***NIGERIAN JOURNAL OF NATURAL AND APPLIED SCIENCES***

 ***(MAIDEN EDITION, IN PRESS)***

 **TOPIC**

**SOME CHALLENGES AND PROSPECTS OF VARIOUS GREEN INITIATIVES TO MITIGATE THE IMPACT OF CLIMATE CHANGE.**

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***ABSTRACT***

*The importance of mitigating the impact of climate change through various green initiatives is a welcome environmental development given that it ameliorates the negative impact of climate change on environmental quality and circumference. However, no projects can be implemented without possible challenges; hence this study is focused on appraising the challenges and prospects of various green initiatives to mitigate the impact of climate change. With the application of exploratory research methodology, some of the various green initiatives are; Low Carbon Pathways, Low Water Pathways, Low Materials Pathways, etc. Some of the identified challenges are given as: Design and building innovation, energy supply, transportation, waste management, etc. The study therefore concludes that there are prospects in the mitigation of the harsh effects of climate change if the various green initiatives are implemented.*

**SOME CHALLENGES AND PROSPECTS OF VARIOUS GREEN INITIATIVES TO MITIGATE THE IMPACT OF CLIMATE CHANGE.**

**1.0 Introduction**

The word "Green" is not the omni-term for anything environmental although there is the tendency to substitute the word "Green" for "Environmental." Environmentalism is to grand topic that has several subdivisions. Under this grand topic to environmentalism, we will find Green, Sustainability, Pollution, and Conservation. Each of these subdivisions are immense subject on their own.
Sustainability is also badly morphed into many applications, but essentially deals with the management of our resources. This is a complimentary issue to Green, so a Green and Sustainable business means that the company considers the health of the workplace as well as the material demands of the business (Atilola, 2005)

Green is primarily a health-related issue that blends into the other topics of sustainability, pollution control, and conservation. By dividing out the topics properly, the plan of attack seems much clearer. To attack the issue in a systematic manner, businesses should be considering "Going Green" first then moving into the sustainable issues. The early disdain for the word Green comes from the anti-business attitudes of ultra-conservationists that needed a target for their vitriol. Green is not an anti-business concept when properly understood. A Green business is one that is a good place for living things in the workplace, in the community, and in the world (Adeyinka, 2005)

The Green Initiative has as its main objective the offsetting of [Greenhouse gases](https://en.wikipedia.org/wiki/Greenhouse_gas) emitted by human activities that can range from complex industrial production processes to simply driving a car, with [reforestation](https://en.wikipedia.org/wiki/Reforestation) projects in [riparian](https://en.wikipedia.org/wiki/Riparian) areas that need to be recovered. The trees absorb [carbon dioxide](https://en.wikipedia.org/wiki/Carbon_dioxide) from the atmosphere and provide, as well [environmental](https://en.wikipedia.org/wiki/Natural_environment) benefits, such as water and air quality preservation, and [biodiversity](https://en.wikipedia.org/wiki/Biodiversity) protection (Adejuwon, 2012).

On the other hand, climate change is a change in the distribution of [weather](https://en.wikipedia.org/wiki/Weather) patterns when that change lasts for an extended period of time (i.e., decades to millions of years). Climate change may refer to a change in average weather conditions, or in the time variation of weather under long-term average conditions (i.e., more or fewer [extreme weather](https://en.wikipedia.org/wiki/Extreme_weather) events). Climate change is caused by factors such as [biotic](https://en.wiktionary.org/wiki/biotic) processes, variations in [solar radiation](https://en.wikipedia.org/wiki/Sunlight) received by Earth, [plate tectonics](https://en.wikipedia.org/wiki/Plate_tectonics), and [volcanic eruptions](https://en.wikipedia.org/wiki/Volcanic_eruptions). Certain human activities have been identified as primary causes of ongoing climate change, often referred to as [global warming](https://en.wikipedia.org/wiki/Global_warming) (Holdren, 2010) According to the United Nations (UN), some of the Green initiatives by agencies and bodies are given as follows:

**Low Carbon Pathways**

This programme primarily focus on identifying and implementing low-carbon pathways to industrial development. It will focus also on the interlinkages between the different environmental dimensions, e.g., carbon, water, materials, etc. In the context of the current round of negotiations leading to the post-Kyoto regime, this choice will give the whole exercise greater resonance. This choice might also allow UNIDO to make connections with the work it will be doing in the coming years as co-convenor for the UN system on technology transfer for climate change, as well as with some of the clusters that are being developed in UN-Energy (Baudi and Ahmed, 2006).

**Low Water Pathways**

This programme will focus on identifying and implementing low-water paths to industrial development. It will also focus on the interlinkages between water and the different environmental dimensions, e.g., energy, materials, carbon, etc. In the context of the growing concerns about water, this would have a great impact and appeal, especially if the country chosen was already under water stress and was likely to become further stressed because of climate change. This too can be connected to the broader activities of the UN system on water through UN-Water (Ekpoh and Nsa, 2011)

**Low Materials Pathways**

This programme focused on designing and implementing low-materials paths (three Rs strategy) as an integral part of a country’s industrial development. It will also focus on ways of reducing inputs of materials in industries. In some parts of the world, rapidly growing economies are causing acute waste-management problems. These economies are also most sensitive to the availability of raw materials, a situation that a three Rs strategy is ideally suited to respond to (Faturoti, 2011).

**Reducing the Environmental Footprint of a Value Chain**

This pilot programme will focus on a value chain rather than a country, working all along a global value chain to reduce the overall environmental footprint of the chosen value chain. This pilot programme will be more conceptual. It will focus on designing the factory of the future. The design remit of the programme will be to propose ways of designing a manufacturing plant in order to minimize its environmental footprint. It will focus on the agro-processing and related priority sectors of UNIDO (Ibe, 2011).

To give the first three pilot programmes a good grounding in the specificities of the chosen countries, they will start with a detailed country-environment assessment. This will lead to an identification of the strongest barriers. On the basis of the assessment, a country-specific programme will be drawn up for implementation. Great care will be devoted to choosing the right set of indicators to make it possible to measure the impact of the implementation of the Green Industry Initiative (Ibe, 2011)

**3.0 Challenges and Prospects of Green Initiatives**

[Nigeria](http://www.howwemadeitinafrica.com/category/countries/nigeria/) is confronted with several peculiar challenges which make a green agenda appear unattainable. Top of these include the solutions that have been adopted because of the inefficiencies in the [energy](http://www.howwemadeitinafrica.com/category/sectors/energy/) and [transportation](http://www.howwemadeitinafrica.com/category/sectors/transportation/) systems, as well as waste management. The building industry also has its peculiar handicaps. Some of these challenges as asserted by Adeagbo (2013) are given as follows:

**Energy supply**

It is reported that Nigerians burn an average of 40 million litres of petrol/diesel per day for the private generation of electricity. Keeping the efficient supply of energy in the hands of licensed providers appears to be a long way away, so is seeking alternative clean power (such as from wind, solar and waste). The Nigeria Energy Commission whose mandate includes to “guarantee adequate, sustainable and optimal supply of energy at appropriate cost and in an environmentally responsible manner to the various sectors of the economy, by utilizing all viable energy resources in an optimal mix appears incapable of championing initiatives in alternative clean energy.

Industry operators can play a significant role in the development and use of clean energy “simple” solutions such as the use of modular solar-powered generating plants (particularly for domestic use) will make a big difference, in a country which is reported to have 60 million petrol/diesel powered generating sets.v What appears to be lacking is a concise government agenda, translating into strategies, top of which are the policies and incentives required to encourage private sector participation.

Several years ago, the Government of Rwanda entered into a 25 year partnership with a German state for the provision of alternative clean power. The Kigali project is one of several initiatives being undertaken under this arrangement. The solar plant will upon completion generate 325 kilowatt of electricity. The government-led initiative has generated sufficient interest within the private sector, which is expected to play a prominent role in future projects under the partnership.

**Transportation**

The poor state of [infrastructure](http://www.howwemadeitinafrica.com/category/sectors/infrastructure/) and the lack of impactful investments mean that most Nigerian cities lack efficient transportation systems. Other more recent problems such as petrol pricing and carbon dioxide emissions should be forcing governments to consider implementing better public transportation initiatives. Unfortunately, a country whose primary mode of transport (in its major cities) is the motorcycle with capacity for two persons (although known to carry four or five) may not be in a position to discuss environmentally efficient ways of achieving mass transportation.

Still, incentives from government can generate private participation, first in basic research and development seeking existing adaptable solutions. Vehicles using clean energy technologies are relatively expensive, a hydrogen powered bus developed in 2009, and whose only emission is water, is priced at US$1.5million.vii However, varieties of cost efficient hybrids have been developed over the past decade and are in use in many developing countries.

A growing range of global environment funds, such as the Global Environment Facility (GEF), are available specifically for the funding of sustainable public transport and less polluting energy supplies. It is reported that in Africa, only [Tanzania](http://www.howwemadeitinafrica.com/category/countries/tanzania/) has taken advantage of the GEF.

**Waste management**

There have been very little done by successive governments or relevant agencies with regards to environmentally sustainable waste disposal. Indiscriminate dumping of waste by individuals and government agencies is rife. Only in the past couple of years has the Lagos State Government developed (and is implementing) a waste management strategy.

**Design and building innovation**

Building better communities through environmental innovation should top the agenda of any government and influencing the way this happens should be a priority. Government needs to lead by example in this regard, rather than passing laws determining what the private sector can do. Government agencies must incorporate sustainable strategies into their own projects. Policies on greening construction/buildings should be introduced with the government championing implementation. Such policies could include energy and water efficiency, environmental quality of building materials and resources, indoor environmental quality and innovation in design. A certification process such as the Leadership in Energy and Environmental Design (LEED) ratings could be introduced, with attractive incentives for compliance by the private sector.

Professionals in the industry must educate themselves and their clients about the benefits of incorporating green initiatives as an upfront investment in construction projects. This is with a view to significantly reduce operating cost over the lifetime of a building, while contributing positively to the environment and the people who use the building.

There is sufficient proof to show that “green” sustainable building projects do not have to be cost-prohibitive. There are many cost effective steps that can be taken to make a community a better place to live and work.

**4.0 Prospects and Conclusion**

Nigeria is said to be endowed with an abundance of renewable energy resources. According to the Nigeria Energy Commission, there are a lack of technologies, a dearth of professionals and an absence of appropriate policies and regulations to stimulate demand and attract investors.

Under the Kyoto Protocol on climate change, developed countries can offset some of their emissions through renewable energy projects in the developing countries via the Clean Development Mechanism (CDM). It is estimated that projects under the CDM could (over the long-term) generate up to $100 billion worth of funds for developing countries. Unfortunately, Africa’s share of such projects remains low. Of the over 300 projects currently approved, only six are in Africa, none of these is in Nigeria. (Asomba, 2015).

What would be a practical way forward? The short answer is “take small steps”. Government agencies must lead by example, professionals in the industry need to educate themselves and their clients and commit to introducing environmental sustainability in design and building. Just like rebranding Nigeria, the government needs to embark on environmental initiatives to develop a green consciousness amongst Nigerians.

**References**

Adeagbo, A. (2013). Achieving Environmental Sustainability (MDG 7) in Nigeria: Progress so far, Challenges and Prospects. Academic Journal of Interdisciplinary Studies,2(6), 47-59. Doi:10.5901/ajis.2013.v2n6p47

Adejuwon, S. A. (2012) Global Warming and Climate Change. Climate Change Workshop, University of Ibadan Conference Centre, Ibadan, February 2012.

Atilola, O. (2005) Environmental Monitoring and Management: The Imperatives of Surveying

and Mapping Services. Invited Paper, Survey Co-ordination and Advisory Board on Survey Training Conference, Kastsina, Katsina State; 29th – 31st August.

Adeyinka, M.A., et al (2005). Country Report, Workshop on Environmental Statistics, Senegal,

Feb. 28 – March 4. <http://unstats.un.org/unsd/environment/Nigeria>

Atilola, O. (2003). Sustainable Development and the Built Environment – The Role of

Surveyors. Paper Presented at the CASLE Pre-CHOGM Seminar, Abuja. 1st December.

Asomba, I. (2015). Job Creation: Ambode seeks private sector partnership to build parks, gardens, Vanguard. Retrieved from <http://www.vanguardngr.com/2015/11/job-creation-ambodeseeks-private-sector-partnership-to-build-parks-gardens/>

Baudi, P. V. and Ahmed, A. N. (2006) The impacts of wind related hazards in Southern Cameroon. Journal of Physical Sciences, 3(2): 82-88.

Ekpoh, I. J. and Nsa, E (2011) Extreme climatic variability in north-western Nigeria: an analysis of rainfall trends and patterns. *Journal of Geography and Geology, 3(1) 51-62*.

Faturoti, G. (2011) Nigeria: Stop paying lip service to climate change. <http://allafrica.com/stories/201101270329.html>

Holdren, J. P. (2010). Climate-Change Science and Policy: What Do We Know? What Should

We Do? Keynote Address, Kalvi Prize Science Forum, International Cooperation in Science, Oslo, September 6,

Ibe, A. C. (2011) Capacity building imperatives for combating climate change impacts in Nigeria’s large marine ecosystem. Being a Public Lecture delivered at the University of Calabar, Calabar. University of Calabar Press.

Volpe, F. and Rossi, L. (2005). Mapping Towns from Quick Bird Imagery. GIM International,

Volume 19, Issue 5.