NEED FOR GREEN BUILDING RATING SYSTEM IN NIGERIA

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ARC/03/1917

ARC 810
COURSE: APPLIED CLIMATOLOGY

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IN PARTIAL FULFILMENT FOR THE AWARD OF M.TECH IN ARCHITECTURE

AUGUST, 2011
ABSTRACT

The need for green housing is essentially embraced in Nigeria but lacks implementation. The need and practice of green building rating system is aimed at reducing the environmental impact of new buildings. The benefit of green building ranges from economic benefit and environmental benefits. The procedure for defining rating scales using the Building Research Establishment Environmental Assessment Methods (BREEAM) was discussed. In conclusion, the paper makes reference to the challenges and need for green building rating system in Nigeria.
1.0 INTRODUCTION
Green building employs a "life-cycle approach," estimating the cumulative environmental and social impacts of a building throughout its lifespan, from construction to use to demolition. This holistic approach to building is not new, but has only recently gained mainstream reputability. The continued adoption of green building on a global scale seems promising as more and more countries and building organisations seek to establish standards and incentives to promote sustainable building practices (Earth Trend, 2000). A green building incorporates design, construction and operational practices that significantly reduce or eliminate its negative impact on the environment and its occupants.

Building green is an opportunity to use resources efficiently while creating healthier environments for people to live and work. A sustainable property industry will balance environmental, social and economic issues to ensure a viable and valuable industry for future generations (Green Star, 2006). ASEAN or The Association of Southeast Asian Nations was established on 8 August 1967 in Bangkok by the five original Member Countries, namely, Indonesia, Malaysia, Philippines, Singapore, and Thailand. Brunei Darussalam joined on 8 January 1984, Vietnam on 28 July 1995, Laos and Myanmar on 23 July 1997, and Cambodia on 30 April 1999.
1.1 REASONS TO BUILD GREEN

Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

(1). Efficiently using energy, water, and other resources
(2). Protecting occupant health and improving employee productivity
(3). Reducing waste, pollution and environmental degradation.

For example, green buildings may incorporate sustainable materials in their construction (e.g., reused, recycled-content, or made from renewable resources); create healthy indoor environments with minimal pollutants (e.g., reduced product emissions); and/or feature landscaping that reduces water usage (e.g., by using native plants that survive without extra watering).

The built environment has a vast impact on the natural environment,

Human Health and the Economy. By adopting green building strategies, we can maximize both economic and environmental performance. Green construction methods can be integrated into buildings at any stage, from design and construction, to renovation and deconstruction. However, the most significant benefits can be obtained if the design and construction team takes an integrated approach from the earliest stages of a building project. Potential benefits of green building can include: Environmental benefits, Economic benefits, and Social benefit

1.1.1 Benefits of green building.

Environmental benefits

1. Enhance and protect biodiversity and ecosystems
2. Improve air and water quality
3. Reduce waste streams
4. Conserve and restore natural resources

**Economic benefits**
1. Reduce operating costs
2. Create, expand, and shape markets for green product and services
3. Improve occupant productivity
4. Optimize life-cycle economic performance

**Social benefits**
1. Enhance occupant comfort and health
2. Heighten aesthetic qualities
3. Minimize strain on local infrastructure
4. Improve overall quality of life

**1.2 TRANSITIONING INTO GREEN BUILDING:**
The rate and extent of transition into green building will differ between countries depending on regional logistical constraints, willingness to change, and available investment capital. In countries where markets for sustainable building materials are slow to develop, the green building market will be restricted to pilot projects. While developing countries must focus primarily on new construction, developed countries will need to pay equal to remodeling existing buildings. The new focus of many building professionals and organizations on green building and energy and resource efficiency will hopefully provide more insight on how to make green building widely accessible on a global scale. (Earth Trend, 2000).
2.0 WORLD MOST COMMON RATING SYSTEMS

Worldwide, a variety of assessment programme have been developed around environmental and energy impact of buildings. The first environmental certification system was created in 1990 in the U.K, The budding Research environmental Assessment Method (BREEAM). In 1998, Leadership in Energy and Environmental Design (LEED) Green building rating system was introduced based quite substantially on the BREEAM system. In turn, in 2005, the green building initiatives (GBI) launched green globes by adapting the Canadian version of (BREEAM) and distributing it in the U.S market. (Thimothy M.S et al. 2006). In Japan, a joint industrial/government/academic project was initiated with the support of the Housing Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT), in April 2001, which led to the establishment of a new organization, the Japan Green Build Council (JaGBC) / Japan Sustainable Building Consortium (JSBC), with its secretariat administered by the Institute for Building Environment and Energy Conservation (IBEC). JaGBC, JSBC and subcommittees are together working on R&D of the Comprehensive Assessment System for Building Environmental Efficiency (CASBEE).

Today, the enhancement and diffusion of CASBEE are being promoted under the MLIT Environmental Action Plan (June 2004) and the Kyoto Protocol Target Achievement Plan (approved by the Cabinet on April 28, 2005). In recent years, several local authorities introduced CASBEE into their building administration. Consequently, environmental performance assessment of buildings is now carried out in many buildings in Japan. The Green Star environmental rating system for buildings was developed by the Green Building Council of Australia (GBCA). Green Star is Australia’s first comprehensive rating system for evaluating the environmental design and performance of Australian buildings based on a number
of criteria, including energy and water efficiency, indoor environment quality and resource conservation.

Table 1. World most common rating systems

<table>
<thead>
<tr>
<th>NAME</th>
<th>COUNTRY</th>
<th>MAIN ASSESSMENT CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEED</td>
<td>U.S.A</td>
<td>Innovation &amp; Design (ID)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Location &amp; Linkage (L.L)</td>
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<tr>
<td></td>
<td></td>
<td>Sustainable Site (SS)</td>
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<tr>
<td></td>
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<td>Water Efficiency (WE)</td>
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<tr>
<td></td>
<td></td>
<td>Energy and Atmosphere (EA)</td>
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<tr>
<td></td>
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<td>Material &amp; Resource (MR)</td>
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<tr>
<td></td>
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<td>Indoor Environmental quality (EQ)</td>
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<td></td>
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<td>Awareness &amp; Education (AE)</td>
</tr>
<tr>
<td>BREEAM</td>
<td>U.K</td>
<td>Management</td>
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<tr>
<td></td>
<td></td>
<td>Health &amp; well being</td>
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<td></td>
<td></td>
<td>Energy</td>
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<td>Transport</td>
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<td></td>
<td>Water</td>
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<td></td>
<td>Materials</td>
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<td></td>
<td></td>
<td>Land Use</td>
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<td></td>
<td></td>
<td>Pollution</td>
</tr>
</tbody>
</table>
GREEN STAR AUSTRALIA
1. Management
2. Indoor Environmental Quality
3. Energy
4. Transport
5. Water
6. Material
7. Landuse & ecology
8. Emmission
9. Innovation

CASBEE (Comprehensive Assessment System for Building Environmental Efficiency)

JAPAN
1. Indoor Environment
2. Quality of service
3. Outdoor environment on site
4. Energy
5. Resource and material

2.1 MOST WIDELY USED GREEN RATING SYSTEMS

Now that the evolution of green rating systems has been introduced, it will take an in-depth look at some of the most widely used systems: BREEAM, LEED, Green Globes and Green Star. These systems were chosen for their popularity and their international usage. The discussion will include:

- Steps required for certification
- Scoring system
Costs and considerations

Average Savings From Survey

Through implementing sustainable initiatives, survey respondents achieved an average of:

• **17% energy savings**

• **18% water savings**

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• Composition of the rating system

• Countries where the systems are currently in use

• How the systems are perceived outside of their home country
3.0 BRE ENVIRONMENTAL ASSESSMENT METHOD (BREEAM)

BREEAM includes eight main categories of environmental impacts. The categories consider topics such as:

- Maintenance and operation policies
- Occupant control
- Carbon dioxide (CO₂) reduction
- Energy and water management
- Recycled and responsible use of materials
- Effect of the building on ecology

Credits are awarded in each of the categories. Weightings are applied to each category and then scores from each category are added together to produce an overall percentage score. In the United Kingdom, many new developments, schools and government buildings require a Very Good or Excellent rating. As the regulations are for new construction schemes, and evaluations occur at several stages during the process, in the authors’ opinion, it is unlikely the process will be completed without achieving the required rating.

Outside the United Kingdom, a country can develop its own adapted version or use a BREEAM International scheme to certify buildings. Two countries that have established their own versions of BREEAM are Canada and the Netherlands. When the International scheme is used, it is necessary that a BREEAM International assessor be used to assess the buildings (BREEAM assessors will be discussed below). Two geographical schemes, BREEAM Europe and BREEAM Gulf, are available for use by BREEAM International.
Table 2: Most widely used green rating systems

<table>
<thead>
<tr>
<th>System</th>
<th>Year established</th>
<th>Country of origin</th>
<th>Buildings certified</th>
<th>Rating schemes</th>
<th>Certification levels</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREEAM</td>
<td>1990</td>
<td>United Kingdom</td>
<td>Over 110,000</td>
<td>Community Courts</td>
<td>Pass Good Very Good Excellent Outstanding</td>
<td>Energy Health &amp; well-being Land use &amp; ecology Management Materials &amp; water Pollution Transport Water</td>
</tr>
<tr>
<td>Green Globes</td>
<td>2000</td>
<td>Canada</td>
<td>Over 1,400</td>
<td>n Retail Schools</td>
<td>Sustainable sites</td>
<td>Water efficiency</td>
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<tr>
<td>Green Star</td>
<td>2002</td>
<td>Australia</td>
<td>Over 220</td>
<td>Existing buildings</td>
<td>New construction</td>
<td>Education</td>
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4.0 CHALLENGES AND NEED FOR GREEN BUILDING RATING SYSTEM IN NIGERIA

“Environmental sustainability”, “global warming” and “green” have become common 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 focus.

“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 lifestyles.

Recently, attention has been focused on the built environment. “We recognise 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” said the GE Real Estate CEO at a forum where the company committed to improving the environmental performance of its substantial commercial real estate portfolio.

4.1 DEVELOPING A GREEN AGENDA FOR NIGERIA

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.

4.1.1 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 licenced 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 utilising 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. 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.\textsuperscript{vi}

\textbf{4.1.2 Transportation}

The poor state of infrastructure and the lack of impactful investments mean 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 to 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.\textsuperscript{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 has taken advantage of the GEF.

4.1.3 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.

4.1.4 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 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.
5.0 RECOMMENDATION

Without any doubt, the idea of green building and their ratings is worthy of being accepted globally considering its economic, social, political benefits. Hence the following recommendations are made. That the world green building council should intensify more efforts through launching series of global campaigns with the aim of bringing awareness and educating people on the importance of building green in future. ASEAN is one of the fast growing regions in terms of buildings and other infrastructure. Unfortunately there is only one indigenous rating system "GREEN MARK" in Singapore which is even yet to be registered as a member of the "WGBC". Hence the recommendation is that, ASEAN government should try to focus their attention towards establishing standard rating systems to meet up with the current and future global challenges of ecological imbalance, biodegradation and green-house effect.

Malaysia has proposed a rating system known as GREEN BUILDING INDEX. Since such an effort is made in place, hopefully the full implementation of rating system will be made as soon as possible. Green building rating system is obviously a need in Malaysia considering the fast growing rate of the country in terms of industrial and public buildings. The industrial and public buildings which were not initially designed as green buildings can be converted to green building once there exist a standard green building rating system with provision for rating of existing buildings such as in LEED and CASBEE.
6.0  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.

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.
7.0 REFERENCES


Earth trend (2000) www.earthtrends.org