

Afforestation/Reforestation and Conservation of Forest Resources in Cross River State, Nigeria

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Abstract

This study examined afforestation/reforestation strategies and conservation of forest resources in Cross River State, Nigeria. To achieve the purpose of the study, a research question was raised and a hypothesis was formulated and tested at .05 level of significance. Review of literature was carried out according to the variable of the study. The study adopted the descriptive survey research design. The population of the study comprised 73,755 registered farmers in Cross River State. A sample of 495 registered farmers was used for the study. The instrument used for data collection was a 48-item structured questionnaire. The research instrument was subjected to validity test by relevant authorities. The instrument was titled afforestation/reforestation Strategies and Conservation of Forest Resources Questionnaire (ARSCFRQ). Cronbach alpha method was utilized to establish the reliability of the research instrument. The testing of hypothesis in the study was done with simple regression statistical tool. The results obtained from data analysis revealed that afforestation/reforestation was significant predictor of conservation of forest resources in Cross River State, Nigeria. It was however concluded that afforestation/reforestation strategies is significant predictor of conservation of forest resources in Cross River State. It is therefore recommended amongst others that conservation agencies should collaborate with traditional institutions to ensure that forests are properly maintained in the Communities, this will help to reduce unsustainable exploitation of forest resources.

Key words: Afforestation, Reforestation, Conservation, and Forest Resources.

Introduction

Afforestation/Reforestation is the process of introducing trees and tree seedling to an area that has previously not been forested. It can be done through tree planting and seedling, naturally or artificially. Similarly, reforestation can be considered a form of Afforestation. Reforestation is the alteration of non-forested area to a forested area through tree planting and seedling. Reforestation is the restoration of an area that has been deforested, Schirmer and Bull (2014), the sustainable management of afforested or reforested land help in pursuing adaption responses, since it maintains forests status and guarantees ecosystem services, especially at local scale by reducing vulnerability to climate change and to biodiversity loss. In case of crop failure due to climate change, forests can provide safety nets for local communities with their products like wood or non-wood products, such as game animals, nuts, seeds, berries, mushrooms, medicinal plants.

Afforestation and reforestation can also control soil degradation, hydraulic and landslide risks and encouraged local communities towards agroforestry or silvo-pastoral system, thus creating new income opportunities, Reyer, Guerick and Ibsch, (2015). Through the agenda 2000 programme, afforestation was intended as an accompanying measure of the agricultural policy. European Union afforestation policies have supported the planting of about 2 million hectares of trees on agricultural land in the period from 1994-2015. However, the level of afforestation has decreased over the last decades although afforestation is currently considered as a mitigation strategy by CO₂ sequestration. When we practice afforestation in areas that had no forests, it gives us benefits of its own. Moreover, this conversion of semi-arid land into forests makes them more sustainable and prevents soil erosion and reduces the impact of climate change.

Imad (2017) conducted a study on critical review on past literature of forestation and impacts on socio-economic conditions of rural community of the world. The study major objectives were to examine the critical review on past literature of forest and to see the impacts on socio-economic conditions of rural community of different countries of the world. A total of 23 studies were selected for critical study and data collected from past literature were analysed. The critical review indicates that afforestation increases the number of trees in the world which further improve ecosystem and give benefit to human society such as increase in their daily income and play key role in human livelihood. However, the study postulated that deforestation destroy the ecosystem and affect human life adversely in a long run, such as increase carbon dioxide and deplete the ozone and create changes in the climate which affect cropping pattern. Deforestation causes soil erosion, decrease fertility of the land, decrease per acre production and also speed up the wave of flood in the area. On the basis of results, the study finally recommended that deforestation control by government is essential balance, cutting of the wood by government and communities as required. Tree plantation by farmers on their farms for keeping balance is required, monitoring team check and balance is required to take action in proper time. Afforestation programme by government is therefore required. Awareness programme about deforestation in the world is required, love trees are required by nations. Good policies preparation for afforestation by government is required.

Amna (2015), carried out a study on evaluation of afforestation activities in Elfasher City, North Darfur State. The aim of the study was to evaluate the afforestation activities in the camps. Field data were compiled from reports, records, field survey, questionnaire and interviews. Afforestation activities in internally displaced peoples' camps in the vicinity of Elfasher which started in 2006. The main species planted were *Azadirachta indica*, *Adansonia digitata*, *Grewia tenax*. In addition, ornamental and fruit trees were mainly planted inside lodgings. Overall performance was promising, giving 95% survival. The local community appreciated the benefits of the afforestation and demanded more afforestation programs to cover the whole camp areas. The study recommended; expansion of afforestation programs in these camps. Allocations of adequate funds, training of local communities on nursery work and seedling production as were instrumental in the continuation of

the afforestation programs. The above reviewed studies are found relevance to the present study in that among other assessment, it sought to assess the importance of conservation of forest resources.

Gross, Few and Martin (2015) carried out a study title perception of adaptation to environmental change in forest adjacent communities in three African nations. Semi-structured interviews were used to explore how rural communities near forests are responding to environmental change in three African nations Cameroon, Equatorial-Guinea and Rwanda. The study first recounted people's perception of environmental change – What are the issues of greatest concern identified by local communities? Second, it explores people's responses to identified environmental problems and in particular the role of forest in this process. Finally, it concluded with a discussion of changing land management practices and how this implementation may affect the future adaptation strategies of such communities. Results suggest that people's current and potential responses and adaptations to environmental change are influenced by the availability and accessibility to which their livelihood strategies have diversified away from forest dependence. It concluded that forest policies will need to be responsible especially between forest conservation and adaptation to climate change.

Csaba (2018) carried out research on reforestation under climate change in temperature, and water limited regions: current views and challenges. The study examined the ecological benefits of forests and afforestation at the sensitive lower edge of the closed forest belt at the xeric limits that is still disputed. It noted that forests control erosion, dust storms and silting of streams but may reduce stream flow and groundwater table level due to higher water use with consequences for water management. The forest/grassland transition zone is especially vulnerable to projected drastic temperature and precipitation shift in the future. In spite of contrary expectations, the effect of forest and afforestation in improvement of regional climate conditions is restricted. Ecologically conscious forest policy and management requires the consideration of local conditions of projections of future climatic conditions and also of non-forest alternatives of land use. Findings showed that forests provide multiple ecological benefits, reforestation on watershed previously used by agriculture or covered by grassland can reduce stream flow due to higher water use and may be serious for water management and sustainable development. It also noted that forest cover

influence atmospheric climate forcing. Therefore, it is believed that forest mitigates climate change impacts such as warming and aridification. Studies indicate that in spite of increased evapotranspiration, precipitation changes are only moderately even in extensively afforested regions.

Mahtabalsadat, Luc, Nadia and Caroline (2022) carried out a study titled review of reforestation value chain planning and management, a conceptual framework. The study looked at the growing importance of sustainable forest management which has led to increased interest in reforestation. The aim of this study was to propose a formal reforestation value chain framework including both the material flow and planning processes at strategic, tactical and operational levels. To do so, a hermeneutic literature review was first carried out to identify existing frameworks in the reforestation value chain and seedling production. A second hermeneutic literature review was conducted, focusing on existing operations research-oriented models in reforestation value chain and then the review was expanded to similar industries aiming to find the models that could be implemented and optimized reforestation value chains. The review revealed significant research gaps that were highlighted for future studies. A formal reforestation value chain framework was then proposed based on these findings. It also noted that reforestation is among the strategies being adopted to reduce pressure on natural forest. The above reviewed studies found relevance to the present study in that, among other assessment it sought to assess the importance of afforestation/reforestation on the conservation of forest resources in protected areas

Statement of the problem

The study area has been seen as one of the major states with natural forest cover in Nigeria and beyond. But today most of the natural vegetation has disappeared as a result of anthropogenic activities like deforestation, unsustainable agricultural practices, bush burning, illegal hunting, and logging activities. As a result, most of the forest reserves are being converted to farm land, plantation farm, housing sites, quarrying sites, roads and construction sites.

Despite the glaring consequences of climate change facing the people in study area, many people do not seem convinced on the need to carry out sustainable agricultural practices as a means of reducing the advert effect of climate change. Resident of the study area are still indulging in farming practices that promote the emission of greenhouse gases into the atmosphere.

Government and other concerned stake holders have made efforts in creating awareness and sensitizing people on adaptation strategies and on the need to consider alternative farming practices that constitutes severe climatic problems. These efforts have yielded no significant results as the incident of forest destruction seem to be on the increase in the study area.

Urgent steps must be taken to tackle the problem of forest destruction in the study area by raising a citizenry that is aware of and committed to finding lasting solution to the conservation of forest resources, which will ensure eco system sustainability, regulate temperature and ensure continuity of the society. This emphasizes the need to consciously promote afforestation/reforestation as a climate change adaptive strategy among the people in the study area. This informs the researcher's resolve to carry out research on afforestation/reforestation strategies and conservation of forest resources in Cross River State, Nigeria.

Purpose of the study

The purpose of the study was to investigate whether afforestation/reforestation predicts conservation of forest resources in Cross River State.

Research question

The research question posed to guide the study is:

How does afforestation/reforestation predict conservation of forest resources in Cross River State?

Statement of hypothesis

There is no significant prediction of afforestation/reforestation on conservation of forest resources in Cross River State

Review of related literature

Afforestation and reforestation activities are vital to maintain the forest resources for providing people's need for forest products and conserve the environment. A large increase in the area of forest plantations is an absolute necessity to satisfy the growing demand for wood products and environmental conservation (Hussein, 2015). Hence afforestation/reforestation of forests is pivotal for further climate change adaptive strategies.

According to Yousif, (2012) forest play a key role in the livelihood of the people by providing important services to support their livelihood. Most of

the population (approximately 66%) is rural and is considered as forest dependent for fuel wood as the main source of energy and on round wood for building. In their productive role, the forests provide products such as rural poles, fuel wood, sawn timbers for construction, furniture and railways sleepers, non-wood products include a wide variety of fruits, gums, nuts, fibre, and fodder and bark that are used for food, medicine and raw materials in cottage industries. Forests are the habitats for a wide variety of wild flora and fauna. Forest plays a crucial role in environmental protection through its influences on soil, rainfall, wind and in relation to climate change. Forest plays an important ecological role by the provision of carbon sinks.

The Kyoto protocol attributes afforestation to the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land, United Nation Framework Convention on Climate Change (UNFCCC, 2016). In contrast, reforestation in general refers to the process of replanting trees in areas depleted of forests mostly done to deforestation. Afforestation/reforestation is mentioned in Target 15.2 of the United Nations Sustainable Development Goals (UN SDGs) #15 (Life on Land), which states that “By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forest and substantially increase afforestation and reforestation globally” United Nation General Assembly, 2015. SDG #15 has direct and indirect relationships with various other sustainable development goals such as SDG #2 (Zero hunger), SDG #6 (Clean water and sanitation), SDG #13 (Climate action), SDG #10 (Reduced inequalities) and SDG #12 (Responsible consumption and production) and can thus help support developing and least developed countries to achieve parallel United Nation SDGs, Baumgartner, 2019. In particular the UN SDG #13 which urges nations to take action for combating climate change and its impacts faces a copious number of impediments in low-income countries as a major proportion of the population here utilize forests for their livelihoods, Food and Agriculture Organization, FAO (2015).

Chao, (2012) opined that an average of 1.6 billion people depend on forest for subsistence, livelihoods, employment and income generation while between 60 million and 20 million indigenous people are almost wholly dependent on forests. With large populations relying on forest for survival,

afforestation/reforestation programs are crucial for managing forests and thereby can contribute to the fight against global warming and help increase climate resilience. Climate change in turn exacerbates existing inequalities and disproportionately affects marginalized communities and countries with limited human and technological resources, (Islam and Winkel, 2017; UNCTAD, 2018). Further, it can result in generating negative feedback loops as individuals will often be forced to place additional pressure on forests to sustain their livelihoods. In this regard, the continuous reduction in forest area which has declined in terms of percent of land from 1990, (33.72%) to 2016, (31.93%) in low- and middle-income countries merits urgent attention, World Bank, (2016).

According to last Food and Agriculture Organization of (2020), the global forest cover in 2000 was 38% of which 95% are natural forest and 5% are plantations. The pressure of a growing population on the natural resources, the migration of people due to political and environmental stresses the civil wars with their economic and environmental consequences, recurrent drought and other unfavourable climate factors and the inappropriate land use policies and practices are the major causes for the degradation and depletion of the forest resources in African countries. The rate of deforestation in developing countries according to FAO during 1990-2000 increased and the forest area declined annually by about 15 million hectares in tropical areas. The deforestation rates are higher in tropical countries such as Brazil, Mexico, Indonesia, Myanmar, Sudan and Zambia. The causes of deforestation vary from country to country and often between regions within the country, but conversion of forests to pasture and crop land has been a dominant case. To save the natural forest resources from this disaster, there is a great need to establish extensive afforestation programs and wood plantations preferably of multipurpose fast growing tree species (Abdalla, 2005).

According to Elhag (2008), artificial regeneration is essential in the tropics and sub-tropics to achieve the following goals – create fuel wood plantations near population centres. Grow straight stemmed trees near population centres, concentrate merchantable trees in accessible plots. Hussein, 2006 postulated that afforestation techniques are pivotal in establishment of forest plantations which facilitates the rehabilitation of degraded lands following the sequence of an afforestation program like seed procurement, raising seedling, site preparation, planting, tending

(pruning, thinning, etc.), felling of mature stands and replanting or coppicing.

Duthy and Bolo-Duthy (2017) asserted that government department of environment and natural resources has used community education in reforestation and protected area management programs in the delivery of community organization, monitoring and evaluation and contract planting. Through the enlightening of community organizers, the involvement in natural resource management by communities is encouraged, facilitated and strengthened. In forest management, there is a strong need for education as awareness is a basic precondition for developing and sustaining participation. By way of analysis, education as awareness reveals a number of critical dimensions of this process. The process begins with people structuring and explaining the dynamics of their reality that is the

social, economic, environmental and political context in which they gain a livelihood.

Materials and methods:

Descriptive survey research design was used for the study. The population of this study consist of all farmers in Cross River State, that are registered under the Agricultural Development Programmes across various Local Government Areas. Records from the Agricultural Department Programme offices across the state showed that there are seventy-three thousand, seven hundred and fifty-five (73,755) registered farmers in the study area. The stratified, systematic and the proportionate sampling techniques were used to selectb a sample of four hundred and ninety-five (495) registered farmers for this study.

Data collected was analysed using simple regression statistics.

Results

Scores of respondents on afforestation/reforestation and their scores on conservation of forest resources were obtained and analysed using simple regression statistics and the following were obtained, as presented in table 1

Table 1

Summary of data and simple regression analysis on the prediction of afforestation/reforestation on conservation of forest resources in Cross River State

Forest Resources in Cross River State					
ModelR	R Square	Adjusted R Square	Std. Error of the Estimate		
.174 ^a	.030	.028	2.69718		
ANOVA ^b					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	112.339	1	112.339	15.442	.000 ^a
Residual	3586.477	493	7.275		
Total	3698.816	494			
Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	16.171	.890		18.177	.000
Afforestation	.184	.047	.174	3.930	.000

a. Dependent Variable: Forest conservation

The simple regression analysis in Table 1 showed the prediction of afforestation/reforestation on predicting conservation of forest resources in Cross River State which produced an adjusted R² of .028. This implies that only 2.8 percent of the variance of the dependent variable (conservation of forest resources)

can be predicted from the independent variable (afforestation/reforestation). The F-value value of 15.442 of the Analysis of Variance (ANOVA) obtained from the regression table with a p-value .000 with 1 and 493 degrees of freedom at .05 level of significance showed that the null hypothesis was rejected. This result

therefore signifies that afforestation/reforestation significantly predicted conservation of forest resources by 2.8 percent. The result therefore implies that there was a significant prediction of afforestation/reforestation on the conservation of forest resources in Cross River

Discussion of finding:

This research hypothesis which addresses the prediction of afforestation/reforestation on the conservation of forest resources revealed that afforestation/reforestation significantly predicted conservation of forest resources in Cross River State. This result is in tandem with Amna (2015) who noted that Planting trees are one of the best ways to reduce the amount of carbon in the air which help in conserving forest resources, stressing that these trees capture CO₂ emissions and with the help of photosynthesis, they create clean oxygen for humans to breathe. Afforestation is the process of transforming barren land into a forest. It refers to planting trees in areas where there has been no tree cover before or not for many years. One of the most significant reasons why afforestation is essential is because it battles climate change and conserves the forest. This process of afforestation can help breathe life into the area and create a new ecosystem thereby conserving the forest resources around the areas. Afforestation can aid in increasing soil quality, prevent erosion, create new wildlife habitats, protect nearby areas from intense winds and floods. This result also agrees with Gross, Few and Martin (2015) who noted that the most significant benefit of afforestation is that it fights against climate change and global warming, stressing that trees absorb carbon and play a crucial role in reducing the greenhouse effect which also aid in conserving the forest. The planting of new forests helps in capturing more carbon emissions from the air. In other words, trees act as carbon sinks and create a more sustainable environment. The process of afforestation is transforming barren lands into flourishing forests. Soil erosion occurs when the ground is exposed to strong winds, flowing water and heavy rainfall. With afforestation, trees block excessive winds and prevent rain from damaging the ground.

Conclusion

Based on the result of the study, it was concluded that: Afforestation/reforestation practices conserves forest resources in Cross River State.

Recommendation

Based on the finding of the study, the researchers recommended that, conservation -agencies should collaborate with traditional institutions to ensure that forest are properly maintained in the Communities, this will help to reduce unsustainable exploitation of forest resources.

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