FORESTRY EDUCATION AND SUSTAINABLE FOREST MANAGEMENT IN SOUTHERN CROSS RIVER STATE, NIGERIA

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Abstract

This study examined forestry education and sustainable forest management in Southern Cross River State. To achieve the purpose of this study, two research questions and two research hypotheses were formulated to guide the study. The correlation research design was adopted for the study. A sample of 542 respondents were selected for the study. The selection was done through the purposive, systematic and simple random sampling techniques. A 4-point modified Likert-typed scale questionnaire was used for data collection. Pearson product moment correlation was the statistical tool used for data analysis. Data collected were analysed at 0.05% level of significance. Based on the findings, it was recommended among others that vigorous enlightenment campaign should be carried out in rural communities in order to re-orient the dwellers about the effect of bush burning, deforestation and other negative impact of depleting the forest ecosystem.

Keywords: Forestry education, forest management, community participation, indigenous knowledge.

Introduction

The issue of sustainable forest management has in recent times called for global discourse and debates in many countries of the world. Sustainable forest management is the judicious use of forest resources in a way that maintains the biodiversity, productivity, regeneration capacity and their potential to fulfil the present and future generation. Forests are gifts of nature and they contain all sorts of important natural resources. The importance of forest goes beyond the provision of physical needs of human; to exert tremendous impacts on our environment. The role of the forest in the environment and every living thing that depends on it directly or indirectly is indeed unique. Forests form an integral part of the biosphere, essential to the stabilization of global climate and the management of water and land resources. They are home to countless plants and animals that are vital elements of our life support system (Offiong, Offiong & Ekpe 2014).

Forest is the entire assemblage of organisms (trees, shrubs, herbs, bacteria, fungi, and animals, including people together with their environmental substrate (the surrounding air, soil, water, organic debris, and rocks), interacting inside a defined boundary. Forests are ecosystems in which the major ecological characteristics reflect the dominance of ecosystem conditions and processes by trees. Forest has the attributes of structure, function, interaction of the component parts, complexity (that reflects the structure, function and interactions) and change over time. The forest reduces extreme heat or cold air which is

essential for human existence and serves as carbon sink absorbing toxic gases emitted from industries and other human anthropogenic activities, thereby not allowing them become harmful to lives (Regal and Orphel, 2008). Forests play vital roles in controlling weather and climatic conditions which subsequently bear their influence in sustainable agriculture, stability of water bodies, reduce chances of flood, wild wind actions, and regulate the amount of rainfall during the year with seasonal variations. The cost on which man lies at birth, the buildings and furniture he uses at the various levels of his education, his endeavours in industry and agriculture, the accommodation and furniture he acquires, his diet and health sustaining systems, the armchair he relaxes at his old age, and the coffin or casket in which he returns to mother earth are forest dependent.

In spite of its importance, forest is plagued by several problems when viewed from different perspectives. Many forest lands have difficulties of reproducing and some cannot give maximum benefit to man, (Food and Agricultural Organization, 2005). Much of our forest resources have been lost through deforestation, lack of adequate sensitization of community members regarding sustainable forest management, logging, abuse of indigenous laws and regulation, unsustainable farming methods, uncontrolled bush burning amongst others. The consequences of these malpractices, includes loss of biodiversity, soil infertility, land degradation and exposure to agents of erosion.

Forestry education encompasses any situation in which people are directly or indirectly involved in forestry activities from which they can derive tangible benefits within a period (Ojo, 2011). Ojo also opined that Forestry education is the process of integrating indigenous and derived knowledge, attitudes and skills to determine what is needed, how it can be done, what local cooperation and resources can be mobilized and what additional assistance is available and may be necessary for forest sustenance. It helps people to examine problems which affect forest ecosystem and to consider if they may be solved, or at least alleviated, by using forestry techniques such as community partnership and indigenous knowledge within the range of their skills and financial resources. Forestry is not just a study but an act of managing the forest ecosystem for sustained yield of forest products. Therefore, when inculcated into the elementary stage of a child's education, it will not be easily neglected. This places the administration of forest resources in a position that will make available to forest users, knowledge and skills that would readily be accepted for conservation purposes (Ajake, 2012).

The need for forestry education even in an early stage of one's life is very important because it is a veritable tool for sustainable forest management. One of the ways of managing forest resources in the community is through community participation, which is seen as a tool to improve sustainable forest management and also as a means to alleviate poverty and promote equity in forested communities. White and Martin (2002) maintained that in recent years the inability of the State to control degradation of forest has been recognized in many countries of the world. Governments have seen the benefits of handing over forest areas to local communities under a variety of community participation.

Community Participation and Sustainable Forest Management

Community participation has been seen as a tool to improve sustainable forest management and also as a means to alleviate poverty and promote equity among forested communities. White & Martin (2002) maintained that in recent years the inability of the state to control degradation of forest has been recognized in many countries of the world. Governments have seen the benefits of handing over forest areas to local communities under a variety of community participation. White & Martin opined that sustainability regarding the forest

can be sufficiently and properly maintained if the community is giving the privilege to manage it for the betterment of the citizens.

The forest plays the central role in the economy of the community. FAO (2005), maintained that the forest of these communities has to meet various demands (fuel wood collection, timber exploitation, soil protection, etc). Majority of the dwellers are farmers and also practice agriculture that is heavily dependent on the forest. Secondly the community also demand commercial timbers and wood for industries and building purposes from the forest. There are also demands of ecological nature to maintain the forest cover for preventing of soil erosion and land degradation and to ensure the stability of the fragile ecosystem. The community forest has been occupied with cash crop like cocoa, cashew, pears, mangrove palm trees etc. as such it is the community members that knows much about their forest land thereby the inhabitant of this forest ecosystem have the right to incorporate their indigenous knowledge in the fight against excessive exploitation of these forest resources by introduction of binding forest (Ukwetang, Otu, & Neji, 2014).

Education and training of community members regarding forestry education are two weapons in the fight against poverty, destruction against natural resources, deforestation, and these two concepts help in rural development. Unfortunately, these two concepts are the most neglected aspects of rural development interventions by national governments and by donors. Right from the seventies, when there was considerable interest and investment in traditional agricultural education, new investments have been few (Atchoarena & Gasperini, 2003).

Community participation plays a prominent role in the hills of Nepal where agriculture and livestock rearing and forest are strongly interlinked. Based on the 1976 National Forestry Plan, the government of Nepal made a policy to involve local communities in forest management, with a view to tackling deforestation and the deteriorating state of the forest all over the country. By 2004 about 25% of all national forests, or around 1.1 million hacters, were being managed by Community Forestry User Groups (CFUGs). There are more than 13,000 CFUGs in the country, involving 1.4 million households (i.e. 35% of population) Kanel (2004), mostly in the hilly regions of Nepal. The Federation of Community Forest Users Nepal (FECOFUN) has grown over the years to become the largest organisation in the country (Penman, Gytarsky, Hirashi, Krug, Kruger, Pipatti, Buendia, Miwa, Ngara, Tanabe, and Wagner, 2003).

Indigenous Knowledge and Sustainable Forest Management

Indigenous knowledge is seen as a local knowledge held by indigenous peoples, or local knowledge that is unique to a given culture or society. This is different from western resource management systems which are designed scientifically to lock out feedback from the environment and to avoid natural perturbations. An indigenous person would look at nature and observe its vibrancy and meaning as well as regard it with awe and uncertainty, while a Westerner would see nature as an inanimate clock governed by simple, universal laws and behaves as an automaton which once programmed will continue to follow the rules inscribed in the program. Other names for indigenous knowledge include: ‘local knowledge’, ‘folk knowledge’, ‘people’s knowledge’, ‘traditional wisdom’ or ‘traditional science’. This knowledge is passed from generation to generation, usually by word of mouth and cultural rituals, and has been the basis for agriculture, food preparation, health care, education, conservation and the wide range of other activities that sustain societies in many parts of the world, Nakashima (2000).

Traditional knowledge and resource management can best be assessed in terms of their own long-term survival, as evidence of ecological sustainability. All groups of resource users have powerful, built-in incentives to conserve the resources on which they depend. In many cases they do conserve them, provided they can control access to the resources and can work out rules for collective action, that is, solve the exclusion and joint less problems of common-property resource management. Indigenous management systems have provided adaptations for societies to cope with their environment. In terms of operation, the indigenous systems are characterized by much closer attention to and much greater sensitivity of environmental feedback, such as declining local catches.

Rural communities in Nigeria are worst hit with respect to the impact of those trends on livelihood as they are generally primary procedures. With a large subsistent sector, and hence dependent on the natural resources systems of the forest, village wood is lost and community forest are disappearing across many settlements in Nigeria. It is coupled with the loss of water shed function of rivers and stream and rivers from domestic and agricultural discharge such as human defecation and agro-chemical was off into streams. The disappearances of plants and animal species of nutritional and economic value are also reported. Much on the Cross River forest, animal species such as the giant pangolin (manisgiganta), the leopard (*Panther pardus*), the elephants (*Loxondonta africana*), the bush cow (*Trangelifus* spp.), the Buffalo (*Syncerus caffer*), the giant porcupine has disappeared (Offiong, Offiong & Ekpe, 2014). The most pervasive of this being the shell nut (*Pega oleosa*), called "Nyore" among the Ejagham of the Cross River State. Ogunbode & Arnold (2012), opines that the fruit use for the local population, but the most common use is that edible vegetable oil is produced from the seeds. It is doubtful if successful rural development programmes can be embarked on that is not contextualized in developing and conserving the natural resources based on the population, as rural livelihood is largely depended on the sustainability of these resources.

Traditional knowledge and resource management can best be assessed in terms of their own long-term survival, as evidence of ecological sustainability, traditional African society-maintained production system that effectively conserved nature and even enhance biodiversity. The quality of the forest and what the forest provides are both dependent on the impact of forestry education resources.

Statement of the Problem

Despite the relevance of forest to the maintenance of a healthy environment, much harm has been done to the forest ecosystem in Southern Cross River. Unbridled logging, bush burning, over grazing, hunting and mining among others, are common in the study area and these unsustainable environmental practices endanger the existing forest resources in the area. The resultant effects of these unsustainable forest practices include climate change, global warming, drought, loss of biodiversity, loss of fertile land required for improved food product and so on.

Efforts of government through the establishment of forest laws, introduction of nomadic education to improve individual knowledge of the forest, awareness creation through television programs, giggles, radio, conferences among others to control the unwanted destruction of forest resources and its consequences has not yielded desired results. This unfortunate situation may be attributed to ignorance of rural farmers about the importance of the sustainable use of forest resources for continued human survival. This implies that farmers especially in the rural communities do not have the requisite

knowledge, skills, information, and ideas to exploit forest resources sustainably. It is against this background that this study seeks to investigate the relationship between forestry education and the sustainable forest management in the Southern Cross River.

Purpose of the Study

The purpose of this study was to determine the relationship between forestry education and sustainable forest management in Southern Cross River. Specifically, the purpose of the study was to;

(i) determine the relationship between community participation in forestry education and sustainable forest management.

(ii) examine the relationship between indigenous knowledge in forestry education and sustainable forest management.

Research Questions

The following research questions were formulated to guide the study

1. Does community participation in forestry education relate to sustainable forest management?
2. Does indigenous knowledge in forestry education relate to sustainable forest management?

Statement of Hypotheses

(i) There is no significant relationship between community participation in forestry education and sustainable forest management.

(ii) There is no significant relationship between indigenous knowledge in forestry education and sustainable forest management.

Methodology

The study was carried out in Cross River State of Nigeria. The correlation design was adopted for this study. This design is suitable for this study because it tries to discover relationships to make predictions. It uses one set of subjects with a couple of variables for each. According to Breakwell, Hammond & Fife-Schaw, (1995), this design enabled the researcher to observe two or more variables at the point in time and was useful for describing a relationship between two or more variables. The population of the study consist of 2,956 registered farmers drawn from four Local Government Areas in Southern Cross River State namely Akamkpa, Biase, Bakassi and Odukpani. The sample of this study consist of five hundred and forty-two (542) respondents drawn from twelve (12) villages in the four (4) selected Local Government Areas in Southern Cross River. The research instrument used for gathering the quantitative data from the sampled respondents was a 20-item structured questionnaire titled: Forestry education and sustainable forest management questionnaire (FESFMQ). The instrument was validated by three experts. These include two lecturers from the Department of Environmental Education and one from Measurement and Evaluation of the University of Calabar. Each of the experts was given a copy of the questionnaire to check the adequacy and correctness of the questionnaire items for the study.

Results

Hypothesis one: There is no significant relationship between community participation in forestry education and sustainable forest management. The independent variable in this hypothesis is community participation while the dependent variable is sustainable forest management, Pearson product moment was used to establish the association of the variables. Result is presented in table 3.

Table 3: Pearson product moment correlation of community participation and sustainable forest management

Variables	N	Mean	SD	r-value	Sig.
Community participation	542	18.50	2.29	-.339**	.000
Sustainable forest management	542	27.85	6.26		

**significant at p<.05; df = 540; critical r.value = .088

Result in table 2 shows that the calculated r-value of -.339 is greater than the critical r-value of .088 at p<.05 with 540 degrees of freedom. This implies that the null hypothesis which states that, there is no significant relationship between community participation in forestry education and sustainable forest management is by this result rejected while the alternate hypothesis is retained. It then follows that, the introduction of community participation among the populace within the confines of the forest ecosystem will help in the maintenance of the forest environment because the populace are the inhabitants of the forest and they are the custodians of the forest products as well as knowing by virtue of indigenous practices, the way the forest in that location should be maintained.

Hypothesis two: There is no significant relationship between indigenous knowledge and sustainable forest management. The independent variable in this hypothesis is indigenous knowledge while the dependent variable is sustainable forest management, Pearson product moment correlation coefficient analysis was used to establish the association of the variables. Result is presented in table 4.

Table 4: Pearson product moment correlation of indigenous knowledge and sustainable forest management

Variables	N	Mean	SD	r-value	Sig.
Indigenous knowledge	542	16.33	3.65	-.298**	.000
Sustainable forest management	542	27.85	6.26		

**significant at p<.05; df = 540; critical r.value = .088

Result in table 4 shows that the calculated r-value of -.298 is greater than the critical r-value of .088 at p<.05 with 540 degrees of freedom. This implies that the null hypothesis which states that, there is no significant relationship between indigenous knowledge and sustainable forest management is by this result rejected while the alternate hypothesis is

retained. It then follows that, indigenous knowledge has help in the maintenance of forest management in the rural communities because of the rules governing the various forest community.

Discussion of Findings

The result of the first hypothesis indicates that there is a significant relationship between community participation and sustainable forest management, the result shows that the calculated r-value is 0-.339 at 0.05 levels of significant which is greater than the critical r-value of 0.88 meaning that the null hypothesis was rejected and the (H_o) alternative hypothesis was retained. This agrees with the FAO (2005), the forest plays the central role in the economy of the community. The forest of these communities has to meet various demands (fuel wood collection, timber exploitation, soil protection, etc). Majority of the dwellers are farmers and also practice agriculture that is heavily dependent on the forest. Secondly the community also demand commercial timbers and wood for industries and building purposes from the forest. There are also demands of ecological nature to maintain the forest cover for preventing of soil erosion and land degradation and to ensure the stability of the fragile ecosystem. The community forest has been occupied with cash crop like cocoa, cashew, pears, mangrove palm trees etc. as such it is the community members that knows much about their forest land thereby the inhabitant of this forest ecosystem have the right to incorporate their indigenous knowledge in the fight against excessive exploitation of these forest resources by introduction of binding forest law etc.

The result of the second hypothesis indicates that there is a significant relationship between community participation and sustainable forest management, the result shows that the calculated r-value is -.298 at 0.05 levels of significant which was greater than the critical r-value of 0.88 meaning that the null hypothesis was rejected and the (H_o) alternative hypothesis was retained. This agrees with (Ukwetang, Otu, & Neji, 2014) that nature must be respected and held sacred. Disrespectful treatment of air, water, forest or some sacred animal could attract punishment from them ranging from diseases, drought, flood, poor harvest and health. When the forest is accorded such respect it, helps in conserving it. The gods can cause streams to dry up, if their abodes (forest) are volatile. The forest is sacred and strictly devoted to some gods, particularly, forest, streams or farmland or obtain farming activities or secrete days should be avoided in order not to offend the gods protecting them.

The ancestral spirits do live with human beings but their major places of abode are the water, air and forest. All these places must be handled with care to avoid offending the gods. Such beliefs promote forest conservation. Land, water, forest and air forces could be invoked for good or evil. The gods can be appeased too. To protect the fertility of the land, the gods living in the forest, water and air must be consulted at the beginning of the farming season. Culture has to do with certain practices, which are carried out by our people in ignorance of their conservation values. It includes the preservation of evil forest shrines, grooves and sacred water which pristine fauna and flora inhabit as their sanctuaries, thus preserving nature indirectly. Also, certain species preserved through totems and taboos. Some animal like pythons and some birds in some parts of Nigeria are declared sacred and therefore are not killed. They are thus allowed to grow and multiply for posterity to know them.

Conclusion

Based on the research findings, the following conclusions were drawn:

1. There is a significant relationship between community partnership in forestry education and sustainable forest management. The more community partners with other community in the fight against ignorance regarding the misuse of forest management the better the forest environment will be and also exposing more people on strategic skills about the maintenance of the forest.

2. There is a significant relationship between community participation in forestry education and sustainable forest management. This shows that community forest management is a strategy that will help the rural populace to be well educated and be informed about the exploitation of timber (logging) and other activities which constitute misuse of the forest resources.
3. There is a significant relationship between indigenous knowledge and sustainable forest management. This shows that when indigenous knowledge is practiced in our communities, the forest will be placed on higher esteem.

Recommendations

Based on the findings and conclusion of the study, the following recommendations were made:

1. Vigorous enlightenment campaign should be carried out in rural communities in order to re-orient the people about the effect of bush burning, deforestation and other negative impact of depleting the forest ecosystem.
2. Forestry education extension centres should be created in rural areas for enlightenment on tree planting.

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