

DEFORESTATIONS, ENVIRONMENTAL SUSTAINABILITY AND HEALTH IMPLICATIONS IN NIGERIA: A REVIEW

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Abstract: Deforestation has to do with the removal of trees without planting new ones to replace those removed. It is associated with life threatening consequences such as global warming, climate change, water, air pollution and soil erosion leading to adversities. Trees can be equated with life. This is because trees produce oxygen which humans depend. Trees also sanitize the atmosphere through the absorption of carbon dioxide which is dangerous to human health if in abundance. Removal of these trees without planting new ones as replacements threatens human existence. Deforestation threatens the sustainability of the environment globally but seems to have more detrimental effects in Nigeria. Nigeria has the highest and worst deforestation rate. Unfortunately, the problem of deforestation in Nigeria is on the increase. Deforestation puts every aspect of the environment at risk. The study was conducted between 2012-2013 to provide an update on deforestation rate in Nigeria. Findings of the study revealed that Nigeria is ranked the worst country with the highest rate of deforestation. Over 90 percent of Nigeria's forest has been lost to deforestation. Seventy percent of Nigerians still live below poverty line. Poverty encourages more of such activities that increase the rate of deforestations. The present paper discusses the scenario of deforestation in Nigeria as an increasing threat. The paper hereby suggests addressing the issue of poverty along with deforestation to stop poverty-induced human activities that lead to deforestation. Everyone should be involved in repairing all of the abuses and damages done to the environment.

Keywords: Deforestation, Climate change, Global warming, Nigeria.

Introduction

Nigeria which is also known as the giant of Africa is well blessed with the abundance of natural resources. Unfortunately, about 45% population of Nigeria lives below the poverty line. This is why economists refer to the vast wealth in natural resources and extreme poverty in a country like Nigeria as the 'resource curse'. Nigeria is the most populous country in Africa and the seventh most populous country in the world with a population of 162.5 million (Library of Congress-Federal Research Division, 2008; World Bank, 2011).

Nigeria has the worst deforestation rate in the world which can be attributed to her increasing population with high poverty level (The International Institute of Tropical

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Agriculture (IITA), 2011). Inability of Nigerian leaders to provide for her citizenry leads to poverty induced activities which causes deforestation. The adverse effects of deforestation are alarming and impacts negatively on human health with serious threats to human existence.

Deforestation has to do with continuous removal of plants without growing new ones to replace what has been removed for economic or social purposes (The Free Encyclopedia, 2007). This in turn exposes the land, mountains, hills and even valleys to erosion. Subsequently, floods, landslides and mudslides, loss of wild life and increasing loss of deserts follow. At the long run human health and life become adversely affected. The annual rate of deforestation in Nigeria is 3.5% which is approximately 350,000-400,000 hectares per year (Food and Agriculture Organization, 2005).

Fakoya (2010) highlighted deforestation as a recurring problem in Nigeria. This might not be unconnected with the high poverty level in Nigeria in the midst of abundant natural resources. There seems to be a relationship between poverty and increase loss of forest. Debarati Guha Sapir posited that vulnerability to natural disasters is almost a direct function of poverty through poverty induced unfavorable activities. These activities include felling of trees to be used as fire wood for cooking due to inability to afford kerosene and cooking gas as a result of cost and unavailability most times. Seventy percent of Nigerians are still living below the poverty line (CIA, 2007).

Continuous removal of vegetation in Nigeria increases its vulnerability to landslides with a high tendency to loss of lives and property. This is not without strong implications for present and future Nigerians. Nigeria has one of the highest rates of forest loss (3.3%) in the world, lost 6.1million hectares or 35.7% of its forest covers. Nigeria also lost 79% of its old-growth forests between 1990 and 2005 with average loss of 11% per year (Fakoya, 2010). The causes of deforestation in Nigeria include use of wood for fuel by the poor for domestic and economic activities, indiscriminate setting of fires in the forests by people due to unknown reasons and ignorance, replacement of primary forests with less biodiverse plantations and secondary forests, menial agricultural activities, logging and timber exportation (FAO, 2005).

Deforestation has contributed adversely to environmental sustainability in Nigeria. Such adverse effects include damages to the natural environment from soil erosion, loss of wildlife and increased desertification (Akanbami, 2003). Deforestation has adversely affected land fertility. Study conducted between 1901 to 2005 revealed a temperature increase of 1.1^{oc}

against the global mean temperature of 0.74^{0c} . This was associated with decrease in annual rainfall by 81mm. High deforestation rate led to increased temperature, reduced the rate of rainfall thus leading to increase desertification. Deforestation impacts socially, economically and agriculturally on the overall quality of life of any nation (Sahney; Benton; & Falcon-Lang, 2010). According to 2000 to 2005 data, Nigeria has lost 55.7% of its primary forest (Akanbami, 2003).

However, the ultimate impact of deforestation is on human health. Social and economic implications are not left out. For instance, deforestation increases the vulnerability to landslides which are capable of causing loss of lives and property. Health is an inevitable requirement for optimal functioning. Without health nothing can be achieved. The focus of this paper is on deforestation, causes, environmental sustainability, health implications and intervention measures in Nigeria. The enormous adverse effects of deforestation warrant a continuous monitoring in Nigeria.

Deforestation in Nigeria

A forest is defined as a land which is covered with more than 10 percent of trees and an area of more than half a hectare (FAO, 2005). A forest includes natural forests and forest plantations and does not include stands of trees established primarily for agricultural production. Such trees include those planted for different types of fruits, oil palm fruit trees and agro forestry trees. Trees are the oldest, reliable, very useful and widely used raw materials that play a crucial role in oxygen supply and absorption of green house gases (Effects of Deforestation, 2010).

Tropical forest trees cover only six percent of Earth's land surface. It is purported that trees contain between 70 and 90 percent of the world's entire species (Effects of Deforestation, 2010). Deforestation has caused the loss of 50 to 100 animal and plant species each day. Many of these species are now at the verge of extinction even with their significant importance to humans, especially in the area of medicine (Effects of Deforestation, 2010).

Tropical rain forests immensely enhance the functioning of the planet. Rainforests accommodates about 50 percent of terrestrial species in the world (Butler 2012). They also help in maintaining the climate which is achieved by regulating atmospheric gases, stabilizing rainfall and protecting against desertification (Butler 2012). Deforestation can therefore deprive the planet of these functions thus constituting a serious threat to human existence (Butler 2012). More carbon is released into the atmosphere through deforestation, climatic changes take place and soil is exposed to rainfalls thus promoting erosions. These

are not without serious health implications. It is estimated that each day at least 80,000 acres (32,300 hectares) of forests vanish from the earth (Butler 2012).

Rainforests produce 28% of the world's oxygen and has earned the name of 'jewels of the earth' and the 'world's largest pharmacy' for being a source of over one quarter of natural medicine (Rainforest at Animal Center 2004). This is processed through the taking in of carbon dioxide by plants and releasing of oxygen into the atmosphere for man. Deforestation therefore promotes an increase in atmospheric levels of carbon dioxide. According to Rainforest Facts, the rain forest houses more than half of the world's species of plants and animals which includes mammals, reptiles invertebrates and birds. Deforestation constitutes a serious threat to the existence of these species, promoting loss of habitat and atmospheric pollution. Deforestation enables the earth soil to run off into sources of water supply due to the absence of tree roots to absorb water thereby causing water pollution. Absence of tree roots further deprives the soil of important nutrients necessary for the growth of new vegetation (Effects of Deforestation).

Unfortunately, deforestation rates are still on the increase irrespective of the increasing awareness on the importance of forests. Figures from the Food and Agriculture Organization of the United Nations (FAO) revealed an increase of 8.5 percent in tropical deforestation rates from 2000-2005 when compared with the 1990s. Loss of primary forests also increased by 25 percent within the same period. Nigeria and Vietnam's rate of primary forest loss has doubled since the 1990s. Between, 1990 and 2010, the forest cover in Nigeria further reduced from 17234 to 9,041 hectares. This produces serious adverse effects such as increased temperature and decreased rainfall thus resulting in desertification.

According to international institute of Tropical Agriculture (IITA) (2011), Nigeria is ranked the worst country with the highest deforestation rate. Deforestation rate in Nigeria is put at 3.5% and 400,000 hectares every year. According to the Federal Ministry of Environments, 400 out of every 1,000 of forestland are deforested every year and only 26 hectares of these are reforested thus leaving 374 hectares deforested (Babalola,2012). During the deforestation, forests and woodlands are permanently destroyed (Institute for Environment and Sustainability-Global deforestation). The situation is reversible with the right attention to nature treatment. Over 90 percent of Nigeria's forest has been lost to deforestation (Peacock 2011). He further added that the massive destruction of the forest calls for intervention by the younger generation.

In terms of the loss of primary forests which is also known as old-growth forest, Nigeria still has the highest deforestation rate in the world (FAO, 2005). Nigeria lost 55.7 percent of her primary forests. According to (FAO), about 6 million hectares of the world primary forest is still lost annually. This is important because primary forests are taken as the most biologically diverse ecosystem on the planet. They further stated that primary forests are replaced by less biodiverse plantations and secondary forests.

Causes of Deforestations in Nigeria

Deforestation is inevitable when about 90% of a population is depending on wood as fuel for cooking and heating. Poor agricultural practices such as slashing and burning also contribute to deforestation (Terminski 2012). Study shows that about 60% of Nigerians use firewood for cooking because of the high cost of kerosene (Akinbami 2003). Some persons ignorantly set fire on forests thereby contributing to deforestation. According to FAO, developing countries from the tropics suffer most from deforestation between 2000 and 2005. This suggests a relationship between poverty and deforestation. Poverty induced human activities are the major causes of deforestation in Nigeria (Terminski 2012).

Corruption is a serious issue in Nigeria and contributes immensely to illegal logging by companies and forest officials (Global witness 2013). Activities of illegal logging lead to deforestation. According to Goncalves, Panjer, Greenberg & Magrath (2012), an area of forest about the size of a foot ball field is clear-cut by illegal loggers every two seconds. Illegal trading in timber and its products lead to massive economic losses and environmental damages (Transparency international 2011).

The rising demand for wood products has made the forestry lucrative and this invariably promotes illegal logging (Transparency international 2011). Logging is said to be the first threat to existing tree population (Effects of Deforestation, 2010). Corruption is also observed at the level of government institutions, wealth and power due to harvesting of forest riches. Unfortunately all these are done on the platform of short term economic benefits (Effects of Deforestation, 2010). Lack of integrity in the judiciary to check illegal logging further promotes deforestation (Transparency International 2011).

Poverty is also a strong factor in the issue of deforestation. Poverty leads to the felling and burning of trees for fuel. Charcoal produced from the burnt trees is sold for money to make ends meet. At the other hand, the felled trees are also sold as timber; cleared land is used as pasture for livestock, plantations of communities and settlements (Terminski 2012).

Industrialization processes along side with oil extraction and mining lead to deforestation (Terminski 2012). Paper products are made from trees (Effects of Deforestation, 2010). Deforestation was a protective measure and deliberate activity during the war to open up closed up areas with trees which could have served as a hiding place for the enemies (Terminski 2012). According to FOA, deforestation is common among populous nations like Nigeria.

Increasing growth in population and demographic pressure contributes immensely to deforestation processes in Nigeria (Effects of Deforestation, 2010). The most populous country in Africa is Nigeria with the population rate of 162.5 million (World Bank (2011). This becomes a serious problem when increasing population combines with the high level of poverty. About 70 percent (105million) of Nigerians are now living below the poverty line (Central Intelligence Agency (CIA) 2012, Sanusi, 2011). Overpopulation causes a corresponding increase in the construction of residential and public areas. This causes the soil to become loose and more susceptible to the possibility of running off and flooding (Effects of Deforestation, 2010). The outcome can be devastating. United Nations Environmental programme (UNEP) posited that Africans are suffering deforestation at the rate of two times of that of the world.

Urbanisation process is another strong factor in the issue of deforestation. Lack of awareness on the adverse effects of deforestation has caused the destruction of over 8,5 million hectares of tropical forest permanently yearly for the construction of buildings and new urban areas. This leads to uncontrollable and continuous destruction of forest resources. In Nigeria, 81% of the original forest cover is removed (Effects of Deforestation, 2010). Other causes of deforestation in Nigeria include clearing of forest for logging, agricultural activities, felling of trees by rural dwellers for sales as a means of sustenance due to poverty and using of trees as wood for fuel which causes serious damages with an end result of desertification.

The chairman of the Nigerian Environmental Study/Action Team (NEST) opined that “human beings are the major contributory factors to the climate change which has become the new reality. Our activities are inimical to the environment, our daily work and behaviour domestically, industrially and even agriculturally are threatening to the stability of the environment as well as the balance of the ecosystem. We often burn bushes to farm, we practice agriculture without due regard to the environment (oil). We cut/fell trees down without knowing that we are altering the eco- system and nature. All these human activities

are threatening the nature and at the end, we ourselves are to face the consequences and are to be blamed”, he said.

In line with the above statement, Nigerian leaders are the major culprits in the issue of deforestation because they have failed to provide for the citizenry through the abundance of God endowed natural resources. No wonder economists refer to Nigeria as being under what they call ‘resource curse’. The poor citizenry resorts to poverty induced activities that lead to deforestation with all the adverse effects notwithstanding as a possible way out of their dilemma. Sad to observe that Nigerian leaders have failed to realize that the consequences of deforestation will not stop with the deprived/poor Nigerians but everyone. The basic cause of deforestation is human activity which is not without direct effects on human life (Nayak, 2008). Until the issue of poverty and corruption are addressed in Nigeria, sad to say that an end might never come to activities that lead to deforestation.

Deforestation and Environmental Sustainability

Deforestation can cause many societal and environmental problems capable of making human existence unbearable. Challenges associated with it include loss of biodiversity, destruction of forest-based societies and climatic disruption (Effects of Deforestation, 2010). Deforestation is a global problem which threatens environmental sustainability with more impact on Nigeria due to the high rate. Deforestation exerts adverse effects on the entire environment, the economy and the citizenry. Cutting down trees cause global warming and climate change (Peacock, 2011). Various forms of health problems are associated with global warming and climate change. Farming activities are affected by deforestations with the end result of hunger causing corresponding health problems. Forests are likened to the skin of the planet earth. This explains why massive cutting down of trees can lead to death of the planet earth. Trees are to the planet earth what the skin is to the body. For instance, loss of up to 70 percent of the skin in a fire incidence could result in death (Peacock, 2011).

When tropical forests are logged, it contributes about one-fifth of greenhouse gas emissions (Burgess; Hansen; Olken; Potapov; Sieber & Stefanie, 2011). Over 20% of global warming emissions might be attributed to deforestation (Matthai, 2012). When trees are removed without adequate replacement, it leads to damage to habitat, settlements, biodiversity loss, aridity, air and water pollution (Terminski, 2012).

Deforestation changes the environment adversely. Removal of trees causes degradation of the environment (The Free Encyclopedia, 2007). It leads to desertification, increases the salinity of the soil, produces land degradation and causes the sea to rise above its levels

(Terminski, 2012). Unfortunately; the adverse effects of deforestation are capable of extending to other two billion people in the world (Terminski, 2012).

Deforestation affects the water table underneath the ground which is a common source of natural drinking water. Availability of underground water is dependent on continuous replenishment otherwise it dries up. Rain water helps in replenishing underground water. This is achieved through the roots of the forest trees which help in absorbing the rainwater with subsequent release into the underground water. In the absence of the trees, the rain water remains on the surface of the earth pending subsequent evaporation process. Deforestation causes change that negatively impacts the earth thus leading to degradation of the planet and natural habitats.

There is declination of wild life with extinction currently up to 100 species on daily basis (Delfgaauw, 1996). The forest animals are exposed to unfavourable conditions such as rain, wind, other animals and man (Dunbar,1993). This adversely affects the supply of food with subsequent threat to human resources and implications for biodiversity. Biodiversity can be defined as, “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part (United Nations Earth Summit in Rio Janeiro, 1992).

Destruction of tropical forests also impacts negatively on tribal populations like the Aboriginal people worldwide. Governments and industries in the name of ‘development’ confiscated their land. Though the forest dwellers may be compensated for this loss, they cannot not still understand the reason behind the invasion of industrial culture on their once simple lives (Effects of Deforestation, 2010).

Soil erosion is another consequence of deforestation. Though the forests appear to be flourishing, they are very poor beneath. The problem is that once forests have been cut down, crucial nutrients are washed out of the soil completely, resulting in erosion. The soil dries and cracks under the heat of the sun in the absence of trees to keep the soil in place (Effects of Deforestation, 2010).

Deforestation and Health Implications

Deforestation produces a reduction in the quality of life (Effects of Deforestation, 2010). The oxygen required for breathing by humans is produced by trees and massive removal of trees reduces the quantity of oxygen while increasing carbon dioxide. Increased atmospheric carbon dioxide has serious human health implications. Various forms of health

problems are associated with global warming and climate change. When farming activities are affected by deforestations, hunger becomes the outcome, with associated health problems. Deforestations lead to the loss of valuable and medicinal plants (Peacock 2011). Plant derived medicines become seriously affected and therefore affects the treatment of fever, fungal infections, burns, gastrointestinal problems, pain, respiratory problems and treatment of wounds (Haidet, 2003).

Deforestation accounts for 87 percent of total carbon emission in Nigeria (Balarabe, 2011). Air pollution is increased due to the reduction in the number of forests that usually help in absorbing the pollutants in the air. Deforestation also enhances the rate carbon monoxide reaches the atmosphere thereby causing ozone depletion resulting in global warming. Ozone layer is a mass of oxygen or O₃ atoms that serve as a shield in the atmosphere against harmful ultraviolet rays from the sun (Balarabe2011).

Animal products such as meat and hides which are good sources of protein are reduced and this can cause protein deficiency health problems. Deforestation affects the replenishment of underground water table which is a common source of natural drinking water and thus causing the wells to dry up. Inadequate water supply can lead to water borne diseases such as diarrhoea and vomiting. According to Jamie Bartram (World Health Organization) and colleagues, a lack of safe drinking water is a 'silent humanitarian crisis' that kills some 3900 children every day and stops any progress to the MDG's targets, mostly in Africa and Asia. According to Howard and Bartram (2003), at least 50 litres of water per person daily is needed to ensure that all personal hygiene, food hygiene, domestic cleaning, and laundry needs are met. Other health problems associated with inadequate water supply include acute infectious diarrhoeal diseases, typhoid fever, guinea worm infections and skin diseases which can increase mortality rate.

Health problems associated with global warming include storms, drought and floods which are capable of threatening human existence. Harvard Medical School doctors attributed recent outbreak of malaria and dengue fever in the West to climate change associated with global warming. Incidence of kidney stones and other health problems may also increase with threat to human existence at the long run (Health Effects of Global Warming, 2009). Other possible health problems associated with global warming include heat stroke, climate stress on agriculture predisposing to malnutrition, increase in the number of malaria-carrying mosquitoes putting 65% of the world population on the risk of malarial infection (Health Effects of Global Warming, 2009). High temperatures associated with global warming

increases the ozone concentration at the lowest level making it a harmful pollutant capable of worsening existing case of asthma and causing damages to the lung tissues. It is worth noting that ozone layer at its normal position which is upper atmosphere protects the earth from the harmful effects of ultra violet radiations (Health Effects of Global Warming, 2009). Other health problems associated with exposure to moderate level of ozone include nausea, chest pain and pulmonary congestion.

Threats that follow the aftermath of flood include diarrheal diseases, respiratory infections, infections associated with poor sanitation, water-borne diseases such as diarrhea, dysentery, cholera and typhoid fever. The poor and the vulnerable are the worst victims due to lack of access to hygienic food, medicine and safe drinking water (Siddique, et al 1991; Public Health Laboratory Service, 2000). These increase morbidity and mortality rate.

Pimentel (2006) posited that soil around the world is being swept and washed away 10 to 40 times faster than it is being replenished. According to Pimentel (2006) "Soil erosion is second only to population growth as the biggest environmental problem the world faces," said Pimentel. "Yet, the problem, which is growing ever more critical, is being ignored because who gets excited about dirt?" The major problem associated with soil erosion is malnutrition and about 99.7 percent of human food comes from cropland. Food is crucial for human survival and promotion of health. Malnutrition reduces the immune functions and increases the susceptibility to different types of health problems. Pimentel (2006) further submitted that cropland is reducing by almost 37,000 square miles each year due to soil erosion while more than 3.7 billion people are malnourished.

Deforestation and Intervention Measures

United Nation's financial support towards the reduction of emissions from Deforestation and Forest Degradation (REDD+) should be appropriately utilized. Children should be educated to identify and appreciate the values of nature to avoid the cutting of trees and shooting of birds. A paradigm shift of Nigeria's movement from the last position to first should be enforced. Youth should be empowered and integrated as part of agents of positive change and transformation of tomorrow from the vices of today such as deforestation. Education programmes should be floated for the farmers on indiscriminate cutting down of trees. Youths should be properly educated to understand the devastating effects of deforestations.

Education on deforestation should bring out the challenges to food security and livelihoods in tropical countries including climate change, soil degradation and other natural resources. Political corruption should be addressed to put a stop to or a check to illegal logging. Integrity should be built into the judiciary to punish offenders of illegal logging so as to serve as deterrence to others. The reforestation programme which has started with the children in Ibadan with planting of trees should be extended to other parts of Nigeria. State Department of Forestry should implement forest management policies to check deforestation (http://en.wikipedia.org/wiki/Deforestation_in_Nigeria_cite_note_12). Use of alternative energy should be reiterated in Nigeria. Less fossil fuels and electricity should be provided for usage. Energy-efficient products such as compact fluorescent light (CFL) bulbs should be made available for usage. Alternative sources of energy should be provided for the poor which should include hydropower, solar and wind energy (Balarabe, 2011). The wealth from abundant natural resources should be shared among the Nigerian citizenry as a check on poverty.

Department of forestry should implement forest management policies. Re-greening or afforestation of the country should be a priority in Nigeria. The society should be properly enlightened on how to handle the forest. More stringent measures should be formulated and applied to address deforestation and illegal logging. The examples of our forefathers should be emulated as in practicing what is known as shifting system of farming (Babalola, 2012). In this system, further farming is suspended after four years of continuous farming. The land is allowed enough time to rest for recovery. During this period fast growing trees would be planted. The land would therefore become a forest by the time farmers would return to the land. Reforestation of deforested forest should be embarked on to save other wild animals yet to be affected. An end should be put to slashing and burning of forests. Nigeria should join in planting trees on the wide world tree planting day called Arbor Day.

Appropriate laws and penalties should be put in place to check the indiscriminate cutting down of trees of great economic values mostly by greedy business men. Measures that will bring back the presence of mature and ripe forests in Nigeria should be adopted. Nigerian leaders should rule by examples. The judiciary should be sanitized so that offenders of deforestation laws will be penalized accordingly without any form of favouritism. The example of Wangari Muta Maathai, a woman from Kenya who won a Nobel Price for single handedly planting over 30million trees in the year 2004 to prevent erosion in Kenya should be emulated (Babalola, 2012).

Conclusion

The problem of deforestation in Nigeria increases on daily basis and is fast becoming a major threat to human existence. Immediate intervention measures are necessary to prevent it from getting worse. Even though man cannot survive outside his environment, his activities are speeding up the destruction of the said environment. Consequences of deforestation include climate change, global warming, emission of carbon dioxide and monoxide, soil erosion, air and water pollution. These are not without deadly life threatening health implications. According to Ukali (2013) soil erosion, desertification, bush burning, ocean upsurge, deforestation, and land degradation are increasing in Nigeria on a daily basis without a serious concern. There is need to repair the abuses and damages done to the environment towards the promotion of environmental friendliness.

References

- [1] Akinbami, J. 2003. "An integrated strategy for sustainable forest–energy–environment interactions in Nigeria." *Journal of Environmental Management Science Direct*, 69(2). pp. 115-28.
- [2] Babalola, F.D. 2012. Charcoal business hurting forest communities. Retrieved from <http://premiumtimesng.com> <http://premiumtimesng.com/metro/5020->
- [3] Balarabe, L.Y. 2011. Tackling deforestation problems. Retrieved from allafrica.com/stories/201106031011.html
- [4] Barnekow, L.J.P; Dhakal, P; Kjaer, E.D; Nathan, I and Shrestha, R. 2000. Conservation of trees through the use by local people and decentralized seed distribution supported by a tree seed. Retrieved from <http://bcb706.blogspot.com/2007/03/consequences-of-deforestation.html>
- [5] Beamon, C. and Cargill, C.J. 2007. Deforestation and desertification. Retrieved from <http://www.munfw.org/archive/45th/csd1.htm>
- [6] Buteyko, K.P. 2005. Carbon Dioxide: Health effects, uses and benefits. Retrieved from <http://www.normalbreathing.com/CO2.php>
- [7] Burgess, R; Hansen, M; Olken, B; Potapov, P. and Sieber, S. 2011. The political economy of deforestation in the tropics. Retrieved from www.illegal-logging.info/approach.php?a_id=201
- [8] Butler, R. 2012. A World Imperiled: Forces behind forest loss. Retrieved from <http://rainforests.mongabay.com/0801.htm>

- [9] Cause and Effect of Deforestation.2012. Retrieved from StudyMode.com<http://www.studymode.com/essays/Cause->
- [10] Central Intelligence Agency (CIA) World Fact book. 2007. Retrieved from www.allcountries.org/wfb2007/haiti/haiti_economy.html
- [11] Central Intelligence Agency (CIA) World Fact book. 2012. Retrieved from www.allcountries.org/wfb2007/haiti/haiti_economy.html
- [12] Collins, J. 2001.Deforestation.Retrieved from <http://www.botany.uwc.ac.za/Envfacts/facts/deforestation.htm>
- [13] Criminal Justice Efforts to Combat Illegal Logging. 2012. Retrieved from www.illegal-logging.info/approach.php?a_id=201
- [14] Delfgaauw, G. J.1996.Effects of Deforestation. In WriteWork.com.Retrieved from <http://www.writework.com/essay/effects-deforestation>
- [15] Dunbar, B.1993. Effects of Deforestation. In WriteWork.com.Retrieved from <http://www.writework.com/essay/effects-deforestation>
- [16] Effects of Deforestation. 2010. Retrieved from StudyMode.com <http://www.studymode.com/essays/Effects-Of-Deforestation-498391.html>
- [17] Effects of Deforestation.1999.Retrieved from StudyMode.com <http://www.studymode.com/essays/Effects-Deforestation-1550.html>
- [18] Effects of Deforestation .2010.Retrieved from StudyMode.com. <http://www.studymode.com/essays/Effects-Of-Deforestation-498391.html>
- [19] Fakoya, O. 2010. Haiti and Nigeria: Case studies in failure of Human ... Retrieved from www.nigeriansinamerica.com/articles/3937/1/Haiti-and...
- [20] Food and Agriculture organization. 2005. Annual rate of deforestation .Retrieved from http://green.wikia.com/wiki/Deforestation_in_Nigeria
- [21] Global Witness (2013).Retrieved from <http://www.medindia.net/patients/lifestyleandwellness/health-effects-of-global-warming>.
- [22] Goncalves, M.P; Panjer. M; Greenberg, T.S. and Magrath, W.B. 2012. Justice for Forests: Improving Criminal justice efforts to combat illegal logging. A World Bank study. Washington, DC: World Bank. Retrieved from <http://documents.worldbank.org/curated/en/2012/03/15966880/justice-forests-improving-criminal-justice-efforts-combat-illegal-logging>
- [23] Haidet, A. 2003.Final Paper:The Medicinal Value of the Rainforest.

- Retrieved from
<http://jrscience.wcp.muohio.edu/fieldcourse03/PapersCostaRicaArticles/FinalPaper.TheMedicinalVa.html>
- [24] Health objectives for the nations labouratory services (2000). Retrieved from
www.cdc.gov/mmwr//preview/mmwrhtml/00001610.htm
- [25] Howard, G; Bartram, J. 2003. Domestic Water Quantity, Service Level and Health. Geneva: World Health Organisation.
Retrieved from http://whqlibdoc.who.int/hq/2003/WHO_SDEWSH_03.02.pdf.
- [26] Lang, C. 2010. Curbing deforestation is a highly cost-effective way of reducing greenhouse gas emissions and has the potential to offer ...Retrieved from
www.redd-monitor.org/2010/08/05/does-the-opportunity...
- [27] Library of Congress-Federal Research Division. 2008. Country Profile.
Retrieved from memory.loc.gov/frd/cs/profiles/Iran.pdf
- [28] Maathai, W. 2012. ... deforestation, water crises, and rural hunger. ... Retrieved from
en.wikipedia.org/wiki/Maathai
- [29] Nayak, S. 2008. The Causes and Effects of Deforestation. Retrieved from
www.studymode.com/...Effects-Of-Deforestation-1319342.html
- [30] Peacock, J. 2013, May. This Day Live, Deforestation: Nigeria Ranked Worst in the world. Retrieved from www.illegal-logging.info/content/deforestation-nigeria.
- [31] Pimentel, D. 2006. Study: Soil erosion threatens human health.
Retrieved from <http://phys.org/news12033.html#jCp>
- [32] Poor water supply affects more people than war, terrorism, and WMD's combined. 2005.
Retrieved from <http://www.thelancet.com>
- [33] Public Health Laboratory Service (PHLS). 2000. Provisional Guidelines on the Public Health, Implications of Flooding London. Retrieved from
http://www.hpa.org.uk/infections/topics_az/flooding/guidelines.htm
- [34] Rainforests of Animal Centre.2004. Animalcorner.co.uk.Retrieved from
www.animalcorner.co.uk/rainforests/rainforests.html
- [35] Rainforest Facts Rain-tree.com 2012.Retrieved from
http://www.rain-tree.com/contact.htm#.Upy6OvvO_XQ
- [36] Rothen, J.S.A.1998. The Choice: Doomsday or Arbor Day. Retrieved from
<http://www.umich.edu/~gs265/society/deforestation.htm>

- [37] Sahney, S., Benton, M.J. & Falcon-Lang, H.J. (2010). "Rainforest collapse triggered Pennsylvanian tetrapod diversification in Euramerica". *Geology* 38 (12). Pp.1079–1082. 10.1130/G3118doi:2.1
- [38] Sanusi, L. 2011. Sanusi predicts increase in Nigeria's poverty level. Retrieved from saharareporters.com/article/cbn-poverty-sanusi-lamido...
- [39] Siddique, A. K; Islam, Q., Akram, K., Alaudim, M and Mitra, A. K. 1991. 1988 Floods in Bangladesh: Pattern of Illness and Causes of Death *Journal of Diarrhoeal Diseases Research*, 9(4). Pp. 310-4.
- [40] Terminski, B. 2012. Current dynamics of deforestation in Africa ... Retrieved from www.thenigerianvoice.com/...of-deforestation-in-africa.html
- [41] The Causes and Effects of Deforestation. 2012. Retrieved from StudyMode.com <http://www.studymode.com/essays/The-Causes-And-Effects-Of-Deforestation-1319342.html>
- [42] The Effects of Deforestation on Our Environment 2012. Retrieved from StudyMode.com. <http://www.studymode.com/essays/The-Effects-Of-Deforestation-On-Our-1314880.html>
- [43] The International Institute of Tropical Agriculture (IITA). 2011. Deforestation: Nigeria ranked worst in the World. Retrieved from <http://www.thisdaylive.com/articles/deforestation-nigeria-ranked-worst-in-the-world/103321/>
- [44] Transparency International. 2011. Tackling Political Corruption to Combat Illegal Logging. Retrieved from www.illegal-logging.info/approach.php?a_id=201
- [45] Transparency International 2011. Building Judiciary Integrity to Combat illegal Logging. Retrieved from www.illegal-logging.info/approach.php?a_id=201
- [46] Trendsupdates.com 2012. Killer Inhabitants of the Rainforests'' Killer Inhabitants of the Rainforests'' Retrieved from www.coolsocial.net/sites/www/trendsupdates.com.html
- [47] Ukali, D. U. 2013. Bush Burning, Deforestation, contributing to Food Crisis, Global Warming. Retrieved from <http://africaproject2020.com/?p=83>
- [48] United Nations Earth Summit in Rio de Janeiro. 1992. Conference on Environment and Development. Retrieved from www.un.org/geninfo/bp/enviro.html
- [49] The Free Encyclopedia 2007. Deforestation. Retrieved from <http://en.wikipedia.org/w/index.php?title=Deforestation&oldid=111799234>
- [50] The Free Encyclopedia 2007. Wangari Maathai. Wikipedia, Retrieved from

http://en.wikipedia.org/w/index.php?title=Wangari_Maathai&oldid=113003501

[51] The Free Encyclopedia. 2007. Arbor Day. Wikipedia, Retrieved from

http://en.wikipedia.org/w/index.php?title=Arbor_Day&oldid=111158566

[52] World Bank (2011). World Bank and Deforestation in CURRENT EVENTS Forum

Retrieved from www.bloomberg.com/apps/news?pid=newsarchive&sid=aFxG.0_m.LGA