

FORESTRY IN NIGERIA: PAST, PRESENT AND FUTURE

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Forestry began officially in Nigeria in 1896 with the creation of an Office of Woods and Forests in the Colony and Protectorate of Lagos—9 years before the founding of the Bureau of Forestry in the U.S.A. and 22 years before the Forestry Commission was set up in the United Kingdom. The need to set aside land for forestry, and to protect and regulate exploitation on it, was perceived by the British in India, who in the 1850s drew on European expertise by employing Germans to establish the Indian Forest Service (IFS), and to develop tropical forest management. The first Chief Conservator of Forests in Nigeria was H.N. "Timber" Thompson, appointed in 1903 after serving 11 years in the IFS, mainly in Burma; Frederick Lugard, the first Governor-General of Nigeria, was born in India of missionary parents and had served in the Indian Army. Thus the Nigerian Forestry Service got off to a flying start, and the Forest Laws of Nigeria are based on those of Upper Burma. From Indian experience Thompson and Lugard realised that for a well populated country 30% of the total land area should be set aside for forestry if it were to be self supporting for wood. Empirically, this seems true also for industrial countries; for example France is 25% covered by forest, Germany 30%, America 33% and Japan an astounding 67%. On the other hand, Britain is only 10% forested and imports 90% of its wood requirements—despite being a relatively modest user of wood. In Nigeria, Lugard set a target for forest reservation of 25%, although ultimately only 11% of the land area was reserved.

The tasks of the new Forestry Department were firstly to regulate forest exploitation for both timber and rubber (then obtained from the natural forest tree *Funtumia elastica*), and secondly to establish forest reserves. Regulations were promulgated to control the area of timber concessions, to fix minimum sizes for timber trees to be felled, and to determine fees and royalties. The intention was to allow only mature trees to be removed, and the minimum felling girths were put at 10 or 12 feet (i.e. 100 to 120 cm bole diameter at breast height, or above buttresses—if higher). Africa was then relatively sparsely inhabited, although Nigeria was a more populated part, with perhaps 10 millions—approximately a tenth of what it is today. There were extensive areas of more or less unoccupied forest, but, at least in southern Nigeria, virtually all land was regarded as belonging to one community or another, held under variants of communal land tenure, with the most senior member of the community acting as trustee to control land use. In making forest reserves, the intention of Government was not to sequester the land, but to leave it in its former ownership, although (Central) Government would supervise management and exploitation. In the Western and Northern Provinces, the Local Governments (then termed "Native Authorities") provided most of the forestry staff and work force, and received the bulk of the fees and royalties from exploiting the

reserves, both for timber and for other produce. At first, a proportion was deducted by Central Government to cover its administrative costs. However this was discontinued in the 1940s and such costs were met from the general purse. This was because of the national benefit conferred by the forest reserves; additionally local authorities received payment of £1 per square mile of reserve in order to compensate for the restriction of their rights to the land (equivalent to over 10,000 naira per km² at present-day values). In the Eastern Provinces, the Central Government Forestry Department managed the reserves directly, due to lack of appropriate traditional authorities to undertake the task.

Reconnaissance surveys were made, and large unoccupied blocks of forest were selected for reservation, especially those that contained quantities of valuable timber, or covered important watersheds or unstable terrain. Local communities were visited and the boundaries were agreed with them, which were surveyed and demarcated as the reserve "settlement" proceeded. The people were allowed to continue their former uses of the forest to satisfy their personal needs, provided these did not interfere with management of the forest for timber production. (At the time, they did not need large trees for their own use, except possibly for making canoes). However, residence or farming within the reserve boundaries were forbidden. A description of the reserve boundaries, and a list of continuing rights permitted within the reserve, were published as Schedules to the Official Gazette Notice that legalised the reserve. Communities agreed to reservation because they realised the value of the forest, and that it could disappear piecemeal if it were unprotected. Moreover, at the time, so much forest appeared to be available that they could not conceive of its ever being needed for other purposes, and, moreover, reservation seemed to confirm their ownership and to help keep other people out.

The Forest Law, besides laying down the procedure for creating forest reserves, and defining the powers and responsibilities of the Forestry Department, also affected lands **outside** forest reserves, due to the "Protected tree" or "Farm tree" legislation which was intended to protect useful trees. Because these were also communally owned, it was considered that if an individual profited from exploiting communal property, then part of the proceeds ought to be paid to the local authority as a licence fee. This particular legislation may have done more harm than good: It brought the Forest Department into conflict with rural people and into disrepute; local forest guards could use it to harass people and extort gratification from them. Moreover the Local Government Authorities, who usually collected licence fees, regarded them as a source of revenue, and therefore became more interested in exploiting the resource than in protecting it!

In the early years, it was intended to cater for forest regeneration, and each concessionaire was obliged to plant 20 economic tree seedlings for every tree felled—usually at stump site. In 1926 this was rescinded, because lack of maintenance afterwards caused few seedlings to survive. The Forestry Department itself then accepted responsibility for forest regeneration. A method was needed that could keep up with the progress of exploitation, but there could be fewer than 5 merchantable trees

per hectare and timber royalties were insufficient to pay for converting all the forest to fully-stocked timber plantations. It was apparent that only regeneration from seedlings or saplings occurring naturally in the forest, or alternatively low-density enrichment planting, would do. Line enrichment, track planting and stump site planting were tried on a pilot scale in the 1930s and again in the 1950s but ran into the same difficulty of maintenance as before. The presence of intervening natural forest and the high incidence of lianes in West Africa protracted the period during which treatment was needed, perhaps up to half rotation age (i.e. half the time a tree takes to grow to maturity), which would not be economic. It was practised on a considerable scale in the former French territories of West Africa, but with similar disappointing results.

In the 1940s and 1950s, partly due to sending Forest Officers from Malaya to Nigeria during the Second World War, a system of natural regeneration was developed - the Nigerian Tropical Shelterwood System (TSS), using techniques similar to those employed in the lowland Dipterocarp forests of Malaya. Starting 5 years before timber exploitation, climbers were cut, and trees of non-utilisable tree species were poisoned by frill-girdling the bole and pouring on a solution of sodium arsenite. Also, forest undergrowth was cut, while retaining seedlings and saplings of valuable species. Ultimately about 2000 km² of forest were treated, and it was intended to be a uniform system, with a "rotation" of 100 years—which was actually a felling cycle. However it proved impossible to treat anything as heterogeneous as natural tropical forest to achieve a uniform effect. Furthermore it was difficult to open the canopy enough to encourage growth of economic regeneration without promoting an overwhelming flush of herbs and climbers. Amounts of regeneration were inadequate to justify economically even the modest costs of TSS treatments.

An alternative was compensatory plantations, i.e. applying artificial regeneration of valuable timber species to smaller areas of forest than those exploited, in this instance by the "Taungya" system. This is a Burmese word, used for a method where farmers clearfell and burn natural forest in order to grow food crops, which are interplanted with a tree crop. Farming usually continues for about 3 years until the planted trees close canopy. It was introduced to Nigeria at Sapoba in the 1920s by St Barbe Baker, who had seen it in Kenya (pers. com.), and subsequently practised by J.D. Kennedy. (After being invalided from Nigeria, St Barbe Baker founded "The Men of the Trees", now the International Tree Foundation). The Oba of Benin had agreed to reservation in the Edo forests on the understanding that Taungya could be practised afterwards, and ultimately 16 percent of the area became forest reserves. He doubtless knew that under relatively high rainfall the loose sandy soils needed 15 years bush fallowing to recover fertility, and were frequently left much longer than that. Taungya villages were established in the reserves and the system was practised successfully from the mid 1920s to the mid 1960s. Although unpaid, local farmers were happy to cooperate, because it was a variant of traditional shifting cultivation, but organised by the Forestry Department. It enabled them to retain their own lands under permanent cash crops of Hevea rubber. The method was cheap, and the cultivation of the arable crops also benefitted the planted



Group of Field Society members in front of large ironwood (*Klainedoxa gabonensis*) after timber extraction from Ago-Owu Forest Reserve. (March 1972)



Mature secondary forest in Bende Forest Reserve. Note presence of oil palms. (October 1961)

trees. Often farmers were prepared to pay a fee in order to participate.

Full-time silvicultural research began in 1926 with the appointment of two silviculturists, J.D. Kennedy and W.D. Macgregor, from among existing staff of the Department. They were sent to tour India and Burma to study forestry practices. When they returned, Kennedy was posted to Sapoba and Macgregor to Olokemeji to establish experimental field stations. Firstly they sifted through the available tree species in order to learn their silvicultural characteristics and to discover those useful for plantation work. Tropical tree species that have proved satisfactory for forestry plantations are surprisingly few, but as seed could not then be imported easily from other parts of the tropics, the emphasis was on native species. They accomplished a great deal with limited resources, especially Kennedy who also published a book: *The forest flora of southern Nigeria*. They laid the foundations for all subsequent silvicultural practice. Nevertheless, due to the economic slump, in 1936 they were withdrawn to administrative duties.

The Second World War caused a hiatus in silvicultural research. This was revived in 1954 by the creation of the Department of Forest Research as a Federal institution, to take charge of forestry research and forestry education in the country; it occupied the former Forestry HQ in Ibadan. Specialists in forest soils, forest pathology and seed physiology were also recruited. However responsibility for administering and managing forest reserves remained with Regional and subsequently with State governments. A Federal Forestry Department (FDF) was not started until 1970, and acted as a data bank and consultant to the Federal Government in forestry matters, and served as a channel for investing considerable sums of Federal money (earned from the burgeoning petroleum industry) in State forestry. However FDF could not legally exert any executive or supervisory role in forest management, as the Nigerian Forestry Department had done before 1954. In 1976 the Department of Forestry Research became the Forest Research Institute of Nigeria (FRIN). In 1980 FORMECU came into existence as a cuckoo in the FDF nest, to disburse World Bank and African Development Funds for forestry, which became necessary because of the drying up of Federal sources of money.

The present situation

The present situation is that most State Forestry Departments lack operating funds and functional transport, and think themselves lucky if they can afford a biro pen! Instead of annual maintenance, forest reserve boundaries have been mostly left uncut since National Independence in 1960, and are becoming encroached. Some reserves, or large parts of them, have been alienated from forestry use. Productive reserves were often treated by State Governments as sources of revenue, or of government patronage, or even of personal enrichment, and are exploited for both timber and other produce with little regard to sustained yield. There has been a reduction in the interval between fellings for natural forest to 10 years or less (from a felling cycle set originally at 100 years). Minimum bole diameters for exploitable trees have been lowered to 80 or 60 cm, depending on species, but these are often disregarded and trees of valuable species are felled down to bole diameters of 30 or 40 cm. As a result, too few seed bearers of



Tropical shelterwood system (TSS) for regenerating natural forest in Akure Forest Reserve -- after cutting climbers and undergrowth and poisoning non-economic overwood (Operation V). (March 1965)



High Forest Monitoring Plots project. Enumeration team working in Omo Forest Reserve -- natural forest. (December 1984)

valuable timber species remain to ensure regeneration. (My work for the High Forest Monitoring Plots Project during 1984-89 indicated that a felling cycle of 25 years would be possible, both for achieving sustained yield and for economic exploitation). Non-timber produce, such as fruits, spices, chew sticks, rattans, snails and bush meat, are being exploited by local people on a commercial scale for sale in towns. Today, natural forests are mainly restricted to inside forest reserves, and these various activities are resulting in their degradation and destruction.

In States where Taungya was formerly practised successfully, it has become a means of destroying the forest; farmers are allowed to clearfell and farm the forest without a tree crop being planted or, if planted, allowed to fail due to lack of maintenance. Teak, and other forestry plantations, are burned annually, killing trees, or in the case of teak, destroying the undergrowth, which allows rain to cause serious soil erosion. Formerly, exploitation in most productive reserves was regulated by Working Plans; but after the mid 1960s these were allowed to lapse. In some States, Local Government Forestry staff were absorbed into the State Forestry Department. It must be admitted that, generally speaking, State Governments have betrayed their trust both to the communal land owners and to the nation.

Future management of forest reserves

What can be done? Firstly it is apparent that State Governments cannot be relied on to manage forest reserves properly, either for the benefit of the country or of the local inhabitants. It seems necessary to depend once again on central government (that is on the Federal Forestry Department) to supervise and monitor the management of forest reserves by State Governments and/or Local Government Authorities—but for this, appropriate legislation is needed. De-reservation of forest reserves ought to require the consent of both the communal land owners and the Federal Government. In order to ensure sustained yield management, a Working Plan should be prepared for each forest reserve; and the Federal Government could pay an annual "rent" or "bounty", calculated on an area basis, to the State government, Local Government and/or communal land owners—to represent the national interest in the existence of the reserve—provided the plan is approved by the Federal Minister for the Environment and the reserve is actually being managed according to the plan.

Secondly, non-timber produce should also be included in the Working Plan and managed on a sustained yield basis. This cannot be achieved without the cooperation of local communities and their participation in protecting and managing the reserves. These communities may obtain over half their income from within forest reserves, and they can exert considerable self-interest in maintaining them. The concept of "support zones" to surround forest or wildlife reserves or national parks is useful, though experience with them is limited. These offer alternative activities outside reserves to substitute for pursuits that people formerly practised inside them, and provide other incentives that encourage everyone to conform, such as improved education and health facilities, or better road access. This is especially important for wildlife conservation; but however



Ona taungya in Sapoba Forest Reserve. John Dobson (ACF Sapoba) holding stem 1-year-old *Terminalia ivorensis*. Note branchless cassava variety. (October 1962)



Original Taungya established by St Barbe-Baker in 1925 at Sapoba Forestry Camp, after 60 years. (December 1985)

good the intention, this can make matters worse, e.g. by attracting more people to live in the support zone, and hence adding to the pressure on the reserve. Before promoting such ideas on a grand scale, they should be tested sufficiently by pilot schemes.

Thirdly, in production reserves, part of the earnings from exploitation should be set aside to pay for their protection, regeneration and management. This could be made legally binding, and the FDF become responsible for monitoring and auditing the accounts for the reserves. Today, fees and royalties are often set far too low (in colonial times they were 12% of the market value of the timber) and have been regarded mainly as a source of government revenue. Moreover the resource has been treated as though it were non-renewable, rather than capable of sustained yield management. Field administration in the Forestry Department(s) could be centred on reserves, as is done for Wildlife, with a senior forest manager in charge of each Working Circle containing a certain number of reserves, rather than basing staff organisation on political units such as Districts. Protection and maintenance of non-productive reserves could be met from the Federal Ecological Fund.

Lands outside reserves and parks, not directly under government control

The area of reserves is less than a third of what ought to be dedicated to forestry, and it is apparent that forestry must be practised also on lands outside reserves, that is, on communally or privately owned lands. However, experience in Nigeria and elsewhere shows that establishing tree crops and land tenure exert a powerful influence on each other. Trees are perennial, and planting a crop on them strengthens the duration of an individual's title to a parcel of land. This is a reason why communities often prevent women and non-natives from planting trees, and only allow them to cultivate arable crops. It is noteworthy that, hitherto, industrial companies who plant trees to safeguard their own future wood supplies have done so only **inside** forest reserves, which (in principle) are dedicated in perpetuity for forestry use.

Since the beginning of the 20th century, the planting of cocoa has been leading progressively towards the establishment of individual, and ultimately freehold tenure. In Kenya, as previously in Europe, changing from communal tenure to freehold tenure itself fostered the planting of trees, producing a dramatic effect on the appearance of the landscape. Given encouragement, rural dwellers may plant trees for wood, but this will mainly be for their own use as fuelwood and poles: Because the period to harvesting is relatively lengthy and the returns modest, they would not usually do it on a sufficient scale to satisfy urban and industrial development. Moreover they prefer to plant exotic rather than indigenous species, as exotics clearly belong to someone. "Protected tree" legislation actually discourages tree protection, because it transfers the responsibility to government and actually reduces personal interest in protecting trees. Today such laws are anachronisms and should be removed from the Statute book. Moreover, a tree should normally belong to whoever has ownership of the land.

As a general rule, communal forestry plantations rarely prove as satisfactory as individually-owned woodlots, even in localities where communal farming of food crops



Teak crop after thinning at age of 40 years in Lokemeji Forest Reserve, being inspected by Dick Jenkin and John Horne. (January 1964)



Surface erosion under Teak trees, exposing roots on knife edges of soil, due to annual fires killing protective undergrowth. Eleiyele Forest Reserve. (November 1984)

is practised. The reason is that in communal farming the shareout usually occurs within about 12 months, whereas for forestry a period of 10 years or more may be needed, so that the participants are much less certain of the outcome. The Land Use Decree failed to resolve such problems, and indeed has made them worse. In effect, it froze the traditional land tenure system, but shifted control of land from the traditional to the political authorities. This, for better or worse, irreversibly weakens the influence of the traditional authorities. A Certificate of Occupancy makes the land user a State tenant; he should not alter the use for which the Certificate was granted, or alienate the land without permission from the State. The certainty and duration of the certificate may be inadequate for long-term investment, and moreover what can be given with the stroke of a pen can be taken away in the same manner. Where the occupier plants trees, the former communal owners may uproot or set fire to them. Nor can the owner realise the value of an immature crop by selling the land, nor use it satisfactorily as collateral to obtain funds for development, or to acquire more land. Only a free market in land allows it to move readily to its most economic use, which in the humid tropics may be tree crops rather than arable crops.

The solution is not to force change in land tenure, but to establish a legal framework that allows communities to re-allocate their rights in land in order to consolidate fragmented land ownership and to strengthen the rights of an individual over a piece of land. This should include the right to sell land. The techniques for doing so are already well understood. It is desirable, but not essential, to register land ownership. These are not particularly African problems, and afflicted much of Europe into the 19th century. They are connected with changing from peasant to commercial systems of farming and land use. In my own village in England, conversion from communal to freehold tenure took place in 1829, but registration became compulsory only in 1980 or thereabouts!

Institutional framework

In Kenya, forestry extension activities have assisted successful conversion from general communal to general freehold land tenure. However, forestry extension and forestry management amalgamated within the same forestry administration did not function well, as they needed to be organised in different ways. Executive government forestry, that is the administration and management of forest reserves, involves the protection and maintenance of a natural resource, and may be better separated off with management of wildlife and fisheries (which have similar aims) within a separate Ministry of the Environment, although this should not be allowed to detract from forestry as a productive activity. Forestry extension, on the other hand, is an advisory service resembling agricultural extension. If arable farming, animal husbandry and tree crops are to be better integrated in farming systems, then these "special subjects" should fall within the Ministry of Agriculture. In any event, agricultural development projects can incorporate all these aspects. The Forestry and Wildlife Departments would be concerned only with extension in the support zones to the reserves.

Adaptive research, or applied research, is best incorporated in the organisation that

uses the results, or at least in the same Ministry. Otherwise it is difficult for research and practice to be adequately integrated. Moreover, because adaptive research converts scientific knowledge into profitable farming or forestry, it is usually necessary for farmers or foresters to do this either for themselves, or in collaboration with the research worker. Hence, agricultural research institutes are also likely to be interested in agro-forestry, and may be able to put greater effort into it than forestry can alone.

It is impossible for the Federal Government successfully to use law to impose its will on communities where it does not have their consent. Hence, for lands **outside** forest reserves, the communities themselves should be responsible for land-use legislation, e.g. employing Local Government By-laws; and the control of land use would be transferred to local governments, where it can respond better to local needs. ("By" is a Viking word for "community"). Federal and/or State governments can help by supervising the planning and land-use activities, and by drafting model by-laws which local governments can adopt or modify to suit their particular circumstances. Federal and/or State legislation should deal with zones of potential conflict between communities, e.g. as regards pollution of a river that flows through more than one local government area. Stronger control of land, both by the community and by the individual rather than by the State, is more likely to encourage responsible development. It is alleged that the ability to buy and sell land encourages land speculation. This is not itself undesirable unless it removes land from use, because it puts a value on land wherever it occurs, and facilitates its development by enabling money to be borrowed using the land as collateral (mortgage). Abuse can be controlled fiscally, e.g. by imposing a land tax that bears proportionately more heavily on larger landowners than on small. In other words if someone acquires land without using it, at least he will compensate society by paying for the privilege.

In other articles in *The Nigerian Field*, I have attempted to pass on some of the experience and knowledge that I acquired during all but 40 years spent working in Nigeria, and I hope that young forest officers and others will obtain both instruction and amusement from reading them.

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