

Sustainable Land Use and Forest Management for Socioeconomic Growth and Development in Nigeria

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ABSTRACT

The rate of deforestation in Nigeria is considered one of the highest in the world resulting in land degradation, desertification and loss of biodiversity. Consequently, Nigeria's contribution to global GHGs emissions, global warming and climate change has soared geometrically, threatening socioeconomic growth and sustainable development. Deforestation and by extension desertification adversely affects the livelihoods of forest dwelling people who dependent directly or indirectly on land and forests. The United Nations' Sustainable Development Goals (UN SDGs) Goal 15 (G-15) aims to promote the sustainable management of forests, combat desertification, land degradation, loss of biodiversity and its effects on climate change in developing countries like Nigeria. Therefore, this paper proposes the concepts sustainable land use (SLU), forest resources management (FRM) and Protection of Biodiversity (PBD) as measures to climate change resulting rapid deforestation, desertification and land degradation in Nigeria. The results and conclusions of the paper submit that SLU, FRM and PBD can significantly reduce the effects of climate change. This can be achieved by investments in early warning systems, public awareness, and educational sensitization campaigns. The successful adoption and implementation of SLU, FRM and PBD practices can potentially stimulate long term socioeconomic growth and sustainable development in Nigeria.

Keywords : Sustainability, Land Use, Forest Resources, Socioeconomic, Development, Nigeria

I. INTRODUCTION

The Paris Agreement (COP21) adopted by 195 countries in 2015, pledged to the long term objective of limiting the increase in global average temperature below 2 °C above pre-industrial levels. Similarly the treaty aims to limit the increase to 1.5 °C but cutting greenhouse gas emissions (GHGs) to zero by 2065. The milestone agreement presents the first ever legally binding deal on climate change aimed at creating a global action plan on cutting anthropogenic emissions. Many analysts posit the Paris Agreement will stimulate the fusion of present

day energy and environmental policies with carbon neutrality [1]. In line with treaty, governments around the world have pledged to cut GHGs but divesting from polluting fossil fuels, promoting renewables and preserving the world's rich land, animal and forest resources. Additionally, the treaty plans to strengthen the capacity of developing countries to adapt to potential effects of climate changes through continued international support [2].

Currently, forest and vegetative plant materials account for 30 % of the earth's surface providing food, water and shelter for millions of the world's

diverse species. Forests are potential players in the quest to combat climate change, protect nature's biodiversity and the livelihood of many native communities. However, the global population growth and rising living standards have led increased consumption and exploitation of the earth's natural resources such as forests. Empirical evidence suggests that over 13 million hectares per year between 2000 and 2010 was lost to deforestation while over 3 million hectares is lost to desertification of arid lands, annually [3]. Consequently, numerous studies have been carried out to investigate and highlight the negative effects of deforestation on the environment [4-7]. The most notable however is the loss of habitat for more than 70% of the world's plant and animal species [8]. Furthermore, deforestation and by extension desertification, are considered key drivers of global climate change, thereby altering the natural biochemical, hydrogeological and climatological cycles which support life in the environment [9-11].

Consequently, the twin environmental maladies, deforestation and desertification, pose grave socioeconomic, environmental and geopolitical challenges. The loss of plant and animal during deforestation and desertification adversely affects the people who directly or indirectly dependent of land and forests for their livelihoods. More so, the loss of natural resources directly impacts on poverty, hunger, disease and famine.

Due to the importance of forests to the future humanity, particularly the livelihoods of citizens of developing countries, the global community has pledged to institute programs and policies to protect, conserve and manage the earth's natural forest and land resources. Consequently, the objective of Goal 15 of the United Nations' Sustainable Development Goals (SDGs) aims to promote the sustainable management of forests, combat desertification, land degradation, loss of biodiversity [3].

The rate of deforestation in developing countries like Nigeria has soared geometrically to distressing

levels of the years. According to the Food and Agriculture Organization (FAO), Nigeria experiences the highest rate of deforestation in the world. With an estimated deforestation rate of 3.0 - 3.5%, the country lost 56 % of primary forests from 2000 to 2005 [12]. The high rate of deforestation in Nigeria can be attributed to the land clearing for subsistence agriculture, illegal logging for timber trade and fuelwood for domestic uses. The culmination of these activities substantially increases the global stock of GHGs emissions, global warming and climate change [13-15]. However, not all deforestation is deliberate as some are caused by natural disasters, wildfires or overgrazing in regions or lands around the globe [8]. As a developing country signatory to the Paris Agreement, Nigeria urgently needs to address the twin issues of deforestation and desertification to halt and significantly lower annual GHGs emissions. In addition, mitigation steps are required to address long term, irreversible effects of climate change and global warming on developing countries in Sub-Saharan Africa.

Consequently, this objective of this paper is to propose the development and implementation of sustainable land use (SLU) and forest resources management (FRM) practices aimed at halting the rate of deforestation, desertification and land degradation in Nigeria. In addition, the paper will highlight the potential merits of SLU and FRM on limiting climate change as well as stimulating socioeconomic growth and sustainable development of Nigeria.

II. METHODS AND MATERIAL

2. Sustainable Development Goal -15 (SDGS)

One of the 17 goals of the United Nations Sustainable Development Goals (UN-SDGs) programmes is to protect, restore and promote the sustainable use of terrestrial forests and ecosystems. Furthermore, "Goal 15", tagged "Life on Land" aims to consciously combat desertification, land degradation and loss of biodiversity.

Figure 1 presents an overview of the 17 goals of the UN SDGs programme.



Figure 1: The 17 goals of the UN SDGs programme (UN SDGs, 2016)

The UN with the help of Non-Governmental Organisations (NGO) and governments around the world have pledged to devote resources to the achievement of Goal 15 of the UN SDGs. In view of this, the UN will address the sustainable management of forests, tackle desertification and loss of biodiversity through outlined targets. Consequently, by 2020 the UN hopes to ensure the sustainable conservation, remediation and sustainable utilization of terrestrial and aquatic ecosystems. Particular interest will be focused on the restoration of swamps, peatlands and drylands based on internationally agreed terms, rules and statues.

Furthermore, Goal 15 aims to promote the sustainable forest management by eliminating deforestation and the global adoption of reforestation programmes. In addition, the remediation of degraded land, soils and terrestrial ecosystems will be promoted through policies, programmes and partnerships. This will be aimed at precluding the proliferation and trafficking of potentially invasive species into fragile ecosystems.

Consequently, the UN and the global community posit the establishment of the targets can potentially stimulate socioeconomic growth and development through poverty reduction and land use.

As a result, scientists around the globe posit that with the successful achievement of the SDGs by 2020 will reduce GHGs, limit global rise in temperatures and climate changes [16, 17]. However, concerted efforts are required, particularly in developing countries, to effectively manage the global environmentally crises of deforestation, desertification and loss of biodiversity. According to the statutes of the Paris Agreement, these challenges can be addressed by preventing, and curtailing the potential damages linked to climate change [18].

Therefore sustainable practices to mitigate climate change needs to be developed, implemented and promoted globally to forestall its damaging effects on the socioeconomic growth and development of

developing countries [3]. Section 3 of the paper proposes the institution of sustainable practices for combating climate change in Nigeria.

3. Sustainable Practices for Mitigating Climate Change

As part of the Paris Agreement, the sum of \$100 billion has been pledged annually by developing nations until 2025 to combat climate change. In addition, the funds will be used to strengthen global awareness, concerted action and support initiatives aimed at creating early warning systems, emergency preparedness and insurance against risk from climate change. It is envisaged that investment of such funds, human resources and logistics will stimulate the creation of ecological practices including sustainable land use (SLU), forest resources management (SFM) and protection of biodiversity (PBD) in developing countries.

3.1 SUSTAINABLE LAND USE

Land use and the exploitation of the earth's natural resources significantly impacts on global climate change. The use of land for agriculture, mining, and housing contributes large emissions of GHGs into the atmosphere annually. It is estimated that over 2.5 billion of the earth's inhabitants rely on subsistence agriculture resulting in the degradation of over 50 % of land. In addition, year 2008 estimates from the UN indicate 75 % of 1.5 billion poor people around the globe are directly affected by land degradation [3]. The direct effects of poor land use over the years have culminated in the loss of over 12 million hectare of land, exacerbating drought, famine and desertification globally. The combined effects of these practices are responsible for global warming and climate change threatening socioeconomic growth and sustainable development [19, 20].

In Nigeria, land preparation, clearing and cultivation of crops and animal husbandry also result in GHGs emissions. In particular the practice of slash and burn for agriculture [21] results in land degradation, GHGs emissions and other environmental challenges such as air pollution, and soil erosion. Consequently, environmental analysts posit strategic planning, policy enactment and sustainable implementation of sustainable land use practices and programmes are required to halt the impending environmental crises [22-24]. This will

significantly limit the effects of climate change, global warming and the effects of land degradation on the socioeconomic and environmental wellbeing of Nigeria and other developing nations. It will require the total eradication of unsustainable slash and burn, land clearing and felling of trees for agricultural purposes [22]. Furthermore, the adoption and implementation of sustainable practices such as bush fallowing, organic manuring, post-harvest grazing, and valorization of agricultural residues will improve land use significantly [25-27].

3.2 FOREST RESOURCES MANAGEMENT

Globally over 30 % of the earth's surface is covered by forests and green vegetation which provides food, water and habitat for over 80% of the world's plants and animal species. It is estimated that nearly 1.6 billion people globally rely on forests for the day-to-day livelihood [3]. Furthermore, forests play an important role in safeguarding the earth's natural cycles ensuring the availability of water, sunlight and canopy which regulate hydrological flows and life in forests. Evidence from scientific research similarly points to the role of forest trees in decreasing the risk of floods, land, mudslides, desertification and salinization [12, 28].

However, with the rate of deforestation approaching dangerous levels, humanity urgently needs to address its potential long term effects on the environment. In addition, forest fires, invasive pest species and climate change are fast abetting the depletion of the earth's forests. Accordingly, the development and implementation of sustainable management of forest resources is required to halt deforestation and desertification currently contributing to global climate change.

Sustainable forest management can potentially diminish the degradation of forests while simultaneously protecting the environment through carbon sequestration, resources conservation and protection of biodiversity. In addition SFM can be adapted to catalyse the social welfare and economic development of forest dwelling people around the world.

The political aspect of SFM hinges on the development and implementation of the promulgation of forest management policies, laws and official charters. In

addition, the allocation of funding, technical training of forest personal and incentives to forest dwelling communities will help promote SFM particularly in developing countries like Nigeria.

The problem of deforestation in Nigeria can also be attributed to energy poverty where trees are felled for fuelwood and used for domestic heating purposes. It is estimated that 60-80% of Nigerians particularly in rural areas depend on fuelwood for cooking and domestic heating [29, 30]. Other uses of forest wood and plant materials include herbal (medicinal) purposes, and provision of sustainable building materials [31, 32].

The UN FAO projects that 80% of rural dwelling people around the globe rely on forests trees and plants for herbal remedies [3, 12]. Conversely, the use of tree biomass for energy purposes increases the rate of deforestation, GHGs emissions and land degradation. However, SFM can be employed to address this through capacity building programmes, workshops, and practical seminars to underscore the importance of education and public awareness on climate change related issues. This approach to climate change mitigation can potentially address the challenges of SFM particular those resulting from socioeconomic poverty.

3.3 PROTECTION OF BIODIVERSITY

The loss of biodiversity and habitat of forest dwelling species is one of the most devastating effects of deforestation on the environment. Scientists around the globe approve that protecting the world's ecosystems can greatly reduce the extent of climate change. Other researchers opine that tackling climate change is impossible without safe guarding biodiversity. Consequently, it stands to reason, there is an interconnection between climate change and biodiversity [33]. Biodiversity, according to the UN Convention on Biological Diversity (CBD), is a generic term for all species, genes and ecosystems on the planet. The CBD is a global accord for safeguarding the conservation, sustainable use and equitable distribution of genetic resources [34].

Similarly, the European Commission White Paper on Adapting to Climate Change – Towards a European Framework for Action identifies with the

significance of addressing the ecosystem dynamics that hasten global climate change [35]. This is based on the premise that the impacts of climate change on humanity can largely be mediated by the environment. However, the protection of biodiversity is critical to climate change mitigation and by extension the global sustainability, economy and the environment. The preservation of the planets diversity abound in forests, peatlands and other terrestrial habitats can reduce the global stock of GHGs. Consequently, there is an urgent need to halt the factors resulting loss of biodiversity such as deforestation, desertification and land degradation to safeguard the planet.

III. CONCLUSION

The paper highlighted the potential of sustainable land use (SLU), forest resources management (FRM) and protection of biodiversity (PBD) as strategies for abating climate change in Nigeria. This is against the backdrop that decreasing deforestation, desertification and land degradation can safeguard the sustainable future of the environment in Nigeria. Furthermore, the authors conclude that the potential merits of SLU, FRM and PBD on limiting climate change are critical to stimulating socioeconomic growth and sustainable development of the country as a developing nation.

IV. REFERENCES

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