WEST AFRICAN JOURNAL ON SUSTAINABLE DEVELOPMENT

SUSTAINABLE FOREST MANAGEMENT PRACTICES TO COMBAT DEFORESTATION

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ABSTRACT

Deforestation has a devastating impact on the environment and society. When forests are cleared for agriculture, logging or development, it leads to a loss of habitat for wildlife and disrupts the ecosystem. Forests are essential in regulating the Earth's climate by absorbing large amounts of carbon dioxide and releasing oxygen. Sustainable forest management (SFM) is the management of forests according to the principles of sustainable development. Sustainable forest management must keep a balance between the three main pillars: ecological, economic and socio-cultural. The goal of sustainable forestry is to allow for a balance to be found between making use of trees while maintaining natural patterns of disturbance and regeneration. We review several techniques for managing a forest sustainably. These strategies include: Adopting sustainable forestry practices that prioritise the long-term health and productivity of forest ecosystems. This includes selectively harvesting trees, replanting and restoring degraded areas, and ensuring sufficient wildlife habitat is preserved. Reducing or eliminating clearcut logging, a method that involves removing entire forests in one go, leads to significant ecosystem disruption. Alternative approaches include selective logging, where only mature trees are harvested, or shelterwood logging, where younger trees remain in place to provide habitat for wildlife and promote forest regeneration. Protecting primary and intact forests, as these ecosystems have remained largely undisturbed by human activities. These areas are essential for maintaining biodiversity and storing carbon, making them vital to the fight against climate change and biodiversity loss. Implementing stricter deforestation regulations, including setting limits on how much forest can be harvested, the methods used, and ensuring that companies compensate for any damage caused. Governments can also provide incentives to companies that prioritise sustainable forestry practices and levy fines and penalties for breaches of deforestation regulations. Encouraging the use of recycled and alternative materials can also reduce the demand for newly harvested timber and promote responsible forestry management. This includes using recycled paper products, alternative building materials such as bamboo or recycled plastic, and supporting the development of sustainable production methods.

Key Words: Sustainable, Forest, Management, Deforestation

© 2023 West African Journal on Sustainable Development (WAJSD) 2024, Vol. 1 (Issue 2), 215 - 220
ISSN (ONLINE): 3026-8923

CHAPTER ONE: INTRODUCTION

1.1 Delineation of deforestation

Deforestation is induced by human activities, cascading into associated cost and economic benefits. The conversion of forested areas into permanent non-forest areas and lands is known as deforestation (FAO, 2010). Deforestation is defined also as a process of shrinking the areas of tropical forests for agricultural, grazing and construction purposes (Okia, 2012). Other authors have presented some more definitions of deforestation. Tariq and Aziz (2015) opined that deforestation is the degradation of the environment that threatens the quality of the existing forests. Notably, deforestation can be intentional and non-intentional clearing of the existing forests, through human activities (Tejaswi, 2007; Pareta and Pareta, 2011). These land use changes come with enormous economic benefits for improved livelihoods across the world (Goll et al. 2014). However, these benefits, could only be sustainable with good forest management practices (Tariq and Aziz, 2015; FAO, 2010). Therefore, it is important to create sustainable use of forest resources across the world, for sustainable development.

1.2 Overview of the problem of deforestation

Human activities tend to justify deforestation as good actions because it support livelihoods. However, as depicted below, deforestation comes with its attendant environmental and socio-economic consequences. Some environmental consequence of deforestation includes: shortages of food, shortages of wood, mass destruction of wildlife and high wildlife migration rate, alteration of vegetation cover and structure, damage and loss of flora and fauna essential for recreation and tourism, desertification, disturbed water cycle, soil erosion, flooding, landslides, and land degradation, reduced atmospheric moisture, destruction of biodiversity, hardening of iron-rich soils to form laterite, changes and imbalances in nutrient cycle and energy, declined pollination, increased poverty levels, decline in soil fertility, decline of medicinal herbs production, decline in income generation, water loss as well as loss of natural flood and erosion control (Kassa et al. 2017; Bennett, 2017; Tariq, 2014). Some Socio-economic consequence of deforestation include: shortages of food, shortages of wood, increased levels of poverty, decline in soil fertility, loss of medicinal therapies, loss of valuable agricultural land, water loss and, inadequate income. These consequences are intertwined with sustainable development. In most communities, forest is valued to an extent that, its destruction amounts to the destruction of their values, beliefs, norms and cultures (Okia, 2012). This further shows that deforestation is not only an environmental issue but is a social and economic issue. Deforestation result in shortages of woods (Boateng et al. 2008). Woods from the forests are used for different purposes which includes making and production of paper, making of furniture, construction as well as firewood and charcoal production

1.3 Importance of Sustainable Forest Management

Sustainable Management of forests means the ability to manage forests in a way that preserves the forest habitat, its resources and the biodiversity within it as well as fulfill the current economic,

social and commercial needs of the human population without rendering them useless or unable to be used by the future population, flora and fauna.

Forests are extremely important natural ecosystems and habitats for floral and fauna species but they also serve humans in more ways than one. Therefore, it is important to manage them sustainably to ensure they can function in a healthy manner. Removal of forests will not only lead to loss of habitat for many species and cause them to invade other species habitat but it could also increase the risk of human-animal encounters that would result in injury or death. As seen in cases of building/expanding new cities in places where there used to be forests; many such animal-human encounters have taken place. Since the animals had lost their homes, they would invade human settlements for survival where they may kill/be killed in defense. Forests need to be preserved and protected in order to reduce the ratio of harmful human-animal encounters.

Other than that, trees in a forest are responsible for carbon sequestration– storage of carbon along with other greenhouse gases that reduces the impact of global warming. Ensuring healthy forest function is vital because it can help us combat the effects of climate change. Cleared land devoid of any trees, shrubs etc., allows for soil erosion and land sliding from slopes that cause more damages due to flooding; as there are no trees that could otherwise retain the water and reduce its effects.

Therefore, through sustainable forestry, we can manage and utilize forest resources effectively rather than exploit them or not use them at all (which is not possible). Sustainable forestry encourages initiatives that protect forests such as building roads and highways through forests instead of removing them; it is done with minimal felling of trees which although does cause habitat fragmentation; it is is still much better than clearing entire land area and impacting the biodiversity and habitat life.

CHAPTER TWO: METHODS OF MANAGING FOREST SUSTAINABLY

There are various methods that can be employed to effectively manage our forests globally. Some of these are mentioned below:

1. Selective Logging: Selective logging may be defined as the removal of mature, over-mature and dcfective trees in such a manner as to leave uninjured an adequate number and volume of healthy residuals of commercial species and other tree species, necessary to assure a future crop of timber and forest cover for the protection of soil and water (Rapera, 1977).

There are two basic silvicultural techniques employed in tropical rainforest. As defined by Ameray et al. (2021) these are: (a) Monocyclic systems, which remove all saleable trees in a single operation. Thc time that must elapse before re-logging can occur equaIs ihe rotation age of the tree. (b) Polycyclic systems, which are based on the repeated removal of selected trees in a continuing series of felling cycles, whose length is less than the rotation age of the trees. selective

logging helps to prevent clearing entire sections of forest land and instead allows us to cut either selected trees/areas and leave the rest untouched (Finegan, 2015)

2. Coppicing : Coppicing is the practice of cutting trees and shrubs ina way that stimulates them to shoot or sucker back up. It involves cutting trees in a way that leaves the stumps intact – a practice known as coppicing. This will allow the tree to regrow and is beneficial for both humans and environment instead of cutting down entire trees and leaving land exposed that will cause subsequent problems like soil erosion, susceptibility to floods and other natural elements. When properly done, coppicing has the potential to provide landowners with two main benefits: a. A sustainable source of wood products, such as biomass/firewood, lumber, mulch, fodder for livestock, and crafting materials (e.g. basketry, tool handles, furniture, etc.). Well-managed coppicing can even extend the lifespan of certain species (Elliot, 2020).

b. Forest regeneration and potential expansion. Coppicing opens up gaps in the canopy for sunlight to penetrate, increasing productivity in the understory. If done at an appropriate scale, this can improve habitat for many species of wildlife. Further, coppicing can promote the expansion of forests into non-forested areas through root suckering, if it is done to species that can send up root suckers (Elliot, 2020).

3. Reforestation: Reforestation is the natural or intentional restocking of existing forests and woodlands that have been depleted, usually through deforestation. Reforestation can be used to rectify or improve the quality of human life by soaking up pollution and dust from the air, rebuild natural habitats and ecosystems, mitigate global warming since forests facilitate biosequestration of atmospheric carbon dioxide, and harvest for resources, particularly timber , but also non!timber forest products. For every tree cut in a forest, sustainable forestry would require another tree plantation of trees to preserve the forest health. The goals of reforestation is to avoid deforestation on a large scale and thus stop the large scale depletion of natural resources, preserve the smooth running of our eco system, and biodiversity (Zhang, 2017).

4. Clear-Cutting : Clearcut logging, a method that involves removing entire forests in one go should be reduced or eliminated as much as possible as it can lead to significant ecosystem disruption. Clear cutting of forests helps the growth of young trees and saplings because of the removal of mature and old trees. This is beneficial as it gives space for younger trees to grow instead of them having to compete with older mature trees. However, some foresters also prefer strip cutting to clear cutting. In strip cutting only strips of forest land if cleared instead of the whole section. But both these practices have their pros and cons (Picchio, 2018).

5. Protecting forests : In some cases where a forest has been exploited to the point of deterioration; foresters may entirely seal it by adding a fence around the forest perimeter to preserve the habitat and biodiversity or have it declared as a protected site to prevent illegal cutting of trees or trespasse. Protecting primary and intact forests, as these ecosystems have remained largely undisturbed by human activities. These areas are essential for maintaining biodiversity and storing

carbon, making them vital to the fight against climate change and biodiversity loss (Müller et al. 2019)

6. Other approach include Implementing stricter deforestation regulations, including setting limits on how much forest can be harvested, the methods used, and ensuring that companies compensate for any damage caused. Governments can also provide incentives to companies that prioritise sustainable forestry practices and levy fines and penalties for breaches of deforestation regulations.It also include encouraging the use of recycled and alternative materials can reduce the demand for newly harvested timber and promote responsible forestry management. This includes using recycled paper products, alternative building materials such as bamboo or recycled plastic, and supporting the development of sustainable production methods (McDermott et al. 2015)

CHAPTER THREE: CONCLUSION AND RECOMMENDATION

Sustainable forest management practices, such as reforestation, agroforestry, and community-based conservation initiatives, can play a crucial role in combating deforestation. These practices not only help preserve forest ecosystems but also support local livelihoods and contribute to climate change mitigation efforts.

It is recommended that policymakers, stakeholders, and communities prioritize the adoption of sustainable forest management practices. This can be achieved through the implementation of effective policies, capacity-building initiatives, and public awareness campaigns. Collaboration between governments, NGOs, local communities, and the private sector is essential to ensure the successful implementation of sustainable forest management practices.

Furthermore, continued research and monitoring are needed to assess the effectiveness of these practices and identify areas for improvement. By working together and taking proactive measures, we can make significant strides towards achieving sustainable forest management and combating deforestation for the benefit of present and future generations.

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