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SUSTAINABLE ECONOMIC DEVELOPMENT THROUGH EFFECTIVE UTILIZATION OF FOREST RESOURCES IN LAGOS AND OGUN STATES

Olabiyi O. S.

Department of Science and Technology Education, Faculty of Education, University of Lagos.

solabiyi@unilag.edu.ng

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Abstract
Although forest has economic significance to man and other living organisms, it remains one of the resources which faces many problems like deforestation for building settlement, construction of transport system, agriculture and burning of trees, leading to the disappearance of some valuable tree species. Therefore, this paper aims at determining the influence of forest settlers on; economic and social benefits relating to wood production, barriers connected to sustainable wood production and other forest products and forest management practices. Descriptive survey research design was used and data were obtained using a structured questionnaire from the sample of one hundred and four forest settlers in Lagos and Ogun states. The collected data were analysed using mean, standard deviation and independent samples t-test to test hypotheses at 0.05 level of significance. The findings revealed that forest increases national income due to the export of wood and other forest products which enable the government at all levels to run the activities and economic development smoothly. There is no significant difference between the mean responses of foresters and inhabitants regarding; the economic and social benefits relating to wood production in context of sustainable forestry; the barriers connected to sustainable wood production and other forest products and the forest management practices that can be used to sustain wood production and other activities. Based on the findings, it was concluded that management practices should be reinforced by effective policy to meet projected wood product needs without deforestation; and awareness should be made by the forest management to educate consumers on how to conserve the forests.
Keywords: sustainable forestry, wood production, economic development, utilization and natural resources

Introduction

The goal of sustainable development is to provide resources for the use of present populations without compromising the availability of those resources for future generations, and without causing environmental damage that challenges the survival of other species and natural environments. The concept of sustainable development recognizes that individual humans and their larger economic systems can only be sustained through the exploitation of natural

resources. To be truly sustainable, systems of resource use must not significantly degrade any aspects of environmental quality, including those not assigned value in the marketplace. A system of sustainable development must be capable of yielding a flow of resources for use by humans, but that flow must be maintainable over the long term. The sustainable development and utilization of natural resources and reserves is an area of critical importance to society given the fast growth and demand of new emerging economies and environmental and social concerns. In sustainable forestry, efforts are put into replacing almost all the resources we get from the forests, while extra care is taken to ensure that there is very little damage to nature and the natural environment. (Forest Resources Assessment, 2005)

However, sustainable forestry means more than just replacing trees as they are harvested, it also involves ensuring that there is no ecological damage to the surrounding environment. Sustainable wood refers to logs that had been harvested responsibly. Sustainable wood production is defined as the capacity of forests to produce wood, products, and services on a long-term basis and in the context of human activity and use (Robert & Seth, 2005). This necessitates that when one tree is cut down to be used, another is planted to replace it. For instance only old trees may be cut down, allowing younger trees to grow to ensure continuity, and trees are planted to replace the ones cut down in the forest. Forestry is the science and craft of creating, managing, using, conserving, and repairing forests and associated resources to meet desired goals, needs, and values for human and environment benefits (SAF, 2008) Forestry is practiced in farmsteads and natural stands. The science of forestry has elements that belong to the biological, physical, social, political and managerial sciences (Young, 2002). Modern forestry generally embraces a broad range of concerns, in what is known as multiple-use management, including the provision of timber, fuel wood, wildlife habitat, natural water quality management, recreation, landscape and community protection, employment, aesthetically appealing landscapes, biodiversity management, watershed management, erosion control, and preserving forests as sinks for atmospheric carbon dioxide.

Forestry is an important economic segment in various industrial countries. For example, in Germany, forests cover nearly a third of the land area, Bundeswaldinventur (2002) emphasized that wood is the most important renewable resource, and forestry supports more than a million jobs and about billion in yearly turnover. Forests are one of the most valuable natural resources in the world. More than one third of the world's population is reliant on what our forests can provide, from firewood to biomass fuels. Not only is wood unendingly useful but it is also indisputably beautiful, especially when it is used to create furniture or to build a home. The texture, the colour, the weight and even the imperfections in the grain come together to create truly unique

personalities for every piece of timber whether they are made into a dining table, a bookshelf or even a bowl. It would be so saddening if this priceless commodity were to disappear.

Fortunately, wood is a totally renewable resource, so it is critical that we remain conscious of our impact on the environment and do all we can to ensure that forests will be here for many generations to come. Forests help to correct the damage we have been doing to our environment since the Industrial Revolution. As we all know, trees produce the oxygen we need to live, and in fact one large deciduous tree produces enough oxygen in one season as ten people will inhale in a year. But it is the carbon dioxide the trees absorb that is really helping to rectify the damage we have done. Carbon dioxide is a greenhouse gas and since the beginning of nineteenth century, we have been emitting more than a healthy amount. Trees are working to absorb our carbon dioxide and help to reduce its damaging effects to our environment. It is necessary, therefore, that we make a conscious effort to recycle timber or replace the trees we have cut down so that our Carbon dioxide levels do not continue to contribute to climate change.

Trees are a source of fuel, poles, and building materials for high ground watershed inhabitants. The fruits, leaves, young shoots, and roots of trees also can be valuable food reserves for people in emergency situations. Trees are a source of food for livestock and browse for wildlife at times when herbaceous forage is not available. Trees can be planted in home gardens and parks, buffer strips along streets and sidewalks, and greenbelts around cities and villages to improve local environmental conditions. Trees play a vital role in maintaining the delicate ecological balance of arid and semi-arid environments. The roots of trees hold the often limited soil resources in place, control soil erosion, and help to stabilize steep slopes. Trees retained in windbreak plantings protect the site from accelerated Aeolian erosion, lessen evapotranspiration rates, and moderate air temperature extremes. Wood from working forests is the most responsible building material on earth. Natural, renewable, and climate friendly, wood is a vital part of the green economy of the 21st Century. From home building to innovative uses in modern architecture, to the thousands of products we use every day, wood is a sustainable, green material that is truly our most natural resource. There is more to forests than just a massive collection of trees. It is a natural, complex ecosystem, made up of a wide variety of trees, which support a massive range of life forms. Apart from trees, forests also include the soils that support the trees, the water bodies that run through them and even the atmosphere (air) around them. Forests of the world are a natural wonder that humans have sadly taken for granted. Forests provide many raw materials for the industries such as wood pulp which are used in the production of paper. By printing on paper we can produce newspapers, magazines and books which help us with an essential means of communication as well as in the education sector as learning and teaching

materials. Provide building materials, through lumbering such as timber, poles and logs which are key forest materials essential for building houses and settlement, timber items are made up of wood that touch our lives in more ways than we can imagine.

The level of employment in forestry is an indicator of both the social and economic value of the sector to society. Employment provides income and, as forestry activities occur in rural areas that are often poorer than the average, it gives some indications of the sector's contribution to poverty alleviation. In social terms, the value of employment allows individuals to become productive members of the society. Economic benefits are usually measured in monetary terms and may include: income from employment in the sector; the value of the production of goods and services from forests; and the contribution of the sector to the national economy, energy supplies and international trade. In addition, the economic sustainability of the sector can be assessed by measures such as the profitability of forest enterprises or the level of investment.

The social functions of forests according to the Forest Resource Assessment (2005) are often more difficult to measure and can vary considerably among countries depending on their level of development and traditions. For example, in developed countries, the benefits of forests for recreation and amenity values or the maintenance of a rural way of life may be most important, while in developing countries, the area of forests available for subsistence activities or the number of people employed in the sector may be a better indication of their social value. Given the difficulties of measuring the social benefits of forests, social functions are often measured in terms of inputs rather than outputs. Forests provide a wide range of economic and social benefits to humankind. These include contributions to the overall economy, for example through employment, processing and trade of forest products and energy and investments in the forest sector. They also include the hosting and protection of sites and landscapes of high cultural, spiritual or recreational value. Maintaining and enhancing these functions must be an integral part of sustainable forest management.

Historically, governmental motivations to populate the area and to convert it to agricultural lands were the major forces behind this deforestation. However in recent years, the tax incentives and subsidies that prompted this deforestation have been reduced. Besides the pressure of agriculture, at present, mining, industrial activities and especially logging for timber are becoming increasingly significant in the deterioration of forests. Although all these human activities exert a significant pressure on forest systems. The demand for food and fuel-wood among most of whom live below the poverty line, is causing progressive deforestation and land degradation, as well as the loss of biodiversity. The institutional framework for the conservation and sustainable use of natural

resources is inadequate, as are the relevant knowledge and resources. Also, fire was a major barrier to tree regeneration because it decreased species richness; species richness was more than twice as high in unburned compared with burned plots. (SAF, 2008)

Another barrier is irresponsible logging which is a real concern today as the demand for timber is rapidly rising, and for many companies, greed surpasses their environmental consciousness. Cutting of trees in excess of the sustainable production level in response to the growing needs of expanding human population is likely to lead to a downward spiralling of available wood resources that is difficult to reverse. Converting woodlands and forests to livestock grazing lands or agricultural croplands compound this problem. Incidences of wildfire and inadequately controlled fire that is set by people in this conversion process are other contributing factors. Applications of appropriate forestry practices are necessary to remedy this situation (Boris, 2014).

Applications of management practices to sustain wood production and other tree-based benefits require a knowledge of the inherent reproductive, growth, and survival characteristics of the trees in question. This knowledge has not always been available in the dry land regions of the world. Unfortunately, rural development strategies often neglect forests because forests have been mistakenly viewed as being outside the mainstream of agricultural development. In addition to the lumber and wood industry, the gathering and marketing of hundreds of forest products, such as forest fruits, fuel wood, and medicinal products, constitute an economic activity of enormous scale. As human populations grow and countries around the world become more affluent, the demand for wood products, both solid wood, pulp and paper, will increase.

There is a fun way to remember the most important points in forest preservation called TREES which means...

a. Teach others about the importance of the environment and how they can help save rainforests.
b. Restore damaged ecosystems by planting trees on land where forests have been cut down.
c. Encourage people to live in a way that doesn't hurt the environment.
d. Establish parks to protect rainforests and wildlife.
e. Support companies that operate in ways that minimize damage to the environment. (SAF, 2008)

The sustainable development and utilization of natural resources and reserves is an area of critical importance to society given the fast growth and demand of new emerging economies and environmental and social concerns, thus necessitating the study to determine sustainable economic development through effective utilization of wood as natural resources and other forest activities.

Statement of the Problem

Unfortunately, rural development strategies often neglect forests because forests have been mistakenly viewed as being outside the mainstream of agricultural development (Ralph, 2005). In addition to the timber and wood products industry, the gathering and marketing of hundreds of forest products, such as forest fruits, fuel wood, and medicinal products, constitute an economic activity of enormous scale (Smallidge, 2011). As human populations grow and countries around the world become more affluent, the demand for wood products, both solid wood, pulp and paper, will also increase. Trees in the woodlands and forests of the dry land areas of the world have often been mined more than managed as a renewable natural resource. Cutting of trees in excess of the sustainable production level in response to the growing needs of expanding human populations is likely to lead to a downward increase of available wood resources that is difficult to reverse. Converting woodlands and forests to livestock grazing lands or agricultural croplands compound this problem.

Applications of management practices to sustain wood production and other tree-based benefits require a knowledge of the inherent reproductive, growth, and survival characteristics of the trees. (SAF, 2008) This knowledge has not always been available in developing countries of the world, because of the inherently limited reproductive capacities, slow growth rates, and low yields of wood of the trees in these ecosystems. Incidences of wildfire and inadequately controlled fire that is set by people in this conversion process are other contributing factors. Applications of appropriate forestry practices are necessary to remedy this situation.

Purpose of the Study

The major purpose of the study is to determine sustainable economic development through effective utilization of forest resources in Lagos and Ogun states. Specifically the study determines the: economic and social benefits relating to wood production in context of sustainable forestry, barriers related to sustainable wood production, and forest management practices to sustain wood production and other activities.

Research Questions

1. What are the economic and social benefits relating to wood production in context of sustainable forestry?
2. What are the barriers connected to sustainable wood production and other forest products?
3. What are the forest management practices that can be used to sustain wood production and other forest activities?

Hypotheses

The following null hypotheses were tested at 0.05 level of confidence:

$Ho_{1:}$ There is no significant difference between the mean responses of foresters and inhabitants regarding the economic and social benefits relating to wood

production in the context of sustainable forestry.

$Ho_{2:}$ There is no significant difference between the mean responses of foresters and inhabitants regarding the barriers connected to sustainable wood production and other forest products.

$Ho_{3:}$ There is no significant difference between the mean responses of foresters and inhabitants concerning the forest management practices that can be used to sustain wood production and other activities.

Methods

The research employed the descriptive survey research design. One hundred and four (104) forest settlers in Lagos and Ogun states, Nigeria participated in the study. The instrument for data collection was a structured questionnaire. The instrument had four sections A to D. Section "A" sought information on personal data of the respondents such as inhabitant or forestry. Section B, C& D sought information on the three research questions. The questionnaire was subjected to face and content validation by three experts. The internal consistency of the instruments was determined using Cronbach Alpha. The reliability coefficient was $\alpha = .89$. The instrument was administered to the respondents through research assistants, and personal contact. Out of 104 questionnaires administered, 87 were duly filled and returned. These represented 84% rate of return. Data generated from the questionnaire were analysed using mean and t-test statistics at .05 level of significance.

Results and Discussion of Findings

Research Question 1: What are the economic and social benefits relating to wood production in the context of sustainable forestry?

Table 1: t- test Statistics of Mean Responses of the Respondents with respect to the economic and social benefits relating to wood production in the context of sustainable forestry.

S/No	Economic Benefits of forest and forest products	$\overline{X}_1$	$\overline{X}_2$	t-cal.	Sig-2 tail
1	Forest increase national income due to export of wood and forest products which enable government to run the activities and economic development smoothly.	3.71	3.69	0.10	0.97
2	Wood provide sources of fuels energy, such as firewood and charcoal which are very essential to societies mostly in rural areas.	3.67	3.65	0.29	0.76
3	Wood provide building material, through lumbering such as timber, poles and logs which are essential for building houses and settlement.	3.88	3.89	-0.08	0.93
4	Development of tourism sector; forest used as recreational agents because different types of species and wild animal are found within it.	3.70	3.72	-0.21	0.82
5	There is opportunity to create forest-related jobs through promoting a more environmentally conscious forest products industry.	3.89	3.89	0.15	0.87
6	Building constructed of wood consumes fewer natural resources and causes less harm to the environment than similar building materials.	3.58	3.59	-0.06	0.94
7	Forests provide many raw materials for the industries such as wood pulp which are used in the production of paper.	3.93	3.77	1.67	0.09
8	The value of employment derived from forest allowing individuals to become productive members of society.	3.69	3.68	0.13	0.89
9	Employment through forest provides income and forestry activities gives some indication of the sector's contribution to poverty alleviation.	3.50	3.50	0.02	0.98
10	It is a source of employment, people are employed in forestry or in forest conservation and this increase their living standard.	3.82	3.77	0.65	0.51
11	Forest lead to an improvement of transport network such as roads and railways to enable transportation of forest raw materials to the industries and tourist.	3.69	3.68	0.13	0.89
12	By printing on paper, newspapers, magazines and books help us an essential means of communication as well as in education system as learning and teaching materials.	3.79	3.78	0.15	0.87

Table 1 shows the results of the comparison between the mean responses of foresters and saw-millers regarding the economic and social benefits relating to wood production in the context of sustainable forestry. The data presented in Table 1 revealed that each of the items had a calculated sig 2- tailed value greater than 0.05. This implies that there was no significant difference between the mean responses of foresters and building saw millers for these items. With this result, the null hypothesis (Ho_1) of no significant difference was upheld at 0.05 level of significance for each item.

Research Question 2: What are the barriers connected to sustainable wood production and other forest products?

Table 2: t- test Statistics of Mean Responses of the Respondents with respect to the barriers connected to sustainable wood production and other forest products

S/No	**Barriers Relating to Wood Production**	$\overline{X}_1$	$\overline{X}_2$	**t-cal.**	**Sig-2 tail**
1	Wood is produced in ways that damage tropical forests in form of outright deforestation, in which forests are completely cut down and replaced by farms or pastures.	3.59	3.57	0.16	0.87
2	Lack of concerted effort to recycle timber or replace the trees cut down so that carbon dioxide levels do not continue to contribute to climate change.	4.53	4.32	0.26	0.78
3	Changes in land use as landowners seek higher returns by converting to agriculture or residential developments	3.69	3.68	0.13	0.89
4	Lack of perceived effectiveness of markets to increase quantities of timber or other forest outputs supplies in periods of rising prices	3.58	3.59	-0.06	0.94
5	Profitable use of land for forestry and related investments such as tree planting are affected by the conversion of forest land to developed uses	3.90	3.90	0.02	0.97
6	During logging, most trees are left standing, collateral damage from the logging process can harm several trees for each one cut down.	4.06	4.25	-1.58	0.11
7	Rules and regulations on farming, timber, and wood, as well as land use and preservation of forests are not encouraged and enforced.	3.68	3.68	0.01	0.99
8	The institutional framework for the conservation and sustainable use of natural resources is inadequate	3.78	3.79	-0.10	0.91
9	Rural development strategies often neglect forests because forests have been mistakenly viewed as being outside the mainstream of agricultural development	3.85	3.89	-0.30	0.76
10	Irresponsible logging is a real concern today as the demand for timber is rapidly rising, and for many companies greed surpasses their environmental consciousness.	3.90	3.90	0.02	0.97

The results of the comparison between the responses of foresters and saw millers regarding the barriers connected to sustainable wood production and other forest products are shown in table 2. Data presented in table 2 shows that each of the items had a calculated sig (2- tailed) value greater than 0.05. This implies that there was no significant difference between the mean responses of foresters and saw millers for these items. With this result, the null hypothesis (Ho_2) of no significant difference was upheld at 0.05 level of significance for all the items.

Research Question 3: What are the forest management practices that can be used to sustain wood production and other forest activities?

Table 3: t- test Statistics of Mean Responses of the Respondents with respect to the forest management practices that can be used to sustain wood production and other activities.

S/No	Management Practices Relating to Sustain Wood Production	$\overline{X}_1$	$\overline{X}_2$	t-cal.	Sig-2 tail
1	Management practices should be reinforced by effective policy to meet projected wood product needs without deforestation.	3.78	3.79	-0.10	0.91
2	Awareness should be made by forest management to educate consumers on how to conserve the forests.	3.79	3.79	-0.10	0.91
3	Forest managers should reconcile the needs of people for fuel and other tree-based products with the ecological benefits obtain from trees.	3.57	3.59	-0.17	0.86
4	Multipurpose tree species ideal for protecting and improving the fertility of soil while providing leaves and small branches for fodder without impairing agricultural cropping should be planted.	3.85	3.77	0.80	0.42
5	Prevention, protection, and, when necessary, control measures against wildfire, disease, and insects should be put in place in forests.	3.99	3.89	0.94	0.34
6	Natural and artificial reproductive methods, intermediate cuttings to achieve optimal tree growth should be encouraged by fosterers.	4.04	4.01	0.32	0.75
7	Applications of fertilizers, and other cultural treatments should be incorporated into woodlands and forests of many dry land ecosystems	3.98	3.95	0.31	0.75
8	Rotational periods and cutting cycles should be used to increase growth rates and yields of wood for the sustainable use of various tree species valued for fuel, poles, and other products.	4.00	4.00	0.00	1.00
9	Management actions should ensure that timber growth equals or exceeds harvest and that inventories are stable or rising.	3.82	3.81	0.08	0.93
10	Efforts should be made to educate industries and individuals on the value of forests resources and the dangers forests face and make people become more environmental friendly	3.69	3.68	0.13	0.89

The result in table 3 shows the comparison between foresters and saw millers regarding forest management practices that can be used to sustain wood production and other forest activities. Data revealed that each of the items had a calculated sig (2- tailed) value ranging between 0.18 and 0.98—greater than 0.05. This implies that there was no significant difference between the mean responses of foresters and saw-millers for these items. With these result, the null hypothesis (Ho_3) of no significant difference on the management practices that can be used to sustain wood production and other forest activities was upheld at 0.05 level of significance for all items.

Discussion of Hypotheses

The first null hypothesis sought to determine whether any significant difference exists between the responses of foresters and saw millers regarding the economic and social benefits relating to wood production in the context of sustainable forestry. The calculated sig (2-tailed) values for identified economic and social benefits were greater than 0.05. Consequently, the null hypothesis was accepted. It was therefore concluded that there was no significant difference between the mean responses of foresters and saw-millers regarding the economic and social benefits relating to wood production in the context of sustainable forestry. The findings in respect of the hypothesis agreed with the findings of Robert & Seth (2005) Who emphasized that forests provide a wide range of economic and social benefits to humankind in contributions to the overall economy through employment creation, processing and trade of forest products, energy investments in the forest sector in the area of hosting and protection of sites and landscapes of high cultural, spiritual or recreational value. Maintaining and enhancing forests is an integral part of sustainable forest management. The European Commission estimates that efficient and sustainable forest exploitation approaches can generate more environmental, economic and social advantages than any other land use (Silvia, 2015).

The t-test analysis between the mean responses of foresters and saw-millers on barriers to sustainable wood production and other forest products did not differ significantly, hence the second null hypothesis was accepted as the calculated sig (2-tailed) values for barriers to sustainable wood production and other forest products were greater than 0.05 level of significance. It was therefore concluded that there was no significant difference between the mean responses of foresters and saw-millers on the barriers to sustainable wood production and other forest products. The findings in respect to the hypothesis agreed with the findings of Silvia (2015) who identifies competition as a barrier. Silvia explained that the consequence of competition on the part of products manufactured starting from local wood is relatively small, and the high costs of the tree - falling activities limit the intensity of forest exploitation. Other problems, are lack of qualified staff and the fragmentation of the forest domain, triggering supplementary costs and a stringent need for a coordinated planning of the wood exploitation measures (Popescu, 2008).

The analysis of t-test between the mean responses of foresters and saw-millers on forest management practices that can be used to sustain wood production and other forest activities showed that the null hypothesis was accepted, as the calculated sig (2-tailed) values for identified management practices were greater than 0.05 level of difference. It was therefore concluded that there was no significant difference between the mean responses of foresters and saw-millers on the barriers to sustainable wood production and other

forest products as was observed in the mean responses of the two groups. The findings in respect of the hypothesis agreed with the suggestion of Silvia (2015) that forests should focus more on the adoption of sustainable production methods that strike a balance between the economic, social and environmental concerns. Also, Giurgiu (2004) opined that efforts should aim to improve the cooperation between forest owners, wood processing enterprises and retailers in order to improve the functionality of the elements of the supply chain between primary production, processing and trade. Also, it is necessary to avoid environmental degradation, the loss of biodiversity, the non-sustainable use of resources and the adoption of technologies based on high power consumption (Silvia, 2015). Ralph (2005) in his view, stressed that natural and artificial reproductive methods, intermediate cuttings to achieve optimal tree growth, applications of fertilizers, and other cultural treatments should be incorporated into woodlands and forests of many dry land ecosystems. Prevention, protection, and, when necessary, control measures against wildfire, diseases, and insects are also important (Boris, 2014). SFI (2011) suggests that there is a need for guidelines that will encourage nations to adopt better forestry laws because it will prevent timber imported from nations with inadequate laws. Other sustainable forestry practices according to Global Forest Resources Assessment (2005) should include the control of burning to encourage forest regeneration, continually monitoring the health of the forest, and working with local communities to ensure the preservation of cultural heritage related to the forest.

Conclusion

Based on the findings of this study, the conclusion was made that forests increase national income due to export of wood and forest products which enable government to run the activities and economic development smoothly; wood provides sources of energy, such as firewood and charcoal which are very essential to societies mostly in rural areas; forests provide many raw materials for the industries such as wood pulp which are used in the production of paper; employment through forest provides income and forestry activities give some indication of the sector's contributions to poverty alleviation; a lack of concerted effort to recycle timber or replace the trees cut down so that carbon dioxide levels do not continue to contribute to climate change; rules and regulations on farming, timber, and wood, as well as land use and preservation of forests are not encouraged and enforced are some the challenges the forest faces.

Recommendations

It was recommended that: management practices should be reinforced by effective policy to meet projected wood product needs without deforestation; applications of fertilizers, and other cultural treatments should be incorporated into woodlands and forests of many dry land ecosystems; efforts should be made to educate

industries and individuals on the value of forests resources and the dangers forests face that people could become more environmental friendly and prevent, protect, and, if and when necessary, control measures against wildfire, diseases, and insects in forests.

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