

## **EDUCATIONAL STATUS AND RESOURCE CONSERVATION IN TROPICAL RAINFOREST IN CROSS RIVER STATE, NIGERIA**

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### **Abstract**

This study investigated the influence of community members' educational status and resource conservation practices in tropical rainforest in Ikom Education Zone of Cross River State. A survey design was adopted for the study. Study's population was made up of all rural dwellers in the study area. Sample was drawn using purposive sampling procedure with a sample of 555 respondents drawn for the study. A 20-item questionnaire tagged "Community Members' Educational Status and Resource Conservation Practices in Tropical Rainforest Questionnaire" (CMESVRCPTRQ) was utilized to collect data. Cronbach Alpha was used to estimate the reliability of the instrument. The hypothesis formulated for the study was analysed using One-Way Analysis of Variance (ANOVA) and tested at .05 level of significance. The findings revealed that educational status had a significant influence on resource conservation practices in tropical rainforest. Recommendations included that; awareness should be created amongst locals in proximity of tropical rainforests on the uniqueness of the forest's services towards each of the environment and mankind.

### **Introduction**

Forests and their resources are natural endowments which are of immense value to both man and his environment. Among all forest types, the ones within the tropics generally known as tropical rainforests are the most endowed. Despite covering only about 6% of the earth's terrestrial surface, the tropical rainforest is renowned for many environmental and ecological services such as climate mitigation, source of natural oxygen, air and water purification, soil and water conservation, flood regulation, natural habitat provision for fauna and flora species, etc.,

Its uniqueness is even more pronounced when it is taken into cognisance that; (i) it houses more than half of all the world's biodiversity and two-thirds of the world's fauna and flora species; (ii) it stores about half of the world's terrestrial carbon; (iii) it houses a variety of highly valued and exotic flora and fauna endemic to its habitat;

(iv) it is known as the “world's largest pharmacy” as many of its plants have been found to be effective against a wide variety of diseases even as it is estimated that only 2% of its plants' potentials have been discovered in terms of herbal/medicinal value, and; (v) its Non-Timber Forest Products (NTFPs), logging and ecotourism services are valued in excess of \$500bn annually (by far the highest amongst all forest types) and it serves as the source of livelihood for more than 2.5 billion rural people (also the highest of all forest types) (Takon and Amalu, 2013; Philip, Akintoye, Olorundami, Nkpena, Ukata & Harrison, 2014).

As at 1960, Cross River State had 17 forest reserves with most of them being situated within the central part of the state (Enuoh and Bisong, 2014). The Forest Reserves (FR) within the state's central part, their locations and sizes in terms of landmass are – Okwangwo FR (Boki – 468.79 km<sup>2</sup>); Afi River FR (Boki – 383.32 km<sup>2</sup>); Cross River South FR (Etung & Ikom – 349.65 km<sup>2</sup>); Ukpon River FR (Obubra & Yakurr – 313.39 km<sup>2</sup>); Cross River North FR (Etung – 129.50 km<sup>2</sup>); Boshi Extension FR (Boki – 67.34 km<sup>2</sup>); some part of Agoi FR (Akamkpa, Biase & Yakurr – 46.62 km<sup>2</sup>); Boshi FR (Boki – 41.44 km<sup>2</sup>); Ikrigon FR (Ikom – 5.29 km<sup>2</sup>), and; Ikom Fuelwood Plantation (Ikom – 1.06 km<sup>2</sup>). These amounted to 1806.40 km<sup>2</sup> as at the time.

In 1994, a Forest Inventory Report carried out within the state revealed the following - Afi River FR (31% cleared); Agoi FR (33% cleared); Boshi FR (51% cleared); Boshi Extension FR (35% cleared); Cross River North FR (61% cleared); Cross River South FR (21% cleared); Ikom Fuelwood Plantation (100% cleared); Ikrigon FR (100% cleared); Okwangwo FR (now part of the Cross River National Park), and the Ukpon River FR (16% cleared) (Cross River State Government (CRSG), 1994), thus totalling 387.83 km<sup>2</sup> (21.45% of the 1806.40 km<sup>2</sup>) as at the time. The drivers fingered for the deforestation situations faced by the forests were clearing and burning the forest for agro-based purposes (establishment of large scale mono-crop plantations, logging and fuel-wood extraction). Attendant issues of unsustainable harvesting of NTFPs, poison-based hunting and fishing techniques, and unauthorized poaching were also mentioned as factors which contributed to the situations faced by the forests.

Investigating the conservation practices of the adjoining community members could yield ecological, environmental and socio-economic benefits. The forest (the Lower Guinean Tropical Rainforest) is a rare type of tropical rainforest endemic to West Africa. Within this unique forest are threatened endemic fauna and flora such as the Cross River gorilla (*gorilla gorilla dielhi*), the bare-headed rock fowl (*picathartes oreas*), Sclater's guenon monkey (*cercopithecus sclateri*), the African rainforest elephant (*loxodonta cyclotis*) and some exotic flora species such as *habenaria prionociaspedon* and *cola philippi jonesi* (Odey, Eyamba & Chapman, 2006; Borokini, 2014). Already, fauna species such as the black duiker (*cephalophinae niger*), bush cow (*syncerus caffer brachyceros*), leopard (*panthera pardus pardus*), water chevrotain (*hyemoschus aquaticus*) and the giant pangolin (*smutsia gigantean*) are believed to be extinct within the area (Enuoh and Bisong, 2014). In addition to the fauna species, Bisong and Buckley (2014) reported that about half of the 86 commercially exploited tree species within the area were identified as being threatened towards extinction with some species requiring urgent conservation attention.

As for loss of NTFP species, Ogar, Bisong and Eka (2016) revealed how logging activities within the area had grossly depleted a wide variety of them towards the brink of being critically endangered. In 2009 the area was included amongst the Global Biodiversity Hotspots. In conservation parlance, a Global Biodiversity Hotspot is an area which has less than 25% of its original biodiversity left. Designating the area as a Global Biodiversity Hotspot was because of the subsequent Forest Inventory Reports in 2003 and 2006. The reports not only revealed further alarming levels of deforestation but also projected that the state's forests and its resources to disappear completely by 2033 based on the current rate of deforestation. Environmentally, decimating the forests ensures that their ability to provide services to the earth's life support system declines drastically, giving way for global warming and its attendant consequences. Lack of forest cover also ensures habitat destruction thereby bringing about undesirable changes in ecosystem functioning that could affect water and soil conservation adversely. Most importantly a drastic decrease in the production of natural oxygen could occur, thus leading to a change in the environment's natural air composition. Socio-economically, deforestation could cause untold hardship to the community members, due to their dependence on the forest as their source of livelihood. A wide range of diseases/ailments could remain incurable if attention is not paid towards the community members' forest conservation practices. Lastly, a wide range of products and resources obtained from the forests could become very scarce thereby upsetting the pattern of livelihoods of the community members.

There are many presumed determinants which could be linked with community members' resource conservation practices in tropical rainforests. Research works have shown that their educational status could serve to influence positive or negative resource conservation practices in the forest. In research parlance, educational level is a variable that refers to an individual's years which such an individual has spent schooling. Most studies have revealed that the more the number of schooling years, the more conservation prone would such an individual be (Badola, Barthwal & Hussain, 2012; Braga and Schiavetti, 2013) while few have revealed educational level as having an insignificant influence on locals' resource conservation practices (Daksa & Kotu, 2015; Mutanga, Vengesayi, Gandiwa & Muboko, 2015). Thus, it is premised that community members' educational status can possibly serve to influence their resource conservation practices in tropical rainforests. In line with the above stated presupposition, this study investigated the influence of community members' educational status on resource conservation practices in tropical rainforest in Ikom Education Zone of Cross River State, Nigeria.

#### Statement of problem

Hectare for hectare, the tropical rainforests house more species, wildlife biodiversity, store much more carbon than any other terrestrial vegetation type thus producing higher amounts of oxygen despite of its relatively smaller size comparable to non-tropical forest types. In addition, among all forest types, they serve the highest number of rural people on earth. These facts imply that they play very strategic roles towards the continuous existence of each of the earth's life support system and man's survival. The forest within the area is a rare type only typical of West Africa, thus providing habitat for some flora and fauna species both endemic and non-endemic to the area. Recent reports have revealed a high level of deforestation with projections being made that the forests and its resources will

disappear long before mid-21st century. Despite designating the area a global biodiversity hotspot, unsustainable tropical rainforest conservation practices continue unabatedly.

Issues of forest clearings for large scale mono-crop agricultural land uses coupled with slash and burn practices decimate the forest immensely from an agro-based dimension. From the commercial dimension, logging and fuel-wood extraction have also contributed a very significant quota towards the fast rate at which the forest is disappearing. On a much lower scale though with significant impacts on the forest and its resources are aspects of harvesting NTFPs unsustainably, unauthorized poaching and usage of chemicals/poisons for hunting and fishing. Based on the issues stated above, this study inquired the following – to what extent do community members' educational status influence their resource conservation practices in tropical rainforest within Ikom Education Zone of Cross River State, Nigeria?

#### Purpose of the study

The purpose of the study was to investigate the influence of community members' educational status on their resource conservation practices in tropical rainforest in Ikom Education Zone of Cross River State.

#### Research hypothesis

Educational status has no significant influence on resource conservation practices in tropical rainforests

As a concept, educational status could refer to a general category of a formal schooling stage which an individual is currently undergoing learning experiences (nursery, primary, secondary or tertiary) or a specific class in any of the aforementioned general categories of formal schooling stages. An individual's educational status is an important indicator of the number of years spent schooling and also could be used to determine the type of certificate(s) obtained upon graduation from a particular schooling stage. For researchers, this variable is a veritable source of insight into an individual's knowledge, attitude and behaviour in any given context due to researchable evidences of the effect of education on an individual. Education not only changes an ignorant mind to an enlightened one, it also transforms an illiterate person to become literate.

Barthwal and Mathur (2012) evaluated locals' knowledge of and attitude concerning wildlife conservation and assessed association between education level and attitude towards wildlife conservation. Result indicated no significant association between education level and teachers' attitude towards wildlife conservation. Indicators of land management practices among farmers were examined by Raufu and Adetunji (2012) who evaluated educational level as an indicator of practicing land-use management techniques such as fallow, crop rotation and crop residue. They found out that secondary and tertiary education levels were significantly associated with each of crop rotation and fallow land-use management techniques, respectively. Attitudes of locals towards conservation of mangrove forests were investigated by Badola, Barthwal and Hussain (2012). Ascertaining predictability of number of schooling years on co-operation towards conservation and associated conservation development programmes revealed number of schooling years as a statistically significant indicator of conservation prone tendencies.

Attitudes and local ecological knowledge of fishermen concerning conservation and by-catch of sea turtles was examined by Braga and Schiavetti (2013). Educational level was found to serve as a statistically significant correlate of attitude towards turtle conservation. An evaluation of attitudes towards community-based conservation vis-à-vis management of mangrove rehabilitation was probed by Abdullah, Said and Omar (2014). Educational level was found to be significantly associated with willingness to pay (WTP) for community-based conservation of the mangroves. Daksa and Kotu (2015) determined the predictability of educational level on locals' propensity to engage in the non-conservative act of deforestation. The finding revealed educational level as an insignificant indicator of engaging in the non-conservative act of deforestation. Mir, Noor, Habib and Veeraswami (2015) assessed rural dwellers' attitudes toward conservation of wildlife and their habitats and revealed educational level as an insignificant indicator of dispositions toward conservation of wildlife and their habitats.

An economic valuation of mangrove ecosystems was investigated by Hema and Devi (2015). Examining educational level as a predictor of WTP for conservation of mangroves revealed educational level as a statistically significant determinant of WTP for mangroves' conservation. Also, it was revealed that those with higher educational attainment indicated higher WTP than those with lower educational attainment. Locals' perception of forest resources' conservation vis-à-vis tourism was researched by Mutanga, Vengesayi, Gandiwa and Muboko (2015). Educational level and perceptive dispositions towards the protected areas was correlated. Result revealed level of education serving as an insignificant correlate of dispositions. Al-Subaiee (2016) assessed socio-economic determinants of natural woodlands' conservation. Association between level of education and usage of each of wood and electricity for cooking revealed level of education as having a statistically significant association with usage of each of electricity and wood.

Rural dwellers' attitudes towards forest conservation were researched by Garekae, Thakadu and Lepetu (2016). The predictability of educational level as an indicator of favourable disposition towards conservation revealed it as a statistically significant positive indicator of attitude towards forest resource conservation. Digun-Aweto, Fawole and Ayodele (2016) examined dispositions towards ecotourism and evaluated formal education level as a predictor of attitude towards a national park. The result revealed level of education as a negative but significant determinant of dispositions toward conservation. This meant that the lower the number of schooling years, the more unfavourable dispositions and vice versa. Rasolofoson, Ferraro, Ruta, Rasamoelina, Randriankolona, Larsen and Jones (2017) evaluated effect of joint forest management on well-being of locals and assessed educational level as a driver of impacting on community forest management. Result indicated that positive impacts on management of community forest was accompanied by increase in level of education while low levels of education was accompanied by negative impacts on management of the forests.

## METHODOLOGY

A survey design was utilized for the study. The study was conducted in Ikom Education Zone of Cross River State. The population comprised all rural community dwellers in the area while purposive sampling technique was employed to select 555 respondents for the study. A questionnaire tagged "Community Members' Personal

Variables and Resource Conservation Practices in Tropical Rainforest Questionnaire" (CMPVRCPTRQ) was used for data collection. The reliability estimate method used was Cronbach Alpha and the result revealed the consistency to be .78 while One-way ANOVA was used for data analysis.

### **Results and discussion**

The study's hypothesis stated that educational status has no significant influence on resource conservation practices in tropical rainforest of Ikom Education Zone. The hypothesis was analysed using One-way ANOVA, tested at .05 levels of significance and presented in Table 1.

**Table 1:** One-way ANOVA of educational status and resource conservation practices in tropical rainforest of Ikom Education Zone

Educational status	N	Mean	SD
FSLC	15	35.63	6.55
SSCE	171	36.88	5.65
First degree	196	40.35	5.33
Higher degree	42	42.10	3.56
Total	514	38.38	6.00

  

Source of variance	Sum of squares	df	Mean square	F-ratio	p-level
Between groups	2520.028	3	840.009	26.855*	.000
Within groups	15952.503	510	31.279		
Total	18472.531	513			

\*Significant at .05 alpha level; p<.05.

The result in Table 1 revealed that the mean score obtained by the 105 subjects who have FSLC was 35.63 with a standard deviation of 6.55 is less than the mean score of 36.88 with a standard deviation of 5.65 obtained by the 171 subjects who have SSCE and this is also less than the mean score of 40.35 with a standard deviation of 5.33 obtained by the 196 subjects who have first degree and this is less than the mean score of 42.10 with a standard deviation of 3.65 obtained by the 42 subjects who have higher degree. This implies that the higher the educational status, the better the resource conservation practices among the tropical rainforest people of Ikom Education Zone.

The result further revealed that the calculated F-ratio obtained was 26.855 with a p-value of .000 at .05 level of significance with 3 and 510 degrees of freedom. With the obtained result, the F-ratio was statistically significant and the hypothesis which stated that educational status has no significant influence on resource conservation practices in tropical rainforest of Ikom Education Zone was rejected. Since resource conservation practices in tropical rainforest of Ikom Education Zone

were significantly influenced by educational status, the source of the difference was determined using Fisher Least Significance Difference (LSD) Post Hoc Test multiple comparison analysis. The result is presented in Table 2.

**Table 2:** Scheffe Post Hoc Test for educational status and resource conservation practices in tropical rainforest of Ikom Education Zone

Educational status	N	Mean	Mean difference	p-level
FSLC	105	35.63	-1.25	.071
SSCE	171	36.88		
FSLC	105	35.63	-4.72*	.000
First degree	196	40.35		
FSLC	105	35.63	-6.47*	.000
Higher degree	42	42.10		
SSCE	171	36.88	-3.47*	.000
First degree	196	40.35		
SSCE	171	36.88	-5.21	.000
Higher degree	42	42.10		
First degree	196	40.35	-1.74	.067
Higher degree	42	42.10		

\*Mean difference is significant at .05 level; p<.05.

The result of the Fisher LSD Post Hoc Test analysis as presented in Table 2 revealed that the mean score in resource conservation practices among the subjects who have FSLC did not differ significantly in absolute sense when compared with that of those who have first degree in favour of those who have first degree ( $MD = -1.25$ ;  $p > .05$ ) but was significantly in absolute when compared with the mean score of those who have first degree in favour of those who have first degree ( $MD = -4.72$ ;  $p < .05$ ) and also significantly in absolute when compared with the mean score of those who have higher degree in favour of those who have higher degree ( $MD = -6.47$ ;  $p < .05$ ).

Furthermore, the mean score in resource conservation practices among the subjects who have SSCE differ significantly in absolute when compared with the mean score of those who have first degree in favour of those who have first degree ( $MD = -3.47$ ;  $p < .05$ ) and also significantly in absolute when compared with the mean score of those who have higher degree in favour of those who have higher degree ( $MD = -5.21$ ;  $p < .05$ ). The result finally revealed that the mean score in resource conservation practices among the subjects who have first degree did not differ significantly in absolute when compared with the mean score of those who have higher degree in favour of those who have higher degree ( $MD = -1.74$ ;  $p > .05$ ). Based on these, the source of the difference was more from the subjects who have higher degree followed by those who have FSLC, SSCE and first degree respectively.

The result of the study's hypothesis revealed educational status as having a significant influence on resource conservation practices in the area with the result suggesting that the lower the educational status, the poorer the resource conservation practices. The source of the difference was determined using a Post Hoc Test and it was revealed that the source of the difference was from the category of those who had a higher degree. This meant that those in the aforementioned category had statistically significant higher means when being compared with the means of those from other categories of educational status while the means of those in the other categories were statistically significant when being compared with each other in the following decreasing order – first degree, SSCE and FSLC.

This finding is somehow not really surprising. It is somehow not surprising as it seemingly suggests that those who are more educated must have undergone more learning experiences in line with modern forest resources conservation practices than those who have not attained higher levels of education. Also, it may not really be surprising in the sense that most of the respondents may rather be more acquainted with traditional ecological knowledge which has some variance with western ecological knowledge.

The finding here is in tandem with that of Raufu and Adetunji (2012) who revealed educational level as a significant indicator of agricultural land-use management practices. The finding is also in consonance with that of Braga and Schiavetti (2013) who reported higher educational levels being significantly correlated to more positive attitudes towards conservation of aquatic animals. The finding is also in line with Abdullah, Said and Omar (2014) who established age as having a significant association with the way which rural dwellers expressed willingness to donate towards conservation of mangroves with the trend being such that the higher the educational level, the more the tendency to express more willingness. Hema and Devi (2015) also established educational level as a significant predictor of willingness to give monies for mangroves' conservation. Lastly, Garekae et al. (2016) revealed a statistically significant predictability of number of schooling years on locals' dispositions towards forest resources conservation.

The finding however contradicts that of Barthwal and Mathur (2012) who established educational level as an insignificant determinant of attitude towards wildlife conservation. The finding also does not agree with that of Mir, Noor, Habib and Veeraswami (2015) who reported educational level as having an insignificant predictability on tendencies towards conservation of wildlife and its adjoining habitats. Mutanga, Vengesayi, Gandiwa and Muboko (2015) also revealed an insignificant relationship between level of education and dispositions towards forest reserves.

### **Conclusion and recommendations**

In present times, based on an accumulation of long-standing acts of negligence of human beings on the environment, the era of environmental sustainability has been ushered in. This implies that it has become an imperative for man's actions or practices in terms of natural resource exploitation to be more conservative in nature. The need for extreme conservative measures towards natural resource exploitation in some ecosystems such as the tropical rainforest is even more of an imperative due to the unique services it renders both to the continuous functioning of the

environment and man's survival. Continuous careless exploitation of this unique ecosystem type by the uneducated is fingered as one of the major reasons which ushered in the phenomenon of climate change. The continuous unsustainable exploitation of this unique ecosystem type can only lead to greater and more undesired impacts from the phenomenon of climate change. Without ameliorating the exploitation tendencies, it implies that human beings might have to learn to embrace more undesired reactions from the environment if we do not learn to appreciate that the need to be more conservative towards natural resource exploitation in one of its most unique ecosystems.

### **Recommendations**

1. Awareness should be created amongst locals in proximity of tropical rainforests on the uniqueness of the forest's services towards each of the environment and mankind
2. Vigorous efforts should be made towards designing joint forest management programmes which would stem the tide of deforesting the tropical rainforest within the area
3. Locals in proximity of tropical rainforests should be included in any forest conservation programme which would be designed to conserve forests within their domain

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