



Fuel Wood Consumption and Desertification in Nigeria

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ABSTRACT

Uncontrolled population explosion especially in the developing countries, the need and struggle for survival as well as the quest for more comfort are the major causes of environmental resources depletion in the world with particular reference to Nigeria. One of the environmental resources over – exploited in Nigeria without adequate replacement is vegetation particularly trees. This paper seeks to look into the degree of fuel wood consumption in Nigeria using data of the percentage (%) distribution of households by type of fuel for cooking in 2007, areas of the desert – prone states in km² and the population figures of the affected states^[1]. The results are presented in tables, analyzed using descriptive and comparative methods, discussed with mitigation measures suggested. The result shows that fuel wood is there about the only means of domestic fire in the desert – prone states leading to desertification as other sources of domestic fire are almost not in use. It is therefore suggested that other means of domestic fuel such as wind, solar, kerosene, electricity, coal and gas should be made available at affordable rates and encouraged for use by ensuring continuous and constant supply. Other measures of mitigating desertification such as afforestation, re – afforestation, creation of more forest and plantation reserves, creation of more shelter belts, controlled grazing and perennial cropping among others were also suggested.

Key words: *Fuel wood, desertification, deforestation, afforestation, re – afforestation, solar energy, wind energy.*

I. INTRODUCTION

Ever since the first man appeared on the planet earth, population has been increasing. Although in the time past; the rate of population growth was very minimal partly due to the heavy presence of some killer diseases which attacked and killed many, especially children. However, following a major breakthrough in medicine which has eradicated nearly all the child killer diseases in particular, world population has been on the rise especially in developing countries like Nigeria. For instance, in 1991 the population of Nigeria was about 88, 992,201; while in 2006, it increased to 140, 003, 542^[1]. Population increase is usually associated with increasing demand for resources prominent among them is fuel wood other wise called fire wood. There are many sources of domestic fuel such as domestic gas, wind energy, kerosene, solar energy, electricity and fuel wood among others. Of all these, fuel wood remains the commonest in Nigeria partly due to its accessibility, affordability, convenience, tradition and vegetation distribution as other sources are either uncommon, modern, costly, sophisticated or required high levels of education and technology to explore, exploit, refine, distribute, store, utilized and maintained.^[2] In Jimeta, Yola, Nigeria; the use of fuel wood constitutes the major energy for cooking and room lighting and mostly used by the low income earners. Though as it may, the use of fuel wood is currently gaining more popularity among the medium and high income earners in urban centres such as Kaduna, Kano, Lokoja, Ibadan, Sokoto, Ilorin, Makurdi, Jalingo and Minna among others due to the scarcity and cost of kerosene which officially was suppose to be sold for fifty naira (#50:00) only per litre, but sells for as high as one hundred and thirty naira (#130: 00) only per litre in most filling stations and one hundred and eighty naira (#180: 00) or more at black market in Abuja and coupled with the epileptic electricity supply.^[3] In Keffi, Nasarawa State of

Nigeria; Kerosene is irregularly supplied and costly hence firewood and charcoal are the major alternative sources of energy. Fuel wood is also a source of income to many hence it is not only sold in the rural areas, but also in urban areas using trucks. Those who engage in this business a time employ the services of men to cut down trees and allow them to dry before they are sold. This has been contributing to desertification in Nigeria.^[4] The demand for fuel wood has been on steady increase by the increasing population and urbanization despite the existing felling of trees edict in the states of the Sudano – Sahelian zone of Nigeria.^[5] Fuel wood extraction is one of the causes of climate change.^[6] The search for fire wood is said to be one of the primary causes for deforestation in developing countries,^[7] fingered fuel wood harvesting as a major cause of the massive destruction of the indigenous trees in Bwari Area Council, Abuja – FCT; while^[8] pointed out that the demand for fuel wood is a major cause of deforestation in northern Nigeria. However, deforestation as one of the anthropogenic activities is contributing to erosion, flooding, loss of soil nutrients, poor agricultural produce, global warming, climate variability, climate change and desertification.

Desertification is the extension of desert – like condition to areas which are not of desert origin. The United Nations Conference on Environment and Development in^[8] defined desertification as “land degradation in arid, semi – arid and dry sub - humid areas resulting from various factors including climatic variations and human activities. Northern Nigeria is prone to desertification mostly due to its proximity to Sahara desert.^[8] Nigeria is losing about 351, 000 km² to the desert representing 38% of its total landmass. It is also estimated that more than 30 million people in Nigeria live under the hardship of desertification^[8]. There are 19 states in Northern Nigeria and the Federal Capital Territory (FCT). Of this number, ten (10) states are already affected by desertification. The affected states include Bauchi, Gombe, Borno, Yobe, Jigawa, Kano,



Katsina, Zamfara, Sokoto and Kebbi [8] [4]. Although, the magnitude of this environmental hazard is not equal, as one moves further north, it becomes more severe [8]. Therefore, the extreme / boundary states of northern Nigeria (Sokoto, Kebbi, Zamfara, Jigawa, Borno, Katsina & Kebbi) experience severe desertification, while Bauchi, Gombe and Kano experience moderate desertification. Meanwhile, Adamawa, Taraba, Kaduna and Niger states are already witnessing the signs of desertification, while the ecological density of the guinea savanna in general is on the decline. Over the years, Government at Federal, Regional and Local levels have been discouraging indiscriminate cutting of trees, but this has not yielded the desired result thereby causing desertification in northern Nigeria and deforestation in southern Nigeria partly due to fuel wood consumption which is not only going on unabated but also increasing at alarming rate. It is on that note that this paper seeks to look into the rate of fuel wood consumption in Nigeria and its contribution to desertification.

II. THE STUDY AREA

Nigeria is a former British colony, which came into existence as a result of the amalgamation of Northern and Southern protectorates, empires and smaller territories [9]. Today, Nigeria is made up of 36 states and the Federal Capital Territory (FCT). Nigeria extends from latitude 4°N to 14°N and from longitude 3°E to 15°E [10]. It is bounded to the North by Niger Republic, Benin Republic in the West, Cameroun in the East and the Atlantic Ocean to the South [10]. Nigeria experiences both rainy and dry seasons [1]. In terms of size, Nigeria has a total area of 923,769km² [11]. Its relief is generally divided into lowlands and highlands [9]. Nigeria is drained by many rivers the major ones being Rivers Niger and Benue. The vegetation is also grouped into two (2) main categories- forest and savanna [9]. Nigeria's population is estimated at one hundred and sixty seven million (167,000,000) [11]. Of this population, over 60% engages in agriculture [9].

III. METHODOLOGY

The data used for this paper are the percentage distribution of Households by type of fuel for cooking in 2007 as well as the areas and population figures of the states affected by desertification obtained from [1]. The results are presented in tables and analyzed using descriptive and comparative methods. The results are further discussed with useful suggestions offered.

IV. RESULTS AND DISCUSSION

The results of this paper are presented in tables 1 and 2.

Table 1: Percentage (%) Distribution of Households by type of fuel for cooking, 2007

State	Electricit	Gas	Kerosen	Wood	Coal
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Abia	0.0	0.7	25.8	73.6	0.0
Adamawa	0.5	0.0	6.2	93.4	0.0
Akwa Ibom	0.0	0.2	18.3	81.0	0.4
Anambra	0.4	0.3	26.8	72.2	0.3
Bauchi	0.0	0.0	2.1	97.6	0.3
Bayelsa	0.9	0.0	41.3	57.6	0.2
Benue	0.0	0.4	3.1	94.5	2.0
Borno	0.0	0.0	1.3	98.4	0.3
Cross River	0.0	0.2	19.6	79.8	0.3
Delta	0.0	1.6	21.3	76.6	0.5
Ebonyi	0.1	0.8	9.2	90.0	0.0
Edo	2.1	0.1	18.6	78.7	0.5
Ekiti	0.0	0.0	24.2	74.3	1.5
Enugu	0.1	2.1	28.3	68.9	0.6
Gombe	2.1	0.0	5.5	92.4	0.0
Imo	0.2	0.7	13.6	85.1	0.4
Jigawa	1.0	0.0	3.9	95.1	0.0
Kaduna	0.3	1.2	9.8	88.5	0.2
Kano	1.3	0.1	3.4	94.9	0.3
Katsina	1.7	0.0	0.5	97.5	0.2
Kebbi	0.5	0.2	0.0	99.2	0.1
Kogi	0.3	0.0	12.0	86.6	1.0
Kwara	1.1	0.0	15.5	62.0	21.4
Lagos	2.8	3.8	89.7	3.1	0.6
Nasarawa	0.0	0.0	9.2	90.8	0.0
Niger	0.7	0.0	5.2	92.9	1.2
Ogun	2.0	0.0	48.8	49.0	0.3
Ondo	0.2	0.2	32.6	66.7	0.3
Osun	0.8	0.2	27.1	56.0	15.9
Oyo	0.1	1.3	44.7	50.2	3.8
Plateau	0.6	0.4	16.8	80.8	1.4
Rivers	0.0	2.8	31.3	65.2	0.7
Sokoto	0.6	0.3	2.5	96.2	0.5
Taraba	0.0	0.0	1.0	98.8	0.2
Yobe	0.0	0.0	0.9	98.7	0.4
Zamfara	0.1	0.1	4.1	95.5	0.3
FCT (Abuja)	0.7	3.4	34.5	57.4	4.0
Sector					
Urban	1.5	2.0	54.1	39.0	3.4
Rural	0.3	0.1	7.0	92.0	0.6
National	0.7	0.7	22.9	74.1	1.6

Source: [1]

From table 1, fuel wood is almost the only source of domestic fuel especially in the desert – prone states. This is mostly attributable to its availability, accessibility and affordability. Electricity use for cooking is very low across the country and it is due to highly erratic power supply and non – coverage of rural areas with electricity. [12] Electricity supply is highly irregular in Lugbe, Abuja – FCT leading to the wide spread use of generating sets which cannot be used for cooking. Even in Niger State which is the “power state” housing two (2) hydro electric power stations (Kainji and Shiroro) with Kainji been the largest Hydro Electric Power in Nigeria, the use of



electricity for cooking is very poor due to the epileptic power supply. The use of gas is also low not because of non – availability, but due to unpopularity, poor technology and ignorance as gas is usually flared to give way to the exploitation of crude oil ^[13]. Kerosene is the second major source of domestic energy in Nigeria (see table 1), but its use is often not smooth due to scarcity and high cost. Lagos state has the highest % of the use of kerosene (89.7%) above other sources. Nigeria is a rich country in disguise leading to high poverty rate especially in rural areas as well as unemployment. Many Nigerians live below poverty level and as such cannot afford the cost of kerosene which is now an essential commodity and more expensive than fuel. For instance, while fuel is sold for ninety seven naira (#97: 00) only per litre; kerosene is sold for one hundred and thirty naira (#130: 00) in most filling stations in Abuja with a long queue. This makes most Nigerians to result to “nature” for fuel wood, hence high rate of fuel wood consumption leading to desertification. Table 1 also shows that kerosene is mostly used in urban areas. This has confirmed the study of ^[14] which stated that fuel wood and kerosene are the most popular sources of domestic energy among women in Akwanga LGA, Nasarawa State, Nigeria.

Coal which is a product of carbon is available in large quantity at Enugu and Okaba (Ankpa LGA, Kogi State) and it is one of the mineral fuels. However, its use as domestic fuel is very poor due to non – distribution and ignorance. Even in the areas where it is found, its use is unpopular.

In addition, from table 1, the use of fuel wood is more in rural area than urban constituting 92.0% of fuel wood because of its availability, cheapness, tradition and because other sources of domestic fuel are near absence. On a whole, kerosene constitutes about 54.1% of fuel for cooking in urban areas. This is not because it is available and affordable, but because wood is scarce due to high urbanization and near absence or scarcity of other sources of domestic energy. At the national level, electricity and gas used for cooking constitute only 0.7% each; kerosene, 22.9%, wood, 74.1% and coal, 1.6%. Kebbi state has the highest % of fuel wood consumption (99.2%) in the country, while Gombe has the least (92.4%) among the desert prone area. These figures are very alarming to believe.

The effects of this continuous and increasing harvesting of fuel wood is the increasing desertification which is leading to the near absence of trees in the extreme northern Nigeria and as such shrubs, leaves, sticks and animal dumps among others are increasingly being used as domestic fuel. ^[8] Nigeria is losing about 38% of its total landmass to desertification. Presently, the spread of desert – like condition is alarming and is extending to states like Kaduna, Niger, Kwara, Adamawa and Taraba. While the northern part of Nigeria is facing desertification, the southern part is facing deforestation leading to savannization of the forest zone as signs of it are already very obvious in states like Edo, Enugu, Anambra, Osun, Ekiti, Ondo and so on. In other northern states not witnessing pronounced desertification, there is the depletion of vegetation resources due to fuel wood harvesting leading to an imbalance or disequilibrium in the ecosystem. Table 2

shows the states mostly affected by desertification in Nigeria which correspond with States that depend on fuel wood for fire, the total areas in km² involved and their populations in both 1991 and 2006 population censuses as well as the difference in population between 1991 and 2006.

Table 2: States Affected by Desertification, Areas (KM²) and their Populations (pop)

S/ N	State	Area km ²	1991 pop.	2006 pop	*Difference
1	Bauchi	49, 119	4, 351,	4, 676	325, 458
2	Borno	72, 609	007	,465	1, 615,
3	Gombe	17, 100	2, 536,	4, 151,	190
4	Jigawa	23, 287	003	193	2, 353,
5	Kano	20, 280	Not	2, 353,	879
6	Katsin	23, 561	available	879	1, 473,
7	a	36, 985	2, 875,	4, 348,	124
8	Kebbi	27, 825	525	649	3, 573,
9	Sokoto	46, 609	5, 810,	9, 383,	212
10	Yobe	37, 931	470	682	2, 039,
	Zamfar		3, 753,	5, 792,	445
	a		133	578	1, 170,
			2, 068,	3, 238,	138
			490	628	-773, 177
			4, 470,	3, 696,	1, 606,
			176	999	862
			714, 729	2, 321,	3, 259,
			Not	591	846
			available	3, 259,	
				846	
	Total	355, 306	26, 579, 533	43, 223, 510	16, 643, 977

Source: ^[1] *Author’s computation

From table 2, the total land area over taken by desertification in Nigeria is 355, 306 km² which confirmed the study of ^[2]. The total population involved as at 2006 population census was 43, 223, 510, while between 1991 and 2006, the affected population increased by 16, 643, 977. The high population of the region coupled with the high population increase as well as the absence of a close substitute to fuel wood account for the high rate of fuel wood consumption in the region which is contributing in no small measure to the desertification of the zone as fuel wood is needed on daily basis for cooking, roasting, bakery, black smith and for warming during harmattan.

Desertification is also affecting agriculture in the zone due to over dryness of the environment, dry spells, drought, inadequate rainfall, increasing temperature, reduction in transpiration, increasing evaporation, low soil nutrients, inadequate pasture, erosion and flooding among others. This therefore is contributing to food shortage, food insecurity, malnutrition, depletion of vegetative resources, increasing unemployment, increasing conflicts between farmers and herdsman, shortage of both surface and underground water especially in dry season as well as the migration of birds,



domestic animals, jungle animals and people in search of means of survival.

In order to mitigate the effect of desertification, the use of fuel wood should be discouraged through the use of alternative domestic fuels such as electricity, gas, kerosene, coal, solar energy and wind energy. Nigeria is a tropical country blessed with a lot of natural resources. Over reliance on one major resource does not only lead to its exhaustion, but also introduces a form (s) of environmental calamities. Although, in January, 2012, the Federal Government of Nigeria partially removed fuel subsidy due to alleged corruption; but in the case of kerosene, government should subsidize it and ensure its continuous availability in not only the urban, but also in rural areas. Government should stop chasing shadow by proposing nuclear energy while other clean and near harmless sources of energy are not only lying wasting, but also crying for attention (exploration, exploitation, storage, use, commercialization and maintenance). Nigeria has no reason not to have abundant electricity, wind energy, gas and solar energy for domestic use and for export.

Other serious measures of mitigation to be adopted are afforestation and re – reforestation. Both government and individuals should not only embark on tree – planting campaign, but should also plant millions of economic trees annually. This would help to check high wind speed, wind erosion, deforestation, desertification, global warming, climate variability, climate change as well as ensuring non - truncated supply of the environmental resource. More forest and plantation reserves should also be created and maintained by the government as well as more shelter belts. Over grazing should be controlled, perennial crops such as cotton should be grown in addition to the annual crops; more dams, lakes and water reservoirs should be constructed to allow for uninterrupted irrigation scheme and for controlling flooding of the down stream during the peak of the rains.

In conclusion, Nigeria's environmental resources are becoming over – depleted especially vegetation. Wood, flowers, herbs, grasses, stems, roots, leaves as well as fruits are on the decline due to non – replacement of trees. Therefore, there is an urgent need for environmental resuscitation, restoration, renewal and protection to prevent the extinction of these resources. Also, due to the over – extraction of vegetative resource without corresponding replacement, there is the existence of disequilibrium to the extent that even if this resource is left unharnessed to regenerate, it would take many decades for it to re – generate and for an environmental equilibrium, stability or balance to be achieved. It is therefore pertinent that the role of man to revive this resource and the environment is non – debatable. It is never too late to correct an error, but always too late not to take a step. So the time to act is now.

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