

The Impact of Forest Policy and Land Tenure System on Bamboo Development in Nigeria

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Abstract

Nigeria, for a long time has depended on its raw material resources to fuel its industrial development aspirations. Since the 1980's, the overexploitation of the nation's economic wood resources has led to dependence on lesser used wood species and wood importation. As the nation has copious quantities of bamboo, it is expected that the development of the bamboo resources will complement or substitute wood in industrial production processes. However, the bamboo resources are underdeveloped as it is regarded as just one of the non timber forest resources. In addition, the forest policy and land tenure system does not give primacy for the development of bamboo. To promote bamboo development in Nigeria, there is need to educate policy makers on the potentials of bamboo. There is also a need for a deliberate bamboo development policy locally.

Keywords: policy, bamboo, land tenure, communal and land use act.

1.0 Introduction

Nigeria depends on its raw materials for sustainable industrial development. Emphases have been placed on the development of both agricultural and mineral raw materials to fuel its industrial development aspirations. This has led to establishment of various organs, parastatals and extra-ministerial bodies to coordinate the development of the various raw materials that are available locally. Among the bodies specifically established to marshal the development and utilization of various agro industrial raw materials in the country are the Raw Materials Research and Development Council, Tree Crops Development Company, the Forestry Research Institute of Nigeria and the Forestry Management Evaluation and Coordination Unit which has since transmuted to the Forestry Service of the Ministry of Environment.

One of the major factors that is militating against optimal performance of some of the organizations is the policy environment in which they operate. For instance, while the forest policy stipulated increase in economic wood availability in the forest reserves, gregarious deforestation has resulted in scarcity of economic wood species. As far back as 1899, the perspective planning for economic development was to exploit forest resources (Adeyoju, 1975). The export revenue from forestry grows at 4.1%, 8.0% and 28.8% between 1950-60, 1960-70 and 1970-80, respectively (Aribisala, 1993). Despite years of deforestation occasioned by dependence of the budget on wood and other forest resources export, the forest policy in Nigeria remains outdated and unable to effectively promote afforestation and development of industrial wood species. These developments have significant impact on the operations of the forest industries, leading to decline in the contribution of the industries to national industrial development (Ogunwusi, 2012c). Studies by RMRDC (2009) indicated that the total volume of usable wood down to 30cm cutting diameter in the forest reserves is 239,775,500cm³. This is not significantly different from 437,507,205.9m³ reported by Akindele *et al* (2001). Closely linked with this, the availability of fund for research and development into propagation of industrial species and utilization of lesser known wood species is constrained by non release of budgetary allocation overtime. A resultant effect of these in the forestry subsector has been a gradual reduction in capacity utilization, continual dependence on importation of raw materials such seasoned wood, coupled, with high dependence on imported tertiary raw materials such as wood based panels (FAO, 2004).

To ease the problems of inadequate availability of wood for use in the industrial sector and to mitigate climate change, a number of experts have advocated the development of bamboo as a substitute to wood in the forestry sub sector. Among the major reasons bamboo is being advocated as a substitute or complement raw material globally are its high growth rate (Alfonso, 1987), technical advancement in bamboo processing (Naxium, 2001), multiple industrial potentials compared to wood (Zhaohua, 2004) its role in poverty alleviation and employment generation (Schenllnhubar, 2009), bioremediation (INBAR, 2009) coupled with its ability to confer resilience in troubled societies (INBAR, 2009). Bamboo is also a very important material to mitigate environmental degradation which a common occurrence in Nigeria (Ogunwusi and Jalaoso, 2012; Charndarshekar, 1996; Andean 1995).

During the last three decades, studies have been conducted on different aspects relating to structural use of bamboo in Asia (Sattar, 1995). Available statistics indicated that there are 70 genera and 1,200 species of bamboo in the world (Jaifu, 2001). The bamboo species ranged from small grasses to giants of over 40m in

height and 30cm in diameter (Tewari, 1992). 19 taxa have been accorded high priority and 18 taxa have been marked important (Williams and Rao, 1994). Most of these species have variable industrial potentials which are being exploited in most countries in Asia (Hidalgo, 1992). Various reports (Ogunwusi, 2011a, Ogunwusi, 2012b; RMRDC, 2004) have also indicated extensive availability of bamboo in Nigeria.

Despite the above, it has been impossible to develop bamboo resources in Nigeria to the level where it can contribute in any reasonable measure to raw materials supply in the forestry subsector or as a foreign exchange earner through export of bamboo products. This study examines the policy environment that determines bamboo development in Nigeria and other factors militating against development of a sustainable bamboo industry in the country. It makes recommendations capable of fostering sustainable development of bamboo in Nigeria.

2.0 Forest Policy in Nigeria.

Formal forest policy formulation started in Nigeria in 1890 when George Denton established a forest administration in the colony of Lagos and set aside some forest estates as government protected areas (Egbo, 1985). The main thrust for forestry development and natural resources conservation is to provide the policy framework for the sustainable utilization and management of forest resources nationwide as well as ensuring that available natural resources are utilized sustainably. A new National Forest Policy was approved in June 2006 and ratified in October 2008 to be domesticated by all the States in Nigeria. The major thrust of the policy is geared towards poverty reduction, promotion of food security, environmental and biodiversity conservation in addition to sustainable production of wood and non-timber forest products (FME, 2012). The new policy, just as the one before it did not give specific consideration to bamboo development as it is treated as one of the numerous non timber forest products. As a matter of fact, the policy followed the guidelines given by the United Nations Environmental Programme (UNEP) and the Centre for International Forestry Research which indicated that the forest policies should embrace:

- 1 Consolidation and expansion of the forest estate (plantation)
- 2 Protection of Environment
- 3 Regeneration at a higher rate than exploitation
- 4 Transportation, processing and marketing
- 5 Forest protection from all agents that poses threat such as fire, poachers, trespassers and unauthorized grazers
- 6 Encouragement of private forestry and creation of manmade forests
- 7 Development of non wood products
- 8 Development of parks and game reserves and increased opportunities in employment
- 9 Encouragement of agro forestry.

From the national forest policy and the set objectives outlined by UNEP, it can be observed that the forest policy thrust concern mainly forest reservation, wood production, government involvement and control of forest industries (Kalu and Izekor, 2005). In the national forest policy, bamboo is classified as one of the non timber forest products. In a major classification by UNEP (2001), bamboo is classified among the fiber and flosses category of non timber forest products. The classification is one of the major impediments to bamboo development in Nigeria and indeed in most developing tropical countries. This classification indicated that bamboo does not have official backing despite its multiple industrial potentials. This creates a disjunction between modern international forest policy and needs of many people in developing countries (Buckingham, *et al*, 2011). According to Buckingham *et al*, (2011), recent international forest policy has focused on the implications of tropical deforestation for climate change, biodiversity loss and livelihoods, while key emerging issues for many developing countries continued to be the supply of timber in the face of increasing demand. While bamboo presents a promising alternative to products from trees, the international forestry policy focus on tree lands (Hunter, 2002). Thus, the potential to develop bamboo in developing countries is constrained by continual institutionalization of bamboo as a non timber forest product, while attention is given to development of trees. The situation in a country like Nigeria is more difficult as tropical forests have significant characteristics which makes monocultures difficult to develop as trees usually respond to minor localized climatic differences that have led to diversification of species (Gorte and Sheik, 2010) and also make sustainable management of tropical forests a difficult objective to pursue (Gorte and Sheik, 2010). According to Buckingham *et. al*. (2011), the problem has four dimensions. One of the most important is that bamboo is neither treated as a crop nor as a tree. Thus, it has no apparent silvicultural or cultivation relevance in tropical forestry. Second, historic policy frameworks equate forest with trees which seek to accommodate bamboo in silvicultural management logistics despite it being a fundamentally different plant. Third, the power and influence of western silvicultural science and practice in international development, continues to expand and as bamboo is not found in most western

countries, it is not given primacy in forest policy development. Likewise the growing influence of market based forest policy instrument, notably the Forest Stewardship Council (FSC) are designed for trees and not for bamboo. Four; bamboo receives minimum attention by development agencies, leading to underfinanced research and development (Buckingham, 2011).

Nevertheless, in view of the need to accommodate bamboo development UNFCCC (2008), has considered bamboo as being on the same level with trees in the context of afforestation and reforestation. According to (Buckingham, *et. al.* 2011), the importance and utilization potentials of bamboo in various industries are compelling arguments for a more assertive approach category for bamboo on the same level as trees. The major reasons being that bamboo could deliver many key contemporary forest policy needs better than trees. However, the ecology of bamboo requires fundamentally different models of commercial management and existing forestry mechanisms such as FSC, are inappropriate when applied to bamboo (Buckingham *et. al.* 2011).

As bamboo has a fundamentally different rooting system compared to trees, the different rooting systems require different management methods, most especially, as the rooting systems also differ from one country to the other. Bamboo has three rooting systems: monopodial (diffused), sympodial (clumping) and amphodial (mixed) (Buckingham 2011). According to Lou *et. al.* (2010), the research on carbon potential of bamboo indicates that it may have equivalent or greater capacity than trees. In bamboos, 52% of carbon is stored in the culm that is used for durable products. 3-5 harvesting cycles under commercial bamboo creates the possibility to rapidly build carbon pools (Liesle, 2009). However, under the Clean Development Mechanism (CDM), most accounting mechanisms only recognize in situ carbon credits residing in standing trees and carbon accruing within harvested wood products are not generally accounted for. As bamboo have shorter life cycle, they must be harvested and converted into products in order to sequester carbon. The failure of CDM to adequately recognize harvested products raises concerns that carbon sequestration potentials of bamboo is being overlooked and by implication, figures on carbon emission are overestimated (Marland *et. al.* 2010).

The increasing industrial deployment of bamboo as alternative to wood products has made bamboo processors to request for certification on bamboo or be incorporated in FSC (Mosobo, 2010) . However, bamboo needs a certification framework designed to meet its distinctive characteristics and this has to be worked out to suit the frame work of tropical and subtropical regions (Buckingham *et. al.*, 2011).

3. The Bamboo sector in Nigeria.

Africa has about 43 species of bamboo covering 1.5million hectares (Kigomo, 2000). Forty of these species are primarily distributed in Madagascar while the remaining three species are found in mainland Africa (Wang 2006). In Nigeria, there are five indigenous species (RMRDC, 2006). An indicative inventory by RMRDC (2004) showed that bamboo is widely distributed in Nigeria . Ogunwusi (2011) reported that Bamboo is mainly distributed in the southern part of the country. The distribution of bamboo in Nigeria is related to ecological conditions with the rainforest areas having the most abundant distribution. According to Ogunwusi (2011b) and RMRDC (2004), bamboo is found in abundance in Ogun, Oyo, Osun, Ondo, Edo, Delta, Rivers, Akwa Ibom, Cross River, Abia, Ebonyi, Enugu, Anambra and Imo States. At least 10% of the natural vegetation in these states was dominated by bamboo, with existing bamboo clumps showing appreciable gregarious growth that is contiguous over large areas. Lagos, Ekiti, Bayelsa, Kogi, Kwara, Benue and Nasarawa States belong to the second category where bamboo distribution is frequent. Pockets of bamboo clumps are found in Niger, Taraba and Plateau States as well as within the Federal Capital Territory. There are 12 states where bamboo occurrence is rare. These are Adamawa, Bauchi, Borno, Gombe, Kano, Kaduna, Katsina, Kebbi, Sokoto, Jigawa, Yobe and Zamfara states.

In Nigeria, bamboo is mostly viewed as a minor forest product, receiving limited financial input and specific planning for its development at the national level (Ogunwusi, 2012a). The major uses of bamboo in most of the states of the federation are as scaffolding materials, fencing, construction, handicraft and yam stakes. In the construction of story buildings, bamboo culms are used as pillars to provide temporary support for the decking. The use of bamboo for this purpose has opened up domestic trade for bamboo culms (Ogunwusi 2011b). In many of the rural areas, especially in Cross River and Awka Ibom States, bamboo is used in the construction of mud houses. In these areas, bamboo culms are used as frames to provide the skeleton for building. The mud is then used to cover the entire skeleton. Houses built this way usually have very straight walls, and they are stronger than mud houses built without bamboo. In the South- East and South-South states, bamboo culms are used by farmers as yam stakes. Also in Nigeria, bamboo is used in the handicraft industry. The handicraft consists of engravings on the outer part of the culm. These are used to make special items, such as cups decorative objects, etc. Other handicrafts made from bamboo in Nigeria include baskets and toothpicks. The bamboo-based handicraft industry is not yet well developed in the country as only Ebonyi and Imo states

produce handicrafts from bamboo. The use of bamboo as fuelwood is very common in some parts of Edo and Delta states. Also in many rural communities where bamboo is available in abundance, it is used in making fences around compounds. In some situations, the culms are split and used for fencing. Apart from these, several other uses exist only on a relatively small scale. For instance, there are some situations where bamboo is used as poles for aerial antenna, electrification, rafters, fishing traps, etc.

All the current uses of bamboo in Nigeria form only a fraction of economic activities in the country. However, given the desired attention, bamboo can become a major industrial raw material, not only for the domestic market, but also for export (Ogunwusi 2012a). One of the major areas where bamboo can become an important raw material in the wood products sector is the wood based panels industry (Ogunwusi, 2012b).

A number of problems have been outlined as constraining Bamboo development and impeding potential of bamboo to generate income and alleviate poverty in Nigeria. According to Leonard (2000), there is general lack of understanding of the industrial potentials of bamboo among policy makers. Currently, there is only one modern bamboo processing company producing floor tiles in Nigeria. The immediate impediment to bamboo development is the lack of interest by government agencies to use the potentials of bamboo in meeting rural subsistence needs and in reducing deforestation (Ogunwusi 2012a). Aside from policy issues, some of the other constraints militating against development of the sector are lack of information on availability of planting materials, lack of information on propagation, establishment, crop management and harvesting methods and lack of appropriate technologies for processing bamboo (Ogunwusi 2012.a) To overcome these difficulties and promote the development of bamboo as an industrial raw material, Ogunwusi (2012a) recommended the establishment of a bamboo development council for the initiation, preparation and monitoring of bamboo development policy implementation in Nigeria.

4.0 Land tenure system and forest ownership in Nigeria

Over the years, land tenure had been the decisive factor in resource management at the local level. Access to land is based on membership of a land holding community by birth right to natural resources such as land, plants, animals and water is often communal (Osemeobo, 1991). The communal tenure enjoys strong proprietary and security rights to biotic resources in rural areas between and among two or more indigenous settlements respectively. This promotes common exploitation and management of resources. Natural resources are used for traditional health care delivery, recreation, food and income generations. Therefore sustained conservation of natural resources through traditional rules, regulations and taboos has evolved over the years as the local tool for natural resources conservation. The commercialization of agriculture production through producing cash crop such as, cocoa, rubber, oil palm and coffee has stabilized land use and led to inheritance of land and individual land ownership. The land tenure recognizes propriety to land titles, promotes strong attachment to land and perpetrates unequal access to land.

According to Bassey (1990), the implications of individual land ownership and dominant user rights on resource conservation are varied, but mostly, include;

- inability of the natural vegetation to exist in contiguous pattern for the stability of wild biotic resources, soils and water sources.
- lack of third party influence on the control of land has led to abuse and misuse of natural resources. For example, the over exploitation of soils for agricultural production lead to declining crop yield and eventual degradation of the environment as in many parts of Eastern Nigeria.
- Rendering farmers landless. Farmers who are unable to gain access to the land through sale and inheritance migrate to areas where farmlands are relatively abundant.
- Perpetration of unequal land tenure. Rural land owners hardly support conservation measures in the face of land scarcity.
- Massive destruction of cultural and economic trees useful to rural economies. Most of the indigenous trees protected under the common property utilization are destroyed in mechanized agricultural production thereby endangering the diversity of indigenous plant species

Egboh (1985), observed that forest and game reserves tenures were imposed on traditional communal land ownership system as natural resources sustain the rural economies for food, cash and shelter, their interests were accommodated in the reservation exercise. In the history of tropical forestry, the pattern of development has been due mostly to external factors. According to Adeyoju (1975), as it takes considerable number of years to obtain mature tropical trees of about 1.8m in diameter needed for processing in Europe, the colonial administration at that time, adjudged that continual supply of selected logs required reserving a high proportion of superficial land area. Thus, both in concept and purpose, tropical forestry generated concepts; the cause and magnitude of which are closely related to the nature and importance of rural economies (Adeyoju, 1975). While

forestry is now an established sector of tropical economies, its operational base, land, remain a source of debate and instability, principally, because of the exclusive requirements of forestry and its largely infeasible considerations which are at variance with the ingredients of peasant economics and traditional societies. The natives were made to understand that the reserves were created for their interests (Adeyoju, 1975). Tenures were imposed on economic trees in private lands and this caused a major conflict between government and rural farmers. The enforcement of tree protection regulation outside the reserves resulted in poor working relationships between the rural people and the government. This has made many rural farmers not to cooperate with foresters in tree planting campaigns on private lands (Bassey, 1990). The rural farmers view tree planting on their lands as an extension of forest reserves.

Nevertheless, the Land Use Decree of 1978 was an attempt by the Federal Military Government to correct some of the problems with the existing land tenure regimes in the country, to provide the country with a uniform land tenure system and to ensure equitable and secure access to land for productive purposes. While all land in each state is vested in the governor (except for land already vested in the Federal Government and its agencies) the Decree also acknowledged the role of customary land law. The strategy of the Federal Military Government was similar to that described by Cleaver and Schreiber (1990) in which governments in developing countries nationalize the ownership of land, relying on customary law to govern the use of some land, but allocating other lands to private investors and political élite groups. According to Egboh (1985), such a strategy undermines tenure security and accelerates the breakdown of customary tenure systems. For rural people whose survival depends on the land, any real or perceived threat to their access to land is a very serious matter. In spite of the land use decree, rural land owners still look onto the reserves as their traditional lands and there have been pressures from local communities for de-reservation. The growing demand for reserve lands for agricultural production has led to habitat loss of wild animals and reduction in diversity of indigenous plant species. This has generated conflict in resource use and management in Nigeria.

5.0 Bamboo tenure in Nigeria

There is no bamboo tenure in Nigeria. Bamboo is treated as one of the non timber forest products and members of the community have access to it. In most locations, bamboo is treated as a weed and is often subjected to annual fires. Bamboo development has been constrained by a number of issues. The most important one is that it is receiving limited financial input and no specific planning for development at both state and national levels. Thus, in Nigeria bamboo tenure is not treated separately from forest tenure as bamboo are also found situ in forest reserves and outliers. A study reported by RMRDC (2004) however indicated that a number of farmers are willing to cultivate bamboo on private lands if economic outlets can be found for the culms. These farmers have more confidence in managing bamboo forest than timber forest, as bamboo forest need less input and have shorter rotations (Ogunwusi, 2012a). The Nigerian government has not fully recognized the importance of bamboo and its role as a substitute to wood in major applications. Thus there is need for serious enlightenment programme to promote government interest in bamboo development in Nigeria.

6.0 Recommendations for developing bamboo resources in Nigeria

Nigeria's bamboo sector is wrought with problems among which are unplanned harvesting, lack of large organized bamboo industries, prevalence of low cost low added bamboo products, lack of research and lack of inventory data for bamboo lands.

The impediments to Nigeria's bamboo development are largely rooted in the country's overall problems with lack of secure forest tenure rights, poor government regulatory controls and disorganization. To solve these basic problems, Nigeria needs to start with some important steps to initiate bamboo sector development. This is imperative as the forest have been denuded of economic timber species. Most industries now rely on lesser used species with unverified properties. As bamboo utilization has been tested over time, it will be appropriate for policy makers to promote industrial utilization of bamboo in the country. For this to be feasible, the following recommendations have to be attended to.

- There is need for a national bamboo policy. The policy should spell out the objectives of bamboo development and provide detailed guidelines for implementation.
- Nigeria needs a bamboo inventory. It is necessary to determine the quantity and quality of bamboo that currently exists, their distribution and types of species and quality of stocks available. Many studies show the lack of reliable data on Nigeria's bamboo. This information gap needs to be filled before the country can develop a plan for bamboo development. This study can be carried out by the National Space Research and Development Agency in collaboration with the Federal Ministry of Environment.

- Establish an association of Nigerian bamboo producers which could help set up quality standards and implement effective quality control, provide a forum for the exchange of information and ideas, collaborate with government agencies to formulate favourable bamboo manufacturing policies with regards to export and import regulations and also organize business promotion activities and build marketing networks.
- The government needs to recognise users' rights of communities to the forest, including bamboo. Until tenure issue is resolved, the hostility between the government and forest dependent communities will continue. Bamboo management can only thrive under a stable system of tenure where bamboo growers can have management and user rights to the crops they grow and harvest.
- Government must promote bamboo tenure reforms. This could be done by giving farmers or groups who are committed to manage bamboo resources proper incentives. A bamboo cluster can be established to form the fulcrum for bamboo processing locally. A number of farmers have also shown interest in bamboo cultivation. These set of farmers should also be encouraged with adequate incentives.
- There is need for relevant agencies such as the Forestry Research Institute of Nigeria to partner with NGO's and donor agencies to transfer technology to local farmers and producers.

7.0. Guidelines for bamboo policy development in Nigeria

In most countries where bamboo has become an industrial raw material, emphases are always placed on policy guidelines to give schematic directions for bamboo development and utilization. According to Anderson (2005), policy is a principle or rule to guide decisions and achieve rational outcomes. It is a statement of intent and it is implemented as a procedure or protocol. Policies can assist in both subjective and objective decision making (Wikipedia, 2013). In Sri Lanka, the policy on bamboo development has led the Ministry of Industry to collaborate with United Nations Industrial Development Organization and Global Environmental Facility to develop bamboo (Dole, 2012). The collaboration exercise yielded a sum of \$24 million to be spent on bamboo processing (Dole, 2012). The aim of the project is to plant bamboo on 10,000 hectares of land by 2019 in order to generate 150,000 tones of dry bamboo annually and to create 10,000 direct and indirect employment opportunities. Likewise, the Philippine government promulgated Executive Order (EO) No. 879 on 4th May 2010 to prioritize bamboo production, processing and access to local bamboo markets (Dayanwansa, 2012). The government also directed that a minimum of 25% of the desks and other furniture requirements of public and elementary secondary schools, fixtures and construction works sponsored by government should contain a minimum of 25% bamboo components.

To promote industrial utilization of bamboo in Nigeria, Ogunwusi (2012a) advocated the need for a bamboo development policy to specifically promote the management of existing bamboo resources and the setting up of bamboo based industries. The policy is expected to promote establishment of appropriate institutions, scientific management, linkage between production and utilization, establishment of industries, preferential treatment of bamboo, formulation and implementation of growers friendly rules and regulations on growing, management, harvesting, transportation of bamboo and products, etc. This is necessary as the bamboo sector needs a comprehensive and long term support that only a national policy could provide.

8.0 Conclusion.

Bamboo is fast becoming a very important industrial raw material globally as a result of its multiplicity of uses. The development of bamboo in Nigeria cannot be fast tracked as the forest policy under which it currently operates does not give primacy to its development. Factors that will promote development of bamboo will include a well articulated bamboo policy that will lay down guidelines for its schematic development. The pattern of development advocated in this study will also assist most developing tropical countries that have experienced serious deforestation of their national forests, but, still have modicum bamboo resources. Development of bamboo in tropical countries has a lot of advantages. Among these is the development of the wood products sector of the different economies, reduction in the rate of deforestation and expansion in employment opportunities coupled with skills acquisition. It is explicit that with increase in marketing outlets, farmers will be encouraged to grow bamboo on private lands. It will also facilitate the sustainable management of tropical forests.

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