

Mitigating Climate Change through Eco-Forestation in the Tropical Region

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Abstract

The fast disappearing of our forest is an ominous pattern behind environmental pollution, local climate failure and economic depression. It is axiomatically believe that the evil that man does live after him such is the devastating impact of bush burning and its attendant effect on the environment and economy. The deteriorating effect of this heinous action of man on our forest is worth orchestrated otherwise the hitherto known tropical forest may best be addressed as Sahel savannah in the nearest future. This paper is out to discover the major causes of forest depletion, its environmental and economic implications, and unearth the plausible planning measures as the panacea. To this effect, discourse on the subject matter are major based on the information sourced from the relevant literature reviewed, the observations and the experiences of the author juxtaposing the observed findings with the extent of deforestation in the forest zone of Nigeria. On the final note, a good number of plausible environmental and planning policies are proposed to drastically address the issue coupled with an enabling law and legislation to back up expeditious action against deforestation as delay may be

Keywords- Forest Depletion, Local climate, Climate change, Eco-forestation,

INTRODUCTION

As part of the indices of development of any nation is essentially dependence of the extent to which the environmental resources, most especially the forest resources she is endowed with had been consciously managed in conjunction with other developmental factors. Many developing nations in the recent past have started devising various resources management strategies and techniques at such levels that their limited resources could not be put into wanton destruction having realised the most important impact that these resources play in any economic development.

Forest depletion simply means the wanton destruction of the forest resources. It is in other words refers to as deforestation. Ogunsanya (2003) in an introductory section of a book titled..... posited that, "man's human and natural environment is deteriorating at a very rapid rate. The trees and forests with their fauna and flora are disappearing due to large scale farming, intensive lumbering, and bush fire. He submitted further that, this large scale deforestation is the cause of gully erosion. "Forest cover is an important input variable for assessing changes to carbon stocks, climate and hydrological system, biodiversity richness, and other sustainable science disciplines. Despite incremental improvement in our ability to quantify rates of forest clearing, there is still no definitive understanding on global trends. Without timely and accurate forest monitoring methods, policy responses will be uninformed concerning the most basic fact of forest cover change". (Defries S. R. 2008) The attendant effect of these foregoing on the nations developing economy cannot be underestimated as the economic potentials of these forest resources have been hampered.

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

CONCEPTUAL FRAMEWORK

THE GAP ANALYSIS CONCEPT: Fewer crises driven is a technique called gap analysis. In its simplest form, gap analysis involve overlaying a map of a species known range on a map of preserved areas, such as, forest reserve, national parks or nature preserved, that shows the difference, or gap, between a species protected habitat that could someday be destroyed. The technique is a premonitory strategy a conception that foresees an area that could be prone to destruction in nearest future. For instance in a particular Nation, Region or an Area, through the gap analysis concept, it become possible to decipher the preserved forest from the unprotected one's and being able to embark on strategic steps to preserve them so as to ensure a under coverage of forests and its resources protection with the environment.

"Gap analysis gives you a target to shoot for" says Biologist I. Michael Scott, who works for the survey. "But it

also tells you where none of these species occur and where there won't be a conflict with development.

ECOJUSTICE: This view holds that, in addition to considering the rights of fellow humans, we should also consider those of other species. Rather than ask what is the maximum number of human that the world can possibly support? Perhaps we should think about the needs of other creatures. As we convert natural landscape into agricultural or industrial areas, species are crowded out that may have just as much right to exist as we do. Perhaps we should seek the optimum numbers of people at which we can provide a fair and decent life for all humans while causing the minimum impact on non human neighbours.

BIOCENTRISM: This is the (life centred) egalitarianisms of John Mur or Ado Leopold, who claimed that all living organism have intrinsic value and rights regardless of whether they are useful to us. Leopold wrote, "Of the 22,000 higher plants and animals native to Wincousin, it is doubtful whether more than 5 percent can be sold, fed, eaten, or otherwise put to economic use. Yet these creatures are members of the land community and if (as I believe) its stability depends on its integrity, they are entitling to continuance... A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise". For many bio centrists, biodiversity is the highest ethical value in nature, species and population as the basic units of biodiversity, are the focus of inherent value.

ECOCENTRISM: (ecologically centred) because it claims moral values and right for ecologically processes and systems, the whole is considered more important than its individual parts. If you kill an individual organism, you deny it a few months or years of life, but if you eliminate an entire species or a whole landscape, you have destroyed some thing that took millions of years to create. It holds biogeochemical cycles as the most important aspects of nature.

ECOFEMISM: a pluralistic, non-hierarchical, relationships oriented philosophy that suggests how humans could reconceived themselves and their relationships to nature in non dominating ways, is proposed as an alternative to patriarchal systems of domination. It is concerned of so much with rights, obligations, ownership and responsibility as with care, appropriate reciprocity, and kinship. This world view promotes a richly textured understanding or sense of what human life is and how this understanding can shape peoples' encounters with the natural world. According to ecofeminist philosophy, when people see themselves as related to others and to nature, they will see life as bounty rather than scarcity, as cooperation rather than competition and as a network of personal relationships rather than isolated egos.

LITERATURE REVIEW

In Geography forest vegetation is made up mainly of trees although there may be a small proportion of woody shrubs and herbaceous plants. "Areola, Goh Cheng Leong et al (1992). Forest is the plant community, predominantly of trees or other woody vegetation occupying an extensive area of land. In its natural state, a forest remains in a relatively fixed, self-regulated condition over a long period of time. The peculiarity of the forest zone demands that it should be consciously managed and maintained (figure (i) shows the forest zone of Nigeria). The forest estate is Nigeria covers about 100,000 km² or 11% of the total land area of the country out of this, only about 26,000 km² or 25% is made up of natural high forest. But it is estimated that an additional 90,000 km² of high forest is available outside constituted forest estate. (Okorie et al 1981) Disturbances such as a forest fire or timber harvesting may result in a shift to another forest type. Left undisturbed, ecological succession will eventually result in a climax forest community.

FUNCTION OF FOREST ZONE: - The importance of forest is well exemplified in Okali et al (1988) Categorisation of the roles of forest as: - productive function, protective function & Amenity function.

PRODUCTIVE FUNCTION for fuel wood, poles, timber, industrial wood, fibre, food, fodder, and other miscellaneous products

PROTECTIVE FUNCTION: Forest serves as, wind break, shelter belts and protection forests all of which enhance soil conservation and stabilization, soil fertility, restoration and improvement, moisture/water conservation, provision of shade (for crops, animals and man) and which thus ensure protection against water and wind erosion, and overall maintenance of environmental stability and quality.

AMENITY FUNCTION for sceneries, aesthetics, and centres for relaxation (such as parks, gardens arboreta, and open spaces) landscape planning, zoo and wildlife conservation.

If the role of forest is such benefiting and naturally indispensable as these it thus redefines the inter-relationship or interdependence of the components of the living segment of the ecosystem (comprising of natural or artificial forest including other forms of vegetative cover, and man, among themselves) with the non-living physical environment.

IMPACT OF MAN ACTION AND CAUSES OF FOREST DEPLETION

One of the earliest and still continuing human impacts on the biosphere is the removal of the original vegetation cover and its replacement by either another or by man-made structure. At the global scale the ecologically most

significant impact of this is deforestation, which could be through bush-burning, tree felling, etc. it has been estimated that about half of the forest or woodland that originally covered two-third of the earth's surface has already been removed and reduction is being maintained at a rate which outstrips replacement. (Joy Jivy, 1996).

Bush burning which causes forest fires is one of the major causes of forest depletion. Forest fires, according to Redmond, W.A (2006) are natural or human-caused fires that burn forest vegetation. Foresters usually distinguish three types of forest fires such as; ground fires, which burn the humus layer of the forest floor but do not burn appreciably above the surface. The second type of fire is surface fires which burn forest undergrowth and surface litter; and lastly is crown fires, which advance through the tops of trees or shrubs. It is not uncommon for two or three of fire to occur simultaneously.

Another indispensable evil bedeviling the forests is agricultural purpose and timber production which have been the unresolved age-long reasons for bush burning. As reported by a Journalist, David Lamb (1998) "the fastest way to clear a rain forest for agriculture or paradoxically for timber production - is to burn it.

The foregoing cause of forest fires coupled with; ignorance, hunting of games, carelessness, carefree attitude of people and the sheer hatred among the farmers to themselves in deliberate setting of co-farmer's, cocoa plantation on fire are inter alia reasons for forest fires and depletion in Nigeria.

Below is the data on deforestation rate of natural forests, 2000-2005 by R. Butler. Analyses of the F. A. O report by Mongabay.com shows that developing countries in the tropics generally suffered the worst rates of forest loss between 2000 and 2005 of the 10 countries with the highest deforestation rate during that period, all were considered "developing" and nine were tropical. Four of the top six were located in the South East Asia. Of these 10 countries, Nigeria with 55.7% top the list of the worst deforestation rate of primary forests, followed by Vietnam 54.5% Cambodia 29.4% Sri Lanka 15.2%, Malawi 14.9%, Indonesia 12.9%, North Korea 9.3%, Nepal 9.1%, Panama 6.7% and Guatemala 6.4%.

Environmental Effect Forest Depletion: - The accelerating destruction of the rainforests that form a precious cooling band around the Earth's equator is now being recognised as one of the main causes of climate change. Carbon emissions from deforestation far outstrip damage caused by planes and automobiles and factories.

The rampant slashing and burning of tropical forests is second only to the energy sector as a source of greenhouse gases according to report published today by the Oxford-based Global Canopy Programme, an alliance of leading rainforest scientists. "Tropical forests are the elephant in the living room of climate change," said Andrew Mitchell, (2011).

Naturally the atmosphere evaporation is reduced; atmospheric humidity is higher while annual and seasonal temperature ranges are dampened down. Dependent on the depth and density of the canopy, the amount and intensity of sunlight and precipitation are reduced.

In this light, deforestation can then effect a more drastically change of micro-climate than the removal of any other types of vegetation. Rainforests are critical to global weather systems acting as the world's thermostat.

Rainforest destruction accounts for as many CO₂ emissions as the USA - a staggering six billion tonnes each year.

1.6 billion People depend on rainforests for their welfare and livelihoods, with 350 million of them living in rainforest communities.

Rainforests are made of carbon. When the forest is destroyed, this carbon is released as climate warming CO₂.

The forest wood is also an important carbon 'sink' or reservoir. About a third of the carbon circulating through the biosphere is retained for shorter or longer period in terrestrial plants- mostly in trees. The effects of deforestation on this cycle are complex and not yet fully understood.

The effect of deforestation is too folded.

Forest plants use CO₂ in their photosynthetic processes. This implies that a destruction of these plants will lead to more concentration of CO₂ in the atmospheric pool;

Through burning of bush/forest, CO₂ will be released directly into the atmosphere, thereby causing more concentration of CO₂.

Deforestation and forest degradation releases about 1.7 billion tons of carbon annually, about 20 percent of global carbon emissions. Total emissions from deforestation in 2008-2012 are expected to equal 40 billion tones of CO₂.

Howden 2007, in his own avers that "In the next 24 hours, deforestation will release as much CO₂ into the atmosphere as 8 million people flying from London to New York. Stopping the loggers is the fastest and cheapest solution to climate change. So why are global leaders turning a blind eye to this crisis?"

Aside from the direct effect on the global warming deforestation may also lead to exposure of the soil layer leading to lifting of the nitrous oxide into the atmosphere. Nitrous oxide has the capacity to destruction can lead to increase in the ultraviolet rays reaching the surface. (Adeyemi 1995)

The Economic Implication of Forests Depletion through human interference is related to the particular potentials of the forest resources that is, valuable economic trees, that are fast removing.

Many trees that grow in rain forests are highly prized for the durability and beauty of their wood. TEAK, ROSEWOOD, and MAHOGANY are rain forest hard woods used to make furniture and cabinetry all over the world. Teak, which resists corrosion from weather, is also highly valued in ship building. All these are cut indiscriminately without any attempt to replace them. <http://www.coolearth.org/405/category/the-rainforest-183.html>

Forest depletion also lead to the exposure of the ground surface and the soil to direct attack of the agent of denudation and soil erosion.

For many farmers, rain forests offer wide expanses of grazing land or land that can be converted for agricultural purposes. Rain forests are also home to a number of exotic animals, such as parrots and monkey, which bring high prizes when captured, sold as pets. Rainforests are home to two-thirds of all living animal and plant species on the planet, with hundreds of millions of species still undiscovered.

In another dimension, the forests are known as the “world’s pharmacy” because of their wealth of natural medicines and destroying them can destroy the chances of new breakthroughs in treatment. Drugs that originated in the rain forest range from early forms of the birth control pill, first manufacture from wild yams growing in Central America, to highly specialized medicine derived from the Madagascar rosy periwinkle used to treat a rare form of Leukaemia. And the drugs already in use represent just a fractional of the potentials the rain forests may hold. It was also discovered that, of the thousands of plants identified as carrying potential anticancer compounds more than half are native to rain forests. Similarly multinational research projects investigating rain forest plants as treatments for a multitude of diseases-cancer and acquired immune deficiency syndrome (HIV) chief among them are under way in hundreds of laboratories across the globe.

RECOMMENDATION

The importance of forest and deteriorating effect of its depletion require environmental education, an attempt at improving understanding between naturally built up environments.

This should not be only introduced into the educational curriculum of the nation, but the post-secondary students should be encouraged to pursue careers related to the environmental issues.

There public should be enlightened to develop an awareness and appreciation of our natural and social cultural environment.

There should be Impartation of the knowledge of basic ecological concepts and introduction of environmental literacy in which every citizen is fluent in the principles of ecology and has a working knowledge of the basic grammar underlying syntax of environment wisdom.

There should be national and political will geared at the forest conservation and proper management its richly endowed resources.

CONCLUSION

Rainforest destruction is a massive contributor to climate change and yet every minute 100 acres of rainforest is cleared. If this continues it will not only have a devastating affect on our climate and water supplies but will threaten millions of species of plants and animals.

Demonstrate effective sustainable management: The tourism industry and individual businesses comply with all relevant international or local legislation and regulations; ensure all personnel receive periodic training regarding their role in the management of environmental, sociocultural, health and safety practices; ensure customer satisfaction is measured and, when necessary, corrective action is taken.

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References

- Daniel Howden, 2007. Deforestation: The hidden cause of global warming
Andrew Mitchell, (2011). <http://www.independent.co.uk/environment/climate-change/deforestation-the-hidden-cause-of-global-warming-448734.html>
James Tulloch 2009, Ten Key Facts about the World’s Forests. In Centre for International Forestry Research, Global Canopy Programme, UN Food and Agriculture Organisation, the World Bank Intergovernmental Panel on Climate Change, WWF, Eliasch Review. <http://knowledge.allianz.com/?419/ten-key-facts-about-the-worlds-forests>

- Achudeme A.C. (2003) Environment and Biodiversity. In Techniques In Environmental Studies. Ed. By H.I. Jimoh 2003.
- Redmond, W.A. (2006) "Forest fire" Microsoft Encarta (R) 2009
- Defries S. Ruth (2008) Humid Tropic Forest Clearing From 2000- 2005 quantified by using Multi temporal and multi-resolution remotely sensed data.
- Speller Berg I an F. (1996) "Concerning biological diversity Conservation Biology Longman, England.
- David Lamb (1998) Los Angels Times March 23, 1998.
- Joy Jivy, (1996) Biogeography (A study of Plants in the Ecosphere Page 326, 3rd edition Longman press
- Stevenson Swanson (1995) Collier's Year Book article
- Olaniran O.J (1992) Middle belt geographer excerpt from interview in the Magazine of the Natural Assoc. of Geography students NAG Unilorin Chapter. P.g 9

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