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# SOCIO -ECONOMIC DIMENSIONS OF COMMUNITY PARTICIPATION IN BIODIVERSITY CONSERVATION AND FOREST RESOURCE UTILIZATION IN BOKI LOCAL GOVERNMENT AREA, CROSS-RIVER STATE

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## Abstract

*This study examined the Socio- Economic dimensions of community participation in Biodiversity conservation and Forest resource utilization in Boki Local Government Area, Cross River State. The study adopted a descriptive research design with two hypotheses. The population of the study comprised 60,000 farmers in Boki local Government Area of Cross River State who are registered under the Agricultural Development program in the State. Purposive sampling and simple random sampling techniques were adopted in selecting 409 registered farmers from six (6) communities in Boki local Government Area, Cross River State. Biodiversity conservation Questionnaire (BCQ) was used for data collection. Data collected were analyzed with One-way analysis of variance and independent t-test. The findings among others revealed that educational and income levels significantly influenced community participation in biodiversity conservation and forest resource utilization in Boki Local Government Area of Cross River State. The registered farmers with secondary and tertiary education as well as those of low and medium income levels participated more in biodiversity conservation and forest resource utilization respectively. Based on the findings and conclusion, it was recommended among others that regular environmental education and sensitization programs should be organized to increase community knowledge and awareness on the importance of biodiversity, ecosystem services and the consequences of forest resource depletion. This should target both literate and non-literate members of the community as well as diverse income levels or groups.*

**Keywords:** Community, Forest, Participation, Biodiversity, Conservation and Resource utilization.

## Introduction

Biodiversity conservation and forest resource utilization have emerged as critical components of sustainable development, particularly in regions where natural resources form the bedrock of local livelihoods and cultural practices. Biodiversity according to Texas Environmental Magazine, can be defined as a variety of life and its processes which include all life forms such as fungi, protozoa, bacteria and organisms consisting of plants, insects, fishes and mammals. Therefore, because of the obvious importance of biodiversity and biological resources and their usefulness to man, conservation has been a subject of great concern for many nations. The African biodiversity group has identical even major uses that need to be addressed in order to conserve biodiversity in Africa. There are people who value biological resources in different ways for different purposes,-spiritually, economically, culturally and scientifically. Forest ecosystems provide a wide array of ecological services including carbon sequestration, water regulation, soil fertility enhancement, and habitat for diverse flora and fauna (FAO, 2020). However, global biodiversity is under increasing threat from deforestation, habitat fragmentation, illegal logging, and unsustainable exploitation of forest resources, especially in developing countries where dependency on forest products is high.

In response to the above challenges, community participation has gained prominence as an effective strategy in biodiversity conservation and forest management. The concept of participatory forest management emphasizes the active involvement of local people in decision-making, implementation, and monitoring of conservation initiatives. It is based on the premise that communities who depend on forest resources are more likely to sustainably manage them

when given the right incentives, rights, and responsibilities (Pretty & Smith, 2024). Biodiversity has a wide array of benefits to human existence and could be seen as a source of life. Biodiversity refers to the variety of life forms found on the planet earth. Biological diversity refers to millions of plants, animals and microorganisms that live on our planet. According to Enuoh and Bisong (2014), Cross River State had 17 forest reserves as at when Nigeria attained independence from her colonial masters and most of these are situated within the geographical location of the present study area which is Boki Local Government Area in Cross- River state, Nigeria. The forest reserves (FR), where they are located and their sizes in terms of landmass are stated as follows; Afi River Forest Reserves (Boki; - 383.32km$^2$); some parts of agro-forest reserve (Akamkpa, Biase, and Yakurr - 46.62km$^2$), Boshi FR (Boki - 4144km$^2$), Boshi extension forest reserves (Boki - 67.34km$^2$) Cross River North forest reserve (Etung - 129.50km$^2$), Cross River South forest reserves (Etung and Ikom - 349.65mk$^2$), Ikom fuel-wood plantation (Ikom - 1.06km$^2$), Ikrijon forest reserve (Ikom - 5.29km$^2$), Okwangwo forest reserves (Boki - 468.79km$^2$), and the Ukpon River forest reserves (Obubra and Yakurr - 313.39km$^2$). In principle, local people own the forest but the management and control of forest reserves which cover around three quarters of forest area is vested on the State Government (Tropical Forest Management, 2015). Before the colonial era, the former Eastern Nigeria had successfully managed forest resources with little or no threat to the environment. This was checked by using traditional institutions such as the family (kingship) religious, town unions, Club, Clan and Kindred meetings among others.

Participatory resources management is often seen as an appropriate solution to reducing resource degradation and it is generally assumed that it would ensure the equitable and sustainable use of environmental resources through local participation, whereby communities would be engaged as stakeholders in managing the resources, thus ensuring commitment to long term management goals (Chukwuone, 2017). A study was carried out by the United States Forest Service (USES, 2010), to assess community participation in biodiversity conservation and forest resource management in Cross River State. This provided a report of great significance. The main objective of the study was to assess the current situation of forest management and wildlife conservation in Cross River State, and to investigate areas of possible technical support. for the state Forestry Commission. Instrument used were series of introductory meetings, technical exchange sessions and field visits. According to the final report, the mission found that, the Cross River State Government have banned logging activities and have put in place a task force to enforce the ban among others. However, anecdotal accounts to date suggests that the ban has prevented logging within the state. The ban and the task force were also apparently successful in slowing down the flow of illegal harvesting of timber. To strengthen the protection of biodiversity, communities in which resources are located were involved in the protection and conservation of their resources which they would benefit from. Stakeholders at the community level have been constituted and given boosters to enable them work. This synergy must be strengthened and encouraged wherever resources are located to reduce if not eliminate depletion.

Community participation and government policies have been ineffective in preventing illegal harvesting of forest resources (Ezenwaka, 2010). This is attributed to the lack of involvement of local people in the decision-making process, leading to the establishment of reservation areas that do not address their conservation needs. The above position could be attributed to the fact that most conservation policies in Nigeria have colonial undertones and do not consider the livelihood needs of local communities. These policies are often designed and imposed without regard for the importance of sustaining local livelihoods or the potential consequences of restricting access to resources.

Educational attainment improves individuals' understanding of environmental issues and the ecological importance of biodiversity. Educated individuals are more likely to comprehend the long-term implications of deforestation, species extinction, and ecosystem imbalance, which in turn fosters a stronger commitment to conservation efforts (Tilbury, 2021). Environmental

education equips community members with the knowledge to recognize the value of biodiversity and the consequences of its loss (UNESCO, 2020). Higher educational levels often translate into better engagement in community governance and resource management. Educated individuals tend to be more vocal in community meetings, capable of analyzing policies, and assertive in advocating for sustainable practices. This leads to more inclusive and democratic decision-making processes in conservation planning (Adams & Hulme, 2021). Communities with higher educational levels are more likely to adopt environmentally friendly practices such as agroforestry, selective logging, and wildlife protection. They are also more likely to accept and implement scientific innovations or policy recommendations introduced by conservation agencies or NGOs (Mehta & Heinen, 2021). Education facilitates the understanding of new technologies and management systems that aid conservation.

Over the past decades, biodiversity conservation in Nigeria has increasingly emphasized community participation, based on the understanding that conservation success depends on the involvement of local people whose livelihoods are closely tied to forest ecosystems (Adewumi & Ajayi, 2018). Among the key socio-economic determinants of community participation, income level stands out as a crucial factor. Income shapes people's dependence on forest resources, their willingness to adopt conservation-friendly practices, and their ability to bear the opportunity costs of conservation (Ayuk, Fonta & Ichoku, 2021). Low-income households in rural Nigeria often rely heavily on forest resources for survival. Forest products such as firewood, bushmeat, medicinal plants, fruits, and poles provide both subsistence goods and cash income (Popoola, 2019). In a study conducted around the Falgore Game Reserve by Aminu, Usman and Garba (2017), forest-derived income accounted for 20–60% of total household income, with poorer households being the most dependent. Similarly, Ayuk et al. (2021) found that forest income contributed significantly to the livelihoods of rural Nigerians, helping to reduce income inequality, yet reinforcing dependence on natural resource extraction. The degree of dependence on forests is inversely related to household income. Poorer households tend to exploit forests more intensively because they lack alternative income sources and face limited access to formal employment or markets (Chukwuone, Okeke & Osondu 2020). Conversely, wealthier households often have diversified income portfolios and can afford alternative energy sources such as kerosene or liquefied petroleum gas, reducing pressure on forests (Olabisi & Adesina, 2021) There is therefore the need to assess the influence of educational and income levels on community participation in biodiversity conservation and forest resource utilization in Boki Local Government Area, Cross River State, Nigeria.

## Theoretical background

**Socio-cultural theory of sustainability (Munasinghe 1993) guided this study**
This theory holds a view that, any location of a group of people (village, hamlet, town or city etc) is a social system, with interrelated sub-sets or social components such as human beings, forest, water bodies with all their faunal compositions. It argues that ethical values, beliefs and institutions develop needs. This,developing sustainable social and cultural practices could help manage renewable resources as well as other major challenges confronting socio-cultural systems. This is why most national socio-cultural systems with renewable forest resources have come to realize that they can no longer neglect the issues of intra-generational and inter-generational equity as a tool to promoting the sustainability of resources.

The implication of this theory to the present study is that the socio-cultural approach to forest management recognizes the centrality of social actions and institutions in sustainable use of renewable resources of the forest. Sustainability must be socially constructed to take cognizance of the fact that, the environment is at risk, not from extra-terrestrial enemies but from mankind .

The theory encourages the formation of policies modus operandi which could point the way to attaining the much-desired sustainable use of resources particularly forest resources. Therefore, by applying this theory, Community Participation in biodiversity conservation should prioritize stakeholders' interest and needs,in promoting human-biodiversity coexistence, Ultimately, this theory informs the need for effective conservation strategies that balance human needs with environmental conservation, resolving conflicts through mutually beneficial solutions.

**Statement of Problem**

The rural areas are replete with abundance of forest resources that host most of the biodiversity in Boki Local Government Area in Cross River State. Therefore, the effectiveness of biodiversity conservation in Cross River State is being compromised by inadequate consideration of human activities, particularly farming, timber businesses, hunting and poaching, chewing stick business among others, which are pivotal to the livelihoods of local communities. Despite their significance, the impact of these practices on biodiversity conservation and to attain sustainable development remains poorly understood, therefore leading to potential conflict between human needs and environmental preservation. The lack of clarity on the contribution of forest resource utilization to biodiversity conservation hinders the development of inclusive and sustainable strategies, ultimately threatening the long-term viability of conservation initiatives.

Despite government interventions and efforts of other non-state actors in the conservation sectors, there are still pressing. gaps. These gaps resonate with the likely challenges of the educational and income levels of community dwellers who participate in Biodiversity conservation and forest resource utilization particularly in Boki local Government Area, Cross River State. This study therefore examined the influence of educational and income levels of community dwellers on biodiversity conservation and forest resource utilization in Boki local Government Area, Cross River State.

**Hypotheses**

The following hypotheses were tested at 0.05 level of significance:

1. Educational level has no statistical significant influence on community participation in biodiversity conservation and forest resource utilization.
2. There is no statistical significant influence of income level on community participation in biodiversity conservation and forest resource utilization.

**Methodology**

Descriptive survey research design was adopted for the study. This research design was considered appropriate because it describes the existing representative population and situation necessary for proper generalization of the findings. The purposive sampling and simple random sampling technique were used to select a total of 409 farmers who registered with the agricultural development Programme in Boki Local Government Area of Cross River State. Biodiversity conservation and Forest resource utilization Questionnaire was used for data collection. Data collected were analyzed with one way analysis of variance and independent t-test statistic.

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## Results

**Hypotheses one:** There is no statistical significant influence of educational level on community participation in biodiversity conservation and forest resource utilization.

***Table 1: One-way analysis of variance of the influence of educational level on registered farmers with the agricultural development programme in Boki LGA of Cross River State.***

| Educational level | N | X | SD |
|---|---|---|---|
| No formal education | 21 | 25.7143 | 3.80976 |
| Primary level | 104 | 26.6923 | 3.93411 |
| Secondary level | 180 | 25.3167 | 3.95855 |
| Tertiary level | 101 | 28.0099 | 3.35409 |
| Total | 406 | 26.3596 | 3.94577 |

| Source of variance | SS | Df | MS | F | p-value |
|---|---|---|---|---|---|
| Between groups | 491.118 | 3 | 163.706 | 11.318 | .000 |
| Within groups | 5814.380 | 402 | 14.464 | | |
| Total | 6305.498 | 405 | | | |

**Significant at .05; df = 405*

The result obtained from analysis of data with respect to hypothesis one reveals that the calculated F.value of 11.318 is higher than the p.value of 0.000 at 0.05 significance level with 3 and 402 degree of freedom. These showed that the hypothesis was rejected. Therefore, there is a significant influence of educational level on community participation in biodiversity conservation and forest resource utilization in Boki L. G. A,Cross River State. Since the result of this analysis is significant, a Fisher Least Significant Difference was carried out to identify where the significance level was highest in terms of mean difference.

***Table 2: Fisher's Least significant difference of the influence of educational level on registered farmers with the agricultural development programme in Boki LGA of Cross River State.***

| Educational level | (J) | Mean Difference | Std. Error | Sig. |
|---|---|---|---|---|
| N No formal education | Primary level | -.97802 | .90984 | .283 |
| | Secondary level | .39762 | .87698 | .651 |
| | T Tertiary level | -2.29562* | .91211 | .012 |
| Primary level | No education | .97802 | .90984 | .283 |
| | Secondary level | 1.37564* | .46843 | .004 |
| | T tertiary level | -1.31759* | .53130 | .014 |
| Secondary level | No education | -.39762 | .87698 | .651 |
| | P Primary level | -1.37564* | .46843 | .004 |
| | Tertiary level | -2.69323* | .47282 | .000 |
| Tertiary level | No education | 2.29562* | .91211 | .012 |
| | Primary level | 1.31759* | .53130 | .014 |
| | Secondary level | 2.69323* | .47282 | .000 |

**The mean difference is significant at .05 level*

The mean difference between registered farmers with the agricultural development programme with primary education and those with secondary education was 1.37564. The mean difference between registered farmers with the agricultural development programme with primary education and those with tertiary education was 1.31759. The mean difference between registered farmers with the agricultural development programme with secondary education and those with tertiary education was 2.69323.

From the result presented in Table 2, the mean difference is highest between registered farmers with the agricultural development programme with secondary education and those with tertiary education (2.69323). The least mean difference is between registered farmers with the agricultural development programme with no formal education and those with secondary education (-.39762) respectively.

**Hypothesis two**

There is no. statistical significant influence of income level on community participation in biodiversity conservation and forest resource utilization.

**Table 3: One-way analysis of variance of the influence of income level on registered farmers with the agricultural development programme in Boki LGA of Cross River State.**

| Income level | | | N | $\bar{X}$ | SD |
|---|---|---|---|---|---|
| Low | | | 165 | 27.6364 | 4.11732 |
| Medium | | | 121 | 23.9835 | 2.31655 |
| High | | | 120 | 27.0000 | 3.97471 |
| Total | | | 406 | 26.3596 | 3.94577 |
| Source of variance | SS | Df | MS | F | p-value |
| Between groups | 1001.349 | 2 | 500.674 | 38.040 | .000 |
| Within groups | 5304.149 | 403 | 13.162 | | |
| Total | 6305.498 | 405 | | | |

**Significant at .05*

Table 3 revealed that the null hypothesis was rejected while the alternate hypothesis was retained. The result obtained from analysis of data reveals that, the calculated r-value of 0.194 is greater than the critical r-value of 0.138 when tested at 0.05 level of significance with 198 degree of freedom. This implies that, there is a significant influence of income level oncommunity participation in biodiversity conservation and forest resource utilization in the area of study

***Table 4: Fisher's protected t-test of the influence of income level on registered farmers with the agricultural development programme in Boki LGA of Cross River State.***

| Income level | (J) | Mean Difference | Std. Error | Sig. |
|---|---|---|---|---|
| L Low | Medium | 3.65289* | .43421 | .000 |
| | High | .63636 | .43526 | .145 |
| Medium | Low | -3.65289* | .43421 | .000 |
| | High | -3.01653* | .46739 | .000 |
| High | L Low | -.63636 | .43526 | .145 |
| | Medium | 3.01653* | .46739 | .000 |

**The mean difference is significant at .05 level*

Fisher's Least Significant Difference (LSD) was used to further identify where significant difference among the various income level groups was highest in terms of mean difference. The

result shows that the mean difference between registered farmers with low and medium income was 3.65289. The mean difference between registered farmers low and high income was .63636. The mean difference between registered farmers with medium and high income was 3.01653. From the result presented in Table 4, the mean difference is highest between registered farmers with low- and medium-income level (3.65289) while the least mean difference was between registered farmers with low- and high-income level (63636) respectively.

**Discussion of findings**

The finding with respect to hypothesis 1, showed that the hypothesis was rejected. The implication of this finding is that there was a significant influence of educational level on community participation in biodiversity conservation and forest resource utilization in Boki Local Government Area of Cross River State. The reason for this finding could be that education empowers an individual to make informed decisions. The finding is in line with that of Mehta and Heinen (2021) which asserted that communities with higher educational level are more likely to adopt environmentally friendly practices such as agroforestry, selective logging, and wildlife protection. They are also more likely to accept and implement scientific innovations or policy recommendations introduced by conservation agencies or NGOs. Naturally,education facilitates the understanding of new technologies and management systems that aid conservation. Similarly, UNESCO (2020) asserted that environmental education equips community members with the knowledge to recognize the values of biodiversity and the consequences of its loss.

The finding of the Study with respect to hypothesis two showed that the null hypothesis was rejected. The implication of this finding is that there was a significant influence of income level on community participation in biodiversity conservation and forest resource utilization in Boki Local Government Area of Cross River State. The reason for this finding could be because income level not only affects forest dependence but also determines the capacity and motivation to participate in conservation initiatives. The finding of this study agrees with that of Okwang and Effiom (2019) which reported that household income significantly influenced participation in forest conservation programs, with higher-income households showing greater engagement. They attributed this to better access to information, education, and mobility among wealthier individuals. In addition, Arifalo (2024) found that in Ondo State, households with higher income levels demonstrated a stronger willingness to engage in conservation activities, particularly when financial or livelihood incentives were attached. The study emphasized that economic stability enhances conservation participation, as households with secure livelihoods are better positioned to commit time and resources to long-term environmental initiatives.

**Conclusion**

This study established that, educational and income levels have significant influence on community participation in biodiversity conservation and forest resource utilization in the study area. Therefore, for biodiversity conservation and forest resource utilization efforts to be successful and sustainable, there is the need to strengthen community engagement across educational and income levels through inclusive policies, capacity-building programs, benefit-sharing mechanisms, and participatory governance structures. The study therefore concludes that a people-centered, participatory approach is vital for achieving long-term biodiversity conservation and sustainable forest resource utilization.

## Recommendations

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

1. Regular environmental education and sensitization programs should be organized to increase community knowledge on the importance of biodiversity, ecosystem services, and the consequences of resource depletion. This should target both literate and non-literate members of the community.
2. Government and conservation agencies should introduce benefit-sharing schemes and reward systems (e.g., payment for ecosystem services, community development projects) to motivate local communities to engage in sustainable forest management practices.
3. Conservation programs in Nigeria should include transparent and equitable benefit-sharing mechanisms that ensure poor and marginalized households receive tangible rewards for participating in biodiversity protection.

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