GNJMR
Global Nexus Journal of Multidisciplinary Research (GNJMR)
www.globalnexusjournal.com
ISSN: 3115-5847
January 2026, Vol. 1, No 1, pg. 136-145.

Impact of Forest Management Strategies on the Sustainability of Forest Resources in the Calabar Education Zone, Cross River State, Nigeria.

[1]Offiong, Agnes Edet Asuquo (Ph.D)
(agnesoffiong04@gmail.com)
ORCID: https://orcid.org/000-0000-34743-6808

[2]Egere, Miriam Akpono
egeremiriam@gmail.com,
ORCID: 0009-0008-1370-8274

[3]Oyamo, Vincent Ita, (Ph.D)
comradeoyamo@yahoo.com)
ORCID: 0009-0003-1096-5674

[4]Ubi, Arikpo Bassey
arikpo198@gmail.com,
ORCID 0009000081362882
&
[5]Adie Isidore Ashindoritiang.
adieisidore2@gmail.com
ORCID: 0009-003-8539-7413

[1, 3, 4 & 5] Environmental Education Department, University of Calabar Calabar,
[2]Institute of Education, University of Calabar Calabar

Abstract
This study examined the Impact of Forest Management Strategies on the Sustainability of Forest Resources in the Calabar Education Zone, Cross River State, Nigeria. Correlational research design was adopted and two research hypotheses guided the study. The population of the study comprised 312,149 regular household heads in Calabar Education Zone (Central Senatorial District) of Cross River State. The sample for the study comprised 1,230 household heads from the four Local Government Areas. Multi-stage sampling procedure was adopted for the study. Instrument tagged "Forest Management Strategies and Sustainability of Forest Resources Questionnaire (FMSSFRQ) was used for data collection. Two experts in the department of Measurement and Evaluation, University of Calabar validated the instrument. To ascertain the reliability of the instruments, Cronbach alpha reliability method was used. The reliability coefficient estimates realized from the result were within the range of .78 to .90. Simple Linear Regression analysis and Multiple Linear Regression analysis were used for data analysis. The results of the analysis revealed that forest regulation strategy, participatory forest management strategy relatively and jointly contributed to sustainability of forest resources in Calabar Education Zone of Cross River State. Based on this result, it was concluded that to maintain sustainable forest ecosystem in the Zone, pragmatic measures must be put in place to enhance the level of forest management in forest communities. It was recommended among others, that adequate forest regulatory measures should be put in place and adequately enforced by forest agencies, community members should be involved.

Keywords: Impact, Forest Management, Strategies, Sustainability, Forest Resource

Introduction

The importance of forest ecosystem to the survival of man and the environment has made sustainability of biodiversity a key development parameter that every developing country seeks to maximize. The global drive for sustainability of forest resources tends to be based on the notion that forest resources provide sources of livelihood to local communities and thus boost socio-economic development of local communities all over the world. It is also a globally-held ideology that sustainability of forest ecosystem does not only promote community-based development, but also enhance the sustainability of world's biosphere, which reduces the tendency of global environmental problems such as global warming, climate change, depletion of the ozone layer, acid rain and greenhouse effect. (Adekunle, Momoh and Agbaje 2018) This implies that sustainability of forest resources has implications on the social, economic, environmental and the cultural wellbeing of people and society, and thus an effort to ensure sustainability of forest ecosystem in Cross River State may be a pragmatic step to enhance the wellbeing of local communities in the State and ensure ecological stability in all parts of the State.

Forest management is an all-inclusive concept that involves all practices meant to preserve forest ecosystem and control the occurrence of destructive and degradable activities in the forest. Adekunle, Momoh and Agbaje (2018) note that forest management is the practical application of the scientific, technical and economic principles of preserving forest ecosystem. These researchers stressed that forest management is the organization of a forest property for maintenance, by ordering in time and place the various operations necessary for the conservation, protection and improvement of the forest on the one hand, and the controlled harvesting of the forest resources on the other hand.

Management of forests broadly involves three main tasks of controlling the composition and structure of the growing stock, harvesting and marketing of forest produce, and administration of forest property and personnel (Paul, 2021). It means that forest management is the process of ensuring that forest resources are conserved for socio-economic gains of society. Given the rate at which forest ecosystem is destroyed in Cross River State despite the fact that people are aware of the socio-economic, cultural, and environmental importance of forest resources to the survival of local communities, is a pointer to ineffective forest management practices in the state and the need to devise feasible forest management strategies to enhance sustainability of forest resources in the State (Amuyou, Wang, Bisong &Antonarakis, 2021)

Sustainability of forest resources is a phenomenon that cannot be downplayed in a quest to ensure effective community development in any society. This is because the survival of local communities largely depends on the sustainability of biodiversity and services provided by healthy ecosystems within the communities (Birdlife International, 2020). Researchers have also argued that forest resources meet the basic nutritional requirement of present and future generations, improve living standards for the rural people, reduce the vulnerability of the agricultural sector to adverse natural and socio-economic factors and other risks and above all strengthen self-reliance of local communities (Onwubuya, Ogbonna & Ezeobiora, 2019; Martins, 2017). The awareness of the social, economic, environmental, cultural and ecological benefits of sustaining forest resources should naturally reduce the level of unsustainable forest practices among communities in Nigeria.

Regrettably, there seems to be an increasing trend of destructive forest practices in Nigerian society. These unsustainable practices observable among community dwellers in Nigeria seem to range from unauthorized logging, indiscriminate hunting, indiscriminate bush burning, using explosives as fishing strategies, and so on. Onwubuya et al (2019) note that the type of natural environment that was obtained in Nigeria some years ago are no longer available because of anthropogenic factors such as farming, bush burning, over grazing by animals, animal hunting, timber logging, over exploitation of forest and other deforestation practices. Ikeke, (2016) argue that despite the immense value of forest resources, forests are being cleared as demand for timber and agricultural activities increases in Nigeria, and that the extreme exploitation of forest resources in all parts of the country has reduced their range and abundance compared with what was obtainable in the past. This implies that the level of forest destruction and unsustainable forest resources extraction practices in Nigeria is on the increase and this does not speak well of the future, social, economic and environmental wellbeing of the Nigerian people especially at local communities.

Forest regulation strategy, participatory forest management strategy, ensure sustainability of forest resources in local communities. Forest regulation involves a process where strict policies are put in place by government or forest agencies to control forest practices in forest communities. Enforcement of forest laws can help in controlling unsustainable forest practices in forest communities. Cubbage, Harou and Sills (2017) argue that governmental regulation of forest use is often instituted to protect the long-term external values that are not provided well by markets and may be required to prevent resource exhaustion or to prevent externalities and market failures from leading to damage of other resources. Again, participation of community members in the management of their forest can motivate rural dwellers to adopt sustainable forest practices. Kobbail (2021) submits that there has been increasing recognition that local communities must be actively involved, and their needs and aspirations considered if forest resources are to be conserved.

Statement of the problem

The persistence of destructive practices is worrisome, suggesting a potential future loss of forest biodiversity despite attempts by the Cross River State Government to mitigate destruction through measures like logging restrictions and tree planting programs. Effective forest management is widely recognized as the key to maximizing resource sustainability. However, it remains unclear to what extent the specific management strategies currently promoted namely Forest Regulation and Participatory Forest Management are effectively impacting or correlating with the sustainability of forest resources within the Calabar Education Zone.

Therefore, this study is necessitated to bridge this knowledge gap by empirically investigating the impact of these two distinct forest management strategies on the observed sustainability outcomes of forest resources in the Calabar Education Zone.

Purpose of the study

The purpose of this study was to examine the Impact of Forest Management Strategies on the Sustainability of Forest Resources in the Calabar Education Zone, Cross River State, Nigeria Specifically, the study sort to find out whether:

1. Forest regulation strategy contributes to sustainability of forest resources.
2. Participatory forest management strategy relates to sustainability of forest resources.

Research hypotheses

The following research hypotheses guided the study.

1. Forest regulation strategy does not contribute significantly to sustainability of forest resources.
2. There is no significant contribution of participatory forest management strategy to sustainability of forest resources.

Literature Review

Forest regulation strategy and sustainability of forest resources

Saka-rasaq (2019) examined forest loss in Nigeria and the impact on climate and people from the perspectives of illegal forest activities and government negligence. The researcher noted that forestry has attracted much attention from the time being, so it is considered as vital to human life as it provides a wide range of resources, and ecosystem services. According to this researcher, forests are important as storage of carbon, for production of oxygen vital for human existence on earth, and also help in regulation of the hydrological cycle, purify water, provide wildlife habitats, and they help in reducing global warming, as well as absorbing toxic gases, contain pollution and above all conserve soil. The study aimed at analyzing the cause of forest decline in Nigeria as well as the effects on climate and offer useful solutions to conserve and achieve sustainable forest management. The study focused mainly on vitiating factors affecting forestry in Nigeria. These factors include illegal forest activities, deforestation, government negligence. A qualitative method was employed where data and facts were assessed from secondary source of information. From the result of the study, the researcher submitted that the preventive measures to curb forest illegalities must be implemented. Stakeholder's involvement in forest management should be encouraged. The study

also recommended that for the local people to feel the sense of entitlement, they need to be educated on the ecological importance of forests and tree coverage. This finding is very clear. The study has established that forest regulation is a good measure to ensure conservation of forest resources in communities.

In another study, McDermott, Cashore and Kanowski(2020) examined the content of forestry regulations in developed and developing countries, specifically determining if and how riparian zones, clearcuts, road construction, reforestation, and annual allowable cuts were addressed. The researcher found a wide range of variation in forestry regulations across and within the 20 countries examined. In particular, forest regulations in developing countries were significantly more "stringent" than those from developed countries (e.g., riparian buffer zone requirements, clearcut size limits). Though policy implementation and enforcement were not systematically examined, the researchers noted that the developing country case studies frequently exhibited perverse land-use policies, inadequately funded government institutions, and a severe lack of enforcement capacity. The researches have established that forest regulation has implications on how forest activities are carried out across countries in the world. This implies that forest regulation as a strategy for sustainable forest practices in forest communities can enhance the way people conserve forest resources in society. This agrees with Ogunwusi (2022) who submitted that one of the major factors that is militating against optimal performance of some of the organizations is the policy environment in which they operate, and that while the forest policy stipulated increase in economic wood availability in the forest reserves, gregarious deforestation has resulted in scarcity of economic wood species. This implies that there is association between forest regulation strategy and management of forest resources in communities.

Participatory Forest management strategy and sustainability of forest resources

Kotru (2021) argued that in combination with local institutional arrangements, technical considerations are indispensable for the success of livelihood-promoting, and that community mobilization and sustainable forest management cannot happen on their own if the capacity-building and empowerment of the communities in terms of local institutional strengthening and management of forest assets is not well conceived, effected and technically backed up. Senganimalunje, Chirwa, Babalola and Graham (2019) added that participatory forest management strategy has the potential to promote good governance, enhance sustainable forest management and livelihoods, and that there is need to reconcile livelihood improvement and conservation through local enforcement and collective action in order to regulate the management and use of forests and forest products. Macharia (2017) stressed that local community participation is the key strategy to current forestry conservation and management, and that if wildlife and all the protected areas are to survive, it is imperative that conservation activities and communities are in harmony so that it does not constrain community livelihoods.

Omari, Omoogun and Effiom (2019) conducted a study on the influence of community participatory mobilization on attitude of farmers towards deforestation in Cross River rainforest zone Nigeria. The main purpose of this study was to examine community participation and attitude of farmers towards deforestation in the rainforest zone of southern Cross River State, Nigeria. One hypothesis was formulated to guide the study. Ex-post facto research design was considered most suitable for the study. A sample of 568 respondents was randomly selected for the study through stratified and simple random sampling techniques. A structured questionnaire was the instrument used for data collection. The instrument was faced validated by three experts in Test and Measurement and the research supervisor who vetted the items developed. The reliability estimate of the instrument was established through the Cronbach alpha reliability method. Simple linear regression statistical tool was used for data analysis. The results of the analysis revealed that there was a significant influence of community participatory mobilization on attitude of farmers towards deforestation in rainforest zone in the study area. Based on these finding it was recommended among others that environmental educators and advocates should ensure community participation to empower them to develop more positive attitude towards eradication of negative environmental practices and actions. This implies that there is a link between the application of participatory forest management strategy and sustainability of forest resources.

Osumanu and Samuel (2017) examined collaboration and partnership in forest conservation using the role of communities in the management of the Gbele Reserve in north-western Ghana. The researchers

observed that since the promulgation of the 1994 Forest and Wildlife Policy, community participation in forest resource management has become the norm throughout Ghana. This study assessed the role of fringe communities in the management of the Gbele Resource Reserve in north-western Ghana. The study used a mixed method approach, with a structured questionnaire survey, key informant interviews, and focus group discussions covering 240 local residents of fringe communities and 12 key informants. The findings revealed that fringe communities are involved in implanting activities, such as seedling planting and fire prevention and fighting, as well as in monitoring activities, including guarding the reserve against illegal activities. The results of a logit estimation model indicate that six factors (gender, occupation, community role, belief in local taboos, perceived ownership of the reserve by a community, and playing a managerial role) were positively significant in determining participation in the reserve's management. The researchers concluded that the economic and environmental benefits of the reserve are not appreciated by fringe communities because they were not involved in the management of the project. The researcher recommended that a project aimed developing rural communities through forest management should be participatory such that community members are fully involved in the planning and management process for better result.

Methodology

The research design adopted for the study was the correlational design, two research hypotheses guided the study. The population of the study comprised 312,149 regular household heads in Calabar Education Zone (Central Senatorial District) of Cross River State. The sample for the study comprised 1,230 household heads from the four Local Government Areas gotten from multi-stage sampling procedure. Instrument constructed by the researcher "Forest Management Strategies and Sustainability of Forest Resources Questionnaire (FMSSFRQ) was used for data collection. Two experts in the department of Measurement and Evaluation, University of Calabar validated the instrument. To ascertain the reliability of the instruments, Cronbach alpha reliability method was used. The reliability coefficient estimates realized from the result were within the range of .78 to .90. Simple Linear Regression analysis and Multiple Linear Regression analysis were used for data analysis.

Presentation of Results

Hypothesis 1

Table 1: Summary of simple regression analysis for the relationship between forest regulation strategy and sustainability of forest resources in Calabar Education Zone of Cross River State

R	R Square	Adjusted R Square	Std. Error of the Estimate
.632	.399	.399	5.161

Model	Sum of squares	df	Mean square	F-ratio	Sig.
Regression	21223.108	1	21223.108	796.877	.000
Residual	31906.142	1198	26.633		
Total	53129.250	1199			

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	34.239	.856		40.014	.000
forest regulation strategy	1.217	.043	.632	28.229	.000

a. Criterion: Sustainability of forest resources in Calabar Education Zone of Cross River State
b. Predictors: (Constant), forest regulation strategy

Forest regulation strategy does not contribute significantly to sustainability of forest resources in Calabar Education Zone of Cross River State.

The two variables in this hypothesis were forest regulation strategy and sustainability of forest resources in Calabar Education Zone of Cross River State. Both forest regulation strategy and sustainability of forest resources in Calabar Education Zone of Cross River State were measured continuously. To test this hypothesis, Simple Linear Regression analysis was used. The result of the analysis is presented in Table 1. Table 1 presents the summary of Simple Linear Regression analysis of the relationship between forest regulation strategy and sustainability of forest resources in Calabar Education Zone of Cross River State. The result in Table 6 shows that the analysis of variance in the regression output produced an F-ratio of 796.877 ($p < .05$), which is statistically significant at .05 probability level with critical F-ratio of 3.85 and 1:1198 degrees of freedom.

This means that the data for forest regulation strategy fit the model better than if forest regulation strategy was not added to the model, which means that forest regulation strategy contributed significantly to the observed variance in sustainability of forest resources in Calabar Education Zone of Cross River State. The result in Table 1 also shows a regression coefficient (R) of .632 and a coefficient of determination (R2) of .399. This implies that forest regulation strategy relates significantly to sustainability of forest resources in Calabar Education Zone of Cross River State and that 39.9 % of the variation in sustainability of forest resources in Calabar Education Zone of Cross River State is accounted for, by the variation in forest regulation strategy in forest communities across Calabar Education Zone of the State. Thus 60.1 % of the variance in sustainability of forest resources in Calabar Education Zone of Cross River State is attributed to the effect of other variables considered in this study.

Similarly, the result of the regression weights of the predictor variable (forest regulation strategy) in Table 1 shows positive unstandardized and standardized Beta coefficients (B and Beta) of 1.217 and .632 respectfully. This means forest regulation strategy has a positive relationship with in sustainability of forest resources in Calabar Education Zone of Cross River State and that a unit improvement in the application of forest regulation as a forest management strategy in forest communities in Calabar Education Zone of Cross River State would lead to a more than one unit improvement in sustainability of forest resources in the Zone. Accordingly, the result in Table 1 shows a t-value of 28.229 ($p < .05$). This implies that forest regulation strategy contributed significantly to the variation in sustainability of forest resources in Calabar Education Zone of Cross River State. With this result therefore, hypothesis one is rejected. This means that forest regulation strategy significantly contributes to sustainability of forest resources in Calabar Education Zone of Cross River State.

Hypothesis 2

There is no significant contribution of participatory forest management strategy to sustainability of forest resources in Calabar Education Zone of Cross River State.

Table 2: Summary of simple regression analysis for the relationship between participatory forest management strategy and sustainability of forest resources in Calabar Education Zone of Cross River State

R	R Square	Adjusted R Square	Std. Error of the Estimate
.624	.389	.389	5.205

Model	Sum of squares	df	Mean square	F-ratio	Sig.
Regression	20674.815	1	20674.815	763.175	.000
Residual	32454.435	1198	27.091		
Total	53129.250	1199			

Variable	B	Std. Error	Beta	T	Sig.
(Constant)	37.311	.765		48.790	.000
Participatory forest management strategy	1.141	.041	.624	27.626	.000

a. Criterion: Sustainability of forest resources in Calabar Education Zone of Cross River State
b. Predictors: (Constant), participatory forest management strategy.

The two variables in this hypothesis were participatory forest management strategy and sustainability of forest resources in Calabar Education Zone of Cross River State. Both participatory forest management strategy and sustainability of forest resources in Calabar Education Zone of Cross River State were measured continuously. To test this hypothesis, Simple Linear Regression analysis was used. The result of the analysis is presented in Table 2. Table 2 presents the summary of Simple Linear Regression analysis of the relationship between participatory forest management strategy and sustainability of forest resources in Calabar Education Zone of Cross River State. The result in Table 2 shows that the analysis of variance in the regression output produced an F-ratio of 763.175 ($p < .05$), which is statistically significant at .05 probability level with critical F-ratio of 3.85 and 1:1198 degrees of freedom.

This means that the data for participatory forest management strategy fit the model better than if participatory forest management strategy was not added to the model, which means that participatory forest management strategy contributed significantly to the observed variance in sustainability of forest resources in Calabar Education Zone of Cross River State. The result in Table 2 also shows a regression coefficient (R) of .624 and a coefficient of determination (R2) of .389. This implies that participatory forest management strategy relates significantly to sustainability of forest resources in Calabar Education Zone of Cross River State and that 38.9 % of the variation in sustainability of forest resources in Calabar Education Zone of Cross River State is accounted for, by the variation in participatory forest management strategy in forest communities across Calabar Education Zone of the State. Thus 61.1 % of the variance in sustainability of forest resources in Calabar Education Zone of Cross River State is attributed to the effect of other variables considered in this study.

Similarly, the result of the regression weights of the predictor variable (participatory forest management strategy) in Table 2 shows positive unstandardized and standardized Beta coefficients (B and Beta) of 1.141 and .624 respectfully. This means participatory forest management strategy has a positive relationship with in sustainability of forest resources in Calabar Education Zone of Cross River State and that a unit improvement in the application of participatory forest management as a forest management strategy in forest communities in Calabar Education Zone of Cross River State would lead to a more than one unit improvement in sustainability of forest resources in the Zone. Accordingly, the result in Table 2 shows a t-value of 27.626 ($p < .05$). This implies that participatory forest management strategy contributed significantly to the variation in sustainability of forest resources in Calabar Education Zone of Cross River State. With this result therefore, hypothesis two is rejected. This means that participatory forest management strategy significantly contributes to sustainability of forest resources in Calabar Education Zone of Cross River State.

Discussion of findings

The analysis of the first hypothesis which stated that forest regulation strategy does not contribute significantly to sustainability of forest resources, revealed that forest regulation strategy contributes significantly to sustainability of forest resources. This implies that the extent forest regulation practices are used as strategies to manage forest in Calabar Education Zone of Cross River State determines the extent to which forest resources are sustained in Calabar Education Zone of Cross River State. This result suggests that the level of sustainability of forest resources in Calabar Education Zone of Cross River State is directly related to the extent to which forest exploitation activities are being regulated in forest communities in the Zone. This result agrees with Cubbage, Harou and Sills (2017) who stated that governmental regulation of forest use is often instituted to protect the long-term external values that are not provided well by markets

and may be required to prevent resource exhaustion or to prevent externalities and market failures from leading to damage to other resources, and thus sets the minimum standard for forestry practices and/or defines permissible and prohibited forest practices. In line with this result, Saka-rasaq (2019) argued that the loss of forest coverage is characterized by illegal logging of forests wood and bad government policies, and that because people do not regard natural forest as an adequate use of land, this feeling of waste, as well as economic necessity, that induces them to enter forest reserves for farm and other illegal activities. Saka-rasaq (2019) further affirmed this result when noted that in Nigeria, inadequate regulations and sometimes uncontrollable exploitation or illegal logging poses a great danger to the forest industry and the forest resource base. This result also supports that opinion of Udeagha, Uluocha and Shomkegh (2016) who stressed that forest policy and administration reflect an ideal approach to fulfill the objectives of furthering rural development, arresting forest degradation and ensuring sustainable forest development.

Participatory forest management strategy and sustainability of forest resources

The analysis of the second hypothesis which stated that participatory forest management strategy does not contribute significantly to sustainability of forest resources, revealed that participatory forest management strategy contributed significantly to sustainability of forest resources in Calabar Education Zone of Cross River State. This implies that the extent participatory forest management practices are used as strategies to manage forest in Calabar Education Zone of Cross River State determines the extent to which forest resources are sustained in Calabar Education Zone of Cross River State. This result suggests that the level of sustainability of forest resources in Calabar Education Zone of Cross River State has a direct congruence with the extent to which members of the communities are involved in the forest management effort in the Zone. The direction of this positive result is people will naturally protect policies that they participated in formulating. With this participatory structure, the community members become part of the management team of their forest, which help to reduce the rate at which they may be willing to carry out destructive forest activities in their communities, thereby enhancing the sustainability of forest resources in the communities.

This result agrees with Kotru (2015) who argued that in combination with local institutional arrangements, technical considerations are indispensable for the success of livelihood-promoting, and that community mobilization and sustainable forest management cannot happen on their own if the capacity-building and empowerment of the communities in terms of local institutional strengthening and management of forest assets is not well conceived, effected and technically backed up. In line with this result also, Senganimalunje, Chirwa, Babalola and Graham (2015) added that participatory forest management strategy has the potential to promote good governance, enhance sustainable forest management and livelihoods, and that there is need to reconcile livelihood improvement and conservation through local enforcement and collective action in order to regulate the management and use of forests and forest products. This result supports the opinion of Macharia (2015) who maintained that local community participation is the key strategy to current forestry conservation and management, and that if wildlife and all the protected areas are to survive, it is imperative that conservation activities and communities are in harmony so that it does not constrain community livelihoods.

The result of this analysis further revealed that participatory forest management strategy significantly contributed to the variance in sustainability of forest resources across communities in Calabar Education Zone of Cross River State, with a t-value of 27.626 ($p < .05$). This result supports the empirical findings of Omari, Omoogun and Effiom (2019) whose finding revealed that there was a significant influence of community participatory mobilization on attitude of farmers towards deforestation in rainforest zone in the study area. In line with this result also, Kinyili (2014) investigated the impacts of participatory forest management approach in OlBolossat forest, Nyandarua County, Kenya and found a strong positive relationship between participatory forest management and community participation, community local structures, PFM enterprises, coordination of PFM activities and forest management and conservation policies.

Conclusion

Based on the result of the study, it was concluded that forest regulation strategy, participatory forest management strategy, significantly contributed to sustainability of forest resources in Calabar Education Zone of Cross River State. It was also concluded that in order to maintained sustainable forest ecosystem in Calabar Education Zone of Cross River State, pragmatic measures must be put in place to enhance the level of forest management in communities within the Zone.

Recommendations

Based on the result of the study, the following recommendations were made;

1. Adequate forest regulatory measures should be put in place and adequately enforced by forest agencies. This will help to promote sustainable forest behaviour in the communities, and thus enhance sustainability of forest resources in the communities.
2. Forest management agencies should ensure adequate involvement of community members in formulating and enforcing forest conservation policies in forest communities in the Zone, as this will motivate community members to maintain the policies which will lead to sustainable forest practices in the communities.

References

Adekunle, E.O, Momoh, A.I and Agbaje, B.O. (2018), Attitudes of local residents towards sustainable ecotourism development in Olumirin Waterfall Southwestern Nigeria. *Ethiopian Journal of Environmental Studies & Management, 7*(5), 561 – 571.

Amuyou, U. A., Wang, Y., FBisong, F., &Antonarakis, A. S. (2021. Livelihood Impacts of Forest Carbon Protection in the Context of Redd+ in Cross River State, Southeast Nigeria. *Sustainability*, *13*(9), 5081-5093.

BirdLife International (2020). *Biodiversity Conservation and local communities*. Quito, Ecuador: BirdLife International.

Cubbage, F. W., Harou, P., & Sills, E. (2017). Policy instruments to enhance multi-functional forest management. *Forest Policy Economy*, 9, 833–851.

Ikeke, M. O. (2016**).** The forest in African traditional thought and practice: An ecophilosophical discourse. *Open Journal of Philosophy*, *3*(2), 345-350. http://dx.doi.org/10.4236/ojpp.2013.32052

Kobbail, A. A. R. (2021). Local people attitude towards community forestry practices: A case study of Kosti Province-Central Sudan. *International Journal of Forestry Research*, *10*, 1-7

Kotru, R. (2021). Participatory forest management and sustainable development outcomes in the subtropical Himalayas: A sequel of environment, economy and equity through social empowerment. Retrieved from: https://www.researchgate.net/publication/278156258

Martín-García, J., & Diez, J. J. (2017). sustainable forest management: An introduction and overview. Retrieved from: https://www.researchgate.net/publication/230710275

McDermott, C., Cashore, B., &Kanowski, P. (2020). *Global environmental forest policies: An international comparison*. London, UK: Earthscan

Macharia, B. W. (2017). Factors influencing community participation in forestry conservation projects: A case of Kithoka-Twajai forest community-based organization, Meru County Kenya. An unpublished M.A. thesis submitted to Department of Project Planning and Management, University of Nairobi.

Ogunwusi, A. A. (2022). The Impact of Forest Policy and Land Tenure System on Bamboo Development in Nigeria. *Public Policy and Administration Research*, 3(5), 13-20.

Omari, A. O. Omoogun, R. M., & Effiom, J. E. (2019). Influence of community participatory mobilization on attitude of farmers towards deforestation in Cross River rainforest zone Nigeria. *Civil and Environmental Research, 11*(6), 5-11.

Onwubuya, E.A., Ogbonna, O. I., &Ezeobiora, O. C. (2019). Conservation of forest resources by rural farmers in Anambra State, Nigeria. *Journal of Agricultural Extension*, *18* (2), 177-184.

Osumanu, I. K., & Samuel, A. A. (2017). Collaboration and partnership in forest conservation: The role of communities in the management of the Gbele Reserve in north-western Ghana. *Ghana Journal of Geography*, *9*(2), 91–124.

Paul, O. (2021). Non-timber forest products (NTFPs): A pathway for rural poverty reduction in Nigeria. *International Journal of Economic Development Research and Investment*, *2* (2), 25-34

Saka-rasaq, O. (2019). Forest loss in Nigeria, the Impact on climate and people from the perspectives of illegal forest activities and government negligence. An unpublished B.Sc project submitted to Department of Sustainable Coastal Management, University of Applied Science, Novia.

Senganimalunje, T. C., Chirwa, P. W., Babalola, F. D., & Graham, M. A. (2019). Does participatory forest management program lead to efficient forest resource use and improved rural livelihoods? Experiences from Mua-Livulezi Forest Reserve, Malawi. Retrieved form: https://www.researchgate.net/publication/283163690.