

PROMOTIONAL STRATEGIES ON GREEN BUILDING PRACTICES TOWARDS BUILDERS' INTENTION IN SOUTH TAMIL NADU

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ABSTRACT

This paper focuses exclusively on promoting green building practices towards builders' intention. As the common understanding of sustainable growth, green building adoption is the solution to solve the difficulties that constantly threaten the health of both human and environment. Green building (GB) as a sustainable concept tries to solve social and economic concerns in environmental problems. As a result, the study analyses the favorable factors and methods of supporting the execution of GB initiatives in South Tamil Nadu. As a data collection method, the study used a structured questionnaire survey. Data was collected from construction professionals in the research (architects and civil engineers). A quantitative approach to data analysis was utilised Chi- square, correlation and Multiple Regression.

Key words : Adoption of green building practices, Promotion strategies, Environmental sustainability and Green building technologies.

1. INTRODUCTION

The Green Construction which involves taking best advantage of the environment's natural resources while not destroying the environment. During the 1960s and 1970s construction professionals did ecological balance through the construction of green building, emerged as a response to environmental problems. The approach can also be referred to as "Sustainable Building," "Ecologic Building," "Natural Building," or "Energy Saving and Environmentally Friendly Building. It is generally understood that the construction sector contains essential inputs and outputs. It contributes to the development of residents' socioeconomics by providing relevant buildings such as schools, hospitals, and other important facilities needed to create commodities and services for the people [1]. Therefore, the location of the building, the materials utilised, and the method in which it is constructed all have affect on both the individuals and the building itself [2]. Despite strong inputs and outputs, the sector has a

harmful influence on the environment, economy, and society. According to the United Nations Environment Program [3], the building sector takes around 40% of world energy and generates 30% of greenhouse emissions.

Sustainable Development and Green Building

'Green Development that fulfills the needs of the present without harming future generations' ie, the capacity to satisfy their own needs World Commission on Environment and Development (WCED) (1987) [4] Environmental, economic, and social sustainability are the three pillars or the triple bottom line of sustainable development. It is a tremendous task to ensure that human lives today and tomorrow without harming the environment. Environmental protection, natural resource conservation, and encouraging of the development and use of renewable resources are at the heart of environmental sustainability[5]. Also, the environmental sustainability model emphasizes that all environmental life-support systems must be healthy (water, soil, and air) which means that their environmental service capacity must be maintained[6].

2. SCOPE OF THE STUDY:

The more people there are the more pollution of water and air there will be. It results in drain on the earth. Moreover, it raises the demand for water, energy, and natural resources, overburdening the ecosystem. The advantages of green building are numerous, and they include economic, environmental, and social elements of sustainability. Green buildings consume 30-50% lesser energy and water than traditional ones. The green rating system of Leadership in Energy and Environmental Buildings (LEED) saves 30% of energy while increasing worker productivity by 25% [7]. Only green buildings have these advantages over conventional buildings in terms of local resources and reduced strain. Low maintenance and operation cost, Energy efficiency, Enhances indoor environment quality, Water efficiency, Better health, Material efficiency, Better environment and reduces strain on local Resources. This research was discussed in south Tamil Nadu architects and engineers' intentions for green buildings.

3. RESEARCH METHODOLOGY:

The research design for this study is descriptive in nature. To gather primary data from the samples, the snowball sampling technique was used. To collect data from the respondents, close-ended and well-structured questionnaire (Likert-5-point scale) was framed. The tools used in this paper consists of chi-square test, correlation analysis and multiple regression. The respondents for the study is 65, which includes engineers and architects.

3.1 Hypotheses :

H01 – There is no association between age and passionate about green practices into construction projects

H02 – Promotional strategies have no impact on the Intention to adopt Green Building practices.

3.2 Objectives of the study:

- To analyse promotional strategies of green building practices towards builders' Intention in South Tamil Nadu,

- To examine the impact of promotional strategies on Builder's intention in South Tamil Nadu.

4. STATEMENT OF THE PROBLEM:

The building sector plays a vital role in socioeconomic growth(UNEP 2009). Traditionally, the building sector can have a harmful impact on the environment, economy, and society. Construction activities and operations produce a huge amount of dust, solid waste, noise, wastewater, and smoke [8]. Furthermore, the building sector has been described as a resource-intensive sector[9] that uses 40% of the globe's raw materials (sand, gravel, and stone), 25% of the globe's wood resources, and 12-16% of the globe's available water. Moreover, the construction sector consumes more than 40% of total world energy; therefore, the industry is responsible for more than 40% of total global energy-related greenhouse gas emissions. (International Energy Agency (IEA), [10]. This greenhouse gas emissions are a major contributor to climate change, which has long been a major worldwide concern. (Intergovernmental Panel on Climate Change, 2007, 2014, 2018). In the present circumstances, it is estimated that if nothing is done to enhance building energy efficiency, the construction industry's energy usage and related greenhouse gas emissions will grow by more than 50% by 2050 (IEA, 2014). This issue may be classified as a global issue.

5. LITERATURE REVIEW ON STRATEGIES TO PROMOTE GREEN BUILDING ADOPTION

Hwang et al. (2017) identified three majority possible strategies for enhancing the adoption of green business parks in Singapore – government co-funding and incentives, green development rules and regulations, and collaboration with research institutes to assess the advantages of green business parks[11].

Hwang and Tan (2012) Identified strategies to encourage green building adoption, such as expanding the scope of government incentives to include GBTs adoption, educating clients on the benefits of green building, developing a green building framework, organising construction tours to educate the public on the benefits of green building, and government funding for green building R&D[12].

Wong et al. (2016) investigated a set of parameters for encouraging green procurement, implementation in the construction industry They selected the top three elements from a list of 35: the government's mandatory environmental regulations, the needs of consumers in tendering, and the requirements of governmental and nonprofit groups. They also discovered ten underlying facilitator groupings. At the very least, they identified government rules and standards, green technology and life cycle considerations, and top management commitment as the most crucial facilitator groups[13].

Darko et al. (2017b) The most essential promotion techniques of GBTs adoption in the US were found to be giving applicable incentives, better knowledge about the costs and benefits of GBTs, and green label and rating[14] .

Qian and Chan (2010) conducted a comparative survey of recent building energy efficiency promotion initiatives in the United Kingdom, the United States, Canada, and China,

and constructed a conceptual model of the measures. Several promotion measures were presented in their model, such as government funding for building energy efficiency technology R&D, financial and nonfinancial incentives, low-cost loans for building energy efficiency implementation, product labeling and rating, and optimised enforcement of existing standards [15].

Potbhare et al. (2009) made an integration strategy to promote green building guidelines adoption in India; access of institutional framework, availability of better costs and benefits information, increasing public environmental awareness through seminars, conferences, and workshops, and educational programmes for contractors, policymakers, and developers were highlighted as important promotion strategies [16].

6. RELIABILITY TEST:

Cronbach's alpha coefficient was used to measure the reliability of the five-point rating scale used to take survey responses previous to analysing the obtained data. Cronbach's alpha measures a rating scale's reliability by assessing the average correlation or internal consistency between the variables measured by the scale (Santos, 1999) [17].

Cronbach's alpha coefficient range from 0 to 1, with the greater the number, the more reliable the chosen rating scale. However, the traditional rule is that the scale is reliable if the Cronbach's alpha coefficient is greater than or equal to 0.70. (Nunnally, 1978) [18].

Factor	No. of Items	Cronbach Alpha
Intention to adopt Green Building practices	4	.905
Government regulations and standards	4	.799
Incentives and Awards	4	.798
Awareness and publicity programs	3	.788
Education and information dissemination	3	.669

In this study, have 18 items, which is larger than 0.7, therefore the value is acceptable. Each construct has a Cronbach alpha value greater than 0.6. This rating indicates that the data gathered for this study are reliable.

7. CHI-SQUARE TEST

H₀ – There is no association between age and passionate about green practices into construction projects

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.287 ^a	6	.508
Likelihood Ratio	6.063	6	.416
Linear-by-Linear Association	2.765	1	.096
No of Valid Cases	65		

The chi-square test was performed at a 5% level of significance and hypothesis was tested.

The Table shows that the significance value is 0.508 which is greater than the probability value ($p > 0.05$). The null hypothesis were accepted. The incorporation of green methods into construction projects by builders has not an impact on their age.

8. CORRELATION:

This analysis is the statistical approach for determining the relationships between the variables. It is also used to define the degree of correlation between variables. Correlation analysis was used to determine the link between variables in the model's construct. This study was used to determine the link between perceived ease of use, perceived usefulness, relative advantages, attitude, and interest in utilising all variables. The average score of many questions in each construct was determined and used for further investigation [19]. When the coefficient of correlation (r) value ranges from 0.10 to 0.29, 0.30 to 0.49 is considered medium, and 0.5 to 1 is considered strong[20]. To avoid multicollinearity, the correlation coefficient should be smaller than 0.8 [21].

Pearson correlation :

Constructs	Government regulations and standards	Incentives and Awards	Awareness and publicity programs	Education and information dissemination	Intention to adopt Green Building practices
Government regulations and standards	1				
Incentives and Awards	.724	1			
Awareness and publicity programs	.593	.584	1		
Education and information dissemination	.566	.664	.777	1	
Intention to adopt Green Building practices	.336	.263	.272	.093	1

** Correlation is significant at the 0.01 level (2-tailed), * Correlation is significant at the 0.05 level (2-tailed)

The correlation value is 0.777, Education and information dissemination and Awareness and publicity programs which is the highest among all variables. As a result, this value is less than 0.80.

9. MULTIPLE REGRESSION:

A statistical strategy for defining a collection of predictor and criteria variables. It is also used to determine how the independent variables relate to the dependent variable. It investigates the relationship between perceived usefulness, perceived ease of use, relative benefit, attitude to use, and desire to buy in this study. R^2 , F_ratio of overall fitness, residual and hypothesis testing, and t_test particular parameters was used to assess the proposed framework. These characteristics were used in this study to discover the direct and positive relationship between variables.

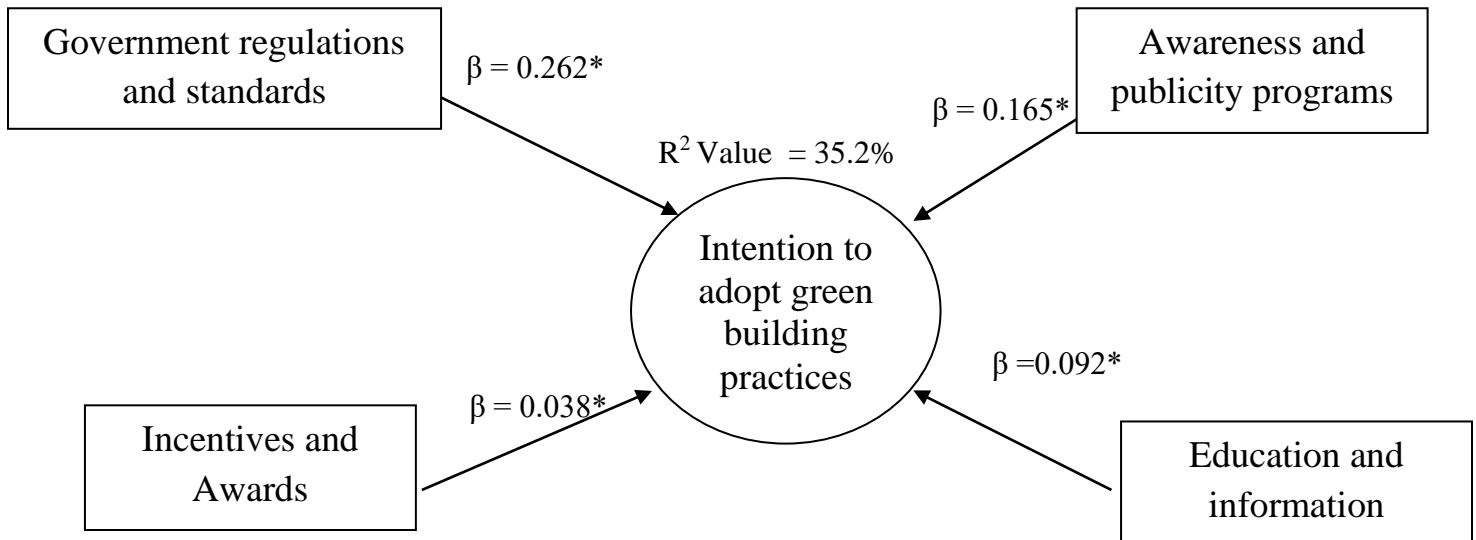
Regression analysis of promotional strategies Vs Intention to adopt green building Practices:

The null hypothesis (H02) of whether Government regulations and standards have a positive influence on Intention to adopt green building has been made, and the tested findings are given in the table. The analysis indicates that the p-value was greater than 0.05 ($p > 0.05$) and the t-test value (2.831) was positive. Constructs P – value are less than 0.05 it indicates the null hypothesis was rejected. So all the constructs will have a positive effect on Intention to adopt green building which had the ability of an exposition of 35.2 %. ($R^2 = 0.352$).

Coefficients of Coefficient of promotional strategies and Intention to adopt green building Practices:

R ² Value = 35.2%					
Coefficient of promotional strategies					
Model	Unstandardized coefficients		Standardized coefficients	- t-value	Sig.
Constant	B	Standard Error	β	3.241	.002
		2.256	.696		
Government regulations and standards	.324	.227	.262		.159
Incentives and Awards	.049	.255	.038	.192	.848
Awareness and publicity programs	.189	.230	.165	.822	.414
Education and information dissemination	.111	.256	.092	.434	.666
Dependent variable : Intention to adopt green building practices					

Government regulations and standards, Incentives and Awards, Awareness and publicity programs and Education and information dissemination have a significant and positive influence on interest to buy. Furthermore, the Government regulations and standards have a strong effect (0.262) on Intention to adopt green building practices then all other constructs.



* represents significant difference $p > 0.05$

10. CONCLUSION:

The multiple sustainability benefits, the introduction of Green buildings has recently attracted significant global attention. As a result, the purpose of this study was to determine the major strategies for promoting green building adoption in South Tamil Nadu. This study adds to the existing body of information on green building by examining the important strategies for promoting green building adoption in the construction sector. The analysis of data for the Chi-square result shows the respondents' age does not depend on the passionate about the green practices. Education and information, dissemination and awareness and publicity programs were, which is the highest among all factors results of correlation. The findings of this research given greater understandings when analysing are Builders' intention to adopt green practices. The promotion strategies impact on interest to adopt green practices for buildings. This study will help to construction sector to follow the green practices.

References:

[1] Ofori, G. (2012). Developing the Construction Industry in Ghana: the case for a central agency. *A concept paper prepared for improving the construction industry in Ghana. National University of Singapore, 13(1), 3-18.*

- [2] Choi, C. (2009). Removing market barriers to green development: principles and action projects to promote widespread adoption of green development practices. *Journal of Sustainable Real Estate*, 1(1), 107-138.
- [3] UNEP, T. (2011). a Green Economy: Pathways to Sustainable Development and Poverty Eradication. *Nairobi Kenya Unep 12-15*.
- [4] WCED. (1987). *Our Common Future*, Oxford University Press, Oxford/New York.
- [5] Abidin, N. Z., & Pasquire, C. L. (2007). Revolutionize value management: A mode towards sustainability. *International Journal of Project Management*, 25(3), 275-282
- [6] Goodland, R. (1995). The concept of environmental sustainability. *Annual review of ecology and systematics*, 26(1), 1-24..
- [7] Ries, R., Bilec, M. M., Gokhan, N. M., & Needy, K. L. (2006). The economic benefits of green buildings: a comprehensive case study. *The engineering economist*, 51(3), 259-295.
- [8] Tam, V. W., & Tam, C. M. (2008). Waste reduction through incentives: a case study. *Building Research & Information*, 36(1), 37-43.
- [9] Shi, Q., Chen, J., & Shen, L. (2017). Driving factors of the changes in the carbon emissions in the Chinese construction industry. *Journal of Cleaner Production*, 166, 615-627.
- [10] Hwang, B. G., & Ng, W. J. (2013). Project management knowledge and skills for green construction: Overcoming challenges. *International journal of project management*, 31(2), 272-284.
- [11] Hwang, B. G., & Tan, J. S. (2012). Green building project management: obstacles and solutions for sustainable development. *Sustainable development*, 20(5), 335-349.
- [12] Wong, J. K. W., San Chan, J. K., & Wadu, M. J. (2016). Facilitating effective green procurement in construction projects: An empirical study of the enablers. *Journal of Cleaner Production*, 135, 859-871.
- [13] Darko, A., Chan, A. P. C., Ameyaw, E. E., He, B. J., & Olanipekun, A. O. (2017). Examining issues influencing green building technologies adoption: The United States green building experts' perspectives. *Energy and Buildings*, 144, 320-332.
- [14] Qian, Q. K., & Chan, E. H. (2010). Government measures needed to promote building energy efficiency (BEE) in China. *Facilities*.

- [15] Potbhare, V., Syal, M., & Korkmaz, S. (2009). Adoption of green building guidelines in developing countries based on US and India experiences. *Journal of Green Building*, 4(2), 158-174.
- [16] Thorndike, R. M. (1995). Book review: psychometric theory by Jum Nunnally and Ira Bernstein New York: McGraw-hill, 1994, xxiv+ 752 pp. *Applied psychological measurement*, 19(3), 303-305.
- [17] Santos, J. R. A. (1999). Cronbach's alpha: A tool for assessing the reliability of scales. *Journal of extension*, 37(2), 1-5.
- [18] Nunnally, J. C. (1978). *Psychometric Theory: 2d Ed.* McGraw-Hill.
- [19] Wang, Y. S., Wu, S. C., Lin, H. H., Wang, Y. M., & He, T. R. (2012). Determinants of user adoption of web'Automatic Teller Machines': an integrated model of'Transaction Cost Theory'and'Innovation Diffusion Theory'. *The Service Industries Journal*, 32(9), 1505-1525.
- [20] Hong, W., Thong, J. Y., Wong, W. M., & Tam, K. Y. (2002). Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics. *Journal of management information systems*, 18(3), 97-124.
- [21] Kabengele, B. O., Kayembe, J. M. N., Kayembe, P. K., Kashongue, Z. M., Kaba, D. K., & Akilimali, P. Z. (2019). Factors associated with uncontrolled asthma in adult asthmatics in Kinshasa, Democratic Republic of Congo. *PloS one*, 14(4), e0215530.

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