

STATE OF FORESTRY RESEARCH AND EDUCATION IN NIGERIA AND SUB-SAHARAN AFRICA: IMPLICATIONS FOR SUSTAINED CAPACITY BUILDING AND RENEWABLE NATURAL RESOURCES DEVELOPMENT

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Abstract

Forestry research and education in Nigeria has come a long way from the establishment of the first organized training of Silvicultural Assistants and later Forest Assistants initially at Zaria in 1939 and later at Ibadan and Yaba, Lagos from 1941 and 1942 respectively, although, this was preceded by organized forestry practice reported to have commenced in the country in 1886 with the appointment of an officer to take charge of the forests of the Colony and Protectorate of Lagos under Sir Alfred Moloney, the then Governor. Series of early research efforts were carried out through botanical expeditions by European scientists focusing on species composition, structure, regeneration and distribution of the Nigerian rainforests. By 1954, the Federal Department of Forest Research (now Forestry Research Institute of Nigeria, FRIN) was established followed by the Department of Forestry (now Department of Forest Resources Management) University of Ibadan, the first professional forestry school in West African Sub-region, in 1963 while Savannah Forestry Research Station, Samaru was established in 1964 both by the FAO/UNDP. Presently, at the university level, more than twenty offers partial or full forestry degree programmes apart from polytechnics, colleges and vocational forestry training in different part of the country with more still springing up. Irrespective of the proliferation of forestry training departments in many academic institutions in the country, the main objective of producing qualitative manpower that can provide the leadership to meet the challenges, stimulate sustainable development and provide solutions to the country's and by extension Africa's problems is still yet to be realized if compared to the past when the few trained Nigeria forestry graduates ranked among the best in the Commonwealth. Various reasons had been attributed to this among which are poor funding, loss of incentives, bureaucratic bottlenecks, brain drain, outdated research, teaching and learning curricula and facilities, among others. The situation in most of other sub-Sahara African countries is not significantly different. Suggestions are offered for the improvement of forestry research and education in order to contribute to sustainable development in Africa.

Introduction

It is incontrovertible that for any sustainable development to be achieved by any nation, the educational sector (especially Higher Education) must play a significant and critical role. This sector is expected to provide human capacity with leadership roles that will meet the challenges of stimulating sustainable development and the democratization of knowledge.

In Nigeria and many (if not all) sub-Sahara African (SSA) countries, the dependence of the majority of the population on agricultural and renewable natural resources (RNR) for livelihood and sustenance is substantial especially in the rural areas where large proportion of the population of the inhabitants of this region resides. Coincidentally, most of the region's poor people live in these rural areas and their number is roughly twice that of the urban poor (Canagarajah 1998; Popoola and Akinwumi 2001).

This prevalent situation in many of these SSA countries thus, gives credence to the assertion that neither lack nor availability of RNR determines the poverty status of any country but lack of appropriate and adequate human resources to develop and make use of science and technology in adding value to these RNR and also to attract investments. This scenario thus, constitutes part of the imperatives for sustained research and education in agriculture, forestry, other RNR management and related discipline in Africa if the objectives of Millennium Development Goals (MDGs), especially tackling poverty and hunger, are to be achieved in this part of the world.

Bada and Verinumbe (2005) noted that forest exploitation is as old as human habitation in Nigeria. However, organized forestry practice along modern scientific lines did not commence until 1886 when an officer was appointed to take charge of the forests of the Colony and Protectorate of Lagos under the then Governor Sir Alfred Moloney, who published his famous

“Sketches of the forestry of West Africa” in 1887 to mark the silver jubilee of Queen Victoria (FAN 1989).

According to Bada and Verinumbe (2005), this publication further triggered interest in the potentials of the forests of Nigeria and indeed the English speaking West Africa. Subsequently botanical expeditions and demands for Nigerian wood and other forest products by Europeans confirmed the tremendous publicity value of Sir Moloney’s publication (FAN 1989).

History of Forestry Research and Education in Nigeria

It is an established fact that science is an important ingredient for national development. Since science is primarily concerned with the intellectualization of facts and values in an unbiased manner (Samuel 1996) research in all its aspects is necessary. Owing to most SSA countries’ socio-economic peculiarities as stated earlier, sustained research in agriculture and RNR management is particularly necessary for this purpose.

In agriculture and natural resource management (NRM), research deals with issues, activities and strategies relating to exploration, documentation, conservation, improvement, sustainable utilization, processing, marketing, industrialization, monitoring and analysis of resources of different kinds and distribution scope and size (Okafor 2003). The 6th Edition of Oxford Advanced Learner’s Dictionary summarized by defining research as a careful study of a subject, especially in order to discover new facts or information about it while education was defined as a process of teaching, training and learning, especially in schools or colleges, to improve knowledge and develop skills.

The implication of the above definitions according to Temu (2006) is that while research generates knowledge, education is a tool for sharing knowledge and in an ideal situation, the two are mutually supporting. Bada and Verinumbe (2005) observed that rudimentary research into

Nigeria's forest resources, especially timber must have started since the 15th Century or earlier with the influence of European merchants notably from Portugal whose vessels birthed in Lagos, trading in slaves and farm produce such as wild rubber, palm nuts, palm oil, local dyes, ivory, spices and many others.

Oseni and Associates (1987) claimed that there was no formal forestry training in Nigeria prior to 1938. Record have it that as at the time of appointing the first specialists for forestry research in the late 1920s in Nigeria, "the scene was not really set for forestry research" because of inadequate forest management staff, incomplete reservation of forest estate and irregular and inadequate forest exploitation to justify silviculture and management research (FAN 1989).

Prior to the shipping of some of the choice wood to Europe for various utility tests including limited laboratory evaluations on the wood properties, the preliminary researches must have been their casual grading and selection in comparison with choice wood in Europe. It was observed that more than 90% of the research efforts in Nigerian forestry sector in the first half of the twentieth century were focused on species composition, structure, regeneration and distribution of the Nigerian rainforests (see Richards 1939; Ross 1954; Jones 1950, 1956), a situation which has not really changed in Africa as its national forestry research has remained overwhelmingly silvicultural in approach (Sayer and Palmer, 1994).

Although, samples of Nigerian hardwoods were later simultaneously taken to laboratories in Europe particularly Princes Risborough in the UK for detailed studies, it is important to note that all these researches were carried out by foreigners most of which were executed offshore, findings of which were mostly available to companies and organization in Europe unpublished, with very small number of studies carried out locally in the country e.g. those of Okigbo (1964); Redhead (1971).

The realization of the fact that the subsisting land-use practices were inimical to sustainable forest management led to the introduction of Tropical Shelterwood System (TSS) in 1944 to enhance the regeneration and improve the stocking of the degraded tropical rainforest based on experience from other British colonies e.g. Burma, India and Malaya (now Malaysia) (Onweluzo 1989), a strategy that failed owing to inadequate knowledge of the ecology of Nigeria's tropical rainforest and the individual species (Kio 1978; Onweluzo 1989).

The various research aspects of Nigerian forestry sector prior to 1950 was more of an informal and uncoordinated one with no government official outfit saddled with the responsibility of forestry research in the country (Bada and Verinumbe 2005). An intervention was made by the government in 1951 when the Nigerian Forest Department was organized into three regional departments with a forest research branch created which later metamorphosed into Federal Department of Forest Research in 1954 (FAN 1989) whose name was later changed to Forestry Research Institute of Nigeria (FRIN) in 1976.

The quest for University education in Forestry in the developing countries led to the establishment of a Department of Forestry (now Department of Forest Resources Management) at the University of Ibadan in 1963 (FAN 1989) where the various early research efforts in Taungya that led to the academic discipline known today as Agroforestry were first carried out in Africa, although, it is necessary to note that in 1955 the University of Liberia had earlier established a Department of Forestry within the William R. Tolbert Jr. College of Agriculture (Adeyoju 1981). The Forestry Department at the University of Ibadan was established to provide professional level forestry training not only in Nigeria but in West Africa sub-region (Wyatt-Smith and Redhead 1988). The scope of forestry research was also expanded by the

establishment of Savannah Forestry Research station in Samaru, Zaria in 1964 (Onweluzo 1989) both by FAO/UNDP.

It is also important to note that other forestry training institutions were also established some of which have been discontinued while others have metamorphosed. For instance, the School of Agriculture in Samaru, Zaria commenced formal technical training in 1939 but terminated in 1940 while a School of Forestry (now Federal College of Forestry) was established at Ibadan in 1941 to run the Forest Assistant course. Advanced Forestry courses were organized at the Yaba Higher College in 1942 but discontinued in 1946. In the late 1950s, vocational training for Forest Guards and Silvicultural Assistants started in Naraguta, Jos, which has metamorphosed into Federal College of Forestry, Jos with a similar one at the Thompson's Cottage, Ibadan (Omoluabi and Bada 1989).

Present Status of Renewable Natural Resource Research and Education in Nigeria and Sub-Saharan Africa

For many years, Africa and Nigeria in particular, has been known as a continent and country respectively, rich in natural and human resources. This might have been part of the reasons for the observation by Pliny that - *Ex Africa semper aliquid novi*- a Latin proverb which means there is always something new from Africa. Unfortunately, this part of the world is bedeviled with the problem of "suffering amidst plenty".

Africa today is the poorest region in the world, where half of the population lives on less than one dollar a day (CFA 2005). Africa south of the Sahara has 21 of the 31 poorest countries in the world (Sayer and Palmer 1994). As expected but disappointingly, Nigeria, which accounts for 54% of West Africa's population and estimated 51% of its GDP (ITC 2004) is one of the poorest countries in the world (Otegbeye *et al.* 2005) with a per capita annual income of about \$320.

The negative influence of these socio-economic characteristics on research, education and development in this part of the world should not be unexpected as there is a correlation between education and economic development (Aigbokhan *et al.* 2005) although, Temu (2006) rightly want we Africans to know that the rhetoric that we are poor and therefore incapable of spawning our own development has dominated communication and information system that they are becoming "facts" in the minds of some people. He went further to state that if this is not nipped in the bud for the youth, it will cost the continent dearly in terms of future development. This is a timely and welcome observation which the author agrees with but the reality is that we are presently faced with challenges which fortunately are not insuperable.

Presently the research and educational sector in Nigeria and many SSA countries is plagued with multi-dimensional challenges which resulted from the socio-economic cum political problems leading to stagnation in their growth and development, some of which are political instability; ethnic conflicts and wars, religious related crisis, cold war, military coup d'état, ineffective leadership; lack of enduring vision, misguided policies, weak implementation of developmental projects, corruption, poor accountability, lack of transparency, human right abuses and poor democratic culture, weak research and educational infrastructure, weak working morale, brain drain, economic immaturity, over-reliance on foreign aids, just to mention a few.

Some of the resultant effects of these socio-economic and political problems in Africa as compared to other parts of the world are tabulated on Table 1. These problems have had various degrees of negative impacts on growth and development of research and educational sector in Africa, most especially in agriculture and RNR management.

Table 1: Some socio-economic indicators of Africa compared to other regions of the world

Socio-economic indicators	Regions					
	Africa	East Asia	Europe and	Latin America	Middle East and	South Asia

		and the Pacific	Central Asia	and the Caribbean	North Africa	
Education (% , 1990)						
Gross tertiary school enrollment	3	9	38	19	17	7
Adult literacy	57	96	96	84	60	51
Health						
Life expectancy	46	69	69	71	69	63
HIV/AIDS prevalence in adults (%)	9	0.1	0.4	0.7	0.1	0.6
Connectivity (per 1000 people, 2002)						
Number of personal computers	12	26	73	67	38	7
Number of fixed and mobile telephone lines	52	273	438	359	180	45
Poverty and growth (%)						
Population <\$1/day (2001, PPP)	46	15	4	10	2	31
Growth in GDP per capita (1990-2003)	0.2	6.0	0.1	1.1	1.1	3.5
Aid dependency (% GDP) (1994 - 2002)	5	0.6	1.0	0.3	0.9	1.0

Source: Adapted from World Bank (2005)

Note: PPP = Purchasing Power Parity; GDP = Gross Domestic Product

Before the 19th century there were two forms of education in Nigeria i.e. traditional, which is the oldest and consisted of general and informal method of training in character, intellectual and physical development, which was a hallmark for the preservation of socio-cultural values and norms, and Islamic education with its language of instruction being Arabic introduced through the northern part of the country around the 11th century.

These were followed by Western education brought by the European Christian Missionaries in 1800s, mostly successful in the southern part of the country owing to the age-long resistance to the perceived Christian missionary activities associated with it by many people in the northern part of the country, accounting for the yawning gap of Western educational inequality between the southern and northern parts of the country presently.

The importance of agriculture and RNR in Nigeria's economy in the 1960's was corroborated by its dominance in foreign exchange earnings and employment generation (Nwoboshi 1989). According to Oseni (1986) this sector earned a yearly average foreign exchange of about N308

million to N412 million or about 2.4% of the Gross National Product (GNP) which thus, necessitated intensive research in all areas of agriculture and RNR but which was recklessly abandoned owing to the discovery and eventual exploitation of crude oil in the Niger-Delta region of the country, wealth from which the majority of the populace has not benefited substantially from. Apart from the oil boom phenomenon, Adegeye and Azeez (2006) also noted that forestry and research has been neglected in Nigeria because of the need to cut down expenses by the sole financier – The Federal Government.

The education sector in totality is not faring better as there is an annual inadequate and inconsistent budgetary allocation distributed as subvention or grants to the different levels of education through coordinating agencies of education e.g. National Universities Commission (NUC). Table 2, shows that the gross budgetary allocation to education increased from ₦2.2 billion in 1990 to ₦69.03 billion in 2002. A cursory look at these annual allocations might give a misleading analysis of education budgetary performance but when these amounts are placed side by side with their percentage of the total annual budget and the expansion in this sector, an inconsistent and downward trend is revealed in the annual budgetary allocation to this sector.

Information from other countries in SSA, except perhaps South Africa, showed that the situation is not in any way significantly different, although, the intensity might differ in scale. It is therefore, not surprising for Douglas and Zinderman (1993) to recognize the fact that resources allocated to education system, especially to the higher education by governments in this part of the world, did not keep pace with the expansion in this sector.

Table 2: Share of Federal Government Budget to Education in Nigeria from 1990 to 2002

Years	Federal Government Annual Budget (₦ billion)	Total Allocation to Education (₦ billion)	% Allocation to Education
1990	40.70	2.20	5.45
1991	38.70	1.80	4.62
1992	52.10	2.40	4.60

1993	111.60	8.00	7.20
1994	69.20	10.30	14.86
1995	111.50	12.80	11.50
1996	121.20	15.40	10.81
1997	188.10	16.80	11.53
1998	246.30	23.70	9.61
1999	249.00	27.80	11.13
2000	Not Available	56.60	8.70
2001	”	62.47	7.00
2002	”	69.03	5.90

Source: Federal Ministry of Education (2003)

It is noteworthy that the bulk of the allocation is used mainly for payment of salaries while research is not provided for. The very few researchers that were and are still active in most of the research and higher institutions offering courses in agriculture and RNR were/are doing so under inadequately and outdated installed research facilities coupled with researchers' incommensurate remuneration.

The inconsistency in government policies on education is another "clog in the wheel" of the sector's progress. The situation in many parts of Africa is not significantly different and this must have made Sayer and Palmer (1994) to generalize some of the problems related to agriculture and related research in SSA as follows, keeping in mind that the situation differs from country to country:

- a large number of small national research systems with less than 100 researchers;
- research programmes that do not reflect agricultural and RNR development priorities;
- obsolete organizational structures and management systems;
- ecological zones and tribal customs and preferences;
- lack of infrastructure within most countries;
- the mediocre quality and low level of training as well as the lack of experience of many researchers;

- insufficient level of funding and staffing to support professional researchers;
- inadequate information on research conducted in other countries and in international institutions and a lack of linkages to them;
- the comparatively low level of university and private-sector research and a lack of effective linkages between this research on the one hand and national agricultural research systems and farmers on the other hand;
- inadequate research facilities;
- the lack of incentives and recognition for good research results;
- the large amount of time spent by researchers on non-research work.

Irrespective of these challenges, it is worth noting that some academic institutions and departments in Nigeria e.g. Department of Forest Resources Management, University of Ibadan, Ibadan, are adopting various strategies that are assisting in "being above board" as regards the issues of research and education in RNR with the aim of solving problems of high national priority. The survey by Iyamabo (1990) also gave pass mark to Forestry Research Institute of Nigeria (FRIN) in the area of research services within Africa, although, more recent survey is needed to ascertain the current status of research activities in this and other research institutes in the country.

Presently, more than forty Universities offer courses in agriculture, forestry and related disciplines in the country (Table 3), with more still springing up both as private and public institutions. Although, a welcome development from the point of view that more intending students will be trained in these institutions but the reality is that the challenges highlighted above being faced by many of the older institutions are likely to be faced by the newly established ones if deliberate and systematic solution to the problem is not found which has thus,

almost always led to poorly trained human capacity which may not be able to face the challenges for which they were trained.

Table 3: Some Nigerian Universities offering courses in Agriculture, Forestry and related disciplines

University of Ibadan, Ibadan	Adamawa State University, Mubi
Ahmadu Bello University, Zaria	Olabisi Onabanjo University, Aiyetoro Campus
University of Nigeria, Nsukka	Rivers State University of Science and Technology
Obafemi Awolowo University, Ile-Ife	Abubakar Tafawa Balewa University of Technology
University of Benin, Benin City	Enugu State University of Science and Technology
Usmanu Danfodio University, Sokoto	University of Ado-Ekiti, Ado-Ekiti
University of Maiduguri, Maiduguri	Cross River State University, Obubra
University of Calabar, Calabar	Igbinedion University, Okada.
University of Ilorin, Ilorin	Nasarawa State University, Lafia Campus
Federal University of Technology, Akure	Abia State University, Uturu
Federal University of Technology, Minna	Ladoke Akintola University of Technology,
Federal University of Technology, Owerri	Ogbomosho
Federal University of Technology, Yola	University of Uyo, Uyo
University of Agriculture, Abeokuta	University of Jos, Jos
Federal University of Agriculture, Makurdi	University of Lagos, Lagos
Michael Okpara University of Agriculture, Umudike	Delta State University, Asaba Campus
Ambrose Ali University, Ekpoma	Imo State University, Owerri
Babcock University, Ilishan-Remo	University of Port-Harcourt, Port-Harcourt
Ebonyi State University, Abakaliki	Kano University of Technology
Bayero University, Kano	Niger Delta University, Wilberforce Island
Anambra State University of Science and Technology	Adekunle Ajasin University, Akungba-Akoko
	Kogi State University, Ayingba

Source: JAMB (2001); Bada and Verinumbe (2005)

Many authors have observed that the major issue posing challenge to the development of research and education in many parts of SSA is funding. In order to surmount the challenges of research financing, researchers and institution go "cap in hand" to source for funds from research funding organizations in such a way that the relationship is mostly that of donor-recipient rather than the real relationship of a co-investor with the scientist, since the funding agency has money and wants a solution to a specific problem and the scientist has knowledge and skills which can

be used to resolve the problem, but s/he lacks the resources to carry out the research (Temu 2006).

Owing to the challenges of poor funding of research and education in this part of the world, globalization which is supposed to assist in exposing the region to international best practices in research and education has also perhaps unintentionally, dealt blows on the sector. According to ACBF (2004) globalization is widening gaps within Africa and between Africa and other regions. While globalization offers opportunities to help African countries enhance their national capacities—through easier access to global knowledge—it also undermines their efforts by contributing to widening domestic income gaps, pulling highly trained talent out of Africa, and accentuating Africa’s lack of competitiveness in international research and development and investment. About 70,000 highly qualified professionals and experts leave the continent annually (ACBF 2004). This phenomenon known as brain-drain is a major contributory factor to academic staff shortfalls in Nigerian higher institutions. Table 4 shows academic staff shortfall in Agriculture and Environmental Science as at 2000. The implication of this reality is that each academic member of staff does more work than what s/he is employed and paid to do.

Table 4: Nigerian University Academic Staff Shortfalls in Agriculture and Environmental Science as at 2000

Subject	Staff Available	Student Enrollment	Existing Staff: Student Ratio	NUC Staff: Student Recommended Ratio	NUC Staff Requirement	Shortfall by NUC (%)
Agriculture	1,904	25,602	1:13	1:9	2,845	941 (33)
Environmental Science	904	15,663	1:17	1:10	1,566	662 (42)

Sources: Adapted from Aigbokhan *et al.* (2005)

We need not go on and on discussing most of these challenges familiar to us, what the author thinks is that how to surmount them is more important, although, we need to know where we are coming from and where we are to be able to chart a course for future growth and development in agriculture and RNR management research and education in this part of the world.

Way Forward

The essence of highlighting the historical perspective and some of the challenges that inhibit sustainable growth and development of research and education in Nigeria and SSA in general is to retrospect the motive for establishing most of the research and educational institutions, reiterate the fact that these challenges are still with us and to device ways of going about facing them head on, an issue which is more important in this kind of discuss.

The crux of the strategies to be adopted at surmounting these challenges appears to be in the area of provision of adequate funding and facility for all aspects of research and education in agriculture and RNR. Irrespective of this, it is important that African researchers and educators should also have a paradigm shift in their research and educational activities in terms of continuous self development and imbibing of international best practices.

First and foremost the governments in Africa should be reminded of their major role in funding research and education on the continent. It should be sounded loud and clear that the products that are picked up from shelves and taken for granted, appeared on the shelves after a lot of resources had been ploughed into researches associated with its development, production and improvement by the producers and or government of originating countries.

The call for technology transfer may not be realistic for obvious reason that bothers around intellectual properties right of originators of these technologies which therefore, calls for support for indigenous researchers and researches. The prevalent reality in many countries is that the government alone cannot fund education, although, it is pertinent to note that education should be part of the social responsibility of the state as stated earlier. This therefore, calls for alternative means of generating funds for supporting this sector. Africa is well endowed with

human and natural resources as also stated earlier which thus lead to the fact that funds for research and educational advancement can be generated from these resources.

The abundance of RNR in Africa cannot be correlated with her level of deprivation and poor funding of research and education when compared with many developed countries with comparably lesser quantity and quality of these RNR. It therefore, follows that strategies that will assist in proper pricing and distribution network of our RNR should be put in place. A situation whereby the pricing of and distribution strategies for RNR obtained from Africa is done in the capitals of Western countries will not augur well for our developmental strategies.

Another means of generating income to meet the challenge of funding is by the introduction of commensurate tax by the government on these RNR for research and education. A good example is the Education Tax Fund (ETF) introduced in Nigeria where companies operating in the country pay a certain percentage of their profit into an account set up for the purpose. Although, there were some controversies as regards the disbursement of the funds, it should be noted that the system, if well harnessed, is a veritable means of generating income for the education sector. Introduction of carbon tax, as it is done in many developed countries will also assist in this regards.

There is necessity for encouraging public-private partnership in issues relating to funding and facility provision for research and education. Consultancy services by academic departments which do not impinge on professionalism should also be encouraged for funds generation. The assistance of international funding bodies should also be sought but it need not be the donor-recipient kind of relationship. The assistance rendered to the University of Ibadan and other institutions by McArthur Foundation in Nigeria is worth mentioning in this regard.

As stated earlier, funding and facility provision is necessary for capacity development in our research and education sector but what is more important is the quality of resource person that will utilize them. It is necessary to reiterate that the prevailing situation whereby researchers are paid pitiable and irregular remunerations is not acceptable. Remunerations and working environment should be made attractive to improve morale and forestall brain drain.

As the world is turning to a global village, the researchers in this part of the world should exploit the opportunities provided by Information and Communication Technologies (ICT). The author need not say that there is need for the provision of these facilities in our institutions. It will also assist our institutions if routine staff development programmes are encouraged, especially the constant exposure to current global best practices in research through overseas training and refreshers courses i.e. training the trainers. Review of our curricula on research, teaching and learning methods is imperative coupled with recruitment of qualitative and well trained younger personnel to replace the aging and retiring group of researchers and educators.

In summary, evidence exists showing that most (if not all) developed countries depend on the strength of their human capital rather than available RNR. This is the main reason why these countries lay more emphasis on adequate investment on human capital development via investment in research and education. This therefore, necessitates and justify the requests for higher percentages of annual budgetary allocations devoted to research and education, monitoring the allocations, disbursements and timely utilization of generated incomes in the education sub-sector, and the sourcing of internal and external funds to support research and education in developing countries and SSA in particular, in order to engender capacity building and sustainable RNR development leading to sustainable development.

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