

A Review of the Impact of Afforestation on the Socio-Economic Development of Nigeria

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Abstract

Afforestation has been a driving force in enhancement of the socio-economic development of many nations including Nigeria. This highlights its impact on climate change, biodiversity, livelihood security and employment creation to mention but a few. This paper reviews the historical trend of afforestation programmes in Nigeria and identified the gaps retarding the full implementation of the previous afforestation programmes. The paper recommends an all-inclusive participatory approach especially with the host communities and other stake holders in afforestation programmes through bottom-up awareness campaign for stakeholders on the consequences of forest degradation. The importance of tree planting and sustainable forest management through a compulsory 'plant and nurture a tree program' was also emphasised for all loggers which is meant to enhance protection and restoration and finally, to put in place a better political will to implement forest management laws and policies to reduce environmental degradation in Nigeria.

Keywords: Forest, Afforestation, Government, Development and Nigeria.

INTRODUCTION

The need to improve the quality of trees and protect the forest has become more crucial than ever as human beings depend on the interaction with the environment for safety, health and survival (Foskett and Foskett, 2004). Forests according to Agbogidi and Eshegbeyi (2008) constitute a vital role in the water cycle and carbon sequestration; they stimulate rainfall, protect soils from erosion and regulate the flow of river and stream water. However, as the environments degenerate and users become affected, people become more environmentally aware and will want to protect the environment.

Oloyede (2008) as reported in the work of Ibrahim and Muhammed (2016) claimed that nearly 50% of the earth's land surface has been transformed by direct human activities with significant consequences on biodiversity, soil and climate. On the basis of this, Kalu *et al.*, (2014) suggested the need to plant and grow more trees due to its numerous contributions on climate change, food production and medicine.

Afforestation is the process of creating a new forest in an area that does not have trees. It is the establishment of forest freshly in a formerly non-forested place. However, studies have shown that afforestation becomes more crucial in dryland environments such as Nigeria (FME, 2013). Afforestation is a comprehensive process which relies on collaboration among a wide range of stakeholders including local communities, scientists, foresters, government officials, non-government organizations and funding ecosystem agencies.

Research shows that healthy forests make substantial contributions to agricultural production and multiple streams of income for forest dependent communities in food, fuel and income

(Busch *et al.*, 2017). Aside the safety-net importance of tree planting, it also contributes to timber production, global carbon budgeting, aesthetics and local entrepreneurial opportunities like; tourism, recreation, and rural livelihoods (MEA, 2005).

Considering the aforementioned contributions of afforestation to socio-economic development of any nation, it is imperative as envisioned by this paper to further review its importance in all ramifications and especially as it relates to climate change and socio-economic development.

Historical trend of afforestation programmes in Nigeria

Tree planting in Nigeria commenced as a response to major concerns about the possible southward shift of the Sahara Desert into Nigeria in the 1930s. To confront this environmental challenge, border emirates were directed to embark on a tree planting project to stop desert encroachment. Thousands of seedlings were raised and distributed to embark on the project. The bad situation of the affected areas further prompted the establishment of shelterbelts in the northern parts of the country in 1960s (FGN, 2012).

The effort of the government to stop the continual deterioration of land in this part of the country became futile and unsuccessful. In 1972-1973, a disastrous Sahelian drought which was recognized as a national disaster propelled the Federal Government to swing into action by establishing afforestation programmes.

World Bank Assisted Forestry I Afforestation Project

In 1974, the World Bank had a meeting with the Federal Government of Nigeria on the commencement of First Forestry Project in Ogun and Ondo States respectively. The main objective of the project was to establish 22,600 ha of *Gmelina arborea* plantations. Subsequent reports by (JIGAP, 1998) showed it was quite successful since the project had achieved about 70 percent of the appraised planting targets in Ogun and Ondo States.

Arid Zone Afforestation Project (AZAP)

Thereafter in 1977, the Nigerian Government set up a National Committee on Arid Zone Afforestation Project (AZAP) with the responsibility of creating a suitable afforestation programme to reduce desertification and improve human livelihood in the affected states. In spite of these efforts, desertification was prevalent (APCU, 1997).

World Bank Assisted Forestry II Afforestation Project

In 1987, Forestry II afforestation project was launched and funded by the World Bank to establish shelterbelts in eleven frontline states namely (Borno, Yobe, Adamawa, Bauchi, Gombe, Jigawa, Kano, Katsina, Zamfara, Sokoto and Kebbi states). The project lasted for nine years according to Medugu *et al.*, (2009) and was conceivably the most successful afforestation project in Northern Nigeria. In order to compliment the Federal Government efforts, the governments of the affected states embarked on free distribution of seedlings to members of the public and monetary rewards to farmers and forest dependent communities. Tree planting campaigns were also intensified by governments in the affected states according to Kalu *et al.*, (2015) with positive impacts on the socio-economic development of the area.

Afforestation targets were achieved through shelterbelts, woodlots and orchards. Increased crop yields were experienced on farms protected by shelterbelts and windbreaks and through the integration of agro-forestry techniques in the woodlots. Increased income was realized from

orchards and woodlots. Participating farmers were trained and empowered to establish private owned plantations which served as a source of income and employment generation. Women were also mobilized and empowered to produce and use fuel-efficient stoves and establish their own orchards and woodlots.

National Action Program

In 2000, Fmr President Olusegun Obasanjo still concerned about the consequences of desert encroachment in the affected areas launched a (National Action Programme (NAP), 2000) to combat desertification. The Federal Ministry of Environment in the year 2000 was tasked with the responsibility of initiating and setting up a greenbelt spanning across North-West and North-East geopolitical zones. The Ministry was saddled with the responsibility of planting about 15million trees along the arid northern zone (Olori, 2002). Nurseries were also established to raise seedlings towards the commencement of the green belt project which lasted for three years.

The Great Green Wall Initiative

In 2013, The Great Green Wall of the Sahara and Sahel initiative commenced as a recent regional response to the effect of natural resources degradation and drought in rural areas bringing together 20 countries from the Sahel-Saharan regions (FAO, 2017). The project was conceived as a thematic project, focusing on creation of a wall of trees of some 15km wide and 7,775 km long from Dakar to Djibouti, through 11 North-African countries, and eleven frontline Nigerian states (FGN, 2012). Corbley, (2019) reported that 15% of the tree walls are complete with significant progress made in Nigeria restoring 4.9 million ha of degraded land in the affected regions.

The Green bond Project

In 2017, the Federal Ministry of Environment instituted the Green bond project. This is an afforestation program which is to be funded by the Nigerian Green bond of the Federal government of Nigeria, and to be implemented through (4) of its departments/Agencies namely: (i) Forestry Research Institute of Nigeria (ii) Drought and Desertification Amelioration Department (iii) Great Green Wall Department and (iv) National Park under a nationally coordinated National Afforestation Program.

Green bonds are bonds that are used to raise capital specifically for environmentally friendly projects i.e. projects that are climate friendly and leaves little or no adverse effect on the environment. According to FRIN (2008), the broad objective of the Green bond afforestation program is to increase the existing Nigeria forest cover through establishment of forest plantations of economic tree species with a view to contributing to Nigeria's commitment towards global climate change mitigation efforts (Paris agreement) and enhancing livelihoods of the rural and urban poor.

The National Afforestation Program of the Green bond is to be implemented across 26 states of the federation covering a total land area of 1,995 hectares in the first phase. It is estimated that the program will impact a population of 3,770,440 people across the pilot states and create a total of 34,494 jobs. The amount of emissions reduction expected to be achieved from the program is estimated at 12,969 tonnes of carbon dioxide. Fade Africa (2017) reported that the projects will be community driven i.e. it will actively engage members of the communities in the planting, maintenance, protection and sustainability of the projects over time. It further pointed out that Climate Change Department (CCD) another department under the ministry is

saddled with the responsibility of Monitoring, reporting and verifying projects performance under the afforestation program. This will be carried out in line with the climate change mitigation programs of the country.

Presently, the National Afforestation Program is in its second phase and operations are on-going in the selected project sites of the participating agencies. For instance, FRIN (2018) reported that Forestry Research Institute of Nigeria has completed the planting of another 150 hectares of forest plantations across 13 states of the federation and the federal capital territory in year 2020 despite the challenges posed by the Covid-19 pandemic restrictions.

National Tree Planting Project

On 23rd September 2019, President Muhammadu Buhari at the United Nations General Assembly (UNGA) meeting made a pledge that Nigeria would plant 25million trees amounting to 23,000 hectares of tree cover (Nigerian Tribune, 2020). Acting on the mandate via the Federal Ministry of Environment, the Director-General of Forestry Research Institute of Nigeria (DG-FRIN) in an interview with Nigerian Tribune stated that the Institute plans to raise 13million seedlings, Great green wall is raising about 7million seedlings and other sister agencies are also expected to raise 5million seedlings to actualise the mandate of Mr. President. The DG-FRIN further stated that the mega seedlings production project will increase the biodiversity hub of the country, regenerate degraded lands, reduce flooding, create employment opportunities for youths, enhance the country's GDP and provide livelihood security; social services and medicinal values for the host communities.

Gaps Identified from the Implementation of Previous Afforestation Programmes

The major reason for the establishment of afforestation programmes put in place by several administrations in Nigeria was to combat environmental changes such as drought and desertification. Despite the effort of previous administrations, some of these programmes were not fully accomplished due to the following reasons:

Exclusion of relevant professionals and stakeholders in program planning and implementation

One of the challenges recognized in the historical trend of afforestation programs in Nigeria is poor program planning and implementation. Policy makers in Nigeria are good at initiating policies and programs to achieve sustainable forest management. The missing links between these established programs is as a result of the exclusion of relevant stakeholders and professionals within the sector. Relevant professionals such as foresters, research scientists and more importantly the farmers/rural dwellers who are usually ignored during planning and implementation of these programs should all be involved in the process. Their non-participation has led to prevalence of environmental challenges and partial accomplishment of the intervention programs. It is therefore necessary to encourage farmers, the host communities and other stakeholders to participate in the planning and implementation of the future programs to ensure effective participation and support for the afforestation activities.

Inadequate monitoring and improper evaluation of programmes:

The main purpose of programme evaluation is to ascertain the achievements of the programme regarding the aims/objectives of establishment. Monitoring and evaluation techniques can serve as a measure to improve implementation and efficiency of programmes after interventions have begun. This technique further reveals the impacts of a specific programme,

exposes lapses associated with achievement of programme objectives and provides opportunities for adjustment. This is evident in the historical trend where there was inadequate monitoring and evaluation of the programmes.

Lumber jacking

Lumber is of vital importance in construction activities. In sub-Saharan countries like Nigeria, trees are mowed without any effort to replant them. Indiscriminate logging and uncontrolled mowing of trees has adverse effect on the environment which results to ecological imbalance.

Discontinuation of Programs and Projects

Another problem militating against afforestation in Nigeria is the discontinuation of programs. It is a common phenomenon in Nigeria to see an administration initiate a program but whenever there is a change in government, the new administration discontinues with the programs put in place by the previous administration. For instance, the Arid Zone Afforestation Project (AZAP) that was established in 1977 under the administration of Gen Olusegun Obasanjo was unsuccessful in spite of the efforts put in place to stop desertification. However, this program was discontinued by the successive administration.

Impact of Afforestation on the Socio-Economic Development of Nigeria

Mitigating Climate Change

Climate change is one of the key environmental issues facing the world today. Ifeanyi-obi *et al.*, (2012) defined climate change as the variability in the weather conditions of a location. Climate change affects the economic system, livelihoods and the availability of natural resources in several regions of the world. The interaction of man with the environment through agriculture, deforestation, urbanization, human settlements, burning of fossils fuels and a host of others contribute greatly to climate change. This manifests itself when there are rising temperatures, irregular rainfall, flooding, rising sea levels, drought and desertification. Afforestation has been commonly considered by contemporary forestry science as one of the most straightforward policy measures in addressing climate change.

In Nigeria, afforestation is very important as the whole country is ravaged by human activities that have striking effect on the environment. Ajewole (2019) indicated that trees reduce atmospheric carbon dioxide (CO₂) by sequestering carbon in the biomass of trees and reducing the concentration of the atmospheric greenhouse gases that induce global warming. IPCC (2007) further stated that planting trees and retaining forests is an easy way to absorb CO₂ from the atmosphere because trees incorporate CO₂ through the process of photosynthesis. Some of the absorbed carbon dioxide is used for energy and discharged into the atmosphere while most of it is transferred to the stem and other parts of the plant where it is stored mostly as food. The tree then becomes a carbon sink which stores carbon for a long period of time as the tree has a physical form.

Studies carried out by Federici *et al.*, (2017) suggest that the climate change mitigation goals cannot be met without the inclusion of forests and improved sustainable forest management. Their findings further revealed that afforestation remains the only proven means of removing and storing atmospheric carbon dioxide at a scale that is meaningful and enough to limit the effects of global warming. Alongside drastic fossil fuel related emissions reductions, afforestation has a great potential to provide important benefits to biodiversity and development. It is noteworthy that forests play a major role in cycling of carbon, oxygen, iron,

magnesium and nitrogen which helps to increase the relative humidity of the air through reduced evapotranspiration.

Enhancement of Biodiversity

Biological diversity often referred to as biodiversity is a term that is frequently used to describe the variability among living organisms from all sources, including diversity within species, between species and of ecosystems (United Nations, 1992). Biodiversity indicators among others include plant species; soil micro flora (algae and fungi); soil micro fauna (bacteria and nematode); birds and insect population; and the macro fauna.

There has been divergence of opinions with respect to the contribution of forests to biodiversity. Some scholars hold the view that forest plantations contribute to biological diversity, others are of the opinion that they constitute a major threat to biodiversity (Carnus *et al.*, 2003). Forests could contribute and enhance the environment of wildlife by sustaining the wild animal species from going into extinction. For example, in-migration of numerous animals; birds and plants was reported in dune plantations in Denmark by Wilkie, (2002). Some of these animals were known to have arrived from the forest of neighbouring countries such as Norway and Sweden, thus enriching and enhancing biodiversity in Denmark.

Forest plantations help to facilitate biodiversity conservation in human-dominated environments. These plantations serve as a refuge to rare or declining species of animals and also provide opportunities for other species to colonize. The impact of forest plantations will not only enhance harmonious biodiversity, it will also help in sustaining cooperate existence.

Provision of Livelihood Security and Employment Creation

Forest products constitute an essential component of food and livelihood security for the poor in many developing countries. This improves ecosystem quality and thus positively affects living organisms and confers socio-economic benefits to human society (Harbi *et al.*, 2018). Forest outputs are broadly classified into wood and non-wood forest products. The wood products include timber, poles, pulpwood, firewood and products that are derived from woody climbers and shrubs (Fuwape, 2000). The non-wood products are wild plants and animal products harvested from forests such as wild fruits, nuts, edible roots, honey, palm, medicinal plants, snails, etc. (Shomkegh and Tem, 2008).

Many people throughout the world make use of these products and the increase in demand for these products has enhanced rural livelihoods and enabled the expansion of domestic markets, particularly in urban areas where woodfuel and other forest resources are scarce (Jones *et al.*, 2004). A research carried out by Charlie and Sheona (2004) on the role and importance of forest in daily lives of rural people in South Africa revealed that more than 85% household used forest products such as wild spinaches, fuel wood, wooden utensils, edible fruits etc. Besides, more than half of the household investigated made use of products like timber for construction, bushmeat, wild honey and reeds for weaving.

In Nigeria, the livelihood security of rural dwellers is enhanced by planting trees in the home gardens and on farms. Owing to the diverse varieties of products obtainable from the forest, a lot of household were able to meet their immediate needs. Additionally, one of Nigeria's major benefit for economic development before commercial exploitation of oil was from the forests (Salami, 2011). Products such as cocoa, rubber and palm products from the southern Nigeria; as well as groundnut, cotton, hide and skin from the north in the pre-independence time all contributed to the economic development of the country.

Ikponmwonba, (2008) stated that more than 60% of the rural dwellers in Edo State are engaged in the collection and processing of forest foods since it provides food and condiments which many people consume and sell for income. Forest based rural industries in Nigeria such as wood crafts, cane furniture, pestle and mortar production, fabrication of tools handles and chew sticks creates employment for a large number of people who are involved in harvesting, processing or marketing of these products. Leaves such as *Thaumatococcus daniellii* (Moi-Moi leaf), *Tectona grandis* (Teak), *Laurus nobilis* (Bay leaf) generates income for rural women while other women in major towns such as Ibadan, Oyo, Ondo and Abeokuta are involved in marketing of these products and wood energy production (Oniroko *et al.*, 2014). It is therefore evident that forest provides raw materials for wood-based industries and non-wood based industries thus generating income and creating employment opportunities for both rural and urban populace. These have placed forests in the limelight as an integral part of national development.

Way Forward

The numerous contributions of afforestation to socio-economic development cannot be overemphasised as it mitigates climate change, enhances biodiversity, provides livelihood security and creates employment opportunities. With the increasing effect of environmental degradation in the country today and the gaps identified in the accomplishment of previous afforestation programmes, this paper therefore recommends that:

- a) Government should embark on aggressive afforestation schemes especially at state and local government levels and also encourage the participation of host communities and other stakeholders.
- b) Awareness campaigns should also be organised to sensitize all stakeholders on the consequences of forest degradation and the need for tree planting and sustainable forest management.
- c) De-emphasizing politics from pragmatic tree planting campaign is key to effective afforestation in Nigeria.
- d) Regulatory bodies with the support of the government and other stakeholders should implement a compulsory “plant and nurture a tree program” for all loggers. This would help protect existing forest plantations.
- e) Forest management laws and policies should also be reviewed with maximum penalties to reduce environmental degradation.
- f) Provision of enabling environment for the laws, policies and stakeholders to effectively flourish in their various sections is important.

CONCLUSION

This paper highlighted the impact of afforestation to socio-economic development. It also traced the historical trend of afforestation programmes put in place by several administrations in Nigeria from the pre-independence to post-independence periods with the gaps in implementation process. The previous administrations have made modest attempts but it is worth saying that these programmes were established in response to several environmental disasters with inadequate planning, monitoring and evaluation measures. However, if these programmes had been properly planned from inception and efficiently sustained, many of the environmental problems currently facing the country may have been effectively mitigated. The

paper recognizes that afforestation is an important driving force that extends the benefits of forest trees to barren lands resulting in social and economic development. It is therefore important to involve relevant stakeholders in afforestation programme planning process in order to ensure proper planning, implementation, evaluation and environmental sustainability.

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