



## **RESEARCH ARTICLE**

### **UNDERSTANDING GREEN BUILDINGS AS A BUSINESS CASE**

**1,\*Naga Vaishnavi, C. and 2Sruthi Reddy, C.**

**<sup>1</sup>Department of Architecture, The Oxford School of Architecture, Bangalore, India**

**<sup>2</sup>Department of Architecture, School of Planning and Architecture, JNA & FAU, Hyderabad, India**

#### **ARTICLE INFO**

**Article History:**

Received 20<sup>th</sup> June, 2018

Received in revised form

09<sup>th</sup> July, 2018

Accepted 26<sup>th</sup> August, 2018

Published online 30<sup>th</sup> September, 2018

**Key Words:**

Benefits of green building,  
Developers, Financial gains.

#### **ABSTRACT**

The rising environmental concern in response to global warming is drawing people's attention to seek sustainable or green solutions. Extensive emissions of greenhouse gases (GHGs) are from the energy use in buildings which in turn marks the real estate industry as a significant contributor to global warming scenario. The environmental benefits of green buildings have been firmly established, but the awareness that green buildings deliver a range of compelling financial and social benefits is not well established. Largely, in cases of green building development, developers face a major challenge regarding the increase in construction costs. Thus they find it intricate to go for green buildings due to cost restraints and complexity in sourcing green building materials, technologies and service contributors or facilitators in India. This research attempts to understand and find solutions to these problems.

**Copyright © 2018, Naga Vaishnavi and Sruthi Reddy.** This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Citation:** Naga Vaishnavi and Sruthi Reddy, 2018. "Understanding green buildings as a business case", *International Journal of Current Research*, 10, (09), 73685-73688.

## **INTRODUCTION**

### **What is a green building**

"A Green building should create delight when entered, serenity and health when occupied and regret when departed" – Perhaps this is one of the most inspiring definitions of a Green building, articulated in the book '*Natural Capitalism*'. Green Building concept essentially increases the efficiency of use of resources for building activity, which includes energy, waste and materials. An endeavor is made to lessen the building impact on the environment and health through improved sustainable sites, sustainable architecture, sustainable development and assimilation of energy conservation.

### **Why are people attracted towards green buildings**

This question has been asked to several users of a green building. Of all the reasons, three top reasons were cited by those occupying these buildings and they are the following:

**Operational Savings:** *Green Buildings engross at least 40-50 % less energy and 20-30 % less water in comparison to a ordinary or a traditional building. But this advantage comes at an marginal cost of about 5-8 %. The incremental cost generally gets recompensed in 3-5 years 'time.*

**\*Corresponding author:** Naga Vaishnavi, C.

Department of Architecture, The Oxford School of Architecture, Bangalore, India.

**Daylights & Views:** Working in environs with access to daylight keeps you energized and focused. Views in connection to the exterior environment have a soothing effect on the mind. Various studies have stated that the efficiency of inhabitants who have access to day lighting and views is at least 12% -15 % higher.

**Air Quality:** Sustainable buildings always have a clean and healthy environment. They use low volatile organic compound (VOC) emissions for the interiors in order to convene the ASHRAE 62 requirements.

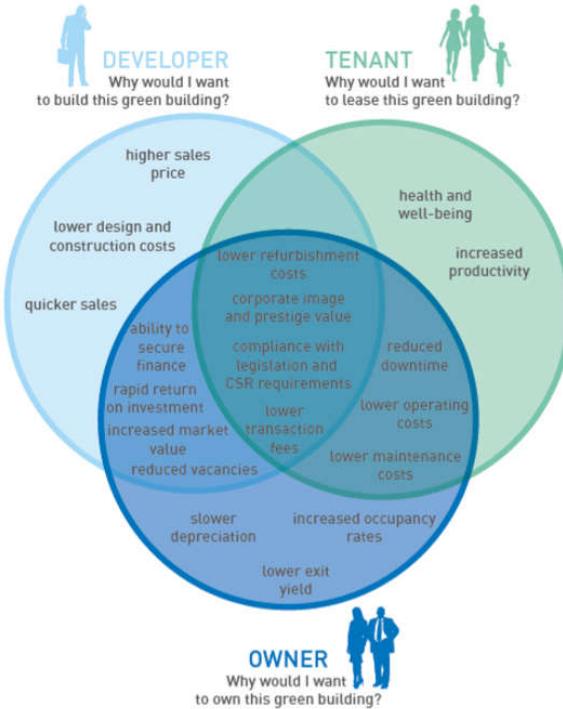
### **Benefits of green building**

Benefits of a Green Building are incredible and include both tangible and intangible. The most tangible benefit is the declining operating energy and Water costs right from the first day, during the entire life cycle of the building. Depending on the extent of green specifications the Energy savings range from 25 – 40 %. Reduction in initial outlay and improved asset worth are the additional tangible savings. Increase in efficiency of occupants 'health, safety benefits and a green corporate image can be listed under intangible benefits. Quite a few communal are now considering Green Building Rating as a tool to increase its marketability.

### **The main players in the Indian green**

There are three main players in the Indian green building space business- they are Investors, Developers and Tenants. The

verdict to build green buildings is ultimately taken by developers and they may perhaps do so for diverse basis including retorting to market requirement from tenants. Once constructed, commercial buildings are sold to a shareholder who will then make lease amount by leasing the asset to tenants, while some developers hold the building themselves. Occupants play a major role in the green construction. Some, such as Novartis, drive the market towards green as that company policy requires them to occupy a certain grade of green building. Many tenants are passive; they occupy green buildings as a matter of preference but not requirement.



Source: Business case for green building by world green building council

**Figure 1. Players in Indian Green Building Industry**

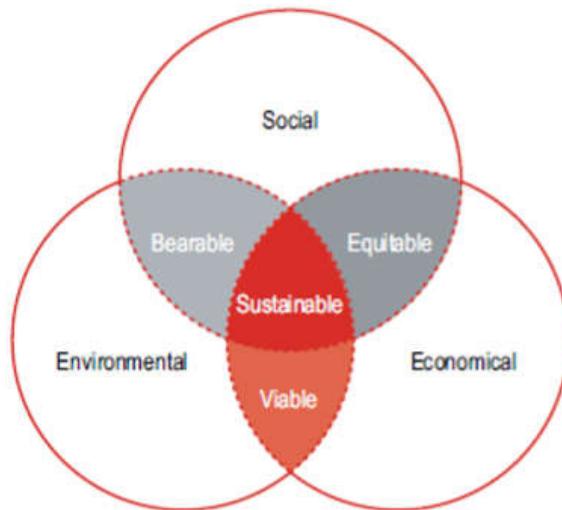
The key contributors in the green initiatives are:

- Developers
- Architects
- Consultants
- Public
- Government
- Students
- Manufacturers and contractors

### Sustainable real estate development and green buildings

'Sustainable development is defined as Meeting the needs of the present generation without compromising the ability of future generations to meet their needs.' (Brundtland, 1987). Sustainable development may be theoretically split into three basic branches i.e. Social Sustainability, Environmental Sustainability and Economic Sustainability (Figure 1). Financial results have always defined the performance of the industrial economy, a concept of single bottom line. Striking a balance between environmental, social and economic performance is extremely essential to achieve desired outcomes. This has introduced the concept of triple bottom line. According to a report by the Intergovernmental Panel on Climate Change (IPCC) in 1996, the real estate industry is

expected to consume 38% of the global energy and emit 3,800 mega tones of GHGs every year. Sustainability in the real estate context shall include energy conservation, resource usage, impact on the neighboring environment and working conditions for tenants. This concern has led to the development and use of green buildings.

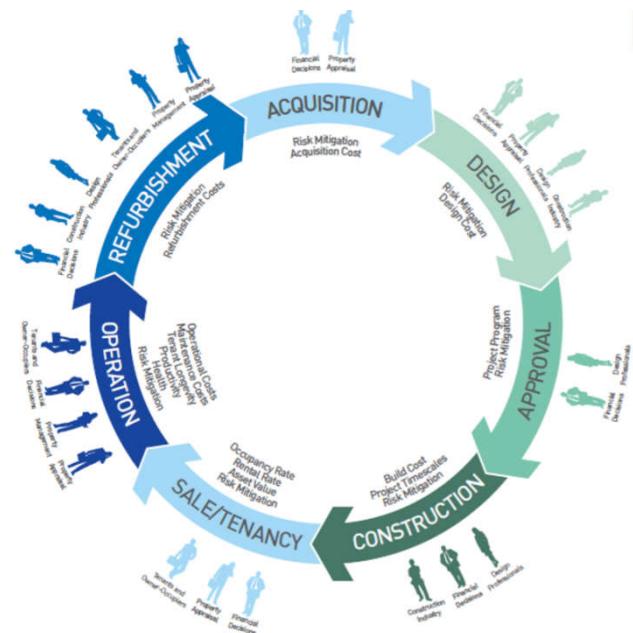


Source: Sustainability model developed by environmentalist John Elkington-1999

**Figure 2. Constituent Parts of Sustainability**

Several sustainable features such as efficient use of water, energy-efficient and eco-friendly environment, effective use of landscapes, use of renewable energy and recycled/recyclable materials, effective control and building management systems and improved indoor quality for health and comfort are integrated in green building plan. These features when envisioned and incorporated right at the design stage will succeed the objectives of a green building. The entire supply chain from material sourcing, energy modelling, resource reuse, civic amenities and waste disposal to tenant education shall also be considered while designing.

### Green building as a business case



Source: Business case for green building by world green building council

**Figure 3. Cycle of a Green building project**

## Design and construction cost

### Analysis

Various researches' shows that building green does not necessarily need to cost more, specifically when cost strategies, environmental strategies, program management are integrated into the development process right from the start. Development industry generally perceives the cost premiums to be high but it is not as high as they perceive. Capital costs for green buildings are usually found to be proportional to the increased level of environmental certification. Often, upfront cost increase in green buildings is compensated by a decrease in long-term life cycle costs, with specific features such as high-performance façades and energy-efficient building systems.

### Recommendations

**Concept of Green should be made a standard:** It is now time to take lessons related to costs associated with these buildings as part of standard practice, and deliver high-quality buildings that are sustainable within conservative budgets and demanding timescales.

**Collect more data:** Reliable and robust cost information on the hard and soft costs associated with designing and constructing green buildings should be made available easily.

**Increase industry awareness:** Education and awareness on green design issues and integrated design processes shall be improved and the importance of a holistic approach to design and environmental strategies should be stressed upon.

**Conduct more research:** The impact of environmental, technological and economic change on the cost of green buildings needs more research.

## ASSET Value

### Analysis

Increasing knowledge and awareness about the environmental and social impacts of the built environment among investors and occupiers, buildings with better sustainability credentials shall slowly enjoy increased marketability. Pattern of green buildings are being able to command higher rents and sale prices. Higher rental rates, lower operating costs, higher occupancy rates and lower yields largely drive the concept of high sales prices of these buildings. Buildings that are not green may rent or sell for less is the brown discount concept that is emerging in markets where green is more main stream. Local market conditions have a significant impact on the valuation of these buildings hence an understanding of what defines green buildings and drives demand in each context is essential.

### Recommendations

**Increase transparency and consistency:** Valuation experts or appraisers need to be engaged with the process of accounting for sustainability measures in the development projects. Transparency and consistency of approach is required to minimize any perceived risks of devaluation or a decrease in

expected benefits from the inclusion of sustainability features in building projects.

**Collect more data:** Impacts of certification or green measures related to building value for different markets at different levels needs more information. In particular, data is needed on the impact of individual measures or strategies, and how they are perceived by valuers. Existing studies for rental and occupancy rates are based on small sample sets and need to be more researched to increase their reliability and robustness. Understanding the implications- The implications of changes in the ratio of certified versus non-certified buildings shall be better understood, understanding and implementation of the trend in legal requirements to upgrade buildings, fiscal incentives to offset capital costs and other external factors which will impact the asset value of both green and non-green buildings.

## Operating costs

### Analysis

Green buildings save money through reduced energy and water use; they also reduce long-term operational and maintenance costs. Green buildings can offer indirect benefits related to costs for refurbishment and reconfiguration of space is also offered in addition to reduced operating costs. In order to achieve their predicted performance, high-performing green buildings need to be backed up by robust commissioning, effective management, leadership and communication.

### Recommendations

**Undertake new research:** Understanding the impact of certification and green buildings on operational costs requires more data.

**Understand the performance gap:** At each stage of the development process, Industry shall understand the nature of the performance gap and all stake holders need to address these issues.

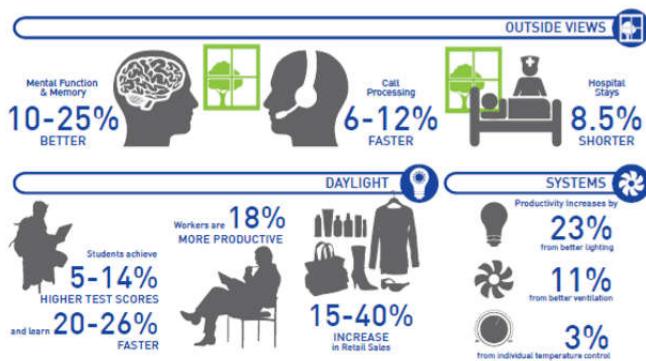
**Raise awareness:** Awareness shall be brought about understanding the role of commissioning and its inclusion in building regulations and standards.

**Adopt green management techniques:** Increased adoption of management and designing techniques such as the green leases and integrated design process should be a primary focus.

## Workplace productivity and health

### Analysis

Studies shows that the green design attributes to indoor environments in turn can improve worker productivity and occupant health and wellbeing, these results in bottom line benefits for businesses. Improved indoor environmental quality has never been a priority in building design and construction. Resistance to incorporating it into financial decision-making still prevails as 'productivity in the modern workplace can be challenging to measure, and it has not been systematically translated into financial metrics.'



Source: Business case for green building by world green building council

**Figure 4. net present value analysis of operational cost and net productivity along with health benefits for leed certified buildings**

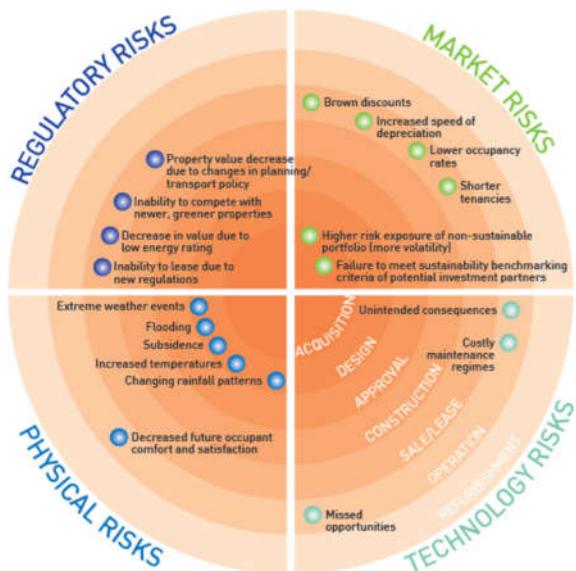
### Recommendations

Proactive working of the industry with researchers to identify the appropriate methodologies to develop the evidence needed for better financial decision making is essential.

**Areas for investigation include:** Which green building features have more impact on human health and productivity in relational to organizational success? How do these parameters vary by building type? Can an existing building evaluation system measure and then calculate the cost-benefit of these strategies? What is the best way to turn the results of productivity measures into meaningful financial metrics?

### Risk Mitigation

Risk factors in sustainability can affect the rental income and the future value of real estate assets, in turn affecting their return on investment. Regulatory risks related to sustainability, including mandatory disclosure, building codes and laws have become increasingly evident in countries and cities around the world.



Source: Business case for green building by world green building council

**Figure 5. Risks in green business**

**Appreciate the growing demand for green buildings:** Occupier preferences for green buildings, particularly, which green features appeal to them needs to be appreciated by the owners.

**Brown discounts and green premiums:** Extent of brown discounts for properties which do not have green certification shall be established by the investors and developers.

### Scaling up from green buildings to green cities

Large-scale economic priorities such as climate change mitigation, resource conservation, energy security, job creation, long-term resilience and quality of life can be met by greening the built environment at the neighborhood and city scale.

### Recommendations

- Mandatory Emission Reduction Programs
- Mandatory Energy Disclosure
- Policy Packages offering Money/Tax Incentives and Planning Incentives
- Voluntary Leadership Programs can be organized.
- Conducting detailed market research and building surveys, providing and developing new techniques.
- Providing workshops, hands-on exercises, detailed user guides and tools to the participants.
- Establishing local teams and networks, including local consultants to coordinate the project with the local government. Running a series of pilot projects in close collaboration with design teams.
- Increasing awareness of the eventual change in artificially-low energy tariffs and encouraging quick and regular updates of national standards.
- Adopting a multi-pronged approach, including capacity building/ training, development of suitable financial instruments, and incorporation of green building curriculum in professional degree courses.

### Future trends

- Developing Hubs of Green Real Estate in India and promote the concept of green and its financial implications.
- Developing a strong Green Industry where the special materials and systems required to adapt sustainability have easy availability. Incentives given for buildings using locally available materials and green techniques shall be promoted and implemented on large scale.
- Sustainable Real Estate Infrastructure takes the sustainability concept in the real estate industry to a higher level. It includes the reduction of resource usage and regeneration, social and communal development, tackling contemporary local issues such as sanitation and public transport in Indian urban areas.
- Creation and implementation of Green Funds in the real estate sector are not yet a popular thing India, but promotion of green funds opens new investment opportunities in India.

### REFERENCES

- Anonymous, "The business case for green building www.worldgbc.org A Review of the Costs and Benefits for Developers, Investors and Occupants. www.worldgbc.org
- Anonymous, "McKinsey & Company, Environment and Energy Sustainability. An Approach for India (2009), www.indiaenvironmentportal.org.in/content/290851/environmental-and-energy-sustainability-an-approach-for-india