Investigation of Barriers in Application of Green Building Objectives

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ABSTRACT

The time is flowing like sand moving through palm, over a period of time we have realized that efforts which were taken in Green Building Technology arena were not satisfactory. Although around two decades have passed since we are talking about this technology's planning & implementation; but its mere fact that still we are not able to reach to the extent which could have been changed the perspectives and fulfilled the targeted plans at initial stages of this revolution. Despite of all efforts still the gap which needs to be bridged. No doubt the number of green buildings has increased but, when the percentage of green building is compared with the total construction the number is insignificant. This paper is an attempt to find out all the barriers in application if Green Building Technology. Out of total 22 barriers with 3 major levels, five main hindrances have been found out by survey methodology.

1.0 Introduction

Green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from sitting to design, construction, operation, maintenance, renovation and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Green building is also known as a sustainable or high performance building.[4] When we talk about impacts of the built environment then certain things like aspects of built environment, consumption, environmental effects and ultimate effects come into picture. Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by: efficiently using energy, water, and other resources; protecting occupant health and improving employee productivity, reducing waste, pollution and environmental degradation[4]

There are organizations which are working in this cause with full enthusiasm & dedication; governments and regulatory authorities are providing supports to uplift the use of green building concept. Since the last decade of nineteenth century various organizations like IIA (Indian Institute of Architects), "LEED" propagated by IGBC and GRIHA introduced by TERI with a few private independent authorities have been giving their inputs to raise the bar of their own capabilities. Despite of all these efforts still the gap which needs to be bridged. no doubt the number of green buildings has increased but, when the percentage of green building is compared with the total construction the number is insignificant (i.e. demand or if we say with the rate of construction the supply of GB technology is not meeting the mark). There are categories in which differences can be seen acting as hurdle/barriers/obstacles/hindrances in some or another aspect to meet the expected growth in GB technology applications. These problems may be classified with the diversions; but one thing will be common as a conclusion that industry is still lagging behind for desired applicability of this beautiful technology on ground.

2.0 Research Objective:

The objective of the research is to find the barriers in application of Green Building Technology. Barriers in micro-level which are effecting from scratch to end at ground zero in Green Building objectives are tried to sum up in this effort. This study also incorporates some tactical tools to overcome these barriers.

3.0 Literature Review

The growing global crisis has created the need to adopt the concept of sustainability. Real estate activity, being one of the significant contributors to energy consumption and usage of resources, is working towards the development of green buildings to reduce energy consumption and the environmental impact. The IGBC has adopted the LEED rating system for evaluating green buildings in India.[2]

The key challenges for the development of green buildings in India are mostly in the lines of awareness on the benefits of green buildings, materials and technology. The CII-IGBC and other professionals are working towards addressing these challenges to enable developers to operate with ease. Although there is an additional investment involved in the development of green buildings, they are certainly ideal developments due to their triple-bottom-line benefits, which can be seen once these buildings are operational.[3]

Green buildings not only produce substantial operating savings, but also contribute in creating market value, improve health of building occupants and increase productivity. However, the greatest challenge faced by developers and buyers is lack of awareness about the benefits and opportunities of green buildings.[1]
Despite the challenges, ignoring this potential is far riskier than pursuing it. India is unlikely to be able to maintain its expected rate of growth over the next 20 years unless it takes significant action to reduce its consumption of resources and energy, and capturing even a portion of the technical potential would make a tremendous difference in many areas.[1]

4.0 Methodology

To identify the barriers in Green building technology applicability it has been seen in past research, stated hindrances were not accumulated. In this Research paper it is tried to sum up all the possible barriers which are occurring in implementation of Green building technology. Problems at various levels which were occurring were finally taken in three major levels on the basis of past researchers classification and questionnaires were floated -

1. Architect/Consultant Level
2. Developer/Contractor Level
3. Customer/ Consumer Level

Initially to frame various three different questionnaire detailed interview of subject matter expertise has been done; also the secondary data has been taken into consideration to collect exhaustive primary data. It created a rigorous base for the validation of data. Collection of primary data through three stated level of online Google docs questionnaires has been done through Emails. Response of 24 Architects, 26 contractors and 30 Customers has been recorded. Taking secondary data with the help of various annual reports, news paper cutting and chairman speeches in Green building arena; we have conducted exploratory study in accordance with various case studies in green building technology.

5.0 Observations & Learning

5.1 Architect/Consultant Level Barriers

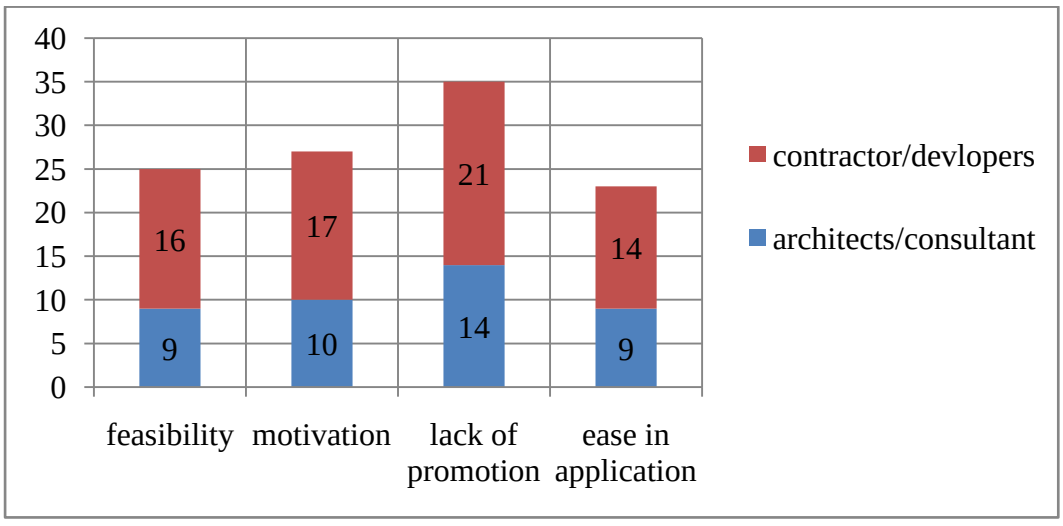
Sustainable and Green technological base can be put up firmly only with the support of Architects and Consultants. They are the people who works on the projects' initial stage; they design/innovate/plan for the implementation phase. There were some disputes (although most of them were proven wrong) where it was said that Architects do not go for Green Building Technology; they go for design & innovation without being sustainable. Lacuna in this side for construction projects for going green affects largely as compare to any other. During this research effort we analysed and listed 15 barriers which are the main hurdles for Green Building Technology's applicability.

5.2 Developer/Contractor Level Barriers

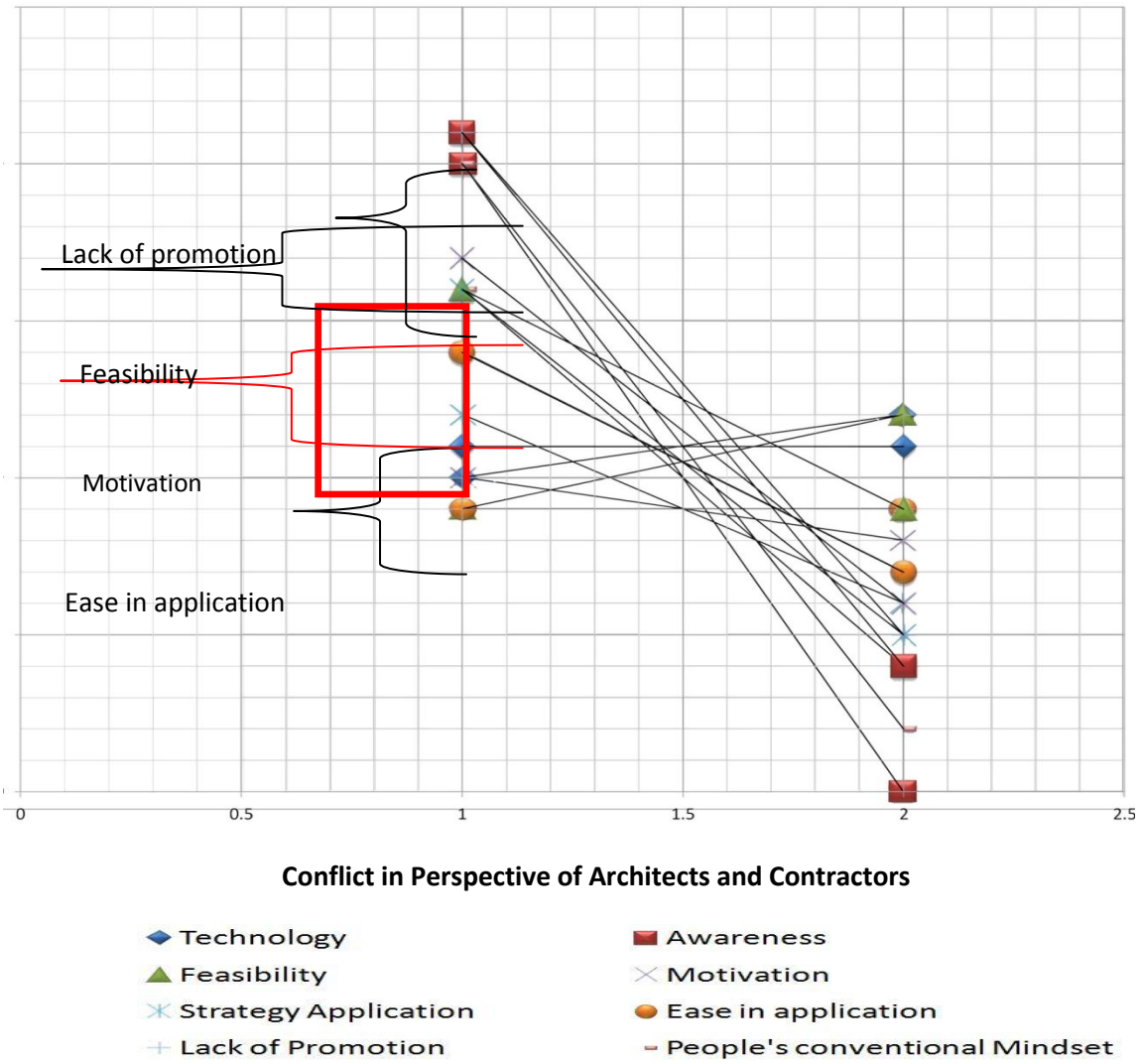
The ultimate load of execution of the designed plan at ground zero is the job of contractor. in projects where choice of 5m's (material, man, method, money and machinery) are contractor's/developers concern; there scope of green building technological applicability will be more. In such regard barriers on this side will be huge. On the other way most of the residential projects are being developed by developer/contractor firm solely; they do planning, designing, staffing, leading and controlling all the activities on their own. Here since whole project comes under one banner of developer/contractor, so barriers lies in their basket only. During this research effort we analysed and listed 20 barriers which are the main hurdles for green building technology's applicability.

5.3 Customer's level barriers:

It's mere fact that the supply of green homes will get discouraged if demand is not there. The use of building/commodity by customer/consumer would be demanding for green building technology only if benefits realized by customer are large as compare to investments. Also there is lack of credit resources to cover up front cost.



Reasons for Non-Compliance



6.0 Findings of the Research

Government Regulations are lenient:

To aggressively encourage this concept government should make it mandatory or provide incentives which would attract people in this direction. McGraw Hill study says "The top trigger for green building activity in Singapore was government regulation, and active role the government took in creating green building policies and incentives."

Extensive Documentation:

Obtaining any certification requires extensive documentation of the building process and design functions, along with strenuous follow ups in the some documents and need for validation and undertaking from Vendors. Motivating Vendors and getting the required documents.

Hard to Convince Team:

Whenever we try to implement change there is a resistance from employee's side and they try to resist the change. This might be because of lack of knowledge or uncertainty of what lies ahead.

Training is required:

Research has shown that architect think that they have a responsibility to offer and educate their client about green solutions but they are unable to the same. They blame this difference on "not enough information." for which we need proper training.

Technological Awareness:

The foundation of green building depends on the knowledge and the participation of people.

Commercial feasibility:

Commercial feasibility majorly deals with issues such as BEP, increase in ROI, decrease in operating cost and increase in valuation of property.

Strategically inapplicability:

The fragmented and often acrimonious nature of the building standards of rating has made it difficult for the client, and their contractors, to know which set of rules is most beneficial to them.

Ease of application:

Lack of proper knowledge, sufficient vendors and skilled labours

Lack of promotion:

Lack of promotion when considered from a point of view of marketing and investment for the research in this field. People's conventional mind set. The cost, benefits, and performance of green buildings must be documented and communicated to expand the market and also remove the misconception from mind of stakeholders.

Extra Requirement of training to employees:

The industry is expanding at a rapid pace and there are very few skill labour available for this type of construction and because of which there is a huge risk when unskilled and inexperienced enter this market

Green Buildings are NOT cost Effective:

The hoax that these building are not worth the extra cost but, what is not being realised is decrease in electricity cost, water bills increase in living quality.

Sub-Contractor's illiteracy

Sub-Contractor's illiteracy in Green building technology affects project in large.

Customers' Low demand of Green Homes:

It is said that renters wont demand green homes as it would increase the rent they might want it but they are not willing to pay for it.

Lack of Eco friendly Material/Manufacturer:

There are very few manufacturers who produce the building material which are required and out of which also few don't live up to mark of what was expected by architects.

Extra Time incurred in this concept

The lack of expertise and resources for green building in many communities often creates an environment that lengthens development time frames. In the public sector, approvals and permitting processes, many of which are not equipped to handle green construction, may cause delays.

Afraid of falsification:

As this is a new concept for the consumers therefore they are worried that they are being tricked.

High cost as compare to conventional construction:

It's no doubt that green building provide financial, economic and environmental. Benefits but the initial investment (capital cost) is high when compared to conventional building the hike in cost varies from 5%- 8%.

Risk of investment

Though the investment in green building is growing for a number of complex reasons still it has not taken a firm hold on the real-estate market which has lead investors in puzzled state of mind outline of risk that exist are:

- **Financial risk**: how will the construction affect the overall profitability?

- **Building material**: as this stream is gaining momentum there are very few manufacturers of the building materials and out of those few also products don't live up to manufacturers promise.

- Uncertainty of regulatory bodies; how they might evolve in GB Projects.

- **Market risk**: It might not reach anticipated result.

- **Performance risk**: Some owner starts their project with an in experienced team and might not get the desired result. Green building is a logical concept but then why aren't all buildings built green. There is a lot of literature on green building but only a few concentrate on the frictional force which is not allowing this concept to gain full potential.

Client's unawareness on Green Building:

"This increasing focus on sustainability from building owners will be a significant driver of market growth," McGraw Hill study. The other stakeholders can only do what client demands for so it is very necessary to educate client who is the end user about this concept.

Liability increment:

Is the liability on the end of developer increased because of increase in risk?

The risk and issues associated with green building might give legal liability under contract.

Feasibility:

1. Skilled labour
2. Unawareness of techniques
3. Limited vendors for green building materials

Motivation:

1. Don't want to come out of their comfort zone
2. They are more inclined towards monetary profits
3. Lack of interest from clients side

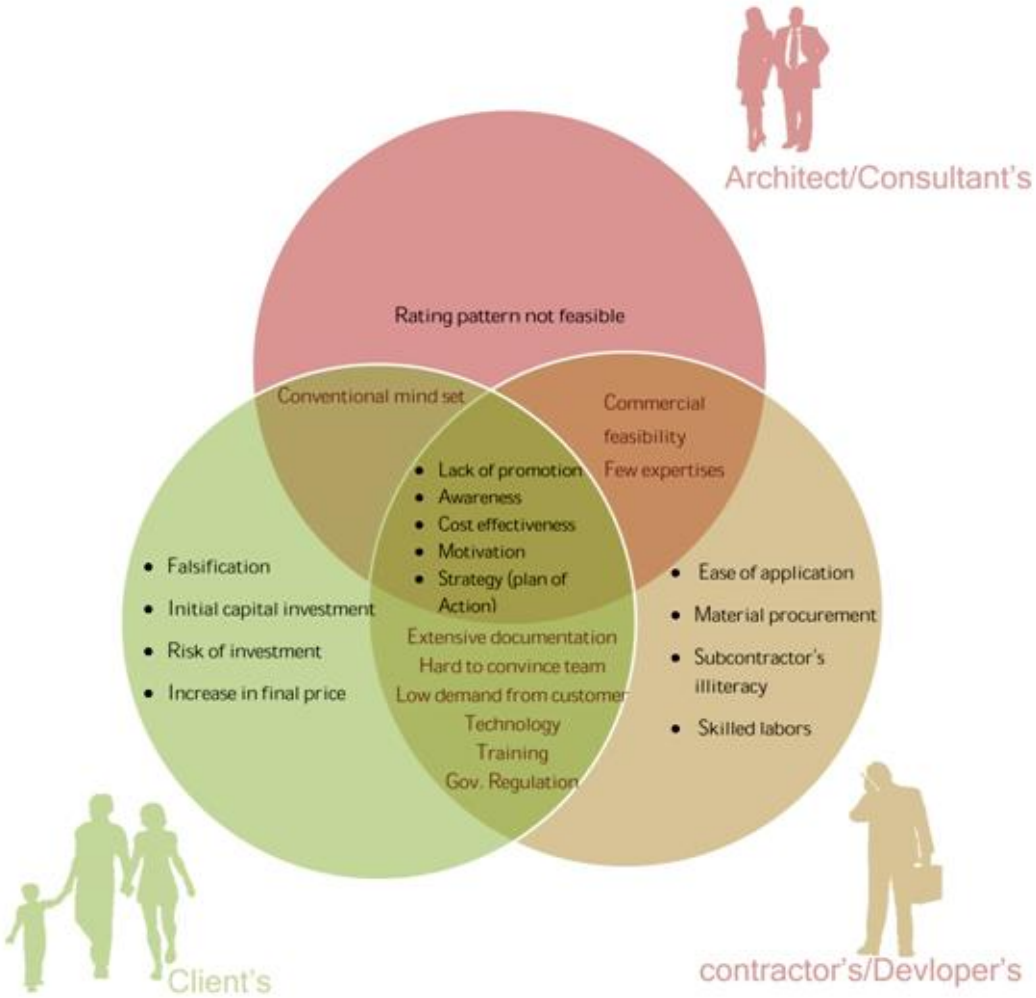
Lack of promotion:

As developers are liable for selling of property lack of promotion affects them directly as the cost escalated

Ease in application:

1. Not traditional techniques which they are comfortable with
2. Lack of expertise
3. Contractor has to spend money on labour to train them

7.0 Conclusion



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