



## Attitude of occupants towards green building concept in Udham Singh nagar district of uttarakhand

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### Abstract

Green Building Concept is a sustainable approach in construction sector. It uses to reduce the impact on health of human and environment. Green Buildings developed through incorporating eco-friendly and energy efficient material, processes and operation. Adopting GBC in residential planning helps to develop sustainable environment. Thus, present investigation aimed to assess the attitude of people regarding Green Building Concept. For the purpose, a descriptive research was conducted in Udham Singh Nagar District of Uttarakhand where 60 male 60 females were randomly selected from 120 families for the assessment. An attitude scale (5 point- Likert scale-strongly disagree- strongly agree) was constructed, validated and used to congregate the required information. Cronbach's alpha was calculated to measure the reliability/ internal consistency of the scale. The scale consisted of aspects namely- meaning of green building, measure of green building in terms of green material, energy and water saving, waste management and environmental issue. The data was analyzed in terms of frequency and percentage and chi square.

**Keywords:** Green Building Concept, Likert scale, Cronbach's alpha, waste management, sustainable environment, awareness, attitude and residential buildings

### Introduction

Growth of construction sectors increasing day by day. Development in this sector changes people's lifestyle improves people's standard of living and modernizes a community. It has been recognized as one of the most important sector imposing significant impacts on both our local and global environments whereas this sector is responsible for high energy consumption, solid waste generation, global greenhouse emission, external and internal pollution, environmental damage and resource depletion (Chan, Tse & Chung, 2010). Nowadays people are focusing on sustainable development and searching on the every aspect of sustainable living. In construction sector Green building designs and standards are developed to improve building operation energy and embodied energy efficiencies, and minimize energy and waste (Kwok *et al.*, 2011). Escultura (2011) defined "sustainable building" or "green building" as an outcome of a design which focuses on increasing the efficiency of resource use Green building practices can play a key role in achieving sustainability in the

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construction industry (Chatterjee, 2009). According Kamana and - energy, water, and materials – while reducing building impacts on human health and the environment during the building's lifecycle, through better location, design, construction, operation, maintenance, and removal. The concept of green building has been adopted by many nations as an option of preserving resources and sustaining the environment. India also started constructing green buildings. Green buildings have numerous benefits in India. These benefits range from the tangible to the intangible. Tangible benefits include reduction of power consumption by 20per cent-40per cent and reduction of potable water consumption between 30per cent and 40per cent. On the other hand, intangible benefits include the health and safety of the building's occupants, better comfort and higher productivity for occupants, and better practices from day one, by having the latest techniques or technologies was stated by Srinivas from his research (2009). Similarly Pawar (2012) reviewed that the green building experiences in India has been exciting and challenging as well. This will ultimately serve to improve not only the energy performance of the buildings but also assist in conserving energy and



natural resources by spurring increased recovery and recycling of building materials in a developing country like India. Availability of these green materials and equipment in the country has made much easier for the designers to adopt local materials to a very large extent. In India building sector started take interest in sustainable building construction many commercial and industrial building develop green building for getting benefit. But there is still loop holes regarding green residential building. This study focuses at identifying the causes as why the concept of green buildings/green home has not caught up in every area of aspect and what can be done to promote its uses in the developing world. objective of this study : Assessing the people's attitude towards green building.

### Material and Methods

To assess attitude of occupants towards Green Building Concept, a descriptive research was conducted in Udham Singh Nagar District of Uttarakhand. For the purpose, 60 male 60 females were randomly selected from 120 families. An attitude scale (5 point- Likert scale-strongly disagree- strongly agree) was constructed, validated and used to congregate the required information. Cronbach's alpha was calculated to measure the reliability/ internal consistency of the scale. The scale consisted of aspects namely- meaning of green building, measure of green building in terms of green material, energy and water saving, waste management and environmental issue. The data was analyzed in terms of frequency and percentage and chi square.

### Results and Discussion

This study helped to examine the attitude of respondents regarding the green building concept in Uttarakhand. The survey findings stated that all respondents shown positive attitude and were ready to become environment friendly consumer. Overall more than sixty per cent agreed to prefer green building concept for their own houses and reported that green building concept is a very new concept but there is a difficulty to find the construction professionals who can provide proper information about it. Less than 30 per cent strongly agreed about reliable quality of green materials. Whereas

all respondent were ready to spread information about green building concept if they get information and they also admitted that they had their duty towards the environment. Only 15 per cent and 9 per cent respondents strongly agreed and agreed that constructing house damage our environment respectively. Twenty one per cent strongly and 27 per cent agree that they were willing to pay for waste water treatment set up. Whereas forty five per cent respondents had neutral attitude toward adoption of low VOC (Volatile Organic Compound) finishes and paints. Overall Seventy per cent agreed that running down of groundwater is a serious issue. Sixty one per cent agreed to set up solar energy. Forty one per cent respondents had neutral attitude and stated that decline in construction waste leads to resource conservation. All respondents had positive attitude towards water management strategies in building design and site design. Overall Sixty per cent had positive attitude that greenery could be conducted anywhere. Half of the respondents reported positive responses towards saving energy through integrated design approach. Overall attitude scale rating showed that female had more positive attitude than male towards green building concept. Respondents showed a positive attitude towards becoming environment friendly consumer and ready to adopt green practices like energy efficient equipment, water efficient plumbing fixture and eco friendly paint and finishes. More than half respondents were ready to adopt green practices if they get proper information about green building concept. Desai (2015) in his study also reported similar results. His results indicate that residents are not clear on what eco friendly means but lot of interest was noticed in understanding the concept. Most of the respondents are not aware about the certification programs currently available in pune city. In response to the questions on how green homes compared to conventionally built homes, interviewees consistently indicated that they were more environmentally friendly. Their responses, however, were not as consistent with regard to water conservation, energy efficiency and material and building quality. This seems to indicate that residents do not link energy/water conservation and quality of materials with environmental quality. The study will be limited to the eco friendly buildings with the purpose of gaining a deeper understanding of green consumer, their awareness and the attributes attract them towards the same.



Attitude of occupants towards green building concept

**Table.1: Frequency and percentage distribution of respondent's attitude towards concepts of green building**

S. No	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	I would like to be an environment friendly Consumer.	64 (53.33)	56 (46.67)	-	-	-
2.	I would prefer Green Building Concept for my own House.	27 (22.5)	50 (41.67)	29 (24.17)	14 (11.67)	-
3.	The Quality of Green materials is trustworthy.	32 (26.67)	36 (30)	35 (29.17)	17 (14.17)	-
4.	If one provides me information about Green Building, I will spread it to other people.	58 (48.33)	62 (51.67)	-	-	-
5.	Human have the right to modify the natural environment to suit their needs.	-	39 (32.5)	4 (3.33)	47 (39.17)	30 (25)
6.	We all have some duty towards the environment.	54 (45)	66 (55)	-	-	-
7.	Constructing a house does not cause harm to the environment.	27 (22.5)	33 (27.5)	30 (25)	19 (15.83)	11 (9.17)
8.	I would like to pay for installing waste water treatment system for my community.	26 (21.67)	28 (23.33)	-	28 (23.33)	38 (31.67)
9.	I would prefer low VOC containing finishes and paints.	17 (14.17)	21 (17.5)	55 (45.83)	25 (20.83)	2 (1.67)
10.	The depletion of groundwater is a critical issue.	43 (35.83)	44 (36.67)	14 (11.67)	13 (10.83)	6 (5)
11.	I would like to install solar energy equipment.	27 (22.5)	74 (61.67)	9 (7.5)	10 (10.83)	-
12.	Reduction of construction debris leads to resource conservation.	17 (14.17)	27 (22.5)	50 (41.67)	24 (20)	2 (1.67)
13.	To conserve water we could incorporate water management strategies into building and site design.	53 (44.17)	52 (43.33)	15 (12.5)	-	-
14.	Greening could be conducted anywhere on the roof, in the streets or in the balcony.	34 (28.33)	39 (32.5)	28 (23.33)	11 (9.17)	8 (6.67)
15.	An integrated design approach will result in energy saving through proper utilization of windows, lighting, mechanical systems and active/passive solar systems.	22 (18.33)	41 (34.17)	44 (36.67)	13 (10.83)	-

Due to the time constraint the geographic scope will be limited to Pune city. And the time scope of the study will be limited to the present scenario and the current situation in the market. Patel & Chugan. (2013) also stated in his study that customers are barely aware of the concepts and benefits of green buildings. Hence builders are undecided whether consumers will prefer green building in future or not. The primary data were collected by using a structured questionnaire and secondary sources consisted of internet and other published sources. Based on the convenience sampling, the units for this study included Architects, Contractors, Residential developers, and Non- Residential developers based in the Ahmadabad City of the

Gujarat State of India. Findings revealed that there was a significant education gap between builders and consumers. Barriers such as the perception of higher costs among consumers, competing green building standards compared to conventional buildings, and the lack of education and institutional-quality market information threaten to slow the adoption of green building. As the prices of green buildings are relatively high, which indeed appears to be in line with the additional future benefits the consumers may derive, there is a strong need to make the consumers aware about the positive impacts on the environment, the long-term financial savings, and the health benefits for the family.



## Conclusion

Green Building Concept is a sustainable approach and has impact on health of human and environment. Adopting GBC in residential planning helps to develop sustainable environment. Present study also concludes that majority respondents were ready to adopt green practices if they get proper information about green building concept. It

points out that there is a need for education in both environmental and economic benefits of the eco friendly buildings. Even though the green building market share is continuing to grow rapidly, there is a lack of understanding “green building” concept which notifies the need for continue outreach efforts for a better society.

## References

- Kwok, K.Y.G., Statz, C. and Chong, W.K.O. (2011). Carbon emission modeling for green building: A comprehensive study of methodologies. *Proceedings of the International Conference on Sustainable Design and Construction (ICSDC): Integrating Sustainability Practices in the Construction Industry*, pp. 9-17, 23-25 March, Kansas, USA.
- Chatterjee, A.K. (2009). “Sustainable construction and green buildings on the foundation of building ecology. *Indian Concrete Journal*, 83(5): 27-30.
- Kamana, C.P. and Escultura, E. (2011). Building green to attain sustainability. *International Journal of Earth Sciences and Engineering*, 4(4): 725-729.
- Chan, C., Tse, M. S., & Chung, K. Y. (2010). A Choice Experiment to Estimate the effects of Green Experience on Preferences and Willingness- to- pay for Green Building Attributes. *Building and Environment* , 45, 2553-2561.
- Srinivas, S. (2009). Green buildings – Benefits and impacts. *Proceedings of World Academy of Science, Engineering & Technology*, 51(3): 790.
- Pawar, A.S. (2012). Green Building. *Journal of Engineering Research and Studies*, 3(1): 87-90.
- Desai, N. (2015). “A Study of Consumer Awareness: Towards Eco Friendly Buildings in Pune City”. *International Journal of Business Quantitative Economics and Applied Management Research*. 1(8): 1-9.
- Patel, Chitral Pravinkumar and Chugan, Pawan K.(2013). Measuring Awareness and Preferences of Real Estate Developers for Green Buildings over Conventional Buildings. Consumer Behaviour and Emerging Practices in Marketing, Eds. Jayesh Aagja, Ashiwini K. Awasthi and Sanjay Jain, Institute of Management, Nirma University, Himalaya Publishing House, Mumbai, 2013, pp.332-341

