

Buying Behaviour of Consumers towards Green Buildings in Delhi-NCR

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Abstract

India is experiencing a tremendous growth in infrastructural sector. In recent decades, the population of Delhi, comprising of both consumers as well as producers have displayed deep concern about environment and its protection. Significant attention and responsibility has been directed towards adoption of green products such as organic food, CNG, green stadium during XIX Common Wealth Games, CFL or waste recycling. Consumer attitudes to cleaner environment, health and nutrition have made a great impact on sensitivity to environmental issues at large. This paper tries to study and review the buying behaviour and motivation of prospective buyers towards green buildings in Delhi-NCR. An attempt has been made to examine the customer awareness and factors affecting buying decisions for “green buildings”. Over a period of time and an increasing awareness about the benefits of using eco-friendly items, has prompted a positive proactive response from the manufacturers as well as marketers all over the globe. Yet, the permeability of this phenomenon has either been slow or negligible in terms of customer buying decision. Though there have been attempts by the government through various rating system like GRIHA and LEED systems. This paper analyses the fact whether green buildings are doing well by doing good to the environment and the society.

Keywords: Green buildings, Sustainable development, GRIHA, LEED, Environmental Benefits.

1. Introduction

Environmental issues are India is experiencing a tremendous growth in infrastructural growth. This paper analyses the fact whether green buildings are doing well by doing good to the environment and the society.

1.1 What constitutes a Green Building

A green building is that building which is constructed with proper design and eco friendly materials and are environmentally responsible and resource-efficient throughout a building's life-cycle: from design to construction, operation, maintenance, renovation, and deconstruction. These are popularly known as ‘green construction’ or ‘sustainable building’ which has green construction. Their construction lessens the dependence on fossil fuels and minimizes its overall negative environmental impact. It aims at achieving energy and environmentally efficient building design which has a huge emphasis on reducing the cooling load of a building. The

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overall strategy is to provide a better quality of life to the incumbents through environment and nature friendly constructions.

As per IGBC Green Homes Rating System "A green building is one which uses less water, optimizes energy efficiency, conserves natural resources, generates less waste and provides healthier spaces for occupants, as compared to a conventional building."

1.2 Why Green Building

Though green building has some technical hitches associated with them because of cost factor, standardization issues and lengthy implementation problem but the long term implication overpowers all issues associated with it. Through centuries human beings are condemning the planet with their selfish acts. But the growing concern on depletion of natural resources, global warming and non renewable energy has given birth to responsible 'Green Citizens' who want to save mother earth.

(a) Economic Value

Studies have shown calculations show that a one dollar saving in energy costs from increased thermal efficiency yields roughly 18 dollars in the increased valuation of an Energy-Star certified building.

(b) Energy-Saving Characteristics

The technology used in green building has proved to have reduced excessive energy consumption by efficiency windows, insulated walls, solar designs, water efficiency, material efficiency, waste reduction and so forth. An increase in the adoption of green building practices could reduce this energy consumption significantly.

(c) Population worries

Population in India is increasing at a very fast rate and there is an exponential growth of need of houses in India which the country has to cater to this growing population.

(d) Environmental Concern

According to the United Nations Environment Programme (2009), buildings worldwide contribute about 40% of global greenhouse gas emissions and are a major consumer of other natural resources such as water and natural materials. As per Royal Institute of Chartered Surveyors, RICS (2005), buildings and their associated construction activity account for at least 30 percent of world greenhouse gas emissions.

"Research should be undertaken on the better application of rapidly reusable materials such as bamboo in the construction industry. The traditional materials will not take us anywhere. Research on how to use it differently, such as laminated bamboo will lead to the development of sustainable products from renewable and home-grown materials. Besides, new systems and process should be developed to produce steel and cement with far less energy consumption," said Mr. C.N. Raghavendran, Chairman Indian Green Building Council (IGBC) on 18th August 2011, while delivering the inaugural address at a conference on 'Green Buildings' organised by the CII Chennai Zone along with IGBC.

(e) Attracting Customers

Green Building has become cutting-edge industrial real estate solutions. It has become a main Unique Selling Point of all the advertisements to provide a sustainable and

comfortable living to the consumers which includes cleaner environment, natural day light, Industry stakeholders have understood the fact that going 'green' is not an option but an absolute necessity in the light of global environmental concerns.

According to the U.S. Green Building Council, buildings account for:

- 36% of total energy use and 65% of electricity consumption
- 30% of greenhouse gas emissions
- 30% of raw materials use
- 30% of waste output (136 million tons annually)
- 12% of potable water consumption

2. Green Certifications

U.S. Environmental Protection Agency gives Energy-Star-certifications to the buildings. In India TERI (The Energy and Resource Institute) has developed an instrument GRIHA (Green Rating for Integrated Habitat Assessment) to rate buildings on their 'greenness' which is accepted by National Building Rating System by Ministry of Non-Renewable Energy. Indian Green Building Council's (IGBC) formed in 2001 is the first programme developed in India, exclusively for the residential sector with a vision 'To usher in a green building movement in the country and to facilitate India become one of the world leaders in green buildings by 2015'. It has launched LEED India Green Building rating system in January 2007 which has made rapid strides since then. The Leadership in Energy and Environmental Design (LEED-INDIA) Green Building Rating System is a nationally and internationally accepted benchmark for the design, construction and operation of high performance green buildings.

The Bureau of Energy Efficiency (BEE) launched a Energy Conservation Building Code (ECBC) a Star Rating Programme in 2009, for office buildings in order to accelerate the Energy Efficiency activities in commercial buildings. The programme developed by the Bureau of Energy Efficiency, BEE is based on actual performance of the building, in terms of specific energy usage (in kWh/sq m/year).

The U.S. Green Building Council (USGBC) has developed the LEED ("Leadership in Energy and Environmental Design") for green building rating system for commercial and institutional green buildings which gives third party certification and validation to green features to green constructions.

The five categories include Sustainable Sites (SS), Water Efficiency (WE), Energy and Atmosphere (EA), Materials and Resources (MR) and Indoor Environmental Quality (IEQ). An additional category, Innovation in Design (ID), addresses sustainable building expertise as well as design measures not covered under the five environmental categories. The number of points the project earns determines the level of LEED Certification the project receives. LEED certification is available in four progressive levels according to the following scale:

There are 100 base points; 6 possible Innovation in Design and 4 Regional Priority points

Certified 40–49 points

Silver 50–59 points

Gold 60–79 points

Platinum 80 points and above

3. Review of Literature

A study was conducted on life cycle costing on GRIHA Rated green buildings in India by Majumdar (2008) concluded that “Green buildings are boon to investors, yielding high returns yielding high as compared to investments in conventional buildings or other investments, in a shorter duration.” Eichholtz, Kok and Quigley (2009), conducted a research on commercial building which have obtained Energy Star Label and or LEED rating clearly indicated in their research that “ the importance of a green label in affecting the market rents and values of commercial space. The results suggest that an otherwise identical commercial building with an Energy-Star certification will rent for about three percent more per square foot; the difference in effective rent is estimated to be about six percent. The increment to the selling price may be as much as 16 percent.”

Orlitzky and Benjamin (2001) addresses the relation between corporate social performance and risk; they argue that the better a firm's social reputation, the lower its total market risk. If this relationship holds for the real estate sector, building green may result in a lower cost of capital and a higher building valuation. So, even if green buildings did not command higher spot rents, they could still be valued higher. Jerry (2008) as highlighted the basics of green building and the projects and people who are advancing this movement.

Friedman (2007) in his article said “The only thing as powerful as Mother Nature is Father Greed. To a degree, the market is already at work on this project — because some venture capitalists and companies understand that clean-tech is going to be the next great global industry.” Lyon and Maxwell (2006) did talk about developing an economic model of “green wash” and NGO auditing and penalizing the firm for failing to fully disclose its environmental impacts.

4. Objectives of the Study

1. To understand does cost has any effect on the buying behaviour of consumers towards green building.
2. To know the awareness of prospective buyers about ‘Green benefits’.
3. Recommend strategies to make green building more popular with the consumers.

5. Scope

The scope of present research is 100 consumers in Delhi-NCR region.

6. Data Collection

The data is collected through the questionnaire which is administered to the sample. SPSS is used to draw inferences.

7. Hypothesis

1. Cost is one of the main factors which inhibit prospective buyers to go for green buildings.
2. ‘Green future’ is mostly considered while making a buying decision by prospective buyers.
3. Awareness amongst prospective buyers about the benefits of green buildings is significant.

8. Analysis and Interpretations:

People surveyed for this research found to have following demographic profile:

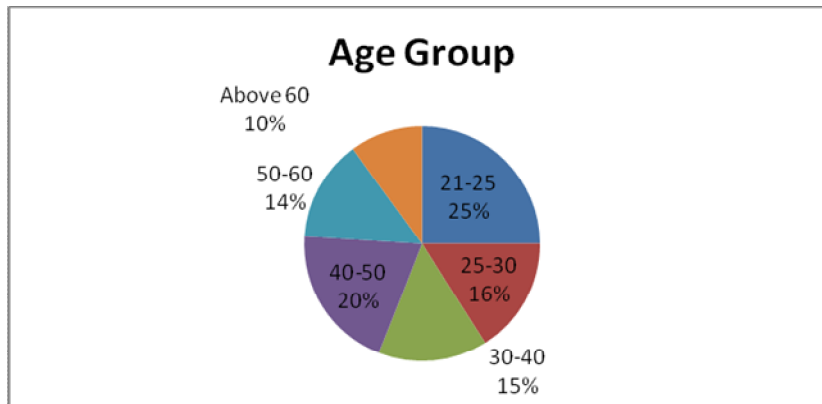
Forty one percent of the people surveyed were in the group of 21-30 years of age, 15 percent were in the 30-40 year of age 20 percent were in the 40-50 year of age, group and rest 24 percent were in the above 50 year of age group.

Forty six percent of the people were professionals and 37 percent of them were businessman. Fifty seven percent of the total respondents were in the 3-5 lakh annual income category and 22 percent are in the below 3 lakh rupees annual income category which reflects that almost 79% of the respondents were in lower middle income category.

Table 1: Demographic Profile

Parameters	No. of People	Percentage of response
Age Group (years)		
21-25	25	25
25-30	16	16
30-40	15	15
40-50	20	20
50-60	14	14
Above 60	10	10
Occupation		
Business	37	37
Professional	46	46
Housewives	17	17
Income(annual)		
Less than 3 lakh	22	22
3-5 Lakh	57	57
5-8 lakh	12	12
Above 8 lakh	9	9

Chart:1



People surveyed for this research found to have following demographic profile;

41 percent of the people surveyed were in the group of 21-30 years of age, 15 percent were in the 30-40 year of age 20 percent were in the 40-50 year of age, group and rest 24 percent were in the above 50 year of age group.

Forty six percent of the people were professionals and 37 percent of them were businessman. Fifty seven percent of the total respondents were in the 3-5 lakh annual income category and 22 percent are in the below 3 lakh rupees annual income category which reflects that almost 79% of the respondents were in lower middle income category.

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Table 2: Awareness of green building in market is optimal

	Frequency	Percent	Cumulative Percent
Strongly agree	64	64.0	64.0
Agree	23	23.0	87.0
Not Sure	2	2.0	89.0
Disagree	10	10.0	99.0
Strongly Disagree	1	1.0	100.0
Total	100	100.0	

In response to the query whether ‘awareness level of green building in prospective buyers is optimal’ 64 percent of respondents strongly agree with the statement and 23 percent of the respondents were agreeing. So in totality 87 percent think that awareness level of green building is optimal in the market. People were aware about the concept but due to some apprehensions in the mind they hesitate to work on the concept in practice. This again shows that our hypothesis ‘Awareness level about the green buildings were significant’ is accepted as most of them (87%) aware about it.

Table 3: Are you willing to pay some percentage extra for buying a green building

	Frequency	Percent	Cumulative Percent
Strongly agree	14	14.0	14.0
Agree	2	2.0	16.0
Not Sure	6	6.0	22.0
Disagree	41	41.0	63.0
Strongly Disagree	37	37.0	100.0
Total	100	100.0	

In response to query, ‘whether you willing to pay some extra for buying a green building’ only 16 percent agreed on the concept. 78 percent of the respondents were not willing to pay extra amount to acquire green building, which means that people were aware about the green building but not ready to shell out extra amount for this. This is in confirmation to our hypothesis that people were not taking decision to purchase green buildings because of cost as a factor.

Table 4: Long term benefits

	Frequency	Percent	Cumulative Percent
Valid Strongly agree	47	47.0	47.0
Agree	40	40.0	87.0
Not Sure	1	1.0	88.0
Disagree	12	12.0	100.0
Total	100	100.0	

Even 87 percent in totality agreed on the query that green building concepts have long term benefits, which means people seems to aware of the concepts and have knowledge that it have long terms benefits but they are not ready to shell extra amount for purchasing a green building.

During the interview session it came out that almost 79 percent of the respondents were below 5 lakh of annual income which suggest that they were in the lower middle income category. People in this category were in the race to acquire one flat by any means by their savings or by taking loan from bank. For acquiring green building they were not ready to bear extra loan or any kind of extra burden.

Table 5: Investing in green building is a good decision

		Frequency	Percent	Cumulative Percent
Valid	Strongly agree	57	57.0	57.0
	Agree	32	32.0	89.0
	Not Sure	5	5.0	94.0
	Disagree	6	6.0	100.0
	Total	100	100.0	

People were fully aware that in investing in green building is a good decision as in totality 89 percent of them were agree to this query that whether investing in green building is a good decision or not.

8.1 Factor Analysis

Factor analysis was adopted to know which factor affected most in taking decision to buy green building.

Table 6: KMO and Bartlett's Test^a

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.694
Bartlett's Test of Sphericity	Approx. Chi-Square	238.968
	Df	21
	Sig.	.000

KMO test suggest that factor analysis is suitable for applying the factor analysis for the given sample. As the value of KMO is 0.694. Even Total variance table suggest that there exist two factors which influenced most. Through Rotated component table it can be concluded that; 'Green Future' and 'Reduction in Pollution' are the main factors which influence the respondents mind while taking decision on the green building purchase. Factor analysis confirm to the hypothesis that 'Green Future' is considered as one of the main factors while taking decision on the green building purchase.

Table:7 Rotated Component Matrix^a

	Raw		Rescaled	
	Component		Component	
	1	2	1	2
Environmental concern	.647	.281	.632	.275
Reduction in pollution	.550	1.203	.396	.864
Green Future	.959	.022	.957	.019
Healthy Future	.486	-.850	.420	-.734
Eco- friendly Material	.685	.260	.688	.261
Advertisement	.156	.549	.147	.520
Sustainable Development	.894	-.176	.834	-.164

In response to the query, which factors create doubt in the mind about the green building concepts, false Information and ignorance about the standards comes out as the main points as described in the table no: 8, 78 percent of the people strongly agree with the false information and 67 percent with the ignorance about the standard which create doubts in the mind while making any purchase decision.

As price also seems to be one of the factors but ignorance of standard and false information become a dominant factor than price.

Table 8: Factors which creates doubt in mind of the customers

Statements	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
False Information	78	10	2	6	4
Price	45	12	23	12	8
Marketing Hoax	24	10	16	46	4
Fraud	12	22	12	14	40
Ignorance of Standards	67	22	2	5	4
Lack of Publicity	24	12	12	22	30

* Figures are in percentages

Table 9: Awareness of GRIHA or LEED ratings

	Fully Aware	Partially Aware	Not Aware
No. of the respondents	04	04	92

* Figures are in percentages

In response to the query whether you are aware of the GRIHA or LEED rating system on the green buildings, 92 percent respondents were not aware of it. Only a 4 percent respondent seems to be fully aware about these ratings (as reflected from table: 9)

Table 10: Factors affecting purchase decision of green buildings

Statements	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
Economic Value	21	9	12	31	27
Comfortable Environment	18	24	50	4	4
Energy Savings	22	24	17	20	17
Enhanced Air Quality	24	12	18	30	16
Healthy Living Conditions	82	12	2	2	2
Environmental Benefits	76	12	1	8	3

* Figures are in percentages

Eighty two (82) percent of the respondents strongly agree with the response that healthy conditions are one of the factors which affect the decision while purchasing green building. 76 percent of the respondents also strongly agree with the point that environmental benefits were also there in mind while purchase decision.

9. Strategies

Realization of Benefits

It is high time to make the consumer realize the cost reward for green buildings so that they accept and learn to use the alternatives like how it protect biodiversity and eco systems, reduces waste streams, improve air and water quality and conserves natural resources. The new developments in this arena are helping to make such building in a cost effective way. As per The Indian Green Building Council (IGBC) following the few benefits of green buildings:-

- Energy saving to the extent of 30 - 40 % right from day one
- Enhanced indoor air quality
- Higher productivity of occupants
- Potable water saving to the tune of 20% - 30%
- Enhanced day light & Ventilation

Advertising Green

Green concept has to grow to be popular and important. There is a need to educate the consumer about benefits of green to halt a disaster on the mother earth. All sectors must acknowledge the benefits and examples like IIT, Kanpur which became the first GRIHA rated building in the country and it scored 5 stars, highest in GRIHA under the system must be communicated to society at large.

Cost Issues

The stigma of being costly weighs heavily on green buildings. It is high time that consumer realizes that the initial cost premiums are nothing in respect of the returns one gets in the whole life time of the building. There is a need for advertisement campaigns for prospective buyers. On the other hand prices for the material used need to be controlled so that the overall cost of the green buildings do not overflow.

10. Conclusion

There is a hesitant fraction of investors, owners, architects and clients in the construction industry in India, who are not willing to invest in or build green due to the common acceptance of the belief that green buildings cost more. However, we cannot ignore the savings through green building features as costs in green buildings are associated with energy efficiency for a greener future tomorrow. So, there is a need to educate people of its immense benefits toward a greener future which has long term effect on both economic and environment performance.

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