

## **Sustaining the Non Renewable Energy: a Strategy for Inter-Generational Equity**

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### **Abstract**

This paper is an attempt to analyse the intergenerational injustice perpetrated by the indiscriminate exploration of Nigeria oil resources without considering the ranges of renewable resources of energy especially the bio-fuel alternative. When oil was discovered in Oloibiri in the present day Bayelsa State, little did Nigeria envisage the unimaginable demand for oil to the extent it has become a global issue forcing exploration countries many to scamper for alternatives for fear of possible extinction of this God given gift from the face of the earth. However, as a precautionary measure/ Nigeria must start looking for substitute, it is this singular attempt that has brought the issue of renewable energy. This paper relied heavily on secondary sources of data and tables from the official website of OPEC. It has been proven that the current rate of daily demand of the white products are unsustainable i.e. PMS 32 million liters per day, HHK 9million liters per day. It is our conclusion that this God given gift will face extinction even before the years OPEC forecast to avoid Nigeria been caught unaware we have recommended an urgent need to double effort in the production of renewable energy to supplement the non renewable.

**Keywords:** *Renewable energy, Inter-generational, Equity*

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### **Background to the Study**

If Nigeria's chief assets were limited to its huge size, the growing millions of its population and the primary products it exported for foreign exchange, it would have qualified to remain a giant with a tiny voice to carry any weight. Nevertheless, because Nigeria was destined for greatness, its profile rose in the comity of nations because of its vast deposit of oil. 10<sup>th</sup> of June 1956, Marks watershed in the political economy of Nigeria when shell British petroleum (B.P), struck the black gold at Oloibiri the present day Bayelsa State, by 1955 shell began to recount barrels of crude oil, the first of its kind was 5,100 barrels per day (bpd, Down Stream Monitor, 2006) as oil exploration increase tremendously so its earnings multiplied. Nigeria became a nation to be courted and appeased by both the developed and the developing nations alike because of the exploration of its 159 oil fields and 1,481 (Down Stream Monitor, 2006) oil wells in operation Nigeria embark on unprecedented exploration at both end without taking cognizance of the fact that fossil fuel deposit is depletable and non renewable, the period between 1970 till date has not only been a period of maximum strain on crude deposit but also one in which the population has grown astronomically, this generation has severely overstressed the Nigeria crude deposit and we feared if the present life style or pattern of consumption continued, the generation to come might have to read from archival materials that their father land was once endowed with abundant fossil fuel, while Canada is boosting of large oil reserve in the world, Nigeria exploration keep multiplying on a daily basis

### **Research Methodology**

The methodology in terms of the sources of data collection for this paper is secondary sources, appropriate and adequate use was made such as OPEC, Statistical bulletin, downstream monitor, books and internet sources.

### **Theoretical Framework**

Theory is a set of assumption or intellectual paradigm upon which the policy scientist take its bearing. There are several development argument, the W.W. Rostow view, the Ken's argument, the Adams Smith comparative advantage but a conclusion must be drawn here that far from reducing inequality, the above theory has widened the gap between the poor and the rich and deepen social imbalance. Hence it is upon this appriori assumption we adopt the sustainable development theory as our intellectual framework, When the World Commission on Environment and Development presented their (1987).

Report, our common future, they sought to address the conflicts between environment and development by formulating a definition of sustainable development. Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs' Bruntland, (1987), in the extensive discussion and use of the concept, there has been a recognition of three aspects of sustainable development.

**Economic:** An economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and external debt and to avoid extreme sectoral imbalances which damage agricultural or industrial production. **Environmental:** An environmentally sustainable system must maintain a stable resources base, avoiding over-exploitation of renewable resource systems or environmental sink functions, and depleting non-renewable resources. This includes maintenance of biodiversity, atmospheric stability and other ecosystem functions, not ordinarily classed as economic resources.

**Social:** A socially sustainable system must achieve distributional equity intergenerational equity, adequate provision of social services including health and education, gender equality, and political accountability and participation.

However, Norggard (1994), criticizing sustainable development thinking,

*In real world, we can rarely avoid trade-off, we can maximise only one objective at a time he concludes that it is impossible to define sustainable development in an operational manner in detail and with the level of control presumed in the logic of modernity, the strongly normative nature of the sustainable development concept makes it difficult to pin down analytically, clearly these elements of sustainability introduce many potential complications to the original simple definition.*

### Oil Production and Consumption Rate in Nigeria

The concept of sustainable development raises the issue of whether the present consumption pattern is acceptable and whether there is any reason to pass them on to the next generation. Because intergenerational equity must go hand in hand with intra-generational equity. Obviously the current rate of consumption of the white product are just unacceptable, today in Nigeria we consume over 39million liters of Premium Motor Spirit (PMS) and over 8.5million litres of household kerosene (HHK)

**Table 1: Crude Oil Production and Value of Petroleum Export in Nigeria (1970-2005)**

Year	Crude oil Production 100bjd	Value Petroleum Export (m\$)
1970	1,083.10	718.00
1971	1,531.20	1,375.00
1972	1,815.70	1,803.00
1973	2,054.30	3,049.00
1974	2,255.00	8,997.00
1975	1,783.20	7,744.00
1976	2,066.80	9,444.00
1977	2,085.10	11,561.00
1978	1,897.00	9,452.00
1979	2,302.00	15,624.00
1980	2,058.00	24,931.00
1981	1,439.60	17,291.00
1982	1,287.00	11,883.00
1983	1,235.50	9,941.00
1984	1,388.00	11,534.00
1985	1,489.90	12,568.00
1986	1,466.60	4,770.00
1987	1,323.00	7,024.00
1988	1,341.30	6,267.00
1989	1,716.30	7,470.00
1990	1,726.70	13,265.00
1991	1,893.10	11,792.00
1992	1,957.00	11,642.00
1993	1,905.20	10,859.00
1994	1,820.90	11,040.00
1995	1,842.60	11,512.00
1996	1,863.10	14,888.00
1997	1,876.70	14,391.00
1998	1,939.00	8,754.00
1999	1,781.50	12,453.00
2000	2,053.60	20,040.00
2001	2,017.60	17,188.00
2002	1,801.70	17,083.00
2003	2,166.30	22,184.00
2004	2,327.50	33,309.00
2005	2,365.90	46,770.00

**Source:** OPEC Annual Bulletin, 2005 Tables

The above table shows a tremendous increase in Nigeria oil production and revenue generation increased steadily from 1,083 million barrels after the war in 1970 to 2,255 million barrels in 1974, it fluctuated slightly below the 1974 record between 1975 and 1978 and then peaked at 2,302 million barrels in 1979 before declining again to 2,058 million in 1980. In spite of the fluctuations, however, oil revenue kept on increasing from \$718 million in 1970 to over \$24.931 billion in 1980 representing over 3,372.28 percent increase within 10 years. Indeed, it was a period of huge wealth for the country. But the wealth was in reality under the control of the multinational oil companies.

As Onimode (1978) cited in liberalization of the downstream sector:

*the Nigeria experience said... in spite of the dominance of this sector in the economy, the Nigerian government exercises only formal control over it ... the seven transnational that dominate the oil oligopoly produced as follows: Shell B:P (British) produced 1,250,785 barrels per day; Gulf (American) produced 2,89,123 barrels per day; Mobil (American) produced 221,930 barrels per day; Agip/Phillips (Italian) produced 182,692 barrels per day Texaco produced 35,873 barrels per day and Ashland produced 11,471 barrels per day,*

At the time Onimode made his submission the trans-national corporations were not only the main oil explorers in Nigeria they were indeed the sole producers. It is crystal clear from the above that exploration in Nigeria has been conducted in the shrewdest manner with reckless abandon. It is more startling when you do a comparative analysis of what was the reserved in 1958, what has been consumed till date and what is left for Nigeria crude reserve is put at 37 billion barrels and an estimate of about 44 years for it to dry up as clearly indicated in the table below.

**Table 2: Declared Reserve of major OPEC Producers (billion of barrel).**

Year	Iran	Iraq	Kuwait	Saudi Arabia	UAF	Venezuela	Libya	Nigeria
1980	58.3	30.0	67.9	168.0	30.4	19.5	20.3	16.7
1981	57.0	32.0	67.7	167.9	32.2	19.9	22.6	16.5
1982	56.1	59.0	67.2	165.5	32.4	24.9	22.2	16.8
1983	55.3	65.0	67.0	168.8	32.3	25.9	21.8	16.6
1984	58.9	65.0	92.7	171.7	32.5	28.0	21.4	16.7
1985	59.0	65.0	92.5	171.5	33.0	54.5	21.3	16.6
1986	92.9	72.0	94.5	169.7	97.2	55.5	22.8	16.1
1987	92.9	100.0	94.5	169.6	98.1	58.1	22.8	16.0
1988	92.9	100.0	94.5	255.0	98.1	58.5	22.8	16.0
1989	92.9	100.0	97.1	260.1	98.1	59.0	22.8	16.0
1990	92.9	100.0	97.0	260.3	98.1	60.1	22.8	17.1
1991	92.9	100.0	96.5	260.9	98.1	62.6	22.8	20.0
1992	92.9	100.0	96.5	261.2	98.1	63.3	22.8	20.0
1993	92.9	100.0	96.5	261.4	98.1	64.4	22.8	21.0
1994	94.3	100.0	96.5	261.4	98.1	64.9	22.8	21.0
1995	93.7	100.0	96.5	261.5	98.1	66.3	29.5	20.8
1996	92.6	112.0	96.5	261.4	97.8	72.7	29.5	20.8
1997	92.6	112.5	96.5	261.5	97.8	74.9	29.5	20.8
1998	93.7	112.5	96.5	261.5	97.8	76.1	29.5	22.5
1999	93.1	112.5	96.5	262.8	97.8	76.8	29.5	29.0
2000	99.5	112.5	96.5	262.8	97.8	76.8	36.0	29.0
2001	99.1	115.0	96.5	262.7	97.8	77.7	36.0	31.5
2002	130.7	115.0	96.5	262.8	97.8	77.3	36.0	34.3
2003	133.3	115.0	99.0	262.7	97.8	77.2	39.1	35.3
2004	132.7	115.0	101.5	264.3	97.8	79.7	39.1	35.9
2005	137.5	115.0	101.5	264.2	97.8	80.0	41.5	36.2
2006	138.4	115.0	101.5	264.3	97.8	87.3	41.5	36.2
2007	138.2	115.0	101.5	264.2	97.8	990.4	43.7	36.2
2008	137.6	115.0	101.5	264.1	97.8	172.3	43.7	36.2
2009	137.0	115.0	101.5	264.6	97.8	211.1	46.4	36.2
2010	151.2	143.1	101.5	264.5	97.8	296.5	47.1	36.2

**Sources:** OPEC Annual Statistical Bulletin 2010/2011

Though the Nigerian oil reserve has been on a consistent increase from 1980 as indicated on the above table, the growth is however not based on efficient management or conscious effort for reservation, the increase is a product of more discovery of oil wells and technological advancement in the downstream sector which is completely dominated by the oil transnational company.

**Table 3: Summary of Reserve Data as of 2011**

Country	Reserves 109 bbl	109 m3	Production 106 bbl/d	103 m3/d	Reserve life years
Venezuela	296.5	47.14	2.1	330	129
Saudi Arabia	264.52	42.055	8.9	1,410	81
Canada	175	27.8	2.7	430	178
Iran	151.2	24.04	4.1	650	101
Iraq	143.1	22.75	2.4	380	163
Kuwait	101.5	16.14	2.3	370	121
United Arab Emirate	97.8	15.55	2.4	380	112
Russia	74.2	11.80	9.7	1,540	21
Libya	47	7.5	1.7	270	76
Nigeria	37	5.9	2.5	400	41
Kazakhstan	30	4.8	1.5	240	55
Qatar	25.41	4.040	1.1	170	63
China	20.35	3.235	4.1	650	14
United States	19.12	3.040	5.5	870	10
Angola	13.5	2.15	1.9	300	19
Algeria	13.42	2.134	1.7	270	22
Brazil	13.2	2.10	2.1	330	17
Total of top seventeen reserve	1,324	210.5	56.7	9,010	64

**Sources:** OPEC Annual Statistical Bulletin 2010/2011

The above table obviously indicate the true nature of the consumption pattern of Nigeria, while Venezuela with a huge reserve of 296.5 is producing 2.1 661/d per day, Nigeria with a very fragile reserve of 37 bb/d is producing 2.5 bb/d this is grossly unsustainable for a nation like Nigeria.

It is based on the aforementioned that this paper strongly advocate for a major restructuring of the National income and consumption patterns as a necessary precondition for any viable strategy of sustainable development today's iniquities are neither sustainable nor worth sustaining. As the World Commission on Environment and Development (WCED 1987), popularly referred to as the Brundtland commission, the commission report, our common future: from one earth to one world called for new conception of development that advanced the material wants of the present generation without depriving future generation of the resources required to satisfy their needs thus, the commission conceptualized 'sustainable development' as paths of human progress which meet the needs and aspirations of the present generation without compromising the ability of future generation to meet their needs. Therefore this paper recommends the development and processing of Bioenergy as a strategy of elongating and sustaining the life span of the non renewable energy (Fossil fuel) both renewable energy and non renewable energy can serve as a supplement to one another.

### **Jatropha Curcas as a Form of Renewable Energy**

Jatropha curcas grows in tropical and sub tropical regions, the plant can grow in waste lands and grows on almost any terrain, even on gravelly sandy and saline soils. It can thrive in poor and stony soils, complete germination is achieved within 9 days it can be propagated by cutting which yields faster results than multiplication by seeds. Jatropha curcas thrives on a mere 2,50mm of rain a year, and during its first two years does not need to be watered in the closing days of the dry season.

Jatropha curcas has a life expectancy of approximately forty years and its yield from 9-12 months time, the best are obtained only after 2-3 years time, oil content varies from 28% to 30% and 80% extraction, one hectare of plantation will give 400 to 600 litres of oil if the soil is average, the oily seed are processed into oil which may be used directly to fuel combustion engines or may be subjected to transesterification to produce biodiesel. However it was the above numerous important of jatropha curcas that Anuforo citing Sambo and Ewa (2011) put it thus:

*Biofuel is a new and renewable energy source that needs to be promoted in the nation's energy supply mix for the purpose of enhanced energy security and global warming mitigation. biofuels are used in transportation and stationary engines for power generation Jatropha curcas is a non food plant that produces seeds which are found to have 30 percent to 40 percent oil from which bio-diesel can be produced. The plants are available in most states of the country. While Ewa (2011), corroborating Sambo's view that the jatropha plant as we are aware is very common and grows in almost all parts of this country.*

As Sambo (2011), further corroborate the position of this paper

*Our country is so huge, the basic issue is that we need to educate, enlighten and sensitize Nigerians, Nigeria is a major oil producer, that oil is exhaustible in some decades to come. So we need to wake up to the fact that we have other resource.*

Therefore in prolonging the life span of the non renewable energy resources in Nigeria and for the sake of the next generation we advocate for a blend of this two gifts of nature and this also proffer a great opportunity for Nigerian farmers to be integrated into the oil sector of the economy.

### **Fuel Ethanol as a Supplement to Premium Motor Spirit**

Ethanol fuel is a clean, colourless, flammable, oxygenated and water free hydrocarbon. Ethanol is an alcohol based fuel produced from crops that contain sugar, ethanol is emerging as important motor fuel. It is produced from biological sources known as biomass. These biomass feed stocks may include agricultural crops (Cassava, sugarcane, potatoes) and agricultural residues trees, grasses, animal waste, municipal solid waste and indeed all organic materials that capture and store solar energy.

As Agbaje and Okafor (2006) cited in Downstream monitor succinctly puts it

*ethanol fuel is one of the means available for fighting air pollution from vehicles. It is also a green house emission friendly fuel, which reduces global warming and ensures complete elimination of the use of octane-enhancing lead and MTBE (Methyl Tertiary Butyl, Ether) which are dangerous pollutants. It is also a high performance motor fuel that cuts poisonous exhaust emission. Ethanol being a renewable fuel made from home-grown commodities. It could be called fuel of the future.*

Ethanol is made by fermenting and then distilling starch and sugar crops... maize sorghum, potatoes, wheat, sugar cane, even cornstalks fruit and vegetable waste, it does not require heavy machine to produce ethanol fuel. Ethanol can be blended with gasoline to create E10 a blend of 100/0 ethanol with gasoline. The Nigerian Ethanol Programme involves the blending of ethanol into petrol (PMS) and initial ethanol content not exceeding ten percent (100/0) by volume. This will improve the automotive exhaust emission in the country and will reduce domestic use of petrol and position Nigeria for development of Green fuel.

### **The Benefits of Tapping into the Bio Fuel Opportunity**

It provides an opportunity for Nigeria to qualify for carbon credits as enunciated in the Kyoto protocol Annex I. countries under the clean development mechanism and Nigeria is not the first in the series Brazil and Guinea paupau are already benefiting.

1. It is a renewable fuel made from plants
2. It is not a fossil - fuel: manufacturing it and burning it does not increase the green house effect.
3. It provides high octane at low cost as an alternative to harmful fuel additives.
4. Ethanol blends can be used in all petrol engines without modifications.
5. It provides high octane at low cost as an alternative to harmful fuel additives.
6. Ethanol is biodegradable without harmful effects on the environment.
7. Ethanol's high oxygen content reduces carbon monoxide levels more than any other oxygenated: by 25.30%.
8. Ethanol blends dramatically reduce emissions of hydrocarbons a major contributor to the depletion of the or the ozone layer
9. Ethanol can reduce net carbon dioxide emissions by up to 100% on a full life-cycle basis.

As Kupolokun (2006) cited in downstream monitor, has rightly observed Ethanol biomass a sustainable bio-fuel industry in Nigeria by leveraging the Nigerian agricultural sector performance through linkage with the petroleum sector; this is achieved through the massive production of sugarcane and cassava in plantations for distillation and conversion into ethanol. It is our believe that if the bio option is tapped into it will bring about direct and indirect job creation which will go a long way in enhancing the standard of living both in the rural and urban areas, generate multiplier effect to other sectors of the economy, increased economic development, particularly in the rural area, and above all free more crude oil for the future generation and ensure a diversified energy resource base.

### **Findings**

This paper however discovered that the Nigerian government has no accurate data on the quantity of oil exploration in Nigerian upstream sector. The paper also observed a strong antithetical link between power supply (electricity) and the consumption of the white product. Nigeria also has the capacity to export in million metric tones of sugarcane and the jatropha oil seed to other African countries to boast its foreign earnings.

### **Conclusion and Recommendations**

However it is our conclusion that this God given gift will face possible extinction if the current rate of consumption continue un-supplemented. However, as a way of remedy, this paper makes the following recommendations.

- i. That the federal government should enact a law banning the importation and the use of vehicles that are not ethanol (E10) compliant.
- ii. That all local government should be mandated to plant jatropha caucus in hectares as a demonstration plot for the local farmers and as a way of enhancing local extension service.
- iii. That the private sector should be wooed into investing in the establishment of jatropha oil processing company.
- iv. That the rural farmers should be enlightened on the importance of the crop and how it could give them opportunity of resource control.



## Reference

- Agbage, S. & Okafor, L. (2006). *The fuel ethanol to the rescue downstream monitor*, 2 (4), Abuja: Prince of Peace Limited.
- Anuforo, S. (2011). *Deregulation matters arising*. Lagos: Guardian Publisher Nig. Ltd
- Bruntland (1978). *Our common future: From one earth to one world' world commission on environment and development report*.
- Federal Government of Nigeria (2006). *Downstream monitor*, 3(4) Abuja: PPRA Publication
- Kupolokun, F. (2006). *Liberalization is the answer*. Newswatch, June 4, Lagos: Newswatch Publishing House.
- Norggard, R. B. (1994). *Development betrayed: The end of progress and co-evolutionary Revisioning of the future*. New York: Rutledge.
- Onimode, B. (2007). *A voice for the black Man: in Gbadamos Kupolokun and Oluleye (ed). The Nigerian oil industry: A reappraisal*. Abuja: PPRA Publication
- OPEC (2011). *Share of world oil resources*. Venezuela World Press Ltd.