 1950 the stage was set for further development.

The relatively short period of the next 15 years proved to be the most active in both the Protectorate's and the Department's histories. At its start, while it was recognised that the country would progress to independence in due course, the official view was that this would take several decades at least, yet in fact it took only a dozen years, and was achieved quite peacefully. Although relationships with Buganda, the largest native kingdom and the most developed province, were upset by disputes with its government and ruler, the Kabaka, and the eventual exile of the latter, there was a progressive development of other local governments and transfer of powers to them.

By now Uganda was a prosperous country based on exports of the three Cs – cotton, coffee

and copper, supplemented by tea and sugar. Substantial funds were accumulated in the cotton cess fund which were then available to promote other development such as education and health; Makerere College (now University) and Mulago Hospital were leading institutions in Africa. Such changes naturally had important repercussions on the policy and work of the Forest Department, primarily in the funding of an expanding programme of work, the transfer of responsibilities to local governments and the training of African staff.

Most of the existing natural forests had now been reserved or were on private property in Buganda, but most remained undemarcated, little known and not covered by working plans, though it was clear that further forest resources would be needed. Swabey, the new Conservator of Forests (CF), spurred his staff ahead with all these activities, and by the end of the period most of these deficiencies had been remedied. Unlike many development projects, however, these were kept under strict financial control by a closely monitored standard costings system. Local governments were persuaded to agree to the reservation of numerous minor forests as Local Forest Reserves (LFRs). As each district achieved its set target it was declared to have an Adequate Forest Estate (AFE) which entitled it to manage and draw revenue from unreserved public land as well as from LFRs.

Dawkins, Forest Ecologist, contributed intensive studies of the ecology of the natural forests, especially the relationship between harvesting management and regeneration success, and established standard methods of assessing and tending natural regeneration and its increment, with emphasis on the use of arboricides to kill weed species. Numerous trials of replanting harvested forest with mahoganies and other desirable species had often met with little success, either due to damage by elephants or to inadequate canopy opening. Dawkins concluded that natural regeneration was the best option and that a monocyclic system of harvesting was required to avoid excessive damage to the regeneration. In parallel with this he developed efficient enumeration (inventory) techniques for assessing forest stocking and permissible yields on a sustained yield basis. This work was complemented by the development of a skilled map section making use of the countrywide air photography and accurate mapping done by the Directorate of Overseas surveys in the 1950s, so that it was possible to map and define the different forest types in each major forest and their potential yield. For long-term management a vital sytstem of continuous forest inventory was developed.

On these foundations it was possible to expand timber production from natural forests but it soon became clear that these would not meet the anticipated needs of the country. A detailed country-wide census sponsored by FAO of the use of timber and other wood confirmed this, and a programme was started for the establishment of extensive plantations of pine and cypress, mainly on grassy hills in the western highlands, so that by the end of the period these comprised 11,320 acres (4,580 ha). The harvesting of these was delayed by the troubled Amin and Obote periods, but these plantations have provided and still provide a very valuable source of timber since then, when demand has been much greater than could be satisfied by the natural forests.

An earlier attempt to provide supplies of high quality saw-timber was based on the premise that mvule, which flourished in the savanna of Busoga and occasionally further north, could be established in the somewhat drier lateritic savannas of Lango and Acholi districts. After

an encouraging start, the attacks of the mvule gall-fly, the disappearance of cheap labour and the failure of the trees to make continuing height growth led eventually to the closure of these projects.

Fuel and pole plantations were expanded, partly to meet increased industrial demands such as fuel for brick-burning, tobacco-curing and tea-drying, and poles for transmission lines following the construction of the Owen Falls dam on the Nile. Domestic demand too continued to grow, driven by the demands of a rising population and rising standards of living and housing.

The training of African staff was a priority and the Forest School at Nyabyeya was repeatedly expanded for the training of foresters and rangers, while professional training was given at universities abroad. Research was conducted into problems of many kinds, from seed provenance, nursery practice and thinning schedules to pathology and entomology. The better utilisation of lesser known timbers was a constant preoccupation, to try to widen the number of species taken in harvesting natural forest, and considerable success was achieved, the number of species commonly taken rising from 35 to 50–60 over the period.

To conclude, the period covered here was marked by great development and expansion of all aspects of the Department's work from reservation of an adequate forest estate, silviculture, management and research to training of staff; in at least some aspects of these the Department was among the leaders in Commonwealth countries. Uganda achieved independence in 1962 and most of the expatriate staff retired soon after and were gradually replaced by Ugandan professional staff as they completed their training. So 1965, when a Ugandan officer took charge of the Department, was the end of an era. Without doubt, expatriate officers who served in Uganda look back nostalgically and with pride to a happy sojourn in 'the Pearl of Africa' and with affection for its friendly people.

PART I

CENTRAL GOVERNMENT FORESTRY

1 Policy and Legislation

Policy

The general policy of the Department remained unchanged until 1964 on the lines of the official statement made by the Governor in 1948 (Appendix G). In brief, the policy aims were:

(a) the reservation of an adequate forest estate for protective and productive purposes;

(b) the management of this estate to obtain the best returns consistent with the above objectives;

(c) fostering among the people of Uganda a real understanding of the value of forests;

(d) encouraging the practice of sound forestry by Local Authorities and private enterprise – and to educate selected Africans in technical forestry.

Generally aims (a) and (b) were achieved within the period (1951–65) of this history but in spite of efforts to publicise the aims and work of the Department, objective (c) was far from being realised.

The first part of aim (d) was carried out successfully until 1964 when, as a result of Uganda becoming a republic in 1963 and of constitutional changes in 1964, the control of Local Forest Reserves and trees on public land was transferred to the Uganda Government Forest Department by statutory instruments enacted in 1964, although the transfers were not carried out until 1967/68.

With regard to the education of Africans in technical forestry, the output of Forest Rangers and Assistant Foresters from the Forest School played a large part in the development of the Department and of the Local Authorities. By 1964, five Ugandans had completed their professional training successfully and thirteen others were under training or had been selected for it.

An important statement, 'Land Policy of the Protectorate Government in Uganda', was issued in 1950. It reaffirmed that rural lands were being held in trust for the use and benefit of the African population.

In 1954 the most important event of the year was the setting up by the Government of the Agricultural Productivity Committee to consider agrarian (including forestry) produc-

tivity. Development proposals were submitted by the Department which resulted in the Committee recommending additional expenditure by the Department of some £234,000 for the five-year period July 1955–June 1960. This was approved by Government. The Department's proposals covered many of its ongoing activities but emphasis was directed to ensuring that:

(a) the productive capacity of the 1,500 square miles (3,885 km^2) of high forest reserves should be systematically developed as they were likely to be the main source of sawn timber in the long run;

(b) financial provision should be made for the regeneration of high forest reserves at the rate of 8,000 acres (3,240 ha) a year;

(c) about 500 acres (200 ha) of softwoods should be planted over five years in areas remote from rail or adjacent to mining development – this was additional to the existing programme;

(d) labour lines should be provided to stabilise the labour forces employed on fuel and pole plantations;

(e) research in silviculture, forest entomology and timber utilisation should be expanded;

(f) the Forest School should be enlarged to train the increased number of staff required for the expanded forestry programme.

Progress reports on the above are given below.

The report of the Royal Commission on Land in East Africa was under consideration during 1955. It did not appear that any significant change in the status or management of forest reserves was involved although the Department was interested in many of the problems raised.

The revised Bunyoro Agreement, 3rd September 1955, included the following clause:

> *The control of all areas gazetted as Central Forest Reserves is invested in the Governor subject to the rights of the people of Bunyoro-Kitara to take forest produce in accordance with the procedure laid down from time to time by Protectorate Laws. So long as Bunyoro-Kitara has an adequate forest estate, the control of all other forests including hill forest reserves, is vested in the Native Government of Bunyoro-Kitara.*

The Department warmly welcomed the setting up of the Natural Resources Committee by the Government in May 1955. The terms of reference of the committee, one of whose members is the Chief Conservator of Forests, are:

> *To keep under review and advise the Minister of Natural Resources on the policy and legislation affecting land utilisation and the conservation and improvement of natural resources: to ensure co-ordination of activities as between Departments dealing with natural resources: and to satisfy itself that policy is being implemented.*

Two policy directives affecting the Department were issued by the Ministry of Natural

Resources in 1955. The first dealt with forestry extension service and laid down that 'it is the function of the Agricultural Department through its field staff to encourage the establishment of farm wood lots and small scale private planting generally in agricultural areas.' The response from the farmers to this attempt at self-help was mixed, the best results coming from areas with little remaining bush.

The planned phase of forest development based on a programme laid down for 1947–56 was pursued steadily and the approved priorities for the remaining three years of this phase were re-emphasised in a Departmental Standing Order as:

(1) the attainment of an adequate (minimum) forest estate;

(1a) the consolidation of reserve boundaries;

(2) the enumeration of all productive forests prior to exploitation;

(3) preparation of working plans for all forest reserves.

It was considered possible that these objectives could be attained, possibly with minor exceptions, and that the emphasis for the following decade would be on:

(a) the scientific and intensive management of the potentially productive forest estate – which would be of limited area – and the securing of maximum production of timber and other forest products;

(b) the development of African Local Government forest services so that they could provide for the needs of fuel and poles, etc. for a diffused rural population;

(c) the training of Africans at all forestry levels.

It was apparent that this programme would move from the extensive to the intensive and would continue to call for a professional and sub-professional cadre of the highest quality. Training facilities for Africans would be expanded both for Protectorate Government and African Local Government services.

In 1956 consideration was given to some revision of the Forest Policy Statement to bring it into line with recent political and administrative development. It was obvious that the Department should be attempting to assess with greater precision the probable future demands for forest produce in the Protectorate. Studies were begun on an estimate of probable population trends and future consumption trends, coupled with a re-appraisal of the potential productivity of the permanent forest estate in the light of silvicultural research of the last few years.

A detailed and crucial study of the country's probable future requirements was made in 1957–59, which indicated that the requirement of saw-logs was likely to be at least 30 million Hoppus ft (38.4 million ft^3, 1.08 million m^3) by the end of the century and might be a good deal more. This figure required further checking, but meanwhile it was taken as a basis for departmental planning. It was also estimated that to supply these requirements, the outturn of the permanent forest estate would have to be at least quadrupled. (*See Present wood consumption and future requirements in Uganda*, FAO, Rome, Report 1287; S.L. Pringle and

J.E.M. Arnold, 1960. A convenient summary is provided in Appendix I, taken from pp. 48–52 of 'The forests and forest administration of Uganda', paper prepared for the 8th British Commonwealth Forestry Conference.)

As it was unlikely that this amount of saw-logs could be produced within the time available by the natural forest alone, it would be necessary to undertake a great deal more timber planting than had hitherto been done – but this would be expensive. It was decided to expand research on planting aiming principally at raising quick-growing species suitable for general construction and joinery purposes.

Also research had shown that under the system of polycyclic selective felling practised previously, the yield from the high forest could not be raised beyond a certain figure, largely because of felling damage, but that it could be raised a good deal further by adopting a monocyclic system approaching more to clear felling. It was decided, therefore, to apply the latter system to productive high forest wherever possible.

These changes were begun in 1958 but unfortunately this coincided with a time of increasing financial stringency. At this time they had not been affected significantly by lack of funds but it was difficult to foresee how far it would be possible to maintain their momentum.

During the period 1959/60, much study continued to be given to the question of how far the forest estate could be made adequate to fulfil the productive functions laid down in point (a) of the policy. As a fundamental part of this, a survey of current timber consumption and forecast of future needs was carried out by a FAO team. Its forecast was that saw-timber requirements in the round would be between 12½ million cubic feet (0.35 million m^3) and 14½ million cubic feet (0.41 million m^3) in 1980 and between 23 and 29 million cubic feet (0.65–0.82 million m^3) by the end of the century, depending on the rate of growth of African consumption. These predictions confirmed substantially the previous Forest Department forecast of about 30 million cubic feet (0.85 million m^3) requirements at the end of the century (see Appendix I).

The FAO team also forecast that from about 1980/85 onwards, Uganda would be faced with a considerable and growing shortage of timber which might reach a figure of 15–20 million cubic feet (0.42 million m^3 to 0.57 million m^3) in the round by the year 2000. This shortage, unless it was met, would appreciably impede the rise in living standards which was the declared general objective of the Government.

At the Constitutional Conference in London in September/October 1961, with Uganda approaching independence, it was agreed that the administration of Crown Forests, i.e. Central Forest Reserves (CFRs), should be transferred to local governments when the Central Government was satisfied that the local governments had the resources and staff to administer them properly. By 1963/64, no action had been taken on the transfer because the Government considered that the local governments did not have the money or the staff with which to manage these important national assets efficiently.

In 1963, Uganda became a republic and as a result of constitutional changes the control of Local Forest Reserves (LFRs) and trees on public land was transferred to the Uganda Government Forest Department by statutory instruments enacted in 1964, although the transfers were not effected until 1967/68.

The main development of 1962 in relation to the Government's Forest Policy was the publication of the Report of the World Bank Economic Survey Mission and the Government's Sessional Paper No 2 setting out its proposals for implementing the main recommendations of the Mission. Broadly, the Mission recommended that investment in production forestry should be continued at its present level but that expansion should only take place if the additional funds required for it could be raised by way of grant or soft loan. The Government accepted this and provision was included in the Five Year Development Plan for a programme for expanded timber planting and natural forest improvement treatment subject to the necessary finance being obtainable. The programme amounted to about £142,000 in addition to the current rate of capital investment of about £30,000 a year. If finance could not be obtained by way of low interest loan or grant, the Government intended to review the programme.

The Departmental Development Plan was revised and recosted in 1964 as a result of substantial wage increases awarded to Government employees. The total cost for the ten-year period was estimated at approximately £855,000, of which about £500,000 was for expansion of the current programme. Capital was still not available for expansion but hopes were high at the end of the year that it would be forthcoming in 1964/65.

These hopes were not fulfilled but the annual targets in the Development Programme for 1964/65 were reached. The priorities laid down to cover the Development Plan period (up to mid-1966) were:

(1) completion of regazetting of all forest reserves;

(2) preparation of working plans or working plan reports for all reserves without valid plans or reports;

(3) the maintenance of existing softwood and fuel and pole plantations;

(4) the tending of exploited or adolescent natural forest;

(5) the continuation of current planting programmes which, for softwoods, was between 900 and 1,000 acres (364 and 405 ha) per annum;

(6) provided additional funds were forthcoming, expansion of the softwood planting programme to 15,000 acres (6,070 ha) per annum and silvicultural treatment of high forest from 12,000 (4,850 ha) to 17,000 acres (6,880 ha) per annum;

(7) the attainment of an adequate forest estate in Lango and Karamoja Districts.

Concurrent with the above priorities, the highest priority should be given at all times to protection of the estate against the greatest danger to it, human encroachment.

The Republican Constitution for Uganda (1963) brought about several changes, including the transfer in 1964 of forestry services formerly under District Administrations, and integrated them within the Uganda Government Forest Department. This important change in policy was welcomed by everyone interested in forestry, including most of the staff of the former District Administration forestry services, as it would ensure efficient and rational development of forest resources throughout the country.

Legislation

In 1951, Legal and General Notices (LN and GN) were gazetted prescribing the use of standard trade names for timber intended for export, the imposition of an embargo on timber exports with certain exceptions, and the freeing of timber from price control. In 1952, Notices covered the reclassification of tree species and minimum felling limits, the prescribing of preservative treatment for timbers susceptible to beetle attack, and the hygiene and proper stacking in timber yards. The embargo on all exports of mvule and on 75% of mahogany production was maintained but all other exports were freed.

Between 1953 and 1956, Notices covered the declaration of central and local forest reserves, the notification of boundaries of reserves, the membership of the Timber Industry Committee, etc. In addition to these the following Notices were gazetted:

GN No 53 of 1954 – declaration of adequate forest estate for Acholi, Teso, Ankole
GN No 618 of 1955 – declaration of adequate forest estate for Bukedi
GN No 1445 of 1955 – declaration of adequate forest estate for Busoga
GN No 793 of 1956 – declaration of adequate forest estate for Buganda.

Such a declaration resulted in the transfer of control of forestry on public land from the Forest Department to the Local Government, sometimes resulting in a substantial rise in its revenue.

No forest legislation was enacted or revised during 1957 nor were any legal notices concerning forestry published. One General Notice – No 643/57 – notified membership of the Timber Industry Committee.

In 1958, Legal Notice No 324 – Jurisdiction of Native Courts – empowered native courts in Eastern, Northern and Western Provinces (EP, NP and WP) to administer certain sections of the Forest Ordinance. These sections were mainly concerned with offences and the effect of this legislation was to facilitate and speed up the hearing of cases in which Africans were involved. General Notice No 672/1958 appointed the District Forest Officer South Mengo as a Public Prosecutor.

Three important items of forest legislation were enacted during 1959/60:

- The Forests (Amendment) Rules 1959 (LN No 150/1959) revised the timber fees;
- The Timber Industry (Repeal) Ordinance 1959 (No 23/1959) wound up the Cess Fund;
- The Forests (Amendment) Ordinance 1960 (No 9 of 1960) widened the powers of native authorities to make rules in respect of forests which they administer; at the same time certain loopholes in regard to unlawful cultivation in forest reserves were closed, to strengthen the law against encroachment in forest reserves.

The amendments to the Forests Ordinance brought to a close protracted negotiations over the rule-making powers of native authorities and made the way clear for them to make forest rules of a substance and in a form acceptable to them. The first such rules, those of Bunyoro, were passed by the native authority and the Minister of Natural Resources (the Forests

(Bunyoro) Rules (LN No 14 of 1961)). These were the first comprehensive Local Government rules to be made law.

General Notice No 953/1960 declared the West Nile District to have an adequate forest estate.

The Forests (Amendment) Rules (LN No 78 of 1961) streamlined licence forms reducing the number from 14 to 7.

Jurisdiction of African Courts in the Toro District (LN No 18 of 1961). This gave African courts in Toro District jurisdiction to administer the provisions of certain sections of, *inter alia*, the Forests Ordinance.

More Local Government forest rules were enacted in 1962:

The Forests (Acholi) Rules – LN No 46
The Forests (Kigezi) Rules – LN No 76
The Forests (West Nile) Rules – LN No 187

African courts in Bunyoro, Acholi, West Nile and Madi were given jurisdiction during 1962, by order under the African Courts Ordinance, to administer and enforce sections 14, 19, 21, 22 and 23 of the Forests Ordinance. The central forest reserves of Buganda were regazetted by LN No 79 of 1962, issued under section 4 of the Forests Ordinance.

The following legislation concerning forestry was enacted during 1962/63:

(1) regazetting of LFRs in Bugisu, Sebei and Mbale Township Districts and Ankole Kingdom (LN No 8/1963);

(2) regazetting of CFRs in the Northern, Eastern and Western Regions (LN No 11/1963);

(3) regazetting of LFRs in Buganda Kingdom (LN No 167/1963).

African courts in Sebei District were given jurisdiction to administer and enforce certain sections of the Forests Ordinance (LN No 223/1962).

The Forests (Madi) Rules 1964 – Statutory Instrument No 119/1964 were enacted. Only five districts, Bunyoro, Kigezi, Acholi, West Nile and Madi, have their own forest rules to date.

2 The Forest Estate[1]

Reservation

In Buganda an important agreement was reached in 1951 with the Land Officer whereby areas of land required for protection forestry in uninhabited country could be gazetted as undemarcated forest pending demarcation by the Forest Department. Such demarcation would not be necessary until pressure of population made it desirable to establish firm boundaries.

In West Nile local negotiations to complete the reservation of 1,000 acres (400 ha) in the highlands for the growing of eucalyptus fuel for the tobacco industry were well underway at the end of the year. In Acholi local opposition to the reservation of the Kilak-Ceri area held up the declaration of AFE (adequate forest estate) for the district.

In Lango matters were brought to a head when the District Council refused to make fuel reserves for the tobacco industry which it wished established. It was necessary for the Council to be told that its powers of embargo were limited and a start was made with a programme of fuel reserves for industry and townships with the approval of the majority of the Lango people, as indicated to their chiefs and the District Administration.

In Busoga the District Council, after rejection of a more detailed programme, approved in principle an outline scheme of forest reservations for the district leaving the details of each individual reserve to be settled with the lower councils. This far-sighted resolution seemed to have cleared the way for progress at a more practical level and survey and mapping were able to proceed for a time. A few years later, however, the attitude of the Council changed and it appeared that settlement of the outstanding reservation problems would be delayed indefinitely. However, towards the end of the year (1954), the senior officials of the Council gave a written assurance of agreement with the reservation proposals which would be completed as soon as circumstances permitted. The assurance was accepted and AFE (adequate forest estate) was gazetted in December 1955.

In 1952, agreement was at last reached on the reservation programme for Acholi and it was expected that 1953 would see its completion. This was not achieved until 1954 when an adequate (minimum) forest estate was declared. Similar declarations were made in respect of Teso and Ankole.

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1 See 'Statistical Tables', Tables 1, 1A and 1B. See Appendix D for previous history of reservation.

During 1952, the Payera CFR in western Acholi district was degazetted primarily to permit settlement as a barrier against the advance of the tsetse fly from the north. The area had little woody growth of any value.

In Lango severe local opposition to any form of reservation continued but under pressure from the Administration, the first LFRs in the District were gazetted in order to provide fuel for the tobacco industry. In spite of this concession it remained doubtful, however, whether there was any possibility of securing a reasonable forest estate in Lango. The doubt was later proved to be justified – by the end of the period covered by this history (1965), Lango was still without an adequate forest estate.

In Teso and Karamoja the large West Amuria CFR of 212 sq m (550 km^2) was degazetted, only some 22 sq m (57 km^2) being retained in the form of three LFRs. This area was the backbone of the pre-war Teso Climatic Belt Scheme intended to form a barrier to the spread of drier conditions into Teso from Karamoja. Experience showed, however, that most of the scrub savanna in the Belt was incapable of improvement, much of it being ill-drained alluvium characterised by *Acacia drepanolobium*. As an obituary on the Belt, its conception was felt to have been erroneous and that it was considered that degeneration of the Karamoja plains would very doubtfully have had any effect on the districts to the west.

Steady progress was made throughout 1954 with the consolidation of the forest estate and this continued in 1955. It was considered that new reservations were unlikely to be of any considerable extent except possibly in Karasuk. In 1954, A.F.E. was declared for Ankole, Acholi and Kigezi.

In Bukedi the District Council gave its final approval to the reservation of two small additional areas and after their demarcation, survey and gazetting, the District was declared to have AFE in 1955. A similar declaration was made in respect of Busoga District.

In Bugisu political agitators aroused local opposition to the reservation of the Namarale Forest which had already been approved by the District Council. Firm administrative action was taken and demarcation was resumed without further incident.

Detailed consideration was given in 1955 to the status of the major CFRs in Ankole. With the passing of the new District Council's Ordinance, it became possible for those areas not required for forest reserves to be developed under planned land-use conditions and early in 1956 proposals to this end were under consideration. In the North Ankole reserve some 50–60 sq m (130–155 km^2) were excised for planned settlement and a more realistic boundary agreed.

In Toro, 500 acres (200 ha) of grassland were excised from the Kibale Forest and further excisions of agricultural land were proposed.

In Bunyoro, the Native Government District Council agreed in 1955 to revision of the boundaries of the Budongo and Siba reserves which, in the case of the former, meant a loss of 5% of the area. The parts to be excised were the long thin arms of riparian forest jutting out from the main forest blocks which were proving to be increasingly difficult and expensive to maintain. The District Council did not agree, however, to the boundaries proposed in 1957 for the hitherto undemarcated Bugoma CFR and after protracted negotiations, the Protectorate Government ruled that these boundaries be adopted and demarcation began at

the end of 1958. As a result of this settlement, ten CFRs amounting to 212 sq m (550 km^2) were transferred to the control of the Bunyoro Native Government and regazetted accordingly.

In West Nile, the Provincial Commissioner over-ruled the objections of the local council to the reservation of Mt Wati with the result that AFE was in sight. This was achieved in 1959/60 when the council agreed to the reservation of certain bamboo areas and an area of grassland for softwood planting. This declaration meant that only two districts, Lango and Karamoja, both in the Northern Province, were without AFE: the first because four local councils were adamant in refusing to reserve one square mile of woodland in each of their areas in spite of being addressed by their Secretary-General and three members of the Natural Resources Committee; the second because, although it had the largest forest estate of any district, the district administration did not have the trained staff to manage the estate.

After considerable negotiation, agreement was reached in 1956 with the Kabaka's Government on the question of AFE for the Province and formal declaration was made in July. The main points of the agreement were:

(a) the Kabaka's Government would assume responsibility for all CFRs in Mubende District, the Singo Hills and 25 sq m (65 km^2) in South Mengo;

(b) some exchange of reserves in West Mengo to simplify the management of the local forest estate.

Because most districts already had AFE, there was little new reservation except in Karamoja and the main work in all other districts consisted of the consolidation of reserves by re-opening and re-beaconing boundaries, adjusting them where necessary to give a shorter or more easily maintained boundary or a more rational use of land. Good progress was made with the field work of this consolidation but no regazetting was done pending determination of the best form of regazetting. This was eventually settled – regazetting would be carried out henceforward as data became available for each district.

One major alteration was in respect of the S Busoga CFR, an area depopulated after the sleeping sickness epidemic of 1901–09. The revised boundaries were finally selected in 1957 and reduced the area from 242 sq m to 62 sq m (from 630 km^2 to 160 km^2). The reasons for this big reduction were to eliminate from the reserve low productivity scrub which was of little use for forestry and to make land available for resettlement.

The main work in most districts continued to be consolidation. The ultimate aim when the field work of consolidation was done, was to regazette the whole forest estate so as to give legal sanction to the many changes that had been agreed from time to time and to define more precisely the boundaries of the reserves which made up the estate.

By 1959/60 the regazetting process was taking much longer than had been expected, largely because of the amount of resurvey that was necessary. The regazetting notices for several districts were nearing completion and it was hoped that they would be published in the coming year. This was not achieved but regazetting of all CFRs was finally carried out in 1962/63.

Regazetting of LFRs, however, did not go as well as expected due to numerous discrepancies and omissions in the field work which required considerable checking and resurveying and

to the large number of reserves involved (348). In an attempt to reduce such errors to a minimum, a survey team consisting of two Rangers and one Forest Guard was set up under the control of the Map Officer. At the end of 1962/63 it was decided to form a second team to accelerate completion of the remaining regazetting work. It was confidently expected that this time-consuming but essential operation which had been going on for six years would be completed within the coming year but the expectations were not realised before legal control of LFRs was transferred to the Forest Department in 1964.

Numerous requests for excisions from the estate were received in 1962/63 but all were refused by the Minister.

Proposals were submitted the same year by the Chief Forest Officer, Kabaka's Government to the Buganda Land Board for substantial additional reservation (260 km^2). The Board approved the application the following year.

Private (Mailo) Land in Buganda

The receipt of some new 1:50,000 maps from the Directorate of Colonial Surveys in 1957 enabled a start to be made with a re-assessment of mailo (private) forest in connection with a dedication scheme (see below). A total of 126 sq m (326 km^2) of private forest for the three sheets alone indicated that the previous estimate of 100 sq m (260 km^2) for the total mailo forest in Buganda was very wide of the mark and helped to explain the prolonged existence of mailo sawmills.

Assessment continued in 1959/60 when approximately half the province was completed. The area of closed forest in that portion was estimated to be about 470 sq m (1,220 km^2). A rough estimate of the remainder indicated a further 160 sq m (410 km^2) making about 600 sq m (1,550 km^2) in all. Of this it was reckoned that 100 sq m (260 km^2) were first-quality forest – the remainder being poor or partially exploited forest.

Buganda Dedication Scheme

A forest dedication scheme, modelled on the UK one, had been started by Sangster in 1949 for the management of privately owned African land in Buganda (Sangster, 1951, see Appendix A). By 1951 it had attracted only three acceptances: one high forest area of 900 acres (364 ha) for 49 years belonging to the Kabaka, and two small areas on a short-term basis for the establishment of eucalyptus plantations. The dedication of the former was complicated by special problems of land tenure, but the other two went ahead and completed their ten-year terms, when control then reverted to their respective owners.

Boundary opening, climber cutting and enumeration were carried out in the high forest area for a few years but work gradually ceased, possibly due to further problems of land tenure or the political vicissitudes of the Kabaka. In spite of this, the Buganda Government made several attempts to revive dedication, but the only offers were for small areas which were considered to be unsuitable. So ended a very promising scheme for the management of private forests.

Boundary Demarcation and Maintenance

All new reserves were demarcated and surveyed in 1951. Increasing use was made of aerial photographs in most districts which accelerated the progress of reserve selection. It was disappointing that the mountainous areas of the south-west remained unphotographed, largely due to cloud conditions. The fragmented nature of the forest estate in Buganda was emphasised by the fact that an area of 270 sq m (700 km^2) of reserve in South Mengo had an external boundary of 890 miles (1,432 km) whereas a compact block of this size would have a periphery of only 65 miles (105 km).

Routine maintenance of reserve boundaries continued but it remained a permanent source of anxiety. After consultation with Provincial Forest Officers (PFOs) and District Forest Officers (DFOs), a consolidated statement of boundary demarcation methods was issued in 1953 as a Standing Order. It had become increasingly obvious that this tedious and unrewarding work required more attention and substantial progress was made in the more permanent marking of boundaries. In the highly fragmented forest reserves in Buganda, the steadily mounting record of encroachment and theft demanded radical reorganisation of maintenance methods. The PFO reported: 'During 1953 it was decided that these forests required a regular patrol organisation and that this could only be secured by opening a footpath along all boundaries. It is intended that maintenance shall be carried out by patrolmen posted at regular intervals.' Work on these lines was started in the middle of the year.

Boundary demarcation and maintenance continued for the next few years to be a major concern for all DFOs. It was expensive but in areas where encroachment and theft were rife, it was the only way by which the forest estate could be made secure. For example, the forest reserves of Buganda with an external boundary of over 1,200 miles (1,930 km) cost an annual expenditure of some £6,000 which would probably continue at this level unless some cheaper method of maintenance could be found. By 1958 the total of direct expenditure on maintenance reached £14,000 per annum, a figure which was regarded as being as low as was consistent with adequate protection.

The use of aeroplanes for inspection of boundaries increased due to the ease and speed with which this essential operation could be carried out. For example, the boundaries of all reserves in Ankole and Kigezi Districts were inspected in only five hours. In a flight over the Kitomi reserve in Ankole, the DFO 'unsportingly' detected an illegal village of 30 Bakonjo who had apparently been there for several years.

As a protective measure against encroachment, a directive was issued in 1962/63 that the highest priority should be given at all times to efficient demarcation and maintenance of boundaries. In that year maintenance was badly hampered by heavy rain. A total of about 2,300 miles (3,700 km) of boundary was maintained for a direct expenditure of £14,800 which was 12% of the total expenditure on Forest Field Works. This disproportionate expenditure on such protection work could have been reduced substantially with more co-operation from the chiefs against encroachers and with better understanding by the people of the value of their forest reserves.

In 1963/64 boundary maintenance on Ruwenzori was interrupted from time to time by the political troubles which afflicted Toro Kingdom but most of the boundaries were maintained.

Encroachment

In 1951 the undemarcated reserves in Mubende continued to offer irresistible temptations to tobacco growers and 68 evictions of squatters without permanent crops were ordered through the Resident's Office. Attempts at encroachment were also numerous around the Mabira forest where the disappearance of the 'mbwa' fly (*Simulium damnosum*) following treatment of the Nile at Jinja made living conditions much more attractive. The programme of planting up encroachments in Mengo with timber trees was held in abeyance in 1951. In a number of cases the planted trees were uprooted or destroyed and several occupiers possessing permits to cultivate encroachments in CFRs attempted to obtain legal restraint on tree planting.

In 1953, it was found on opening the boundaries of a number of ALG reserves in Busoga that gross encroachments were rife. A serious aspect of the problem was that it had been aggravated by the connivance of the local chiefs. Despite strenuous efforts by the Secretary for Agriculture and Forestry of the Busoga ALG, it was not possible to make much progress with eviction.

The DFO West Nile recorded 'some comings and goings in the Kei reserve by people from the Sudan during the recent (1955) disturbances'.

In the Western Province a group of encroachers were evicted from the Bugoma and Nyabyeya CFRs. Encroachers were finally evicted from the Budongo reserve. In the South Ankole reserve over 100 people were evicted through the much appreciated support of the Administration.

In 1957 encroachment was a serious problem in several areas, especially Buganda. The worst areas were East and West Mengo where the number of encroachments at the end of the year was 245. Prosecution of offenders was accelerated and this, coupled with success in all the cases prosecuted (19), resulted in a considerable improvement in the situation. There was, however, still room for improvement and as an aid towards this and to relieve the burden on the police, who normally prosecuted forest offences, the nomination of a Forest Officer to act as a Prosecutor for forest offences in Mengo was under consideration at the end of the year. The authorisation the following year was a great help but owing to a loophole in the law, prosecutions had to be suspended for 18 months which resulted in a crop of new encroachments.

Following the closing of the loopholes, vigorous action was taken and 73 convictions were obtained in the South Mengo District Court. By the end of the year (1961), the number of encroachers in Mengo had been reduced from well over 300 to 220 and the large concentrations in the Mabira and Mpigi ranges had been largely cleared, over 600 acres (243 ha) being recovered for forestry. It was encouraging to record the co-operation of the Kabaka's Government staff in this work.

Successful action over the next 2–3 years resulted in a remarkable transformation. All unlicensed encroachers were evicted from East Mengo reserves and all but 12 from West

Mengo and against those few, legal proceedings had either been taken or were pending. Great credit was due to the staff concerned for carrying out so successfully without incident a most difficult, unpleasant and, at times, dangerous operation. The cleared areas were planted up with musizi (*Maesopsi eminii*) as fast as possible, about 500 acres being planted.

In the Eastern Province the most serious case was in the Mt Elgon CFR where, after a change of Forest Guard, some 47 people were found living and cultivating illegally in the forest. Thanks to the aid of the Administration, all were evicted.

In Karamoja, because of the unsettled state of the district, people were moving into forest reserves, especially Mt Moroto, in considerable numbers to escape from raiders. In the state of the district at the time (1962/63), it was virtually impossible to evict them and efforts were concentrated on containing them in the lower valleys. Tribal raiding decreased the following year and a start was made with eviction of encroachers from forest reserves. With the help of the Administration nearly 400 people were removed from Kadam CFR.

During 1963/64 there were incursions from Rwanda into the Echuya and Mgahinga CFRs in Kigezi and cutting of bamboo reached alarming proportions. Discussions were held on the demarcation of the international boundary but agreement had not been reached by the end of the year. Clearing and theft of bamboo was, however, contained by vigorous patrolling and after a new forest reserve boundary had been demarcated well inside the Uganda side of the border.

Theft

In the early 1950s large-scale illegal felling was rife in East Mengo but on a minor scale in the rest of the country. The old system of merely claiming fees on the traceable timber was replaced with heavy compounding charges. Although the offenders wriggled hard, all the amounts levied, plus the fees, were eventually collected. A detailed survey by the Forest Ecologist in Mpanga Research Forest in West Mengo revealed an average of one sawpit per 1½acres (0.6 ha), an indication of the intensity of illegal felling in the past.

In plantation areas theft of produce remained at an astonishingly low level due partly to the sale of lop and top in exploited plantations at nominal prices. Although in 1957, petty pilfering of poles and fuel was reported from most plantation areas, it was considered that, on the whole, theft of forest produce was not a serious problem in Uganda. But only a few years later, theft increased to a serious level in the Kampala plantations. Most of the thieving took place at night and was occasionally accompanied by violence. The most serious depredations were in the Kalume and Mpanga plantations from which an average of about 500 poles a month were being stolen. These thefts were nearly all carried out by gangs with whom the somewhat scarce and elderly forest staff were unable to cope. In 1962/63 some relief was effected through a meeting between the local chiefs, the Administrative Officer, the Regional Forest Officer and the nearby villagers.

During 1956, while illegal timber felling was on a reduced scale in Mengo, due probably to more intensive patrolling, there was no reduction in thefts from the lake shore forests in Masaka. It was also reported that much mvule was being stolen from the Busoga islands of

Lake Victoria which found its way to Kenya. Little could be done about these pirates whom even police found very difficult to control. Theft of timber trees continued in West Mengo and Masaka but energetic measures by the staff kept the loss at a reasonable level.

In Kigezi there was a marked increase in theft and illegal grazing in the bamboo reserves. Some 92 cases were dealt with, of which 38 resulted in convictions. In the Echuya reserve on the Uganda-Rwanda border, great difficulty was experienced through large bands of armed Banyarwanda stealing bamboos and attacking any forestry staff attempting to interfere.

3 Enumerations, Mapping and Working Plans[1]

There had been enumeration surveys in a few of the major forests prior to 1951 but these had not been critically designed and supervised to reduce errors and facilitate statistical analysis. The recently appointed Forest Ecologist, after practical trials, produced new guidelines addressing both these points based on a layout of randomised pairs of parallel transects within strata composed of parallel strips of forest. Each transect comprised a series of temporarily demarcated plots two chains long and one chain across (40m x 10m), which permitted rigorous field checking of a proportion of the records by a supervisor, besides differentiation and location of forest types already recognised on air photos. Detailed forest type mapping of all the major natural forests was a very important aid in the interpretation of enumeration data as well as in the planning of operations of all sorts. For management purposes, especially the issue of licences to sawmills, it is important to have a reliable estimate of the *minimum* stocking of timber that can be expected (RME = Reliable Minimum Estimate) and it was decided to aim at an RME which was not more than 20% below the mean at 95% probability. Trials showed that in a forest of 50 sq miles (130 km^2) this could be achieved with a sampling proportion of only 2%. Full details are given in Dawkins (1958).

This fundamental management tool for the preparation of working plans in unharvested natural forest was later complemented by two further important inventory practices for monitoring progress. One was the use of diagnostic sampling to assess the status of regeneration along temporary transects through recently harvested natural forest, as indicated by the condition of the leading desirables in each plot. From this it is possible to determine whether liberation or refinement treatments are required, the former being directed at freeing the individual desirable tree, while the latter effects a general removal of weed species and inferior stems from the crop. Full details are given in Dawkins (1958).

The other was the establishment, starting in 1958, of a system of permanent continuous inventory plots in all major forests, whether plantations or natural forests, remeasured every few years. The aim of these was to provide a flow of information both on the silvicultural condition of the crop and on the probable yield at harvest. Within a very few years the plots in the fast-growing softwood plantations had provided valuable information on their growth,

1 See 'Statistical Tables', Table 4A.

which by comparison with the growth of older Kenyan and South African crops permitted predictions of yield and enabled important adjustments to be made to thinning schedules. Developments in the natural forests were slower and depended more on comparisons of remeasurements, so had not yet received detailed analysis by the end of this period (see Appendix H).

A major programme was started for enumerating all the major forests where harvesting was taking place, both for the immediate control of harvesting and as a basis for the preparation of working plans. In 1951, the Forest Ecologist (H.C. Dawkins) completed the enumerations of Nakiza and Uni forests in South Mengo. A paper on the subject prepared by him was published which included the following conclusions:

(a) a stratified random two-per-block layout of one chain (20m) wide fully demarcated transects interrupted at two chains (40m) was suitable;

(b) a table of sampling intensity applicable to South Mengo but probably also to the forests of Bunyoro, Toro and Ankole was agreed;

(c) when estimates of volume or quantity of regeneration are required from an enumeration, they should not be based on the mean but on the mean minus its standard error.

Enumerations were carried out in Buganda, Toro and Bunyoro. A 100% enumeration of exploitable timber was done in coupe IV of Budongo by Forest School Learners and mill-hands employed by the concessionaires and from this stock maps on 1:50,000 scale were prepared. The milling company was so impressed with the result that it sent a man to the Forest School to be trained in this method.

Enumerations were started in the lake shore forests of Masaka. There were indications that illegal felling during the war had resulted in a lack of good-sized timber. On Mt Elgon the forest was divided into hill/valley units. The first unit of $1\frac{1}{2}$ sq m (3.9 km^2) was sampled on a 5% basis. Provisional data indicated that timber of exploitable size worked out at about 640 ft^3 per acre (44 m^3 per ha), 50% known to be marketable.

Considerable thought was given in 1952 to the simplification of costing records and working plan forms. Clarification was also necessary on the definition of units of management – the compartment. The Budongo and South Mengo plans had prescribed very large compartments coincident with forest types – a courageous attempt at simplification but, in practice, difficult to apply. A more normal division of the area based on annual coupes was considered to be preferable.

The most important single working plan project in 1954 was the second revision (1955–64) of the Budongo Working Plan (170 sq m, 440 km^2). The main features of the plan, the implementing of which would bring in a guaranteed minimum revenue of £23,000, were:

(a) division into Production and Research Working Circles – the old Mahogany and Ironwood Circles were abandoned;

(b) adoption of the old coupes as compartments – future compartments were to be based largely on natural features;

(c) shortening of the felling cycle to 60 years – raising of the mahogany minimum girth limit to 12ft 6in (3.80m) and fixing the mahogany annual volume yield at 450,000 ft^3 (12,750 m^3) – control of other species to be by area and girth limit;

(d) adoption of natural regeneration techniques based largely on the use of arboricides.

Preparation of this plan was assisted by the use of an excellent topographic and stock map of the forest prepared by the former DFO (A.B. Cahusac) at the International Training Centre for Aerial Survey at Delft, Holland, using the 1951 aerial photographs. In the following year (1955) a small Map Section was set up under his charge. Its duties were to be primarily responsible for type-mapping all forest reserves from such aerial photograph cover as was available and, eventually, to take responsibility for the indexing and custody of all Head Office maps and for the co-ordination of mapping and map production throughout the Department. A most encouraging start was made in forest stock-mapping. During 1956 there was a remarkable improvement in the standard of maps produced due to the growing experience of the young drawing office staff but also to the much higher standard of plotting accuracy demanded by the radial line plotter. As the Chief Conservator of Forests (Swabey) remarked later – 'it was difficult to understand how the Department had managed to do without a Map Section for so long'.

Enumerations of a block of 43 sq m (110 km^2) in South Busoga and another unit on Mt Elgon were completed. Results on the former case indicated that exploitable timber averaged 280 tons/sq mile (117 tonnes/sq km) of mvule and 410 tons/sq mile (172 tonnes/sq km) of other species, mainly *Albizia*. With regard to Mt Elgon, the estimate of 2,000 tons of exploitable timber per square mile (840 tonnes/sq km) appeared to be optimistic but as the stands were highly gregarious, with considerable concentrations of timber species scattered in a relatively barren matrix, the yield was considered to offer a possible commercial proposition. The deciding factor would probably be that of extraction from a rugged country terrain.

Enumerations of four reserves on the Sesse Islands revealed a disappointingly low volume (90 ft^3 per acre; 7 m^3 per ha) of marketable species.

The major enumeration work in 1956 was in Kibale/Itwara where 100 sq m (260 km^2) were sampled at approximately 1% which required over 80 miles (130 km) of transect lines. The enumeration confirmed previous estimates of elephant damage of regeneration over the last 50 years. It was a remarkably rapid bit of work which reflected the greatest credit on the African staff engaged on it.

Following their triumphs in Kibale, the enumeration team moved to Bugoma and again the value of air map cover was outstanding. Results showed that the volume of standing timber of harvestable size, i.e. above 5 ft (1.5 m) gab (girth above buttress) of all species enumerated, was about 54 million ft^3 (1.5 million m^3). This was equivalent to a sustained annual yield of about 407,000 ft^3 (11,500 m^3) of species which were then marketable. The principal economic species were *Cynometra* (33%), *Alstonia* (14%), *Albizia* (12%) and *Celtis* (12%).

Analysis of the Zoka enumeration in 1960/61 showed a high proportion of trees with signs

of game damage. From the size class distribution it was clear that the forest was not regenerating, the reason being the heavy concentration of elephant and buffalo at times in the area and the consequent damage to the younger trees.

The Busoga mvule enumeration from 1960 to 1962 over 1,000 sq miles (2,600 km^2) indicated that there was much more mvule of harvestable size than was thought originally. It was reckoned that there was an RME (reliable mean estimate) of about 6.6 million cu ft (1.87 million m^3) of harvestable mvule remaining in Busoga – equivalent to about 20 years cutting at the existing rate of harvesting, although it was realised that mvule was very unpredictable with regard to hidden defects such as 'stone' and fire damage which would reduce the usable amount of timber.

Map Section's work continued to be concentrated chiefly on production of boundary plans for regazetting purposes. A welcome addition to the staff in 1963/64 was a Norwegian Peace Corps volunteer trained in photogrammetry. A good deal of attention was devoted to the possibility of flying and photographing reserve boundaries suitably marked, to complete survey more quickly and cheaply than by ground methods. For this purpose a suitable camera was hired and mounted in a home-made frame slung on the outside of a door of a light aircraft. The photographs taken all proved to be satisfactory although there was much still to be learned about the technique of this work. The main limitation on the speed of the work was in the capacity of the Section to deal with the resultant mapping.

The production of working plans was regrettably slow in the early 1950s, only 16% of the gazetted estate being under plan. According to the PFO/Northern Province, the reason was that 'officers are too prone to approach the making of working plans with unwarranted awe'. Whether or not that had been the reason, there was a great improvement over the next four years, 1954 to 1957, when no less than 46 plans were approved. A specialist Working Plans Officer was appointed in 1957 and by the end of 1963, 98% of the estate was under plan. (See Table 4A and Appendix A.)

There were no new enumerations in that year, all forests under intensive management having been already sampled.

Progress on the establishment of permanent inventory plots (see Appendix H) in natural forest and plantations remained unsatisfactory due chiefly to shortage of staff.

4 Silviculture[1]

Introduction

By 1951 it had already been realised that the rapidly growing population of Uganda, with rising living standards, were going to need supplies of saw-timber much greater than those available from the natural forests. This had led to a three-pronged attack: the improvement of regeneration in the natural forests after harvesting; the planting of indigenous hardwoods; and the planting of exotic softwoods.

For two decades there had been attempts to increase the stocking of high quality hardwoods in harvested forests by various types of line-planting and underplanting, but these all required labour-intensive and expensive maintenance and met with limited success, largely because of failure to open the tree canopy adequately. Over the period of this history, the policy moved towards securing natural regeneration, aided by two major developments: first the decision to adopt a monocyclic harvesting system which would both avoid damage to a young crop by the frequent fellings of a polycyclic system and admit more light to the young crop; and second the use of arboricide to remove 'weed' trees of species valueless as timber. Although biodiversity and biological conservation were seen to be important, it was thought that this could be achieved by setting aside one or more compartments in each forest as nature reserves, and these figured in most working plans for major forests. The economic imperatives of timber supply were the primary consideration, as modern international aid for conservation was not available to offset these.

Plantations of indigenous hardwoods for saw-timber also had a long history of limited success or failure. This was partly due to attempts to plant on unsuitable sites and partly to the depredations of various pests, large and small, which enjoyed the facilities offered by closely spaced plantation crops. The sad history of a scheme, which at first offered great hope, is recounted in Appendix E.

In the Kenya highlands, and further away in South Africa, plantations of exotic softwoods, mainly cypress and pines, had shown phenomenal adaptability and growth, and early trials in Uganda had reproduced this. It was felt that cheaper exports from Kenya might undercut Uganda supplies in the east and centre of Uganda, so four major sites in the west,

1 See 'Statistical Tables', Tables 6A, 6B and ALG 3B.

then remote from rail access though this has since been extended, were selected for a large plantation programme. These mainly comprised existing grassy hill protection reserves at 5,000–7,000 ft (1,500–2,000m) altitude, but there were some important differences between these sites. In the extreme northwest was Lendu CFR (and Use and Awung LFRs) in West Nile District with an annual rainfall of 55–60 inches (1,400–1,500 mm); in the mid-west were some hills in Toro District with a slightly lower rainfall and Rwoho in South Ankole, a large hilly area which was significantly drier (35 inches, 900 mm); and in the extreme south-west Mafuga in Kigezi District, which was both rather higher and wetter than the others and partly covered with bush rather than grass.

Large and successful plantations of Eucalyptus had already been established in CFRs to supply poles and fuel to the main centres of population amounting to 11,000 acres (4,000 ha), besides 1,500 acres (600 ha) with the main function of draining malarial swamps. Some additions to these were still required, particularly as LFRs in rural areas to supplement the 7,000 acres (2,800 ha) already existing there, but their silviculture was well established and a matter of routine. Moreover they were increasingly being supplemented by large and small scale private planting.

Plantation Statement

At 31st December 1951, the areas of plantations were:

	Fuel and Pole Plantations	Softwood Timber Plantations	Hardwood Timber Plantations	Anti-Malarial Plantations	Total
State Plantations	10,190 acres (4,120 ha)	1,390 acres (560 ha)	2,350 acres (950 ha)	1,460 acres (590 ha)	15,390 acres (6,230 ha)
Local Government Plantations	7,000 acres (2,830 ha)	130 acres (50 ha)	—	270 acres (110 ha)	7,400 acres (2,990 ha)
	17,190 acres (6,950 ha)	**1,520 acres (610 ha)**	**2,350 acres (950 ha)**	**1,730 acres (700 ha)**	**22,790 acres (9,220 ha)**

At 30th June 1965, the areas were (the changes in column 1 are just legalistic):

	Fuel and Pole Plantations	Softwood Timber Plantations	Hardwood Timber Plantation	Productive Planted Firebreaks*	Total
CFRs	10,960 acres (4,440 ha)	9,790 acres (3,960 ha)	3,190 acres (1,290 ha)	1,030 acres (420 ha)	24,970 acres (10,110 ha)
LFRs	12,830 acres (5,200 ha)	1,530 acres (620 ha)	—	80 acres (30 ha)	14,440 acres (5,840 ha)
	23,790 acres (9,630 ha)	**11,320 acres (4,580 ha)**	**3,190 acres (1,290 ha)**	**1,110 acres (450 ha)**	**39,410 acres (15,950 ha)**

*Mostly Eucalyptus in softwood timber plantations

PLATE 1

PLATE 2

PLATE 1. Plantation of mvule, *Milicia* (= *Chlorophora*) *excelsa*, at Aboke, Lango, aged 16 years. In excellent condition, with current annual girth increment about 1.5 inches (4 cm). This was one of the plantations in Lango and Acholi intended to replace the scattered mvule being felled in Busoga. (*H. C. Dawkins, 1958 Annual Report*)

PLATE 2. Photo from the same position as Plate 1 at 25 years of age (1956). Nearly all the mvule are dead, with the underplanted *Phyllanthus* and some *Maesopsis* (musizi) forming a thin canopy. The major causes of this failure appear to have been the drier climate, the lateritic soil and attacks of mvule leaf gall. Although some *Maesopsis* persisted, their growth did not match that of plantations on better sites. (*D. Leuchars, 1958 Annual Report*)

It is noteworthy that the Local Governments had overtaken the Central Government in establishment of fuel and pole plantations, a proper function for them.

State Timber Planting

During 1951, some modifications of regeneration techniques and programmes were introduced. These were due partly to the accumulated experience of past years, partly as a result of visits by EAAFRO (East African Agriculture and Forestry Research Organisation) specialists and partly to increasing labour shortages. The general tendency was for concentration rather than diffusion of effort.

PLATE 3

PLATE 4

PLATE 3. Mvule Leaf Gall (*Phytolyma lata*) showing the serious damage caused to young shoots, not only the leaves. This was one of the causes of the failure of many repeated attempts to establish plantations of mvule, *Milicia* (= *Chlorophora*) *excelsa*, particularly those in Lango and Acholi. This pest attacks mvule everywhere but seems less severe on scattered natural regeneration in banana gardens, the probable origin of much mvule in Busoga. (Uganda Forestry Department)

PLATE 4. A successful plantation of *Maesopsis eminii* (musizi) about 15 years old in Lwankima Forest, Buganda. This species has fast growth with tall clean stems, especially where there is an understorey, and provides a useful general purpose timber. On moist sites and good soils in, for example, Buganda and Bunyoro, it regenerates naturally in gaps and it is the most promising indigenous hardwood species for enrichment planting or plantations, as it is easy to raise in the nursery and unlike the mahoganies and mvule it is free from serious pests and diseases. It is an important source of food for hornbills, etc. which are also important in distribution of seed. (Uganda Forestry Department)

Lango and Acholi Hardwood Plantations

(See Plates 1,2,3, Appendix E and H.C.Dawkins 1949 Timber planting in the *Terminalia* woodlands of Northern Uganda. *Emp. For. Rev.* 28 (3), 226–247)

A further 210 acres (85 ha) were planted with mvule, mahogany and other species but the condition of these plantations (1,552 acres, 630 ha) gave rise to increasing concern during 1951. This area was chosen originally on the grounds of cheap and plentiful labour and absence of mvule gall; the former no longer existed while the latter had arrived. As a result of inspections by senior officers of the Department and measurements made in all the annual planting areas, the following conclusions were reached:

(a) establishment technique was so finely balanced in this area that any adverse factor such as failure to obtain labour at the right time would result in doubtfully successful establishment;

(b) if grass was not eliminated, a satisfactory crop would be unlikely;

(c) a 2–6% sampling of all areas indicated that while the survival rate of mvule averaged 88%, less than 50% of the trees showed promise of making reasonable trees in the final crop. Timber height seldom exceeded 20 ft (6m) in the oldest (10-year) crop, branching was low and a vigorous leading shoot was seldom seen;

(d) measurements in the younger age classes verified that planting shock virtually brings the large transplant striplings to a standstill for the first two years;

(e) it was believed that better results might be obtained under better climatic and soil conditions and that the increased vigour to be expected might render the young trees less susceptible to gall.

It was therefore decided to declare a moratorium on new planting, apart from beeting previously planted areas, and to concentrate on experimental work. This would involve:

(a) trials of different spacings of mvule in pure stands with a view to early elimination of grass; trials of stumps as against striplings to study the effect of transplant shock; these were to be established both under natural woodland shade and after clear felling. Electric fencing to be tried to exclude buck;

(b) experimental pure mvule plantings to be undertaken on optimum forest sites in Budongo and South Mengo.

Further extension of underplanting was suspended in 1952 and trials of closer spacing with a view to early grass elimination were begun. The normal maintenance of previously planted areas was continued in the face of grave labour shortages. Serious fires at Opit and Abera underlined the danger of failure to suppress grass. In 1954, the bulk of the work was experimental but very grassy areas in the 1950/51 areas at Opit and Kachung were weeded. This work was subsequently discontinued as results did not appear to justify the expenditure incurred. Moreover it was felt that intensive management of these older areas should await the outcome of research into methods of dealing with the overwood.

Experiments over the next four years showed that neither mvule nor any of the other timber species tried derived any benefit from being planted under a canopy, however incomplete, of indigenous woodland. Plots of mvule and mahogany established by the new techniques of so-called vigorous stump planting in clear-felled plots behind protection of electric fencing against browsing were no better in height or girth at six years of age than the same species planted as tall striplings in unfelled woodland in the period 1939 to 1943. Similarly, the formerly praised and latterly deprecated early plantings at Kachung, Opit and Abera contained many stems well up to the standard of the once spectacular plantations at Aboke and Jala (Lango District) which are now deemed to be failures. The disappointing conclusion was that mvule at least could not be raised to timber size in close plantation either in Lango, Acholi or Busoga but that it showed every sign of proving an ideal species for wide-spaced culture as might be achieved by a peasant planting scheme with fixed agriculture.

In spite of this disappointing conclusion, fire protection and boundary maintenance continued in the Lango/Acholi plantations for the next few years. In 1961/62, counts were made of mvule and mahogany which seemed to have a reasonable chance of growing to timber size. These showed that there were some good but scattered groups of mvule at Abera and, to a less extent, at Opit but very few at Kachung. In all cases, the survival of mvule was about double that of the mahogany. The figures indicated that there was some prospect of getting a crop off parts of these former planted areas. The next step was to consider a liberation treatment of those trees by poisoning their competitors, if the results of trials then in progress showed any response to liberation. Treatment continued in the plantations on an experimental basis in 1963/64 but results were still inconclusive.

At 30th June 1965, the area of the Acholi hardwood plantations was 850 acres (350 ha) and that of the Lango plantations was 560 acres (230 ha). It seemed a very disappointing and sad end to a scheme which had promised so much when begun.

Other Hardwood Plantations

(Plate 4)

In 1951, a further 233 acres (90 ha) of mixed mahoganies were underplanted in harvested forest in South Mengo at a spacing of 20 ft by 20 ft (6m by 6m). This work was continuing satisfactorily but it became apparent that the growth of munyama (*Khaya anthotheca*) could only be obtained on the best soils and that this species should not be planted on the poorer soils.

At Budongo, it was found necessary to stop any further diffuse planting at 75 ft by 25 ft (22m by 7m) as it had become impossible to obtain labour for the maintenance of these very extensive areas. Unless the young plants were freed from climbers and unless the necessary canopy manipulation was assured, survival and rate of growth were very poor. After consultation with the Silviculturist, EAAFRO, provisional conclusions reached were:

(a) compensatory plantations to be at 15 ft by 6 ft (5m by 2m) in pure plantations in heavily harvested forest;

PLATE 5

PLATE 6

PLATE 5. Trial plots of softwoods, North Rwenzori CFR. This is typical of many of the hills used for softwood planting – unforested, unsuitable for cultivation and with poor grazing.
(H.A.Osmaston, 1953 Annual Report)

PLATE 6. Recently pruned 5-year-old cypress (*C. lusitanica*) at Kyehara Plantation, Toro. This was previously similar to the landscape in Plate 1. At left, H.A. Osmaston, then DFO Toro.
(Public Relations Photographic Department, 1953 Annual Report)

PLATE 7

PLATE 8

PLATE 7. Softwood plantations of *Cupressus lusitanica* and *Pinus spp.* covering a valley at Mafuga Plantation, Kigezi. This is at a higher altitude (c. 7000 ft, 2000 m) than Plates 1 and 2, the original vegetation being lower montane bush and poor forest. Giant Lobelia are visible in the foreground. These and similar plantations currently (2001) supply the bulk of Uganda's sawn timber, but are not yet being replaced. (D. Leuchars 1956 Annual Report)

PLATE 8. A 30-foot span steel girder bridge in Use softwood plantation, West Nile, designed and constructed by district forest staff. This was in the most remote district in Uganda, and demonstrates how district staff had to turn their hands to many tasks besides growing trees.
(H.A.Osmaston, DFO, 1956 Annual Report)

(b) species to be mvule, munyama (*Khaya anthotheca*) and nkoba (*Lovoa*); later musizi (*Maesopsis*) was added;

(c) the first thinning to be mechanical to halve the crop when it was 35 ft (11 m) high but this to be reconsidered in four years' time;

(d) thinning or poisoning of the overwood to be completed before the first thinning and leading shoots to be kept free of interference during the intervening period.

In 1952, tending in Budongo was limited to opening up the 1946 and 1947 Khaya compensatory plots. A full programme for maintenance of the older plantations awaited the completion of sample enumerations in the 1,700 acres (690 ha) treated with climber cutting. The programme of line planting through harvested forest and reclaimed encroachments in Mengo was completed in 1954, as was canopy and line opening in the 1951 regeneration area of Zirimiti.

This type of work was replaced by natural regeneration treatments – one of the problems posed by the underplanting technique was always that of suppression. There was evidence that planted Khaya striplings, surviving but stagnant for six years, were capable of full recovery when the suppressive canopy was removed provided the whole forest area was given tree-weeding treatment. It was the linear silviculture which appeared to be unsound, not the diffuse planting.

Softwood Plantations

(plates 5–8)

From 1951 to 1964 the establishment of softwood plantations was pursued energetically chiefly in the Western Province and West Nile. The areas achieved ranged from 300 acres (120 ha) to over 900 acres (360 ha) per annum. The species composition was originally *Cupressus lusitanica* with lesser quantities of *C. benthami* and various species of pine but later the proportion of pine, especially *P. patula*, dominated the composition. Important factors influencing future work were recognised in 1951 after inspection and discussions with the Silviculturist, EAAFRO:

(a) the absence of the need for growing first quality knot-free timber for export;

(b) labour and staff shortages for pruning and thinning;

(c) disease incidence in relation to pruning;

(d) serious rat damage of cypress;

(e) ease of impregnation of pine timber as opposed to cypress;

(f) maintenance of herbaceous ground flora.

These factors led to the decisions:

(a) all species to be grown pure;

(b) C. *lusitanica* to be grown on class I sites – *P. patula*, *P. taeda*, *P. caribaea* and *P. radiata* on class II sites – *P. patula*, or failing that, *P. taeda*, on class III sites;

(c) spacing to be 6 ft by 6 ft (1.8m by 1.8m) – 7ft by 7ft (2.1m by 2.1m) on slopes over 20°;

(d) the first diagonal line thinning to be carried out when the crop is 25ft (7.6m) high – the second diagonal thinning when the trees are 35ft (10.6m) high.

In the following year, it was claimed that a better understanding of site classification was being achieved and that *Cupressus* must be confined to the more favourable sites with *Pinus* species taking over on the drier, rockier sites. The composition of planted firebreaks still gave concern and for the time being, close-planted *Eucalyptus saligna* and *E. citriodora* were being used.

In the Western Province plantations, there was a tendency to expand new planting with an inadequate labour force and this resulted in some of the younger crops stagnating under heavy grass cover while a considerable back-log of thinning and pruning accumulated. It was necessary, therefore, to reduce the area of new planting temporarily until larger labour forces had been built up and arrears of maintenance dealt with.

The Queensland Selection System was used in 1955 at Mafuga and West Nile for first thinning and pruning of young cypress crops with satisfactory results.

In 1958 the Working Plans Officer, H.A. Osmaston, returned from UK leave via South Africa and Swaziland, visiting many of the large softwood plantations there, the management and silviculture of which had already provided guidance for Uganda. Much useful, new and up-to-date information was gathered (Tech. Note 10/58).

The first thinning experiment was established at Lendu in 1958 in 5-year-old C. *lusitanica*. It embodied a revolutionary clinal design, the brain child of H.H.C. Pudden, Silviculturist, Kenya, whereby 16 thinning treatments were tested in a single rectangular plot of 4.8 acres (1.9 ha), the principle being that each treatment differed only fractionally from its neighbours. A second plot was laid out in 1959/60 at Mafuga. Both plots were assessed the following year and another pair were laid out in 3-year-old *P. patula* at Lendu. Modifications were introduced in 1961/62 due to objections on statistical grounds to the systematic order in which the treatments had been laid down. As a result, several replications had to be established at each site and orientated at random.

In 1963/64 two new plots were established in Mengo. J.N.R. Jeffers, Statistician with the UK Forestry Commission, recommended strongly that, wherever possible, pruning treatments should be imposed upon the existing thinning experiments and this was accepted by the Specialist Sub-Committee on Forest Research.

Although small compared with the other schemes, a new plantation at Kapkwata, in forest on the north slope of Mt Elgon, was interesting as being the only one in Uganda in which the *taungya* system was employed. Fifty acres (20 ha) were under licence.

A disturbing feature in 1958 was the high mortality of cypress at Awung in West Nile where C. *benthami* planted on a hill-side in 1951 died out in large numbers. At first it was

PLATE 9

PLATE 10

PLATE 11

PLATE 12

PLATE 13

PLATE 9. The Royal Mile, Budongo Forest. This is a publicly accessible example of natural moist semi-deciduous forest in Uganda, which has been carefully protected from harvesting. Numerous species are present in this mixed stand including mahoganies.
(*Khaya* and *Entandrophragma* spp.). (D. Kershawg, *The Forests and the Forest Administration of Uganda*, 1961)

PLATE 10. *Entandrophragma angolense* (Budongo Mahogany, muyovu, mukusu) in the Budongo Forest, Bunyoro. Formerly abundant in many Ugandan forests and probably the best cabinet wood of all the East African Meliaceae, but now (2001) scarce due to illegal felling by pitsawyers. Like most of Uganda's mahoganies it regenerates readily in sufficiently open gaps when large enough seed trees are present, and nursery stock can be easily raised and planted. It is susceptible to but usually eventually overcomes shoot-borer, but is extremely palatable to elephant, which can repeatedly destroy all regeneration, natural or planted.
(W.J. Eggeling, *The Forests and the Forest Administration of Uganda*, 1961)

PLATE 11. *Cynometra alexandri* (muhimbi, Ironwood), dominant in parts of the Budongo Forest and other forests in Bunyoro. This exceptionally large buttressed tree illustrates the problems which arise in measurement and felling. Unfortunately many stems are of poor form which, with the very hard timber, makes them difficult to saw economically. Though it provides excellent flooring blocks, there is a limited market for these. The figure is ranger Maurice Kamya who served from before 1937 till after 1965.
(W.J. Eggeling, *The Forests and the Forest Administration of Uganda*, 1961)

PLATE 12. Measurement of girth above buttress of a *Cynometra alexandri* (muhimbi) during the Budongo Forest enumeration, using a linen tape and ring-ended pole. Precise rules, thorough training, careful measurement and frequent checking are necessary to avoid errors and biases in enumerations. The stem partially seen on the left shows how closely large trees sometimes grow in natural forest.
(1954 Annual Report)

PLATE 13. The application of arboricide to a heavily buttressed 'weed' tree in Mpanga Research Forest using a mixture of 2,4,5-T and 2,4-D in diesel and a knapsack sprayer. This effective technique was used to refine large areas of forest after harvesting (especially ones with much unmarketable *Cynometra*), and thus promote and liberate regeneration of more desirable species. It formed the major silvicultural activity in natural forests during the period of this history. Later it fell into disuse, initially because of political upheavals, and more recently due to the surge in nature conservation values.
(*The Forests and the Forest Administration of Uganda*, 1961)

PLATE 14

Plate 14. A demonstration of natural regeneration of desirable species in Mpanga Research Forest after the removal of all understorey weeds. In the background is the dense understorey of an uncleared control plot. Such abundant regeneration was the aim of the refinement technique (Plate 13), but this understorey weeding would not normally be necessary unless diagnostic sampling showed that the regeneration was being suppressed.
(H.C. Dawkins, 1956 Annual Report)

thought to be due to shallow soil and/or drought. A thinning was done to reduce root competition but the deaths continued. The Forest Pathologist, Kenya Forest Department, examined the trees but could find no evidence of fungal attack or insect damage. The deaths continued over the next two years. Soil and leaf samples were analysed and the site examined by the Director, EAAFRO. As a result, it was concluded that the trouble was due to drought combined with general soil poverty, particularly base deficiency, and possibly aggravated by excessive manganese. Fertiliser trials were started but even if they were successful, it was not known how long the effect would last or whether it would be economic to treat large areas.

The shortages and high cost of labour in the plantations of Western Province prompted an increase in the proportion planted in West Nile District, where it was found that satisfactory establishment could be obtained by planting in a single disc-plough furrow. 1961/62 was a record year, a total of nearly 1000 acres (400 ha) being planted but concern was expressed at the high proportion of *P. patula* used. It was hoped to increase the proportion of *P. caribaea* which looked to be one of the most promising introductions but difficulty in getting enough seed of good quality had prevented this hitherto.

There was a considerable drop in the acreage (840 acres, 340 ha) planted in 1962/63 due to the Lendu scheme being almost completed and to the need to deal with arrears of tending. *P. patula* continued to be the major plantation species but due to better seed supplies, a larger acreage (73 acres, 30 ha) equivalent to 9% of the total, of *P. caribaea* was achieved.

Arrears of tending were tackled vigorously and in most areas thinning and pruning were up to date. The total area tended was about 4,500 acres (1,820 ha). The difficulties and costs of high pruning to 32 ft (10m) of final crop trees decreased as the gangs became more experienced in using nylon rope ladders.

The total acreage planted in CFRs in 1963/64 was 725 acres (290 ha), a drop of 115 acres (50 ha) on the previous year. The composition by species was Mexican Pine (*P. patula*) 61%, Cypress (*C. lusitanica*) 24%, Monterey Pine (*P. radiata*) 8%, Honduras Pine (*P. caribaea*) 6% and others 1%. It was decided later to cease planting of *P. radiata* due to its susceptibility to disease (*Dothistroma pini*).

Regeneration of High Forest

(Tables 6A and ALG3A; Plates 9–14)

Until the early 1950s the demand for forest products from the high forest areas of Uganda was confined to one or two well-known species of long rotation. Natural regeneration of these species was in many areas conspicuous by its absence and emphasis was therefore placed on their artificial introduction by more or less diffused underplanting of the selectively logged forest. The picture was, however, changing rapidly: the demand for saw-logs was increasing and large numbers of new species were becoming marketable; impregnation plants were being installed to permit the use of timbers otherwise susceptible to insect and fungus attack. At the same time it was increasingly difficult to maintain the large labour force necessary for any form of diffuse underplanting.

A new pattern was therefore emerging and it was visualised that the high forest would in future be regenerated largely by natural means with appropriate pre- and post-exploitation treatment. A wider range of species would be potential timber producers, many of them of relatively short rotation. It was believed that this method could be introduced immediately in the South Mengo forests but that there was still a lot to be learnt about the western forests.

In many high forest areas, particularly in relatively young forests, woody climbers not only intercepted light at canopy level but were the cause of extensive felling damage at the time of exploitation. It was decided, therefore, to undertake pre-exploitation climber cutting in coupe III of the Budongo Forest and some 2,000 acres (800 ha) were treated in 1952. In the following year climber cutting was carried out in the Mabira and West Mengo concessions but it was not possible to get this work done more than a short time ahead of exploitation. The aim was to complete the climber cutting two years before the timber harvesting was due.

Concurrent with this work, the hardwood timber plantings were tended in Budongo where the 1946 and 1947 compensatory plots of *Khaya* were opened up. A full programme of maintenance of the older diffuse plantings awaited the completion of sample enumerations in the 17,000 acres (6,900 ha) treated.

In South Mengo, no new underplanting was carried out in 1952, all available labour and plants being used on the beeting with striplings and cut-backs of previous years' areas as far back as 1948. Much beeting was required – from 22% to 48% of the original plants needing

replacement. In 1953, a further 300 acres (120 ha) of close spaced underplanting were completed in South Mengo (Zirimiti) which had been incompletely exploited under wartime conditions in 1943. The remaining marketable trees were felled in 1951/52. The species used in the underplanting were *Khaya anthotheca* (57%), *Entandrophragma utile* (20%), *E. angolense* (15%), *Milicia* (*Chlorophora*) *excelsa* (6%) and *Lovoa brownii* (2%). After planting, a canopy opening was carried out – also in the 1948 and 1951 planting areas.

1954 saw the emergence on a field scale of a new technique of mixed forest tending based on the extensive use of contact arboricides for selective 'weeding' or 'refining' at all levels of the forest. The techniques adopted for field use were considered to be largely experimental and would be subject to constant review and improvement as experience was gained. The programme for 'Timber Stand Improvement' (TSI) suffered from unfortunate delays in 1955 in delivery of the arboricides but nevertheless valuable experience was gained. In the Gangu forest (West Mengo) 527 acres (210 ha) were treated using 2% 2,4,5-T in diesel oil and in the Budongo forest 605 acres (245 ha) were treated with a mixture of 1% of 2,4,5-T in oil, increased later to 2%.

The programme of line planting through exploited forest in Mengo was completed in 1954. Canopy and line opening in the Zirimiti forest 1951 regeneration area was completed in 1955. In Mengo pre-exploitation climber cutting was carried out over 3,200 acres (1,290 ha) in 1956 and was well ahead of exploitation.

TSI increased from 1,130 (460 ha) to 3,600 acres (1,460 ha), of which 2,200 acres (890 ha) were in Budongo. During the year, there was considerable development of technique and a 3% solution of 2,4,5-T and 2,4-D in the ratio of 1:2 in heavy diesel oil was standardised. Barrier and cleansing creams and overalls were issued to staff as protection against dermatitis.

Pre-harvesting climber cutting was carried out in 1957 in S Mengo (2,406 acres) (970 ha). Including this together with regeneration inducement and tending (TSI) (4,967 acres, 2,010 ha), the total area treated in Budongo, S Mengo and Masaka was 7,373 acres (2,980 ha), an increase of nearly 1,400 acres (570 ha) over the previous year's figures but still a long way short of the target of 8,000 acres (3,240 ha) a year laid down in the Agricultural Committee's Report. The main reasons for the shortfall were:

(a) lack of sufficient trained sub-professional staff such as Assistant Foresters and Rangers to tackle greater areas;

(b) game damage which made it necessary to delay operations in Budongo CFR for the time being;

(c) unseasonably heavy rains which held up spraying in Budongo.

The aims and methods of high forest treatment continued as before and in 1958 they were codified in the form of a Departmental Standing Order which consolidated experience to date.

During 1958, 4,216 acres (1,710 ha) of forest in Mengo were given pre-harvesting climber cutting. This completed the block which had been partially treated and, with the adoption of the uniform system of silviculture, this work would be discontinued.

A total of 1,513 acres (612 ha) in Budongo were given regeneration inducement. The aim of the treatment was to kill the climbers, weed trees and defectives of the upper and middle storeys so as to increase light at the time of harvesting and promote regeneration of the valuable species, but in the course of the year it became apparent that this treatment, as hitherto applied, was not opening the canopy sufficiently for this purpose. In the last few months of the year, a greater degree of canopy opening was sought by poisoning all muhimbi (*Cynometra alexandri*) above 3 inches (7.6 cm) in diameter.

A total of 7,184 acres (2,910 ha) was given post-harvest tending during the year. Of this, 4,685 acres (1,900 ha) were forest which had been cut over, and 2,179 acres (880 ha) were adolescent forest that had not been previously treated but in which liberation of the young crop was desirable. The remaining 320 acres (130 ha) were forest that had been previously tended and which were given a second experimental tending. The net increase in the area of tended forest was therefore 6,864 acres (2,780 ha). Thus the total area given liberation treatment, pre-harvest regeneration inducement and post-harvest tending treatment during the year was 8,377 acres (3,390 ha), excluding climber-cutting and excluding the 320 acres (130 ha) given an experimental second tending. This represented an increase of about 60% on the previous year's figures and achieved for the first time the target of 8,000 acres (3,240 ha) a year laid down in the Agricultural Productivity Committee Report.

In order to determine how far this rate of treatment was in fact adequate to meet the needs of the situation, a review was made during the year of the progress of treatment in relation to the rate of cutting and the area of previously cut-over forest requiring treatment. This indicated that the current rate of post-harvesting treatment (4,600 acres, 1,860 ha a year) was not enough to keep pace with the then rate of cutting (about 6,700 acres, 2,700 ha a year) and could not make any inroads on the backlog of cut-over forest requiring treatment. There were between 60,000 (24,300 ha) and 70,000 acres (28,300 ha) of such forest which had been cut-over more than five years ago and which needed treatment. The longer this was left untreated, the greater the loss of future increment. Taking account of all the various factors involved, it was estimated that the rate of post-harvesting tending ought to be raised as soon as possible to about 13,000 acres (5,260 ha) a year, to which should be added such pre-harvesting inducement treatment as might be necessary. The gross total, therefore, for both pre- and post-exploitation treatment should be about 14,500 acres (5,870 ha) a year. The limiting factors to this expansion were staff and money, the decisive factor being the former because even if more money were to be forthcoming, no appreciable expansion could be undertaken until more trained sub-professional staff became available. It was hoped that this would be so in two or three years' time.

As foreshadowed in 1958, pre-harvesting climber cutting was stopped although in the light of more recent regeneration assessments it seemed likely that it might be necessary to reintroduce it in some areas.

Regeneration inducement was practised only in the Budongo Forest. Operations progressed normally and a total of 2,821 acres (1,140 ha) was treated over the eighteen-month period 1st January 1959 to 30th June 1960. There was a very satisfactory drop in cost from shs 45 per acre (shs 110 per ha) to shs 24 (shs 60 per ha) despite the more intensive poisoning of

muhimbi introduced in 1958. The decrease was due to more efficient supervision and more care in spraying.

Tending was carried out in Budongo and Kibale forests in the Western Province and in the East and West Mengo and Masaka forests in Buganda. In the Kibale forest, treatment was started for the first time in January 1960.

In East and West Mengo, treatment of the forests which had previously been underplanted was then started in forests which had been cut-over but which had not had any form of silvicultural treatment. In Masaka, treatment was concentrated in unexploited adolescent forest.

In all, a total of 11,906 acres (4,800 ha) over the 18 month period of which 4,121 acres (1,700 ha) were in unexploited forest and 7,785 acres (3,100 ha) in harvested forest. Including the inducement treatment in Budongo, the grand total was 14,727 acres (5,940 ha).

During the 6½ years since treatment began, a total of almost 33,000 acres (13,300 ha) were treated. This hardly kept pace with the current rate of cutting and the aim was, as indicated in 1958, to get the treatment of harvested forest up to about 15,000 acres (6,000 ha) a year. Ministerial approval was given in principle for this and provided the necessary funds were forthcoming, little difficulty was anticipated in achieving it within the next year or two. In the light of the FAO forecast of future timber requirements, however, it would be desirable, when practicable, to raise this rate of 15,000 acres (6,000 ha) a year, which related only to harvested forest, by a further 6,000 acres (2,400 ha) a year in the young unexploited forest which, without treatment, was only putting on minimal increment.

In 1961/62, pre-harvesting climber cutting was carried out in the Mabira and Bugoma forests at an average cost of shs 3 per acre (shs 7 per ha). In the Mabira the work was two years ahead of felling. Regeneration inducement continued ahead of harvesting in Budongo CFR. Diagnostic sampling to determine the composition and state of the crop and hence the type of post-harvesting silvicultural tending required was carried out over approximately 17,500 acres (7,000 ha) in Bugoma, Kibale, Mabira and the lake shore forests. General refining was carried out in Budongo, Bugoma, Kibale, the East and West Mengo and the lake shore forests. A total of 9,775 acres (3,950 ha) were treated, an increase of 8% on the previous year.

In all, 12,083 acres (4,900 ha) of forest were given silvicultural treatment, not counting climber cutting. This was about 120 acres (50 ha) short of the programme, largely because of the wet weather but it was the highest figure achieved to date and its attainment in a particularly wet year was a fine achievement by the field staff concerned. At 30th June 1962, the total area of natural forest given silvicultural improvement treatment of one kind or another was about 63,000 acres (25,000 ha).

In 1962/63, climber cutting continued in West Mengo but not in the Mabira forest, where the area treated was at least two years ahead of schedule. Regeneration inducement continued in Budongo forest and to keep ahead of exploitation, the annual programme had to be increased from 2,000 to 2,500 acres (800 to 1,000 ha). The results of this work were reported to be very striking.

General refining was carried out in Mabira, West Mengo, Jubiya, Sesse, Budongo, Bugoma

PLATE 15

Poles for electricity transmission lines being cut from a ten-year-old coppice crop of *Eucalyptus saligna* (probably actually *E. grandis*) in Kampala Plantations. Large numbers of these were needed for the expansion of the Uganda Electricity Board distribution network in Uganda following the building of the Owen Falls Dam; previously the UEB had imported Norway Spruce poles at great expense. This species was (and still is) the mainstay of fuel and pole production in Uganda.
(*The Forests and the Forest Administration of Uganda*, 1961))

and Kibale forests. In spite of the wet weather which hindered the work considerably, a record total of 13,478 acres (5,400 ha) was treated, an increase of nearly 1,400 acres (560 ha) over the total for the previous year which was itself a record.

As a result of diagnostic sampling in the Mabira forest which indicated that the next crop in the *Celtis–Holoptelea* type of forest would be poorly stocked with desirable species, it was decided that enrichment planting was necessary in this forest type in East and West Mengo. Accordingly large felling gaps and tractor paths were planted with musizi (*Maesopsis eminii*) at spacings of not less than 20 ft (6 m) apart and only in gaps with full overhead light and minimum ground vegetation.

During the year, it was discovered that people exercising their privilege of free poles for their own use in Mengo were cutting pole-sized trees of desirable species in areas which had been refined. As the stocking of such well established regeneration was not high, this practice would have an adverse effect on the future timber crop and attempts were made through talks and distribution of leaflets to enlist the co-operation of the local people in preserving the desirable species although some of them were not reserved.

The aims and methods of the natural regeneration and improvement treatments of high forest remained unchanged as described previously. With the gangs becoming more experienced and the supervision more skilled, the results of the canopy treatments with arboricides were very effective and it was considered in 1963/64 that the results on a large (field) scale were just as good as those obtained in research plots. The tending of natural regeneration in

the high forests continued in 1964 using arboricides to remove weed trees but the policy was changed to treating as soon after exploitation as possible in order to obtain maximum canopy opening to allow light to reach the desirable regeneration. Pre-exploitation treatment was consequently stopped.

Fuel and Pole Plantations

(Tables 6A and ALG3B; plate 15)

Major additions to the plantations ceased in Buganda in 1955 and somewhat later in the other provinces, the reasons being that investigations had shown that the Buganda plantations were sufficient for the probable demand in that region and that the other provinces had completed their programmes. Also, some demands especially in the minor townships and rural areas were increasingly being met from local forest reserves and from peasant planting schemes.

In Buganda, with the help of the Hydrological Department, the main drain in the swamp area between Namanve plantation and the open water of Lake Victoria was realigned in 1952. In spite of this and subsequent attempts to improve the drainage after a rise in lake level due to the building of the Nile dam at Owen Falls and an increase in rainfall, the lower plantations continued to cause much concern and the expensive works brought little improvement, if any. In 1963/64, over 1,100 acres (460 ha) were written off because the crops had been killed by flooding and because it was unlikely that the lake level would go down sufficiently for the area to be utilisable again. So all the sterling work done by Forester Harry Adams in the early 1930s in converting a huge area of papyrus swamp into successful plantations of *Eucalyptus robusta* and *saligna* after three decades of valuable production came eventually to naught.

In the Eastern Province, attempts to accelerate and cheapen the cost of establishment by the use of mechanical ploughing were disappointing owing to unfavourable weather conditions and mechanical troubles. Planting programmes had to be reviewed in the light of continuing labour shortages and all available labour was concentrated on securing full establishment of previous plantings which had suffered from lack of attention.

The Soroti plantations continued to present a most depressing and unhappy picture – regeneration continued to fail and the smoke of burning plantations to darken the Teso sky. Fortunately, the regeneration elsewhere of felled areas was satisfactory.

In the Western Province, the Eucalyptus plantations of Fort Portal continued to be the main source of pit props for Kilembe copper mine. A further 12 acres of *E.saligna* (5 ha) were planted in drained swamp land there and the spectacular growth of previous plantings was maintained. No new areas were established at Katwe in the Queen Elizabeth National Park but attention was directed to preventing and repairing the ravage of big game in this highly productive plantation. The efforts were, however, unsuccessful and the plantation gradually disappeared under the onslaughts of the game. It appeared that its survival could only be possible by prohibitively expensive expenditure on fencing and 100 acres (40 ha) were written off in 1956.

At Mbarara, the combination of unfavourable soil and climatic factors, short supply of labour and over-supply of termites had its usual depressing effect on the plantation.

In the Northern Province, another satisfactory planting year was recorded at Arua in 1951 and it was hoped that the chronic fuel shortage in the township would be overcome in the following year. These excellent plantations of *E. saligna* were extended by a further 63 acres (25 ha) in 1953 but, later, serious mortality occurred suddenly over wide areas under very puzzling conditions. No pathological symptoms were detected and it appeared that the deaths were caused by drought. A further 54 acres (22 ha) were planted successfully. An important minor product of these plantations was the little bunches of leaves without which the ladies of the district were disturbingly underdressed.

In Lango, after consultation with the medical authorities, 39 acres (16 ha) of unimpressive anti-malarial plantations in Lira were written off. The main block was drained and managed chiefly for pole production. It was reported that 'the trees also afford a cool retreat for foresters and birds'.

Similarly, in Acholi, with the concurrence of the Medical Department, sections of the anti-malarial plantations at Gulu were abandoned as productive areas, part being taken over by the Township Authority as an amenity area. These areas had been consistently uneconomic so with the change in malaria control by DDT and drugs it was a relief to be able to excise them from the formal working plan areas.

The most urgent artificial regeneration problem remained – to find a suitable species for short rotation fuel and pole crops in the northerly areas of the country: a drought resistant and termite resistant species which could be relied upon to form a dense enough canopy to suppress the rhizomatous grasses, *Imperata* and *Digitaria*.

In 1947, a promising introduction had been the Hunters Rise strain of the *Eucalyptus camaldulensis* which for the first four years grew at the rate of 9.5 feet (2.9m) per annum on good sites. But the early promise of this introduction and of other red gums was not maintained and E.saligna was preferred. Further trials of *E. camaldulensis* (*aff. tereticornis*) from Zanzibar were made over the ten year period to 1961 when at last this species was accepted as a successful substitute for *Cassia siamea* as a pole and fuel crop in the savannah areas of the Northern region, where drought and termites seriously affect *E.saligna*.

Nursery Work

Towards the end of 1958, the Horticulturist, EAAFRO visited a number of nurseries and gave instruction to local staff in nursery work. His chief criticisms were that the Rangers in charge were, in too many cases, not sufficiently practical and that the work was spread over too many small scattered nurseries. Largely as a result of his visit, there was a marked improvement in the standard of work and considerable economies in the cost of raising plants in the Eastern Province. Nurseries were centralised both there and in Buganda. Later however in 1962/63, nursery practice continued to give inconsistent results, in spite of all the time given to it in recent years. The main faults were poor pricking out and unsatisfactory soil mixtures.

5 Fire Protection and Pest Control

Early Burning

In accordance with Government policy, all savanna forest reserves were early burnt in 1951 except the Kaduku reserve in Bunyoro where a Tsetse Control late-burn was permitted. A carefully controlled burn of the Lakure valley in the Imatong mountains in Acholi was carried out in 1952 which was reported to have had the desired effect of dissuading game from retreating there in the dry season. In spite of the intensity of the 1952/53 drought, the stream flow was not unduly lowered.

Early burning is carried out in savanna to encourage thickening of the woody cover. These areas are burnt as soon as the grass has dried out sufficiently for the fire to take and therefore the timing of the early burn is controlled by climatic conditions. The standard of early burning was by no means satisfactory in many areas in the mid-1950s and it was obvious that if this operation was to be silviculturally effective, it should be carried out under close supervision and over a much longer period of time. Departmental Standing Orders on early burning were therefore revised and consolidated.

In 1959/60 early burning was carried out successfully in all savanna forest reserves except for two which were late burnt for reasons of tsetse control. The total area concerned was about 1,700 sq m (4,400 km^3) which cost about £450. For the next three years, completion of early burning was delayed due to rain in November/December but nevertheless results were satisfactory. In 1964 early burning was restricted to Karamoja reserves and around the edges of Budongo natural high forest where advance and thickening of woody vegetation was considered to be essential. Early burning in other reserves was discontinued.

Fires

During 1951 the abnormal rainfall experienced over most of the country resulted in relatively little fire damage though maliciously set fire destroyed 48 acres (20 ha) of plantation at Mpanga. Some damage was also caused to plantations at Tororo, Nagongera and Nyabirongo (Toro). Fires were reported on the moorlands of Mt Elgon.

Damage to plantations the following year was also happily at a low level but in the

Northern and Eastern Provinces a period of serious fire hazard developed towards the end of the year which was intensified in early 1953. In 1952 by far the most serious plantation fires occurred in the mvule planting areas at Abera and Opit where fire swept over 280 acres (110 ha) of plantation. All young burnt stems were cut back and coppice regrowth had already begun to appear by the end of the year. In 1953 extensive fires broke out in fuel and pole plantations at Gulu, Soroti, Mbale and Tororo. Although damage was not always severe, it was obvious that periods of abnormal fire hazard called for abnormal control measures and the whole question was reviewed. The improved protection methods introduced were apparently successful because damage was not significant in the 1953/54 fire season.

In spite of the abnormal and prolonged drought over the next few years which affected most districts, only 26 fires were reported and none did serious damage. This was very fortunate and in the softwood plantations particularly was largely a matter of luck as fire control measures and equipment in those areas were far from adequate.

It was encouraging to record that at one small fire in the Kyehara softwood plantations, the local people turned out voluntarily to help extinguish it. On the other hand, deliberate arson at night was the cause of several fires in the Soroti fuel plantations.

The drive to improve fire control measures in the softwood plantations continued and good progress was made. There was a great improvement in the firebreaks in all areas, roads and tracks were extended, lookout towers erected and fire protection plans overhauled. The cost of these works was not excessive – fire protection expenditure in softwood plantations worked out at about 6% of the standing value of the plantations, not an excessive insurance to pay. Despite the generally severe dry season in 1959/60, only about 20 fires were reported and the damage was very small. The following dry season was long with a high fire risk. Thanks to keenly applied control measures, the fires reported in the coniferous plantations caused little damage.

Due to the prolonged rains the fire hazard the following year was low throughout the year and there were no fires of any importance. Fifteen small fires occurred during 1963/64, the largest being four acres (1.6 ha) of musizi in West Mengo and sixteen acres (6.5 ha) of research plots at Abera. Some of the fires were set deliberately by local people with a grudge against the Department and others were due to carelessness by graziers. Though small in size, the loss of research plots was a serious matter particularly those which formed part of a replicated series and special measures were adopted to protect them from fire.

In the following year the fire season was a very mild one and there were no large fires. The most annoying loss was at Lututuru in the Imatong Mountains, where three acres (1.2 ha) of trial plots comprising one acre each of promising one year old *P. radiata*, *P. massoniana* and *P. caribaea* were deliberately burnt by a disgruntled employee.

PLATE 16

PLATE 16 Collapse of mature *Celtis kraussiana* in the Kibale Forest due to rot caused by repeated stripping of the bark by elephants. Abundant evidence from here and other forests showed that productive forestry and resident elephants are incompatible. This may have contributed to the dominance of *Cynometra* (which is not damaged by elephant) in some forests.
(H.C. Dawkins, 1956 Annual Report)

PLATE 17 An example of felling damage in natural forest. The two crowns falling together and the subsequent extraction activities will devastate the existing regeneration on about a fifth of an acre (0.1 ha).
(Department of Information, 1957 Annual Report)

PLATE 18 Electric fencing in Kibale Forest to try to keep elephant and buffalo from damaging regeneration in felling gaps, using barbed wire at 5ft 6in (1.6m) height and plain wire at 2ft 6in (75 cm), charged by Wolseley battery-powered units. This was unsuccessful and for decades the regeneration continued to be damaged and the herbaceous climber tangles perpetuated. Now, half a century later, trees have re-established over much of the area, but with low stockings of formerly abundant desirable timber species such as *Piptadenia buchanani*. R.P. 348.
(R.A. Plumptre, 1958 Annual Report)

PLATE 17

PLATE 18

Mammals

(Plates 16–18)

In high forest areas in the Western Province, elephant and sometimes buffalo continued to be a source of concern to gangs working on boundary demarcation or on roads in the forest. Buffalo and elephant showed their aversion to boundary markers by damaging *Dracaena* and sisal planted for that purpose in Mubende and North Mengo.

With the disappearance of bush for agriculture outside forest reserves, pressure on western high forest reserves increased dramatically – later on, national parks were also affected. The extent of damage by elephant on valuable trees in high forest areas was studied in the Budongo and Kibale forests. In the latter, as the result of a safari by the DFO and two Game Rangers, it was reckoned that the resident elephant population might have reached the astonishing figure of 3,000 animals. The effect of herds of such magnitude on the full utilisation of these forests was a problem requiring far fuller study.

In Budongo, it was estimated that 34% of the surviving stripling mahogany planted in 1946/47 had been damaged. In 1956, as a result of TSI operations, the damage increased to an almost catastrophic extent. The estimated 100,000 young mahoganies reacting vigorously to the treatment were threatened with destruction and valuable experimental plots were completely destroyed.

Similarly, enumerations in the Kibale forest demonstrated the magnitude of the damage. About 81% of all timber-sized *Lovoa* had severe bark damage reaching higher than 6 ft (1.8m) from the ground and 25% were entirely girdled. It became necessary to delay any attempt at silvicultural treatment of this valuable forest until suitable elephant control measures could be put into force.

Trials had been made over several years with electrified fencing at Katwe, Budongo and Kibale but difficulty with maintenance reduced their efficiency considerably although, at first, results had been promising.

Culling by shooting was tried out and over 600 elephants were shot over a seven-year period – with limited success in spite of a ministerial directive for control operations and a plan of campaign having been drawn up. Because control in Kibale forest would, as it extended southwards over the reserve, have some effect on the conservation of elephant in the nearby Queen Elizabeth National Park, proposals were drawn up for a study of the ecology of the elephants in that area and the extent to which their conservation depended on the forest.

Funds for the project were provided in 1961/62 by the National Science Foundation (USA), the New York Zoological Society and the Uganda Government and Dr I.O. Buss and L.D. Wing were recruited from Washington State University to carry out the investigation. An interim report was published at the end of 1963 which stated that a very rough estimate of the elephant population in the forest in August 1963 was 2,500, i.e. over 12 to the square mile (2.6 km^2). The report on their work over two years was received in 1967 and contained a mass of data on the seasonal distribution of elephant in the forest, the species which they ate, the areas they favoured and estimates of population size but, unfortunately, the report was found to be of little practical value for planning control.

When, halfway through the project, funds were getting low and Dr Buss was discussing with the writer of this history where additional funds might be obtained to finish the project, it was a revelation to be told by him that as an officer in the US Navy during the war, he might be able to get financial assistance from this source. Unfortunately, the Navy was not put to the test.

Other big game pests were lion which gave considerable concern to labour gangs opening the boundary of the South Ankole reserve. In Toro, a leopard impaled himself on the cut stems on a road trace in the Kibale forest when jumping down from a tree. Hippo destroyed part of the arboretum at Kimaka (Jinja).

The major pest of softwood plantations continued to be rodents and it was obvious that particular attention would have to be paid in those areas to induce by appropriate silvicultural techniques, habitat conditions unfavourable to the maintenance of high rodent populations. As an indication of the extent of the problem, the bag of rats trapped at Mafuga in 1955 was 17,650. The PFO decided that introduced predators might be helpful and arranged for the resident ratters to be supplied with pairs of cats drawing cat allowance and, possibly, a kitten bonus. But in their customary way, the introduced cats sought more comfortable quarters and did not seriously incommode the local rat population.

Close planting to secure early grass suppression was the most promising of the various measures tried though invasion from adjacent grassy areas would still remain a problem. The PFO wrote up the results of three years control work covering trapping, poisoning and hunting and though increased catches were achieved, damage was more lasting and more severe than any experienced in Kenya and continued so until the end of this historical period.

Insects and Fungus Diseases

Termites continued to be a nuisance in 1951 in plantations of *Eucalyptus saligna* and to restrict the possible range of this valuable species. In Busoga, treatment of mounds with a proprietary DDT emulsion was very successful in swampy sites where the termite population was concentrated below the large conspicuous mounds but less successful on drier sites with a more dispersed population.

Mvule gall, *Phytolyma lata*, continued to be a menace both in South Mengo and in the Lango/Acholi plantations. The mahogany shoot-borer, *Hypsipyla albipartalis*, did extensive damage to young mahogany, even in the nurseries. Overhead shade appeared to be the best means of combating this pest.

In 1953, an important first record in Uganda was the identification of *Oemida gahani* on *Podocarpus sp* in the Kaburoron area of the Mt Elgon CFR – an extremely serious pest in exotic conifer plantations in Kenya. It was later (1959/60) confirmed at Mpanga forest but not in softwood plantations. In 1963/64 Cypress canker *Monochaetia unicornis*, was found by the Plant Pathologist on *Cupressus macrocarpa* at Kabale and the use of this species was stopped. It was found later at Nyabyeya and Lendu. About 20% of the crop at the latter site was attacked but seemed to be recovering. The damage at Mafuga was also mild, due perhaps to the strain of the disease being a weak B strain. It was hoped that sound forest hygiene and prompt thinning would reduce the disease.

The importation of large quantities of untreated Podo and Cypress from Kenya for the construction in 1962 of the Independence stands on Kololo, drew attention to the dangers of the Kenya strain of the Cerambycid beetle, *Oemida gahani*, being introduced into Uganda. The Uganda Oemida which was common in the S Mengo forests was quite different in both appearance and habits from that found in Kenya and in view of this, and of the damage caused in Kenya's softwood plantations by their Oemida, it was decided to take steps to minimise the risk of live insects being brought into Uganda. As a result, an order was passed under the Plant Protection Ordinance prohibiting the import of Podo and Cypress from Kenya unless accompanied by a certificate stating that the timber had been inspected and found free of all traces of *Oemida* or had been treated in such a manner as to kill any insect present. The scheme worked well and resulted in a marked improvement in the quality of timber brought in.

An outbreak of defoliation by larvae of the Pinelooper Moth at Mafuga was controlled by an application of 10% DDT powder spread by a powerful duster. About 6–8 acres were defoliated.

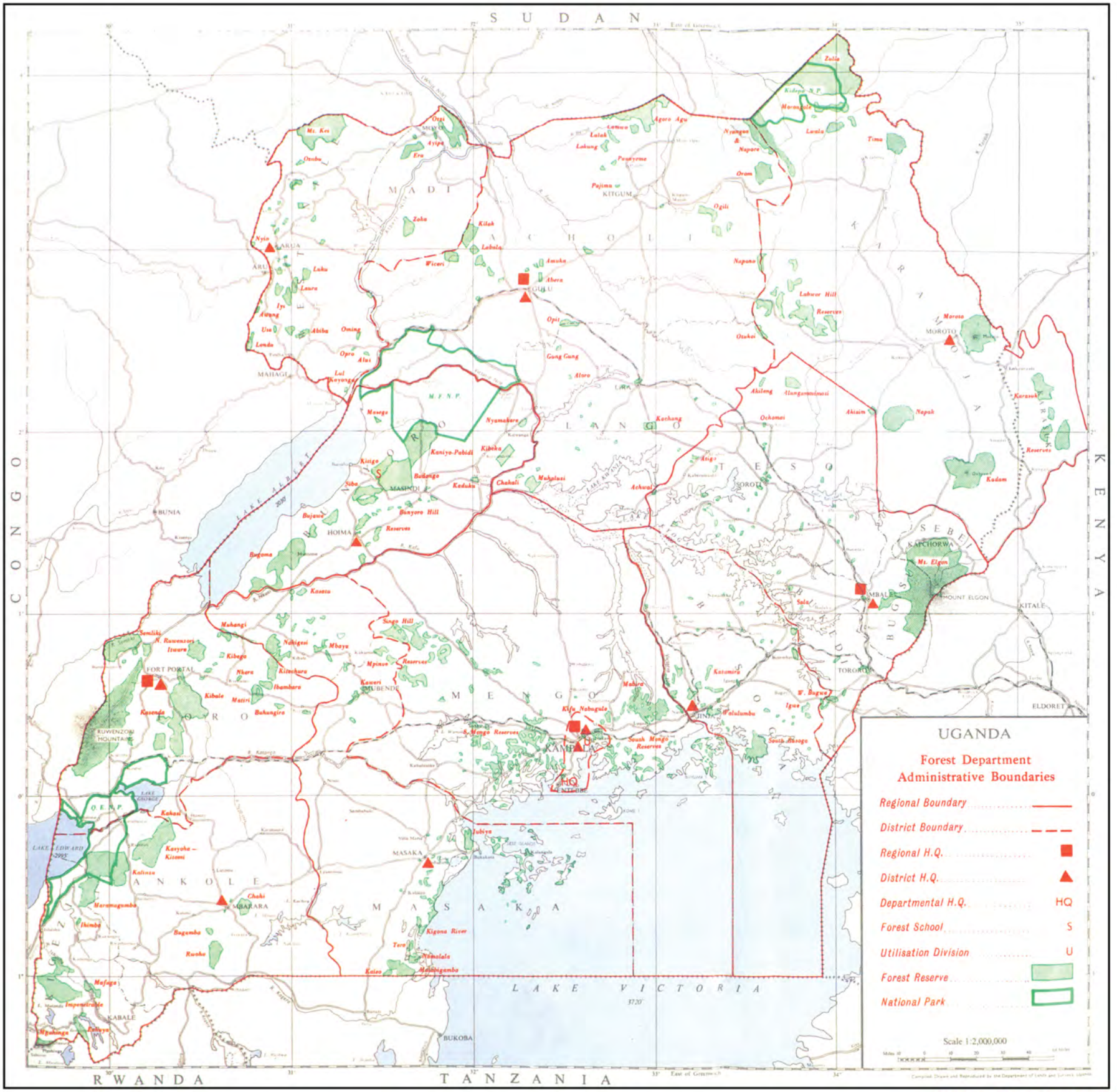
In 1953, the PFO/NP suffered from an outbreak of carbuncles caused by a species of *Sporotrichosis*, a fungus common to man and gum trees. He reported 'though possibly indicating the increasing lignification of the PFO, he considered it a poor return for a life-time devotion to the genus *Eucalyptus*'.

There was a most unwelcome appearance in 1962/63 of the Dry Wood Termite, *Cryptotermes dudleyi*, a major pest of structural timber throughout the Pacific and Caribbean areas. It had first appeared in East Africa some years previously but had been restricted to a

narrow coastal belt where it caused severe damage to buildings in Mombasa, Dar-es-Salaam and Zanzibar. It had been hoped that the climate inland would be unsuitable for its development but the discovery of a thriving colony in the woodwork of a Nyabyeya Forest School bus that had not been out of Uganda for six years, showed that climate could not be relied upon as a protection.

Following 12 years' absence, the Eucalyptus weevil, *Gonipterus scutellatus*, was found at Mbale and Walulumbu near Jinja, seventy miles further west than any previous record. Checks on parasitism of the egg masses by *Anaphoidea* indicated that a major outbreak was unlikely.

In 1962/63 the *Fusarium* disease of *Maesopsis* and the Radiata pine needle cast, later identified as *Dothistroma pini*, a serious pest of *P. radiata* pine plantations in Kenya and Tanganyika (Tanzania), were recorded in small plots in Uganda, but not in the main plantation areas. It was most unlikely that the ultimate infection of all *P. radiata* plantations could be avoided, in which case further plantings of this species might have to be stopped. Two years later, *Dothistroma* was confirmed in most areas of the country, most seriously at Mafuga and Lendu where it caused considerable defoliation but few or no deaths. Field scale planting of *P.radiata* was stopped.



UGANDA

Forest Department
Administrative Boundaries

- Regional Boundary
- District Boundary
- Regional H.Q.
- District H.Q.
- Departmental H.Q. HQ
- Forest School S
- Utilisation Division U
- Forest Reserve
- National Park

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Overprint drawings supplied by Forest Department.
Printed by the Department of Lands and Surveys, Uganda. 1966.

6 Communications and Buildings

Roads

A number of public transport developments were announced which affected the Department. The western extension of the railway was to pass through a number of forests in West Mengo and would radically facilitate timber exploitation further west. A district road alignment in the Luhiza–Kayonza–Kanungu area was to cross the Impenetrable Forest in two places. New roads in Mbale District improved access to the Mt Elgon and West Bugwe forests.

In 1951 there was an urgent need for construction of further departmental access roads in areas under concentrated regeneration – this applied particularly in the case of short-term fuel and pole crops where such roads became immediately revenue-producing. But over the next two years the programme of extending motor roads in plantation areas was limited by the availability of labour. This was particularly so at Mafuga where the inadequate labour supply persisted until 1957.

Another factor which restricted the road-making programme was the inadequate Departmental fleet of vehicles (Table 16) and it was not until new lorries and County Crawler tractors with ancillary equipment were obtained that the situation improved. In 1957 one of these tractors with a dozer blade built nine miles of new road 11 ft (3.30m) wide and reopened four miles of old road during the last eight months of the year. This was as cheap and a good deal quicker than building by hand. About the same time, a welcome addition to the vehicle fleet were five Land Rovers which were mostly engaged on the servicing of staff and labour engaged on boundary demarcation, enumeration surveys and TSI.

The programme of extending roads or Land Rover tracks into reserves was pursued energetically between 1956 and 1963/64 in order to keep up with new planting in softwood areas and treatment of TSI areas. In that period more than 400 miles (640 km) of new roads including 100 miles (160 km) of LR tracks were built. By 1959/60 new road construction was well up to the planting and high forest tending programmes. In Karamoja LR tracks were made to give access to the Ilipath cedar forest on Mt. Moroto and to a group of reserves in Dodoth. The following year the track on Mt Moroto was continued 14 miles (22 km) to the plateau at about 8,000 ft (2,440 m).

In 1956, a major road project was begun when a contract was placed for the construction

of some 15 miles (24 km) of road in the extremely difficult topography around Mafuga. Unfortunately, the contract had to be cancelled the following year for non-performance and as no replacement was available, the road programme fell seriously behind. When road making was resumed by Departmental labour, great difficulty was met due to the rocky nature of the ground and much blasting had to be done. As a result, costs went up astronomically to over £1,000 per mile (£620 per km).

A new National Parks road to the Murchison Falls provided better access to the remote Kyabatwa reserve in Bunyoro. Roads were pushed through the Budongo and Kibale Forests.

As softwood plantations expanded, it was necessary to accelerate the rate of road building in the interests of fire control. Roads were made into Kyehara and Kikumiro in 1958–59 using a County Crawler, which was also used for a road into Kanyawara/Namasika from the Bigodi road.

In Busoga, much time and effort was expended by the South Busoga enumeration team in maintaining the Ikulwe–Kityerera road which proved of great value in giving access to the southern portion of the reserve.

The bridge on the approach road to Use over the river Ora (under construction since 1954) was opened to traffic at the end of 1955 – a major construction with reinforced concrete abutments and 30 ft (9 m) span steel girders with temporary wooden decking (Plate 8). Lack of skilled staff along with delays and losses in cement deliveries (by rail, lorry and steamer) almost doubled the estimated cost of the bridge. In 1958, the Uganda Mountain Club built a 50 ft (15 m) suspension bridge over the Mubuku river in the Ruwenzori CFR and re-aligned and cleared the worst section of the path along the Bujuku valley as part of a scheme to improve communication on the mountains. A somewhat novel departure in Uganda forestry was the construction of a landing strip near the Lendu plantations in which the Department joined with the Administration. This was done partly for security reasons and partly to make the plantations more accessible to visitors.

The Department co-operated with the Ankole NG in repairing and reconstructing the Nyakafunjo-Bugamba road, the Department providing a light bulldozer. Approximately 7 miles (11 km) of the road were rebuilt of which 2 miles (3 km) passed through the S Ankole softwoods scheme.

The loan of a D6 from the Department of Agriculture enabled good progress to made in 1961/62 with the elephant defence road round the softwood trial plots in the Nyamasika grassland of Kibale Forest. A vertical cut of 7 ft (2 m) was made on one side which, it was hoped, would keep out the elephants. The cost was about £200 per mile (£124 per km) which was a great deal less than the ditch tried previously and would be supportable on a plantation scale. The road was completed the following year but had not proved its efficacy.

In 1961/62 the prolonged heavy rains resulted in a great increase in road maintenance work. New extraction roads were constructed by the licensees in Budongo and Kasala Forests in 1963/64 in accordance with the conditions of their licences.

Vehicles

(Table 16)

At the beginning of the period (1951) the Department had a most inadequate fleet of only three lorries whose performance was far from satisfactory. Over the next 3–4 years, there was little improvement in the situation when the vehicles seemed to spend the bulk of their time under repair. Some relief was obtained by the purchase of two Land Rovers but lorry maintenance continued to give a disproportionate amount of trouble.

In 1955 there was a welcome addition of one truck, two tractors and three Land Rovers to the fleet. The Land Rovers were largely engaged on the servicing of staff and labour engaged on boundary demarcation, enumeration surveys and timber stand improvement. Their use made possible some important works which otherwise would have been long delayed. The improvement continued in the following year with the acquisition of four more wheeled tractors and one crawler along with ancillary equipment such as grass-mowers, grading blade, ploughs and harrows etc. A log trailer was acquired at the end of the year for the extraction and transport of logs for the timber-testing programme. A 200-gallon (900-litre) tanker trailer for use with Land Rovers for the transport of arboricide mixtures into the forest was also a welcome addition.

By 1959/60 the amount of use which the Land Rovers had to bear was reflected in the writing off of three vehicles and the knowledge that several more were coming to the end of their economic life. Only one replacement was expected. In the following year, the situation was improved by the addition of two 5-ton trucks, two Land Rovers and a tipping trailer in place of one truck (written off) and two LRs awaiting writing off. In 1961/62 three Land Rovers, one wheeled tractor and tank trailer were obtained but they only replaced the three Land Rovers and one wheeled tractor which was written off. At the end of the year, the main components of the fleet were 10 Land Rovers, 8 trucks, 10 tractors and 11 trailers and the total mileage run was 207,400 miles (334,000 km). It was increasingly felt that it was uneconomic to try to prolong the life of old vehicles.

Buildings

The original building programme at the Forest School was completed in 1951 with the result that the School was now suitably housed, both practically and aesthetically. New office accommodation was built at Arua and Head Office and the DFO Mbale moved into more commodious offices in the new government office block. Construction of the new workshops and ancillary buildings at Nakawa for the Forest Engineer proceeded throughout the year.

Rangers' houses were built in Busoga, Mbale, Buganda and Kigezi. Labour lines were built at Kigezi and Bunyoro. In the following year the Departmental team did a good year's work in Buganda with the building of houses for African field staff, labourers' quarters and stores. A new forest village was built at Lendu and new labour lines begun at Budongo.

A number of movable aluminium (Uniport) houses were in use during the year and proved to be of great value. Further supplies were obtained in 1953 and 1954. They saved an enormous amount of time and expense when temporary accommodation was required in remote areas.

The PFO/WP was fervent in his campaign to house subordinate staff and labour and in collaboration with the Forest Engineer, produced an acceptable design for a prefabricated wooden frame house with expanded metal and cement filling. In 1955, five junior staff quarters of this design were erected in the WP but although of excellent standard, prefabrication was only partial and it was very expensive in time and labour to complete building on site when craftsmen and supervision were both absent. A number of semi-experimental designs were tried out in the field and the Forest Engineer completed eight pre-fabricated four-roomed quarters for Rangers and one unit suitable for labour. These were of sectional design using treated timber covered with expanded metal, leaving only the concrete work to be completed on site.

The programme of construction and maintenance of housing for subordinate staff and labour continued for the next ten years. A new forest village was completed at Sonso (Budongo). As projects expanded, or new projects were initiated, more buildings were required for the new staff and to re-house those previously in temporary accommodation. In an attempt to solve the problem of buildings being needed in small numbers in difficult areas, a contract was signed for the erection of 12 wooden pre-fabricated housing units for field staff and labour at Entebbe, Mpanga, Jubiya, Kapkwata, Kirala and Sebutole. These were made in three-foot pressure-impregnated panel units by a sawmilling company and were delivered and erected by the company in any part of the country which could be reached by a five-ton lorry. These buildings were a success though certain improvements in design were necessary later. A rest house was built at Nakawa for the user of rangers, guards, drivers etc attending courses.

In the process of devolution of responsibilities to ALGs, a number of buildings were transferred to the Kabaka's Government and the Busoga ALG.

The programme of improvement of rural staff quarters continued and thirty 1,000 gallon (4,500 litre) water tanks were purchased in 1956. In the following two years, 11 and 10 staff houses, and 14 and 20 sets of labour quarters were built respectively, but despite the progress made there was still much building to be done before the junior field staff and labour in remote areas were adequately housed. The programme for housing subordinate staff continued until 1965, but on a reduced scale.

The buildings at the Forest School became a heavy burden, not only on account of the new buildings necessitated by the expansion decided in 1957 but also in regard to maintenance of the existing buildings and services such as electricity and water supply. There were at this time, more than 60 buildings of various kinds at the School, some of them very old and needing much upkeep. The School water supply was a cause of anxiety during the year because of a declining yield from the main bore-hole, defective distribution piping and a main storage which was liable to fail at any time. All these defects, however, were rectified in the following year. It was a great relief to the teaching staff and also to Head Office to have the School buildings and water supply completed after three years' work which had been bedevilled by repeated delays and which had been a heavy burden on staff who had carried out all the work except electricity work.

A laboratory and insectary for the Forest Entomologist was completed in 1958 giving this officer very adequate work facilities.

7 Research

Silviculture

In 1949 and 1950 there had been major developments in the direction and organisation of forest research, under the newly trained and appointed forest ecologist. These centred on learning much more about the ecology of the natural forests and the most effective and economic methods of regenerating them after harvesting; on studying the growth and management of the recently started the softwood plantations; on formalising research procedure and records in conformance with the Indian Silvicultural Research Code; and on close liaison with the advisory staff at EAFFRO.

This programme proceeded satisfactorily in 1951 and close liaison was maintained with specialists of EAAFRO. Visits by the Silviculturist and the Horticulturist resulted in valuable modifications to nursery and planting techniques. The Department adopted the Indian Silvicultural Research Code as a basis for research procedure and progress was made in introducing standard forms for all current research work. A beginning was made in the compilation of data for a publication on 'The Silviculture of East African Trees' and on the introduction of exotics into the country. The former did not materialise within the period of this history but the latter by Dale was published in 1953.

Natural High Forest

As a result of a study by the Forest Ecologist of girth/frequency figures of all species in typical forest plots in South Mengo, he concluded in 1951 that silvicultural improvement operations should centre on the tending of existing young stems rather than the inducement of further seedling regeneration. The next step would be experimental to test various methods of pre-exploitation work with the object of securing maximum survival and growth of economic species. To this end, the 760 acre (307 ha) Mpanga Forest was selected as a research forest and excised from the productive area of the South Mengo working plan. A further series of plots were laid out in Mpanga to investigate the relative effects of four different types of understorey and shrub removal. Work was also begun on weed-tree poisoning.

Work on pre-exploitation treatment of high forest was continued and extended at

Mpanga in 1952/53 and a new permanent research area was opened at Nyakafunjo (Bunyoro). It was hoped that these two plus another to be opened at Sebutole (Toro) would provide sufficient check for the time being on the extensive regeneration work it was hoped to initiate in all high forest exploitation areas.

The work of the Ecologist on arboricides produced results of the greatest value and significance which were summarised in a paper produced in 1954 that there was sufficient evidence that diesel-borne Finopal was an effective arboricide on weed trees of tropical forest. Death of trees followed in from one to eighteen months after spraying of a 4% solution on the bole.

The experiments on understorey felling, ground weed slashing, understorey weed poisoning and ground weeding continued in 1955 but as these long-term experiments proceeded, it became apparent that assessment methods would need revision. The main deduction possible so far was that heavy fellings resulted in regeneration of the order of 150 established saplings of desirable species per acre in three years (three times more than in untreated plots) and that these would survive if given weed-slashing treatment.

An experiment was begun at Mpanga to assess the felling damage during a normal timber exploitation operation. On an area of about 140 acres (56 ha), 154 timber trees were felled by a milling company. All felling gaps were measured and their area calculated; the average devastation including tractor paths amounting to 0.13 acre per tree. All plots were assessed for regeneration and 30 were laid out to study the effects of various types of canopy and understorey weeding.

Increment work in natural forest disclosed extraordinarily high variability in individuals of the same species, on the same site and of apparently comparable silvicultural status. As this would affect the whole question of potential productivity of the forests, the study was considered to be of major importance. Research work on natural forests underwent a major change of emphasis as a result of the Ecologist's work on the management of natural tropical high forest. The principal conclusions reached in 1957 were:

(a) any polycyclic system of management with fellings collapsing into immature growing stock was unlikely to achieve an annual acre increment of over 20 cu ft (0.57 m^3) and would probably attain considerably less;

(b) under a monocyclic system it was unlikely that final crops of more than 20 stems per acre (50 stems per ha) at eighty years of age or perhaps 40 stems per acre (100 stems per ha) at 40 to 50 years could be achieved;

(c) even with growth rates averaging 2 ft (0.61 m) girth in ten years mean annual increments of the final crop were unlikely to exceed 60 ft^3/acre (4.2m^3/ha). Over wide areas the annual acre out-turn of 6 ft (1.8 m) to 8 ft (2.4 m) girth trees were likely to average no more than 30 ft^3/acre (2.1 m^3/ha) to 40 ft^3/acre (2.8 m^3/ha).

In the light of these conclusions, research was therefore directed primarily to a very limited stocking of 'leading desirables' in each crop, it being realised that the land was unlikely to carry healthy final crops of over 100 to 120 sq ft per acre (23–28 m^3/ha) and that adequate growth rate could only be achieved by allowing full crown freedom, at least in the pole stages

of the crop. It was further confirmed, as Malaya had pointed out eight-years previously, that increment cannot be calculated from repeated inventory of tropical high forest crops unless trees are individually identifiable throughout their measurement history.

In all treatments to date, all forms of canopy opening. no matter what their subtle distinctions, promoted seedlings, saplings and small poles while none had any effect on timber-sized trees, however much these appeared to need liberation. After only five years' complete crown liberation, adolescent high forest trees in Uganda had made no useful response to opening such as had been reported from Ghana. If these conclusions were to be substantiated by further work, the logical sequence would be to concentrate tending operations only on the younger crops, i.e. in practice mostly on the regeneration resulting from harvesting and conversion to the uniform system. Therefore the success with field scale arboricide treatments led to more attention being paid to attempts to measure the results of pre-exploitation operations to induce more and better regeneration.

The Silvicultural Section's Annual Report for 1959/60 ran to 16,000 words and the report period was stated to be the most fruitful yet in terms of results achieved, a claim which would be difficult to refute.

The trends in growth rates already established were maintained throughout 1962/63 and confidence was established that the target of a MAI of 1.2 in (3 cm) gbh over a rotation of 60 years, i.e. to produce a 6 ft (1.8m) girth tree in 60 years was achievable. In fact, it was believed confidently that a rate of growth considerably greater than this was possible.

Research plots established in older plantations in Mengo and Bunyoro showed how much their development depended on the degree of clearing before planting. Those planted without deliberate opening, although in lightly exploited forest, stagnated but at least they survived. Experiments were begun to measure their acceleration after arboricidal opening.

New plots were planted with *Maesopsis* after total clear felling.

The Research Plan

An important and stimulating advance was the production in 1953 of a Territorial Silvicultural Research Plan (SRP) which was prepared in an experimental form by the Forest Ecologist and approved in September. The main objectives of the plan were:

(a) to indicate the main problems obstructing silviculture efficiency and to assign priorities to them;

(b) to ensure the sound design, execution, recording and assessment of research plots and to perpetuate the results.

The plan covered a wider field than silviculture in the strict sense and included botanical and ecological studies, the study of pests and diseases of the living plant, etc. The most important principle of the plan was the full and proper recording of all research plots. Progress was made but many plots still remained in 1954 to be properly written up and recorded. Of an estimated 350 plots, 150 were fully recorded but further progress had to await the appointment of an

additional officer to the Silvicultural Division. With his arrival towards the end of 1955, great progress was made in 1956 with the full recording of research plots, a further 145 being written up to give a total of 322 plots at the end of the year.

The 1953 Plan was entirely revised in 1958 by division into a number of separately defined research projects arranged on the Oxford Decimal Classification and ordered according to nine priority headings based on the Government's forest policy. It proved to be most useful and, unlike the original, was in daily use by research staff. A major amendment to the Plan was the addition of a policy statement for an outline of the methods to be used in following up successes amongst the species trials with provenance studies and tree breeding. This was first circulated around the Department as a Technical Note and was later incorporated in the SRP after its approval at a Regional Officers Conference in June 1963.

The second revision of the Plan was completed in June 1963. It included prescriptions for the improvement of control of silvicultural research and continued the work of codifying research practices with the eventual aim of producing standard methods for all the experiments in common use. There were 533 research plots on the register at the end of July 1963, of which 330 were active.

Enumerations

The results of the 1950/52 work in South Mengo were summarised in a paper published in the Empire Forestry Review (June 1952) entitled 'Experiments in low percentage enumerations of tropical high forest'. The most important new conclusions reached were:

(a) sampling errors depend too intimately on population density and distribution to allow prediction of the necessary sampling intensity in a new area before the work starts;

(b) transects need to be fully demarcated and recording units should not be longer than two chains (40m) – as this work is performed by subordinate staff, it is essential to have a method whereby efficient and rapid checking can be done by a responsible officer in the absence of the original enumerator;

(c) considerable care is needed in the categorization of species for enumeration and in the definition of size classes.

Research was also started on intensive enumerations in the Mpanga experimental forest. The forest was enumerated in tenth acre (0.04 ha) plots, about 30 of the more important species being recorded.

Botanical

In 1952 about 300 specimens were laid into the Entebbe Herbarium and 338 distributed to Kew, Oxford and the East African Herbarium. The secondment of an officer of the Department to the Ruwenzori Expedition resulted in a great accretion of montane material

which had not been dealt with by the end of the year. Routine botanical collection continued particularly in the course of enumerations in Kalinzu and Budongo forests.

The publication of I.R. Dale's revision of Dr Eggeling's *Indigenous Trees of Uganda* was a landmark in the Department's history and this officer was also engaged during the year on the preparation of a proposed book on the 'Introduced Trees of Uganda'. It was published in 1953.

A full-time Herbarium Assistant and Librarian was available throughout 1953 with highly beneficial results both to the herbarium and the library. The herbarium contained about 8,800 sheets in 2,600 species but several hundred sheets from Ruwenzori had still to be determined by the British Museum. Some 300 permanent specimens were determined by the Forest Ecologist and many more by Kew and the East African Herbarium.

The herbarium was maintained and extended between 1954 and 1956 – 300 duplicates were distributed to other herbaria. In 1957, the herbarium reached 10,000 sheets in about 3,000 species. District herbaria were maintained at most district headquarters. (This herbarium was eventually handed over to Makerere University to be merged with the one there in 2002.)

A notable discovery in 1956 by the Research Ranger in Budongo was of several large individuals of the West African tree, *Discoglypremna caloneura*, hitherto unrecorded from East Africa. They were only a few yards from a road which had been in constant use since 1943. A considerable achievement was the collection of five trees of *Albizia grandibracteata*, *A. zygia* and *A. gummifera* in apparently 'pure' form for timber tests. Until recently it had proved impossible to distinguish large trees of the first two without leaves – it could now be done on bark alone.

Entomology and Mycology

After completion of training at the Forest School and instruction under the Forest Entomologist, EAAFRO, two Rangers were posted in 1952 as Insect Rangers. They were trained primarily in the routine of collecting information under 'Survey of Forest Insects in East Africa'. One was posted to Opit (Acholi) to make a special study of mvule gall. General collecting by the Insect Rangers made steady progress from 1952 to 1956. A Forest Entomologist was recruited soon after the end of 1956. This initiated a new section of departmental research. The insect collection at Nakawa numbered 455 named species. Two years later it had reached 529 named species, of which 88% were Coleoptera and 40% Cerambycidae alone.

In 1956 *Armillaria mellea* was found on *Pinus radiata* and *Widdringtonia* spp., the latter being apparently highly susceptible. As part of a survey, a plot of eight different pines was established in a heavily infected area to compare susceptibility. The most serious fungal disease was musizi (*Maesopsis eminii*) canker which was first reported from Mwere arboretum (Bugoma) and subsequently was found at Wangu, north of Bombo in West Bugwe and at Mubende. Few trees appeared to have been killed and in the worst affected plantation, Wangu, most of the trees recovered. The exact identity of the causal fungus was uncertain, perhaps a *Fusarium* sp.

Although the reference collection of forest insects increased by only one hundred species in 1956 to a total of 1,404, it received more attention than the previous year in view of the impending preparation of the Departmental Annotated List and EAAFRO's backlog of several thousand unidentified specimens.

Research on termite attack in eucalyptus plantations and treatment with various chemical compounds continued. With the exception of one plot at Moroto, termite control research was centred at Walulumbu where it would receive more attention from the Section. The value of potted plants in reducing the losses (hitherto attributed mainly to termites) suffered by young eucalyptus plantations was clearly shown by Department research plots and by some independent research by the Agricultural Department.

In 1962 a new plot was opened in Budongo as part of a joint project with the EAAFRO Forest Entomologist to study the fluctuations in Ambrosia beetle populations in high forest and their reactions to the intensive tree-poisoning carried out under TSI operations.

Contact was maintained with the entomologist working on the *Milicia* (*Chlorophora*) Gall Fly (*Phytolyma*) in West Africa and on his recommendation some seed of C. *regia* was obtained for trial in Uganda. Although closely related to M. (C.) *excelsa* and apparently producing an identical timber, M. (C.) *regia* appeared to be much less liable to *Phytolyma* galling. This appeared to be borne out by the results – after only one year, from the research plot at Mpanga which showed that the gall fly did not attack the exotic *Milicia* (*Chlorophora*) *regia* and consequently, it might grow twice as fast as the indigenous species.

The insect reference collection expanded considerably in 1963/64 with over 350 new species.

Artificial Regeneration

Arboreta and trial plots were extended in most districts during 1953. Species trials consisted of two categories – the arboretum and the trial plot, the former being confined to groups of not more than 25 trees and including all possible species. The trial plot was normally a chain sq (20 m) and was used only for species of distinct known possibilities. Arboreta were maintained and extended at all silvicultural centres and a large number of new species, largely of *Eucalyptus* and *Pinus* species, introduced in 1955. In all, 124 species were represented in trial plots in 1956. Accelerated work in the discovery of suitable species for plantations in the semi-arid north was badly needed. At the end of 1957, the number of species in trial plots and arboreta was 131, the majority being exotics. There was little sign that the well-tried favourites such as C. *lusitanica*, *P. patula*, *E. saligna*, were likely to be outdone in their respective spheres. The number of trial plots planted in 1963 dropped markedly and fewer unreplicated extensions were planned for the following year.

Hardwood Timber Plantations

A series of trials using closer spacing of indigenous hardwoods was started in 1952 at Budongo, Opit and Kitambwa, covering 29 acres (12 ha). The species used were Mvule, *Khaya* spp., *Maesopsis eminii* and the introduced tree *Gmelina arborea*.

During 1955 there was no extension of work on the silviculture of mvule but all existing experiments were maintained. Dr E.W. Jones of the Imperial Forestry Institute, Oxford spent three weeks in Uganda as part of a study tour right across Africa with a view to a preliminary assessment of the major problems affecting the silviculture of mvule. No new work was undertaken on mvule in 1956 but all plots were kept under observation, a depressing but necessary duty. After from six to 17 years' observation, it was concluded in 1958 that neither *Milicia* (*Chlorophora*), *Khaya*, *Phyllanthus*, *Maesopsis* nor *Gmelina* derived any benefit from being planted under a canopy, however incomplete, of indigenous woodland. *Milicia*, at least, could not be raised to timber size in close plantation either in Lango, Acholi or Busoga but it showed every sign of being an ideal species for wide-spaced culture as might be achieved by a peasant planting scheme with fixed agriculture.

The early growth of *Maesopsis* in Acholi was most promising but it was too soon to judge whether it could be grown on to timber size. Later (1958) it continued to do well. At all major *Eucalyptus* plantations plots were set aside to grow on to timber as this genus was considered to have a potential place in the future timber picture. An experimental thinning of the Kityerera teak plantations was carried out.

Utilisation

The experimental workshop buildings at Nakawa were completed in 1951 except for the seasoning shed. A 3-ton gantry was also erected to unload logs and feed the bandmill. Additional equipment was obtained in 1953 for the experimental workshops at Nakawa. It included a bandsaw lap grinding machine, electric muffle furnace and fly press with dies for blanking saw-teeth. This enabled a start to be made with the workshops although the seasoning sheds had still to be built. The initiation during 1954 of a programme for large scale trials of indigenous species for railway sleepers was a development of probably the greatest potential significance in regard to forest utilisation. The trials were arranged with the EAR&H and embraced the testing in the track of 500 sleepers from each of some ten species at Gilgil in Kenya. It would, of course, be several years before results became available; an assessment in the mid-1960s showed that the *Erythrophloeum* had performed best.

In 1951 strength testing of *Chrysophyllum albidum* and *Albizia zygia* was carried out at the FPRL as well as general tests on mubura (*Parinari excelsa*), a timber with a high silica content which has an abnormal blunting effect on saws and cutters. In 1952 root stocks of tree heaths from Ruwenzori were sent to Dunhills in London for pipe-making trials.

In 1955, a Forest Products Utilisation Research Plan for the period 1955–59 was prepared and approved. It was complementary to the Silvicultural Research Plan approved in 1953 and was drawn up in consultation with the FPRL in the UK. General tests and special tests continued in 1955 on various timbers. Special peeling trials for veneer and plywood were carried out at the FPRL on *Piptadeniastrum*, *Newtonia*, *Mitragyna* and *Aningeria*.

In 1956 general tests were completed at the Utilisation Section Workshops on the timber of *Aningeria altissima*. It was considered to be suitable as a general purpose joinery timber. Trials were completed at the FPRL in England on *Bosquiea phoberos* and *Chrysophyllum albidum*

as plywood timbers. Results were disappointing, the latter being considered unsuitable for any but the lowest grades of plywood while the former, although technically suitable, was considered to be unsuitable for British mills. Other special tests in progress included sea defence trials of Parinari excelsa (mubura) in collaboration with the Timber Development Association in the UK, and in 1960 these showed that after $5\frac{1}{4}$ years of exposure, the annual rate of wear was slightly lower than that of greenheart installed nearby. From the report, it appeared that mubura was as good as greenheart for this purpose and should be considerably cheaper.

The main emphasis in 1957 continued to be on research into the properties and uses of local timbers but towards the end of the year, a programme of milling recovery studies was also begun. Local timber testing was aimed primarily at obtaining immediately useable information and to screen species as a preliminary to more exhaustive testing. For this purpose only relatively elementary pilot testing of the basic properties was done locally. More exhaustive comprehensive tests or special tests for advanced methods of manufacture such as peeling or pulping trials were undertaken by overseas laboratories by arrangement.

The resignation of the Logging and Milling Engineer at the end of 1958 on the expiry of his contract resulted in the mill recovery studies having to be put into abeyance for the time being.

In 1960, sleepers of five species, *Parinari excelsa*, *Holoptelea grandis*, *Celtis sp*, *Erythrophleum guineense* and *Mildbraediodendron excelsum* were handed over to the Railway for preservative treatment and installation in the tracks. Collection of *Piptadeniastrum africanum* sleepers continued. Because of the lack of a Utilisation Officer, research was limited to timber testing as well as peeling trials of *Eucalyptus saligna/grandis*. The *Eucalyptus* was given the normal processing at the Sikh Sawmills & Ginners' plywood plant and a number of test sheets made up. The plywood was of good appearance and no special problems were encountered in manufacture.

Research on *Eucalyptus* crops for transmission poles and timber was raised to third priority because they represented a lot of capital investment and still required an annual recurrent expenditure almost equal to that of the high forest or the softwood plantations. In addition recent suggestions for setting up a paper pulp mill and a continued if unpredictable demand for transmission poles stimulated interest in their growth characteristics.

After tests on fast-grown 13-year-old *Pinus patula* from Kenya, it was considered that mature *P. patula* grown in Uganda could reasonably be expected to be of adequate strength for general building purposes.

A proposal for the establishment of a central utilisation research centre for East Africa with the assistance of UNO was still not decided at the end of 1964. As a result, revision of the Utilisation Research Plan was delayed and no new long-term projects were started. It was thought that if routine timber testing were to be carried out by a central laboratory it would enable the Utilisation Section to devote more time to the improvement of methods of extracting, sawing and handling of timber. R.A. Plumptre was appointed Utilisation Officer in 1963 and timber strength testing continued during the 1960s as did tests on shrinkage and movement.

Conversion studies were carried out on *Eucalyptus saligna* logs from six different sites. Seasoning was undoubtedly the most difficult problem and was critical in the utilisation of this timber in Uganda. Properly seasoned, *E saligna* is an easy timber to work and is very decorative but it will not stand the normal seasoning treatment given by most mills to other Uganda timbers. However it would respond to reconditioning in a special steam chamber built for the purpose alongside the conventional kiln. A trial plot of *E. saligna* at Mbale was maintained with a view to timber production and was thinned accordingly.

The agricultural revolution involved considerable fencing on and around farms. Normally the life of fence posts of either *Eucalyptus* or of commonly available bush species is only one year or two at the most and therefore there is a great potential demand for cheap and efficiently preserved posts. The Section carried out a range of preservation tests using sap displacement by copper-chrome-arsenic salts. The trials were very promising and the method and results were given a very wide circulation.

In 1965, the first revision of the Utilisation Research Plan and the first Entomological and Pathological Research Plan were approved and published. The plans together with that for Silvicultural Research laid down priorities and procedures for research and list all projects and trials.

Timber testing of natural high forest species was nearing completion in 1964/65. Plans were made for full scale testing of the more important plantation species.

A small pressure impregnation plant was installed and trials started to determine the resistance to impregnation of NHF species. A prototype solar dryer was built in 1965

A 70hp four-wheel drive articulated logging tractor was obtained as a gift from the Canadian Government. A log turner, also from the Canadian Government, was installed. The British Government supplied conveyors and a new 8-inch Stenner bandsaw and carriage, plus conveyors for the whole mill and a sawdust extraction system..

For the first time it was possible, due to the availability of staff, to carry out detailed sawmill studies.

Increment/Establishment Plots

Plots of various exotic species were maintained or extended in 1951. Increment plots of native species including mahogany, mvule etc were maintained. Remeasurements were made of *Podocarpus* trees planted by L.C. Chalk in Masaka in 1922/23. Height growths ranged from 10 ft to 40 ft (3–12 m) with gbh up to 2 ft 6 in (0.75m).

Increment and establishment plots were maintained or extended in 1952 – a number of new species, coniferous and broad-leaved were introduced. Rotation and spacing plots of *E. saligna* were felled (4 years) at Kampala – girth varied directly with the spacing but yield was in inverse proportion.

Soil Investigations

Soil investigations were made at West Bugwe, Kigezi and Kyehara in 1951 and fertiliser trials were begun in the Lango/Acholi nurseries.

In nursery fertiliser trials at Opit there were indications that NPK had a beneficial effect on mvule transplants.

A series of fertiliser experiments in eucalyptus, pine and cypress nurseries showed a universal benefit from the use of NPK, ranging from 10% to 200% improvement in height of seedlings according to locality. At Kitubulu, mvule showed no response either to fertiliser or trace elements.

Work on *Maesopsis* seed started in 1956 began to show results in the nurseries but direct sowings in the field continued to disappoint.

Arboricides

Assessment was continued on the efficiency of contact arboricides, the indication being that 2,4-D was almost as lethal as 2,4,5-T though taking longer to act.

Work was started in Karamoja on the use of arboricides for killing out scrub growth with a view to pasture improvement. Experiments near Moroto proved that most bush species could be killed by a basal spray of ½% 2,4,5-T in diesel oil and that crown sprays were uneconomic and were only partially effective.

Electric Fencing

Three experimental fences were erected in natural forest and maintained with a great variety of batteries, insulators and wire but maintenance costs reached the appallingly high figure of £5 per mile (1.61 km) due to the frequency of short circuits from cob-webs, falling branches, climbers and luxuriant vegetation and the frequency in some areas of breaks caused by animals. Buffalo were generally defeated, elephant rarely. The study was wound up in 1960 for the above reasons.

In the only area where elephant were excluded successfully, the effect on sapling regeneration was phenomenal. Five years of persistent lopping gave way to some of the most rapid growth ever seen in Ugandan natural forest.

Microclimate

The construction in 1958 of a 120 ft (37 m) steel tower in the Mpanga forest by the EA Virus Research Institute to study mosquitoes allowed the Department to accumulate data on wind, humidity and temperature at all layers of the forest. It was soon evident that saturation deficit was very considerably lowered by understorey conditions. An attempt was made later to move the tower or erect another one at a more suitable location.

An unexpected bonus came via the light traps on the tower which were a notable source of other interesting species of insects.

Volume Tables and Analysis of Data.

New mahogany volume tables for Budongo were compiled in 1956 taking full account of buttress and crown rejects. This required no change in yield control prescription for the forest.

Considerable progress was also made with the production of volume tables for the high forest species with the assistance of the computer service of the Commonwealth Forestry Institute. In all, 20 two-dimensional tables (i.e. based on girth at 10 ft (3 m) and timber height) and 19 tables based on girth at 10 ft (3 m) only were produced.

J.N.R. Jeffers, Statistician with the UK Forestry Commission, spent one month in East Africa, including ten days in Uganda, visiting research plots and examining details of individual plots as well as general principles of their control, design, execution and analysis. The purpose of the visit, which was sponsored by the Department of Technical Co-operation, London, was to advise on the application of statistical methods to forest research with particular emphasis on modern methods of recording experimental data so that they could be subjected to mathematical analysis by means of electronic digital computers. His valuable report was accepted and the implementations of its recommendations resulted in improved planning of research and, what was badly needed, speedy analysis of the data.

Yield Tables

Work on compiling East African yield tables for the main conifers was started during 1956 with co-ordination by EAAFRO. Quality classes for *Cupressus lusitanica* were tentatively defined and sample plot work started early in 1957. According to the first draft of a yield table produced the following year, Uganda crops were of high quality, lying mostly in QI with some QII. By East African standards there were no QIII crops. Seven- to ten-year-old crops on better sites at Mafuga and Lendu showed mean annual increments from 245 to 325 cu ft/acre (17 to 23 m^3/ha).

Some astonishing volume increments were found in softwoods and *Eucalyptus* in 1959/60. In the latter, MAI ranges from 250 ft3/acre (17.5 m^3/ha) on poor soils in the east to over 800 ft^3/acre (56 m^3/ha) in Toro. In the case of conifers, MAI ranges from 150 to 350 ft^3/acre (10.5 to 24.5 m^3/ha), the best performance being Cupressus on forest sites at from 5,000–6,000 feet altitude (1,500–1,800 m) in altitude.

Diagnostic Sampling

This technique of diagnosis adapted from Landon's 'LS' method of Malaya was tested on field scale by research staff in 1958. This resulted in some simplification of the method described in Paper 34 (Imperial Forestry Institute) as set out in departmental standing orders for tropical high forest treatment.

Seed Supplies

Thanks to the contacts made by the Silviculturist during the FAO study tour of Latin America and the attention which the tour focussed on these countries, the supply of seed of many of the Latin American conifers improved although it still remained inadequate. The most welcome acquisition was 35 lbs (15 kg) of *Pinus caribaea* var. *hondurensis* obtained through the Department of Technical Co-operation, London.

Seed Orchards and Tree Breeding

In 1962/63 the *Ecologist* reported 'Talk, talk, talk and paperwork was all there was to report'. Grafting for practice was started in the Entebbe nursery.

8 Production and Trade

Timber (Tables 7–10)

General

While production of timber in 1951 was maintained at approximately the 1950 level, it soon became apparent that domestic demands were unlikely to be satisfied unless exports were reduced. Consequently in March an embargo was placed on all exports from the territory with the exception of *Antiaris* logs, shorts and flooring strips. At the same time price control was abolished in the hope that if prices were allowed to find their own level, it would be a stimulus to production. Although the export embargo was introduced as a temporary measure, it was not possible to lift it a year later since accumulated stocks of sawn timber were still very low. Towards the end of the following year, the embargo was removed except for mvule and part of the mahogany production.

There was an increase in production of sawn timber during 1952 and in certain categories, a buyers' market was developing. The expected introduction of preservative treatment plants in Jinja and Kampala in 1953 would permit the utilisation of a much wider range of species and, it was hoped, the release of mvule and mahogany from export control.

Owing to the failure of the suppliers to secure onward shipping space, it was not possible to take full advantage of the promising market in South Africa for *Antiaris* logs and this was aggravated by the high incidence of Ambrosia beetle damage. The filling of orders from the UK for muhimbi (*Cynometra alexandri*) flooring gave great concern during 1952. The successful use of this timber in the flooring of the foyer of the Royal Festival Hall and in other installations in London, gave a valuable impetus to demand but none of the mills was able to maintain an acceptable standard of production. Ambrosia beetle was the principal reason for rejection.

Exports continued to be negligible both in volume and value and mills were almost entirely dependent on the domestic market which showed no signs of weakening. Unless it was possible to obtain export orders for sleepers and a less exacting specification for flooring strips, the immediate prospect of marketing muhimbi in quantity, appeared remote. In 1955 the muhimbi cut increased from 1,000 to 2,000 tons (900 to 1,800 tonnes).

As a result of a recommendation of the East Africa Timber Advisory Board in 1958, accepted by all three territories, saw-logs were measured in cu ft true measure instead of Hoppus foot from 1st July 1958.

The Uganda Timber Sales (UTS), a co-operative marketing association in existence since 1937, was voluntarily wound up at the end of 1959. The company had fallen on hard times and the members felt that their interests would be better served by a return to independent marketing.

The local market was very dull in 1959 and 1960 due to a trade boycott in Buganda and the general fall in agricultural produce prices which also resulted in reduced timber sales.

Some interesting information regarding local markets was revealed by the survey of timber consumption carried out by the FAO mission as a preliminary to forecasting future needs. One major point was the magnitude of the African domestic consumption by which was meant use for doors, windows, shutters and their frames, roofing timbers and furniture in African households. Out of a total present sawn timber consumption of about 3 million cu ft (85,000 m^3) a year, this sector was reckoned to absorb about 2 million (57,000 m^3) and was expected to continue to do so. Compared with this, the Public Works Department's consumption, on which many millers set great store, was modest, absorbing only about a twelfth of the total.

Another point was the large amount of packing case wood that is re-used for African domestic purposes – it was estimated that about a fifth of the African consumption was obtained from this source. Thirdly, the consumption of timber appeared to be closely related to the African income level and closely paralleled the payments to cotton and coffee growers. And lastly, although timber consumption had declined somewhat over the last two or three years, it had held its own well compared with other building materials. These factors indicated the importance of the African domestic market and suggested that in the long term it would repay millers to devote greater attention to it.

The Timber Industry Committee and the Cess Fund were wound up on 2.7.59. The Government's share of the cash balance was £9,677 which was placed in a special fund to be devoted to utilisation research.

There was an increase of about 12½% in the cut of saw and veneer logs in 1960/61, surprising in view of reports that the local market was very depressed. The main increases in harvesting came from Local Government forests and unreserved land in Buganda, Bunyoro and Busoga (mvule).

Sawmilling

The number of mills working in 1961 remained much the same as in the previous two years at about 30. These comprised eight working in or supplied from concessions over CFRs, six from concessions over LFRs and unreserved public land and about 16 working in private woodland. These numbers remained about the same over the next three years.

Industrial mill outputs ranged from a few hundred tons to over 7,000 tons (7,100 tonnes). Most of the mills cutting in CFR concessions produced between 1,000 (1,020 tonnes) and 3,000 tons (3,050 tonnes) but one produced over 7,000 tons (7,100 tonnes). The mills working in private woodland rarely produced more than a few hundred tons and their working was often spasmodic. Their production returns, even if available, were not reliable so with the

aim of improving production statistics, not only from private forests but from all mills, a new form of return which it was hoped would be less ambiguous and more comprehensive was drawn up and agreed with the industry and brought into use with effect from the end of 1961. In spite of the improved form, reliable production figures from private mills and from some concession mills were still lacking.

There was a drop of 400,000 cu ft (11,000 tons), i.e. 12½%, in harvesting in 1961/62 due to the general trade recession and the heavy rains in the last quarter of 1961. Several mills ceased production for several weeks at a time. One mill in the lake-shore podo forests in south Buganda was closed for the whole year because of flooding.

Developments worthy of note were: (1) the completion of a modern steam-electric mill in the Western Province; and (2) the addition to a large established mill, also in the Western Province, of machinery for producing mouldings, floor blocks and strips. In spite of these advances, the power in most mills in Uganda was inadequate for the saws. Steam power continued to be used in the majority of mills but diesel or electric power was becoming more popular in the larger ones. Also extraction was still being carried out by crawler tractors and/or lorries. Only half of the tractors were equipped with winches and very few with logging arches. One new concession was opened in 1963/64 over the Siba/Biisu block of the Budongo Forest. Erection of the mill was almost completed by the end of the year. It was the only mill in Uganda with log-turners and conveyors.

The licensees in the softwood plantations at Lendu and Mafuga/Muko overcame their teething troubles and were able to sell all their production in 1963/64. The Lendu miller was hampered by lack of capital for the purchase of another and larger saw which was needed to cope with the increasing amounts of thinnings available. This was rectified in 1965 when he obtained a loan from the Uganda Development Corporation for the purchase of a new band-saw whereupon production increased from 20 to 41 tons (20 to 41 tonnes) per month. Two McConnel saws purchased by the Department and operated by Ugandans at Kyehara and Bugamba also contributed to the output of softwoods from these plantations.

A Uganda Timber Millers' Association was formed in 1963 with the object *inter alia* of representing and advocating the views and policies of the Association to Government and other authorities and bodies. It comprised ten of the major millers but it was far from being a strong and energetic organisation. The results of a survey of the sawmilling industry were published in *Forest Department Bulletin No 8 – The Uganda Timber Industry.*

Logging

There were indications at the beginning of the period of some improvement in the operation of concessions and sawmills on Crown lands although there was a disappointing reduction by 17% in the cut for the year. Incentive to invest capital was provided by longer terms of tenure and the equipment installed or on order would result, it was hoped, in an increase in production by the end of 1952 but, more importantly, an increase in quality of output. There was still a tendency to indulge in excessively long tractor hauls and a reluctance to build permanent lorry loads. Some improvement was made in the construction of lorry roads in 1952

under the new long-term licences. With one exception, all logs were still ground-skidded by tractors. The following year, it was reported that there was little progress in improvement of logging methods, only two operators using logging arches with highly successful results. There was also some reluctance to install suitable saw-doctoring facilities but equipment was on order.

In the following year, there was some improvement in modernisation of logging equipment. The policy of granting long-term licences (ten years with renewal options for two further ten-year periods) made it possible to insist on modernisation for all mills operating in CFRs. During the last two or three years the industry had invested large amounts of money in rebuilding and re-equipping their mills and it was now essential that a corps of skilled operatives be built up so as to get the best out of the new machines. But there was still no system of apprenticeship or any form of training for young operatives. Later, in 1963/64, the lack of proper technical training of staff at all levels was deplored – the strictures applied not only to milling and logging but also to seasoning and preservation.

Timber Grading and Seasoning

The Timber Grading Officer and his staff graded 3,350 tons (3,400 tonnes) of timber in 1951 but there was still too high a proportion of poor quality timber presented for inspection and the rejection was high in many cases. The only seasoning undertaken in Uganda was by the Uganda Timber Sales but the demand was so heavy that stocks were very low at the end of the year.

In spite of reduction in exports, there was an increase in the demand for graded timber for domestic use in 1952. The TGO and his staff graded 4,295 tons (4,360 tonnes) and in the course of their duties travelled 26,000 miles (42,000 km) by road, rail, canoe, steamer and bicycle. In March, grading charges were introduced – shs 4 per ton of 50 cu ft (1.4 m^3) of round timber and shs 12 per ton of sawn timber. Stocks of seasoned timber were again very low but there was some improvement in 1953 when stocks held by UTS amounted to about 2,500 tons (2,540 tonnes). These stocks were almost solely of mahogany, mvule and podo and the entire production of secondary timbers found its way onto the market unseasoned. There was an increased demand for graded timber for domestic use in 1953 – a total of 5,650 tons (5,740 tonnes) was graded of which 4,385 tons (4,450 tonnes) were passed. Towards the end of the year, the timber trade expressed its willingness to have its own graders and this came about the following year. During 1954, deliveries to the UTS for seasoning increased to 3,300 tons and sales were 3,000 tons. In 1957, it was reported with satisfaction that grading of export timber continued up to standard.

The PWD expanded its storage facilities at Kampala and Jinja and installed excellent modern seasoning sheds which enabled them to increase their own seasoning. Towards the end of 1954, the first commercial seasoning kiln was in course of construction at Jinja and was ready for operation in 1955. Also in that year, the first commercial pressure impregnation plant was in operation also in Jinja, and a second one started operations in Kampala. Three more were on order. The building trade, however, was slow to use impregnated timber

and the treatment plants already installed were not working to full capacity. In spite of this disappointing performance, two more plants were installed in 1957, making the total four. A fifth was added in 1962. One mill used a steam treatment before drawing a vacuum which improved the penetration due to the pre-seasoning of the timber. All the other plants were treating timber which had not been dried sufficiently beforehand. Nevertheless, the PWD gave an invaluable lead in the use of pressure impregnated timber in permanent structures, which practice, it was hoped, would spread. The UTS maintained seasoning depots at Masindi, Jinja and Nsinze and opened a new depot at Kampala, but there were still little or no stocks of properly seasoned and treated timber in the country except those of the Ministry of Works.

New draft East Africa grading rules were approved by the East Africa Timber Advisory Board. Timber imported from Kenya continued to be inspected against *Oemida*.

Plywood

One of the major sawmilling concerns began the installation of a plywood and block-board factory in Jinja and was almost ready to start production at the end of 1958. The eventual aim was 10 million sq ft (900,000 m^2) a year. It made substantial progress in 1959 when about 2.4 million sq ft (0.22 million m^2) of plywood and block-board were produced, a large part of production being tea chests for the EA tea industry. In the following year, the factory increased its production substantially to about 3.7 million sq ft (0.33 million m^2) of plywood and 123,000 sq ft (11,400 m^2) of block-board. Tea chest production was about 300,000 a year. Because of its successful record, expansion of the plant was begun.

Progress continued in 1961/62 when it produced just over 5 million sq ft (450,000 m^2) of plywood and 79,000 sq ft (7,200 m^2) of block-board. This was 35% more than the previous year, the greater part being tea chests (235,000). There was another increase the following year when production of plywood increased to 5.7 million sq ft (0.5 million m^2) but block-board declined to 47,000 sq ft (4,300 m^2). In 1963/64 production of plywood went down to 5.6 million sq ft (0.5 million m^2) and block-board increased to 120,000 sq ft (11,000 m^2).

Pulp and Paper

Plans were announced in the press in 1962/63 for the establishment of a pulp and paper mill and a match factory in Jinja but they appeared to be still at the exploratory stage at the end of the year. No decision was reached about the pulp and paper mill by the end of the following year but a match factory was expected to be completed by the end of 1964. It went into production in 1965 with a capacity of 40 million boxes/year. Several indigenous species and some exotic softwoods were tried and several were found to be satisfactory. The factory standardised on *Maesopsis eminii* for outer and inner plies of boxes; this was also found suitable for matches but its dark colour was not acceptable.

Timber Production (in cubic metres)

	CFRs and Public Land	LFRs	Public Land	Amounts of Mahogany and Mvule Cut on CFRs and Public Land		
				Mvule	*Mahogany*	*Total (5 & (6)*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1951	43,100	–	–	12,200	15,200	27,400
1952	56,900	–	–	13,700	11,000	24,700
1953	57,400	3,100	–	6,600	13,400	20,000
1954	58,300	–	–	9,100	17,700	26,800
1955	71,400	4,900	–	11,400	21,400	32,800
1956	55,900	1,100	8,300	900	21,600	22,500
1957	59,100	210	8,200	700	17,500	18,200
1958	65,300	2,400	15,200	1,800	24,000	25,800
1959 (½ year only)	33,400	3,100	7,700	–	–	–
1959/60	64,600	2,100	16,500	–	–	–
1960/61	67,000	4,300	21,600	4,200	19,000	23,200
1961/62	60,500	1,800	19,500	3,000	19,100	22,100
1962/63	64,700	74,000	11,300	2,300	16,400	18,700
1963/64	80,600	49,000	5,000	800	18,400	19,200
1964/65	87,700	250	14,900	900	23,900	24,800
	925,900	**146,260**	**128,200**	**67,600**	**238,600**	**306,200**

Notes
1. Column 2 refers to public land in districts which have not achieved AFE.
2. Column 4 refers to public land in districts which have achieved AFE.
3. The table is not complete – the blanks are due to the information not being available.

From columns (5) and (6) it can be seen how important a contribution to the out-turn was made by mvule and mahogany from CFRs and public land (column 2). In the early years, it was as high as 45% to 66% but after 1955 when Busoga achieved AFE, and therefore control of cutting on public land there passed to the control of the local government, the amount of mvule decreased considerably. This did not affect the total out-turn which continued throughout the period at over 56,000 m^3 due to two factors.

The first was the surge in output of mahogany which reached peaks of 24,000 m^3 in 1958 and again in 1964/65. The second was the increasing number of timber species which were being harvested. In 1953, the first year in which most of the various species were identified in the records, there were between 35 and 40 and in the following two years, the total was about the same. From then on it rose steadily to between 60 and 65 due to the work of the Utilisation Section in promoting them and to the saw millers responding to the prompting of the Department.

Imports and Exports

	Imports £	Exports £
1951	52,650	67,600
1952	53,070	16,200
1953	44,320	11,610
1954	199,480	20,890
1955	813,480	23,400
1956	–	–
1957	664,860	55,220
1958	770,810	98,550
1959	630,540	159,900
1960	646,000	254,000
1961	631,650	293,150
1962	604,320	250,640
1963	765,500	216,700
1964	1,226,900	189,600
1965	1,683,800	328,500

This table is based on annual returns from the East African Customs and Excise and refers to calendar years. The figures for 1956 are missing.

As can be seen from the table, the figure for imports in 1955 increased four-fold and from 1957 to the end of the period (1963), they were in the region of £600,000 to £770,000, well above the figures for exports, and then jumped to over a million pounds. The reason for these large increases was due to items for pulp and papers of various kinds being included for the first time. From 1955 until 1962 they amounted to between £450,000 and £500,000 per annum and in 1963 were over £553,000.

Before 1955, the main exports included in the returns were timber in the round and sawn, and timber remained the backbone throughout the period. From 1957 onwards when the plywood factory at Jinja came into production, the annual exports were about one million sq ft (91,000 m^2) bringing in a return of approximately £22,000 a year. Almost the whole of the output exported went to Kenya and Tanzania. In the early years, in addition of the timber exports there were only a few smaller items such as flooring strips, builders' woodwork, wooden furniture and fibre boards. By 1963, the list had grown to 22 items covering both imports and exports.

It is interesting to note (Table 11) the countries which did business then with Uganda. On the exports side they were UK, Kenya, Tanzania, Southern Rhodesia (Zimbabwe), Congo, Ruanda, Sudan, India, Pakistan, Aden/Bahrain and Belgium. There is a much longer list for imports – UK, Kenya, Tanzania, Congo, Ruanda, Japan, Finland, Sweden, Norway, Denmark, Netherlands, West Germany, South Africa, Canada, Austria, France, Israel and Czechoslovakia. In addition to these lists, there were probably others which were unspecified because they were for small amounts.

Poles (Table 7B)

From the table of output of poles, it will be seen that production from CFRs went down after 1956 and that from LFRs took its place as the chief provider from 1958. Before those dates, it had been felt that the African Local Governments were supplying an increasing quantity of poles – and firewood – but the extent of their activities was not realised because records were not available until 1958. In the west the principal consumer of poles in 1952 was the Kilembe mine and the Fort Portal plantations continued to supply them at the rate of 1,800 per month.

The following year the demand for poles showed its usual local fluctuation depending on the scale of constructional activities. In Buganda there was some temporary difficulty in meeting the requirements of the Uganda Electricity Board for special-sized transmission-line poles which increased from 830 in 1952 to 2,300 in 1953. In Masaka the demand for smaller poles rose from 12,000 to 20,000. In Toro, sales from the Fort Portal plantations dropped from 10,000 to 3,000 largely because Kilembe mines were able to obtain their requirements elsewhere – on the other hand, production from the Nyamusagani plantations rose from 6,000 to 14,000, mainly owing to the Kazinga Channel Bridge project. In the Eastern Province the demand for poles increased abnormally to 90,000 due partly to extensive building activities and partly to provide temporary shelters for the record 1953 maize crop.

With the steady devolution of responsibility for forest growth outside CFRs to Local Authorities, there was a decline in the quantity of bush poles and fuel recorded by the Forest Department. On the other hand, there was a substantial increase in 1955 in production of plantation-grown poles and fuel. Supply of poles increased from 273,000 to 335,000, much of the increase being due to the surprisingly heavy demands on the Kampala/Entebbe plantations where sales over the last two years were:

	small poles (number)	transmission poles (number)
1954	92,840	4,274
1955	113,350	7,200

There was, however, in spite of the increases, room for considerable expansion in the use of locally grown transmission poles – large numbers of creosoted poles were still being imported for the distribution network supplied by the Owen Falls dam and other generators. Discussions were held with the Posts and Telegraphs Administration and the UEB on the question of additional impregnation plant for transmission poles but no decision was reached by the end of the year. In 1956 the demand for plantation-grown poles increased to 398,000 which included a large number of transmission poles (4,300 in 1954, 7,200 in 1955 and 12,000 in 1956). In the past, many of these poles were obtained partly from Scandinavia and South Africa but normal demands could now be met locally.

There was a large drop in demands for plantation poles in 1957, the number cut being only 252,000 as against 398,000 in 1956, i.e. a drop of 36%. Although there was a reduction

in the cut of plantation poles, the sale of bush poles increased from 5,400 in 1956 to 23,600 in 1957. At the time this was thought to be due to the fact that fees for plantation poles, but not for bush poles, were increased in 1956 but this idea was contradicted the following year when output of plantation poles increased by 7,000 whereas that of bush poles went down by 8,000. Output from LFRs and public land was first recorded in 1958 and over the next two and a half years was generally little below that from CFRs.

	CFRs		LFRs	
	plantation poles	**bush poles**	**plantation poles**	**bush poles**
1958	249,000	1,600	243,500	680
first half of 1959	134,000	–	128,000	–
1959/60	253,000	41,000	220,000	1,000

The first record of softwood poles from thinnings from the Mafuga and West Nile plantations was in 1959/60 when over 47,000 were produced and increases were maintained over the next five years except in 1962/63 when only about 41,000 were produced.

In the year to June 1961, the total output of poles was 447,000, a decrease of 67,000 or 13% on the 1959/60 figure. The main drop was in the Central Government hardwood plantations in all provinces except the EP which remained at much the same level as the previous year. The reason for the fall was probably the general shortage of money due to poor agricultural crop prices and the reduced building activity. There was some resurgence in demand for transmission poles, about 1,800 being harvested, but, nevertheless, it was a far cry from the figures of 10,000 to 11,000 which prevailed four and five years previously, partly because the Uganda Electricity Board had completed the main expansion of their distribution system.

In the year 1961/62, a total of 411,000 poles were harvested, a low figure which was due partly to the lowest output at 110,000 from CFRs for the last ten years. This clearly falling trend pointed the need for an early appraisal of the future for many of these pole and fuel plantations. A welcome new activity was the production of preservative-treated fence posts which were becoming very popular with progressive farmers, cattle ranching schemes etc. A start was made in 1960/61 when 3,000 posts were produced in the EP but sales suffered later on from competition from wattle poles from Kenya. Local production, however, continued and 2,830 posts were sold in 1963/64.

The total consumption of poles in the country was reckoned by the FAO study team who also included poles in the study to be about 23 million cubic feet a year (c. 20 million poles). Of this, all except about half a million came from unreserved woodland. Future requirements were expected to more than double by the end of the century.

Output of Plantation and Bush Poles

Period	CFRs and Public Land				LFRs and Public Land	
	Plantation			Bush	Plantation	Bush
	Hardwood Total Cl.1–4	Hardwood Cl.5–6 (Transmiss.) (no.)	Softwood Cl 1–4 (no.)	Hardwood	Hardwood Cl 1–4 (no.)	Hardwood (no.)
1951	300,000 cu ft			21,050 cu ft		
1952	344,200 cu ft	830		8,300 cu ft		
1953	308,500 no.	2,300		10,100 no.		
1954	273,000 no.	4,300		35,200 no.		
1955	335,000 no.	7,200		34,500 no.		
1956	396,000 no.	12,000		5,400 no.		
1957	242,100 no.	10,000		23,600 no.		
1958	249,000 no.	9,000		15,520 no.	243,500	680
first half of 1959	134,000 no.	1,500		29,000 no.	128,000	
1959/60	253,000 no.	1,500	47,260	41,500 no.	220,000	1,000
1960/61	146,750 no.	1,800	57,750	15,000 no.	226,200	900
1961/62	104,200 no.	5,800	54,300	20,700 no.	221,700	4,000
1962/63	81,900 no.	3,400	40,820	21,020 no.	218,350	5,370
1963/64	100,130 no.	1,850	68,000	7,780 no.	90,820	520
1964/65	135,000 no.		54,600	5,900 no.	142,000	1,080

Notes

(a) Hardwood plantation poles are mainly *Eucalyptus*, with some *Cassia siamea* and other spp.

(b) Pole sizes (from Tech. Note 88/1960). All measurements are at the base of the pole, over bark. Underbark measurements are 10% less. This classification was later changed:

Class		Max. Girth
1	10 in	25 cm
2	20 in	51 cm
3	25 in	63 cm
4	30 in	76 cm
5	36 in	91 cm – electricity transmission line poles
6	48 in	122 cm – electricity transmission line poles

(c) The figures for the first two years are given in cubic feet (numbers of poles are not available); the remainder are in numbers of poles of all sizes. Sales of poles were locally recorded by number and size class; then for central records and annual reports these were converted to volumes in cu ft by factors which were changed several times during these 15 years. To maintain serial compatibility, this table records numbers of poles. An approximation to volume may be obtained by applying a conversion factor of 1 pole = 1.2 cu ft = 0.034 cu m, this being the size of the commonest pole, Cl 2, 15 ft long. For transmission poles, an approximate factor is 1 pole = 10 cu ft = 0.28 cu m.

(d) Before 1959 softwood poles were not recorded; nor were poles from LFRs and public land before 1958.

(e) The figures in the table are for the recorded output only and do not include the very large numbers of bush poles taken by Africans for their own domestic use from unreserved land plus many fewer from their own planted trees, neither of which are recorded, though total consumption was estimated by FAO at 23 million cu ft (c. 650,000 cu m, c. 20 million poles).

Firewood (Table 7B)

While there were local decreases in production of firewood in 1951, total production under Forest Department licences increased by about 10%. One exception was the Kampala fuel plantations which were hit badly by flooding of some of the swamp compartments due to the abnormal rains. In 1963/64 over 1,100 acres (450 ha) were written off because all attempts to improve the drainage had been unsuccessful and the crops had been killed by flooding. Elsewhere township supplies were, in general, adequate though the situation was serious in Mbarara due to lack of foresight in the management of the plantations. At Fort Portal it was difficult to convince the irate inhabitants that the magnificent Eucalyptus plantations proliferating on their very doorsteps were not for their firewood supplies but for the pole and pit-prop requirements of Kilembe mine.

Production of plantation-grown fuel continued in 1954 at much the same level as the previous two years. In Bukedi demands for fuel for the new cement factory were heavy at the beginning of the year and were supplied partly from the West Bugwe LFR and partly from Departmental plantations. Owing to changes in production methods at the factory, no more bush fuel was cut after the middle of the year and the eventual requirements of the factory for fuel were unknown. In Buganda an increase of 6,000 cu yd of plantation fuel from the Kampala plantations was due to purchases by the Railway to feed the wood-burning locomotives in temporary use on the Western Extension of the Railway. This offset to some extent the declining use of domestic wood fuel in the major townships.

Over the next few years, there were fluctuations in the output of firewood as may be seen from the table. The increase in the consumption of bush fuel was due partly because the factories in the Western Province were taking considerable quantities for drying tea. As with pole production, the inclusion of records for firewood production from LFRs and public land from 1958 onwards shows the important contribution which these sources made to the total output.

Charcoal (Table 7B)

A promising development was the start in 1960/61 of production of charcoal from the Tororo plantations for the Uganda Cement Industries. It was begun on a trial basis the previous year and the contractor concerned had got into regular commercial production and was producing 50 to 60 tons (51 to 61 tonnes) a month. It was hoped that production could be expanded and extended to other plantations in the vicinity but the hope was not fulfilled. Production got into difficulties owing to the contractor failing to maintain the quality of the charcoal to the required standard. As a result, no further supplies were accepted by the cement works and the business was at a standstill with consequent disruption of the plantations in the Mbale/Tororo area. Although this attempt to establish a charcoal industry was a failure, the industry made a spectacular comeback from 1963 onwards based on the utilisation of weed trees in the Mengo natural forests.

Output of Plantation and Bush Firewood

	CFRs and Public Land		LFRs and Public Land	
Period	Plantation	Bush	Plantation	Bush
1951	solid cu ft	solid cu ft		
	300,000	21,050		
1952	344,200	8,300		
1953	stacked cu yds	stacked cu yds	stacked cu yds	stacked cu yds
76,750	174,450			
1954	76,100	10,390		
1955	99,380	43,160		
1956	89,910	16,630		
1957	86,140	20,050		
1958	84,105	2,570	19,290	31,000
first half of 1959	39,000	4,000	13,000	78,090
1959/60	87,000	10,000	25,000	66,000
1960/61	81,610	7,020	22,410	78,090
1961/62	82,010	7,990	35,110	50,100
1962/63	63,270	14,390	62,700	56,344
1963/64	76,020	36,630	49,320	29,730
1964/65	66,200	61,500	41,600	11,000

Notes

(a) The figures for 1951 and 1952 are recorded in cubic feet – the remainder in stacked cubic yards (= 0.76 stacked cu m). Solid wood volume, under-bark, is about half of this.

(b) Records for LFRs and public land were started in 1958.

(c) These figures do not include the very large quantities of bush fuel taken by Africans for their own domestic use from unreserved land. These are not recorded but were estimated by the FAO census to be several million cu.m annually.

Minor Forest Produce (Table 7B)

In the early years of the period, the chief products were collection of wild coffee from the Kibale forest, the sale and free issue of seeds and plants, bamboos and canes and to a lesser extent, Christmas trees in urban areas. The most valuable of these was the collection of wild coffee which was carried out under licence on a system whereby the profits were divided between the licensee and Government. The maximum production was achieved in 1958 when 166 tons (169 tonnes) were collected but the highest value was probably in 1951 when over £3,000 was the Government's share. In 1960/61, because of the need to restrict coffee production and the poor quality of the coffee, no further licences were granted. By comparison, although regarded as an agricultural product, the collection of the fruits of the Shea Butter Nut Tree (*Butyrospermum parkii* = *paradoxum*) brought a sum of £34,000 to the collectors in Teso District alone in 1951.

Seeds, chiefly Eucalyptus species, were sold or given free to encourage private planting. During the five-year period beginning in 1957, the average annual issue was nearly 240 lb (104 kg), a huge number of the tiny Eucalyptus seeds, but these figures were eclipsed in 1962/63 when no less than 1,048 lb (456 kg) were sold or issued free. Distribution of plants,

again chiefly Eucalyptus species, was about several thousand annually in the early years but reached over a million in 1959/60.

Bamboos and canes were very popular in the Northern and Western Provinces. The cut ranged annually around half a million except in 1959 when it was estimated to be in the region of a million. The sale of Christmas trees went from 220 annually in the 1950s to over 2,200 in 1963/64.

9 Training and Publicity

Forest School

(Plate 19)

From 1932 to 1941 a forest school for training rangers had been sited at Kityerera in south Busoga, but then had to be closed due to invasion of the area by tsetse flies carrying the sleeping sickness epidemic. Training lapsed during the war and was not resumed until 1948.

By great good fortune an ideal site for the new forest school became available. During the 1939–45 war large numbers of Polish refugees, originally deported to Soviet Russia then later permitted to leave, had arrived in Uganda. They were accommodated in two camps one on Kojja on the shore of Lake Victoria near Mukono, the other at Nyabyeya in Masindi district, on the edge of the Budongo forest. In 1943 the latter held 3,200 refugees, mostly women and children, but by 1948 all had left and the camps had been closed, so the Department was given the use of the camp at Nyabyeya and opened it for courses immediately (Kiyaga-Mulindwa, 2000).[1]

By 1951 the school was fully in operation with ranger students in residence and the Budongo forest being used as a convenient area for practical instruction. A major programme had been started to replace the original buildings (all of timber cut in the Budongo forest and some now showing the ravages of termite attack) with new masonry ones, though the large Polish masonry church and its graveyard still survive (Osmaston 2001).[2]

In August 1953 the Principal, H.R. Webb MBE, retired after 24 years of exceptional service in Uganda. The School was almost entirely of his making, physically, instructionally and morally, and the tone of the School was as substantial a record of his work as the buildings and curriculum. It was fitting that on the eve of his departure, H.E. the Governor and Lady Cohen, should visit the School and lay the foundation of Webb Hall, the new instructional block named in honour of Ray and Helen Webb.

1953 was a memorable and arduous year for the school. Major building developments were begun during a period of staff changes and under considerable difficulties. Much of the

1 Kiyaga-Mulindwa, 2000. 'Uganda: a safe refuge for Polish refugees', *Uganda Journal* 46, 67–72.

2 H.A. Osmaston, 2001. 'Snakes and Poles', *Uganda Journal* 47, 80–82.

PLATE 19
The Forest School, Nyabyeya, near the Budongo Forest in 1958/61. Founded in 1948 on the site of a former wartime Polish refugee camp, during 1950–65 this was developed into an effective training establishment for the large numbers of rangers and foresters required by the expanding department (it survived the terrible events of the 1980s and has expanded further, being now (2001) 'Nyabyeya Forest College' under the control of the Education Department but staffed by foresters).
(J.W.M. Stephens, Principal, The Forests and the Forest Administration of Uganda, 1961)

time of the staff was devoted to the building programme necessitated by the expansion of the training programme. A sum of £76,000 was provided for this work out of the African Development Fund. From the very beginning, difficulties were experienced in obtaining building contractors and in arranging for delivery of materials. Eventually, building was undertaken under the supervision of the school staff, employing such local artisans as could be found. Nevertheless, in spite of the difficulties, good progress was made by the end of the year. Progress continued throughout the next two years and by 1956, the programme was nearing completion.

Sporting activities were not neglected. The school football team won the Omukama's Cup in 1951 and had another successful year in 1952. In 1952, Learner Wagabono had the distinction of winning the bantam weight Amateur Boxing Championship of Kenya and Uganda.

Ranger Training

Two successful years were recorded in 1951 and 1952 but it was disappointing that none of the trainees achieved a first class certificate in the final examinations. Instruction generally followed the lines of former years but more time was spent in Budongo forest to improve training in topographical and stock surveying and enumeration. An important feature of training was the actual carrying out of field works under the Budongo Working Plan. Owing to heavy recruiting in other more popular departments, it was not possible in 1953 to fill all vacancies in the junior year and only four FD candidates joined the School along with three ALG learners. In the final examinations, all students passed but again the standard reached did not permit the award of any first class certificates. Eleven students completed the course in 1954, four FD and seven ALG, but there were still no first class certificates.

In 1955, recruitment for the first year Ranger course was exceedingly disappointing. Out of a target of 25 recruits, only five FD and ten ALG were enrolled. There were better results in the following year when 25 recruits were enrolled. The general level of marks in the finals was extremely high and the three top men were unlucky to miss a first class certificate. This distinction was, at last, achieved in 1957 when three students gained the coveted first class. Any satisfaction, however, from this result was mitigated by the failures in the junior class to complete the course. Of the 16 candidates recruited, only five survived at the end of the year. The others appeared to have little taste for field work.

A review during 1957 indicated that the existing training programme should just suffice as far as Assistant Foresters were concerned but that it would not meet demands for Rangers. Some expansion would be needed at the school. Prospects improved in 1958 when the new course started with 25 trainees. For the first time, there were sufficient applicants with the Cambridge School Certificate to allow selection to be restricted to this category. The rise in the educational standards of trainees continued in 1959/60 and was marked by the award of seven first class certificates in the finals. One trainee who joined the course in 1959 was the son of a serving Ranger – a very welcome first occasion.

From the beginning of 1960, the time devoted to survey and administration was increased and botany decreased because of the weakness of so many serving Rangers in these subjects. There was a good deal of wastage from the 1960 class which dwindled during the year from 17 to 10. Two left to take up Indian Government and American scholarships, one on account of ill-health, one was dismissed and the others resigned. The resignations were attributed to a dislike of the rigours of forestry and because there were plenty of opportunities of softer jobs. During the year, it was decided to shorten the course from three years to two years, the main reasons being the higher educational standard of entrant now being obtained and the need to accelerate the output of Rangers. The results in the final examinations in December were disappointing after the excellent results in earlier years – nine 2nd class, five ordinary pass and five failed. Once again the weak subjects were surveying and administration, despite the extra attention being given to these subjects.

Because the number of Rangers in training would meet the needs of the Department at its present level of work and as no funds were in sight for the expansion proposed in the Development Plan, no trainees were recruited in 1961/62. A limited number were recruited in 1962/63 and 1963/64 but defections during the course meant that only six and four respectively survived.

Assistant Forester and Forester Training

An important decision was reached in 1952 on the question of sub-professional training. During the late 1940s, the decision had been taken not to recruit any more expatriate Foresters so that the cadre should be fully open to Africans. It was the intention of Government that Africans be trained for these posts. The full details of the course had not yet been fully worked out but a provisional syllabus was drawn up by the Principal of the Forest School and the first two trainees would start their studies early in 1953. On successful

completion of their training, the men would be posted to the Professional Division of the Local Civil Service as Assistant Foresters and would be eligible for promotion to the rank of Forester. These two trainees completed a year's advanced course at the School in 1953 and went on a short training course with the Forestry Commission in the UK. They then received their well-earned promotion to Assistant Forester.

Three Rangers and Senior Rangers joined the course in 1955. The Principal recorded that 'their willing and cheerful work on all practical jobs set a splendid example to the younger students and, on the School tour in particular, they showed high qualities of leadership'. Early in 1956 they went to England for six months with the Forestry Commission. The syllabus followed that of the Ranger course but at a considerably more advanced level and all class work was on a round table discussion basis. It was a promotion course for Rangers of at least three years field service who had already proved their work in the field.

A further class of seven men was selected for training in 1957/58 but was subsequently reduced to six when one was awarded a Government scholarship for full professional training. In 1958, passing of the Departmental examination for promotion to Senior Ranger was made a qualification for selection for AF training.

In 1959, applications were received from Nyasaland (Malawi) and Tanganyika (Tanzania) for places on the AF course. Four men from the former country joined the course in September 1961, but Tanganyika withdrew their application. The presence of the Nyasaland men on their course was stated to have a most stimulating effect on the other trainees. All eight, including the four Malawians completed their course successfully in 1963/64.

When the Department lost more than half of the expatriate professional staff after independence in 1962, the Foresters played an important part in maintaining the progress of the Department and justified fully their promotion.

Professional Training

In the absence of professional training facilities in East Africa, candidates had to go outside Uganda. The first candidates were four ex-students of the Forest School who had undertaken or been selected for full professional training in the UK. One (Martin Rukuba) was awarded a Toro Government scholarship and after taking his GCE (Advanced) was accepted by Aberdeen University. He completed his training and joined the Department in November 1959, the first Ugandan professional officer to do so. In July 1965, he was promoted CCF.

As Uganda approached independence in 1962, more scholarships from various donor countries became available and six men were awarded scholarships. Also as the first Natural Science (General) degree candidates at Makerere University approached the end of their course, recruitment of potential ACFs from this source was investigated. None of the final year was likely to apply to join the Department but some of the first and second year men appeared interested. In fact, one graduate was recruited later on completion of his degree and went to Oxford on a special forestry course. A second Makerere graduate was recruited in 1962/63 and after entomological training was appointed Entomologist.

In 1963/64 the position was:

on undergraduate training or selected for it	12
on postgraduate training (entomology)	1
	Total 13

In addition to the above, there were five Ugandan professional officers who had completed their training as well as two professional officers on secondment from the UK Forestry Commission who gave valuable service for a number of years.

During 1965, the feasibility of providing professional training at Makerere was raised by the Norwegian Government which also indicated its willingness to co-operate in such a venture. Investigations were begun which seemed to be promising but for various reasons a decision was not possible for several years.

Publicity

In the end, the security and development of the forest estate must depend on the existence of a well-informed official and public opinion in favour of forestry. With increasing levels of political interest and concern among the public, increasing powers for local governments, and increasing numbers of officials, some ignorant of forestry, on the administrative teams, it became important to show more widely and more clearly that forestry is an essential and useful activity at all levels from national to domestic. As self-government approached the creation of such an opinion was increasingly urgent, to replace the unflattering image of the Department among many of the public as being primarily concerned with the sequestering of land and forbidding the cutting of trees.

Largely because of the calls of other and, at the time, more fundamental work such as the creation of the forest estate and the introduction of scientific management, publicity and propaganda lagged far behind the other activities of the Department. During 1959/60, i.e. only 2–3 years before the arrival of independence, a start was made towards remedying this by increasing forest publicity and propaganda. The work was made the responsibility of the OC Map Section but, unfortunately, owing to shortage of staff, he was able to make only a very modest start. The work was mainly exploratory into ways and means and the relative utility of various media. A travelling exhibit was prepared, lectures and talks given as opportunity occurred, and news items and features submitted to the Press.

Not much work was possible in 1960/61 but the travelling exhibit was displayed for the first time at the Bugisu District Show (attendance about 30,000) at which it won first prize and the prize for the best Government stand. Results the following year were mixed. Travelling exhibits were displayed most successfully at a District Show and two other centres. Towards the end of the year, preparations were in hand for the Nile Centenary Festival and the British Commonwealth Forestry Conference. In connection with the latter, open days were held at the Utilisation Section Workshops, Nakawa.

But attempts to increase the flow of publicity material from district staff and to make them more news-conscious met with a poor response and it appeared that something very

startling was needed to make Uganda foresters publicise their work. Some new thinking and perhaps a new approach was needed on this problem to break the traditional taciturnity. In 1962/63, there was at long last an encouraging response from field staff to appeals for material and effort in the field improved. There was no longer any doubt that there was a growing body of foresters who were conscious of the necessity to publicise the policy and work of the Department. This applied to Local Government staff as well as to Departmental staff.

A Departmental float was entered for the Independence Pageant in 1962 and gained second prize. Exhibits were staged at the Nile Centenary Festival and at the Science and Industry Pavilion which drew very large crowds. A Departmental instruction was issued which laid down that Open Days must be held annually at all major forestry centres. Preparation for such events was very time-consuming but was considered to be well worth the effort.

The number of Press releases and radio talks increased considerably as did the production of leaflets and booklets. The *FD Gazette* was replaced by the more attractive *The Woodsman* which went to all English-speaking staff in Uganda and abroad and also to the forestry staff of local governments and to the other East African Forest Departments.

The posting of an AF to the Section in 1963 gave the work added impetus especially in the field of radio talks and news releases. Although the Section's activities covered a wide range considering the limited staff and the money available, too much was left to it by the field officers and they would have to participate much more if the maximum possible effort was to be achieved. But in spite of all the increased efforts by the Publicity Section and other Departmental officers, there was still in 1963/64 regrettably little sign that the people of Uganda were beginning to realise the importance of forestry and the long-term value of the forest estate. Consequently there were numerous requests for excisions from the estate, some of them from people in responsible positions who should have been guiding public opinion towards forestry and not against it.

10 Administration, Staff and Labour

(Table 13)

Administration

From 1st January 1954 the Department came under the newly appointed Secretary for Agriculture and Natural Resources, an arrangement which improved materially the Department's contacts with higher levels of Government. With the establishment of a ministerial system in the middle of 1955, the Secretary became the Minister of Natural Resources. At this time the internal administration of the Department was largely decentralised on a territorial or functional basis. Territorially there were four provinces each in the charge of a Provincial Forest Officer (PFO) and twelve district charges each in the charge of a District Forest officer (DFO). In addition there were three functional or specialist divisions, the Silvicultural Division (silvicultural research), the Utilisation Division (utilisation research, advisory and trade training work, transport maintenance) and the Forest School.

During 1956, there was internal reorganisation of the Department which was organised into three divisions: Direction, Management and Development. These changes were more of nomenclature than of function but they served to emphasise the administrative pattern which was emerging:

Direction Division – the clerical work organised in four sections, accounts establishment, registry and stores;

Management Division – the normal territorial field organisation with 4 PFOs and 12 DFOs;

Development Division – comprising:

(1) **Silvicultural Section** –Ecologist in charge of natural regeneration research, increment studies, herbarium; silviculturist in charge of plantation research, seed supplies, library, etc;

(2) **Mapping Section** – interpretation and type-mapping from aerial photographs; preparation and custody of maps;

(3) **Working Plan Section** (not set up until January 1957) – preparation and revision of certain major working plans, initially in the Western Province;

(4) **Utilisation Section** – research into the properties and uses of Uganda timber, advisory work in logging and milling, maintenance of departmental vehicles, training of apprentices and assistance in departmental housing and road-building. Some of the service functions were pruned in 1957 and research extended to include logging and milling studies to help the Section to fulfil better its primary function, the promotion of more complete utilisation of Uganda's forests;

(5) **Entomological Section** (not set up until January 1957) – pests of the living trees and of converted timber;

(6) **Forest School** – training of Rangers and Foresters.

On the formation of a new elected Government on 14th April 1961, the Department was transferred from the Ministry of Natural Resources to the Ministry of Land and Water Resources. On the change of Government which occurred after the elections in April 1962, the Department was involved in yet another change – to the Ministry of Agriculture and Co-operatives. Attempts to have Forestry, one of the oldest departments in Government, incorporated in the title of the new ministry were unsuccessful.

At the same time the organisation of the Administration by provinces was abolished. The organisation of the Department, however, continued on the same basis, the former provincial forestry charges being redesignated regional charges and remaining coincident with the former provinces. The practice of linking conservator posts with regional charges had to be abandoned in 1962/63 in the interests of continuity during a period of frequent staff changes. The officer in charge of silviculture research assumed control of utilisation research as well and his post was upgraded to Conservator rank.

With the departure on retirement of the Regional Forest Officer (RFO) (North and East) in November 1963, the RFO (West) in April 1964 and the transfer of the RFO (Buganda) to Conservator (Research), all regional offices were closed indefinitely due to lack of officers with sufficient experience to post to them. Supervision and control of district officers had then to be undertaken by Head Office, far from being a satisfactory or efficient arrangement. This serious shortage of experienced officers was emphasised by the fact that at the end of the year, all district charges except one were held by officers who had little more than one year's experience, if that, in a professional charge or of tropical conditions. Nevertheless, it was a tribute to their enthusiasm and keenness that so much was accomplished during the year.

Staff

In 1950 it had still seemed that independence for Uganda lay in the distant future, so the staff structure continued to be seen (as it had for half a century) as comprised of a few expatriate professional and sub-professional staff, primarily concerned with forest management, directing the activities of a much larger body of junior local staff. The first specialist officers, Ecologist, School Principal and Engineer, had only been appointed in 1948 and 1949. However, great changes took place in the next 15 years prompted by three major

factors. The flourishing economy allowed a great expansion of forestry activity; the educational standards of potential Ugandan recruits arose rapidly; and political development accelerated, eventually resulting in independence in 1962 and the need for the Department to be seen to be managed by Ugandans.

The first factor permitted the recruitment of a few more expatriate staff, though even so these did not suffice for a DFO for each of the then 14 administrative districts, but rather enabled appointments to more specialist posts such as silviculture, working plans, mapping, utilisation and entomology. The other factors resulted in increasing emphasis on the training of Ugandan professional staff abroad, and this instalment of the history ends appropriately with the appointment of the first Ugandan Head of Department.

Nevertheless, the story for almost the whole period of this history was shortage of staff, professional and clerical, due to a large degree to difficulties in recruitment. Moreover though the senior staff was at full strength for most of 1951, the exigencies of leave and post-graduate courses made it difficult to man the minimum number of charge posts. Nevertheless a high degree in stability in posting was achieved except in South Mengo which was badly affected by leave and sickness. I.R.Dale acted as CF from the beginning of 1951 until May when C. Swabey assumed duties on transfer from British Guiana (Guyana). A Saw Doctor was at last recruited in England and arrived in Uganda on 1st January 1952.

The clerical position continued to be critical – it was extremely difficult to recruit and keep suitable clerks in the face of commercial competition. It was so bad in the following year that it was necessary to recall the Chief Clerk to duty before the expiry of his leave in Goa. It was very gratifying to record the award of the Certificate of Honour to C.J.P.J. Rodrigues after nearly 30 years of devoted and loyal service.

In 1952 I.R. Dale was promoted to the new post of DCF, but the Department suffered a severe loss in the transfer of R.G. Sangster (PFO Buganda) and J.A. Fraser (DFO South Mengo) to Tanganyika (Tanzania) after 16 and 15 years' service respectively in Uganda. While the general standard of the Forest Ranger cadre was improving steadily, there was a serious lack in 1952 of senior Rangers of the requisite ability and experience to undertake the more responsible duties – a problem which only time could solve.

In 1953, the titles of Conservator of Forests (CF) and Deputy Conservator of Forests (DCF) were changed to Chief Conservator of Forests (CCF) and Deputy Chief Conservator of Forests (DCCF) to bring them into line with the other East African Territories. No functional or financial changes were involved. H.R. Webb, MBE, the Principal of the Forest School, retired and D.W.G. Bacon was appointed in his place. G.J. Leggat was appointed PFO/WP in October 1953.

It was possible to recruit only one ACF leaving three vacancies at the end of the year. This coupled with normal leave requirements and the absence of four officers on post-graduate courses led to serious under-staffing for most of the year. It was still impossible to fill clerical vacancies. When seven were advertised in September, only one was filled. The ranks of Forest Guards and Senior Headmen were merged into one cadre of Guards and Senior Guards with four classes to provide better promotion facilities and to permit the recruitment of a better type of man.

PLATE 20

PLATE 20. Presentation of the MBE to Mr J.M.S. Asavedo (Head Office Superintendent) by H. E. The Governor, Sir Andrew Cohen, to mark the former's retirement after 33 years service. This splendid image of imperial pomp and circumstance emphasies the valuable contribution of the Goan staff to the running of the Department. (Annual Report, 1955)

Coronation Medals were awarded to the CCF, DCCF, H.R. Webb, MBE, and Mrs Webb, and F.X. Kamunye, Forest Ranger.

In 1954, the retirement was recorded with regret of Brigadier Goodwin, OBE, Timber Grading Officer, and of R.G. Miller, SACF (PFO Buganda). Miller had 22 years' service in Northern Rhodesia (Zambia) and Uganda and the loss of this experienced and efficient officer was a serious blow to the Department. The Department continued to face grave shortages of clerical staff. Of 35 clerical posts, it was possible to maintain only 21 and 10 were filled by unqualified clerical assistants and 4 remained vacant. These deficiencies, both numerical and qualitative, imposed unnecessarily severe burdens not only on the available clerical staff but also on professional officers.

The death was recorded with deep regret of Forest Ranger N. Kaliebara in a motor cycle accident. He was a most promising young officer and the best African field botanist the Department had ever had.

The awards were recorded with great pleasure of:

(1) the MBE to J.M.S.Azavedo, Chief Clerk and Storekeeper, after thirty years' service in the Department; (Plate 20)

(2) the Certificate of Honour to Forest Guard Z.Lunanoba after 43 years' of Government service, 15 with the Department;

(3) the Certificate of Honour to Forest Guard Huseni Abedi after 35 years' of Government service, 23 with the Department.

In 1955, three vacancies were filled, one by transfer from the Sudan and two by appointment of Colonial Office scholars (graduates who completed their first year's Oxford Course in 1954/55). But the new posts of Forest Entomologist and Logging and Milling Engineer and two ACF vacancies had not been filled by the end of the year.

Two new posts of CF were approved in 1955 and filled by the promotion of G.J. Leggat and G. Webster from the ACF cadre. It was intended that these posts would be filled by the officers in charge of the Western Province and Buganda, the most important territorial changes in the Department. G.W. St Clair-Thompson, SACF (PFO Western Province) retired in 1955. 'Miti' Thompson joined the Colonial Service in 1927 and after service in the Gold Coast (Ghana) and Tanganyika (Tanzania), came to Uganda in 1938. His imagination and enthusiasm left a permanent mark on the Department's silvicultural work.

The award of the MBE to H.C. Dawkins, Forest Ecologist, in the New Year's Honours 1956 was noted with much pleasure. The post of Chief Clerk and Storekeeper was upgraded to that of Office Superintendent and J.M.S. Azavedo, MBE was appointed to it. J.C.F. de Souza, J.F.U. Pereira and R.S. Britto, all members of the clerical staff were promoted in the C scale.

A Departmental Consultative Staff Council was set up in 1955 with provincial and district sub-councils. This formal machinery for the airing of views and problems of all grades of staff got off to an excellent start and meetings were held in all districts (except Karamoja) and the provinces. One territorial meeting was held at HQ.

Ivan Dale retired in 1956 after 28 years' service (18 in Uganda); during his career he had been in charge of each of the provinces and also of the Department and his wide knowledge, wisdom and humour were widely missed. In the same year, J.M.S. Azavedo, MBE, Office Superintendent, retired after service for 33 years in the Department with the utmost loyalty and integrity. It is appropriate at this point to pay tribute to the sterling work of the Goan officers who served in the Department with great efficiency and loyalty and who were the backbone of the clerical branch. Forest Ranger F.X. Kamunye also retired after serving in the Department for 33 years.

Vacancies for one ACF, a Logging and Milling Engineer and an Office Superintendent were filled in 1956. Vacancies for another ACF, a Forest Entomologist and DCCF were filled soon after the end of the year. For the first time for many years the Department thus had, at any rate for a week or so, a full complement of senior staff.

The following year it was not possible to maintain a senior officer in all districts but, on the whole, continuity was reasonably satisfactory. The administration of Buganda Province was particularly stretched as, in addition to shortage of district staff, the officer in charge of the Province also performed the duties of Deputy Chief Conservator of Forests throughout the year, first in an acting capacity and later substantively. The previous year, he had at various times held the posts of DCCF (acting), PFO Buganda, DFO West Mengo (acting), DFO Busoga (acting), and DFO Mbale. A District Commissioner, on reading about these postings in the Official Gazette, enquired what he did in the afternoons.

Of the approved Ranger staff of 93, only 56 were on field posting at the end of the year, 20 Learners being under training, leaving 17 vacancies to be filled as suitable applicants and training facilities became available. A Departmental Promotion Board was appointed during the year to advise the CCF on appointments and promotions in the field staff. The excellent work of P.F. Antao, Office Superintendent, and Forest Guard E. Muwereza was recognised by the award of the Certificate of Honour.

During 1957, two Colonial Forest Service (CFS) Officers and one sub-professional officer retired and one CFS officer was appointed. The retirements included C. Swabey who retired from the post of CCF to take up that of Forestry Adviser to the Secretary of State. He had been head of the Department since 1951 and his inspiring leadership guided the Department through those years of great development.

In a postscript to the Departmental Annual Report for 1956, he added, possibly with tongue in cheek, 'When completing this Report, it occurred to the writer that this was the twentieth Colonial Forest Department Report that had appeared over his signature. He was, therefore, nostalgically constrained to turn up his first – for 1937. On reading it again, he was distressed to observe that the problems of today seemed to be no less numerous or baffling than those of 20 years ago, while the writer's style had, if possible, deteriorated.' His successor as CCF was W.E.M. Logan, formerly DCCF Tanganyika (Tanzania). In spite of ever-increasing difficulties, he carried on the good work until 1962 when he retired and was succeeded by G. Webster who, in turn, retired in 1965.

Other retirements which merited mention were G. Elliott, Superintending Forester, Senior Ranger M. Kamya and S. Kiwanuka and P. Semanda of the clerical staff. These four officers between them had a total service to Government of 113 years, the lowest being 20 years. Their retirement was a great loss to the Department.

Changes of staff during 1958 were:

one CF appointed on transfer from Tanganyika (Tanzania), one ACF recruited;
the Logging and Milling Engineer resigned on expiry of contract;
two Rangers appointed, two Rangers retired or resigned;
six Forest Guards retired, resigned or dismissed;
one Accounts Officer retired, one Clerk resigned.

The Accounts Officer was J.C.F. de Souza. He had been with the Department for 20 years and had served Government in all for 32 years.

The Departmental Promotion Board functioned smoothly and usefully.

With the retirement of the Logging and Milling Engineer, the opportunity was taken in 1959/60 to introduce the post of Utilisation Officer as head of the Section. Two possible candidates expressed interest but nothing came of it in either case. The lack was a crippling handicap in that field and, to avoid any further delays and disappointment, training was sought and achieved under the Colombo plan for one of the Department's ACFs, R.A. Plumptre, in 1962/63.

Four retirements deserved mention: P.F. Antao (Office Superintendent), J.S. Kabengwa, E.A. Holyoak (Assistant Principal of the Forest School) and Forest Ranger W.Mugenzi. Mr Antao had served for 35 years, 31 with the Department, and Mr Kabengwa for 23 years. Mr

Holyoak had served for only six years but he had made a great contribution to the Forest School with his teaching of Ranger and AF trainees and the many fine buildings he had built at the School. Mr Mugenzi had served the Department for 28 years, 18 as a Ranger. He was later appointed an Honorary Forest Officer. Four Rangers who retired had a total of 103 years in the Department between them: G.M. Byakagaba, J. Kajjula, A. Mutono and Y.K. Mukasa.

The Ecologist, H.C. Dawkins, MBE, was awarded a Nuffield Foundation Scholarship for three years to study the productivity of tropical high forest which he took up in September 1960. While his departure was a severe loss to Uganda, his fellowship was regarded as a great gain to the wider sphere of tropical forest silviculture and management as a whole.

Following the attainment of full internal self-government on 1st March 1962, and the grant to expatriate officers of the option to retire with compensation for loss of career, five expatriate officers out of an establishment of 26 opted to retire. The departure of these officers gave rise to acute staffing difficulties in the following years. No less than seven further professional officers retired during 1962/63 which with the retirements of the previous year, and the absence of two officers on a fellowship and a course, meant the loss of more than half of this cadre.

Two officers, one a Ugandan, were recruited and assumed duty; two others, both Ugandan, were appointed and sent on post-graduate courses. Four others were expected to join the Department early in the following year but in spite of these useful additions, it was to be a long time before the loss of experience could be made good. On the bright side, sufficient AFs and Rangers were available to meet requirements.

In accordance with the Government's Ugandanisation policy, a Ugandan, Martin Rukuba was promoted to DCCF in January 1963 and to CCF in July 1965.

A further five professional officers retired during 1963/64/65 but the loss in numbers was made good by the return of a Ugandan ACF on successful completion of his degree course, by the recruitment of an expatriate officer on contract and by the secondment of two professional officers from the UK Forestry Commission. Two other Ugandans completed their professional training and were due back in August 1964. A welcome addition to the staff was a member of the Norwegian Agency for International Development who had the necessary training and experience to be able to take charge of the Map Section when the Map Officer went on vacation leave.

Labour

In 1951, labour supply in Buganda was generally adequate, though there were seasonal difficulties at Masaka and Kampala while the Mabira Forest continued to be as unpopular as ever due to the mbwa fly *Simulium damnosum* (though a few years later this carrier of onchocerciasis, River Blindness, was eliminated by treating the River Nile with insecticide).

In other districts labour shortages were almost universally chronic and resulted in considerable modifications of programmes. It was difficult to see what the answer was: improved housing and living conditions might help and improved labour lines were constructed in some districts. Wage increases were made during the year but as they formed part of an

inflationary spiral, they were hardly likely to improve labour recruitment. Economy of labour through mechanisation was an attractive solution but it was hardly possible with the scattered operations and lack of skilled mechanics. Joint staff and labour committee meetings were initiated in most districts and, in general, got off to an excellent start with a far less degree of irresponsibility than had been expected.

The labour shortage continued throughout 1952 with a few local exceptions and it was difficult to recruit men for forestry work when less arduous and perhaps more congenial jobs were available. This often had most unfortunate results on silvicultural work, much of which was dependent on securing adequate labour at the right time. There was some improvement in supply in 1953 except in the EP where there was a steady deterioration. Works committees were maintained or established wherever the numbers or permanence of labour forces warranted it. In many areas a change was made from the cumbersome and laborious monthly pay system to a daily pay one.

In November 1954 a new wage structure for Government unskilled labour was announced based on an eight-hour day (six hours task work) which generally was bound to mean substantial increases in labour costs for most operations. A complementary revised wage structure for skilled and semi-skilled labour was under consideration by Government at the end of the year. A revised structure based on a grouping system was introduced in 1955 and was acceptable by FD labour to a greater degree than had been expected and the change-over to the new system was made with little trouble.

The supply of labour became increasingly difficult in the WP and seriously affected departmental operations. Labour for the softwood plantations of Toro and Kigezi was consistently inadequate and more active steps were needed to encourage recruitment. There were seasonal difficulties at Mbale and Soroti, and in the West Nile softwood plantations. In Soroti, the shortage remained acute and it was possible to do only the minimum of maintenance of plantations. In the remoter parts of Buganda (Mubende, Singo Hills) it was difficult to get labour for boundary demarcation and maintenance. Elsewhere labour supply was adequate and in Mbale it was sufficient for the first time in five years.

The Works Committees continued to perform a thoroughly useful function though a somewhat tedious one for DFOs. Efficiency tests for labour were introduced without major difficulties and the efficiency bonus was raised in September 1956. The average labour force of some 2,400 men proved adequate to deal with normal works but there was the usual seasonal difficulty in obtaining the additional labour required during the planting seasons. In many districts the output of work showed few signs of improving and increased mechanisation, particularly in plantation work, was becoming inevitable.

The labour supply improved in 1957 except in Toro, Bunyoro and Karamoja districts. In Toro it was both short and of poor quality. In Buganda the labour force was reduced at all major plantation centres as part of an economy drive. The average labour force employed during the year was just over 2,000, a reduction of nearly 300 on the preceding year.

In 1958, for the first time for eight years, the supply of labour was adequate in all charges. In the WP there were statutory increases in wages in certain districts but no visible signs of increased output resulting from them. In Buganda further economies in labour were made

both in plantation and high forest work. In this province the standard of labour in nurseries and plantation was reported to be poor even with labour of long-standing experience. In high forest work, on the other hand, an encouraging development was the building up of a regular force of sprayers who were willing to live in temporary camps as the work moved on to more distant forests.

In 1959/60 adequate supplies were again available in all charges. In fact, due to wage increases which were applied in several districts, economies had to be practised, the result being a reduction in the departmental labour force by about a quarter. As usual the Department was required to meet the wage increases from within its existing financial provision by economising on labour and increasing tasks. This was done but it would not be possible in future to cope with more wage increases without extra funds.

Supply was adequate in 1961/62 in all districts and there were no disputes or stoppages. The average labour force of the Department was about 1,700. In the following year, supply was again adequate and there were no disputes. Wages were increased for labourers working in or near the main towns of Kampala, Entebbe and Jinja. The average force was approximately 1,400.

11 Revenue and Expenditure

(Tables 14 and 15)

Summary of Revenue and Expenditure

	Revenue £			Expenditure £		
	Total Revenue	Timber	Plantation fuel & poles	Total	Personal Emoluments	Forest field-works
1951	60,000	33,000	22,000	122,000	37,000	41,000
1952	70,000	45,000	21,000	132,000	48,000	51,000
1953	90,000	63,000	22,000	140,000	55,000	60,000
1954	91,000	64,000	18,000	160,000	70,000	68,000
1955	101,000	73,000	24,000	172,000	65,000	75,000
1956	72,000	38,000	31,000	253,000	83,000	104,000
1957	82,000	47,000	31,000	240,000	102,000	94,000
1958	89,000	49,000	34,000	242,000	97,000	100,000
Jan–June 1959	45,000	27,000	14,000	116,000	45,000*	50,000*
1959/60	96,000	51,000	25,000	233,000	105,000*	105,000*
1960/61	92,000	63,000	23,000	232,000	108,000	91,000
1961/62	79,000	52,000	23,000	245,000	103,000	81,000
1962/63	87,000	63,000	20,000	264,000	104,000	102,000
1963/64	79,000	55,000	18,000	274,000	104,000	129,000
1964/65	96,000	68,000	21,000	355,000	134,000	160,000

*estimates

As may be seen from the above table, the two main revenue items were timber fees and fees from fuel and pole plantations which together amounted to around 90% of the total. There was considerable fluctuation in the annual figures, e.g. there was a decrease in 1956 in timber fees of £35,000 which was caused by a number of factors including:

(a) all mvule revenue from public land in Busoga was now being paid directly to the ALG;

(b) there was some reduction in timber production from CFRs owing to general bank restrictions which fell heavily on the building trade.

With regard to expenditure, there were also two main items, personal emoluments and forest field works, which together represented from 75% to 85% of the total.

12 Miscellaneous

National Parks

The Department welcomed the passing in 1952 of the National Parks Ordinance and the declaration of the first two National Parks, the Murchison Falls Park and the Queen Elizabeth Park. The latter included part of the Kalinzu Forest and the small blocks near Katwe. At a meeting held in July, 'the Trustees agreed that it was their policy to co-operate in every way possible with the Forest Department. They were unanimously of the opinion that the Parks authorities should not in any way interfere with the proper development of the forest reserves as heretofore'.

Amenity Planting

In 1953 arrangements were made for the raising of ornamental trees and shrubs in departmental nurseries in all districts where this was not already being done. This replaced in part the centralised service provided by the Agricultural Department.

Commemorative Tree Planting

Lady Cohen, the wife of the Governor, planted a Wild Kapok (*Bombax reflexum*) in Government House grounds to commemorate the Coronation of H.M. the Queen. H.M. the Queen Mother planted a mahogany (*Entandrophragma angolense*) and H.R.H. Princess Margaret a Cape Chestnut (*Calodendrum capense*) at Government House on 17th July to commemorate their visit to Uganda. Uniformed Forest Guards were in attendance at these ceremonies. HM the Queen planted a mvule (*Milicia excelsa*) in the grounds at Government House in 1954 close to the trees planted by the Queen Mother and Princess Margaret.

Records and Returns

Progress was made in the simplification and standardisation of departmental record-keeping. The first consolidated issue of departmental standing orders was made in 1954. They were greatly appreciated by the staff.

Visits and Conferences

In 1957 the following conferences were attended by members of the Department:

(1) 7th British Commonwealth Forestry Conference (Australia and New Zealand);

(2) EAAFRO Forestry Research Co-ordinating Committee.

Visitors included M.V. Laurie, Chief Research Officer of the UK Forestry Commission and F.C. Ford Robertson, Director of the Commonwealth Forestry Bureau.

H.E. the Governor visited forests in the Northern Province and the Sesse Islands in 1958. Later the Acting Governor visited the softwood planting project on north Mt Elgon.

In 1959/60, the Ecologist visited Kenya at the invitation of the CCF Kenya to advise on the silvicultural treatment of natural forest.

Visitors included Professor Mobbs of the University College of North Wales, Jack Westoby of the FAO Forest Products Division, Dr Russell, Director of EAAFRO, the Minister of Natural Resources and the Minister of Local Government.

In 1961, the PFO Northern Province attended the first meeting of the Forestry Commission for African organised by FAO.

The Silviculturist took part in a seminar and study tour of Latin American conifers organised by FAO followed by a brief visit to the southern States of the USA.

Visitors included members of the World Bank Economic Survey Mission, the Minister and Parliamentary Secretary of Natural Resources, the Katikiro of Bunyoro.

The Eighth British Commonwealth Forestry Conference in East Africa was attended by the CCF and DCCF; the Forest Engineer attended only the Forest Products pre-Conference tour. The Conference was the highlight of the year. There were three visits to Uganda, one pre-conference tour designed to show operations in the dry savanna woodland zone and two plenary tropical mixed forest. Visits were also made to eucalyptus fuel and pole plantations, the Forest School and the plywood factory in Jinja. It was a pleasure to welcome back among the Conference visitors, two former CFs, Dr Eggeling and C. Swabey.

A Regional Forest Officers Conference was held in 1962 but due to the numerous problems arising from the loss of senior staff, a second conference was held later in the year. The Minister of Agriculture and Co-operatives addressed both conferences.

During his leave in the UK the Ecologist attended a Senior Officers Conference at the Commonwealth Forestry Institute, Oxford. He also visited tree breeding research centres of the UK Forestry Commission and studied electronic computer techniques.

In 1963/64, the CCF attended meetings of the East African Forestry Research Co-ordinating Committee and the East African Wildlife Co-ordinating Committee, the East African Timber Advisory Board and the Eighth General Assembly of the International Union for the Conservation of Nature and Natural Resources in Nairobi.

E.K. Serwanga, ACF, attended the Twelfth Session of the FAO Conference in Rome.

The following seminars were attended:

Aerial Forest Inventory (USSR) – M.L.S.B. Rukuba, DCCF
Savanna Afforestation Techniques (Sudan) – C.M. Kerali, Forester
Forest Fire Prevention and Control (USA and Canada) – A.G.R. Jasi, Forester.

Visitors included J.N.R. Jeffers, UK Forestry Commission, advising on research methods, and A. Lamb, Commonwealth Forestry Institute, studying tropical pines.

We were particularly pleased to welcome back W.E.M. Logan, FAO, formerly CCF Uganda.

PART II

LOCAL GOVERNMENT FORESTRY[1]

1 Several aspects of local government forestry are also covered in Part I.

13 Policy and Legislation

The policy of devolution of local forest responsibilities to African Local Governments was pursued steadily from 1952 onwards, coupled with the building up of ALG forestry staffs. The Protectorate Government agreed to make a grant to ALGs in districts accepted as having a minimum Adequate Forest Estate (AFE), of half the net revenue accruing from CFRs in such districts. The total for 1951 and 1952 amounted to £4,593 and larger sums were likely to accrue in future. It was hoped that this arrangement would stimulate forestry activities in the districts concerned.

Difficulties were experienced in the evolution within the existing legislative framework of satisfactory forestry rules or regulations suitable for the management of forests controlled by ALGs and draft rules for West Nile and Acholi were held up on this account. In Bunyoro, Toro and Kigezi, LG forestry orders or rules were introduced during 1952. In Acholi, forest rules prescribing the fees payable in LFRs were gazetted.

In 1954, the policy of devolution was endorsed by the Agricultural Productivity Committee who considered, however, that the encouragement of small-scale private tree planting and farm wood lots in agricultural areas could be carried out more effectively through the agency of the agricultural extension services.

During the latter part of the year, the new District Councils Bill was under consideration and draft model district forest regulations were submitted. Although good progress was being made with devolution, DFOs had still to exercise a considerable amount of supervision in some districts.

AFE was declared in 1954 for Ankole, Acholi and Kigezi and in 1955 for Bukedi and Busoga. In some districts in the Western Province various steps were taken to implement the proposals for farm wood lots and peasant planting to be part of the agricultural extension services, while in others discussions were still in progress. In Kigezi, 15 village forests were given official approval and status.

As it had proved impossible for the one Ranger in Toro to supervise all district forestry projects adequately, the Agricultural Department agreed to undertake responsibility for all forestry works in the Busongora Agricultural Development area, a very satisfactory solution to the problem.

In 1956, Buganda was declared to have AFE. As a result, all CFRs in Mubende (90 sq miles – 230 km^2) all reserves in North Mengo (the Singo Hills 154 sq miles – 400 km^2) and

25 sq miles (65 km_) of high forest in South Mengo were transferred to the Kabaka's Government. In the Eastern Province, in all districts except Bugisu, devolution of responsibility for LFRs and public land was virtually complete but because District Council Forest Rules had not been passed, special forest licences were not in use. In the Northern Province, the beginning of a forest service in Karamoja was made with the training of two nurserymen. A full service could not be started until a tree species had been found that would grow satisfactorily in the rigorous conditions in Karamoja and sufficient funds became available.

An amended and up-to-date policy governing LG services in Ankole for a number of years to come was drafted in 1956 and approved by the District Council the following year. Its main aim was to get the people to plant their own wood lots and not to depend on the local authority for their forestry needs. A similar statement of policy was made by the Kigezi ALG in 1957 and by the Toro and Bunyoro Governments in 1959.

The long-standing debate about local forest rules continued until 1961/62 when rules were at long last approved for Acholi, Kigezi and West Nile District Councils. Attempts the following year for Buganda, Busoga, Madi, Ankole and Toro were unsuccessful and there was a similar lack of progress in 1963/64.

Although it is outside the scope of this history, it should be mentioned that the Republican Constitution for Uganda brought about several changes, probably the most important for forestry being the transfer of forestry services formerly under District Councils and their integration within the Uganda Government Forest Department.

14 The Forest Estate

(Tables 1, 1B and ALG 1–ALG 5)

At the beginning of 1951, the total area of LFRs amounted to 627 sq miles (1,620 km^2). By the end of the period (30th June 1965), it was 1,600 sq miles (4,150 km^2).

Working plans were prepared by DFOs for a number of LFRs including one for the LG reserves and plantations near Gulu. With the production in 1956 of working plans for the Busoga Bush Reserves and the Busoga Plantations, the whole of the forest estate for the district was under plan. The districts of Acholi, Ankole and Kigezi were declared to have AFE in 1954 and similar recognition was made in 1955 in the case of Bukedi and Busoga. Buganda followed suit in 1956.

The first sawmilling licence in an LFR was granted in the Olwal reserve in Acholi. The total cut in 1953 was 31,000 cu ft (870 m^3) but a major problem was the technical difficulty of sawing *Sapium ellipticum*, one of the commonest trees in the area.

Silviculture

The areas of fuel and pole plantations managed by ALGs were:

	1952 (acres)	1965 (acres)
Buganda	390	*
Acholi	410	630
Lango	850	1,150
Madi	50	110
West Nile	205	2,070
Busoga	2,120	6,440
Mbale	750	200
Teso	860	880
Bunyoro	300	230
Toro	160	220
Ankole	290	*
Kigezi	480	*
Bukedi	nil	470
Bugisu	nil	190
Karamoja	nil	20
Sebei	nil	10
	6,865 acres (2,780 ha)	**12,620 acres (5,110 ha)**

*returns incomplete or not received

In connection with the above table, an official return from Teso reported that '40,887 Cassia, 73,181 Elira and 31 donkeys were planted by private individuals' but the DFO considered it 'unlikely that either such numbers or variety were in fact established'.

With the improving staff situation, the plantation programme and various peasant planting schemes went ahead vigorously, as did the creation of new nurseries for the raising of plants for official use and for sale or free distribution to the public. The chief species used were *E. saligna* on favourable sites and *Cassia siamea* on difficult ones. Replacement of Cassia by *Eucalyptus camaldulensis* was started on a field scale in plantations in Lango and Acholi.

There was a considerable improvement in silvicultural treatment of plantations but in many cases, beeting still suffered from lack of forethought on the part of the staff – too few plants were raised too late. Despite this, nursery techniques were improved, largely due to a nursery course held by the Horticulturist, EAAFRO, in 1956 which was attended by, amongst others, 12 ALG Rangers. Substantial improvement in nursery work in the Eastern Province was effected by centralisation of nurseries.

In 1961, half a million plants were distributed for communal and individual planting in the Western Province. The area of greatest demand was Toro where approximately 300,000 plants were taken by farmers. In Buganda, demands for plantation fuel and poles from LFRs gradually dropped because there were so many private plantations. Arboretum plots and trials of quick-growing timber plantation species were expanded in all provinces in 1960/61, especially in Buganda, Eastern and Northern Provinces.

The Busoga District Council sharply criticised the mvule harvesting policy – which had been followed since 1958 – on the grounds that it had not been consulted during its formulation; this was despite the fact that the Secretary for Agriculture and Forestry had been concerned at all stages in drawing it up. A sub-committee of the Council was appointed to redraft the policy. The enumeration of mvule on public land in Busoga was completed early in 1961/62. Calculation of the harvestable trees indicated that as many as 15 mill units – a unit being taken as 7,200 tons (7,350 tonnes) were available. However, because of the distribution of the trees and the difficulties of demarcating units and providing supervisory staff, it was decided that only three units should be offered in the first instance and then only *after* the mvule harvesting policy had been approved by the District Council. Since it had not been approved, no concessions were offered. In the following year, the harvesting policy and the draft Forest Rules were returned for certain amendments to be made and for the final approval of the Lukiko. Busoga produced the biggest crop of illegal felling of timber, nearly all mvule.

The total cut of timber under Local Government control in 1960/61 was 434,200 cu ft (12,300 m^3) of which Busoga produced 356,200 cu ft (10,100 m^3), Bugisu 74,900 (2,200 m^3) and Bukedi 3,100 (90 m^3). There was a sudden demand for African Blackwood (*Dalbergia melanoxylon*) for export to Japan. Two licensees cut 3,000 cu ft (80 m^3) between them and a third 1,600 cu ft (45 m^3) in Northern Province but the first two stopped cutting when they experienced difficulties with the Japanese traders and the third one left the produce lying in the bush.

An innovation in Busoga was the enrichment planting of 10 acres (4 ha) in Lubani LFR.

Half was planted in lines of musizi and the remainder in groups of the same species. In the Northern Province the severe dry season caused a heavy toll amongst *E. saligna* planted by the West Nile Tobacco Fuel Scheme.

In 1961/62, about 100 sq miles (260 km^2) of public land were earmarked for reservation in Buganda counties lacking natural forests for the purpose of planting exotic species or quick-growing indigenous species of timber value. Large scale planting of musizi was started in forests with poor timber stocking in Mubende District.. Arboricide treatment and enrichment planting with musizi was started in Mengo District.

Encroachment remained a big problem in the Mityana, Mukono and Bowa Divisions of Buganda in 1961. Steps were taken to serve eviction notices to encroachers without appropriate licences. In the Eastern Province, the PFO reported that he feared the District Councils had little true appreciation of the value of a forest estate. Two requests for opening reserves to cultivation were seriously considered in Teso and one in Bukedi. Fortunately wiser counsel prevailed and the estate remained intact.

In the Northern Province, the Lango District Council continued to be the only area in the country except Karamoja which had no LFRs, without a declared AFE. Three local councils still refused to reserve one square mile (2.6 km^2) of woodland in each of their areas in this District. The Uru (Atyak) bamboo area in West Nile was finally agreed. It was expected that the area would amount to about 1,000 acres (400 ha).

Forestry Staff

The strength of District Administration and Kingdom Government Forest Services at 31st December 1965 is given in Table ALG 5.

Appendix A. Publications

1. General Publications

1951 A History of the Uganda Forest Department 1898–1929. *Forest Department Bulletin No. 3* (based on typescript document by N.V. Brasnett).

The Forest Dedication Scheme in Buganda Province. R.G. Sangster. Paper prepared for Commonwealth Forestry Conference, 1952.

Working Plan for Indigenous Forests, Buganda Dedication Scheme. R.G. Sangster.

Uganda Statement prepared for Commonwealth Forestry Conference, 1952. I.R. Dale.

Graphical Field Keys of Uganda Trees: I Forest Trees Mengo District. H.C. Dawkins. *East African Agricultural Journal*, October 1951.

1952 The Indigenous Trees of the Uganda Protectorate. W.J. Eggeling, revised and enlarged by I.R. Dale.

Is East Africa Drying Up? I.R. Dale. *East African Agricultural Journal*, April 1952.

Eucalyptus in the urban and rural economy of Uganda. G.J. Leggat. *East African Agricultural Journal*, April 1952.

Experiments in low percentage enumerations of tropical high forest. H.C. Dawkins. *Empire Forestry Review*, June 1952.

The Silviculture of Mvule. D.W.G. Bacon. Letter to *Empire Forestry Review*, September 1952.

1953 Kalinzu Forest fruitbats. H.A. Osmaston. *Journal of the East African Natural History Society* 22, 74–75.

A descriptive list of the introduced trees of Uganda. I.R. Dale. Government of Uganda.

The Uganda Timber Cess fund. .R. Dale. *Empire Forestry Review*, March 1953.

Timu and the vanishing forests of north-east Karamoja. H.C. Dawkins. *East African Agricultural Journal*, December 1953

Trials of non-toxic arboricides in tropical forest. H.C. Dawkins. *Empire Forestry Review*, September 1953

1954 The Construction of Commercial Volume Tables for Tropical Forest Trees. H.C. Dawkins. *Empire Forestry Review.*

The Northern Province Mountains, Speculations on Climate and Vegetation History. H.C. Dawkins. *Uganda Journal.*

A Uganda Softwood Scheme. G.J. Leggat. *Empire Forestry Review.*

Timber Utilisation in Uganda. C.H. Tack. *Empire Forestry Review.*

Forest Spread and Climatic Change in Uganda during the Christian Era. I.R. Dale. *Empire Forestry Review.*

The Extensive Sampling of Closed High Forest as Developed in Uganda. H.C. Dawkins. Paper presented to the 4th World Forestry Congress.

Contact Arboricides for Rapid Tree Weeding in Tropical Forest. H.C. Dawkins. Paper presented to the 4th World Forestry Congress.

1955 A History of the Uganda Forest Department 1930–50. N.V. Brasnett and I.R. Dale. *Forest Department Bulletin No. 4.*

Regeneration of Chlorophora excelsa (Mvule) in Uganda in relation to soil-root conditions. G.H.S. Wood and E.M. Chenery (Agricultural Department, Uganda). *East African Agricultural Journal.*

Tree Growth on a seasonally dry swamp in Eastern Uganda. J.E.M. Stephens. *East African Agricultural Journal.*

The refining of mixed forest, a new objective for Tropical Silviculture. H.C. Dawkins. *Empire Forestry Review.*

INEAC in the Forêt Dense, some impressions of high forest research in the Congo. H.C. Dawkins. *Empire Forestry Review.*

The Indian origins of some African cultivated plants and African cattle. I.R. Dale. *Uganda Journal.*

1956 Statement by the Uganda Forest Department for the 7th British Commonwealth Forestry Conference 1957.

Rapid detection of aberrant girth increment of rain-forest trees. H.C. Dawkins. *Empire Forestry Review.*

Determination of age/girth and similar relationships in tropical forestry. H.A. Osmaston. *Empire Forestry Review*, 35, 193–197.

1957 Seven papers presented to the 7th British Commonwealth Forestry Conference:

The management of tropical high forest; recent development in Uganda. H.C. Dawkins.

Some latin square and randomised block experiments in tropical high forest. H.C. Dawkins.

Some results of stratified random sampling of tropical high forest. H.C. Dawkins.

Forest mapping from aerial photographs in Uganda. A.B. Cahusac.

Selection and dedication of land for forestry in Uganda. C. Swabey.

The development of forestry training in Uganda. C. Swabey and D.W.G. Bacon.

Exotic forest trees in Uganda. D. Leuchars.

The Strength Properties of Uganda Timbers. *Forest Department Bulletin*, No. 5.

A fresh-water wood borer. H.A. Osmaston. *Empire Forestry Review*, 36.

Papers for the Second Inter-African Forestry Conference (Pointe Noire, July 1958).

The measurement of basal area increment in tropical high forest. H.C. Dawkins.

Recent progress in extensive treatment of tropical high forest in Uganda. H.C. Dawkins.

The relative merits of hormonal and arsenical arboricides. H.C. Dawkins.

1958 The management of natural tropical high-forest with special reference to Uganda. H.C. Dawkins. Inst. paper 34, Imperial Forestry Institute, Oxford. 154p.

Sustained yield – our snare and delusion? H.A. Osmaston. *Empire Forestry Review*, 37.

1959/60 Present wood consumption and future requirements in Uganda. FAO, Rome. Report 1287, 1960. S.L. Pringle and J.E.M. Arnold.

Nomenclature of Uganda Timbers. *Forest Department Bulletin*, No 6.

New methods of stand improvement in tropical forest. Paper for 5th World Forestry Con - ference, Seattle, 1960. H.C. Dawkins.

Eucalyptus in Uganda. Eucalyptus Conference, Brazil, 1961. D. Leuchars.

The volume increment of natural tropical high forest and limitations on its improvement. H.C. Dawkins. *Empire Forestry Review* 38(2).

The mechanical properties of *Eucalyptus saligna* transmission poles. C.H. Tack. *Journal of East African Institute of Engineers*, Vol. 9(1).

1960/61 Country Report to FAO Latin American Conifer Seminar, 1960. D. Leuchars.

1961/62 Timber supply, consumption and marketing in Uganda. *Forest Department Bulletin*, No.7. C.H. Tack.

Eleven papers presented to the Eighth British Commonwealth Forestry Conference, 1962:

A handbook on the Forests and Forest Administration of Uganda, 1961.

Progress report, 1955–60 by the Forest Department of Uganda.

The planning and practice of trials of exotic species. D. Leuchars.

Trials of species for timber planting in the savanna woodland zone of north Uganda. R.A. Butt.

Termite control research in Uganda. K.W. Brown.

The management of tropical high forest with special reference to the introduction of monocyclic felling in Uganda. M.S. Philip.

A long-term plan for conversion to monocyclic working in the Central Forest Reserves of South Mengo District, Buganda Province, Uganda. J.F. Hughes.

The planning and organisation of current silvicultural treatments in Central Forest Reserves of South Mengo District, Buganda Province, Uganda. J.F. Hughes and J.R. Lang Brown.

The reconciliation of forestry and game preservation in western Uganda. G.J. Leggat.

Lower Forestry Education. W. Finlayson.

The nomenclature of East African Timbers. East African Timber Advisory Board.

1962 The ecology and soils of the Kibale grasslands, Uganda. J.R. Lang-Brown., and J.F. Harrop. *East African Agriculture and Forestry Journal*, April 264–272.

The ecology and soils of the Kibale grasslands, Uganda. J.R. Lang-Brown. Oxford Forestry Inst. Thesis. (Original also held by Empire & Commonwealth Museum Library, Bristol, UK.)

Costs and efficiency of bush clearing by arboricides in Karamoja. *East African Agriculture and Forestry Journal* 27. (Special issue on hydrological effects of changes in land-use in some East African catchment areas.

1962/63 The Uganda Timber Industry. *Forest Department Bulletin*, No. 8. C.H. Tack and Sohan Singh Lall.

1964/65 Uganda Timbers. C.H. Tack. Govt. Printer, Entebbe.

2. Uganda Forest Department Bulletins

1. The Mimosaceae of Uganda (W.J. Eggeling, 1934).
2. Native names of trees and shrubs of Uganda (W.J. Eggeling, 1934).
3. A history of the Uganda Forest Department, 1898–1929 (N.V. Brasnett, 1951).
4. A history of the Uganda Forest Department, 1930–1950 (N.V. Brasnett and I.R. Dale, 1955).
5. The strength properties of Uganda timbers (C.H. Tack, 1957).
6. Nomenclature of Uganda timbers (C.H. Tack, 1959/60).
7. Timber supply, consumption and marketing in Uganda (C.H. Tack, 1961/62).
8. The Uganda timber industry (C.H. Tack and Sohan Singh Lall, 1962/63)
9. Uganda timber users handbook (R.A. Plumptre, 1967) (superseded by a book with the same title but much expanded by P. Kityo and R.A. Plumptre, 1997, Commonwealth Secretariat).
10. The resistance of some Uganda timbers to vacuum-pressure impregnation with copper-chrome-arsenate wood preservatives (R.A. Plumptre and B. Kasirye, 1968).

Note: For convenience this covers the entire series up to 2002.

3. Uganda Forest Working Plans approved during the period 1950–1965

Type: F&P = Fuel & Pole Pln.; STP = Softwood Timber Pln.; HTP = Hardwood Timber Pln.; THF = Tropical High Forest; MMF = Moist Montane Forest, montane bamboo & moorland; Hill = Hill Protection Res. (savanna); Sav = Savanna or bush (for fuel), or lowland bamboo. UFD = number of copies held by UFD in 2000 (* = incomplete); OFI + = copy held by Oxford For. Inst. in 2000; Repr. R = reproduced 1999–2000 by Commonwealth Secretariat; Rev.= revision; ext. = extended.

District	Forest	Type	Period	Rev.	Author	Pages	UFD	OFI	Repr.
Acholi									
	Acholi ALG Reserves (Gulu)	F&P	1952–1961						
	Acholi Bamboo LFRs	Sav	1962–1972		Kingston	6	3		
	Acholi Bush Fuel LFRs	Sav	1962–1972		Kingston	32			
	Acholi Plantation LFRs	F&P	1963–1972		Kingston	10	1		
	Aringa River LFR	THF	1962–1972		Kingston	6			
	Okavu-Reru Reserves	Sav	1965–1971		Kingston	19	1		
	Gulu Plantations CFRs	F&P	1952–1961			37	2		
	Gulu Plantations CFRs	F&P	1955–1964		Leuchars & Tothill	13	*1	+	
	Gulu Plantations	F&P	1963–1977	1st		15	2		
	Jaka & Pajimu LFRs	Sav	1962–1972		Kingston	23	1		
	North Acholi Hills CFRs	Hill	1952–1961						
	North & East Acholi Hills CFRs	Hill	1955–1965		Dale			+	
	West Acholi LFRs & CFRs	Sav	1962–1972		Kingston	12	2		
Ankole									
	Bugamba & Rwoho CFRs	STP	1964–1973		Lang Brown	51	2	+	
	Kalinzu CFR	THF	1960–1970		Osmaston	47	2	+	R
	Kasyoha-Kitomi CFR	THF	1957–1961		Leggat			+	
	Kasyoha-Kitomi CFR	THF	1965–1977		Synnott (?)	9	*1		
	Mbarara Plantations CFR	F&P	1956–1963		Watson, R. B.		25	1	+
	Mbarara Plantations CFR	F&P	1964–1974	1st	Ball				
	North Block, S. Ankole CFR	STP	1957–1961		Watson, R. B.		26	1	+
Bugisu									
	Bugisu Plantations LFRs	F&P	1955–1959		Webster	18	1		
	Bugisu Plantations LFRs	F&P	1961–1971	1st	Bacon			+	
	Mbale Plantations C&LFRs	F&P	1953–1960		Webster				
	Mbale Plantations C&LFRs	F&P	1961–1970	1st	Bacon	13	1	+	
	Mount Elgon CFR	MMF	1954–1958		Webster			+	
	Namatale LFR	THF	1959–1968		Kingston	13	6		
Bukedi									
	Bukedi Plantations LFRs	F&P	1955–1960		Webster			+	
	Bukedi Plantations LFRs	F&P	1961–1971		Bacon	12	1		
	Nagongera Plns. CFR	F&P	1954–1958		Webster	28	1	+	
	Nagongera Plns. CFR	F&P	1959–1970	1st	Kingston	39	1	+	
	South Bukedi Industrial	Sav&Hill	1954–1961		Webster				
	& Hill LFRs	Sav&Hill	1962–1972	1st	Osmaston	8	9		
	Tororo Plantations CFR	F&P	1954–1960		Webster & Swabey			+	
	Tororo Plantations CFR	F&P	1961–1971	1st	Bacon	19	1	+	
Bunyoro									
	Budongo, Siba & Kitigo CFRs	THF	1955–1964	2nd	Trenaman	22	3	+	
	Budongo, Siba & Kitigo CFR	THF	1964–1974	3rd	Philip	74	1	+	
	Bugoma CFR	THF	1948–1953		Dale				

District	Forest	Type	Period	Rev.	Author	Pages	UFD	OFI	Repr.
Bunyoro (*contin.*)									
	Bugoma CFR	THF	1960–1970	1st .	Osmaston	55	1	+	R
	Bunyoro Hills LFRs	Hill	1959–1968		Beaton	12	*1	+	
	Bunyoro Kingdom N.G. Plns.	F&P	1957–1966	–	Beaton	17	1	+	
	Bunyoro Lowland LFRs & Public Land	Sav	1960–1970		Philip & Osmaston		12	1	+
	Nyabyeya CFR (Forest School)	STP	1957–1966	–	Bacon	14	7	+	
Busoga									
	Busoga Plantations LFRs	F&P	1956–1965		Stephens			+	
	Busoga A.L.G. Bush Reserves	Sav	1956		Stephens			+	
	Mutai Industrial Fuel Res. CFR	F&P	1955–1961		Stephens			+	
	Mutai & Mile 20 Plantations CFR	F&P	1962–1972	1st	Plumptre	11	2		
	Mutai & Butamira LFRs	F&P	1962–1972	1st	Plumptre	24	2		
	Kimaka CFR	F&P	1952–1961	1st	Trenaman,	17	1	+	
	Kimaka CFR		1961–1975	ext.	Wood, Miller				
	South Busoga CFR	Sav	1955–1964		Leggat			+	
	Namasagali Plantation CFR	F&P	1955–1960		Stephens			+	
	Walulumbu, Msoli and Gulibi LFRs	Sav	1956–1960		Stephens			+	
	Walulumbu, Msoli and Gulibi LFRs		1960–1965	ext.					
Karamoja									
	Kadam CFR	Hill	1957–1966		Philip	12	2	+	
	Kamalinga (Napak) CFR	Hill	1955–1959		Philip			+	
	Kamalinga (Napak) CFR	Hill	1964–1968		Philip				
	Labwor Hills and Otukei CFRs	Hill	1958–1967		Philip			+	
	Moroto CFR	Hill	1955–1964		Philip			+	
	*North Karamoja CFRs	Hill	1964–1973		Philip				
Kenya (part admin. by Uganda)									
	Karasuk Hills	Hill	1964–1968		Philip	25	2		
Kigezi									
	Cheilima LFR	MMF	1961–1971		Tothill			+	
	Echuya CFR (bamboo)	MMF	1956–1960		Watt			+	
	Echuya CFR (bamboo)	MMF	1960–1965	1st.	Kingston				
	Ihimbo Forest	THF	1964–1974		Lang Brown	5	2		
	Impenetrable CFR (Bwindi NP)	THF	1962–1971		Leggat & Osmaston	45	3	+	R
	Kabale Plantations CFR	F&P	1957–1961		Tothill	14	*2		
	Kabale Plantations CFR	F&P	1961–1967						
	Mafuga CFR	STP	1954–1963		Lyon & St. C. Thompson				
	Mafuga CFR	STP	1964–1974	1st	Lang Brown	70	1	+	
	Mgahinga CFR (now Nat.Pk.)	MMF	1956–1960		Watt	12	1	+	
	Mgahinga CFR (now Nat.Pk.)	MMF	1960–1965	1st.	Kingston				
	Muko LFR	STP	1958–1967		Tothill	11	1	+	
	Rwensama Village Fuel Supplies	THF	1957–1966		Tothill	13	2	+	

District	Forest	Type	Period	Rev.	Author	Pages	UFD	OFI	Repr.
Kigezi & Ankole									
	Maramagambo CFR (QENP)	THF	1960–1970		Osmaston	15	2	+	R
Lango									
	Lango Bush Fuel LFRs	Sav	1962–1972			8	7		
	Lango Plantation LFRs	F&P	1962–1972		Kingston				
	Lira Plantations CFR	F&P	1955–1959		Leuchars & Tothill			+	
	Lira Plantations CFR	F&P	1961–1966	1st.	Kingston				
	Maruzi Hills CFR	Hill	1962–1972			6	4		
Lango & Acholi									
	Timber Plantation CFRs	HTP	1955–1964		Leuchars			+	
Madi									
	Madi CFRs	Sav&Hill	1955–1964						
	Zoka CFR	THF	1962–1972		Stuart-Smith	10	3		
	Masaka Lake Forests CFRs	THF	1956–1965		Stuart-Smith			+	
Masaka & West Mengo									
	Masaka Plantations CFR	F&P	1954–1963		Philip & Miller			+	
	Masaka Plantations CFR	F&P	1965–1974	1st.	Ball (?)	23	3		
	Mpanga Research Forest CFR	THF	1960–1965		Dawkins & Philip	29	2		
	Mpanga Research Forest CFR	THF	1965–1970			37	1		
	Sango Bay CFRs	THF	1955–1965					+	
Mengo									
	Buganda Dedication Scheme	THF	1951–		Sangster			+	
	Buganda Kingdom Plantns LFRs	F&P	1961–1963	1st.		36	1		
	Buganda Kingdom. Plantns LFRs	F&P	1957–1961		Butt			+	
	Entebbe Plantations CFR	F&P	1951–1957	1st	Trenaman	30	1		
	Entebbe Plantations CFR	F&P	1957–1964	2nd	Webster			+	
	Entebbe Plantations CFR	F&P	1965–1969	3rd	Butler	20	1		
	(not published; incorporated into Kampala & Entebbe Plns. 1966–1976)								
	Kampala Plantations CFR	F&P	1950–1954	1st	Webster			+	
	Kampala Plantations CFR	F&P	1955–1959	2nd.	Elliot			+	
	Kampala Plantations CFR	F&P	1960–1965	3rd	Hughes	30	3	+	
	Mengo High Forests, Buganda Kingdom LFRs	THF	1956–1966		Butt	21	1		
	Singo Hills CFRs	Hill	1956–1965		Lyon			+	
	South Mengo Forests CFRs	THF	1948–1957		Sangster (pub.1950)			+	R
	South Mengo Forests CFRs	THF	1961–1971	1st	Webster	58	2	+	R
Mubende									
	Mubende LFRs	THF	1959–1968		Webster	7	1	+	
Sebei									
	Sebei Plantations LFRs	STP	1962–1967		Osmaston	3	17		
	Sebei Natural Forests LFRs	MMF	1963–1967		Osmaston	4	5		
Teso									
	Soroti Plantations CFR	F&P	1954–1963	1st	Stephens & Miller			+	
	Soroti Plantations CFR	F&P	1964–1969	2nd.	Watt	12	1		

District	Forest	Type	Period	Rev.	Author	Pages	UFD	OFI	Repr.
Teso (*contin.*)									
	South Teso plantations LFRs	F&P	1954–1958		Webster			+	
	Teso Bush LFRs	Sav	1954–1963		Webster			+	
	Teso Bush Reserves LFRs	Sav	1964–1973	1st.	Stephens (?)	4	*1		
	West Teso Hills LFRs	Hill	1954–1963		Stephens			+	
	West Teso Hills LFRs	Hill	1964–1973	ext.					
Toro									
	Bugoye & Maliba LFRs	THF	1963–1970		Beaton	10	1		
	East Toro LFRs	THF	1963–1972		Beaton	11	2		
	Fort Portal Plantations CFR	F&P	1965–1975	2nd	Kingston	42	1		
	Fort Portal Plantations CFR	F&P	1956–1960		Leggat	16	*1	+	
	Fort Portal Plantations CFR	F&P	1961–1965	1st	Leggat			+	
	Itwara CFR	THF	1949–		Dale				
	Kasenda LFR	THF	1964–1968		Beaton	16	1		
	Kibale CFR (now Nat.Pk.)	THF	1948–1953		Dale				
	Kibale & Itwara CFRs	THF	1959–1965	1st	Osmaston	206	1	+	R
	Kibale & Itwara CFRs	THF	1965–1970	2nd.	Kingston	231		+	
	Kihabule LFR	Sav	1952–1956		Osmaston				
	Kihabule LFR	Sav	1957–1966		Lang Brown	15	1	+	
	Kisangi CFR	THF	1960–1970		Osmaston	26	1	+	
	Kyehara and Kikumiro CFRs	STP	1952–1956		Osmaston				
	Kyehara and Kikumiro CFRs	STP	1956–1965	1st.	Lang Brown			+	
	Kyehara and Kikumiro CFRs	STP	1965–1975	2nd.	Kingston	85		+	
	Muhangi CFR	THF	1964–1968		Beaton	9	2		
	Oruha LFR	STP	1959–1968		Plumptre			+	
	Ruwenzori CFR (now Nat.Pk.)	MMF	1961–1971	1st	Leggat & Beaton	33	3	+	R
	Semliki CFR	THF	1958–1961	Ext.	Dale			+	
	Semliki CFR	THF	1961–1971	1st	Leggat	28	1	+	
	Toro Plantations LFRs	F&P	1965–1975			8	1		
	West Toro LFRs	THF	1963–1973		Beaton	9	2		
West Nile									
	Arua plantations CFR	F&P	1956–1961	1st	Osmaston			+	
	Arua Plantations CFR	F&P	1962–1973	2nd	Stuart Smith	10	2		
	Bush Fuel LFRs	Sav	1965–1975			19	2		
	Lendu Softwood Plantations CFRs	STP	1952–1956						
	Lendu Softwood Plantations CFRs	STP	1957–1961	1st	Osmaston	15	1		
	Lendu Softwood Plantations CFRs	STP	1962–1971	2nd	Stuart Smith	35	*1		
	Mt. Kei CFR	Hill	1955–1964					+	
	Mt. Kei CFR	Hill	1964–1974		Beaton	15	1		
	Northern Escarpment Hills LFRs	Hill	1963–1973		Stuart Smith				
	Northern Escarpment LFRs	Hill	1955–1961		Beaton	14	1		
	Nyio Bamboo Reserves LFRs	Sav	1962–1972		Stuart Smith	8	6		
	Southern Escarpt. Hill Tracts LFRs	Hill	1952–1961						
	Tobacco Fuel Plantations LFRs	F&P	1954–1960			14	1		

West Nile (*contin.*)							
	Tobacco Fuel Plantations LFRs	F&P	1954–1960		Beaton	14	1
	Tobacco Fuel Plantations LFRs	F&P	1962–1972	1st	Stuart Smith	15	2

Note
By 1965 almost all the reserved forests in Uganda were under approved, current Working Plans, a 'sustained yield' being normally the primary object of management of all production reserves. This list of plans for about 100 reserves and groups of reserves was compiled mainly from lists of incomplete holdings at the Oxford Forestry Institute and the Uganda Forest Department, besides Annual Reports and various personal records and memories (particularly B. Kingston, WPO 1966–1974); some details are missing and the list is probably incomplete. Many of the UFD stocks of working plans were stolen during the Amin-Obote periods, probably to provide wrapping paper for peanuts in the local markets, as paper was desperately short, so some important ones were reprinted in 1999–2000. Some districts have since been subdivided.

4. Technical Notes

1953–58 numbered serially in each year; 1959 onwards serially from No. 72.
All are held on microfilm at the Oxford Forestry Institute library, now part of the Bodleian Library
RP = Research Plot

1953
1/53 A note on the mechanical properties of *Chrysophyllum albidum and Albizia zygia.* (C.H. Tack)
2/53 Logging in Switzerland. (C.H. Tack)
3/53 A note on the Forests (Pest Control) Rules. (C.H. Tack)
4/53 Forest operations at Kakamega, Kenya. (C.H. Tack)
5/53 Plywood and veneer species. (C.H. Tack)
6/53 Electrified fencing. (I.R. Dale, H.A. Osmaston, K. Trenaman and D. Leuchars)

1954
1/54 Wood borers in buildings. (C.H. Tack)
2/54 Natural regeneration of *Eucalyptus saligna* and *robusta.* (A. Stuart-Smith)
3/54 Productivity of Uganda high forest. (H.C. Dawkins)
4/54 High forest tree increment. (H.C. Dawkins)
6/54 Notes on a visit to the Imatong Mountains. (D. Leuchars, C. Swabey and H.C. Dawkins)
7/54 Death and coppicing of *Eucalyptus saligna* at Mbarara. (H.A. Osmaston)
8/54 Extracts from 'Records of Investigations' Agricultural Department, 1/4/50–31/3/52.
9/54 Forest productivity in Uganda. (C. Swabey)
10/54 Silviculture of Musizi. (C. Swabey)
11/54 Fence posts. (I.R. Dale)
12/54 Exotic bamboos. (I.R. Dale, R.G. Miller)
13/54 Bending timbers. (C.H. Tack)
14/54 A lens key to some Uganda timbers. (K.W. Trenaman)
15/54 Uses for sawdust and shavings. (C.H. Tack)

1955

1/55 Abstracts from colonial research. (C. Swabey)
2/55 Extracts from South African Department of Forestry Report 1953. (I.R. Dale)
3/55 Costs of arboricide. (H.C. Dawkins)
4/55 First arboricide trials in Karamoja. (H.C. Dawkins)
5/55 Investigation into the growth of *Chlorophora excelsa* in plantations. (C. Swabey)
6/55 Technical liaison in Uganda Forest Department. (C. Swabey)
8/55 Forestry notes on a trip from Uganda to the Cape. (I.R. Dale)
9/55 The moisture content of timber in buildings in Uganda. (C.H. Tack)

1956

1/56 The relationship of solid to stack volume for *Eucalyptus saligna* fuel in Arua. (H.A. Osmaston)
2/56 Natural regeneration of *Eucalyptus saligna*. (G. Elliott)
3/56 Use of arboricide in forest tree weeding. (H.C. Dawkins)
4/56 Preliminary graminicide tests at RP 5. (H.C. Dawkins)
5/56 Arboricide concentration conclusion of RP10 Mpanga. (H.C. Dawkins)
6/56 Phomopsis on *Cassia*, conclusion of plot. (H.C. Dawkins)
7/56 Interim results RP 11 Mpanga, spray application. (H.C. Dawkins)
8/56 Interim results RP 13 Mpanga, measurement accuracy. (H.C. Dawkins)
9/56 Interim results RP 16 Mpanga, felling damage. (H.C. Dawkins)
10/56 Interim results RP 32 Bunyoro, underplanting of partially felled forest with *Khaya* and *Chlorophora*. (H.C. Dawkins)
11/56 Direct sowing of *Maesopsis* (as nurse for *Chlorophora*). (H.C. Dawkins)
12/56 Underplanting *Khaya grandifoliola* in Budongo. (H.C. Dawkins)
13/56 Underplanting of *Entandrophragma utile*. (RP 36 conclusion of plot). (H.C. Dawkins)
14/56 *Brousonettia papyrifera* in felled forest. (H.C. Dawkins)
15/56 Small plant establishment of *Khaya* and *Chlorophora* in felled forest RPs 42 & 43 Bunyoro. H.C. Dawkins)
17/56 Crown classification of natural forest trees. (H.C. Dawkins)
18/56 *Chlorophora* plantation in grassland and elephant. (H.C. Dawkins)
19/56 Root trenching of *Khaya* underplanted in forest RP 47 Bunyoro. (H.C. Dawkins)
21/56 Some recent American work on arboricides. (H.C. Dawkins)
23/56 Pre-germination of teak. (H.A. Osmaston and H.C. Dawkins)

1957

1/57 Plotting maps from aerial photographs. (A.B. Cahusac)
3/57 Soil description and sampling. (revised). (H.A. Osmaston)
4/57 Seed trials of *Maesopsis*; interim report RP 303 Entebbe. (D. Leuchars)
5/57 Abstracts from colonial records. (D. Leuchars)
6/57 Eradication of *Eucalyptus* coppice and Lantana. (D. Leuchars)
7/57 An improved cutter blade for the Hayter. (D. Bacon)
8/57 Changes in nomenclature of certain exotics. (D. Leuchars)

1958

1/58 Regeneration of *Khaya* grandifoliola. (H.A. Osmaston)
2/58 Uganda hardwoods suitable for flooring. (C.H. Tack)

3/58 Terminology for tropical African vegetation. (H.C. Dawkins)
4/58 *Eucalyptus saligna* crop data from Kampala plantations, RP 107 & 108, conclusions. (D. Leuchars)
5/58 Arboricide research in Karamoja. (H.C. Dawkins)
6/58 Further measurements of felling damage in tropical forest. (H.C. Dawkins)
7/58 Sapwood thickness and volume of some indigenous trees. (H.C. Dawkins)
8/58 Seasonal effectiveness of arboricides. (H.C. Dawkins)
9/58 Kenya softwood plantations tour notes. (D. Leuchars)
10/58 A tour of South African forests. (H.A. Osmaston)

1959

72/59 General volume table for *Eucalyptus saligna*. (H.C. Dawkins)
73/59 Computation of survey traverses. (H.A.Osmaston)
74/59 A silve for use in Uganda. (H.C. Dawkins)
75/59 Forestry in Rwanda. (W.E.M. Logan)
76/59 Control of Ambrosia beetles in logs. (K.W. Brown)
77/59 Information on the Mpanga Research Forest. (H.C. Dawkins)
78/59 A nursery technique for dry areas. (J.R. Lang Brown and D. Leuchars)
79/59 Eucalypts in Uganda. (D. Leuchars)
80/59 Further experience of electric fencing. (H.C. Dawkins)
81/59 Nursery gadgets. (B. Kingston and D. Leuchars)
82/ [not issued]

1960

83/60 Eucalyptus taper and volume by diameter limits. (H.C. Dawkins)
84/60 Weekly measurement of rainfall. (H.C. Dawkins)
85/60 A nursery sprinkler. (B. Kingston)
86/60 Field characters of the Uganda Forest *Albizia*. (H.C. Dawkins)
87/60 Latin American conifers in Uganda. (D. Leuchars)
88/60 Volume table for *Eucalyptus saligna* poles. (H.A. Osmaston)

1961

89/61 Silves and volume tables. (H.A. Osmaston)
90/61 *Maesopsis* plantations in Kakamega Forest Kenya. (M.S. Philip)
91/61 Tour notes, Latin America, September–November 1960. (D. Leuchars)
92/61 Tour notes, Florida and Louisiana, November 1960. (D. Leuchars)
93/61 Notes on *Analeptes* (= *Diastocera*) *trifasciata* F. (Col. Lamidae) and *Kotochalia* (= *Acanthopsyche*) *junodi* Heyl. (Lep. Psychidae), two possible pests of *Eucalyptus*. (K.W. Brown)
94/61 Yields of *Arundinaria alpina* K. Schum. (M.S. Philip)
95/61 Report on the FAO Forestry Conference, Nigeria. (R.A. Butt)
96/61 Notes on tests of plywood preservatives. (K.W. Brown)
97/61 A report on various phytotoxicity tests. (K.W. Brown)
98/61 An interim report on termite research. (K.W. Brown)

1962

99/62 Notes on recent outbreaks of looper caterpillars. (Lep. *Geometridae*) in coniferous plantations in Uganda. (K.W. Brown)
100/62 Interim report on RPs 61, 62 & 76 for BCFC. (M.S. Philip)
101/62 Report on visits to plantations in Eldoret Division, Kenya. (A.M. Stuart Smith)
102/62 Interim report on RP 50, Budongo. (M.S. Philip)
103/62 A forestry history of Kigezi District 1900–1960/61. (A.H. Tothill)
104/62 Regeneration counts and early tending in Kibale Forest. (M.S. Philip)
105/62 R.P. 6 Budongo Forest. (M.S. Philip)
106/62 Establishment of *Dendrocalamus strictus*. (A.M. Stuart Smith and D. Leuchars)
107/62 Susceptibility of *Drypetes sp.*, *Diospyros abyssinica* and *Parinari excelsa* sub-sp. *holstii* to Finopal. (M.S. Philip)
108/62 The effectiveness of different types and makes of paint when used on living trees. (M.S. Philip)

1963

109/63 Volume table for *Eucalyptus saligna* poles. (W. Finlayson)
110/63 Tending of *Maesopsis eminii* in grasslands. (R.P. 506). (M.S. Philip)
111/63 The policy for work subsequent to species trials in Uganda. (M.S. Philip)
112/63 Plantation sample plots. (H.A. Osmaston)
113/63 Provenance trials of *Cupressus lusitanica*. (R.P.396). (M.S. Philip)
114/63 Observations on crown-diameter, stocking, silviculture requirements and possible yield of *Maesopsis*. (H.C. Dawkins)
115/63 Interim Report – Afforestation trials on the alluvial sands bordering Lake Victoria. (M.S. Philip)

1964

116/64 Recommendations for the preservative treatment of small round timbers by sap displacement and for fencing techniques. (R.A. Plumptre)
117/64 Volume table for *Pinus patula* at Mafuga. (M.S. Philip)

1965

118/65 Some properties of Uganda grown *Eucalyptus saligna*. (R.A. Plumptre)
119/65 A rope ladder for high pruning. (B. Kingston)
120/65 Erection of fire-towers in Uganda. (B. Kingston)
121/65 Dry-wood termites in structural timber in Uganda. (K.W. Brown)

Appendix B. Glossary

Staff

CCF	Chief Conservator of Forests
DCCF	Deputy Chief Conservator of Forests
CF	Conservator of Forests
ACF	Assistant Conservator of Forests
PFO	Provincial Forest Officer
RFO	Regional Forest Officer
DFO	District Forest Officer
P/FS	Principal of the Forest School
AF	Assistant Forester

Miscellaneous

AFE	adequate forest estate
ALG, NG	African Local Government, Native Government. Authorities wielding certain devolved powers in each district. NGs were progressively converted to ALGs from 1950 onwards.
CFR	Central Forest Reserve (managed by the Forest Department)
CFS	Colonial Forest Service
EAAFRO	East African Agriculture and Forestry Research Organisation
EAR&H	East African Railways & Harbours
EP,WP, NP	Eastern, Western and Northern Provinces
FAO	Food and Agriculture Organisation
FPRL	Forest Products Research Laboratories
gab	girth above buttress
gbh	girth at breast height
GN	General Notice
Hoppus	a traditional British method of conservatively estimating log volume, based on squaring one quarter of the girth (see Appendix F)
IFI	Imperial (later Commonwealth, later Oxford) Forest Institute)
LFR	Local Forest Reserve (managed by an African Local Government)
LN	Legal Notice
MAI	mean annual increment

NHF	Natural High Forest
NPK	nitrogen, phosphorus and potassium fertiliser
Taungya	SE Asian term for a system of planting trees in temporary farmers crops.
TSI	timber stand improvement
UTS	Uganda Timber Sales

Trees

kirundo	*Antiaris toxicaria* (Rumph ex Pers) Lesch.
mahogany	*Khaya* and *Entandrophragma* species
mubura	*Parinari excelsa* Sabine subsp. *holstii* (Engl.) R. Grah.
muhimbi	*Cynometra alexandri* C.H. Wright
munyama	*Khaya anthotheca* (Welw.) C.D.C.
musizi	*Maesopsis eminii* Engl.
mvule	*Milicia* (formerly *Chlorophora*) excelsa (Welw.) C.C. Berg
nkoba	*Lovoa brownii* Sprague
podo	*Podocarpus* species
bamboo (mountain)	*Arundinaria alpina* K. Schum
bamboo (savanna)	*Oxytenanthera abyssinica* (A. Rich.) Munro
cane, rattan	*Calamus deeratus* Mann & Wendl

The commonest *Eucalyptus* species planted in the period was known as *E. saligna* Sm., but is now considered to be a form of *E. grandis* (Hill) Maiden.

Appendix C. Staff List

(to 1965)

Professional Forestry	Period
D.W.G. Bacon (Forest School)	1949–58
J. Ball	1963*
A. Beaton	1952–64
K.W. Brown (Entomologist)	1957*
M.C.F. Butler	1957–64
R.A. Butt	1944–63
A.B. Cahusac (Map Officer)	1947–65
W.V. Calder	1956–57
I.R. Dale (DCCF)	1938–56
H.C. Dawkins MBE (Ecologist)	1942–60
D.E. Earl	1963*
W. Finlayson (Forest School).	1961–63
J.R. Hilton	1949–50
J.F. Hughes	1958–63
R.C.B. Johnstone	1963*
P.K. Karani	1962*
B. Kingston	1958*
E. Kiwutta-Kizito	1963*
S.S. Kyama	1952*
J.R. Lang Brown	1955–63
G.J. Leggat	1946–62
D. Leuchars (Silviculturist)	1949–62
W.E.M. Logan OBE (CCF)	1957–62
D.C. Lyon	1953–62
D. Midholi	1949*
R.G. Miller	1949–54
Murekezi	1965*
E.K.B. Mwanga	1963*
J. Oakley	1963*
H.A. Osmaston (Working Plans)	1949–63
S. Otim	1965*
M.S. Philip MBE (Ecologist)	1947–64
R.A. Plumptre (Utilisation)	1957*
M.L.S.B. Rukuba (CCF)	1959*
R.G. Sangster	1935–52
E.K. Serwanga	1963*
D. Sim (Forest School)	1964*
G.W. St. Clair Thompson	1938–55
J.E.M. Stephens (Forest School)	1950–62
A.M. Stuart Smith	1950*
C. Swabey (CCF)	1951–57
T. Synnott	1960*

A.H. Tothill	1955–60
K.W. Trenaman	1949–56
R.B. Watson	1955–59
R.H. Watson	1956–63
A.W.M. Watt	1947*
G. Webster OBE (CCF)	1937–65
G.H.S. Wood	1949–53

Utilisation

C.G. Bouette (Saw Doctor)	1951–57
Brig. P.T. Goodwin OBE (Timber Grader)	1947–54
Sohan Singh Lall (Sub-Overseer)	1954–65
F. Mugwanya	1964*
C.H. Tack (Forest Engineer)	1949–63
D.D.H. Trask (Logging & Milling)	1956–58

Clerical

P.F. Antao	1925–60
J.M.S. Azavedo MBE	1923–56
R.S. Britto	1945*
J.S. Kabengwa	1937–60
P. Kateba BEM	1946*
B.A.P. Lobo	1951*
J.F.U. Pereira	1944–65
C.J.P.J. Rodrigues	1920–1952
D.F.P.V .de Souza	1950*
J.C.F. de Souza	1926–58

Subprofessional Forestry

E.A. Apyettu	1952*
J.N. Bakamunaga	1952*
J.W. Batesaki	1938*
G. Elliot	1937–57
E.A. Holyoak (Forest School)	1954–60
J.A. Fraser	1936–52
A.G.R. Jasi	1946*
E.J.B. Kadoko	1951*
E.O.K. Kauma	1941*
E. Kaye	1950*
C.M. Kerali	1954*
A.W. Kigundu	1935*
H.R. Kimera	1952*
C.M. Kiragga	1951*
S.D. Mukasa	1937*
S.D. Mukunya	1963*
L.E. Muwanga	1948*
G. Nsubuga	1951*

J. Rwaheru	1952*
H.R. Webb MBE (Forest School)	1929–53
J.B. Zabasaija	1952*

Notes

* Service continued after 1965.

Individuals are listed in their final category (professional, etc.) reached in 1965 or before, but their period of service includes any in a different category, e.g. for those who started as rangers.

Specialist and other posts shown against individuals often refer to only a part of that officer's service.

Due to looting during civil disturbances in the 1970s many records were destroyed, so some of the above information (mainly dates) may be inaccurate, or there may be omissions.

Appendix D. The History of Forest Reservation, 1898–1950

(extracted from the previous *Histories of the Uganda Forest Department*)

The Uganda (Buganda) Memorandum of Agreement, signed in March 1900 by Sir Harry Johnston and the Regents and Chiefs of the Kingdom of Uganda (Buganda), stated that 1,500 sq miles of forests in the Kingdom should be brought under the control of the Uganda Administration.

This applied only to the then Buganda Province (17,300 sq miles), the area of which was overestimated in 1900 at 19,600 sq. miles. The Agreement stipulated that 1,500 sq miles of forest not in private ownership were to be brought under the control of the Uganda Administration, together with a further 9,000 sq miles of waste and uncultivated land. The forests were to be maintained as woodland in the general interests of the country.

The Toro Agreement of 1900 and the Ankole Agreement of 1901 both contained a clause to the effect that all forest and waste and uncultivated land was the property of the British Government. The Bunyoro Agreement of 1933 vested in the Governor 'the control of all existing forests and all areas hereinafter to be declared forest' in Bunyoro. In areas where no Agreements were made, the Governor had the right under the Laws of the Protectorate to appropriate areas which he considered were required for forests, with the proviso that the Governor should in every such case consult the African Government concerned and give full consideration to its wishes. Rural lands in Uganda were, of course, held in trust for the use and benefit of the African population.

From the foregoing it is clear that the stage was set at a very early date for the reservation of forests in Buganda totalling nearly 9% of the land and swamp area of the Province, of all existing forests elsewhere in the Protectorate and of such uncultivated bushland as it was deemed advisable to reserve. Most unfortunately, the chance to effect this reservation early in the history of European administration in Uganda was not taken, nor was much attention paid to this most important matter by forest officers during the next two decades. This caused Nicholson to comment in 1929 that 'had half the money spent on various afforestation schemes been spent on selection and demarcation, the forest position in Uganda would have been far sounder than it is to-day' (J. W. Nicholson, *The Future of Forestry in Uganda*).

In 1904 the Survey Department began the task of surveying and demarcating the 9,000 sq miles of private and official estates recognised by the Uganda Agreement. There is no evidence to show that forest officers took any interest in the selection of the boundaries of these estates, and consequently of the Crown forests which were to. be reserved. The surveyors immediately came up against difficulties about forest claimed as part of estates, but this issue was settled in 1907 by the Uganda Memorandum of Agreement (Forest), which declared that only forests half a square mile or more in extent, and 300 yards or more in width, could be claimed as Crown forests.

The interpretation of the Forest Agreement appears to have been left entirely to the surveyors of the Survey Department and it is recorded that one of them, Mr. J. M. Y. Trotter, earned the name 'Lion of Kyagwe' – the man who ate up the land – because of his insistence that there must be no encroachment on Crown forest in that area. Interrupted by the 1914–18 war, the survey of private estates was completed in 1936, when the total area of the forests demarcated in the process was found to amount to only 333 sq miles. In addition there were some 171 sq miles of forest worth retention which had not been demarcated separately from adjoining land, so that the total area of Crown forest in Buganda was 504 sq miles, only one-third of the area which it had been agreed should be maintained as woodland in the general interests of the country. Most of the forests were marked on maps as Crown

forest but none was actually gazetted as such until 1932.

The Eastern, Northern and Western Provinces, where private estates are few and scattered, had been gradually surveyed topographically by the Survey Department. On the maps produced, forest areas appeared as undefined patches of tree symbols, marked Budongo forest, Kibale forest, etc. Dawe investigated many forests in Buganda and the Western and Northern Provinces between 1903 and 1910, and some examinations for possible exploitation were made spasmodically between 1911 and 1928. Between 1928 and 1930 Nicholson toured most of Uganda, accompanied in 1929–30 by the Conservator. By 1932 the results of all forest investigations to date were embodied in recommendations to Government for the gazetting of a considerable number of demarcated and undemarcated Crown forests. The total gazettement amounted however to only 1,412 sq miles, or 1.8% of the land and swamp area of the Protectorate, and only 274 sq miles were demarcated.

In 1935 Government accepted the advice of the Conservator that a dangerously low percentage of the country had been constituted Crown forests and issued instructions to all Provincial Commissioners to prepare, in consultation with the Forest Department, proposals for further reservation, a decision which was of great assistance to Divisional Forest Officers. The fruits of this policy did not begin to appear in the Official Gazette until 1937, but between then and 1942 the labours of a number of officers, notably Eggeling, Sangster, Thompson and Cree, who had toured and argued with administrative officers persistently, resulted in the gazetting of very considerable areas and the settlement of boundaries of many forests vaguely described in previous gazetting.

In 1938 a new class of forest called Native Forest Reserves was instituted and it was possible to secure the reservation of some areas for control by Native Administrations which could not be gazetted as Crown forests.

1946 may be regarded as the beginning of the consolidation of the Forest Estate. Some of the land gazetted in the previous decade was on further investigation found to be useless for economic or for protective forestry, and excisions began.

The position at the end of 1950 was that Bugishu, Madi, Kigezi and Bunyoro had been declared to have adequate forest estates, Toro was about to be declared, and the Ankole reservation programme was almost complete. In the Eastern Province where forest and woodlands are small and population dense, great efforts were being made to reserve forest remnants and sites for plantations. In the North, reservation in the West Nile had started late but was proceeding well; the Acholi were co-operative and the Lango antagonistic; and in Karamoja, where many undemarcated reserves had been gazetted, further reservation and demarcation was at a standstill, owing to the backwardness of the country and to lack of staff.

It had been realised that the reservation of 1,500 sq miles in Buganda was impossible of attainment. Only 530 sq miles had been reserved, chiefly in southern Mengo. There was scope however for reserves in northern Mengo, Masaka and Mubende.

The progress of reservation in Uganda was as follows:

Year	Area in sq miles gazetted during the year		Total gazetted area in sq miles at end of the year
	Crown Forests	Native Forest Reserves	
1932	1,412		1,412
1940	1,230	87	4,919
1950	14	42	6,317

In the same period demarcation progressed as follows:

	Crown Forests	Native Forest Reserves
Forests demarcated up to end of 1932	274 sq m	0 sq m
Forests demarcated up to end of 1940	2172 sq m	57 sq m
Forests demarcated up to end of 1950	3544 sq m	218 sq m

Appendix E. The mvule (*Milicia = Chlorophora excelsa*) plantations of Lango and Acholi

Their Rationale and Early History

See plates 1–3

For those reading Chapter 4 who are unfamiliar with the previous history of these plantations it may be hard to appreciate fully the depressing tale of their decline and fall. They were started in a mood of optimism, apparently justified by the success of early trials, and by ecological views of what the climax vegetation of northern Uganda might be in the absence of fire. Their failure is a warning to future foresters that the successful establishment of this prime timber species is fraught with problems. Originally perhaps established by seed scattered by fruit-bats and birds in the banana gardens of Busoga, where it was protected from fire and grass, it grew up sufficiently spaced for *Phytolyma lata*, the Mvule Gall Fly, to be less of problem than in close plantations. After being a mainstay of the Uganda timber industry for a century, recent surveys in Busoga have shown that in the last decade 80% of the remaining mvule has been cut. Perhaps the wheel has come full circle and the new land legislation, giving occupiers legal rights over their land and any planted timber on it, may encourage the re-establishment of mvule in the banana gardens of Busoga.

The following account is extracted from *A History of the Uganda Forest Department 1930–1950*. See also:

E. Kauma (1948) Short notes on nursery and planting techniques at Abera timber plantations, Acholi District, Uganda. *Empire Forestry Review*, 1948 27 (1) p. 76–79.
H.C. Dawkins (1949) Timber planting in the Terminalia woodlands of Northern Uganda. *Empire Forestry Review*, 28 (3), 226–247.
D.W.G. Bacon (1952) The Silviculture of Mvule. Letter to *Empire Forestry Review*, September 1952.
R.A. Butt (1962) Trials of species for timber planting in the savanna woodland zone of north Uganda. Paper presented to the Eighth British Commonwealth Forestry Conference.

Natural regeneration of mvule is practically non-existent in closed forest, very sparse and unreliable in bush and very difficult to protect from fire and browsing in the open, where any survivors are generally badly shaped on account of attacks of gall-fly (*Phytolyma lata*). It appears probable that most of the trees in Busoga germinated and grew up in the protection of banana gardens which were sometimes later abandoned. In 1900–1910 the previously dense rural population of south Busoga suffered 100,000 deaths from sleeping sickness carried by tsetse flies and much of the area was evacuated. By 1930 a considerable proportion of the larger mvule in south Busoga were dead, either from natural causes, fire or change of climate. In north Busoga there were few old but many young mvule, indicating a northward spread which could not be explained. For many years exploitation of mvule went on in Busoga and in 1930 serious experiments were started at Kityerera in the South Busoga Crown Forest to discover a method of raising a reasonable stock of young trees in bush or grassland. Sowing at stake and small plants failed miserably; stumps and large plants suffered from browsing, root destruction by pig and porcupine and severe attacks of gall. Planting in grassland failed and in the bush the low shade retarded growth. Shade reduction exposed the plants to their natural enemies, fencing of blocks was prohibitively expensive and individual protection of plants meant constant creeper cutting or the plant guards were smothered and growth slowed down. Experiments with lime and ash application to

accelerate growth through the age of vulnerability to animal, vegetable and insect enemies were in progress in 1941 when the South Busoga Crown Forest was closed on account of sleeping sickness.

Native Administration planting spread to Lango shortly after 1926 and a number of very good nsambya (*Markhamia platycalyx*) plantations were established there. In around 1929 planting of mvule became popular in Lango and in 1933 3,770 mvule were successfully planted in Koli County. At this date it was reported that Koli and Eruti counties were free from the mvule gall-fly and that the trees were growing well and fast. Most of the plantations were of pure mvule at wide spacing which encouraged heavy side branches; so in 1935 mixing with *Cassia siamea* as a nurse tree was tried in a number of small plots. T.R.F. Cox, who was then Assistant District Commissioner, Lango, took a great interest in the work and started several valuable experiments at first alone and later in co-operation with the department.

The encouraging behaviour of the species in Lango led to a search for a suitable area for reservation for State planting and eventually 14.5 sq miles of savanna land near Kachung Port were obtained and gazetted as the Kachung Crown Forest. In 1939, 50 acres of mvule in mixture with various other species, notably *Phyllanthus discoideus*, were planted. These did well and in 1941 a programme of 50 acres a year was put into operation.

At the same time an area of four sq miles of good *Terminalia* savanna in Acholi was gazetted as the Abera Crown Forest and experimental mixtures of mvule and large-leaf mahogany (*Khaya grandifoliola*) were started.

The results in both areas were astonishing after the disheartening struggles in Busoga, and A.S. Thomas, Senior Economic Botanist of the Agricultural Department, who was very interested in the efforts to grow mvule, attributed the difference mainly to soil quality. The fact that there were fewer browsing and rooting animals and the absence, probably only temporary, of the gall-fly were sufficient to account for a considerable difference. An effort was made to maintain a belt round the gall free area in which no mvule tree was permitted to grow, but as this could only be quite narrow and the fly might have alternative hosts, not much reliance was placed on it. In 1944 operations were extended to the Opit Crown Forest, Acholi, and an annual programme of 160 acres of mvule mixed with Tido (*Khaya grandifoliola*) was started. These plantations were much admired and were regarded by one eminent authority as the most promising mvule plantations he had seen. The ecological premise of this work was that it was hastening a natural succession from the present *Combretum-Terminalia* savanna, seen as a fire controlled sub-climax, to the supposed climax woodland.

During 1946 labour shortages appeared, and labour especially during the planting season became increasingly difficult. Nevertheless planting was increased in 1949 to 195 acres and by 1951 about 1,500 acres (600 ha) had been planted. By 1954 increasing evidence that the early good growth was not continuing and some mvule were actually dying, resulted in a halt of the main programme and for the next decade only protective and experimental work continued.

In conclusion it may be said that labour shortages and higher costs led to the decision that the economic success of the technique was dubious. Moreover, because of the recolonisation of well-established plantations by savanna grasses, despite the exclusion of fire, it was concluded that both the ecological premise and silvicultural success were increasingly doubtful. This was a sad end to a promising project.

A similarly promising project in Olwal LFR in western Acholi met similar problems, even though this was an apparently better site already supporting a dry type of natural forest which a sawmill started to harvest in 1953. Unfortunately the most abundant species was *Sapium ellipticum*, the wood of which proved to be difficult to saw. Trial plots of potential timber species were planted, the most promising broadleaf being musizi (*Maesopsis*) which reached 16 ft (5 m) height after only two years. However later growth proved to be very variable and in 1962/63 it was concluded that pines, especially *P.caribaea*, would be the best choice.

Appendix F. Conversion Factors

Hoppus/Imperial/Metric

1 km	=	0.6214 miles	1 sq ft QG*	=	0.116 sq.m
1 mile	=	1.61 km	1 cu m	=	28.66 H ft*
1 sq mile	=	2.59 sq km	1 H ft*	=	0.0349 cu m
1 sq km	=	0.386 sq mile	1 H ft*	=	1.273 cu ft
1 acre	=	0.4047 ha	1 H ft/acre*	=	0.0976 cu m/ha
1 ha	=	2.471 acres	1 sq ft/acre	=	0.230 sq m/ha
1 ft	=	0.30477 m	1 cu ft/acre	=	0.070 cu m/ha
1 m	=	3.28128 ft	1 ton/sq mile	=	0.419 tonnes/sq km
1 sq ft	=	0.0929 sq m	1 litre	=	0.035 cu ft
1 sq m	=	10.76 sq ft	1 litre	=	0.22 gal (UK)
1 cu ft	=	0.0283 cu m	1 gal (UK)	=	4.546 litres
1 cu m	=	35.34 cu ft	1 gal (UK)	=	0.004546 cu m
1 ton	=	0.984 tonnes	1 cental	=	100 lb (pounds)
1 tonne	=	1.016 tons	1 lb (pound)	=	0.4536 kg

* Hoppus or Quarter-girth measure

Appendix G. Forest Policy

1. Statement of Forest Policy

The Forest Policy of the Government of Uganda is:

1. (i) To reserve in perpetuity, for the benefit of the present inhabitants of Uganda and of posterity, sufficient land (either already forested or capable of afforestation) to maintain climatic conditions suitable for agriculture, to preserve water supplies, to provide forest produce for agricultural, industrial and domestic purposes, and to maintain soil stability in areas where the land is liable to deterioration if put to other uses.

   (ii) To manage this forest estate to obtain the best returns on its capital value and the expenses of management, in so far as such returns are consistent with the primary aims set out above.

   (iii) To foster, by education and propaganda, a real understanding among the people of Uganda of the value of forests to them and their descendants.

   (iv) To encourage and assist the practice of sound forestry by Local Authorities and private enterprise; and to educate selected Africans in technical forestry.

2. To achieve the first objective of this four-point policy, namely the creation of an adequate forest estate, the following guiding principles shall be observed

   (i) The climatic and physical conditions of the country must be preserved and, if possible, bettered, by first, the reservation of suitable land and secondly, the maintenance, improvement or re-establishment of vegetation on the most important catchment areas and on other strategic positions.

   (ii) The supply in perpetuity of the, many forms of forest produce required to satisfy the wants of the people of Uganda both now and in the future must be assured by the reservation, preservation, development and management of the minimum area of forest land needed for this purpose.

3. It is accepted that the satisfaction of the needs of the inhabitants of Uganda must take precedence over purely financial considerations and the establishment of an export trade; and that only when these needs have been satisfied can the aim of management be directed, in production reserves, to obtaining the greatest revenue compatible with a continuous yield, and to promoting an external trade in timber and other forest produce.

2. General Directions for the Implementation of Forest Policy

4. Greater attention shall be paid to the protection, management and development of savanna forests than has been the case in the past. By far the greater part of Uganda is covered by savanna vegetation and it is from the savannas, and not the closed forests, that the every day needs of the local inhabitants for forest produce are chiefly met.

   Nevertheless, it is appreciated by Government that timber for industrial development can only come from the relatively small area of closed forest now remaining in the Protectorate and that this will therefore require intensive management.

5. The policy of Government for the general improvement of the soil in savanna regions in Uganda, both inside and outside forest reserves, is to apply controlled early burning. This policy may be varied in certain areas, for tsetse fly or other reasons.

   It is accepted that late-burn areas may require to be protected from early fires by the Department controlling them in the same way that the Forest Department is responsible for the protection of forest reserves from firing generally.

6. Because of Uganda's dependence on agriculture, the rapid development of the country, and the continuing increase of its population, it is necessary to limit the size of the forest estate to the minimum area which will achieve the primary aims of management.

7. If maximum benefits are to accrue from this minimum area, the forest estate must be developed under controlled and carefully planned management. As this is impossible without security of tenure, it follows that first attention must be given to the secure establishment of the forest estate, with the general aim of a balanced distribution of reserves throughout the country, in so far as this is possible.

8. The forest estate shall be composed of two main categories of reserves, the first of chiefly regional value, controlled by the Central Government, and consisting mainly of larger reserves and plantations: the second of smaller reserves and plantations of strictly local value, controlled by Local Authorities.

9. Until a reserve is placed under planned management its boundaries may be adjusted at the special direction of the Governor only, and in accordance with major decisions of planned land utilization, with the object of obtaining a better balanced and better distributed forest estate. The boundaries of reserves which are placed under planned management are intended to represent long period decisions. They will, therefore, in general rest on a formal decision of the Governor-in-Council, and as it is the intention that they should not be changed save in wholly exceptional and unforeseen circumstances, no alteration will be made without the approval of the same authority.

10. Production forest reserves shall be managed, except in special circumstances approved by the governor, to produce a continuous supply of forest produce. Subsidiary objects of management shall be in accordance with the forest policy of the government.

11. Wherever the competence and will to undertake responsibility exists, the control and management of forest reserves of local value shall be devolved upon Local Authorities, who will receive all the revenue from them but who shall be subject to such control by Government as will ensure that management is in accordance with Government policy.

12. It is the policy of the Government of Uganda to encourage the acceptance of responsibility by Local Authorities. The Government wishes to encourage, also, as suitably trained Africans become available, the formation of a cadre of African Forest Officers (functioning within the Forest Department) with a view to the ultimate replacement of Europeans by Africans in the management and control of the forest estate.

13. Natural forest growth on unreserved land in areas which have been declared by the Governor to have an adequate forest estate may be exploited without replacement, in the interests of the local inhabitants, by the Local Authorities controlling the declared areas. Exploitation of this nature must, however, be subject to general safeguards designed to prevent excessive depletion of resources and to preserve local amenities. Such safeguards must include provision for the protection of the banks of streams, for the preservation of vegetation along roads, for the general protection of any types of forest produce of exceptional local or general value for food, etc., and for the creation of additional local productive reserves for the supply of forest produce to meet new demands. Thus if,

in a declared area, a steady demand which cannot economically be met from existing forest reserves should arise for the supply of forest produce to a specific undertaking, and it appears in the interests of the local inhabitants that this demand should be met, the 'user' of sufficient Crown land (the ownership of which would remain vested in the Crown) to meet the demand on the basis of a sustained yield might be assigned to the Local Authorities controlling the declared area for management by them as a production forest reserve. Reserves of this type would of course be profit earning and the profits would accrue to the Local Authority, after payment to the Central Government of any loan needed to initiate the scheme.

3. Immediate Steps to be taken to Implement Forest Policy

14. It is the intention of the Government of Uganda that its forest policy shall be implemented generally in accordance with the recommendations contained in the 'Development Plan for Uganda' The Government recognises the special necessity in forest matters of very long-range planning if the Department is to function efficiently, and subject to any alteration which may be required by the general financial situation it proposes during the next ten years to seek sanction in the normal manner for the necessary expenditure.

15. It is now clear that the cost of the 'normal expansion' envisaged in the Development Plan as published will be considerably greater than the figure given in the Report. Normal expansion on this scale, together with the degree of development proposed in the Report will require an average annual expenditure of approximately £78,000 a year. It would, however, be desirable if finance were available to undertake a greater degree of development which would bring the average annual expenditure up to approximately £89,000. During this period, revenue from forest activities will not, so far as can be foreseen, exceed a peak figure of £50,000 in any one year. On these figures the annual loss on the working of the Forest Department would vary between £30,000 and £40,000 or between £40,000 and £50,000, dependent upon whether it proves possible to finance forestry development on a bigger scale than is envisaged in the Development Plan for Uganda.

16. It must, however, be realised that the figures of expenditure mentioned are for estimating purposes and are purely provisional and that it remains to be determined from time to time what money can in fact be made available.

17. In the opinion of Government the primary tasks of the Forest Department during this decade must be to complete the formation of the forest estate. It considers that within ten years all major reservation and consolidation works should be completed, and that only then should priority be given to matters of management and supply.

J. Hathorn Hall,
Governor

Entebbe, 9th June 1948.

Appendix H. Continuous Forest Inventory

In 1958 a growing concern was felt for the adequacy of Uganda's future timber supplies, confirmed by an FAO. survey of the rapidly increasing consumption and a prediction of its future growth. Major efforts and expenditure were being made to regenerate the natural forests more productively after harvesting, while timber plantations were being made at an expanding rate to supplement the production of the natural forest. The capital investment which they represented demanded reliable information about their growth, to secure maximum efficiency and support requests for further funds.

Dawkins (ecologist) and Leuchars (silviculturist) therefore started a project for establishing permanent sample plots in all major forests, both natural and plantations, those for the former being based on the proposals for 'yield plots' in Dawkins (1958). Osmaston (mensuration officer) was responsible for its development and subsequently for analysis of the initial results obtained in plantations. Instructions to ensure uniformity and reliability of establishment and measurement practices were published in Departmental Standing Orders.

Softwood Plantations

The following information is summarised from UFD Technical Note number 112/63 (available on microfilm in the Oxford Forestry Institute Library).

Methods

By then these plantations totalled 6,000ac (2,500 ha). Permanent sample plots were progressively established in the plantations at an intensity of 1%, using 1 randomly sited fifth-acre (0.8 ha) plot for 20 acres (8 ha), starting when a crop was 4 years old. The sample plots were established at the time of the first thinning, usually at four years old, and in the oldest plots up to three consecutive measurements had been recorded. The total number of plots established up to the end of 1962 was *Cupressus lusitanica* 72, *Pinus* spp. 30, representing 2000 acres (800 ha).

This policy as a routine tool for management decisions and supervision was thoroughly vindicated by the valuable results already obtained and by the promise of more to come. Without these plots we should not have been able to make reliable comparisons between the growth of young crops here and in South Africa, which enabled us to place our estimates of future yields on a firmer basis. Nor should we have known to what extent the stocking of our plantations varied from that prescribed in our thinning schedules; nor whether those schedules were having the desired effect on the growth of the crop.

The difficulties which some people had predicted in marking, maintaining and relocating permanent plots were not too serious. The facility with which errors may be detected both by field checking and by comparisons between successive measurements was proven. Such checks showed that the sources of by far the largest errors were tree height measurements and the measurement of and correction for ground slope. Indeed the difficulty of measuring the former sufficiently accurately for making *short term* estimates of increment led to the recommendation to use conventional smoothed mean heights for this purpose, based on a height/diameter ratio of 6.0 for both *P .patula* and C. *lusitanica.* Dominant height is much more important than mean height, but there was slight divergence between the EAYT which used the 100 tallest trees/acre (250 trees/ha, 20 trees/sample plot) and the Uganda practice of taking the mean height of the 100 largest diameter trees per acre. It was recommended that to save effort in measuring the smaller and less important trees in young crops, the heights of only the 20 largest trees

should be measured. The mean height if required could be estimated from research plot data.

There is a dilemma between marking a plot and its constituent trees sufficiently clearly to make re-identification easy yet not so prominently as to result in 'special' treatment at thinnings, but the former is the most important. Plots were permanently marked by trenches and labels, and individual trees by an aluminium nail 20 cm above BH. Special care is needed to ensure that thinnings removed between plot measurements are fully recorded.

Plots should be measured at the following times:

1. One year after the first thinning, i.e at about age 5 years.
2. One year later, chiefly as a check. If this was not fully satisfactory, then annually until it was so.
3. Every four years subsequently.

Results

The results of the measurements up to 1962 were analysed in detail and presented in graphs, the main conclusions being:

1. Comparisons were made with the South African (SA) yield tables for their 'fair average quality' crops (75 ft, 23m, at 20 years, planted 8 x 8ft, 2.5 x 2.5m). Dominant diameters for ages up to 15 years (25 cm) at Mafuga for both C. *lusitanica* and *P. patula* lay close to this, but slightly below at Lendu. Dominant heights at both plantations lay close to the SA line, 60 ft (18m) at 15 years..
2. Comparisons were also made with East African Yield Tables (EAYT) compiled at EAFFRO, mainly from Kenyan data. Major internal inconsistencies were found in the EAYT between figures for diameter, stocking and basal area which rendered comparisons with the two latter useless. The EAYT QC I/II curves for both diameters and heights lay close to the 75 ft SA one, so bore similar relationships to the Uganda crops.
3. Plots of dominant height (ft)/dominant diameter (in) for Uganda crops for C.lusitanica and P.patula lay along almost straight lines with a slope of 6.0 ft/in (equivalent to 0.72 m/cm), indicating that the thinning schedules were achieving a uniform degree of competition, since SA research had shown that this ratio is very sensitive to stocking. For the very fast-growing *P. radiata* however this ratio rose to 7.5 ft/in (0.90 m/cm) in the oldest plots, indicating that they had been inadequately thinned.
4. Existing thinning prescriptions had been based on age for convenience and from lack of knowledge. This had resulted in under-thinning the best crops and over-thinning the worst. In future the time of thinning should be based on growth. A new schedule was proposed based on crop height.
5. Based on these figures and the yields obtained in SA, Ugandan softwoods should yield about 6,000 cu.ft. u.b./acre of final crop at 35 years (420 cu.m./ha).

Eucalyptus Plantations

At this time there were about 20,000 acres (8000 ha) of fuel and pole plantations, predominantly of *Eucalyptus* spp., particularly E. *saligna* (= *grandis*), with peak yields of 850 cu.ft/ac/yr (60 cu.m/ha/yr). Initially a similar programme of establishing sample plots was started in these. These could be successful in well established first generation crops, but many of the plantations were in second or later rotations. In these it was found that site quality and growth are so irregular, the coppice regeneration from stumps after felling so inconsistent, and the proportion of beating up so variable in both amount and success, that it is impossible to get satisfactory results for predicting growth and yield from such

small and widely spaced plots. Adequate estimates of yields for the short rotation period (usually 5–7 years) of these crops can be derived from research plots. The programme was therefore discontinued, with the proviso that if Eucalyptus plantations for saw-timber production were to be established, it should be re-started in these.

Natural Forests

Similar problems of irregularity affect natural forest even more acutely, but the potentially high value crops and their long rotation make management control and yield prediction very important. The large areas involved permitted the sampling intensity to be low, only 0.8%. To economise effort and restrict records to manageable and essential amounts, attention was concentrated exclusively on the trees from which the final crop was likely to be drawn. These were expected to be about 50 trees per hectare of about 0.8 m dbh but, since changes and casualties among these are likely in natural forest, the best 100 trees/ha were monitored, subject the proviso of their being well distributed, i.e. defined as the four leading individuals of desirable species in each of 25 sub-plots. Although these were marked, damage or casualties might result in different ones being selected at the next measurement. Plots were measured every five years.

LAYOUT

2 randomly sited plots per 250 ha of forest.

Each plot was 100m x 100m, i.e. 1 ha.

Each plot was divided into 25 sub-plots, each 20 x 20 m.

In each subplot the four leading desirables (LDs) were recorded, i.e. the four largest (but not deformed) trees of a list of economic species, compiled separately for each forest. Each LD was marked with an aluminium nail and a paint band. Plots were located by bearing and distance from a marked point on an extraction road. The access line was marked by an interrupted line of trenches at 66' (20m) intervals, each 6'x1'x'1' (2x 0.3x.0.3m). Plot corners and the intersections of the 25 subplots were also marked by similar trenches and cairns.

A considerable number of plots was established in the Budongo, Bugoma and probably Mabira forests, but unfortunately remeasurements and analysis could not be maintained due to staffing problems after independence and later the civil wars. Though these old measurement records still exist, relocation of the plots is problematic and by now many of the young leading desirables will have grown big enough to have become victims of illegal pit-sawing.

(A programme for the establishment of similar continuous inventory plots has recently been restarted with a few changes, e.g. the recording of all trees over 20 cm dbh. The advent of computers has made record keeping and analysis easier.)

Appendix I. Present Wood Consumption and Future Requirements in Uganda

S.L. Pringle and J.E.M. Arnold, Food & Agriculture Organisation, Rome, Report to the East African High Commission 1287, 1960
A summary from pp.47–53 of *The Forests and Forest Administration of Uganda*
Paper for 8th British Commonwealth Forestry Conference, 1962

The sustained supply of the needs of this country for forest produce, enjoined by the Forest Policy, requires as close an assessment as possible of what those future needs will be, so that adequate and timely measures can be taken to meet them. Of the many forms of forest produce that will be needed, saw-timber takes the longest and is the most expensive to produce; poles and fire-wood can be produced in 4 to 12 years under Uganda conditions. Accordingly, during the past two or three years a good deal of attention has been devoted to assessing the future needs of Uganda for saw-timber. For this purpose, forecasts have been made up to the end of the century, as 30 to 40 years is about the minimum needed to grow saw-timber under Uganda conditions. At the same time, very rough forecasts have been made of future pole and fuel requirements over the same period, but as these can be grown relatively quickly and easily and as at present supplies exceed demands, the need for close prediction of the future requirements of these commodities is not so pressing as for saw-timber.

The Forest Department has from time to time made forecasts of future timber requirements. These indicated that future requirements were likely greatly to exceed supplies but they were of necessity based on somewhat slender data. Because, if these forecasts were correct, the cost of meeting the predicted needs would be heavy, it was considered desirable to obtain a second opinion on the Forest Department forecasts. Accordingly in 1958/59 the assistance of FAO was sought for an independent forecast. As the three last African territories form virtually a common market, the forecast was projected on an East African basis to cover all three territories separately. FAO generously acceded to this request and in 1959 a team of two forest economists provided by FAO commenced work in Uganda. The forecast in respect of Uganda was completed in 1960 and the team moved to Kenya and Tanganyika. The forecasts for these two countries have not yet been published. Although the main object of the work was to forecast future saw-timber requirements, the team took the opportunity also to include consumption of pulp and paper, poles and firewood in their study. The FAO team's figures have been taken as the basis for future planning in Uganda.

Owing to the complete lack of records of the large volume of forest produce removed free by Africans for their own use from public land, and to inadequacies in other records, it was impossible to obtain a satisfactory estimate of apparent consumption by striking a balance between production, exports and imports, so the main work of the team consisted of a census of actual current consumption. In the five largest towns, and for certain other consuming sectors such as Government and industry, estimates of consumption were prepared directly from statistics of building areas, bills of quantities and similar records. The remainder of the country, predominantly rural, was divided into strata according to the level of cash income and the availability of timber, and from these a sample of 143 parishes was selected; in each sample parish 25 African households and all other buildings were visited and for each the quantity of furniture, and the size and method of construction of any building started in the last five years were recorded. Estimates of the volumes of sawn timber and poles used were then derived by the application of conversion factors.

Present Consumption

Sawn timber

The present consumption of sawn timber in Uganda is about 3 million cu ft (85,000 cu m) a year. This is equivalent to about 6.7 million cu ft (190,000 cu m) of timber in the round, or roughly 1 cu ft (0.3 cu m) per head of population.

About two-thirds of this consumption is by African households and the balance is divided roughly equally between government and missions on the one hand, and commerce and industry on the other.

The African household consumption is mainly in the form of building joinery such as doors, windows and their frames, furniture and to a limited extent rafters. Timber-framed or clad houses are very rare. Consumption per head works out at an average of about 4 board feet (0.1 cu m) a year, but individual strata (income/wood availability) vary from two to ten board feet (0.05 to 0.28 cu m.).

The apparent consumption of sawn timber calculated from mills' production returns and from export and import statistics only amounts to two-thirds of the consumption revealed by the census. The difference is attributed to the extensive use of shorts and rejects not included in mill returns, of packing case material and, in some areas, of hewn wood.

Plywood and hardboard

The current annual consumption of these materials is about 2.5 million sq ft (230,000 sq m) of plywood and about 0.8 million sq ft (74,000 sq m) of hardboard. The consumption of fibre wallboard is included under pulp and paper products. Until 1959 all were imported, but in that year Messrs Sikh Sawmills and Ginners Ltd. opened a plywood and blockboard mill at Jinja and in 1959/60 produced about 2.4 million sq ft (223,000 sq m). The ultimate production target of the plant is 10 million sq ft (900,000 sq m) annually. About half the plywood is used in tea chests and flush doors. The round timber equivalent of the present local production of plywood is about 0.1 million cu ft (2,800 cu m).

Pulp and paper products

The current annual consumption of pulp and paper products, including fibre wallboard and insulating board, is about 3,600 tons. Rather more than half of this is kraft papers and fibre-board, the greater part being kraft bags for the cement industry. All these materials are imported and there is no consumption of pulpwood in Uganda.

Poles

Most African houses are built with walls of poles and mud, and even in the very high income strata over 90% of new houses are built in this way. Roofs are similarly usually made of poles whether covered with thatch or corrugated iron (the latter being an ambition of nearly every householder), but some use of sawn rafters occurs in the more prosperous areas. There is little use of poles for agricultural purposes, such as fencing.

The consumption of poles varies considerably between strata, being lowest (1.8 cu ft/head/year – 0.05 cu m) in the prosperous areas, apparently due to the use of fewer but better poles, and being highest (5.5 cu ft) in the areas of medium and poor income and scarce timber, apparently due partly to tradition and partly to the poor quality of the poles and to their more rapid destruction by termites. The average consumption is 3.8 cu ft/head (0.11 cu m), which corresponds to a total annual consumption by African households of 22.8 million cu ft (0.65 million cu m or about 35–40 million poles). Other consumers use an additional 0.7 million cu ft (20,000 cu m), making the total pole consumption about 23½ million cu ft (0.66 million cu m).

Firewood

Because of the patent unreliability of consumption figures given by householders, the FAO census made no attempt to record the quantities, but merely recorded the type of fuel used by each household sampled. The results show that 67% of all African households use only wood-fuel, and that a further 27% use wood and some other fuel, usually grass or papyrus. Most of the remainder use charcoal. Applying an estimate of consumption of 18 stacked cu yds per household per year, the total consumption of the 1.2 million African households attains the large quantity of 22 million st cu yds. a year. Adding institutional and commercial uses, which are reckoned to amount to about 2 million st cu yds., the total firewood consumption at present is estimated to be very roughly around 24 million st cu yds a year. (1 st cu yd = 0.75 st cu m).

Present Sources of Supply

At present about half the country's saw and peeler log requirements (3 million cu ft) come from forest reserves, the balance being obtained from unreserved public land and private woodland. The sustainable yield of the forest estate is currently about 8 million cu ft (85,000 cu m) of saw-logs a year, assuming timber planting is continued at its current rate, so present supplies including those available from unreserved woodland are more than enough to meet present timber requirements.

The greater part of the pole and fuel requirements are obtained from unreserved public land and private woodland. Only a very small proportion comes from forest reserves; for poles it is about 2% and for firewood rather less than 1%. There is currently no shortage in supplies of these products; on the contrary, in many areas, supplies available from plantations exceed requirements.

Future Requirements

Because of the lack of data, predictions of the future requirements of Uganda are difficult to make and depend on a number of assumptions and intelligent guesses about the many factors that may influence future consumption. For the purposes of their forecast the FAO team assumed the following:

(a) that current attitudes towards the use of timber, such as the prejudice against wooden railway sleepers and against wooden walled houses, will continue;

(b) that the population will continue to grow at the same compound rate as between the 1948 and 1959 censuses, viz. at a mean rate of 2.54% per annum;

(c) that mean cash income per head will grow at a rate between 1.0% and 1.6%, these representing low and high estimates respectively;

(d) that the supply of timber will be increased so as to meet demands with the same facility as at present;

(e) that in African households the future pattern of consumption will be related to income in the same way as at present;

(f) that no major new use for sawn timber will develop. It is expected that even in the highest income stratum 50% of new buildings will still be pole and mud walled in 2000 AD though most of them will have sawn rafters. The rate of government building is likely to slacken, except for schools which will increase. A considerable increase in the consumption by commerce and light industry

is also foreseen with the increasing entry of Africans into these activities and the conversion of the country to a cash economy;

(g) that the recovery of sawn timber in milling will improve from about 40% at present to 50% in 2000 AD;

(h) that there will be great increases in the use of plywood and similar materials for joinery, furniture and tea chests;

(i) that consumption of pulp and paper products would increase at approximately the lower rate forecast for African countries in the FAO. study, 'World Demand for Paper to 1975';

(j) that house building poles will retain their importance, though economies may result from better design and the use of preservatives. The future for fencing poles is impossible to predict; scarcely any are used now, but if the teaching of the Agriculture and Veterinary Departments is popularly accepted substantial quantities will be needed.. The industrial use of poles is likely to remain steady;

(k) that 90% of African households will still depend on wood-fuel in 1980, and 75% in 2000 AD.

On the basis of these assumptions and the current consumption figures, the future annual round-wood requirements of Uganda have been forecast by the FAO team to be as shown in the following table (for comparison, current consumption is also shown):

Product	Units	Present (1955–59)	Future			Round-wood equivalent in 1000s cu ft	
			Level of forecast	1980	2000	1960	2000
Sawn timber	1,000 cu ft	2,960	upper	6,390	11,900	14,185	27,800
			lower	5,470	11,040	12,143	22,080
Plywood & building board	1,000 sq ft		upper	10,000	26,000	390	1,014
			lower	8,000	20,000	312	780
Pulp and paper products	tons	3,660		12,000	30,000	1,800	4,500
Total, other than poles and firewood			upper			16,375	33,314
			lower			14,255	27,360
Poles	1,000 cu ft	23,500	upper			35,000	49,000
			lower			37,000	56,500
Firewood	st cu yds (st cu ft)	24 million (350 million)		34	46	5000,000	700,000

For conversion factors see Appendix F

Future Sources of Supply

The sustainable out-turn of saw and peeler logs from the permanent forest estate, assuming that timber planting is maintained at its present rate, will remain at about 8 million cu ft a year, until the increased yields which are expected to result from the present silvicultural treatment of the natural forest become available. These increases are not likely to become effective until about 2020 at the earliest.

In addition to the yield. from the permanent forest estate, there will be a variable and unregulated quantity of saw-timber available from unreserved public land. and. private woodland. It is expected. that this will be exhausted in 20 to 25 years' time.

From the mid-1980s onward, therefore, the supplies of saw-timber available from within Uganda are expected to fall short of requirements by a substantial and growing margin which may reach 15 to 20 million cu ft in the round by 2000. Part of this may be met by imports from Kenya but it is by no means certain that sufficient supplies will be available from this source and imports would in any case be an appreciable drain on the economy.

If Uganda is to meet all or a substantial part of her future timber requirements, a considerable expansion of timber planting and natural forest treatment will therefore be necessary. The extent of the expansion needed will depend on the degree to which Uganda decides to aim at self-sufficiency. If reliance is placed on importing 50% of Kenya's surplus timber, Uganda will have roughly to double her present rate of timber planting to about 1,800 acres a year and step up natural forest treatment so as to get round the whole of the productive natural forest within the next 80 years; allowing for second treatments falling due and the need to treat adolescent forest early, this will entail raising the rate of treatment of natural forest to about 17,000 acres (6880 ha) a year over the next five years. As indicated in the preceding sections, plans to this effect have been submitted to the Government for consideration.

These plans take no account of the increased requirements forecast for poles and fuel. A part of these will no doubt be met as they arise, by the by-products of timber production. Special measures to meet the rest are not needed at present and can be formulated much nearer the time that the needs arise, as poles and. fuel can be produced in a matter of 4 to 12 years under Ugandan conditions. No shortages of these products are expected within that period.

Statistical Tables

Most of the following tables have been taken from the Uganda Forest Department Annual Report for 1964/65 which was compiled and published late, due to various difficulties (some tables still had notes of missing data from local government forest services), together with the reports for the following three years. The numbering of the tables (not in a continuously numbered sequence) may appear eccentric, but this follows a standard numbering developed over the years from that recommended by the Empire Forestry Conference, 1920, for use by all member countries in their annual forestry reports, and followed compliantly by Uganda. This facilitates not only comparison with annual reports for previous individual years, but also inter-country comparisons.

We had originally hoped just to reproduce these tables directly from the 1965 annual report, but unfortunately their typographic quality was not good enough and they contained errors. We have therefore had to reset them completely and have taken the opportunity to correct such errors as we could, clarify their composition and remove some details which seemed inappropriate to this history.

Some of the tables have been simplified to show merely the position at the end of the period of this history (either 30th June 1965 or 31st December 1965), e.g. the country's forest estate and the area of forest reserves covered by working plans, omitting the changes during 1964/65. Others present only the figures for 1964/65, or for the last three years, for example the cut of timber classified by species, as being representative of typical years during the period of the history. Tables 15 and ALG 2 cover the last 10 and 12 years respectively. Table 11 and all the ALG tables are for the calendar year ending 31st December 1965. Table No.13, 'The Strength of Uganda Forest Department Staff' was not published for 1964/65, so the table for the previous year has been reproduced.

Some readers will undoubtedly complain that quantities are expressed in Imperial measures: acres, sq miles, cu ft, etc. and even centals. Having provided both Imperial and metric units throughout the text, we considered this carefully for the tables also, and decided that complete conversion to metric units was beyond our resources and would inevitably introduce errors and rounding problems; that it would complicate cross-comparisons with individual annual reports and other records for this period, both concerning Uganda and other Commonwealth countries where Imperial units were still standard; that space precluded showing both on the same table, but that complete duplicate sets of forms in metric and Imperial Units would be excessive; and that in these days of pocket calculators it would not be difficult for readers to convert the quantities of particular interest to them. We have provided a complete table of conversion factors in Appendix F.

Central Government Forestry

Local Government Forestry

(also see Tables 1B and 4A above)

Table 1. Extent, Nature, Ownership and Permanence of Forest Land, 30.6.65 (square miles)
(total land and swamp area of Uganda = 78,836 square miles)

Category of Forest and Vegetation	Permanent State Reserves		Permanent Local Authority Reserves		Private		Unreserved Forest		TOTALS		Percentage of Total Land and Swamp	
	Total Gazetted	Protection**	Total Gazetted	Protection**	Total	Protection**	Total	Protection	Permanent	Forest Land	Permanent	Forest Land
Closed Forest on 30.6.65	2,262	775	401		600				2,663	3,263	3.4%	4.1%
Woodland on 30.6.65	1,925	1,760	772	433			29,000		2,697	31,697	3.4%	40.2%
Open Areas and Grassland on 30.6.65	285	225							285	285	0.4%	0.4%
	4,472	**2,760**	**1,173**	**433**	**600**		**29,000**		***5,645**	**35,245**	**7.2%**	**44.7%**

*Includes 97.33 sq miles duplicated in error in gazetting, being in both Buganda and Bunyoro.
**Gazetted reserves with a protective function (see Tables 1A and 1B), also included in the 'Total Gazetted' areas.

Table 1A. Analysis of Central Forest Reserves, 30.6.65
(in square miles, taking account of all gazetted changes up to Statutory Instruments 1965 No 186)

District	Gazetting Status		TOTAL	Classification							
	Undemarcated	Demarcated		Production				Protection			
				Closed Forest	Savanna Woodland	Other	Total	Closed Forest	Savanna Woodland	Other	Total
Buganda											
Mengo		294.68	294.68	294.68			294.68				
Masaka	62.49	88.54	151.03	151.03			151.03				
Mubende											
Eastern Region											
Busoga		64.93	64.93	54.93	10.00		64.93				
Bugisu		200.34	200.34					140.34		60.00	200.34
Mbale Town		1.77	1.77	1.77			1.77				
Bukedi		2.02	2.02	2.02			2.02				
Teso		1.75	1.75	1.75			1.75				
Sebei		263.64	263.64					183.64		80.00	263.64
Northern Region											
Karamoja	397.27	789.56	1,186.83						1,186.83		1,186.83
Lango		41.40	41.40	0.50	19.82		20.32		21.08		21.08
Acholi		311.80	311.80	0.31	48.66		48.97		262.83		262.83
Madi		124.59	124.59	23.51			23.51		101.08		101.08
West Nile		155.43	155.43	7.32			7.32		148.11		148.11
Western Region											
Bunyoro		350.86	350.86	273.00	51.66	*1.20	325.86		25.00		25.00
Toro		765.30	765.30	321.55		59.00	380.55	284.75	15.00	85.00	384.75
Ankole		349.19	349.19	170.56	35.07		205.63	143.56			143.56
Kigezi		207.19	207.19	184.61			184.61	†22.58			22.58
TOTAL	**459.76**	**4,012.99**	**4,472.75**	**1,487.54**	**165.21**	**60.20**	**1,712.95**	**774.87**	**1,759.93**	**225.00**	**2,759.80**

* Nyabyeya † Mgahinga and Echuya

Table 1B. Analysis of Local Forest Reserves, 30.6.65 (square miles)

District	Undemarcated	Demarcated	TOTAL	Production				Protection			
				Closed Forest	Savanna Woodland	Other	Total	Closed Forest	Savanna Woodland	Other	Total
Buganda											
Mengo		192.29	192.29	32.08			32.08		160.21		160.21
Masaka		2.27	2.27	2.27			2.27				
Mubende		126.88	126.88	117.30	9.58		126.88				
Eastern Region											
Busoga		61.57	61.57	34.32	13.82		48.14		13.43		13.43
Bugisu		3.29	3.29	2.96	0.33		3.29				
Mbale Town		0.36	0.36	0.36			0.36				
Bukedi		18.45	18.45	10.00	5.94		15.94		2.51		2.51
Teso		61.10	61.10	1.37	42.74		44.11		16.99		16.99
Sebei		0.20	0.20	0.02			0.02	0.18			0.18
Northern Region											
Karamoja											
Lango		35.52	35.52	1.95	33.57		35.52				
Acholi		80.03	80.03	0.60	33.57		34.17		45.86		45.86
Madi		5.60	5.60						5.60		5.60
West Nile		92.40	92.40	3.85	13.43		17.28		75.12		75.12
Western Region											
Bunyoro		364.37	364.37	85.00	165.67		250.67		113.70		113.70
Toro	2.59	94.69	97.28	97.28			97.28				
Ankole		15.79	15.79		15.79		15.79				
Kigezi		15.12	15.12	11.15	3.97		15.12				
TOTAL	**2.59**	**1,169.93**	**1,172.52**	**400.51**	**338.41**		**738.92**	**0.18**	**433.42**		**433.60**

Table 4A. Area of Forest Reserves (CFRs and LFRs) Covered by Working Plans, 30.6.65 (areas in sq. miles)

District	Without Valid Plans		With Valid Plans	TOTAL
	None	Expired		
Buganda				
Mengo			485	485
Masaka		1	152	153
Mubende			127	127
Eastern Region				
Busoga			132	132
Bugisu			203	203
Mbale			2	2
Bukedi			20	20
Teso			65	63
Sebei			264	264
Northern Region				
Karamoja		129	1,058	1,187
Lango		20	57	77
Acholi	21	24	347	392
Madi		101	29	130
West Nile	3		245	248
Western Region				
Bunyoro		194	617	811
Toro		8	854	862
Ankole	16	1	348	365
Kigezi	8		214	222
TOTAL	**48**	**478**	**5,217**	**5,743**

Table 6A. Silvicultural Treatment of Natural High Forest (CFRs only), 30.6.65 (areas in acres)

WORKING PLAN AREA	Tending of Young Forest not yet Harvested		Pre-harvesting Treatment	Regeneration and Tending of Harvested Forest					
				Area Harvested		Under-planted but not yet Effectively Tended	Tended after Harvesting		TOTAL Direct Cost £ in 1964–65
	1964–65	Total	1964–65	1964–65	Total	Total	1964–65	Total	
Budongo			2,020	2,018	48,560	6,538	973	*15,967	3,520
Bugoma			2,518	1,760	15,860		1,680	5,462	2,151
Kibale & Itwara				550	6,850	50	600	3,252	648
Lake Shore (Masaka)	878	12,333		450	5,617		1,275	5,793	3,848
Kalinzu			4,951	1,003	7,427			524	1,805
E. & W. Mengo			256	2,342	70,488		3,609	28,200	4,915
Sango Bay					30,800				
S. Busoga				3,371	35,000				
TOTAL	**878**	**12,333**	**9,745**	**11,494**	**220,602**	**6,588**	**8,137**	**59,198**	**16,887**

*In addition 1,831 acres were tended, which had been tended previously.

Table 6B. Regeneration and Afforestation in Plantations (CFRs only), 30.6.65 (areas in acres)

District	Hardwood Timber Plantations		Softwood Plantations			Fuel and Pole Plantations		
			Softwoods		Productive Fire-breaks	Regenerated 1964–65		TOTAL Direct Cost £ in 1964–65
	1964–65	Total	1964–65	Total	Total		Total	
Buganda								
Mengo	465*	1,657	65	95		257	4,665	11,618
Masaka		11				33	473	1,082
Mubende								
Eastern Region								
Busoga		30	25	25		197	887	6,000
Bugisu			22	119	10			1,163
Mbale Town						14	911	430
Bukedi							1,085	317
Sebei			146	450	56			680
Teso						22	1,132	680
Northern Region								
Karamoja							36	1,367
Lango		563					320	
West Nile				3,390	503	41	552	3,092
Acholi		850	25	25		9	198	2,371
Madi								
Western Region								
Forest School		30		30		1	6	432
Bunyoro		50	296					
Toro			342	1,389	150	26	234	4,444
Ankole			175	1,479	115	19	460	9.527
Kigezi				2,789	191			7,971
TOTAL	**465***	**3,191**	**1,096**	**9,791**	**1,025**	**619**	**10,959**	**51,174**

*Better classed as enrichment planting. See 1965 Annual Report for numerous notes on uncertainties.

Table 7. Output of Timber and Fuel, year ended 30.6.65

(cu ft round-wood under bark)

	From State Forests		From Commercial Forests		From Other Land		TOTAL	
	Conifer	Non-conifer	Conifer	Non-conifer	Conifer	Non-conifer	Conifer	Non-conifer
Saw-logs	138,335	2,994,069	22,683	126,988	4,133	*529,366	165,151	3,650,423
Pulpwood and pitwood								
Other industrial roundwood	55,048	126,976	1,098	146,312		**	56,146	273,288
TOTAL industrial roundwood	193,383	3,121,045	23,781	273,300	4,133	529,366	221,297	3,923,711
Fuelwood		1,724,004		709,952		**1,459,741		3,893,697
TOTAL	**193,383**	**4,845,049**	**23,781**	**983,252**	**4,133**	**1,989,107**	**221,297**	**7,817,408**

* This does not include any estimate of timber cut from private forests.

** This does not include any estimate of the very large unrecorded quantities of poles and fuel cut by Ugandans for their own use.

Table 7A. Detailed Production of Round Timber Cl. I & II, 1964/65, 1963/64 and 1962/63 (true volume, under bark) (cu ft)

		1.7.1964–30.6.1965				1963/64	1962/63
Botanical Name	**Class**	**Other Name**	**Central Forest Reserves**	**Local Forest Reserves***	**Public Land***	**Total**	**Total**	**Total**
Chlorophora excelsa	**IA**	**Mvule**	**33,938**	**8,743**	**393,163**	**435,844**	**189,441**	**349,757**
Albizia coriaria	IB	Mugavu	7,536	11,030	4,383	22,949	11,930	18,666
Entandrophragma spp.		Mahogany	524,909	15,561	13,668	554,138	488,858	489,689
Fagara spp.		E. A. Satinwood	35,949			35,949	32,735	23,442
Khaya spp.		Mahogany	221,343	30,431	49,403	301,177	210,294	222,382
Lovoa spp.		Nkoba	103,672	1,127	7,530	112,329	105,877	96,080
Olea welwitschii		Elgon Olive	40,243			40,243	31,706	42,582
Others			607		1,764	2,371	5,149	93
TOTAL CLASS IB			**934,259**	**58,149**	**76,748**	**1,069,156**	**886,549**	**892,934**
Albizia spp.	II	Red Nongo	113,978	4,961	1,579	120,518	97,364	58,800
Cordia millenii		Mukebu	5,869	394	757	7,020	5,964	9,093
Exotic conifers		—	114,439	22,476		136,915	152,508	20,633
Fagaropsis angolensis		Mafu	15,525			15,525	7,093	2,902
Holoptelea grandis		Mumuli	62,116			62,116	24,512	69,766
Maesopsis eminii		Musizi	169,991	8,919	5,224	184,134	251,652	225,353
Markhamia platycalyx		Nsambya	4,700		177	4,877	1,163	156
Mitragyna stipulosa		Nzingu	1,254		275	1,529	—	1,243
Morus lactea		Mukoge	22,996		1,977	24,973	29,220	21,375
Newtonia buchananii		Mucence	61,068	634	1,561	63,263	48,875	58,993
Piptadeniastrum africanum		Mpewere	83,197	3,356	4,747	91,300	65,814	51,795
Podocarpus spp.		Podo	23,896	207	4,133	28,236	15,746	10,773
Pygeum africanum		Ntasesa	34,137	79	100	34,316	36,378	40,947
Symphonia globulifera		Musandasanda	18,508			18,508	27,200	9,072
Trichilia splendida		Sesambya	31,196		377	31,573	9,170	1,950
Others			5,276	1,215	2,550	9,041	6,405	76,380
TOTAL CLASS II			**768,146**	**42,241**	**23,457**	**833,844**	**779,064**	**659,231**

There were serious transcription errors in the 1963/64 and 1962/63 columns of the 1965 annual report. These have been corrected here from the original annual reports.

Table 7A. (contin.) **Detailed Production of Round Timber Cl. III & IV, 1964/65, 1963/64 and 1962/63** (true volume, under bark) (cu ft)

Botanical Name	Class	Other Name	1.7.1964–30.6.1965				1963/64	1962/63
			Central Forest Reserves	Local Forest Reserves*	Public Land*	Total	Total	Total
Albizia glaberrima	III	White Nongo	136,225			136,225	103,456	66,458
Aningeria spp.		Mutoke, Osan	76,110		351	76,461	28,653	12,923
Canarium schweinfurthii		Muwafu	613		6,058	6,671	25,613	23,182
Celtis mildbraedii		Lufugo	119,228	1,731	668	121,627	121,242	136,589
Chrysophyllum spp.		Nkalate, Munyamata	23,272	59	250	23,581	23,568	19,702
Erythrophleum guineense		Mumara	21,624	6,226	5,031	32,881	30,077	78,843
Mildbraediodendron excelsum		Muyati	42,918	7,211	1,240	51,369	50,045	56,982
Pterygota mildbraedii		Mukoko	400	21,263	3,414	25,077	25,052	10,828
Strombosia scheffleri		Munyankono	7,767			7,767	6,354	7,801
Others			1,416			1,416	1,028	2,481
TOTAL CLASS III			**429,573**	**36,490**	**17,012**	**483,075**	**415,088**	**415,789**
Alstonia boonei	IV	Mujwa	203,046		5,750	208,796	154,863	123,434
Antiaris toxicaria		Kirundu	109,729	749	3,108	113,586	135,776	148,085
Celtis spp.		Nyamanunka	43,953		50	44,003	12,597	17,206
Chrysophyllum spp.		Munyamata	39,742	318	63	40,123	—	6,100
Croton spp.		Munyabakaikuru	33,436			33,436	27,891	4,556
Cynometra alexandri		Muhimbi	1,247	2,227	6,377	9,851	101,093	39,370
Funtumia spp.		Musanda	42,137			42,137	20,740	15,197
Parinari excelsum		Mubura	408,187			408,187	373,395	248,649
Schrebera spp.		Ndela	20,703	119	1,625	22,447	14,252	26,490
Ficus spp.					100	100	266	1,601
Unclassified							97,629	
Others			64,308	635	6,046	70,989	25,739	31,012
TOTAL CLASS IV			**966,488**	**4,048**	**23,119**	**993,655**	**964,241**	**661,700**
TOTAL ALL CLASSES			**3,132,404**	**149,671**	**533,499**	**3,815,574**	**3,234,383**	**2,979,411**

*These figures do not include Bukedi or Buganda, whence no returns have been received. Returns from the following were incomplete: Bugisu D.A., January and February for Namatale L.F.R. only; and Kigezi D.A., January to March only. Some botanical names have changed: Chlorophora to Milicia; Pygeum to Prunus
There were serious transcription errors in the 1963/64 and 1962/63 columns of the 1965 annual report. These have been corrected here from the original annual reports.

Table 7B. Production of Poles, 1964/65, 1963/64 and 1962/63

Category	Unit	1.7.1964–30.6.1965 Central Forest Reserves	Local Forest Reserves*	Public Land*	Total	1963/64 Total	1962/63 Total
Softwood Plantations							
Class 1	Number	3,486	5		3,491		
2		50,056	1,096		51,152		
3		738			738		
4		325			325		
5							
Total	Number	54,605	1,101		55,706	67,987	40,883
Approx. Volume	cu ft u.b.	55,048	1,098		56,146	71,978	49,100
Hardwood Plantations	Number						
Class 1		41,984	49,604		91,588		
2		86,887	73,630		160,517		
3		3,668	18,476		22,144		
4		2,238	250		2,488		
5		200	42		242		
TOTAL	Number	134,977	142,002		276,979	190,950	300,235
Approx. Volume	cu ft u.b.	124,777	145,385		270,162	179,170	235,000
Hardwood Bush	Number						
Class 1		5,575	358		5,933		
2		341	676		1,017		
3			46		46		
4							
5							
TOTAL	Number	5,916	1,080		6,996	8,297	26,395
Approx. Volume	cu ft u.b.	2,199	927		3,126	8,056	21,300
TOTAL POLES	**Number**	**195,498**	**144,183**		**339,681**	**267,234**	**367,513**
Approx. Volume	**cu ft u.b.**	**182,124**	**147,410**		**329,434**	**258,204**	**305,000**

1. This table does not include the very large unrecorded quantities of poles, firewood and bamboos taken free from public land and forest reserves by Ugandans for their own domestic use or forest produce cut on private land. 2. The volume of poles has been calculated according to the table in U.F.D. Technical Note No.109 (1963) – the average length per pole is taken as 15 ft.

* Buganda, Bukedi, Bugisu, Ankole and Teso produced no returns. Kigezi covered Jan–March only. Lango covered July –December. Acholi covered July–November.

Table 7B. (contin.) Production of Fuel and Minor Forest Produce, 1964/65, 1963/64 and 1962/63

Category	Unit	1.7.1964–30.6.1965				1963/64	1962/63
		Central Forest Reserves	Local Forest Reserves*	Public Land*	Total	Total	Total
FIREWOOD:							
Plantation	st.cu.yds.	66,192	41,590	—	107,782	125,334	125,973
Bush	st.cu.yds.	61,512	10,999	108,129	180,640	66,364	70,735
TOTAL	st.cu.yds.	127,704	52,589	108,129	288,422	191,698	196,708
Approx. solid volume	cu.ft.u.b.	1,724,004	709,952	1,459,741	3,893,697	2,567,923	2,658,000
MINOR FOREST PRODUCE:							
Seeds	Pounds	44	10		54	18	1,048
Plants	Number	75,833	22,672	—	98,505	172,228	168,000
Christmas trees	Number	1,394	—	—	1,394	2,223	780
Bamboos	Number	359,914	1,496	—	361,410	459,882	450,000
Canes	Number	600	1,500	—	2,100	3,607	4,000
Palms	Number	23,305	12	—	23,317	21,678	23,800
Posts	Number	6,913	—	—	6,913	2,830	—
Charcoal	Bags		—		—	193	—

1. This Table does not include the very large unrecorded quantities of poles, firewood and bamboos taken free from public land and forest reserves by Ugandans for their own domestic use, nor forest produce cut on private land. 2. The conversion factor used for firewood is: volume in stacked cubic yards x 13.5 = solid volume under bark in cubic feet.

*Buganda, Bukedi, Bugisu, Ankole and Teso produced no returns. Kigezi covered Jan–March only. Lango covered July–December. Acholi covered July–November.

Table 9. Sawn Timber (Lumber) Production, Stocks and Values, 30.6.65

Product	Unit	Quantity	Value £
PRODUCTION			
Conifers	cu ft	43,836	£15,101
Non-conifers	cu ft	1,767,881	£927,472
Boxboards			
Conifers		(included under plywood)	
Non-conifers			
Sleepers	cu ft	—	—
Plywood	sq ft	6,420,305	£165,573
Blockboard	sq ft	72,122	£8,989
Matches	boxes	3,283,200	£16,416
STOCKS			
Conifers	cu ft	3,432	£1,150
Non-conifers	cu ft	123,760	£61,900

Table 10. Size of Forest Industries, year ended 30.6.65

Nature of Industry	Number of Industrial Units by Sizes			Number of Persons Employed Annually			Roundwood used (1,000 cu ft u.b.)
	***	**	*	Whole time	Part time	TOTAL	
PART I PRIMARY							
Sawing		5	20	2,500		2,500	3,816
Plywood & Veneers			1	250		250	296
Match production			1	50		50	—

***Over 750,000 cu ft production per annum
**175,000 to 750,000 cu ft production per annum
*Less than 175,000 cu ft production per annum

Table 11. Exports and Imports of Forest Produce (other than Minor Produce), 1965

S.I.T.C.*	Product	Unit	Exports			Imports		
			Quantity	Value £	Destination (quantity)	Quantity	Value	Origin (quantity)
241-1	Fuelwood	centals				345	422	Kenya 100%
241-2	Charcoal	centals				388,471	101,919	Kenya 100%
242-1	Wood in the round	cu ft						
242-2	Wood (conifers)	cu ft						
242-3	Wood (non-conifers)	cu ft	9,039	3,325	Kenya 66%, Tanzania 34%	600	90	Kenya 100%
242-4	Pitprops							
242-9	Poles, Piling, Posts & other roundwood	cu ft				s?	8,272	Kenya 100%
243-1	Railway sleepers	cu ft	10	9				
243-2	Lumber sawn (conifers)	cu ft	3,046	1,303	Ruanda 100%	154,774	49,913	Kenya 70%, Tanzania 30%
243-3	Lumber sawn (non-conifers)	cu ft	208,088	160,959	Kenya/Tanzania 53%, U.K.27% Others 20%	36,018	19,606	Kenya 90%, Tanzania 10%
251- 01	Paper waste & old paper	centals	298	418		13,551	13,767	Denmark 74%, Sweden 23% Other 3%
631-48	Improved worked wood					?	5,153	
631-2	Plywood	sq ft	589,077	16,038	Kenya & Ruanda (100%)	1,181,712	49,947	Kenya/Tanzania 32%, Finland 17%, Hong Kong 11% Other 40%
631-4	Particle board.	sq ft	640	34	Ruanda 100%	99,033	5,232	France 22%, Finland 21% Poland 21%, Other 36%
632	Wood manufactures	centals	15,927	110,618		16,157	118,904	
633	Cork manufactures	sq ft	?	19		?	22,364	
641-6	Fibreboard (other)	sq ft	13,360	796}		262,836	10,144}	{Sweden 47%, Finland 28%
	Compressed (board)	sq ft	94,216	1,880}	Ruanda 100%		}	{
	Non-compressed (insulation)	sq ft	34,720	928}		2,950,560	46,841}	{USSR 7%, Other 18%
641-1	Newsprint	centals	—			18,881	53,793	Canada 48%, Sweden 23% Norway 19%, ?? 10%
641-2	Printing and writing paper	centals	1,550	22,507		53,705	437,870	
641-3/9	Other papers, paper board	centals	364	4,359		21,677	102,944	
	Tissue & thin paper	centals	?	933		1,594	74,234	
642-1	Wrapping paper	centals	193	1,743		62,236	412,699	
642.9(9)	Other paper & paper board		?	2,632		?	133,794	
	TOTAL in 1965		**Exports £328,501**			**Imports £1,683,783**		

*S.I.T.C. = Standard Industrial Trade Classification (see: http://www.tradeport.org/ts/planning/sitc/ch2.html)

Table 12. Domestic Consumption of Forest Products, year ended 30.6.65
(population = 7,367,000)

	Quantities in 1,000 cu ft u.b.				Consumption per head cu ft u.b.
	Production	Imports	Exports	Net Consumption	
Fuelwood & charcoal	*350,000	413	—	350,413	47.6
Sawlogs & veneer logs	3,816	—	—	3,816	0.52
Other industrial wood	*25,000	688	482	25,206	3.4
Paper products by value		£1,301,693	£39,044	£1,262,649	£0 172

*Includes estimated quantities of produce taken from unreserved woodland by Ugandans for their own domestic use, which are not recorded.

Table 13. Strength of Forest Staff (excluding Local Government Staff), 30.6.64**

Territorial or Other Unit	Professional Staff				Intermediate Staff*		Subordinate Staff		Clerical Staff	Other Staff	Average Labour Force
	Forestry Trained		Other								
	Expatriate	Ugandan	Expatriate	Ugandan	Expatriate	Ugandan	Formally Trained†	Not Formally Trained††		***	
Direction Division	1	1		—	—	—		—	9	5	2
Management Division	1	—		—	—	—		—	—	—	
Buganda Region	2	—		—	—	3	27	—	5	4	500
Eastern Region	—	1		—	—	2	8	44	2	2	187
Western Region	2	—		—	—	3	19	10	5	3	565
Northern Region	1	1		—	—	2	10	36	4	3	288
Publicity Section	—	—		—	—	1	—	18	—	—	—
Map Section	1	—			1	—	6	—	1	1	—
Research Division	2	—		—	—	—	—	-	—		—
Silvicultural Section	—	—		—	1	3	7	3	—	—	30
Entomological Section	1	—		—	—	—	1	4	—	—	—
Utilisation Section	1	—		—	1	—	—	—	3	4	36
Training Division	—	—		—	—	—	—	—	—	—	—
Forest School	1	—		—	—	1	2	—	1	1	30
In training or selected for training	—	—		13	—	7	9	—	—		—
Other	—	—		—	—	—	—	—	—	—	—
Vacancies	8	—		—	—		—	—	—	—	—
Seconded	—	—		—	—	1	2	—	—	—	—
Total	**21**	**3**	**—**	**13**	**3**	**23**	**91**	**115**	**30**	**23**	**1,638**

*Foresters, Statistical Assistant, Senior Foreman
†Senior Rangers, Rangers, Draughtsmen, Entomological Assistant
††Forest Guards

**Not available for 1965
***Not available for 1964 or 1965. Figures taken from 1966

Table 14 (i). Summary of Expenditure (excluding Local Government), year ended 30.6.65 (£)

	Expenditure £									
	H.Q.	**School**	**Research**	**Utilisation**	**Maps**	**Buganda**	**Eastern**	**Northern**	**Western**	**Total**
Personal Emoluments***	87,018									87,018
Travelling & Transport	3,476	976	2,148	648	788	4,081	815	2,069	2,973	17,974
P.O. Water & Electricity	566	4	390	612		203	66	66	93	1,981
Incidentals	66	40	421	100	17	28	9	20	19	720
Stores, Equipment & Vehicles	16,373	129	523	2,082	252	279	32	178	1,271	21,119
Group Employees	875	103	522	198	112	5,967	1,195	2,292	4,011	15,275
	*31,851	—	—	—	—	—		—	—	31,851
Forest Field Work	5,996	4,915	8,733		**1,688	43,602	17,182	18,128	23,837	124,081
Roads	—	—	—		—	797	441	—	2,310	3,548
New Plantations	80	—	—		—	800	3,291	9,847	22,680	36,698
Game Ecology	1,632	—	—		—	—	—	–	—	1,632
Buildings	4,591	—	—	218	—	2,582	—	371	5,101	12,863
TOTAL	**152,524**	**6,167**	**12,737**	**3,858**	**2,857**	**58,339**	**23,031**	**32,952**	**62,295**	**354,760**

*Whole department, allocations to regions not available.

**Includes £739 on publicity

Total expenditure agrees with Ministry accounts but adjustments have been necessary to make departmentally reported expenditure agree; such adjustments have chiefly been made under HQ.

***Includes pay and allowances of all departmental staff, expatriate and Ugandan.

Table 14(ii). Summary of Revenue (excluding Local Government), year ended 30.6.65 (£)

	Central Forest Reserves							Public Land					
	Buganda	Eastern	Northern	Western	School	HQ	Total CFRs	B.	E.	N.	W.	Total PL	Total CFRs & PL
Timber fees	25,362	1,074	245	41,721		—	68,402						68,402
Bush Fuel and Poles	1,902		323	745	—	—	2,970			89		89	3,059
Plantation Fuel and Poles	9,450	6,822	2,006	2,637	47		20,962						20,962
Other	1,558	126	120	964	650	141	3,559						3,559
TOTAL	**38,272**	**8,022**	**2,694**	**46,067**	**697**	**141**	**£95,893**			**89**		**89**	**£95,982**

Note: Revenue from public land in most districts, which have been declared to have an adequate forest estate, accrues to the relevant local or kingdom government

Table 15. Annual Revenue and Expenditure, 1955–1965

Expenditure (based on ministry accounts)							Revenue				
	Revenue Budget		Capital Budget		Total		Departmental		Timber		
Year	Estimate	Actual	Estimate	Actual	Estimate	Actual	Estimate	Actual	Cess	Total	Deficit
£	£	£	£	£	£	£	£	£	£		
1955–56	219,158	205,739	31,405	20,302	250,563	226,041	69,000	81,780	14,503	96,283	129,558
1956–57	233,174	214,046	19,330	14,168	252,504	228,214	80,236	73,969	13,944	87,913	140,301
1957–58	231,980	222,024	12,250	9,616	244,230	231,640	82,000	94,928	14,648	109,576	122,062
1958–59	234,138	230,514	12,286	11,341	246,424	241,855	86,100	85,457	15,867	101,324	140,531
1959–60	212,468	203,992	29,580	28,540	242,048	232,532	95,800	95,607	**18,909	105,285	124,247
1960–61	216,470	209,344	25,460	23,040	241,930	232,384	94,800	92,413	—	92,413	139,971
1961–62	212,670	214,063	33,840	30,529	246,510	244,592	86,500	74,626	—	74,626	169,966
1962–63	238,850	230,832	35,510	30,108	274,360	260,940	89,000	86,934	—	86,934	174,006
1963–64	241,645	232,438	49,530	41,351	291,175	273,789	82,200	78,658	—	78,658	195,131
1964–65	260,340	261,905	71,410	61,392	331,750	323,297	82,200	95,982	—	95,982	227,315

*1963–64 figures are departmentally supplied.

**Includes sale of investments on winding up the Timber Cess Fund, of which £9,678 accrued to government and is included in the total column.

Table 16. Vehicle Fleet

Year	1954	1955	1956	1957	1958	1959/60	1960/61	1961/62	1962/63	1963/64
Lorries, trucks	4	5	7	6	7	7	8	8	6	6
Land Rovers	2	5	6	7	10	8	8	10	11	11
Trailers	2	3	3	5	9	6	7	8	8	8
Motor cycles	4	3	3	1	1	2	2	2	2	1
Wheeled tractors		2	7	7	7	8	8	8	8	8
Crawler tractors			1	1	2	2	2	2	2	2
Tipper truck			1	1						
School bus			1	1	1	1	1	1	1	1
Log trailer			1	1	1	1	1	1	1	1
Tanker trailer			1	1	2	3	3	3	3	3

Table ALG 1. Forestry Revenue and Expenditure, 1965 (£)

Kingdom or District	Revenue	Expenditure		
		Personal Emoluments	Other Charges	TOTAL
Acholi	468	1,512	1,698	3.210
Ankole	?	?	?	?
Buganda	?	?	?	?
Bugisu	?	?	?	?
Bukedi	1,732	2,464	3,550	6,014
Bunyoro	14,013	3,645	3,663	7,308
Busoga	37,569	4,325	9,505	13,830
Karamoja	16	166	503	669
Kigezi	2,250	2,260	7,355	9,615
Lango	1,1452	1,447	1,818	3,265
Madi	135	151	273	424
Sebei	71	–	148	148
Teso	1,823	3,493	4,798	8,291
Toro	1,869	?	4,720	4,720
West Nile	6,760	?	7,182	7,182
TOTAL	**68,158**	**19,463**	**45,213**	**64,676**

Table ALG 2. Comparative Statement of Forestry Revenue and Expenditure, 1954–1965

Year	Revenue	Expenditure		
		Personal Emoluments	Other Charges	TOTAL
1954	468	4,818	32,328	37,146
1955	30,203	12,904	37,128	50,032
1956	46,250	15,231	43,560	58,791
1957	62,447	19,294	47,754	67,048
1958	59,424	20,611	47,692	68,303
1959 (half)	25,820	10,492	23,998	34,490
1959/60	82,581	24,697	47,295	71,992
1960/61	88,856	28,554	50,298	78,852
1961/62	82,544	31,974	49,874	81,848
1962/63	81,387	32,764	57,505	90,269
1963 (half)	46,106*	10,193**	15,062**	25,255*†
1964	72,336	14,291	45,132	59,423
1965	70,934†	14,244†	19,613†	33,857†

*Figures not available for Ankole and Buganda

**Figures not available for Bugisu and Teso

† Complete figures not available for Ankole, Buganda, Bugisu, Busoga, Kigezi, Sebei and Teso

1963 and 1965 totals include some expenditure not identified as either PE or OC

Table ALG 3A. Silvicultural Treatment of Natural High Forest (LFRs)

Working Plan Area	Tending Forest Not Yet Harvested		Tending Harvested Forest		Total cost £
	Tended in 1965	Total at 31.12.1965	Tended in 1965	Total at 31.12.1965	
Lubani (Busoga)	100	310			150
Namatale (Bugisu)	10	70	40	405	30
Olwal (Acholi)				1,400	
Buganda*					
Lowland LFRs (Bunyoro)			600	2,800	159

*Return not received

Table ALG 3B. Regeneration and Afforestation in Hardwood and Softwood Timber Plantations and in Fuel and Pole Plantations (LFRs)

Kingdom or District	Hardwood Timber Plantations	Softwood Timber Plantations			Fuel and Pole Plantations			Cost
		Softwoods		Firebreaks				
		Planted 1964/65	On 31.12.65	On 31.12.65	Regenerated 1964/65	Planted 1964/65	On 31.12.65	£
Acholi	Nil				1	7	638	1,500
Ankole								*
Buganda								*
Bugisu					16		186	566
Bukedi					49		467	2,000
Bunyoro					22	20	††319	1,380
Busoga					50	113	†6,558	2,050
Karamoja					1		18	482
Kigezi		173	1,018	*	30			755
Lango					58		1,146	1,648
Madi						5	112	200
Mbale Town							204	—
Sebei							13	120
Teso					44		878	*
Toro		137	367	40			216	*
West Nile		60	149	47	175		2,073	1,064
TOTAL	**NIL**	**370**	**1,534**	**87**	**446**	**145**	**12,828**	**11,765**

*Return incomplete or not received.
†Includes 73 acres established at Butamira LFR by the sugar company.
††Includes 93 acres transferred from Buganda during the year.

Table ALG 4. Production from Local Forest Reserves and Public Land by Districts, 1965

District	Local Forest Reserves						Public Land			Minor Produce	
	Timber (cu ft)	Poles (number)		Bush	Firewood (cu yds)		Timber (cu ft)	Bush poles (number)	Bush firewood (cu yds)	Plants (number)	Bamboos (number)
		Plantation			Plantation	Bush					
		Hardwood	Softwood								
Acholi			6,169		680	246			60	2,908	1,700
Ankole			5,005		57	213	112				
Buganda*											
Bugisu	29,424		4,180		1,160		500			10,641	
Bukedi			6,966		241		8,453		40	10,608	
Bunyoro	75,807		15,566		1,053		187,060	1,080	1,649	7,570	
Busoga			26,487		6,307	10,072	400,555		700		
Karamoja			197							560	
Kigezi	105,783	113	7,846		303		15,188				
Lango			232,819		747	925		628			
Madi			935				430		215		3,600
Sebei	1,195		91		48		1,200				
Teso			14,731		1,824	2,807			438		
Toro		811	7,813		8		1,670	187	20,867	7,684	
West Nile*											
TOTAL	**212,209**	**924**	**328,805**		**12,428**	**14,263**	**615,168**	**1,895**	**23,969**	**39,971**	**5,300**

*Returns not received.

Note: These figures represent commercial sales of forest produce.
They do not include the very large quantities of bush poles and fuel taken free by Ugandans for their own domestic use.
They do not include plants grown for planting in LG plantations (but include some tree seedlings distributed free).

Table ALG 5. Strength of Forest Services Staff, 31.12.65

District	Professional Staff	Sub-Professional Staff			Clerical Staff	Other Staff	Average Labour Force
	Foresters		Forest Rangers/ Forest Supervisors		Forest Guards/ Overseers		
Acholi			1	9	1		30
Ankole			2	10	1	1	20
Buganda		3	*	*	*	*	*
Bugisu			2	4			30
Bukedi		**1	3	3	1	1	40
Bunyoro			4	15	1	2	58
Busoga		1	4	4	1	1	100
Karamoja						3	10
Kigezi		1	4	10	1	1	90
Lango			1	7			50
Madi				1			2
Sebei				1			5
Teso		1	4	7	1	1	50
Toro		1	3	7	1	1	70
West Nile		[†1]	2	11			100
TOTAL	**None**	**8**	**30**	**89**	**8**	**11**	**655**

Complete figures not available
**In training
†Seconded from Forest Department

Postscript: 1966–2003

Much has happened in Uganda and to forestry there in the four decades since independence in 1962 and the close of this history in 1965. In the first few years, with Milton Obote as president, economic progress in the country was encouraging, and despite the departure of most, though not all, of the expatriate staff, and their replacement by newly qualified and inexperienced Ugandans, the Forest Department pressed ahead under a competent Ugandan head, Martin Rukuba, with the programmes already in train.

Idi Amin seized power in 1972 and the economy, and law and order, started to break down. Funding for all government departments dropped sharply. Little was possible in the way of forest operations or even protection, and transport was scarce. Amin encouraged farmers to encroach on forest reserves. He expropriated and evicted the long-established Asian population, who (particularly the Sikhs) provided most of the managers and key engineers in the saw-milling industry, which collapsed. An attempt to remedy this by the creation of the Ugandan Timber Corporation to run the mills was unsuccessful, due to lack of spares and skills, and the efforts of Amin's corrupt lieutenants to seize and run the mills for their own advantage. Rukuba, who had been seconded to run this organisation, was kidnapped from his home by one of these men, carried off in the boot of a car and imprisoned in a cupboard at one of the mills. He was only rescued from probable murder by his neighbour who, informed by Rukuba's young daughter who had run through a gap in the hedge, strapped on his revolver and set off in pursuit. After his rescue Rukuba had to flee the country and subsequently worked for FAO, an unfortunate loss to Ugandan forestry. The forests were used as dumping grounds for the bodies of the many people tortured and murdered by the army or police.

After the eviction of Amin by Tanzania, Obote returned to power in 1980 but matters went from bad to worse. Staff were mainly concerned with 'keeping their heads down' and supplementing their pay. Inflation resulted in the purchasing power of the salary of a forest officer in 1988 being worth only 0.4% of what it was in 1962, enough to buy four loaves of bread a month. Although most people in Uganda still owned their family farm and could rely on that for some basic necessities, government staff needed extra money to support their families. Sometimes they obtained this by legitimate employment, sometimes by corruptly allowing encroachment or the theft of forest produce. Manufactured goods were not produced or imported, and in the markets even paper was so scarce that government offices were stripped of files to provide wrapping for peanuts. The entire stock of forest management plans disappeared in this way; fortunately the original tracings of maps were on film.

Obote was re-evicted in 1985 and in the following year, again with Tanzanian help, was succeeded by Yoweri Museveni. Law and order were re-established, but desperate economic straits continued, partly due to the large part of the budget taken by the armed forces. Nevertheless it was remarkable how well the structure of British bureaucracy had survived; huge sums in international aid were applied to reconstruction and development. In a remarkable display of political strength Museveni ordered the eviction of all encroachers from forest reserves and much effort was put into redemarcation of their boundaries, but no funds were

available for reforesting these abandoned areas. In many forests reforestation occurred naturally, but in the Mabira Forest it was overtaken by the colonisation of 7000 ha by the exotics *Brousonnettia papyrifera* (Paper Mulberry) and *Lantana camara*, the eradication of which still presents an unsolved problem. One side effect of the slaughter of many of the wild animals in the National Parks by the army was that the reduction of elephant populations to low levels permitted greatly improved regeneration of mahoganies in adjoining forests. The elephant populations are recovering fast and may once more present a problem.

The softwood timber plantations established in the 1950s and 1960s were not thinned or pruned during the troubles but fortunately escaped burning, and despite some deaths of cypress in some areas from drought and disease, they have mostly grown well. It is production from these that is meeting the needs of a rapidly growing national economy, but no replanting has yet been done despite much discussion. The population is five times what it was when the FAO wood consumption survey was done in 1959/60, and standards of living have greatly increased, so these plantations will be exhausted in a few years. At the same time, growing demand has caused a very serious rise in illegal felling of timber trees in reserves by pit-sawyers. It has proved impossible to police this effectively, partly due to some continuing corruption at all levels of the administration.

The increased emphasis on nature conservation, often insisted on by international organisations as a condition of aid, has had two effects on future timber supplies. Several of the largest forest reserves have been declared National Parks and so removed from potential timber production, while in the larger remaining reserves a 20% core area has been designated as a strict nature reserve, with a protective 30% belt where only limited harvesting is allowed. The potential timber-producing area has thus been seriously reduced, reinforcing the need for an immediate large plantation programme of fast growing species which are likely to be mainly pines, eucalyptus and *Maesopsis*. The silvicultural methods of improving the productivity of the natural forests, developed and used successfully in the 1950s and 1960s, using arboricides to kill defective individual trees and unproductive species, have fallen into disfavour and an effective replacement has not yet been found.

The increase in population has brought about a big rise in the demand for bush fuel and at the same time has meant that much of the land which originally produced it has been occupied. Very large quantities of charcoal are transported to the larger towns for domestic consumption, as electricity from the Nile Dam is still too expensive for most people. Fortunately it seems probable that as demand for fuel and prices increase, there will be a compensatory growth of planting by farmers. In Buganda and the west this has already occurred to meet the demand for building poles. The large commercial fuel-using firms such as tea and tobacco companies have already established large private plantations.

On the organisational side, forestry has been dominated by top-level political decisions, by substantial support from overseas aid and by weak (sometimes corrupt) leadership of the Forestry Department. A re-formation of the department as a Forest Authority has been planned for several years and is now near implementation. It is hoped that this will improve efficiency by removing some of the budgetary and staff management constraints of the Civil Service. The original pre-independence national structure of 12 districts grouped into four

regions has been fragmented into 40 districts controlled from the centre. Devolution to these local governments of the management of forestry on public land and in lesser reserves was reversed some years ago but is now again being considered. Finance for forest operations remains inadequate pending the expected re-organisation. Partly because of the constraints caused by this, and partly because of uncertainty about future management of the natural forests and the possible establishment of new large timber plantations, very few of the forest management plans have been revised and brought up to date. However there is no shortage of trained staff, indeed the department is over-staffed. Makerere University has a Forestry Faculty for professional training, while Nyabyeya Forest School has become Nyabyeya Forest College administered by the Education Department and continues to flourish.

The government's progressive policies have attracted donor support and investment from EEC, DANIDA, UNDP, CARE and IDA in support of the Forestry Rehabilitation Project. The Norwegian Forestry Society supports the National Biomass Survey and CARE has supported a village tree planting project. IUCN and NORAD have also been involved in various sustainable development programmes, together with other international and local NGOs. The Uganda Forestry Sector Co-ordination Secretariat supported by DFID (UK) is currently organising the change to a Forest Authority and the establishment of saw-timber plantations.

Uganda has one of the fastest growing economies in Africa. Total wood production in 1998 was 22 million tonnes worth Ush.130,000 million ($100 million), and the country still has a viable forest estate of 14,900 km^2, of which 6000 km^2 is natural high forest, half in forest reserves and half in national parks. If its foresters and their international advisers and supporters can overcome the problems described above, especially the need to develop a stronger administration and to ensure future timber supplies by the establishment of fast-growing plantations, they will have an opportunity to place Uganda once more in the front rank of tropical forest management.

Henry Osmaston
April 2003

A History of the Uganda Forest Department 1951-1965

The forests of Uganda and their management are of particular interest in the field of tropical forestry. Lying on the boundary between the lowland forests of the Congo basin and West Africa and the savannahs of East Africa, Uganda's abundant and reliable rainfall supports considerable areas of moist tropical forest, with much of the land suitable for the planting of fast growing tree crops.

Part of a British protectorate from 1893, post-1950 Uganda became a world leader in the composition, harvesting and management of natural forests, complementing this with the establishment of is own extensive plantations for the production of fuel, poles and saw-timber.

Many of the challenges documented in this book will be as relevant today as in previous years: the accelerating deficit of saw-timber, urban encroachment, costly demarcation of boundaries and decentralisation of management all remain vexing and, at times, controversial issues.

This book, compiled by two former members of Uganda's forestry department, is not only an invaluable historical record but also provides authoritative experience from which to draw on for all involved in forestry and land management today.

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