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FORESTRY AT CROSSROADS IN NIGERIA

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CHALLENGES OF FUNDING FORESTRY EDUCATION AND RESEARCH FOR SUSTAINABLE FORESTRY DEVELOPMENT IN NIGERIA

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Abstract

Sustainable Forest Management is an integral part of a nation's economic growth, social equity in development and environmental sustainability and it is greatly impacted by education. Forestry education and research has however been neglected in Nigeria because of the need to cut down expenses by the sole financier – The Federal Government. The state and local government, as well as private financial contributions to forestry development is noticed only in the area of forest plantation management. This is as a result of forestry education not meeting job market demand and hence aspiration of the 21st century undergraduate. Apart from this, less than 3% of any public institution's budgetary demands are financed. Also, the policy framework that should put in place for a sustainable forestry education and research was non-existence in Nigeria until the recent National Forestry Action Plan (NFAP) of 1997. Even at that, NFAP is yet to be implemented to date. This and other challenges of forestry education, research and development were analyzed by this paper and some suggestions made on ways of moving forward.

Introduction

Effective empowerment is assisting resource owners in harnessing and use of their resources within their whims. Thus, one is least surprised at the non commensurate results that woke past Sustainable Forest Management (SFM) efforts in the developing African countries. Consequently, SFM is a big challenge to African countries where only 31 of the 53 countries register rates of economic growth in excess of their population growth rates (ECA, 1997). This can partly be attributed to the vague status and potential of forest resources in many these countries, despite their participation in the debate on SFM (FAO, 2000). According to FAO (*op. cit.*), SFM is an integral part of a nation's economic growth, social equity in development and environmental sustainability.

Also topical is the food security nexus with sustainable forest management and rural development, which have increasingly become matters of concern for developing countries (Africa inclusive) and for the international community. But while many complex factors have been identified as

influencing sustainable development and food security, it is clear that education on the interdependency of renewable natural resources (RNR) is imperative. Such education was posited as playing an important role in preparing farmers, researchers, educators, extension staff, members of RNR-businesses and others to making productive contributions to sustainable RNR management (Van Crowder *et al.*, 1999). Thus, FAO (*op. cit.*) identified the changes and adaptations required in RNR education as critical issues in the 21st century for it to more effectively contribute to improving food security, sustainable agricultural production and rural development.

Rogers, (1996) also identified "poor training of RNR extension staff as part of the problem of the relative ineffectiveness of much of extension in the field." This applies not only to extension staff, but to forestry professionals in general. Unfortunately, the training of human resources in SFM is often not a high priority in the development plans of countries. As a result, curricula and teaching programmes are not particularly relevant to the production needs and employment demands of the forestry sub/sector. Also, investment in forestry research and the extent of the human resource available to conduct research in developing countries is low in comparison to the value of goods and services derived from forests (CIFOR, 1999).

This may be attributed to the low value of benefits from such research, which is low compared to costs. For example, Mergen *et al.* (1988) estimated forest research expenditures as a percentage of the value of production at 0.019 for low-income developing countries, 0.059 for middle-income developing countries and 0.070 for semi-industrialized countries. However, the corresponding ratios for agricultural research expenditures were estimated at 0.451, 0.863 and 0.816 respectively (Mergen *et al.*, 1988; TAC, 1994). Although, it should be quickly pointed out that a large proportion of research effort in forestry is not directed towards outputs or outcomes that can be readily captured by crude aggregated indicators (of value addition), such indicators also does not capture the many and varied non-tradeable goods and services provided by forests.

The neglect of forestry research, education, training and development has become more serious in recent years due to the economic crises in the public sector in many developing countries. In the past, the public sector absorbed nearly all forestry graduates. Bengston *et al.* (1988) observed that technical support for research in developing countries in the Asia-Pacific was higher in government research institutions. This also seems to be true for West and Central Africa in the late 1990s. Forestry Research Institute of Nigeria (FRIN) used to have more than ten support staff per researcher. This is no longer the case, and forestry graduates are finding it increasingly difficult to find employment. Governments can no longer afford to hire every graduate, and education in forestry has not kept up with the increasingly sophisticated labor demands of the private sector. These and other factors, such as environmental degradation, rapid changes in technical knowledge and the increasing marginalization of rural areas, call for changes in the current systems of education, research and development in forestry in many developing countries.

Forestry Education in Nigeria

World Bank (1999) submitted education in general and higher education in particular, as fundamental to the construction of a knowledge economy and society since globally, economic and social development is driven by the advancement and application of knowledge (Saint *et al.*, 2003). Thus, education is imperative to sustainable harnessing, utilization and management of forest resources. In Nigeria, there was no formal training for indigenous forestry staff in Nigeria prior to 1938 (Oseni, 1988). But, on the job trainings on elementary botany, useful timber species identification, simple survey, forest laws and protection and nursery techniques were provided. In the late fifties, a school of forestry was opened in Jos to provide a six month formal training on nursery practice and afforestation techniques in the savanna areas of the country when the need for it was felt. Similar schools were established in Ibadan and Obubra in the late sixties and the seventies to impact experience from those parts of Nigeria on uniformed forestry staff. The Department of Forestry, University of Ibadan was established in 1963 to provide professional level forestry training not only in Nigeria but in the West Africa sub-region (Wyatt-Smith and Redhead, 1988). Presently, apart from Ibadan, there are over ten Nigeria universities offering forestry training at professional levels while vocational forestry training schools have also increased. Despite all these, the desired forestry sub/sector contribution to the nation's economic and social development is still elusive.

This paper therefore attempts to identify a number of issues which affect development of forestry viz-a-viz forestry education in Nigeria. The issues identified are categorized into the following groups:

- Contextual constraints
- Changes to curricular content and emphasis

Contextual Constraints

Changing Employment Opportunities in Forestry

As at 1960, the predicted manpower needs of Nigeria for professional foresters was put at between 8 and 10 by Adeyoju (1988), which was part of the rationale for establishing University of Ibadan. The Department then train mainly for public service. This has since changed due to reduced government spending on RNR education and the job market requirement in Nigeria. Thus, the need for forestry education curricula to be job-creation oriented is inevitable in the face of structural adjustment enforcing reduction in government spending in the RNR education sub-sector.

In Nigeria., labor market demand for degree-based professional skills over the period 1991–1999 was reported to be centered largely in engineering, business administration, health services, accounting and marketing (Oni, 2000). During the same period, however, 49% of the supply of graduates produced by federal universities was concentrated in Arts, Education, Law and Social Sciences (Saint *et al.*, 2003). The mismatch is clear. But mismatch or not, labour market

demand and supply does not reflect the import of forestry or other renewable natural resources training and education effort in Nigeria. Invariably the need for adaptive RNR institutions responses vis a vis the labor market for public and private employment is imperative. This can be done by their engaging in frequent consultations with prospective private-sector employers to obtain estimates of the numbers and types of RNR management jobs that are likely to be available for graduates and to plan curricula accordingly.

Ideally, institutions should set up permanent mechanisms for observations of the job-market and continuous adaptation of courses. However, a lack of financial and human resources often makes this difficult to accomplish. Some institutions are taking action, however, to establish better contact with potential employers of graduates (Saint *et. al. op. cit.*).

Improving the employment opportunities for graduates requires that curricula focus less on specific technical knowledge that will quickly become obsolete and more on processes and abilities of students to think and solve problems that are relevant to societal needs. Students should learn skills and abilities that are transferable to a wide range of occupations. For example, it is imperative for logical reasoning of wood utilization student to be enhanced after their exposure to basics just as excellent communication skills are needed by forestry graduates who plan to work in extension. Likewise, teaching methods should be changed to reflect the needs of society, and thus better respond to demands for trained human resources. Boeher and Linsky (1990) reposed this fact when they submitted that teaching with practical, reality-based cases is a good example of how teachers can change methods to meet student needs and those of the larger society.

Budgetary and financial crisis

Forestry is administered in Nigeria at the three tiers of Government i.e. Federal, State and Local Government but the major source of funding and financial support for forestry education and research in Nigeria is the national government. The economic crises of recent years and recurrent structural adjustment measures have imposed severe budgetary restrictions in many countries which have negatively affected support to forestry education. This was why institutions use up to 85 percent of their total budget for salaries (FAO, 1997; CIFOR, 1999). If the educational infrastructure were in place (teaching labs, instructional equipment, and materials) spending 80-85 percent for salaries is within an acceptable range. However, in most developing countries this is not the case.

It is obvious that forestry education is expensive. It requires teaching aids and materials, scientific and technical equipment as well as adequately equipped training and field stations. The initial funds for buildings, teaching equipment, text books, and agricultural machinery have usually been provided in the past by governments and donor assistance. But, the maintenance and replacement of these facilities is generally beyond the existing financial resources of many institutions. The result is that forestry education institutions face great difficulties in ensuring properly equipped, maintained and functioning laboratories and field laboratories. Not surprisingly, the

objectives of experimentation, teaching, outreach or forestry production are inadequately achieved.

Budget cutbacks have also made it difficult to maintain teaching standards due to reductions in recruitment and in staff development programmes, especially those involving training abroad. Limited budgetary resources often do not allow teachers to obtain the scientific and technical publications necessary to keep their knowledge current, or to conduct up-to-date research. This has resulted in a decline in the standards of teaching, research and extension in many countries.

New innovative ways of funding institutions need to be explored. A small percentage of money received from the sale of cash crops could be used as "check-off money" for research and extension efforts. Forestry-based enterprise support of funding schemes for research could also contribute revenue.

Marginalisation of Forestry and Rural Life

As they develop, almost all countries of the world have decreasing proportions of their economically active populations dependent on forest resources. Despite increased dependence on timber and non-timber forest products (Olawoye, 1996) the percentage of the population which makes a living directly from forestry continues to fall in developing countries. Intensification of production through improved technology and increased inputs is responsible in most cases for increased production, rather than from increased numbers of producers.

National budgets tend to be directed at satisfying the needs of urban centres at the cost of funding and services for rural areas. This urban bias and rural neglect has led to decreasing levels of real income in the rural areas. This situation is unlikely to change as long as admission to institutions offering RNR education and training is based solely on academic qualifications which place rural young people in direct competition with better schooled urban youth. The result is a significant waste of human resources, since rural youth possess unique aptitudes and qualities for understanding and working in the rural sector and are well suited for technical work in RNR management.

In some cases, the urban origin of RNR students is now so dominant that it is becoming difficult to teach them about forestry without special, often expensive, educational efforts. The result is that urban-based graduates, with little practical knowledge of rural development and RNR production, are working as RNR change agents.

The increasing number of students with urban backgrounds has led some institutions to look for ways to ensure that these students gain a practical understanding of the realities of rural and farm life. One way is early integration of students in rural life through practical training before final admission and a series of practical training periods throughout the programme of study. RNR universities and colleges need to take into consideration during admission the willingness of students to follow RNR management career and their ability to adapt to work in rural areas.

Policies and strategies need to be developed that ensure representation of rural youth in higher forestry education. Bright but economically disadvantaged students need access to education. Quotas or community representation schemes are one means to ensure opportunities for rural youth. Another option is community or regional scholarships for capable youth interested in studying forestry. Intellectually capable rural youth lacking academic skills may require an adjustment period and a make-up year to meet standards. Similarly, urban youth may need to obtain forestry competencies through mandatory internships and systematic exposure to rural life.

Relationship between forestry education and research and extension

With few exceptions, the institutional relationships between forestry teaching and research and extension services are inadequate. In many countries, this is the result of the deliberate separation of education, research and extension into different ministries and agencies and a lack of functional mechanisms to link them together to solve common problems.

Forestry like other RNR research is usually conducted at government research stations and laboratories, the majority of which are not linked with universities. Research activities are often carried out as part of postgraduate programmes of higher forestry education, but they are seldom directly related to national research priorities and programmes.

The participation of higher education institutions in research activities needs to be planned as part of the regular activities of the teaching staff and their students. The credibility of these activities, and the possibility of obtaining the necessary research resources, depends on the activities being relevant to end users and to national research priorities. For forestry education institutions to participate more fully in research, the role of research should be clearly defined in the institutional policies and in the responsibilities of faculty members.

As with research, close working relationships between forestry education institutions and extension systems are indispensable in order to ensure the relevance and contribution of forestry education. As with research, however, the involvement of forestry education institutions in extension and community outreach is often limited. Even in those countries where extension and forestry education are not separated into different ministries, the lack of resources and linking mechanisms greatly limits joint activities.

One way for universities and technical institutes to implement development outreach activities is by follow-up technical support to graduates working in forestry-businesses or managing their own production enterprises. Also, short courses of continuing education can be designed to update extension officers' knowledge and to qualify extension staff for career advancement. Continuing education should, wherever possible, make use of forestry-based community associations, graduate associations, NGOs, commercial enterprises and research and extension

centres.

Forestry education institutions, working with appropriate government agencies and NGOs, need to develop research and demonstration plots that directly address users' needs. This requires that users' be valued for their contribution to production through their innovations and sharing of local knowledge. For their part, users' organizations need to do a better job of communicating the needs of their members to forestry education institutions. There is also the need for an advisory boards to bridge the communication between forestry education institutions and local producers.

Changes to curricular content and emphasis

Rapid scientific progress and technical change

Although agriculture generally kept up with scientific progress in the past, the pace of change is much faster today, requiring continual updating of curricula. Scientific knowledge is changing very quickly as modern communication technologies facilitate the global sharing of information among scientists and educators. Since "new" knowledge becomes "old" knowledge so quickly, it is essential that students develop the skills and attitudes that will allow them to continue to learn and develop their competencies throughout their professional lives.

Rapid advances in information technologies (e.g., electronic mail and the Internet) now make possible new modes of collaboration and cooperation between institutions of forestry education. Reduced funding for education makes inter-institutional collaboration both increasingly necessary and difficult to achieve. Access or lack of access to the Internet will determine if the information gap is reduced, or if it will widen even further. If institutions are to keep pace with rapid changes in science and technology, continuing education for faculty members is necessary through scientific meetings and inter-institutional exchanges, including those that apply innovative uses of electronic information systems (e.g., electronic networks for collaborative curriculum development and distance education). A commitment must be made by institutions to improve the information infrastructure to ensure that students and faculty have access to the new information technologies (Richardson, 1997).

New global developments in science and technology have profound implications for forestry education institutions. New advances in science and technology influence the subject matter and types of courses students need to understand today's forestry. Multiple use forest management, biotechnology, wood and fibre science, agroforestry systems development and multi-stakeholder analysis are some of the subject areas which need to be incorporated into curricula. These subjects will attract increasing numbers of students as new employment opportunities are created which demand expertise in these fields. Advances in biological sciences increase the complexity of forestry and complicate access to technology by poor nations. Regional cooperation and centers are a possible solution.

Partnerships with private companies should also be explored as a means to improve access to new technologies. In addition to new scientific knowledge, the most important source of knowledge for forestry development is rural people themselves and the time-tested systems of resource utilization that embody their knowledge. An understanding of rural people and their production systems should be an integral part of forestry education. This requires that forestry education institutions play not only an academic role, but also a community development or outreach role that allows them to understand local knowledge and combine it with modern forestry science. Understanding the contributions that local people can make to solving their own problems is the key to sustainable rural development.

Environmental issues in forestry education

In many parts of the world, the increasing needs of growing populations for food, fuel and fibers have led to deforestation, severe soil erosion, loss of water resources, and eventually declining crop production. It is clear that the loss of natural resources and environmental degradation affects food security. Environmental and sustainable forestry development problems require an interdisciplinary approach to curricula since sustainable development relates not only to technological concerns, but also to economic, social, cultural, ecological, and public policy matters. Experience shows that institutions of forestry education can play a vital role in bringing about changes in peoples' attitudes and practices so that they are more environmentally responsible. Developed countries have for some time included environmental concerns in their teaching curricula, research activities and outreach programmes.

Three main issues can be identified which affect the challenge of integrating environmental and sustainable development themes or issues into forestry education programmes. First, the diversity and complexity of forest utilization and ecological balance, which involve synchronizations of social, cultural, political and economic of living with technical and scientific information to obtain the right mix. Thus, an interdisciplinary approach is essential (Bawden, 1996).

Second, the interdependency of RNR education institutions units are mostly lost on faculty members. Substantial institutional reorientation and attitude change among faculty members viz the training and redeployment of teachers may therefore be necessary. It may also be necessary to involve students as well as younger, environmentally-aware staff and rural communities in the design of new curricula. Third, the importance of the indigenous knowledge base of the local people is imperative to evolving sustainable forestry education and environmental awareness among the rural people. These new approaches should involve people (students, teachers, producers) learning together in collaborative, knowledge-sharing situations on campus and in the field. The ultimate aim should be to make environmental issues inseparable from the professionalism of graduates, the production practices of farmers, the commercial objectives of Non-Timber Forest Products (NTFPs) marketers and the interests of society for a safe and secure environment.

Integrating population issues into forestry education

Population projections suggest that the world population will continue to increase from the present figure of nearly six billion people to between 11 and 14 billion people by the end of the next century. There is a great need in the developing countries to teach forestry students population issues in relation to development problems. Institutions of forestry education need to incorporate population education concepts and principles into curricula since many forestry graduates will become managers, planners, and policy-makers who need to understand the dynamic inter-relationships between forest products, population, the environment and socio-economic development. Furthermore, students trained to work as extension agents need to be able to engage forest resources users in dialogue about sensitive population issues and to effectively communicate population messages to rural people.

Population education should develop awareness and understanding of the nature, causes and implications of population growth and distribution as they relate to agricultural productivity and rural development, and how these issues affect, and are affected by, farmers, their families and society as a whole. Population education can be integrated into training institutes by creating a separate population education course required of all students; by introducing population education as modules into existing courses; and by integrating population education issues and content into relevant topics in courses of study within existing curricula.

Populations issues are a good example of how to integrate the teaching of values and attitudes into a forestry subject area. It is population pressure that brought to the fore the impact of exploitation on the forests. For example, the impact of deforestation for agriculture was not felt with shifting cultivation and bush fallow systems of farming, until the fallow period became naturally reduced due to population pressure. Educators need to develop teaching strategies that emphasize and help students develop their affective reasoning skills. Since the attitudes and values that people possess are difficult to change, educators need to place greater emphasis on the psychology of the change process, thus improving the likelihood that change in practice will come as a result of educational efforts.

Gender issues in Forestry Education

Women play a major role in the world's forestry production systems. In the less developed countries, an estimated one-third of all rural households are managed by women. In Sub-Saharan Africa and the Caribbean, women produce 60-80 percent of basic foodstuffs, while in Asia they perform over 50 percent of the labor involved in intensive rice cultivation.

In recent years, there has been widespread recognition of the vital roles played by women in all areas of forestry and the need for women to have access, through formal and non-formal training, to the knowledge and skills needed for improved production, processing and marketing. Extension agents, researchers, teachers and students all need to be educated and informed about rural women's problems, potentials and aspirations.

The 1991 FAO expert consultation urged that special efforts be made to recruit and support female students from rural areas who could become extension agents, agricultural researchers, teachers and policy-makers. One of the reasons why there are few women extension workers, researchers and other forestry professionals is the small number of female graduates from intermediate and higher-level agricultural education institutions. Yet, there are various countries where the enrollments of women are proportionately high. On average in Africa, FAO data show that there has been a 10 percent increase from 1983 to 1993 from about 15 to 25 percent female enrollment in agricultural education institutions.

The question of how to attract more female students to agricultural disciplines is linked to the issue of encouraging students from rural areas to enter higher education. As noted above, the number of female students has increased over the past ten years and this trend should be supported and encouraged. Also, more role models for young women to emulate are needed, including teachers in agricultural education institutions. Raising the number of women in agricultural education, both as educators, administrators and students is important as a means of reinforcing a commitment to understanding and changing the status of women in agriculture.

Educators need to become more responsive to gender related issues by taking into account women's roles and contributions in the total agricultural industry. While there is a trend for increased enrollment of women students in agricultural sciences at the technical or higher levels, this has not resulted in the dissemination of improved technology to women farmers because few female graduates are employed in extension work. Agricultural education institutions may increasingly have gender-sensitive admittance policies, but due to traditional barriers female graduates continue to have problems finding employment in agriculture (Crowder, 1998). Strategies, curricula, and policy shifts need to emphasize and include women as role models and leaders in agriculture.

Gender-sensitive policies have, at best, resulted in training programmes in which women are treated equally with men. However, it is not only the equal treatment of women that is important, it is equal employment benefits that are important. Equal treatment does not necessarily lead to equal benefits for women; indeed, the treatment may have to be different in order to take into consideration the different needs, time constraints and productive activities of women.

Gender-sensitive educational policies should be developed with a wide-range of stakeholders, including community leaders, politicians, potential employers and especially women themselves. Measures should be put in place to encourage young women and better prepare them to take up agricultural studies. For example, special attention should be paid to revising admissions policies that discriminate against women and to the creation of special scholarships for women to study agriculture. There is also a need to provide gender sensitisation courses for teaching staff and to eliminate stereotyping of females in agricultural studies. In some cases, professional organizations of women foresters can act as pressure groups for these changes.

Forestry Research

Research is successfully conducted through the synergistic interplay of different skills. This was reposed by CIFOR (1999) that research efficiency is optimized by a range of different roles and skills, which it required. The forestry Sector did not have a separate policy before the commencement of the National Forestry Action Programme. What obtained was an encapsulation of the National Forest Policy within an overall "Agricultural Policy for Nigeria" which was published in 1988 under the aegis of the Federal Ministry of Agriculture. Details of this have little or no forestry education and research inputs. However, since the 1980s, many African countries have addressed research in their National Forestry Action Plans (NFAPs)/ National Forestry Management Plans (NFMPs). Structural adjustment has led to the downsizing of public institutions in many sub-Saharan African countries, as elsewhere. National Agricultural Research Systems (NARS), of which forestry research is a component, have also been restructured. The prevailing trend is to decentralize agricultural research by transferring national research staff to regional multi-disciplinary research programmes within the country. Whilst bringing researchers closer to extension services and the end-users of knowledge, this process may also weaken national capacity in forestry research, at least over the short term, by diluting a slender body of expertise already below the critical mass.

In terms of numbers, Nigeria appears to have more qualified and experienced forestry researchers, i.e. those with M. Sc. and Ph. D. qualifications and over 4 years of experience. However, as a proportion of the total in each institution, Benin, Cameroon Nigeria and Ghana have more than 60% (CIFOR, 1999). Despite this and other advantages the only forestry research institute in Nigeria (FRIN) has over her its African contemporaries (Table 1), appointment of non-professionals to direct the institute is a threat to its continuous existence.

Table 1: Self-Diagnosis: Forestry Research Institute of Nigeria

Strengths

- Only research Institute in the forestry sub-sector in Nigeria
- Highest concentration of forestry specialists in Nigeria
- Some staff have regular part-time teaching experience at universities
- Long institutional history and accompanying attributes of experience
- Outstations are present in all agro-ecological zones of Nigeria
- Impact of the institute is enhanced by the four Diploma-awarding Colleges of the Institute

Opportunities

- May be broken into smaller Research Institutes in the future
- Many research questions relevant to Nigeria remain unanswered
- Good opportunities for support from international funding agencies due to mandate

Weaknesses

- Large turnover of trained staff
- Inadequate and irregular release of funds
- Poor remuneration
- Brain drain

Threats

- New organisations and environmental NGOs use research results of FRIN and sometimes take over FRIN's role
- Undue delays in the promotion of deserving staff
- Appointment of Director or Chief Executive sometimes from outside the Research Institute system

Sources: CIFOR, 1999.

Human resources, in terms of graduate staff in forestry research institutions do not follow the same pattern. More researchers, 25% of the global total, are located in the Asia Pacific developing countries. In Sub-Saharan Africa, universities represent only 14% of the forestry-related research institutes. The figures for West Asia-North Africa, Asia-Pacific and Latin America-Caribbean are 10.3%, 20.5% and 31.3% respectively. An Expert Consultation on forestry research took place in Accra from 30th September to 2nd October, 1997. This focused on recent trends in research and on its impact and response to the developing needs of the forestry sector at national and regional levels. Consideration was given to institutional aspects and to effective technology transfer at national level. The need for national collaboration was also emphasized to allow for diffusion of ideas and enjoyment of economies of scale on facility usage. However, like all the other recommendations, its implementation is still being awaited.

Current level of Inputs to Forestry development in Nigeria

Governments

Like other development sectors, forestry in Nigeria is funded through the normal annual budgetary allocations by the various tiers of Government. The forests are held in trust by the states and local government councils for the communities. However, forest management per se is carried out by the state governments who have access to limited funds and personnel required for forestry development. A little above 1% of funds proposed for forestry programmes are actually released to the SFDs. Most of this "real" budget is also devoted to payment of salaries and wages. Consequently, vehicles are left abandoned. It is not surprising, therefore, to notice very low activities in most states, resulting in dwindling staff morale.

The Federal Department of Forestry also receives the same treatment at the Federal level (Table 2). On the average, budgetary allocation to the department is only about 3.45% of the total allocation to the supervising ministry. The allocation could barely meet the cost of staff salaries and some essential services. Consequently, there has been low funding of the field offices, which have no facilities to carry out their normal duties. Most of the infrastructures, including the Sawmill Training Centre, Benin-City and the Manpower Development Centre at Oluwa, are already decaying. FORMECU that used to enjoy buoyant financial resources is equally cash-strapped since most of the programmes it monitors have been concluded. The overall implication is that FDF and its organs have been incapacitated by lack of funds to effectively discharge its statutory roles despite the availability of skilled personnel.

Table 2: Federal allocation to Federal Department of Forestry, 1989 – 1999

Year	Allocation to Ministry (n'000)	Allocation to FDF (n'000)	% of allocation	Remarks
1991	265,569,690	10,649,240	4.0	The % allocation represents ratio of distribution between forestry and the Ministry.
1992	305,055,000	12,000,000	2.45	
1993	656,891,000	10,966,080	1.67	
1994	425,200,000	20,460,000	4.8	
1995	1,432,203,218	39,000,000	2.72	
1996	1,986,451,500	27,495,000	1.38	
1997	3,800,000,000	100,000,000	2.65	
1998	N/A	N/A	N/A	
1999	828,265,000	66,000,000	7.96	

Source: FDF (2000)

Forestry at the local government level is seen as a revenue-generating venture and as such, not given any consideration in routine budgetary allocation.

International Funding Agencies

The precarious financial situation hampering forestry development in Nigeria has drawn the attention of International Funding agencies since the 1980s. Such financial supports are secured through the Federal Government (FDF/FORMECU) and they are directed at areas of serious deficiency in forestry development in the country. Worthy of note however, is that states that enjoy external funding are those with substantial budget allocation to forestry development. The large part of such allocations is directed at meeting counterpart funding, which they are compelled to contribute before they could benefit from external assistance.

Private funding

The long gestation period of forest goods has been a serious dis-incentive to private participation in Nigeria. This is further compounded by issues relating to land tenure, which constrict land into strict ownership structure. Private financial input to forestry development in Nigeria had, therefore, been very low and in most cases geared towards small plantations to meet local consumption. Inputs to community forests are normally not in strict financial terms but in communal labour and support. The NGOs are mostly involved in forestry extension and advocacy, but less concerned with direct financing of forestry development programmes.

Overview of Resource requirements for Sustainable Forest Management in Nigeria

Presently, level of production of goods and services from the country's forests is not sustainable. However, FORMECU (1996) computed (Table 3) a reasonable level of resources that would be required to achieve sustainable forestry development in Nigeria in the National Forests Action Programme (NFAP) proposed for the country.

This is understandable, given the present revenue earning capacity, which is considerably in favour of the Central Government, which takes about 58% of the country's total revenue. Forestry education was however not part of the computation and research is expected to be taken care of by the 13.21% allotted to institutional strengthening programme.

Table 3: Estimated investment requirements for forestry development in Nigeria (US\$ Million).

Programme	Donor	Federal	State	Local govt.	Community	Private	Total
1. Forest Management Programme (FMP)	23.5	8.8	4.9	1.35	1.35	3.3	43.2
2. Social Forestry Programme (SFP)	14.3	8.05	2.5	0.75	3.5	3.0	30.1
3. Forest Industry Development Programme (FIDP)	2.0	2.3	0.8	0.5	-	5.2	10.8
4. Institutional Strengthening Programme (ISP)	7.0	4.45	-	0.35	-	-	12.8
TOTAL	46.8	23.6	9.2	2.95	4.85	11.2	96.9

Source: FORMECU (1996)

Conclusions and recommendations

Forestry will remain for many years a major contributor to the economies of most developing countries. In some countries, however, its share of GDP will progressively decline. In Nigeria, unless there is a paradigm shift from policy formulation without implementation, efforts directed at appropriate pricing of forest products and forestry education and research accorded the recognition deserved, the real contribution of forestry to the nation's GDP may not be known.

The forestry sector in developing countries is undergoing rapid changes as a consequence of both technological progress and economic forces which call for an increased market focus, competitiveness and higher productivity. Employment opportunities in the off-farm sector are expected to increase at a faster rate than in forestry and other RNR management sub/sector. This will further emphasize the present employment shift of forestry graduates to related sectors, requiring a revisit of existing curricula to better address educational needs.

Forestry education curricula need to be redirected to address the labor demands of the private sector. Curricular reorientation will need to incorporate both the new role of market-oriented forestry as well as issues of direct relevance to food security, environmental amelioration and rural poverty. Curricula also will need to better reflect the importance of social and environmental issues for sustainable forestry development. Meaningful curricular revisions will require a better understanding and incorporation of the underlying psychological processes that influence learning,

with special attention to experiential learning and participatory learning strategies that focus on deductive reasoning skills.

FRIN and affiliated colleges of forestry as well as forestry departments in colleges and universities need to determine their unique functions and the special attributes that they can offer students and the forest enclaves and adjoining communities. This is with a view to justifying huge financial implication of their continual existence. Moreover, they are expected to solve forestry related landuse problems in the communities they serve. To this end, a holistic approach to teaching forest resources management and production through a multi-disciplinary systems perspective will increase the utility of both scientific and local knowledge.

Inter-institutional alliances offer a means to capitalize on individual forestry institution strengths and to reduce costs associated with effort duplication. Regional collaborative strategies should be explored as a means to keep pace with accelerated scientific advancement. A commitment to developing communication infrastructure, especially with regard to the new computer-based communication technologies, should be a priority because of the potential to reduce the information gap.

The curricula colleges of forestry and universities in developing countries need to adjust to the current and future employment needs of graduates. The emphasis in curricular revisions should be on process skills of problem solving and on skill sets that are transferable to a diverse employment sector. New options for programs of study should be based on enabling students to meet the expectations of RNR management employers, and increasingly the employment needs of the private sector. Given the severe restrictions on financial resources, governments in developing countries need to determine levels of continued support to higher education in forestry based on the ability of colleges and universities to carry out curricular modifications that reflect employment markets. In Nigeria, growth has been recorded in the programmes leading to the award of diploma and degree in forestry education. The challenge is to achieve a "better fit" between the supply and the demand for trained human resources in agriculture. In the next century, forestry education and research institutions in Nigeria will need to address not only immediate production needs, but also long-term food security, sustainable agriculture and rural development needs. This will require moving from a single disciplinary approach to an interdisciplinary, systems approach which incorporates a wide range of new topics, including gender, environmental and population issues.

A major challenge will be the transformation of forestry education and research institutions into dynamic promoters of change within their environments. This will require that they abandon long-established traditions of academic isolation and become active contributors to sustainable forestry and rural development through innovative teaching, research and extension.

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