IMPACT OF OIL EXPLOITATION ON SUSTAINABLE DEVELOPMENT AND GREEN ECONOMY IN NIGERIA: THE NIGER DELTA CASE

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ABSTRACT

Nigeria depends on oil revenue for 95% of national income and foreign exchange earnings. The source of this wealth is the Niger Delta region of the country. The Nigerian government, oil corporations, and oil-dependent Western countries are not implementing reforms aimed at aiding a desperately under-developed area and remediating the unsustainable environmental degradation and green economy depletion that petroleum extraction and exploitation has wrought. A green economy is an economy or economic development model based on sustainable development, it results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. Nigeria's envisioned green economy is summed up in the Vision 2020 Initiative but 2020 is about 8 years from now and no proper foundation has been laid for this vision in terms of green economy sustainability. Oil exploitation activities in the Niger Delta has caused the depletion of the green economy through oil spills, air pollution, gas flaring, anthropogenic climate change, water pollution and mental pollution. However, efforts can be made to save the green economy through replacing fossil fuels with new biofuels, development of new oil exploration technologies, eliminating subsidies to the oil industry, imposition of taxes on environment polluters and development of alternative sources of power/energy supply. Furthermore, international sources of financing clean technology should be sought to compliment the national efforts, legal framework for punishing offenders of the green economy should be put in place in addition to refocusing policies and investments to target sectors and areas including renewable energy, agriculture, forestry, tourism and enhanced ecosystem services.

Keywords: *Sustainable development, green economy, oil exploitation, Niger Delta*

INTRODUCTION

Some fifty years ago, oil was discovered in the Niger Delta Region of Nigeria. Today, the country produces 2.1 million barrels of oil per day and is the eleventh-largest oil-producing country in the world (OilandGasPress.com, 2009).The petroleum industry in Nigeria is the largest industry and has been the main generator of GDP since the 1970s. (Wikimedia Foundation, Inc, 2011). The amount of oil extracted from Nigeria was expected to expand from 15000|oil-bbl/d|m3/ in 2003 to 1.27|Moil-bbl/d|m3/ in 2010 (Human Rights Watch, 1999). Natural gas reserves are well over 187 trillion ft (2,800km³), the gas reserves are three times as substantial as the crude oil reserves. Nigeria's total petroleum refining capacity is 445,000 barrels per day (70,700m3/d) (Wikimedia Foundation, Inc, 2011). There are four major oil refineries, the Warri Refinery and Petrochemical Plant, the New Port Harcourt Refinery, the old Port

Harcourt Refinery, as well as the now defunct Kaduna Refinery (NigeriaBusinessInfo.com, 2011). Nearly all of the country's primary oil reserves are concentrated in and around the delta of the Niger River (NigeriaBusinessInfo.com, 2011). The recent Niger Delta Development Bill defines the Niger Delta to include states in the South-South geo-political zone, comprising Edo, Delta, Bayelsa, Rivers, Akwa Ibom and Cross River States, and the neighboring oil producing parts of Ondo, Abia and Imo States (Omofonmwan and Odia, (2009).

The Niger Delta comprises 70,000 km² of wetlands formed primarily by sediment deposition. Home to over 20 million people and 40 different ethnic groups, this floodplain makes up 7.5% of Nigeria's total land mass. It is the largest wetland and maintains the third-largest drainage area in Africa. The Delta's environment can be broken down into four ecological zones: coastal barrier islands, mangrove swamp forests, freshwater swamps, and lowland rainforests. This incredibly well-endowed ecosystem, contains one of the highest concentrations of biodiversity on the planet, in addition to supporting the abundant flora and fauna, arable terrain that can sustain a wide variety of crops, economic trees, and more species of freshwater fish than any ecosystem in West Africa (Baird, 2010). According to Omofonmwan and Odia (2009), the amount of deprivations and damages oil exploitation has caused the people in the region dating back to 1956 is enormous and include: environment pollution, environmental degradation leading to low agricultural yield, destruction of aquatic life, home displacement, etc. It is obvious that enough has not been done to satisfy the yearning and aspirations of the people, replace the lost resources or sustain the green economy of the area.

Nigeria's envisioned green economy is summed up in the Vision 2020 Initiative launched in 2007 with a mission that by year 2020, Nigeria will be one of the 20 largest economies in the world able to consolidate its leadership role in Africa and establish itself as a significant player in the global economic and political arena (Adekoya, 2010). Between now and the year 2020 is just a matter of 8 years and still no proper foundation is laid in preparation for this vision in terms of green economy sustainability. Thus, this paper seeks to examine the impact of oil exploitation in the Niger Delta on sustainable development and the green economy, and alternative policy measures that may be put in place to sustain the green economy in Nigeria.

THE ENVIRONMENT AND ECONOMIC PROBLEMS

The economic problems relating to the environment was brought to limelight during the second half of 1900s, however, before then, Marshal (1890) first analyzed the degradation of the environment through his concept of 'externalities', then called external economics, where he outlined the benefits that can accrue to economic identities from general industrial development, and was silent on the negative effect of it. Pigou (1920) pointed out later that the concept of externalities is a double edged sword, with benefits on one side and the cost on the other side. Pigou stated clearly that not only could production conditions of third parties be influenced outside

the market, but that the welfare of private persons could be seriously affected both in cost and benefit terms (Ukpak, 2001). More advancement in the treatment of externalities was made by Kapp (1950) who anticipated the far reaching adverse consequences of economic growth on the environment. Kapp's analysis hinges on the social cost, which is the direct and indirect burden imposed on third parties or the general public by the participants in economic activities. According to Kula (1992), social costs includes all costs emanating from productive processes that are passed on outsiders by way of air and water pollution, which harms health, reduces agricultural yield, accelerates corrosion of minerals, endangers aquatic life forms, flora and fauna, and creates problems in the preparations of drinking water, in other words, these costs are costs of green economy depletion.

Ukpak (2001) identifies that social costs are problems arising essentially from scarcity of all resources in an economic system. This means that these natural resources are subject of the law of scarcity as the final goods and services produced by man, they also serve as proof that the basic economic problem is to satisfy unlimited wants with limited green economy depletes/pollution as well as with limited green economy/resources. To solve the scarcity problem in the face of competitive market, price system comes in handy to direct the efficient allocation of scarce resources, determine what goods and services to produce, at what price, bearing what cost and in anticipation of what benefit/profits. If the goods/services to produce are to enhance green economy, they could thus be an aspect of a price mechanism solution to the green economy conservation and thus our environment. Green economy enhancing activities is a cost of using scarce resources of land, air and water and should thus enter the market-price mechanism as part of the cost of getting supplies of scarce resources for all scarce resources has prices.

Brookfield (1991) asserts that modern theorizing about environment centers around issues like stemming depreciation of environmental values and its resources so as to guarantee its aesthetic and life sustaining services for both the present and future generations. According to Ibanga and Obi (2001) this theorizing is embodied in the concept of sustainability. Sustainability is a process which tells of a development of all aspects of human life affecting sustenance. It means resolving the conflict between the various competing goals, and involves the simultaneous pursuit of economic prosperity, environmental quality and social equity famously known as three dimensions (triple bottom line) with the resultant vector being technology-continually evolving process; the 'journey'-process of achieving sustainability- is of course vitally important, but only as a means of getting to the destination (the desired future state). However, the 'destination' of sustainability is a set of wishful characteristics of a future system (Hasna, 2007).

SUSTAINABLE DEVELOPMENT

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the

present, but also for generations to come. The term was used by the Brundtland Commission who defined it as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs (Smith and Rees, 1998; United Nations, 1987). Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. As early as the 1970s, "sustainability" was employed to describe an economy "in equilibrium with basic ecological support systems" (Stivers, 1976).

The sustainable development debate is based on the assumption that societies need to manage three types of capital (economic, social, and natural), which may be non-substitutable and whose consumption might be irreversible (Dyllick, and Hockerts, 2002). Daly (1991), for example, points to the fact that natural capital can not necessarily be substituted by economic capital. While it is possible that we can find ways to replace some natural resources, it is much more unlikely that they will ever be able to replace eco-system services, such as the protection provided by the ozone layer, or the climate stabilizing function of the Cross River forest. In fact natural capital, social capital and economic capital are often complementarities. A further obstacle to substitutability lies also in the multi-functionality of many natural resources. Another problem of natural and social capital deterioration lies in their partial irreversibility. The loss in biodiversity, for example, is often definite. Moreover, the depletion of natural and social capital may have non-linear consequences. Consumption of natural and social capital may have no observable impact until a certain threshold is reached. If the degradation of natural and social capital has such important consequence the question arises why action is not taken more systematically to alleviate it.

Cohen and Winn (2007) point to four types of market failure as possible explanations: First, while the benefits of natural or social capital depletion can usually be privatized the costs are often externalized. Second, natural capital is often undervalued by society for lack of knowing the real cost of the depletion of natural capital. Information asymmetry is a third reason-often the link between cause and effect is obscured, making it difficult for actors to make informed choices. However, contrary to economic theory many firms are not perfect optimizers. Firms often do not optimize resource allocation because they are caught in a "business as usual" mentality.

THE CONCEPT OF GREEN ECONOMY

A green economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (United Nations Environment Programme (UNEP), 2010). A green economy is an economy or economic development model based on sustainable development and knowledge of ecological economics. Ecological economics considers the impact of human and their economic activities on ecological systems and services and vice versa. It may be defined as the study of the efficient use, allocation and management of our natural

environments, resources from these environments, and the output and/or services provided by those resources to ensure the preservation and sustainability of these natural capitals. Burkart, Karl defines a green economy as based on six main sectors: (i)Renewable energy (solar, wind, geothermal, marine including wave, biogas, and fuel cell); (ii) Green buildings, green retrofits for energy and water efficiency, residential and commercial assessment; green products and materials; (iii) Clean transportation, alternative fuels, public transit, hybrid and electric vehicles, carsharing and carpooling programs; (iv) Water management, Water reclamation, greywater and rainwater systems, low-water landscaping, water purification, stormwater management; (v) Waste management, recycling, municipal solid waste salvage, brownfield land remediation, Superfund cleanup, sustainable packaging; (vi) Land management, organic agriculture, habitat conservation and restoration; urban forestry and parks, reforestation and afforestation and soil stabilization.

Green economy's most distinguishing feature from prior economic regimes is its direct valuation of natural capital and nature's services as having economic value and a full cost accounting regime in which costs externalized onto society via ecosystems are reliably traced back to, and accounted for as liabilities of the entity that does the harm or neglects an asset. The Global Citizens Center, led by Kevin Danaher, defines green economy in terms of a "triple bottom line," an economy concerned with being:

1. Environmentally sustainable, based on the belief that our biosphere is a closed system with finite resources and a limited capacity for self-regulation and self-renewal.
2. Socially just, based on the belief that culture and human dignity are precious resources that, like our natural resources, require responsible stewardship to avoid their depletion.
3. Locally rooted, based on the belief that an authentic connection to place is the essential pre-condition to sustainability and justice.

Green economy includes green energy generation based on renewable energy to substitute for fossil fuels and energy conservation for efficient energy use. The green economy creates jobs, ensures real, sustainable growth and prevents environmental pollution, global warming, resources depletion, and environmental degradation. Because the market failure related to environmental and climate protection as a result of external costs, high future commercial rates and associated high initial costs for research, development, and marketing of green energy sources and green products prevents firms from being voluntarily interested in reducing environment-unfriendly activities, the green economy may need government subsidies as market incentives to motivate firms to invest and produce green products and services.

OIL EXPLOITATION IN THE NIGER DELTA AND ITS ATTENDANT COSTS

As of 2000 in Nigeria, oil and gas exports accounted for more than 98% of export

earnings and about 83% of federal government revenue, as well as generating more than 40% of its GDP. It also provides 95% of foreign exchange earnings, and about 65% of government budgetary revenues. Nigeria has a total of 159 oil fields and 1481 oil wells in operation. The most productive region of the nation is the coastal Niger Delta Basin in the Niger Delta or "South-south" region. Most of Nigeria's oil fields are small and scattered, these small unproductive fields accounted for 62.1% of all Nigerian production while the sixteen largest fields produces 37.9% of Nigeria's petroleum (Wikimedia Foundation, Inc, 2011).

In the Niger Delta region and beyond, Oil production and dredging have caused acid rain, fouled the air and the water, and caused widespread and dramatic erosion. Whole communities have watched their lands erode away. Fishing and farming, the traditional occupations of these people, is no longer viable. This situation has caused poverty, hunger and desperation among these peoples, who are struggling to eke out a living (Concannon, 2004). According to Anwana (2004) pollution of coastal corridors and wetlands is a recurrent disaster. Gas flaring has become a notorious pollutant of the local communities of the Delta. Oil spills and gas flaring have destroyed whole fishing communities, reducing vital fishery resources and terrestrial vegetation and compromising the health of local people in and around oil installations. People living around the creeks and villages in this region are made drink oil polluted water with the attendant health implications. Since the people's source of livelihood depends on aquaculture and farming, with the destruction of fishery resources and the terrestrial vegetation, the economic life of the people are at stake, which is why the area is bedecked with acute poverty, low life and aggressiveness as is exemplified in militancy of youths. All these translate to huge economic burden and heavy transaction, security, social and other relevant costs to the Nigerian economy.

Suzie Canales note that communities that live by refineries and chemical plants are burdened daily from toxic emissions that these facilities release from everyday operations. Air Contaminants Emitted by oil companies through refineries include: Ammonia, 1-Butene Benzene, Butane (N-), 1-Butene, Carbon monoxide, Cis-2-butene, Ethylene, Hexane, Hydrogen sulfide, Isobutane, Isobutene, Isopentane, Nitrogen dioxide, Nitrogen oxide, Particulate Matter, Pentane (N), Propane, Propylene, Sulfur dioxide, Sulfur trioxide, Trans-2-butene, volatile organic compounds (VOCs), Opacity, etc. These pollutants are contributors to ozone formation; ozone also leads to adverse health conditions that cause serious health effects for the people. Hexane is a hazardous air pollutant that is toxic to the nervous, respiratory, and reproductive systems. It can also have adverse effects on a developing child, such as birth defects or even death of a fetus in a pregnant woman. The heptane, isobutene, and pentane released can all be toxic to the central nervous system, inducing confusion, fatigue, irritability and other behavioral changes. Propylene is toxic to the respiratory system. The other contaminants mentioned are all toxic to certain systems of the body.

There is a tremendous economic burden from these ailments resulting from these contaminant chemicals. These economic burdens or costs represent a significant portion of health care costs to the citizens. These costs also add up to annual aggregate losses to Nigerians in terms of medical expenses, lost time and productivity, and other health-related factors. Illnesses cause loss of workdays. Sick people are forced to go on welfare and disability. People are forced to go on Medicare. People are also forced to take exotic drugs that they cannot afford. Paying for associated problems and clean-up costs causes increased public taxes. There are tremendous public costs in doing research and studies on pollution. Monitoring must be essential for safety's sake, but it costs a great deal.

IMPACT OF OIL EXPLOITATION ON THE NIGER DELTA GREEN ECONOMY

Oil Spills: In Nigeria oil spills are a common occurrence; it has been estimated that between 9 million to 13 million barrels have been spilled since oil drilling started in 1958 (Baird, 2010). Oil spillage of great dimensions and high quantum have been experienced in areas such as Mbo, Eket/Ibeno in Akwa Ibom State from Exxon-Mobil facilities in the area, Ogoni land in Rivers state from the facilities of Shell BPC, and other areas. Oil spillage has a major impact on the ecosystem. Large tracts of the mangrove forests, which are especially susceptible to oil (this is mainly because it is stored in the soil and re-released annually with inundation), have been destroyed. An estimated 5-10% of Nigerian mangrove ecosystems have been wiped out either by settlement or oil. Spills take out crops and aquacultures through contamination of the groundwater and soils. Drinking water is also frequently contaminated, and sheen of oil is visible in many localized bodies of water. If the drinking water is contaminated, even if no immediate health effects are apparent, the numerous hydrocarbons and chemicals present in oil represent a carcinogenic risk. Offshore spills, which are usually much greater in scale, contaminate coastal environments and cause a decline in local fishing production. Nigerian regulations are weak and rarely enforced allowing oil companies, in essence, to self-regulate (Baird, 2010).

Gas Flaring: Nigeria flares more natural gas associated with oil extraction than any other country, with estimates suggesting that of the 3.5 billion cubic feet (99,000,000 m3) of associated gas (AG) produced annually, 2.5 billion cubic feet (71,000,000 m3), or about 70% is wasted via flaring (Friends of the Earth, 2010). Flames from flared gas welcomes one to Port Harcourt in Rivers State, Ibeno, Mbo and Eket in Akwa Ibom State share the same burden of heat precipitated by flared gas, so also is Ogoni and other communities in Rivers State, and various other communities of Delta and Bayelsa States. Gas flaring in Nigeria releases large amounts of methane, which has very high global warming potential. The methane is accompanied by carbon dioxide, of which Nigeria is estimated to have emitted more than 34.38million

tons in 2002, accounting for about 50% of all industrial emissions in the country and 30% of the total CO2 emissions (Friends of the Earth, 2010). Gas flares release a variety of potentially poisonous chemicals such as nitrogen dioxides, sulphur dioxide, volatile organic compounds like benzene, toluene, xylene and hydrogen sulfide, as well as carcinogens like benzapyrene and dioxin. Often gas flares are close to local communities and lack adequate fencing or protection for villagers who may risk nearing the heat of the flare in order to carry out their daily activities. Flares which are often older and inefficient are rarely relocated away from villages, and are known to coat the land and communities in the area with soot and damage adjacent vegetation.

Air Pollution: Air pollution arises from burning fossil fuels and gas flaring. These pollutants contribute to ozone formation. They release highly reactive volatile organic compounds (HRVOCs) and volatile organic compounds (VOCs) which combine with nitrogen oxides on hot sunny days to form ground-level ozone. Carbon monoxide is a recognized developmental toxicant, which can cause adverse effects on a developing child. Carbon monoxide is also suspected of being toxic to the cardiovascular or blood, nervous, respiratory, and reproductive, systems. Styrene is suspected of causing every category of adverse health effect and benzene is a recognized carcinogen, developmental and reproductive toxicant, as well as a suspected cardiovascular or blood toxicant, endocrine toxicant, gastrointestinal toxicant, respiratory toxicant, skin or sense organ toxicant, and toxic to the immune system. Hydrogen sulfide is a suspected cardiovascular or blood toxicant, neurotoxicant, reproductive toxicant, and respiratory toxicant. Exposure can cause adverse effects on the cardiovascular (heart and blood vessels) or hematopoietic (blood) systems, on the respiratory system, on the nervous system, and can cause adverse effects on the male and female reproductive systems. Sulfur dioxide is a suspected cardiovascular or blood toxicant, developmental toxicant, gastrointestinal or liver toxicant, neurotoxicant, and respiratory toxicant. Exposure can cause various adverse effects to the respiratory system, central nervous system, and in a developing child.

Anthropogenic Climate Change: is attributed to greenhouse gas emissions from burning oil, gas, and coal.

Water Pollution: the springs, streams, and rivers of the Niger Delta have been polluted due to the activities of the oil and industries in the area, which poisons the water, and harm plants, animals, and humans. Oil production and dredging have caused acid rain, fouled the water, and caused widespread and dramatic erosion of lands, water ways and the air. Fishing and farming, the traditional occupations of these people, has thus been rendered uneconomical causing mental, social and economic poverty. These water pollutions have affected the coastal corridors and wetlands of the Niger Delta destroying its rich ecosystem known to harbor one of the highest concentrations of biodiversity, the once abundant flora and fauna, arable terrain, varieties of crops, and economic trees, and denying the area of its wide species of freshwater fishes.

Oil spills and gas flaring have destroyed whole fishing communities, reducing vital fishery resources and terrestrial vegetation and compromising the health of local people in and around oil installations.

Mental Pollution: The mental well being of the people have also been polluted, take for instance the craze for militancy, prostitution, kidnapping, illegal bunkering and all other vices experienced in the Niger Delta area of late. Prior to the discovery and large scale exploitation of oil in the area, the people never had the mentally polluted ideologies as would warrant the above mentioned vices, rather, the people of the area were well known for their educational brilliancy, uprightness, virtuous lifestyles, trade activities in addition to their cultural farming and fishing activities.

SAVING THE GREEN ECONOMY

Where the following are done, the green economy will not be depleted and thus it will saved from extinction:

Replacing Fossils with New Biofuels: focus should be beamed on the development and use of new bio fuels. Biofuels are renewable fuels made from biological materials, they are derived from biomass including recently living organisms like plants or their metabolic byproducts like cow manure, however unfortunately though, these biofuels are derived from palm oil, soy, corn, rapeseed and sugar cane whose trial use jacked up food prices, promoted large scale deforestation, depleted water supplies, worsened soil erosion and lead to increased air and water pollution. New biofuel will not be made from the former components of living organisms which also served many other purposes, including human/animal food, but will rather make use of farm waste, native grasses, weeds and other metabolic by-products like soy manure, which if adopted will eliminate most of the negative effects of the older biofuels.

Development of New Oil Exploration Technologies: New alternative methods of oil exploration should be sought, this method should rely less on processes that are ecologically damaging. Efforts in this direction will produce technologies for producing compressed natural gas which is a cleaner burning fuel than gasoline, hydrogen fuel-cell based technologies and technologies that will minimize the incident of oil spills, gas flaring and pollutant emissions into the environment.

Eliminating Subsidy: to enhance reasonable investment in research and development of greener technologies, subsidies by the government for oil and gas industry should be eliminated. The private sector should be allowed to do the investments while the government should play the role of monitoring, evaluation, control, legislation and disciplining. If government invests or subsidizes, it will be difficult to exercise these roles and responsibilities maximally. The funds hitherto expended on subsidizing oil and gas production should be diverted to the provision of social amenities, infrastructures and facilities.

Imposition of Pollution Taxes: For the government to control, monitor, evaluate,

legislate and discipline, they should then put in place adequate tax policy and enforce strict implementation. However, it should be noted that the effects of taxes depends on the elasticity of demand and supply of the product to be taxed as are shown in the diagram below:

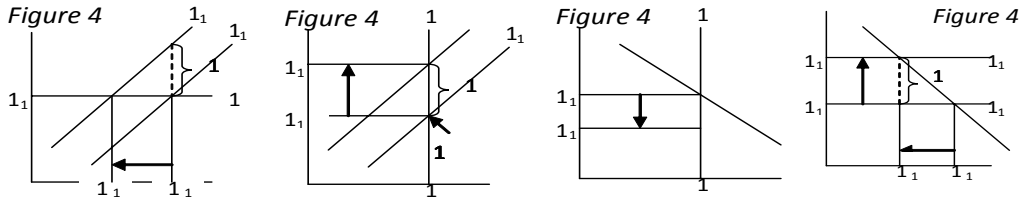

Figure 1 depicts a perfectly elastic demand curve for a product, if tax is imposed on such a product, the supply curve will shift from S1 to S2 reducing the equilibrium quantity from Q_1 to Q_2, however, price will not be affected. Since the equilibrium quantity is reduced due to the imposition of the tax, consumers' and therefore society's welfare will be reduced. Figure 2 is a case with a perfectly inelastic demand, imposition of tax will lead to price increase from P_1 to P_2, though the quantity will not be affected, consumers welfare will be reduced also due to tax imposition. In Figure 4 where the supply curve is perfectly elastic, imposition of tax will reduce consumers' welfare, through the reduction in quantity from Q_1 to Q_2 and an increase in price from P1 to P2, this is a more terrible case than other two cases. Figure 3 with a perfectly inelastic supply curve is a unique case that favours the consumers' welfare as the quantity does not change and prices reduces from P_1 to P_2 with tax imposition. Oil and gas production or supply has an inelastic supply curve and from this analysis, it will be beneficial to the public if tax is imposed on polluters in the oil and gas industry by the government. On the other hand, the imposition of pollution tax will check pollution and therefore save the green economy.

Development of Alternative Power Supply: Alternative way of power generation or electricity production should be sought and adopted, such sources as: the solar energy, wind power, geothermal heat, biomass, tidal change, waves and fresh water/salt water differentials electricity generation sources can be adopted to replace the hydro, gas and oil fuel sources. In Nigeria, with abundance of solar energy, if solar power is developed, we can export this power and gain solar economy while preserving our forests, ecosystem and hence our green economy. Also, Nigeria is blessed with the potentials for the development of a wind power where if tapped will generate advantageous wind-power economy while at the same time maintaining our green economy. There are enough water sources, both salt and fresh water to enhance tidal change, waves, fresh and salt water sources of energy.

CONCLUSION AND RECOMMENDATIONS

Nigeria's economy relies significantly on natural capital assets such as agriculture, forest resources, biodiversity, tourism, minerals and oil extraction. There also exists

a large potential for renewable energies. Nigeria can jump start the green economy transition by maintaining and expanding good sustainable practices, such as low-carbon, labour intensive agriculture and community-based forestry. The Niger Delta area is fast loosing its well endowed fauna, flora and terrain, its wide varieties of crops, economic trees, aquatic life, fresh water fishes and other resources are fast depleting due to oil exploitation activities. Efforts should be geared towards resuscitating the rich ecosystem and unique biodiversity of the Niger delta because it might be impossible to be renewed.

The management of the Niger Delta's economic, social and natural capita leaves doubt to its sustainability for long, oil exploitation activities has added both social and economic costs that should not be allowed to be too excessive before its impact is recognized, the various oil spills should be cocked, gas flared abated, air polluted cleaned, water polluted cleaned, and the mentally polluted resuscitated if we must ensure the maintenance of our green economy. Persistent poverty and low human development in the Niger Delta region of Nigeria can only be reversed if structural constraints underpinning their economic vulnerability are addressed. This requires a removal of constraints on productive capacities such as poor access to energy, the preservation and enhancement of ecosystems and ecosystem services including fisheries and forests that form the basis of livelihood of the poor and more resilient food and agricultural production systems. The resource endowment and the low-carbon profile of Nigeria are all elements on which to build for future growth and development that enhances human well being and social equity. Through targeted spending, appropriate national policies and incentives, governments can set a direction to spur green investments, both public and private.

International cooperation will be essential to complement national actions of Nigeria. International sources of financing to support clean technology adoption and trade-related capacity building in green sectors are needed to catalyze and sustain Nigeria's transition to a green economy. Through concerted national and international action, realizing a green economy could make a valuable contribution to enhanced economic diversification, inclusive growth, poverty reduction and achievement of the conducive living environment that have focus on green economy. There are numerous means through which the green economy can be sustained and as indicated above, they include: replacing fossil fuel with new biofuels made from farm waste, native grasses, weeds and other metabolic by-products; development of alternative oil exploration technologies that relies on processes that do not cause much damage to the ecosystem; elimination of the subsidy to the oil industry and enhanced government monitoring and control of oil exploration and exploitation activities; and the development of alternative source of power/energy supply such as will make use of solar energy, wind power, geothermal heat, biomass, tidal change, waves, fresh water/salt water differentials. These alternatives should replace the hydro, gas and oil fuel sources we are currently adopting in Nigeria.

We need a carbon tax to price pollution, a carbon tax puts a price on pollution.

Pollution has been officially free for industry up until now. The public purse pays for the environmental damage the oil industry causes. Mining and other big polluters of the environment should be held accountable for some of their waste. It is a first step towards bringing down emissions. A Pigovian tax should be imposed that is equal in value to the negative externality from green economy depletion. The result is that the market outcome would be reduced to the efficient amount. A side effect is that revenue is raised for the government, reducing the amount of distortionary taxes that the government must impose elsewhere

All efforts leading to the adverse effects on the growth, sustenance and regeneration of the green economy should be criminalized, that is, legal framework should be put in place to punish offenders of the green economy in Nigeria. The government should refocus policies and investments to target sectors and areas including renewable energy, agriculture, forestry, tourism and enhanced ecosystem services can lead to the economic empowerment of Nigeria, be more conducive to inclusive growth and jobs and make a significant contribution to achieving green economy for the country as a whole. Bringing energy to the rural poor is one of the most important contributions that a green economy can make to Nigeria.

REFERENCES

Adekoya, A. (2010), Environmental and Resource Conflicts in the Niger Delta: An Impediment to Nigeria's Transition To The Green Economy, Shell Petroleum Development Company, Nigeria,

Anwana, E. (2004) Resource Exploitation In Nigeria: Taking Control Of Africa's Resources, African Voices On Development And Social Justice, Pambazuka News 167, 29 July

Baird, J. (2010). Oil's Shame in Africa, Newsweek, Lagos, Nigeria, July 26

Brookfield, H. (1991), Environmental Sustainability with Development: What Prospects for a Research Agenda? The European Journal of Developments Research 3 (1) June

Burkat, Karl, http://www.mnn.com/green-tech/research-innovations/ blogs /how-do-you-define-the-green-economy, retrieved 18/08/2011

Cohen, B. and **Winn, M. I.** (2007), Market Imperfections, Opportunity and Sustainable Entrepreneurship, Journal of Business Venturing, 22(1): 29-49.

Concannon, T. (2004) Resource Exploitation In Nigeria: Shell Fights Fires Over Niger Delta Oil Spill, African Voices On Development And Social Justice, Pambazuka News 140, 22 January

Daly, H. E. (1973). Towards a Steady State Economy. San Francisco: Freeman.

Daly, H. E. (1991). Steady-State Economics (2nd ed.). Washington, D.C.: Island Press.

Dyllick, T. and **Hockerts, K.** (2002). Beyond the Business Case for Corporate Sustainability, Business Strategy and the Environment, 11(2), 130-141

Elena, G. (2011) We Need a Carbon Tax to Price Pollution, Green Left Weekly, Sunday, March 20

Friends of the Earth (2010), Gas Flaring In Nigeria: A Human Rights, Environmental And Economic Monstrosity, Climate Justice Programme And Environmental Rights Action/Friends Of The Earth Nigeria

Global Citizen Centre (http://www.globalcitizencenter.org/content/view/2/1/

Hall, C. R., Hodges, A. W. and **Haydu, J. J.** (2005), Economic Impacts of the Green Industry in the United States, Final Report to the National Urban and Community Forestry Advisory Committee. *www.utextension.utk.edu/hbin/greenimpact.html*

Hasna, A. M. (2007). Dimensions of Sustainability. Journal of Engineering for Sustainable Development: Energy, Environment, and Health 2 (1), 47-57.

Human Rights Watch (1999), The Price of Oil: Corporate Responsibility and Human Rights Violations in Nigeria's Oil Producing Communities

Ibanga, I. and **Obi, P. B.** (2001), Sustainability and Dependability of Resource Use in Ngeria: The Case of Crude Oil, in Natural Resource Use, the Environment and Sustainable Development, Selected Papers for Year 2001 Annual Conference of the Nigerian Economic Society, Ibadan: The Nigerian Economic Society

Kapp, K. W. (1950), The Social Cost of Private Enterprise, Cambridge: Cambridge University Press

Kula, E. (1992), Economics of Natural Resources and Environment, London: Chapman and Hall Publishers

Marshall, A. (1890), Principles of Economics, London: Macmillan Press

Morong, C. (2009), Determining the Cost of Pollution Is Hard (Which Makes Finding the Right Government Policy Hard, Too), The Dangerous Economist, Sunday, September 20

Nigeria Business Info (2011), Nigerian Crude and Gas Industry, NigeriaBusinessInfo.com

O'brien, B. (2005) Industrial Upset Pollution: Who Pays The Price? An Analysis of the Health and Financial Impacts of Unpermitted Industrial Emissions, Public Citizen, 1002 West Ave. Ste. 300 Austin, Texas

OilandGasPress.com (2009): EIA Nigeria Oil Data Analysis and Statistics. 15/02/2010.

Omofonmwan, S. I. and **Odia, L. O.** (2009), Oil Exploitation and Conflict in the Niger-Delta Region of Nigeria, Kamla-Raj and J Hum Ecol, 26(1): 25-30

Pigou, A. (1920), Income, Macmillan Press, London

Roger (2009), Economic Basics: Externalities, Posted in Economics, The Amateur Financier 2009 - 2011

Smith, C. and **Rees, G.** (1998). Economic Development, 2nd edition. Basingstoke: Macmillan.

Stivers, R. (1976). The Sustainable Society: Ethics and Economic Growth. Philadelphia: Westminster Press.

The Alliance for A Clean Environment (2001). Hidden Costs of Pollution: The Costs Of Not Preventing Pollution And Disease Are Astronomical, Stowe, Pa 19464: Ace, Ace@Acereport.Org retrieved 18/08/2011

Ukpak, N. (2001) Man, Development and the Environment: The Case of Nigeria, in Natural Resource Use, the Environment and Sustainable Development, Selected Papers for Year 2001 Annual Conference of the Nigerian Economic Society, Ibadan: The Nigerian Economic Society

UNEP, UNCTAD and UN-OHRLLS (2011), Why a Green Economy Matters for the Least Developed Countries, A joint publication of United Nations Environment Programme (UNEP), United Nations Conference on Trade and Development (UNCTAD), and Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS) for the LDC-IV Conference in May.

UNDP (2009): Nigeria Summary Human Development Report, 2008 - 2009

United Nations (1987). Report of the World Commission on Environment and Development. General Assembly Resolution 42/187, 11 December 1987. Retrieved: 12-04-2011

United Nations Environment Programme (2010), Green Economy Report: A Preview. http://www.unep.org/GreenEconomy/LinkClick.aspx?fileticket JvDFtjopXsA%3d&tabid=1350&language=en-US

U.S. Energy Information Administration (1997) Nigeria Country Analysis Brief, December

Wikimedia Foundation, Inc (2011) Petroleum Industry in Nigeria, Wikipedia, the Free Encyclopedia, F:\Petroleum_industry_in_Nigeria.htm