

A STUDY OF GREEN BUILDING - RENEWABLE ENERGY HARVESTING TECHNIQUE

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ABSTRACT:

Harvesting renewable energy is possible by many ways and one such recent development is Green Building. Green building is the novel method of creating building structures by using less Carbon foot print and making the structure on sustainable way and less energy consumption which results better environment. The present paper aims to report recent review on green building under various aspects in different regions.

KEYWORDS: *Green building, carbon footprint, sustainability, energy consumption, indoor air quality, renewable energy management.*

INTRODUCTION:

Green building is the focus of modern cities which begins from the construction, maintenance and sustainable living space for human. Large amount of electrical energy is consumed by buildings in any cities across the world. This is mainly due to HVAC and lighting. Green building reduces the consumption of water, electricity and handling wastages in an efficient manner so that its impact, results reduction in CO₂emission,global warming and value added human living.Many countries have already initiated towards certification for Green building and few are LEED, BREEAM, Green MARK Green STAR, Al-Safat etc. The present paper focus on recent studies on Green building and environment in various countries under different aspects.

House Developers

Elias and Lin reported about the residential green building in the aspect of developers (Eliasa and Lin, 2015) in Malaysia. They interviewed twenty two house developers and interacted with them about green

building. They found that 17 of them aware about the need of green building however increase of cost play significant role on customer demand. They followed two methodology to collect data first one direct reading published data from various sources such as, journal article, survey reports, magazines, conference proceedings etc. The second method they involved in direct field survey, interviewed house developers, people. Based on spiral of data analysis they concluded that some of the challenges such as lack of technical expertise, lack of awareness among common people, R & D towards reducing cost and performance and government policy making will drive the Green building and sustainability of home developers. In India local government bodies provide subsidies, fund, incentive etc [2]. Diyana, and Abidin (2013) have reported a motivational values and groundsof expectation for green building construction.

Indoor Environment

Allen et al., (2015) reported about health aspects of Green building. Green building conceptually proven for the conservation of energy and water. However the occupant's health related issues are the subject of interest for them. Their paper is based on direct reading of published data as well as their proposed metrics for evaluating health parameters. Based on the survey of published results for comparative measure for Indoor Environment Quality which includes air quality, thermal comfort, ventilation, acoustics, asthma, respiratory symptoms of conventional building with green building they found that discrepancy among reports. They also found that most of the reports based on the self declaration of occupants. To avoid the intuition based self report authors' proposed Health Performance Indicators framework with example metrics. They considered work productivity and use of sensors for measure of IEQ.

Steinemann et al. (2017) have raised ten questions about influence of green building on health issues particularly Indoor Air Quality (IAQ). The IAQ refers not only quality of air but also other allied quality parameters such as acoustics, dust particle size, pollutants, particulates, pesticides etc. Green building rating system also do not ensure the quality of IAQ. Authors' rise these issues and recommended for re-certification should consider better IAQ while involving rating system.

Feasibility of Green Building

Arijit Sinha et al. (2013) have considered sustainability of green building materials for their investigation. For a product, the energy consumption during life cycle starts with collection of the raw material, manufacturing, transforming to the installing station, handling, maintenance, and end life and then recycling. By considering the whole process of building material and energy needs and reduction in carbon foot print they emphasized the use of wood. The dynamic change of renewable energy is one of the major challenge for the management. Emilie (2017) et al reported about Strategies for sustainable managementof renewable resources duringenvironmental change. They

proposed novel technique on Learning-By-doing in adaptive management by reflecting the uncertainties on renewable sources. It is noticed that their strategies have resulted better than analytically optimum solution for a dynamic system.

Socio-Economic Factors

The transition of green building from conventional building is facing significant barriers arises due to socio-economic factors. Wimalaa et al. (2016) reported about such factors based on survey conducted from 75 occupants belongs to conventional as well as green building in Indonesia. They followed SWOT analysis to prescribe their recommendation. They have considered the following issues are barriers which are burdensome implementation, lack of supported atmospheres, resistance to change, inadequate knowledge and information, negligence, high cost of green building options, insufficient supervision, lack of awareness, low availability of green products on the market, and lack of building management role. These data were analyzed using Strengths, Weaknesses, Opportunities, and Threats (SWOT) method. Based on the analysis new strategies were recommended to eliminate the barriers in the future (Wimalaa et al., 2016). Their major recommendation fall on incorporating green building related education and government policies to encourage people to move towards green building.

Sarah J. Tayouga and Sara A. Gagné (2016) conducted a review to identify the socio-economic factors that are influencing the adoption of Green building. They identify mainly six parameters which are education, service providers, finance, stake holder's coordination, government laws and policies etc. They presented a direct as well as indirect relationship among these socio-economic factors.

Initiative in UAE

Buildings are consuming 60% of electrical energy (WayesTushar, 2018). Hence if the electrical energy is handled in a smart way will helpful to save the energy consumption. WayesTushar et al reported about the usage of Internet of Things (IoT) and Artificial Intelligence (AI). They listed major factors in a building are HVAC, lighting, dynamic human load, Diagnostics and prognostics and uncertainties in the weather. IoT of things and suitable sensors are blend together to manage building for effective utilization of electrical energy. Government of Dubai have listed the green building regulations and specifications and recommended new constructions should adhere minimum Bronze rating to get permission (Al-Safat). Issa and Al Abbar, (2015) reported about the initiatives taken by the government in UAE towards green building. AlThuraya Tower, an office building in Dubai Media City has already implemented IoT and AI (13). However the few challenges needs to be addressed which are lack of technical awareness, air quality for occupants, innovation, and sustainable development of green building.

CONCLUSION

From the open literature it is realized that the significance of Green building in the view of energy conservation, better environment, sustainable structure, waste management etc. It is recommended that the rating system for green building should be very exhaustive and include all aspect of well being of human. A field survey on various aspects should be conducted for any particular place will be useful for policy makers. Simultaneously the Renewable energy management needs to be addressed by all the stake holders.

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