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Inclusion of Well-Being and Ecological Values in Green Building Assessment Tools

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ABSTRACT

Many building sustainable rating tools rate the effectiveness of a building's contribution to a better world environment by measuring its performance in relation mostly to energy with additional emphasis in other aspects such as water, waste, indoor environment quality, transport, materials, and emissions. A simplified analysis is tabled to highlight the limited direct response of most green building rating tools to the health and well-being of building occupants. Inquiry into this deficit identifies a few salient points as a preamble to a larger discussion of use of rating tools to assess effectiveness of sustainability and the impact on ecology. Past notions of a sustainable planet resided in the making of sustainable buildings that reduced consumption of energy and other resources. The increased interest in creating healthier office environments as a sustainable action needs further analysis especially in relation to the ecological environment.

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INCLUSION OF WELL-BEING AND ECOLOGICAL VALUES IN GREEN BUILDING ASSESSMENT TOOLS

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Abstract

Many building sustainable rating tools rate the effectiveness of a building's contribution to a better world environment by measuring its performance in relation mostly to energy with additional emphasis in other aspects such as water, waste, indoor environment quality, transport, materials, and emissions. A simplified analysis is tabled to highlight the limited direct response of most green building rating tools to the health and well-being of building occupants. Inquiry into this deficit identifies a few salient points as a preamble to a larger discussion of use of rating tools to assess effectiveness of sustainability and the impact on ecology. Past notions of a sustainable planet resided in the making of sustainable buildings that reduced consumption of energy and other resources. The increased interest in creating healthier office environments as a sustainable action needs further analysis especially in relation to the ecological environment.

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1. Introduction

In response to existing global issues of global warming and dwindling resources, many countries have advocated the use of a variety of green building assessment tools. Many of the more well-known ones such as LEED,[1] BREEAM [2] and LBC [3]; and others such as GBCE,[4] Green Mark [5] or GBI [6] measure the performance of the building with varying but usually more weighting towards efficiencies of energy, water usage and improved indoor environmental quality. To a lesser degree, some points are given over to ecological values and this might include the incorporation of vegetation within the building envelope. No direct points are given to design decisions made specifically for the health and well-being of the building occupants or the surrounding ecosystems or biodiversity of the locality of the building.

This short paper discusses the evolving trends in architectural discussion to include people and nature into the design of buildings and also points out some of the limitations that rating tools may have in relation to these two areas of concern.

2. Literature Review

There is a range of assessment tools for rating the sustainable performance of buildings or communities. Some academic articles illuminate the differences of several countries on an international level [7], [8] or within a single country [9] while others compare particular aspects such as social quality of the tool [10] or awareness of it.[11]

Growing interest in health, well-being and productivity in the workplace has generated the development of additional rating tools for the marketplace such as WELL Building Standard [12]; and guidance tools such as the '14 Patterns of Biophilic Design'[13]; and a Health, Wellbeing & Productivity in Offices report put out by the World Green Building Council.[14] Interest has also increased with use of the more demanding Living Building Challenge (LBC) rating tool.[3]

Generally, green rating tools (GRTs) assess a building's performance under the main categories of Energy, Water, Waste, Indoor Environmental Quality, Materials and can also include Transport, Emissions,

Management, or Ecology. Rarely does a green building rating tool specifically include health and well-being.

Janis Birkeland does not believe that the sustainability of a building can be fairly gauged with rating tools that use “linear-reductionist analyses”. She advocates a more innovative approach of using the idea of net positive systems to “create levers for biophysical improvements and social transformation at the ‘glocal’ scale.”.[15] Environmental regulation processes that do not include ethics or ecology tend to segregate nature from building design without contribution to the public good.

3. Research Methods

In relation to the limited intentions of this short paper, only an abbreviated comparison of selected rating tools for non-residential buildings is highlighted below. In addition, only the main titles obtained from the respective tools have been used for a quick glance for better understanding. Information about the GRTs were obtained online from the websites of the organisations.

Tool	Ecology	Well-Being	Energy
LEED - US Leadership in Energy and Environmental Design - US	Sustainable Sites	(indirectly affected through Air, Water and Light)	Y
BREEAM - UK Building Research Establishment Environmental Assessment Method	Land Use and Ecology	Items termed for Well-being are somewhat similar to IEQ items in other rating tools	Y
GBCA - Australia Green Building Council of Australia	Land Use and Ecology (with Ecological Value calculator)	(indirectly affected through IEQ)	Y
BCA GreenMark - Singapore Building and Construction Authority	(indirectly affected through Urban Harmony)	(indirectly affected through IEQ) with 2 pts for Well Being (Spatial Quality); and 2 pts for Social Benefits	Y
GBI - Malaysia Green Building Index	N	(indirectly affected through IEQ)	Y
LBC - US Living Building Challenge	Place	Health and Happiness; Equity; Beauty	Y
WELL - US WELL building standard for Offices	N	Nourishment; Fitness; Comfort; Mind (indirectly affected through Air and Light)	N
14 Patterns of Biophilic Design (guiding principles not a rating tool)	mainly using naturally occurring elements without overt engagement with ecosystem functions	Connecting with Nature in the space; Using natural analogues in design	N

4. Analysis & Results

Many assessment tools give predominant weightings to the reduction or more efficient consumption of energy, water and other material resources. Few incorporate benefits of increased local biodiversity or improved ecosystems near to the building.

For most green rating tools mentioned previously, the improved health and well-being of building occupants are usually addressed indirectly under items assessed in relation to indoor environmental quality such as air pollutants, mould, daylighting or electric lighting, noise levels or external views.

There are many drivers for increasing health and well-being in buildings. In its Health, Wellbeing & Productivity in Offices report, the World Green Building Council states that its ultimate aim is to enable “maximised return on investment for all strategies designed to benefit occupants and improve productivity”.[14] Some of these strategies include reduced employee absence costs, greater staff productivity, reduced occupant complaints, increased company revenue. By contrast, the philosophical framework for the LBC focuses on envisioning “a future that is socially just, culturally rich and ecologically restorative” through the generation of net positive conditions for water, energy, and waste that “work in harmony with... the site and its surroundings”.[3]

One would likely be correct in thinking that many of the items listed in these rating tools have already been practised by good architects where natural light is maximised or universal access provided for closer proximity to natural elements. What has not been done previously is to identify these design intentions as assessable items in relation to sustainable design.

5. Discussion & Conclusion

The explicit inclusion and expansion of health and well-being as assessable features in new green rating tools such as the WELL Building Standard is a recent development. The only building rating tool prior to WELL that has a more explicit emphasis on a healthy environment for people is the LBC which has been evolving since 2006. Currently, the LBC is the only rating tool that has a coordinated rating system of connecting the building to the larger landscape it is located within, through its format of “scale jumping”. This is a meaningful addition to the environmental tools discussion as it causes one to address the implications of building construction outside of its building footprint such as on-site biodiverse habitats and close-by ecosystem functions.

Additionally, the LBC requires the deliberate incorporation of nature within the designed lived spaces to provide for “sufficient and frequent human-nature interactions” and not just the provision of views. Due to public awareness, there is growing interest in the incorporation of biophilic elements in architecture. Although not a rating tool, the ‘14 Patterns of Biophilic Design’ is a guidance tool prepared by US environmental consulting firm Terrapin Bright Green to promote biophilic qualities in architectural design such as the use of visual and non-visual (haptic) connections with nature, and non-rhythmic sensory stimuli.

Desiring to include views or a more direct participation with nature is both relevant and laudable. However, this biophilic desire must be met in connection with its impact on the ecology. Our desire for a nice view of plants right outside our window should not come at great cost of increased potable water usage. Neither should our preference for a particular ‘natural’ look override existing locally functioning ecosystems, for example, the

use of large expanses of lawn over a less manicured patch of indigenous shrubs which is likely more biodiverse. Making ourselves feel better with views of nature may not benefit the very nature we say we love.

Setting a higher standard for addressing ecology and occupant well-being in architectural design is warranted. The difficulty might lie in the equitable measurement of these aspects since they are elements that function within an open rather than a closed loop system. However, this challenge must be met to assist in providing long-lasting sustainable outcomes.

In conclusion, green building assessment tools have been evolving in response to new knowledge and identified concerns for people as well as for the animal and vegetative environments. We are starting to realise that if we only concentrated on making buildings work more efficiently in terms of material resource consumption without paying just as much attention to the surrounding ecosystems that support our very existence, we will not go as far in addressing local or global environmental issues. Each one affects the other in deeper ways than originally thought or acknowledged. It is becoming apparent that we are all connected within a larger system whether ecologically or economically. Thus, as designers or policy makers, taking a step towards a more direct connection between building design and the way we can live within the built form as well as the natural ecosystem needs to be urgently considered.

We must put people and ecology back into the sustainability equation. As to how we do that “without ecological offense or the disadvantage of anyone”.[16] via current rating tools is a challenge that is worth debating and refining because what is at stake is the earth we all inhabit.

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