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NOTES ON THE FORESTRY SITUATION IN FOURTEEN COUNTRIES OF THE EAST AND CENTRAL AFRICAN SUB-REGIONS

M69-2696

Following a meeting of East and Central African Foreign Ministers held in Dar-es-Salaam on 4-6 February 1969, five recommendations concerning promotion of co-operation in the fields of agriculture, livestock, agricultural research, forestry and fishery development were adopted by the meeting. Subsequently, these recommendations were endorsed by Heads of State at a meeting held in Lusaka, Zambia (14-16 April 1969).

Follow-up proposals concerning these recommendations will take the form of technical meetings which are to be held in Nairobi to discuss the implications implicit in these recommendations, as they concern the Central and East African countries involved.

Approved recommendation (C)

"The establishment of a joint consultative and implementation Committee on Forestry Development, in order to initiate among other things, a regional programme of action to promote the development of timber, wood products and paper manufacturing industries."

The Committee may wish to direct its attention to the following areas of importance:

Main forestry activities, kinds of forests, forest potential, forest exploitation, kinds of timber produced, wood-based industries that are operating or being developed, research in all aspects of forestry being undertaken, training at professional and sub-professional levels in the field of forestry, trade in timber and forest-based products, wood pulp and paper manufacture.

The notes which follow, which may be of some assistance to delegates, were prepared by the staff of the ECA/FAO Joint Agriculture Division, Addis Ababa, from country statements submitted by the FAO Forestry and Forest Industries Division, and from national development plans.

B U R U N D I

Burundi is probably the most eroded and deforested country in tropical Africa. The degraded forests cover only some 3.5 per cent of the country's land area, and are mainly located in the Congo-Nile and Bururi range. In 1964 there were 22,500 ha of plantations of Acacia mollissima, Cupressus lusitanica, Grevillea robusta and Eucalyptus spp. The plantations are in small units. Little afforestation has been carried out since independence. In 1967, 700 cubic metres of saw-logs and 113,000 cubic metres of fuelwood were removed from the forests. The annual per capita consumption of wood is about 0.04 cubic metres.

There is one sawmill in Burundi. This is controlled and operated by the Department of Water and Forests. Production from this mill apparently meets the country's demands for sawn wood, although it is also assumed that unrecorded supplies also reach the country from Tanzania and Congo (Democratic Republic of). There are no recorded exports of wood or wood products, and about 1,000 tons annually of paper and paper board is imported.

Wild life numbers are decreasing because of this country's rapidly increasing population and the agricultural pressure which is now being applied to the land. As farming and stock-rearing expand out of control, erosion is becoming more widespread and future forestry activities should be concentrated immediately on reforestation.

It would appear to be highly desirable to formulate a national land-use policy which will take account of the unusual physical and socio-economic conditions of the country.

The Government of Burundi has unofficially applied for aid from the WFP for a soil conservation project in the Mwaro region. It is understood that aid is being sought for the afforestation of part of the plain of Rusizi. It is also reported that the Danes are interested in a development study of the Imbo, and especially a pilot afforestation proposal put to them by the Burundi Government. The forestry service and the training of forest technicians is greatly in need of an overhaul. It is recommended that a study be made of the forestry conditions requiring most immediate attention and that a project of proper land use and rehabilitation be submitted to UNDP for consideration.

CENTRAL AFRICAN REPUBLIC

The total land area of CAR is estimated to be 61,700,000 ha of which closed forests cover an area of about 2,200,000 ha, and under timber exploitation (1967 permits), approximately 348,230 ha. The main wood species being exploited, processed and exported are Ajous and Sapelli.

Forest industries in CAR include nine sawmills with an average annual output of about 48,000 cubic metres sawnwood. Seven mills are operating in the Lobaye region and two small production units have started operations in the Haute Sangha region.

Near Bangui, there is in operation the Forestry Training and Demonstration Centre (FAO and UNDP/SF Project). Joinery, furniture making and packaging manufacture, are carried out in small artisan production units or in special departments integrated with sawmilling and logging operations.

In the past two years total log output from 12 logging enterprises has been of the order of 175,000 cubic metres (round), the bulk of this output being processed or consumed in the country and only 10,000 cubic metres being exported. Transport is a considerable problem in this land-locked country and costs tend to be high.

Training and demonstration

There exists at Bangui a Forestry Training and Demonstration Centre - Centre forestier piloto de démonstration et formation professionnelle. This organization is financed by the UNDP/SF and by the Government of CAR. The Centre exists in order to improve the technical level of logging, sawmilling and lumber processing, as well as to increase the qualifications of the personnel employed in the forest industries.

Research in forest-based industries and the popularization of forest products is carried out by the Bureau Technique du Bois which is financed by the Federal Republic of Germany. Woodworking enterprises are associated in the Chambre syndicale du bois de la République centrafricaine in Bangui.

Basic factors affecting sawnwood production and marketing are:

(1) Low domestic consumption market for sawnwood and sawnwood products.

(2) Low degree of integration with further lumber processing, facilities.

(3) High transport costs to export harbour (Pointe Noire).

C H A D

Forestry operations in Chad are the responsibility of the Service des eaux et forêts. In a territory represented by the Desertic and Sahelian ecological zones, forest resources are limited to the production of fuelwood, traditional building timber and gum, the latter representing the product of several species of Acacia.

The principal activities of the service are confined to the reafforestation of suburban limits around larger population centres, with a view to maintaining and increasing the availability of fuelwood supplies and to the development and enclosure of gum tree plantations both natural and cultivated. The reforestation of 50 ha with suitable fuelwood timber species, involves an investment of approximately 1.2 million CFA francs, with recurrent charges of 240,000 CFA francs per annum.

The current production of gum amounts to approximately 2,000 tons but with the additional creation of 3,000 ha of cultivated gommeraies envisaged, an additional yield of 600 tons per annum is expected. A research centre for the production of gum is being established at Abeche.

Since there are no primary woodworking industries in Chad, furniture manufacture, joinery and construction are fully dependent on sawnwood and panel imports from other UDEAC countries.

CONGO (BRAZZAVILLE)

In Congo (Brazzaville) forest exploitation is carried out in an area of 888,995 ha by 151 logging enterprises, the main timber species harvested for export and domestic processing being Okoume and Limba.

Forest industries comprise 18 small-scale sawmills with an average output of about 30,000 to 33,000 cubic metres sawnwood, and four veneer plants with, in the last two years, an annual output of 38,000 cubic metres following the start in 1967 of a new veneer mill in Pointe Noire. Total production of veneers from all mills will increase by 1975 to 100,000 cubic metres of veneers per annum. Furniture making, joinery, etc., is produced and is the work of small local artisan production units.

There is no pulp or paper mill, or paper conversion mill operating in the country.

Total log output (sawlogs, veneer logs and logs for sleepers) in 1968 amounted to 691,000 cubic metres of which 556,000 cubic metres were exported and about 135,000 cubic metres or 19.5 per cent, locally processed or consumed.

The value of all forest product exports is of the order of US$22.5 million, of which processed wood products account US$3.2 million. The relocation of sawmills to new exploitation area is to be realized shortly.

The principal exploitation areas in Congo (Brazzaville) are at Niari and Kouilou. The "Congo Basin - La cuvette congolaise" is to be exploited later.

Average national output per mill is very low, approximately 1,800 cubic metres, sawnwood per annum. Machinery equipment in many of the mills is obsolete, and the general layout of mills antiquated. The degree of mechanization varies substantially from mill to mill. There are no dry-kilns or preservation plants.

Training and research

A forestry centre for demonstration and professional training financed by UNDP/SF, is presently under construction at Mossendjo. The Research Institute for Tropical Timbers - Institut de recherches des bois tropicaux - in Pointe Noire, deals with identification of new wood species, advice on technological and marketing problems as well as with research at the experimental plantations near Pointe Noire and Loudima.

Principal factors affecting the present unfavourable situation of the sawmilling industry in Congo (Brazzaville) may be summarized as foolows:

(1) The smallness of production units.

(2) Low degree of mechanization and poor layout of mills associated with obsolete machinery and equipment.

(3) The large number of timber species to be handled per production unit.

(4) Low milling yield, often below 50 per cent, and a low degree of integration with further sawnwood processing, e.g. the possibility of manufacturing palettes and containers for modern transportation purposes.

(5) Uncertain export markets and the small domestic consumption market.

(6) Lack of adequate training facilities in forestry practice, silviculture, and timber utilization.

CONGO (DEMOCRATIC REPUBLIC OF)

Forests cover 129 million hectares or 57 per cent of the land area of the Congo (Democratic Republic of) of which closed high forests occupy 90 million hectares. The remaining forested areas are described as savannah and woodlands. Of an average/volume of exploitable timber per hecatre in the high forest, reckoned at 80-100 cubic metres per hectare, only some 20-25 cubic metres are extracted under normal commercial exploitation.

The Mayombe forests extending to approximately 240,000 hectares are near to the coast and are noted for the frequent occurrence of the valuable species Terminalia superba. In this area this species occurs in pure natural stands, in plantations, or mixed with other species. Another important logging region lies around Lake Leopold II from whence the Congo river provides transport facilities, although these are to some extent limited by the falls in the Mount Cristal area.

Forest plantations including line plantations in the moist high forests, protection plantations in the savannahs, and closed plantations of exotic species in all cover about 60,000 hectares. Conifers account for only about 2,000 hectares.

On average, about 6 million cubic metres have been harvested annually between the years 1962 and 1967. Most of the log output is processed locally by a few industrial enterprises concentrated in the western and coastal areas. Small sawmills supply the internal markets in the rest of the country, their output, however, is low.

Currently, sawmilling, plywood and veneer manufacture, particle board production are the only wood-processing industries in the Congo. In 1962 the value of their output was more than US$16 million. This figure is conservatively expected to rise to about US$60 million by 1985.

The trade balance in wood and wood products in the Congo is favourable, and this is expected to continue especially if wood pulp and paper are to be manufactured.

The overall contribution of the forestry and forest industries sector to foreign trade is relatively very small when the natural resources available to commerce are considered. The value of the exports of wood products is only about 10 per cent of that returned by agricultural products, and negligible when compared to total exports.

One promising feature, however, is that the export of unprocessed logs has been less important than that of manufactured wood products. Most of the value added therefore accrues to the Congo itself.

Little outside investment has been made in the forest industries of the Congo in recent years and the Congolese Government should encourage entrepreneurship in this area of endeavour so as to create rural employment for populations whose fortunes have been badly interrupted as the result of the unsettled conditions brought about by the struggles for independence.

The present supply of raw material in the Congo seems favourable, but development and survey is called for to determine the most suitable logging areas, to increase communication by improvement of all kinds of transport services and facilities, to conserve the large forest resources by adoption of approved silvicultural practices, and to utilize timbers unsuitable for industrial manufacture in the production of wood pulp for paper making.

Professional and sub-professional training

The Congo (Democratic Republic of) is urgently in need of improved facilities for training personnel at both professional and sub-professional levels.

Facilities at the Université Lovanium must be brought up to the standard required to train professionals to the highest possible levels. In this connexion, planning should consider the possibility of widening the scope of such facilities to include undergraduates from neighbouring French-speaking countries in the Central African su-region.

One or more forestry schools are also required to provide sub-professional training and to provide facilities for in-service training particularly as regards the special training required by commercial exploitation and activity. To get such proposals under way, application should be made to UNDP for assistance to man such institutions and to FAO/IBRD to assist in the appraisal and possible financing of the survey work necessary to commercialize one of the Congo's richest assets.

E T H I O P I A

The current estimate of forest resources in Ethiopia accounts for 4½ million hectares of closed forests, eight per cent of which are located in the relatively inaccessible south-west provinces; in addition, 28 million hectares are represented by degraded open woodlands and thorn scrub savannahs the consequence of long periods of time in which uncontrolled utilization, shifting cultivation, charcoal burning, the burning of grazings, and so on, have all played a part in a situation of advancing soil and general agricultural deterioration.

Five types of forests are recognized in Ethiopia namely:

(a) Juniperus forests (approximately ten per cent of the total forested area) confined to the higher slopes in central Ethiopia, the eastern escarpments of the Ethiopian plateau, and on the upper slopes of the north-west side of the Galla Somali plateau.

(b) Podocarpus forests, found in areas of relatively humid climate with well-distributed rainfall, in Ethiopia found on the western slopes of the Galla Somali plateau.

(c) Pouteria forests, characterized by their density and variety of species in relatively low-elevation country associated particularly with the warm humid areas of the south-west Ethiopian plateau, where total rainfall is more than 1,400 mm.

(d) Acacia forests are widely distributed in the country, but in general are to be found in hot, dry low-lying sites on the lower slopes of the escarpments of the plateau, in the Rift Valley, and in the region north of Lake Tana.

(e) Bamboo forests are scattered in small groups and clumps over a large area at higher altitudes above 2,200 m as well as in the region of the Podocarpus forests above 2,500 m, and the Juniperus forests up to 3,200 m.

Broadly classified, the kinds of forests in Ethiopia may be described as follows:

Kinds of forests	Area (ha)	Output	Cubic metre
Closed forests	4,000,000	200 cu m/ha	800,000,000
Woodlands	1,100,000	50 " "	50,000,000
Unproductive forests	2,653,000	10 " "	27,000,000
Total			877,000,000

Source: Forest resources of Ethiopia, Ministry of Agriculture, 1966.

Forest exploitation

The utilization of forests and forest products in Ethiopia for commercial purposes is limited, reflecting serious under-development of an important raw-material resource.

Compared with developed countries, consumption of sawn timber per head is fifty times lower than the European average, while for paper and boards, ninety times lower.

The wood utilization pattern in Ethiopia is very simple. There is as yet no sizable production of pulp and paper although a new mill, using imported pulp, is now in operation at Wonji. In the first five years it is planned to produce 7,500 tons annually. Later it is hoped to integrate the operation with a kraft-pulp mill constructed for the use of waste product bagasse from the Wonji Sugar Estate. Production will then be increased to about 12,000 tons per annum. In Ethiopia, no timber is used in the mines or for railway sleepers, and there is relatively little box or furniture making.

Three groups of products cover production and consumption:

(1) Sawn timber is utilized 90-95 per cent in construction, while wooden boards are used for furniture making.

(2) Pole-timber is used for construction of local types of buildings.

(3) Fuelwood dominates the wood use picture where it is conservatively estimated that about 25 million cubic metres are consumed annually.

Production of sawlogs and veneerlogs, estimated at present to be of the order of 90-95,000 cubic metres are removed annually from State forests: the rest being obtained from private forests.

Ethiopia has a very unfavourable balance of trade (US$1 million) in forest-based products, which is tending each year to become worse.

Forestry education and training

A team of forestry advisers from Sweden recently visited Ethiopia to advise on the organization, administration and manpower requirements for developing the forestry services and resources of the country. The Government has also requested a UNDP(SF) project for a training school for Forest Rangers including a Pilot Forest Administration Unit. This is at present under consideration (June 1969). Finally such a centre may be sited at Ambo.

Forestry development

In the Second Five-Year Plan, planned investment on Forest Development was fixed at $7 million of which $1.6 million was to be spent by the Government. Actual total expenditure came to $700,000 or ten per cent of the target. Currently control and management of State forests is vested in three ministries, Ministry of Agriculture (17,000 ha), Ministry of Mines and State Domain (400,000 ha), the remaining forests being the responsibility of the Ministry of Interior.

The degradation of existing forest resources, and the need to conserve and increase the scope of forest reserves are patently obvious, as is, however, the cumulative effect of soil erosion in almost every part of the country of Ethiopia due to serious overgrazing and lack of forest cover to protect a reasonable area of Ethiopia's erodable land surface.

The new Third Five-Year Plan reiterates the policies and programmes of the predecessor, but with stated determination that this time they be undertaken. Policy will stress three main interlocked objectives:

(a) The strengthening of the forestry service;

(b) The protection of forest resources;

(c) The economic exploitation of State forests.

The efficiency of the Forestry Department is to a large extent a reflection of the administrative and technical capability of the Ministry of Agriculture of which it is a Division. The standard of efficiency will be raised by appropriate staffing, organization and funds for the Forestry Department and the assignment of high priority to the implementation of the forestry programme. 120,000 additional hectares are to be afforested by the end of the Third Five-Year Plan period.

Research

The Third Five-Year Plan indicates that along with the programme of afforestation, a simultaneous programme of research is to be carried out.

K E N Y A

Kenya has a smaller proportion, just over 3 per cent, of its total land area under forests than most other East African countries, yet this country is probably the best situated as far as industrial wood supplies are concerned. The sound husbandry of these forests (6,000 square miles) and the costs involved, are recurrent responsibilities of the Kenya Government. Development funds available for forestry, are largely devoted, as they have been for 25 years, to the planting of fast-growing coniferous and hardwood forests which are favoured by very suitable climatic and soil conditions. About 200,000 acres have been planted, and planting is currently proceeding at the rate of 12,000 acres per annum. It has been assessed that the Government's target of 300,000 acres of coniferous plantations by 1980 will have to be directed upwards, however, if the country's needs for saw and veneer logs are to be met. The main species involved in these new plantations are Pinus radiata, P. patula and Cupressus lusitanica. It is expected that the country will be virtually self-sufficient in industrial wood by 1985.

Exploitation and further development

Kenya already has the highest paper and paper products consumption in East Africa. In 1967 36,000 tons were consumed locally and the market is still expanding rapidly. The Development Plan (1966-1970) outlines a project to establish a pulp and paper mill at Broderick Falls. In order to reduce wood freight costs and to establish a pool of pulp wood suitable for paper making and pulping, 50,000 acres of land suitable for planting has been acquired in the Turbo area sufficiently near to the proposed pulp-mill site. It is planned to establish this area of plantation within a ten-year period, and to commence clear-felling in the eleventh year. Assistance is being received through United Kingdom sources to open up and develop the planting area, through provision of road-making plant which includes heavy earth-moving machinery and development personnel. The Canadian Government has also rendered valuable technical assistance in drawing up forest inventories in the indigenous forest areas, which will be used in the formulation of soundly-based forest industrial development plans.

In Masailand, approximately 700 square miles of valuable indigenous forests exist including stands of cedar. An inventory of these assets is to be undertaken and feasibility studies made to determine the prospects for establishing industrial enterprises to make use of this asset.

Technical assistance

A considerable amount of technical assistance has been made available to Kenya in recent years and further requests have been sympathetically received by Commonwealth countries, the United States and FAO/IBRD. The Department of Forestry relies heavily on Canada and New Zealand for technical assistance aid. New Zealand for instance has provided personnel for the pilot logging unit, on which future logging developments will be modelled and for the running of the Forest Industries Training Centre, Nakuru.

Education and training

Although Kenya's forestry institutions are soundly based, there is urgent need for strengthening local professional staff. Plans are in hand for the provision of professional forestry education which at the moment is largely obtained in the United Kingdom. The current thinking on this matter is to support the setting up of a forestry department at Makerere College, Uganda, with possible Norwegian assistance.

Sub-professional training in forestry is offered at Londiani. It is now proposed to run a composite training course designed to serve the requirements of both rangers and foresters.

Trade and industry

At the present time (1969) there is an unfavourable trade balance in wood and wood products, which is mainly due to the comparatively high import bill for paper and paper board. With the possible construction of a pulp-mill at Broaderick Falls to supplement an out-turn of 2/3,000 tons of paper per annum from a mill at Thika, and with the expected expansion of other wood processing industries, by 1985 the current deficit is expected to change to a surplus of about US$9 million. FAO study No. TA.3224 sets out recommendations and indicates the steps which should be undertaken before embarking on the construction of this plant at Broaderick Falls. If the Kenya Government intend to invest in this project, these recommendations should be accepted and the pre-feasibility study undertaken as soon as possible. There are current misgivings in East Africa about the flush of pulp and paper mills which are proposed for the several East African countries, and whether it will be possible to secure economic markets for their eventual output. IBRD might be approached to make the pre-feasibility report suggested in this study.

M A L A W I

There are about 750,000 hectares of forest reserves (1.85 million acres) in Malawi. Most of these reserves represent catchment areas managed with the primary objective of regulating and controlling water supplies and water resources. Forestry tends to be concentrated in the mountainous areas of the country in view of the farming pressure on agricultural land in the lowlands. As Malawi lacks large areas of indigenous forests, plantations are being established, mainly of Pinus patula, to supply the country's timber requirements. The current area of plantations, mainly on the Vipya plateau, is about 24,000 hectares, (60,000 acres). The ultimate target is to establish 90,000 acres of Pine plantations to create the necessary raw material for a paper pulp industry.

USAID have engaged a firm of consultants to consider the above project. It is apparently considered feasible to establish an unbleached kraft mill with a capacity of 150 tons per day (50,000 tons per year) for the manufacture of industrial papers at a capital cost of US$25.4 million. The gross return on the investment is expected to yield 16 per cent per annum by 1975 from the excellent stands of P. patula which have been established.

The demand for sawnwood will be about 40,000 cubic metres and wood-based panels 7,000 cubic metres by 1975.

There are no facilities in Malawi for training professional officers but ranger training is given at the Malawi Forest School where in-service training is also offered.

R W A N D A

In many ways Rwanda has forestry problems similar to Burundi. A country of mountains and plateaux, erosion problems of a serious nature now face the country calling for enforceable measures to halt uncontrolled burning and timber exploitation and the grazing of cattle on unprotected slopes. The natural "Montane" forests have now been reduced to an area of about 15,000 ha.

Although there are markets for many of the forest species, the present yield is low and extraction is difficult because of the rugged nature of the terrain.

There are about 25,000 ha of plantations, mainly of eucalyptus, of which half are already of exploitable size. Between 1964-1967 the country imported between 2,000 and 2,500 cubic metres of wood and wood products annually, mainly from East Africa. In addition, between 200 and 500 cubic metres are removed from the local forests by the Forest Service, and between 1,000 and 1,200 cubic metres by private exploiters. The demand for wood products is rising rapidly, however, and it is expected that total demand by 1985 will have reached crisis proportions.

Wild life is relatively abundant, although numbers are being depleted with some species disappearing. There is a game reserve in northeastern Rwanda at Kagera National Park. The Forest Service is also responsible for game conservation, but lack of funds and trained personnel make this almost an impossible task. One of the most urgent needs in Rwanda is to train forestry officers both at professional and at field technical levels, to demarcate the State's forest domain and to promulgate a forest code.

As is true also of Burundi, Rwanda's Forest Services are in need of a major overhaul, before erosion and illicit exploitation ruin the country permanently. Evaluation surveys of the natural forests require to be made immediately and management practices made much more efficient.

Plantations must also be set up to control the worst effects of erosion and to meet the growing demands for timber, fuelwood and wood products. A gradual expansion of the primary wood-converting industries is also recommended.

It is recommended that the Government of Rwanda be induced to apply to UNDP/TA sources to assist with the many obvious forestry problems which face the country.

S U D A N

Determined by ecological conditions, and more particularly by rainfall distribution and soil type, the forests and scrubland of the Sudan may be broadly described as representing five different kinds of forest.

1. Semi-desert scrub (75-300 mm rainfall), approximate total area 302,000 square km of which productive forest occupies 42,000 square km. Three acacia-dominant associations may be described in the Sudan as representing this general forest type.

2. A. Woodland savannah (400-1,000 mm rainfall areas) approximate total area 691,000 square km of which 234,000 square km are productive. According to soils and level and distribution of rainfall, areas of specialization are noted, divided as between various Genera including the Acacias, Anogeissus, Combretum, Albizzia and Terminalia varying in form at the lower level of the rainfall scale, from thornland to deciduous woodland at the higher level of the scale.

   B. High-rainfall woodland savannah (900-1,800 mm rainfall areas) approximate total area 347,000 square km of which 164,000 square km are productive, comprising mixed Anogeissus - Khaya - Isoberlinia woodlands, and woodland savannah recently derived from rain forests, with associated small additional areas of rain forest.

3. Flood region (700-1,600 mm rainfall areas) approximate total area 246,000 square km of which 12,000 square km are productive.

4. Montane forests (500-2,000 mm rainfall areas), approximate total area 6,000 square km of which 3,000 square km are productive.

Forest development and potential

Approximately 194,000 feddans (1 feddan = 1.038) have been planted in the Sudan up to the years 1967/68 at annual rates of about 18,000 feddans. It is now estimated that existing forests are capable of producing approximately 150,000 cubic metres of sawn timber including sleepers annually. Exploitation of existing forests is in the hands of the Forest Department which runs seventeen sawmills and fory hand-sawing camps, divided into four groups. The total annual average production of these groups is estimated at 30,000 cubic metres, including about 20,000 cubic metres in the form of railway sleepers. Several wood-based industries operate in the Sudan including:

(a) Match production. The wood of Sclerocarya birrea is used to some extent for matchbox making and to a limited extent for splinters. Research is proceeding to determine suitable

exotic tree species suitable for the industry, and also for testing timbers of some indigenous species which appear to have possibilities for this purpose.

(b) Particle board. This is an operating industry started in 1966 which is now in a position to export in excess of domestic requirements.

(c) Development of cottage industries. These include production of local bedsteads, boat building, and turnery work and bent chairs.

Research in forestry

The Research Division of the Forest Department comprises the following branches:

(a) Research branch for silvicultural research with sub-branches carrying out specialized work for arid zone, clay plains, in sandy areas, and the particular region represented by the Southern Sudan.

(b) Research branch for timber technology.

(c) Research branch for gum Arabic production and improvement.

(d) Resarch branch for forest botany.

Training in the field of forestry

As no faculty of department of forestry exists in the University of Khartoum, university training is obtained at overseas universities, mainly those universities in Scotland.

Training of forest rangers is carried out in the Khartoum Forest Rangers' College which is under the directorship of the Ministry of Education. Students accepted for training have passed fourth year secondary education and enter a course which runs for two full years. Certificates are awarded on successful completion of the course. On-the-job training is offered to forest overseers and forest guards.

Trade in timber and forest-based products

Imports. The value of the following imports has shown little change since 1962/63:

		1966/67
(a)	Timber, plywood and other timber products	£1,404,491
(b)	Paper, carton, etc.	1,528,629
(c)	Sacks	2,522,970

The following recent notice has relevance to Sudanese imports of timber (June 1969).

Khartoum - Sudan is to supply the Central African Republic with 20,000 head of cattle under a first trade agreement signed here today. The deal, to help the CAR meet its requirements for meat, is valued at 400,000 Sudanese pounds.

Payment will be half of foreign currency and half in timber for the Sudanese railways.

Home production and export	1966/67
(a) Gum	£7,104,971
(b) Railway sleepers	111,990
(c) Sawn timber	89,600
(d) Fire wood	103,083
(e) Pole	113,713
(f) Bamboo	4,117
(g) Domestic production (nuts and fibres)1/	4,797
(h) Furniture	43,913
(i) Garad2/	15,809
Total	£7,591,993

1/ Hyphaene thebaica.

2/ Fruit of Acacia nilotica used for tanning.

SOMALIA

The forests in Somalia cover 8.8 million hectares, but are mainly thorn trees and shrubs. Larger trees such as acacias and euphorbias grow along the main rivers, whilst incense, myrrh and gum arabic, are collected from free-growing trees in the northern regions.

Limited work was done up to 1965 to implement the 1963-67 plan which included plans to regenerate the Erigaro forests, to fix sand-dunes with trees, and to extend the plantation areas. Shortage of funds prevented nearly all of the projects being fulfilled.

The short-term development programme envisages a project for scientific reafforestation in the southern regions, and the shifting of the Erigoro sawmill to Almadu in Las Koreh district.

Charcoal production is estimated at 48,000 tons annually (worth 9.6 million shillings 1/) and requires 3.8 million cubic feet of timber. Charcoal exports were reduced from 42,500 tons in 1965 to 19,400 tons in 1966. Emphasis is now being laid on the need for restricted export of charcoal as well as the introduction of better, more economical methods of charcoal production. In 1967, exports virtually reached the 1965 level again totalling 41,200 tons.

The short-term development programme 1968-1970 emphasizes the need to carry out a comprehensive forest inventory, to determine the content, rate of growth and rate of depletion of the indigenous forests arising from shifting cultivation, burning, grazing and indiscriminate cutting.

There is also great need to improve forestry skills and training, and to develop a rational forestry policy and future plan of development.

Projects planned for this short-term development period include the setting up of an efficient game service which will look after the preservation of wild life. It is also envisaged the Al-Madow sawmill will be modernized. Its present daily output is about 600 cubic feet of processed timber, and gross income around 1 million shillings yearly, based on a 250 working day-year. With additional investment, the gross income is expected to rise substantially.

Somalia's greatest need in the field of forestry is to develop a forestry shcool where technicians and forest rangers may be trained. Meantime in view of the smallness of the general service, professionals preferably should be trained in other areas of Africa.

1/ US$1 = 7.14 Somali shillings.

TANZANIA

The current development plan became operational on 1 July 1969 and continues until 30 June 1974

Forestry development

About 38 per cent or 160,000 square miles of Tanzania's land area is covered by forests. Approximately 2.5 per cent or 3,500 square miles of this forested area is classified as closed high forest in the Mount Meru, Kilimanjaro, and Usumbara areas. Of the total forested area, 50,000 square miles have been set aside as forest reserves made up approximately as follows: closed high forest 3,591 square miles, woodlands 45,185 square miles, mangroves 308 square miles, open areas and grasslands 1,375 square miles.

A regular planting programme was started in 1959, since when 60,000 acres of coniferous plantations of Pinus patula, P. elliottii, P. radiata, P. caribea and Cupressus lusitanica and 5,000 acres of fine hardwoods including teak have been established. Of the indigenous forests, 23,000 acres have been brought under intensive management.

Exploitation

Over the last three years official records show that five million cubic feet annually have been extracted from these forests. Of this total 2.2 million cubic feet came from forest reserves and 2.8 million cubic feet from unreserved lands; 2.9 million cubic feet is from indigenous forest. Forests on unreserved land are rapidly disappearing following on cropping expansion.

Production from the indigenous forests can be doubled during the next five years by:

(a) Utilizing many more species of trees;

(b) Investing in additional hardwood logging and sawmilling facilities;

(c) Investing in effective exploitation control.

Afforestation programmes started in 1958 are now coming into production. By the end of the second plan period (1974) the annual yield from these plantations will have risen from 3.0 million cubic feet to 9.0 million cubic feet. Emphasis is therefore to be placed upon the efficient and full utilization of this large and valuable resource.

There are over 60 small sawmills in Tanzania. Plywood and veneer are also produced locally. There is no paper production, but a fair amount of paper conversion takes place. Two paper-box factories have recently gone into production.

Per capita consumption of fuelwood is high, but that of sawnwood is low, by 1985 the latter is expected to be of the annual order of 0.012 cubic metres per capita. Paper and paperboard consumption is also very low, present per capita consumption being about 0.7 kg per annum. This is projected to rise to 1.5 kg by 1985.

Despite these low levels of consumption, Tanzania has a trade deficit close to US$1 million in the forest products sector. This deficit is expected to increase to $2.3 million by 1985. Over 70 per cent of this deficit import bill is for paper and paperboard.

A feasibility study to consider the worthiness of establishing pulpwood plantations was carried out in 1969 - the report is not yet available. By 1985 it is considered that Tanzania will be self-sufficient in wood and wood products, but not for paper or paperboard.

The Natural Resources Division of the Ministry of Agriculture, Food and Co-operatives is responsible for the development and utilization of forestry. The 1969-74 plan envisages the following developments during this period.

(1) The establishment of nine softwood and hardwood logging units;

(2) The establishment of nine sawmills with proper drying facilities to produce seasoned timber for the development of wood-using industries;

(3) Production of transmission poles and fencing posts to supply existing local users and for the needs of the Tanzam railway;

(4) To develop hardwood plantings;

(5) To plant catchment forests;

(6) Collaboration with UNDP in setting up a forest industries development project;

(7) To develop indigenous forests, miscellaneous forest services, forest management, beekeeping, regional tree nurseries, and to organize a central timber marketing project.

Forestry research

This is carried out in the fields of utilization and silviculture and includes the following general areas of investigation; assessment of wood quality and inheritance studies, wood structure, weight and shrinkage properties, strength properties, sawing and machining tests durability and wood preservation studies, wood seasoning, seed supplies, seed testing, progeny trials, nursery research, water use, forest pathology. Beekeeping research, (Tanzania is the world's largest exporter of beeswax), etc.

Education and training

Undergraduate training is currently secured overseas, but a proposal has been put forward that a forestry department be established at Makerere University, Uganda, which might help to remedy this situation. There is a Forestry Training School at Olmotonyi for sub-professional grades of forestry staff. In 1966 the professional staff establishment was 31.

Trade. In 1966 the grand total of forest exports amounted to £1,897,447 of which £1,495,864 was exported overseas and £401,583 to Kenya and Uganda.

Imports for the same period amounted to £2,633,137 of which £1,403,882 came from overseas and other countries. Imports from Kenya/Uganda amounted to £1,229,255. The largest import item was aper, paper products and manufactured paper, which represented 70 per cent of total imports.

U G A N D A

The area of the permanent forest estate is approximately 1.5 million hectares (3,705,000 acres) just under half being represented by closed forest, the remainder is savannah-woodland. There are about 15,000 hectares of exotic softwood plantations.

Development is taking place along two lines, namely, by silvicultural treatment of natural forests which treatment it is intended should increase from 12,000 acres per annum to 17,000 acres. See Second Five-Year Plan 1966-1971. This treatment consists in the main of the elimination of upromising species, the benefits of which treatment take some time to realize often about 60-80 years. The second line of development consists of stepping up new softwood planting from 800-900 acres per annum to 1,000-2,000 acres. The softwood plantations take 30-40 years to reach maturity.

Exploitation

There are over thirty sawmills in the country, a plywood mill, a particle board mill, and a paper mill. The latter is located at Jinja and has a capacity of 20 tons per day and is not integrated. The mill uses imported kraft pulp for the manufacture of industrial paper. Paper conversion processing is also well established.

In 1967, 11,000 tons of paper were consumed in Uganda. The country is nearly self-sufficient in wood and wood products. The demand however is rising and it appears that the future demand for forest products is likely to exceed the output of the permanent forest estate. It will be necessary, therefore, to increase the area new plantations, and to raise the productivity of the natural forests through improved silvicultural treatment.

Training

Like most other East African countries, Uganda suffers from a shortage of indigenous professional forest officers. If the Department of Forestry which it is proposed to establish at Makerere University is set up, this will undoubtedly help to remedy this manpower deficiency. There is a reasonably good forestry school at Nyabeya which offers training to foresters at sub-professional level. The United Nations have provided a Director for this school, a Silvicultural Research Officer and a Forest Economist under their Technical Assistance Programme.

Z A M B I A

A high priority has been given in the First National Development Plan (1966-1970) especially to the industrial plantation programme. Forest products are already used to a large extent in the mining industry and contribute to the country's export earnings. As the growing area of pines and eucalyptus come into production, Zambia will be able to supply a growing proportion of its own timber requirements, thus reducing imports. By the end of the plan period, Zambia will have laid a solid foundation for a fully integrated forest products industry, which will create further employment opportunities.

The vegetation of Zambia is mainly open woodland or savannah, although to the north and east the country maintains a thin forest. The "Commercial" forest area is only about 12,000 hectares (29,640 acres).

It is estimated that between 150,000 and 180,000 acres of pines and eucalyptus will be required by the end of the century. To allow for these future needs, the Forestry Department since 1967 has doubled its rate of planting from 2,500 to 5,000 acres a year. This level will be maintained. Application to the World Bank was made to secure financial assistance for the plantations programme.

The success of the Zambian forestry plantations has largely been the result of painstaking research and efficient management carried out in the country, and this programme provides for expansion of the Research Division to cope with the very rapid increase which will be required in terms of the supply of good quality seed, pruning and thinning schedules, and other data vital to the success of the planting programme. The forest products research and marketing programme will allow for the completion of the Forest Products Centre at Kitwe, together with its research facilities, and a commercial-scale depot for treating and selling plantation produce.

The Centre manages and carries out research into the properties of Zambian timbers, searches for new timber uses, and tries to improve the marketing of both indigenous and plantation produce.

Training

Professional officers are trained overseas. In 1966 there was only one Zambian professional forestry officer. Sub-professional foresters, forest rangers, and in-service students are trained at the Forest Training Centre, Mwekera, near Kitwe.

Exploitation

No plywood, veneer, particle board or pulp or paper is produced locally and paper conversion is not well developed. It is understood that a plant for the production of 200 tons of corrugated boxes per month has become operational. There are also small conversion industries such as IMCO, Lusaka, which produces 2,000 tons per annum of single-ply paper bags and toilet paper. In 1967 the country's consumption of paper and paper products was 18,000 tons.

Zambia needs to expand its plantation programme in order to meet the growing demand for wood and wood products. A UNDP/FAO project shich is undertaking a feasibility study of forest industries, is already operational.

Conservation and protection

The forestry programme includes under this heading the Forest Protection and Management Service. The programme is of national importance in that it aims at protection of the head-water areas of the principal rivers and the development and management of forests serving the national timber industries in the Borotse, western and northwestern provinces. The project also provides and supervises the numerous production forests of regional and local importance.

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