

Environmental Sustainability in the Built Environment – Challenges and Benefits of “Going Green” in Nigeria

“Environmental sustainability”, “global warming” and “green” have become common place terms in discussions on the subject matter about the effects of our economic and social activities on the environment. Emerging economies are also starting to appreciate environmental issues, albeit to varying degrees. According to a recent report on the green agenda of African countries, South Africa, Kenya and Ghana top the table in terms of promoting projects with an environmental sustainability focusⁱ.

“Going Green” is the phrase referring to corporate and individual action consciously taken to curb the harmful effects on the environment through consumer habits and life styles.



Fig.1 – Dibner Library Building, New York

Recently, attention has been focused on the built environment. “We recognize that the building sector is one of the largest contributors to (green house gas) emissions, with commercial buildings contributing between 30%-40% of these emissions annually” says GE Real Estate CEO at a forum where the company committed to improving the

environmental performance of its substantial commercial real estate portfolioⁱⁱ.

This edition of RE Insight discusses some of the issues which impact the development of a sustainable green agenda in Nigeria, with a focus on the built environment.

“When it comes down to it, the whole definition of environmental sustainability is making sure that we use resources in such a way as to ensure that future generations have access to these same resources.”ⁱⁱⁱ

Developing a Green Agenda – How Feasible?

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 and transportation systems, as well as waste management. The building industry also has its peculiar handicaps.

Energy Supply

It is reported that Nigerians burn an average of 40million litres of petrol/diesel per day for the private generation of electricity, spending over US\$13million per annum^{iv}. 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”^v appears incapable of championing initiatives in alternative clean energy.

Industry players 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 60million petrol/diesel powered generating sets^{vi}. 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 (pictured below) will, upon completion generate 325kw of electricity.



Fig. 2 – Solar “Farm” Kigali, Rwanda 2007

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^{vii}.

Transportation

The poor state of infrastructure and the lack of impactful investments mean most 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 motor bike with capacity for 2 persons (although known to carry 4 or 5) may not be in a position to discuss environmentally efficient ways to achieving mass transportation.

Still, incentives from government can generate private participation, first in basic R&D, 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^{viii}. 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 has taken advantage of the GEF^{ix} which has provided millions of dollars to initiatives in Asia and Latin America.

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. The agenda of many countries in this area are centered on recycling, i.e., “waste to wealth” and commercial generation of energy.

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Fig. 3 – WTE Plant Kent UK .Photo Jan 2007

This Waste to Energy (WTE) plant in the UK has a throughput of 500,000 tons of refuse a year, sorting 65,000 tons of materials suitable for recycling in the same period and generating electricity from the heat energy harnessed through controlled incineration. This private sector owned facility was financed (GBP 150 million) through special incentives offered by the Government.

The chain – waste collection, recycling, controlled incineration and energy generation seems to be a simple model which can very quickly be replicated.

The construction industry generates a fair amount of waste. A construction waste recycling organisation set up for the purpose of promoting and regulating environmental responsibility in the building community may be a first step in the right direction.

Design and Building Innovation

Building better communities through environmental innovation should top the agenda of any government and influencing the way this happens, a priority.

The 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 LEED^x (Leadership in Energy and Environmental Design) 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.



Fig.4 – Solar panels integrated into the design of the commercial property in Colorado.2009



Fig.5 – Environmentally Compliant Mksolaire Museum centre in Chicago.- February 2010

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.

Conclusion

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

Under the Kyoto Protocol on climate change, developed countries can offset some of their emission 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,^{xii} none of these is in Nigeria.

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.

ⁱ Greening Africa Report 2009
ⁱⁱ GE Real Estate Launches Green Initiative. 2008
ⁱⁱⁱ Building Better Cities Through Environmental Innovation – Lee Lohman AIA
^{iv} The Vanguard Newspaper Jan 28, 2008
^v Nigeria Energy Commission website
^{vi} Afrika.No. The Norwegian Council on Africa - The Vanguard Newspaper Jan 26, 2009
^{vii} www.industresearch.com
^{viii} Sustainable Public Transport Systems Alternative Energy News - April 2010
^{ix} Sustainable Public Transport Systems – Alternative Energy news Apr. 2010
^x LEED – Rating system developed by the US Green Building Council
^{xi} Matching Electricity Supply with Demand in Nigeria. A.S. Sambo DG Energy Commission Q4, 2008.
^{xii} UNEP Executive Director, Achim Steiner.2009.