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Analysis of Energy Sources, Impact on Environment and Sustainable Development Referencing Landmark Cases in the USA, South Africa and Nigeria

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Abstract

Development is often predicated on energy supply in any part of the world. This informs attraction of investment so as to produce a robust economy with seldom consideration for sustainability. Presently, there is urgent concern to preserve the environment for the sake of human beings in the present and in the future otherwise referred to as sustainable development which informed this research. The researchers examined sources of energy, the environmental impact of some types of energy sources like the fossil fuel such as crude oil, gas and coal as well as nuclear resource of energy which most times negative the environment. The renewable energy sources such as biomass, geothermal, wind power solar, were not left out as they proved to be more environmentally friendly, caused much less pollution or degradation to the environment and accorded with the concept of sustainable development with satisfaction. However, they are often costly to procure. The researchers utilized in the main review of various literature sources and landmark court decisions. The findings showed that though the renewable energy sources are more protective of the environment and desirable, the fossil fuel is still of prime utilization in Nigeria.

Key Words: Energy sources, Exploitation, Environment and Sustainable Development

1.1 Introduction

The environment is no doubt key to human existence. It is trite that one of the greatest challenges facing humanity today is environmental degradation. Therefore, the need for a clean or unpolluted or less polluted environment cannot be over emphasized. Environmental challenges occur as a result of unguarded activities of human beings in the exploitation of natural resources especially in the areas of sourcing for energy supply (Oladeji 2015). Though atimes, the environmental challenges are as a result of natural disasters such as earthquake, erosion, volcanic eruption, desertification etc. Thus issues of environment together with investment and development remain one of the greatest concerns of human beings globally. The desire for development particularly for socio-economic advancement requires constant energy demand and supply. However, the course of production of the required energy yields to environmental issues. There is constant consciousness of the impact of development on the environment especially in the areas of production and supply of energy through the fossil fuel sources, referring basically to coal, crude, oil and natural gas exploration production and transportation. The process of producing and consuming any form of energy is an economic activity that impacts on the ecosystem. Notably, materials and ecologically processing cycle flow from the ecosystem into the economy and non-useful energy and other by-products including pollution flow back into the ecosystem, changing the natural environment. No doubt human investment in energy production has repercussions on the quality and quantum of human life. This is why currently conferences, policies, treaties, protocols and declarations place great emphasis on long term sustainability (WCED 1978).

1.2 Description of Terms

For better understanding of this research, some key terms will be espoused. It is noteworthy that some of the terms defy clear explanations or definitions. However, the writers espoused the following:

1.2.1. Energy

For the purposes of this research refers to sources of power to drive production or development. While renewable energy simply means energy generated from sources which occur naturally and repeatedly in the environment. Such sources include, wind, waves, the sun, biomass (trees, plants, animals and human decay) (Thornton & Bechwith 2004). Recently renewable energy is preferred because of its environmental friendliness, availability and cost effectiveness.

1.2.2 Environment

There is no definite definition of the term environment. Some scholars have conceptualized the term environment from word rooting and / or its relationship to humanity. For example

Fagbohun (2010) defined environment as a term derived from the French word environ or environment meaning 'around' or 'round about' 'to encompass' which in turn is rooted in old French word virer or viron which means around or circle. The writers maintain that in a nutshell environment refers to our surroundings often understood to include not only land, air and water but also the built environment and condition of the local neighbourhood.

The totality of the surroundings and all the elements therein both living and non-living things for the benefit of human beings also include places in which we live, work and interact with other people in our cultural, religious, political and socio-economic activities for self-fulfillment and advancement of our communities, societies or nations. It is within this environment that both natural and man-made things are found (Dworkin 1987).

Still, the term is inherently technical in scope and application. Environment means the total surrounding of an organism or group of organisms (Ikoni 2010).

Garner (1999) defined environment as the totality if physical, economic, cultural, aesthetic and social circumstances and factors which surround and affect the desirability of value f property and which also affect the life the people live.

This is also the explanation by United States of America (USA) Court on the meaning of environment in US v Amadio (2015) C.A. India F. 2nd 605, 611.

Environment was defined by one of the Nigeria's Laws on Environment, the National Environmental Standard Regulations Enforcement Agency (NESREA) Establishment Act, No. 25 2007. Its section 37 defined environment to include water, land, air and all plants and human beings or animals living therein and the inter-relationship which exist among these or any of them.

Thus the strive of (human beings) to sustain the environment is a mandatory ontological concern. His success at it concurrently enriches the quality of human life and time on earth …failure merely confirms his perceived desires for irresponsibility and untimely suicide (Olajide 1998).

Some other scholars related environment to include water, land, air and all plants and human beings or animals living therein and the inter-relationship which exist among these or any of them. (Atsegbua et al 2010) In a limited sense, which is essentially physical and biological, environment encompasses an array of ecosystems, consisting of both living, and non-living components such as water, land air and so on (Ladan 2004).

Thus, writers of this article maintain that environment mean our surroundings, neighbourhood and beyond also include atmosphere (air),(water) the hydrosphere and the lithosphere (land) structures, and inter-relationship between all these and living things.

Or

Elements in their original state which include, human beings, and other living things natural resources-trees, stones land, water air, oil, gas, and all manner of interactions between all these elements.

1.2.3 Sustainable Development

A term of two words which infer development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Fabiyi 2006). It is the usage of a thing in such a way that it can continue or be continued for a long time.

Nonetheless, the United Nations has added that it also requires the maintenance, rational use and enhancement of the national resources base that underpins ecological resilience, economic growth and implies progress towards international equity (Abdukadir and Sambo 2011)

Furthermore, it involves the exploitation, management and use of nature's resources in a rational, practicable, coherent and comprehensive manner to minimize contradiction and duplication, while enhancing co-operation at all levels constitute the externalization of the concept of sustainable development (Aina & Adedipe 1991)

The concept of sustainable development in the exploitation and management of any nation's resources assumes the facts that; all life on earth forms parts of one single interdependent system which influences and depends on the non-living components of the planetary rock, soil water and atmosphere. Thus each person or society is obligated to the protection of these natural resources for the mutual benefit of all (Ajai 1995)

2. Methodology

Data for this research was obtained from existing literature, case analysis from Courts of law and a comparative analysis of what obtains in the USA, South Africa and Nigeria.

4. Objectives of Study

- To enumerate the sources and types of energy.
- To examine Nigeria's appreciation of healthy environment in energy development.
- To examine the impart of each source of energy
- To compare decisions of Courts on environmental issues in the USA, South Africa and Nigeria

5. Findings

The review revealed that Nigeria as a nation is highly dependent on non-renewable energy sources (the fossil fuels). While due to lack of capacity for its exploitation and production there is obvious encouragement of the Multinational Oil Companies (MOCs) or International Oil Companies (IOCs)to exploit and produce crude oil, gas etc in the most unwholesome manner with near absolute disregard to legislations and safety of the environment. This leads to degradation of the Nigerian environment without caution and adequate remedies, notwithstanding all the existing legislations. (Ikpeze et al 2015). In fact, the Courts in Nigeria are encouraged to advance to the dictates of the oil investors for fear of their withdrawing from the country. Thus Courts that are bold enough to give judgments that meet the justice of environmental degradation are atimes "punished" by transfers. This must be discouraged in line with what obtains in the United States of America and South Africa, where the Courts are often minded to apply the principles that encourage preservation of the environment based on the Rio Declaration on Environment and Development, and espouse on laws that protect the environment especially in the areas of energy search.

6. Types of Sources of Energy

Basically, we have two types of energy: non-renewable and renewable energy.

6.1 The Non-Renewable Energy: Non-renewable energy is energy that exists free in nature. Some of them exist infinitely. They took million of years to form, and are bound to run out one day. It is energy from fossil fuels (coal, crude oil etc) and uranium. Fossil fuels are mainly made up of carbon. It is true that fossil fuels were formed over 300 million years ago Non-renewable energy consists of:

(a) Nuclear Energy: It is one of the important sources of energy globally.
(b) Propane: This is one of the Liquefied Petroleum Gases (LPGs) that are found mixing with natural gas and oil.
(c) Natural Gas: Natural gas supplies about 23.8 percent of the world's energy.
(d) Petroleum otherwise called Crude Oil .
(e) Coal: It was the primary energy source from 1900 – 1960 (Oladeji 1998)

Note that using coal to produce energy causes some problems, usually on greater scale than the use of oil or gas. These problems include acidic sulfur oxide emission, carbon dioxide emission, poorer land and hazardous waste . There are several forms of coal that exist in the world. They are Anthracite, Bituminous Coal and Sub-Bituminous Coal. (Letcher 2008)

6.1.1 The Effects of Non-renewable Energy

Non-renewable energy sources cause the greatest environmental pollution even in the process of its production; by spillage or gas flaring despite regulations to prevent gas flaring. A scholar posited that it is due to the fact that the Petroleum Amendment Act (1973) failed to control gas flaring, possibly because the Nigerian government lacked the necessary infrastructure for the utilization of associated gas in the cause of energy production (Orji 2014).
Therefore lack of infrastructure is one of the banes of environmental degradation in Nigeria whereby the MOCs and IOCS with the technological knowledge tend to treat environmental issues in Nigeria with great level of ignominy.

Furthermore, other forms of environmental degradation caused by non-renewable energy is enormous, such as water pollution, desertification and atmospheric disaster. There is need to have **hard core laws** to protect the environment by way of regulating against its misuse and abuse by human elements who are beneficiaries of the environment (Waite & Jawell 2001). It must be noted that International agreement among nations has played important role globally to preserve and improve the environment. Though basically persuasive, the agreements contribute to global environmental protection (Dugard 2005) which the Court and Tribunals in most cases apply. For example, the US case of Trial Smelter v Canada (1941) where environmental injuries crossing boundaries was held that the causative country was responsible - Canada was held responsible. Same held in United States of America v Shell Offshore INC & Shell Exploration and producing Company.

6.2 Some types of Renewable Energy

In summary these are energy sources obtained from continuous or repetitive currents of energy recurring in the natural environment and / or energy flow which is replenished at the same rate as it is "used". The following are sources of renewable energy:

(a) **Solar Power:** Photo Voltaic (PV) solar power harnesses the sun's energy to produce electricity. Solar power is one of the fastest growing energy sources (Mcmillan 1990)
Interestingly, the Federal and State Governments in Nigeria lend assistance to solar programmes to make "green" energy a more economically vuable option. Good example are the solar panels energizing the street lights. However it is expensive to build and has chemical pollution on the environment (Win 2015).

(b) **Hydroelectricity:** This is electricity generated by hydropower, i.e. the production of power through use of the gravitational force of falling or flowing water from a high level to a low level at a high efficiency (Atsegbua 2009).
According to World Energy Council;

> …Carefully planned hydropower development can, and does, make a great contribution to improving electricity system reliability and stability through the world [it] will play an important role in the improvement of living standards in the developing world [and] make a substantial contribution to the avoidance of green house gas emissions and the related climate change issue.

Thus it is paradoxical that investment in hydro scheme looks extremely favourable is retrospect… but extremely uncertain in prospect or in one specific case. (Munasighe 1989)

(c) **Nuclear Power:** Nuclear power is a sustainable energy source that reduces carbon emissions and increases energy security .

(d) **Biomass:** In this context, biomass refers to plant matter grown to generate electricity and include agricultural waste, animal dung, industrial effluents, Municipal solid waste etc (Sambo 2015)

(e) **Geothermal Power:** Geothermal is the only form of 'renewable' energy that is independent of the sun, having its ultimate source within the earth. (Boyle 2004)

(f) **Tidal Power**: The power created through tidal generators is generally more environmentally friendly and causes less impact on established ecosystems.

(g) **Wind Power:** Otherwise referred to as Wind farm (Bradbrook 1997) is gaining popularity.

It is noteworthy, that renewable energy is the current global intendment for the reason of its minimal negative impact on the environment especially non-release of green house gas (emissions). However, no single renewable energy can meet all the needs of all peoples. It also import need for governments to provide infrastructural facilities to reduce energy investors' bluff particularly in developing countries

7.1 The Various Courts' Decisions on Environmental Protection

The writers undertook to compare the attitude of the Courts on environmental issues by analyzing a case each from the United States of America, South Africa and Nigeria. At the end, the impact of such decisions on applications of available legislations and general attitude towards developmental investment in each country was assessed against the principles enunciated in the Rio Conference to enhance sustainability.

7. 1.1 The USA Case

United States of America v Shell Offshore INC & Shell Exploration and Producing Company (2003) Civil Action No. CV03 1458.2

It was a case instituted on Gas flaring in the Western District of Louisiana at the Lafayette Opelousas Division. The USA made allegations that Shell has engaged in unauthorized flaring and/or vesting of natural gas in excess of small volumes much of which was economically recoverable at different location in the country. Example at Tahoe, Enchilada etc from fifty thousand cubic feet per day to about six million cubic feet per day since 1975 to 1999. Shell admitted to the claims / allegations made against it by the USA Shell also acknowledged that it flared the gas without first obtaining permission from appropriate authority and that it also failed to state accurately and timely calculate and pay royalties on national gas flare as required. She consequently agreed to pay the USA Forty- Nine Million Dollars ($49,000,000) minus (or less) the royalties of One Million Six Hundred and Seventy – eight thousand, One hundred and twenty four Dollars ($1,678,124) already paid . it is noteworthy that Shell Company readily admitted its irresponsible acts on the USA environment exhibiting sensitivity and honesty as against what it does in Nigeria. However this is very instructive to the Nigerian Courts.

7.2 The South Africa Case

Wildlife Society of Southern Africa & Ors v Minister of Environmental Affairs & Tourism of the Republic of South Africa & Ors. (1996)(3) SA 1095 (T)

In this case, the applicants sought an order against the respondents to enforce section 39 of Decree No. 9 (Environment Conservation) 1992 to declare that the Environmental Conservation Act 73 of 1989 and the General Policy in terms of the Act are applicable to the area in the former Transkei and that the policy and act are enforced. In terms of section 39(2) no person is allowed without permission from the relevant authorities to carry on infrastructural development activities which may harm the environment.

It was noted that certain land use practices have developed along use practices have developed along almost the entire Transkeian Coast which have been destructive of the ecology of the coast line. Therefore constitute real threat to the environmental sensitivity of the whole area. The 1st Respondent admitted all the averments.

The Court held:

1. On Locus Standi
   That where a statute imposed an obligation upon the State that a body such as the 1st Applicant can apply to the Court to promote environmental conservation in South Africa by order compelling the State to comply with the obligation in terms of such statute.
2. That the law on locus standi must change so as to protect the interest of the people on environment.
3. The Court ordered the respondents to take all necessary steps to enforce section 39 of the Decree.

It must be noted that the Environmental Conservation Act 73 of 1989 currently applies throughout the Republic of SA by virtue of Proc. R29 GG. 16346 of 1995 and Proc R43 GG 17354 of 1996.

7. 3 The Nigeria Case

Gbemre v Shell Petroleum Dev. Co. Nig. Ltd & AG Fed. (2005) Unreported judgment of Federal High Court Benin, Suit No FHC/B/CS/53/05

Mr. Jonah Gbemre sued Shell PDC totalfina Elf and Agip JVC, NNPC Nig. and AG Federation Gas flare in his community(Iwhereka) in Niger Delta as pollution by way of poisoning the community's air, water, food and vegetation which caused them terminal diseases such as chronic bronchitis, cancer and painful breathing etc, It was an application on fundamental Rights, Enforcement on right to life dignity in accordance with Sec. 33, 34of the Nigerian constitution and Article 42 of African Charter on Human and Peoples' Rights (ACHPR).

It was posited by Counsel to the Plaintiff BEI Nwofor SAN that "right to life meaning only if the things that endanger it are removed which is the massive gas flaring. He further analyzed right to life in its widest calculative using the Black Law Dictionary to mean:

a. The sum of all the forces by which death is resisted.
b. The state of humans in which they are organized and capable of performing their functions
c. All personal rights and enjoyment of the faculties which gas flaring definitely diminishes. The Applicants insisted that the 1st and 2nd Respondents had no valid Ministerial certificates permitting them to flare gas and that their action is actionable under Section 4 of the Associated Gas Re-injection Act with is an offence which makes violators liable to penalties. The Fed. High Court Sitting in Benin City per C.V. Nwokorie J held as follows:

a. That Mr. Jonah Gbemre had authority to represent himself and the community.
b. That the fundamental rights to life and dignity of the human person as guaranteed by section 33 and 34 respectively of the 1999 Constitution inevitably includes the rights to clean, poison free, pollution free, healthy environment .
c. That the respondents continuous acts of gas flaring amounted to a gross violations of their (the communities) fundamental rights to life including healthy environment and dignity of human person as enshrined in the constitution.
d. That failure of the respondents to carry out Environmental Impact Assessment (EIA) in the applicants community amounted to a clear violation of their human rights.
e. The Court apart from holding that specific sections of the Associated Gas Re-injection Act and of the Regulations made under it were inconsistent with the applicants rights to life and dignity guaranteed under the Constitution, also declared that the above laws were inconsistent with the African Charter on Human and Peoples' Rights (Ratification and Enforcement) Act Cap A9 laws of the Federation of Nigeria (LFN) 2004

   Further the Court put restraint on the respondents, their servants, or workers from engaging in further flaring of gas in the applicant's community. And dismissed the case put forward by the 1st and 2nd respondents as well as their various preliminary objections and declared that they lacked merit.

   It must be noted that the respondents refused to obey the judgment of the Court and applied to the Federal High Court which varied the order and gave the 1st and 2nd respondents till April 2007. That is one year after the application to obey the court's judgment which was a conditional stay of execution. What an unfortunate adjudication. The Respondents further appealed to the Court of Appeal.

   On 26th September, 2006, the Benin Court of Appeal Division ordered the Federal High Court not to sit on the day appointed for personal appearances (that was May 2006) or any other day and granted the stay of execution but left the order of the Federal High Court untouched. However, Honourable Justice C.V. Nwokorie had been transferred to Katsina.

   This case goes to demonstrate that the arms or organs of government mandated to ensure justice and guarantee Nigerian citizens healthy environment, for reasons best known to them but obviously bordering on unaccountability, shirk such constitutional duties thereby exposing the environment which includes human beings in Nigeria to grave danger, meanwhile they pretend to protect the investment while yielding unsustainability and non-development. The Nigerian Courts are urged to emulate what

happens in the USA and South Africa as in many other countries on attitude of the Court towards investment, environment and sustainable development.

The vital question is will there be future investments on energy if government allows investments which destroy the environment to continue? The Obvious answer is NO. Therefore it is high time the environment is protected. Thus government must organize and implement legislations by the MOCs or IOCs operations in line with international law and concept of sustainable development.

8. Conclusion

It is clear that the quest for development within nations have impacted negatively on the environment, thereby placing human existence in danger. Technological and developmental concerns have attracted and occupied center stage globally. Conferences have been organized where Conventions, Treaties, Protocols and Declarations etc are adopted with regard to economic, sustainable development, protection and preservation of the environment. Examples are the Stockholm Conference of 1972, Rio Conference of 1992 with the various enunciated principles as guide to nations, to set out policies and legislations to regulate their peoples' and investors especially with reference to Rio principle 3,4,7,8,10,13,16,17 and 20, to mention but a few

It was observed that environmental impact of the non-renewable (fossil–fuel) and renewable sources of energy on nations are more in the negative than positive. It was deduced that the environment is more affected by dependence on the non-renewable sources of energy when compared with effects of renewable sources. It was also found that the renewable energy sources are not absolutely pollution free with the elucidations of their unique environmental challenges. All in all, environmental protection and safety must not be sacrificed on the altar of development so as to guarantee sustainable development for the present as well as the future generations.

8.1 Recommendations

It is hereby recommended as follows:

Duties of the Legislature

- Must review legislations relating to energy taking into cognizance the prevailing conventions, treaties, declarations and Protocols protecting the environment to guarantee sustainable development.
- There is need for the Nigerian Legislature to ensure adequacy of penalties in any enactment relating to energy especially Oil and Gas exploitation and production in line with what happens in other places like USA and South Africa.
- Must make legislations that criminalizes grave acts in the course of energy production.
- Must make legislations (laws) to establish special Courts on environmental degradation or crime
- Must by legislation establish monitoring Agencies at all levels – local Government, State and Federal.
- To revamp and implement the provisions of the Energy commission of Nigeria Act 1979 now amended by Act No. 19 of 1989 Cap E10 LFN 2004. Renewable Energy falls under the National Energy Policy which ironically is not comprehensive enough to attract both local and foreign investors to the energy sector.
- Need to put up Bills before the Legislature for laws that will specially encourage the use of renewable energy sources with minimal environmental pollution in Nigeria.
- To provide subsidies for investment in renewable energy within a legal framework
- To lessen promotion of investment in fossil fuels.
- To create awareness on potentials of renewable energy technologies.
- Create employment in green jobs by being involved in renewable energy investments.

The Courts

- To be alive to its mandate of ensuring manifest justice in especially adjudication on environmental issues. The case of Gbemre v Shell Coy at the Trial Court level was very pro-active but marred by the Court of Appeal position.
- To be sensitive to the destruction going on in the Nigerian environment by investments and unguarded development by investors so as to assist in ensuring sustaining development.

The NGOs

- To daily go to Court to seek redress even by public interest litigation in the interest of the citizens on environment.
- To create awareness by sensitization and advocacy.
- To monitor environmental issues and address them as done in the USA and South Africa.
- To document and collect data for appropriate policies by government.

The Citizens

- To always be aware of happenings in their environment
- To always be bold and seek redress in Court, directly or through NGOs.

The Executive

- To ensure implementation of relevant legislations
- To establish monitoring and evaluation teams for prompt reporting on environmental issues.
- To set mechanisms to addressing environmental emergencies.
- To take all steps to stop gas flaring in Nigeria by ensuring application of the Associated Gas Re-injection Act. The companies that flout it ought to be severely penalized as in the USA case of America, Gbemre v Shell Coy. Cognisance is taken of the law (paltry) penalty. That is why the companies obey the Act in breach. However, the writers believe that if the legislature does it part that there will be adequacy of penalty to be paid by any company that goes contrary to any Act in relation to energy investment.
- To compensate victims of environmental degradation based on investment where government has interests.
- Government must as a matter of urgency acquire some technological to know how and infrastructure to stem the bluff of MOCs and IOCs in the energy sector.
- To develop other power sources especially in the areas of wind and tidal powers (Harker & Blackhurst 1981).

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