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Extraction of Wood for Fuel: a Threat to Landscape Conservation in Nigeria

Edmund I. Itanyi
Department of Archaeology & Tourism University of Nigeria, Nsukka
itanyiedmund@yahoo.com
John Kelechi Ugwuanyi
Department of Archaeology & Tourism University of Nigeria, Nsukka
john.ugwuanyi@unn.edu.ng

Abstract
Nigeria, a developing nation with the estimated population of 170 million people (Moghalu, 2013) has about half of this number residing in the rural areas where their effort towards the extraction of wood for fuel is highly recognized. Wood extraction for fuel is economical and serves as alternative to every other source of energy for cooking, parboiling of certain grains like rice, smelting, and smithing, among other things. This trend has gone beyond rural activities; rather, urban dwellers in Nigeria have joined. In their case, both dead and live woods were harvested, and in the newest approach, wood is reduced to charcoal and used for the same purpose. The magnitude of impact done on the landscape by this activity is what the local nationals are ignorant of and should be properly informed. Employing ethnographic techniques, this study investigated the diversified areas of wood extraction for fuel among Nigerians, the likely impact, and suggests the control and conservative measures through which the impacts can be mitigated.
Keywords: Wood Extraction, Fuel, Threat, Landscape, Conservation, Landscape Conservation, Nigeria

INTRODUCTIION

The population of Nigeria is growing faster than expected with its implication being felt on every aspects of human endeavor. And in a country with high poverty rate such as Nigeria, indiscriminate felling of trees is one of such effects of this rapid population growth. It seems to be a culture among the people, because it is economical, readily available and accessible. The expensive nature of other sources of energy in the country has succeeded in pushing families down the energy ladder. Despite the high population, Babanyara and Saleh (2010) have identified that fuel wood constitutes the main sources of fuel for cooking by over 76% of the Nigerian population, living only 24% to cooking gas, kerosene, electricity and so on.

In the recent past, wood extraction for fuel was a rural habit. Today, urban dwellers use wood fuel more than do the rural dwellers; wood is now harvested in large quantities and transported from rural to urban areas (see plate 6) for economic gains. Many people are now into the business of supplying firewood and/or charcoal to people (vendors) in urban areas. This development is what Babanyara and Saleh (2010) expressed thus, “this has found acceptance in urban areas and in a manner to which its demand is leading to the harvest of both dry and wet wood, as against the mostly harvested dead woods, dry branches and twigs”. On a similar view, Sambo (2005) discovered that Nigeria use 80 million cubic meters (4.3×109kg) of wood fuel for cooking and for other domestic purposes per annum. And this has constituted a threat to landscape conservation in Nigeria.

Recently, a shift is made from the direct use of firewood for cooking to the indirect use with the reduction of wood to charcoal. Before this, wood dust (saw-dust) was collected from timber shades and was used for fuel. In both inventions, wood dust and/or charcoal were used in a stove-like oven with little or no smoke being generated. The new technology encouraged more urban dwellers to resort to wood fuel for cooking/heating than every other energy source. It is important however, to explore areas where wood is used for fuel, expose the implication on the people and their environment and suggest ways through which this incessant felling of trees for fuel and the consequent effect on the environment can be controlled. And this forms the basis of this research.

Plate 1: Saw-dust stove-like oven

Plate 2: Two different types of charcoal oven in a dealer's shop

DATA COLLECTION

Complete participant observation was the major technique used for data collection. Both authors have lived in rural and urban areas in Nigeria for more than three decades and have in most situations participated in the harvest of wood for fuel. It was one of our routines as kids to embark on the search for fuel wood every evening while in the village, and as cosmopolitans of urban and rural dwelling, we have assisted in the purchase of fuel wood and (in the recent days) charcoal for domestic use at the urban city. We have keenly observed other activities that utilize wood for fuel such as bakery, smithing, parboiling of grains and many agricultural produce; and also the disappearance of some flora and fauna species and the crisis that had befallen energy sources in the country. However, the data gathered through observation were compared and crosschecked with literature. And the datedness of these literatures portrays the moments when important works of this phenomenon were undertaken.

DIVERGENCE OF WOOD EXTRACTION: FUEL WOOD USERS

Excess population cum urbanization in the country re-oriented many people/organizations to depend heavily on wood fuel as source of energy for several reasons. One of such reasons is the hike in prices of other sources of energy like electricity, cooking gas, kerosene and its stove etc. Wood fuel is affordable and readily available, unlike other sources that are recurrently scarce with constant hike in prices.

Because poverty seems to be endemic in Nigerian society, everyone is resorting to wood fuel for cooking among other things. The first users of wood fuel for cooking and heating were people at the rural areas. This category of users used wood directly, harvesting only dead woods, dry branches and twigs. It was when the trend extended to urban areas that the harvest of wet or life woods commenced. Saw-dust from wood were collected from timber shades and be used in a stove shaped oven. In another development, wood is reduced to charcoal, which is supplied to urban areas to be used as fuel in a stove-like oven; another type different from that of the saw-dust.

Plate 3: Charcoal oven in preparation for use

Plate 4: Cooking in progress

However, iron smelting and blacksmithing processes done in many Nigerian communities in the past and at present for the later required lots of charcoal/firewood from hard woods for fuel. When iron smelting was experimented on by Umundu smelters at the University of Nigeria, Nsukka, Okpoko and Ibeanu (1999) reported that the ratio of ore to charcoal in a layer was 1:3, which is one basketful of ore to three basketful of charcoal. If this is so, one can imagine the number of trees being harvested for smelting all over Nigeria, where there had been records of extensive iron smelting in the past. Yet, the bloom gotten from smelting will be furged by blacksmiths who will need another charcoal for the furging processes.

As agriculture continued to improve, there arose another need for energy to process agricultural products to be consumed. Processing of palm produce demands a large quantity of firewood. With the increased establishment of palm oil mills adding to the household processing, much trees were fell to supply firewood to these milling industries. In addition, the supply of wood to rice milling industries became imperative; hence, parboiling of rice necessarily required trucks of wood for fuel. Rice mills at Abakiliki/Afikpo in Eboyi state, Adani in Enugu state, Gboko/Alede in Benue state etc could be used as true testimonies to the above assertion. The demand for garri in Nigeria is alarming; thus, the rich and the poor appreciate this food for its affordability. Several metric tons of garri were produced on daily basis in Nigeria, demanding much firewood for the processing. Howbeit, these high exploitations of the environment are exerting much impact on the landscape there by threatening its conservation.

Notwithstanding, the ratio of bakery industries requiring firewood/charcoal in Nigeria is about 1:2, that is one urban centre is to two bakery industries. Olusegun (2009) succinctly maintained that the number of urban centers (settlements with population of 20,000 or more) increased from 56 in 1953 to 359 in 1991 and 450 in 2000. By this assertion, Nigeria will be having about 900 bakery industries operating on daily basis as at the year 2000. This number of bakery industries demand firewood/charcoal in trucks daily; the implication is that the environmental sustainability being preached by the government, NGOs, professionals (including all of us) will not be actualized in Nigeria. Being part of the millennium development goals, all hands must be on deck in the country to ensure the achievability of these goals.

Plate 5: Using firewood to power bakery ovens

Most of these indigenous and/or agro-based industries similarly demand for firewood/charcoal from hard wood. Preferably, firewood/charcoal supplied to them were made from trees like *Pentaclethra macrophylla, Aciona bateri, Dialium guineensis, Burkea africana,Parkae spp., Anacardium occidentalis, Chorophora excelsa, Pterocarpus soyauxii, Erythorpholeum guineense, Cylicodiensens gabonensis, Acacia nilotica, Tamarindus indicus,Gacinia cola,* and *Irvingia gabonensis*. Some other ones useful for fuel for whatever purposes are *Mangifera indica, Citrus sinensis, Canarium schweinfurhii, Detarium microcarpum, Chrysophyllum spp., Dacryodes edulis, Hevea braziliensis, Psidium guajava, Pennisetum Purpureum, Azadirachta indica* and so on. The existence of most of these tree species some of which are indigenous tree plants in Africa are threatened by extinction due to over exploitation.

Plate 6: Rural-Urban migration of firewood

Plate 7: A typical charcoal dealer's shop

THE IMPLICATIONS OF LUMBERING FOR FUELL WOOD

Of the 923,768sqkm total land area of Nigeria, open land cover about 910,768sqkm and water area 13,000sqkm (World Fact Book, 2010). Out of the open land area, 349,278sqkm is of natural forests and 97,047sqkm constituted forest reserves (Umeh, 1989 in Nweze, 2003). The murky lumbering activities in Nigeria have greatly reduced this forest cover, gradually unveiling a new landscape vegetation of derived savannah, and dessert. Babanyara and Saleh (2010) buttressed this point when they disclosed that between 1990 and 2000, Nigeria lost an average of 409,700 hectares of forest … and between 2000 and 2005, 6,145,000 hectares. Nigerian's relationship with the environment have gone through several stages; starting with the primitive times when human beings lived in a state of symbiosis with nature till this period of increased mastery over nature, culminating in this rapid material intensive growth pattern which adversely affected natural resources in many ways (Ofomata, 1980).

With much pressure on the biodiversity i.e. fuel wood extraction in addition to the high demand for timber, felling of trees for construction of industries, roads, houses etc, great damage is made on the landscape, paving way to all kinds of erosion, deforestation and dessert encroachment. With little plant cover to protect the land from wind and water erosion, precious topsoil may be blown off or washed away; further reducing the productivity of the land, inducing persistence decline in local per capital production (Ayogu, 2010) and per capital income. He (Ayogu, 2010) further argue that loss of vegetation culminate to a decrease in the rate at which groundwater is replenished, killing plants with shallow root systems including young trees. If this is true, then, it will also disturb hydrological cycle hence, a lot of water is needed from the groundwater which will be lost in form of vapour by transpiration to form cloud for rainfall. In this case, it may lead to drought. Consequently, UNCED (1992) opined that loss of vegetation causes the salt level in soil to rise, which results in deteriorating quality of water, and silting of rivers, streams and reservoirs.

The increased harvest of trees with its implication of deforestation exposes soil to ultra-violate rays/radiation, making soil loose moisture and causing soil infertility. According to Ani (1999), the stabilization of the global climate or filtering out of harmful ultra-violate rays by the stratospheric ozone layer will become impossible with the lost of vegetation, and the implication on humanity will be detrimental.

Continuous deforestation will actually end up in desertification. Okoye and Ezeonyejiaku (2010) stressed that desertification makes areas more flood-prone. Citing Bullock and Le Houorou (1996), they added that desertification reduces soil fertility, particularly based-cat ion content, organic matter content, pore spaces and water-retention capacity. The nag on soil infertility/low production as a result of deforestation and/or desertification is because it will actually result into food scarcity thus, bringing about extreme poverty and hunger to worsen the case in the present day Nigeria. Certainly, its continuation is a time bomb for Nigeria waiting to explode.

Moving forward to the implication on the environmental contents, flora and fauna species will be lost. Subscribing to this ideal, Nasiru (2007) recognized inter-alia that "some fauna species such as the Sitodunga Antelope, Chectah, Lion, Giraffe, and Elephants are endangered. Other endangered species are the Crowned Crane, the Bustard, Palearctic Migrants, Ostriches, Fulvov Tree Ducks etc". In the 70s, 80s and 90s, we use to sight different types of monkey, antelope, porcupine, wide lizard, bush pig and so on around rural areas of Nsukka in the southeastern Nigeria; today, these animal species have disappeared in the serenity of that area. What a sad but inevitable story to be told? Federal Department of Forestry (1997) cited in Nweze (2003) identified that there are over 4,600 plant species out of which 205 are endemic while about 496 species are threatened. This portrayed the gradual extinction of different plant and animal species in the country. The likely

question to emanate from this ugly situation is what future do we have for our environment?

Forest areas of Nigeria are turning to derived savannah due to the high demand for fuel wood. Nsukka area provides a veritable example. Nsukka is said to be forested in the past, but the demand for fuel for iron smelting eventually landed the vegetation to derived savannah. Communities that had similar iron smelting activities as do Nsukka suffer the same problem. The reverse effect is fuel wood scarcity, a stage where the exploitation exceeded regeneration bringing the smelting work to an end. Then, the question remains, was there a balance between forest regeneration and off-take?

Air pollution consisting of oxides, fumes, ash, dust and gaseous pollutants leads to airborne contaminants that eventually contaminated soils and vegetations surrounding rice mills, palm oil mills, smelting and blacksmithing sites, bakery industries etc. People living close to these industries as well as those working in them have experienced several health problems emanating from soot and smoke knowingly and unknowingly; most of whose death were met. World Bank (2006) estimated that 40,000 cases of chronic bronchitis occur yearly due to people's exposure to soot and smoke. In a recent report, World Health Organization cited in Premium Times (2013) says that over 98,000 Nigerian women die annually from the use of firewood. And it further explained that if a woman cooks breakfast, lunch and dinner, it is equivalent to smoking between three and 20 packets of cigarette a day. With all these problems, landscape conservation will ever remain an unrealizable dream that will ever be in the minds of the dreamer; just as the issue of environmental sustainability has remained a theoretical framework that works perfectly among academics but not in the real practical life among the local nationals.

CONTROL/CONSERVATIVE MECHANISM

Despite the economic nature of wood as source of energy, an adjustment must be inherent if the landscape is to serve same purposes to generations un-born. Though an adjustment to other energy sources is proposed here, efforts should be made to replenish the landscape that is currently facing a dreaded degradation. It is believed to be reversible at this point but must be done immediately before it looses its ecological balance which will make recovery very difficult.

Most importantly, Nigerian government efforts on the campaign for tree planting program should be prioritized to ensure the continued replacement of the trees already destroyed. Flagging off this campaign in Gombe state, Obasanjo (1999) in Mba and Mba (2003) expressed the importance of this program thus;

> this new dispensation requires all hands to be on deck for the rebirth, reconstruction, revival and rejuvenation of our nation and the society within. Our ardent desire should therefore be to see that our natural resources flourish as democracy takes root and the nation and its people prosper in harmony with nature. This should be reflected in our demonstration of efforts towards the protection of our progressive agrarian communities now struggling with the problems of gully erosion and desert encroachment through the viable option of tree planting.

Invariably, this dream was given a fair but short attention and has not been actualized. Here, we would want to provoke public enthusiasm for the love of saving the landscape of Nigeria by sticking to this tree planting program initiative. Concerned stakeholders such as the Nigerian Conservation Foundation (NCF), Forestry Association of Nigeria (FAN), Federal and State Ministries of Environment and so on, should as a matter of urgency invoke this afforestation program and pursue it rigorously. It will go a long way to revitalize the dreaded landscape.

Intermittently, this program can be on while other sources of energy are explored and harnessed properly. Among the numerous sources of energy that could provide an alternative were electricity (powered with solar energy, wind energy, water or hydro energy and coal), kerosene, cooking gas etc. Most resources needed to improve and/or tap these sources are naturally available in Nigeria but none can be relevant without government's support for research and development. Cooking gas and kerosene were already in use. Inversely, they are not affordable as a result of their constant scarcity and hikes in prices. Electricity is a major problem in Nigerian society today. It is not reliable and fails almost every hour of the day. The reliant on water/hydro power generating plants, which the government fails to harness properly, has failed in all capacity. The world is going with solar system though expensive yet, more reliable. Paradoxically, both water/hydro, solar and wind energy sources are renewable. The problem remains corruption which evokes poor management, maintenance and none encouragement of research for better options. Whatever way, these energy sources are expensive to harness. Coal is an alternative and will be more economical. The efficiency of converting coal into electricity matters: more efficient power plants use less fuel and emit less climate-damaging carbon dioxide…. Coal-fired plants provide over 42% of global electricity supply (International Energy Agency, 2010). And IEA suggests that coal is the least costly and most accessible fuel for some of the most developing economies which Nigeria in one. When coal is used for electricity generation, it is usually pulverized and then combust in a furnace with a boiler. Inman (2010) explained that the furnace heat converts boiled water to steam, which is then used to spin turbines

which turn generators and create electricity. He further stated that the efficient and clear way of coal combustion is a form of coal-water slurry fuel (CWS) first developed in Russia (since the Soviet Union time), which significantly reduces emissions there by saving the heating value of coal.

With several alternatives, Nigeria can relieve the landscape of the dreaded dilapidation caused by over dependent on fuel wood for cooking and heating. These alternatives can be concurrently tapped and harnessed to ensure sustainable energy supply in a large and highly populated-developing nation like Nigeria. Let us also hope that the recent privatization policy empowering private companies to own power plants will hold a water of hope for Nigeria.

SUMMARY AND CONCLUSION

In summary, the landscape conservation and environmental sustainability in Nigeria is hanging on a life support of a temporary over-exploited environment. The conservative level is low to carry the environmental sustainability forward. If the environment were to crash tomorrow, Nigeria as a nation will swim in extreme poverty and hunger and will depend on other nations of the world for survival thereby taking them back to a dependent nation – a notation that has partly become a history in the minds of many Nigerians since 1960 (though an illusion in the economic sector).

Presently, Nigeria is estimated to be harboring about 170 million people whose 76% (about 129 million) are dependent on fuel wood for cooking and heating; an activity that dominated the daily activities of every household in Nigeria with much industrial inclusions. If this percentage of fuel wood users is not reduced, by 2050 when the country's population will be three times the present population, the environmental resources will actually vanish and the people will face the effects as identified earlier. While trying to look at the politics around the oil rent in Nigeria, Soludo (2010) forecast that "in ten years' time, there will be about 212 million people in Nigeria, and about 520 million in 2052". He also proposed that the current system will be catastrophe for this population and suggested that the only option on the table is a dramatic CHANGE NOW. He maintained that oil and other natural resources must be regarded as a grant from God to build a sustainable future for Nigeria.

If the above projection comes true, what will be Nigeria's faith for the survival of these people especially when the environment is no more? Then, 76% of 212 million will be about 161 million and 520 million will be about 395 million people solemnly depending on fuel wood for cooking and heating. Frankly speaking, this will be a time bomb. We agree with Soludo's view of dramatic change now, where the renewable energy sources enumerated should be taped and harnessed with immediate effect. There is no gain saying that there will be a future for Nigeria if this environmental issue is not properly addressed. Funny enough, Nigeria is a member of the United Nation with the eight millennium development goals, enlisting environmental sustainability as one of such goals proposed since year 2000 to be met in 2015-just a year away from now. And nothing has been done on the environmental sustainability in Nigeria so as to join other countries of the world to celebrate the proposed world with much future and hope.

It is pertinent to state categorically that Nigerian government must support and encourage research to seek alternative source of energy for cooking and heating; a source that will be economical, affordable and renewable with little or no environmental and health risks. We further advocate for more public awareness on the hazards of deforestation and importance of afforestation.

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Dr. Edmund Ikechukwu Itanyi is a senior lecturer in the Department of Archaeology and Tourism, University of Nigeria, Nsukka. He obtained a B.A (Hons) degree in Archaeology and History in 1985, M.A (Hons) in 1990 and PhD in 2012 all from the University of Nigeria, Nsukka. He has a good skill in the cultural history of Igboland and had published widely in both local and international journals. He is an astute member of both national and international organizations such as Archaeological Association of Nigeria (AAN). He can be reached through his email: itanyiedmund@yahoo.com

John Kelechi Ugwuanyi is a Graduate Assistant in the Department of Archaeology and Tourism, University of Nigeria, Nsukka. He had his B.A (Hons) in Archaeology and Tourism in 2010 and M.A (Hons) in Cultural Resource Management and Tourism in 2013 at the University of Nigeria, Nsukka and graduated with first class honours and distinction respectively. He received the University of Nigeria award for the best final year student of his department in 2010. His research interests are Heritage Studies, Heritage Conservation, Empowerment Archaeology and Tourism. He can be reached through his email: john.ugwuanyi@unn.edu.ng