

## **Green Building and Sustainable Development: A Review**

Dheeraj sharma<sup>1</sup>, Col Vivek Mathur, Retd<sup>2</sup>

<sup>1</sup>Department of Civil Engineering, Sharda University,

<sup>2</sup>Department of Civil Engineering, Sharda University

*Abstract—The aim of this paper is to explore the concept of feasibility study and economic assessment of a green building project. The phenomenon of global warming or climate change has led to many environmental issues including higher atmospheric temperature, intensive precipitation and increased green house gaseous emission resulting in increased indoor discomfort condition. The green house approach goes beyond reducing energy use or improving indoor air quality, it should actually address the whole system and not only the pieces. The purpose of this paper is to highlight how sustainable materials can contribute to lessen the impact of environmental degradation and how green house concept help to minimize the impact of global warming.*

*Keywords— Sustainable Material, Recycle, Global Warming, Green Building etc.*

### **I. INTRODUCTION**

A green building is that building which in its design, construction and operation, reduces or eliminates negative impact, creates a positive impact on our climate and natural environment. Green building preserves precious natural resources and improves the quality of life. There are number of features which make buildings, green such as efficient use of energy, water and other resources, use of renewable energy such as solar, biogas etc, recycling and reuse of material, pollution and waste reduction measures, use of non toxic material, ethical and sustainable, consideration of quality of life of occupant in design, construction and operation. Selection of construction material which have minimum environmental burden is useful in the sustainable development of building as well as the country. Selecting environmentally preferable building product is an excellent method to boost a building environment performance.

A building has tremendous impact on the environment for an industrial nation, 40% of natural resources are extracted on industrial nation, 70% of electricity, 12% potable water, producing between 45% -65% waste disposals in landfills, 30% of green houses gases due to their operation and additional 18% induced directly by material exploitation and transportation. Sustainable building materials by definition are materials which are domestically created and sourced which decreases transport cost and CO<sub>2</sub> emission. A sustainable building material not just minimizes, transportation costs, carbon emission and in most cases material cost, it also offers employment and skill manpower.

### **II. LITERATURE REVIEW**

**Kolokotroni et al. (2016)** performed the analysis of the impact on energy use of green and cool roofing technique applied to a typical steel goods storage building. Five distinct climates considering local thermal building practice of each region were considered. They studied experimentally that roof with insulation would reduce the thermal energy transfer into a building the most at round 78% more than vegetated roof. He also compared that conventional roof versus green cool roof technique and that toward cool roof has the greatest economic net saving over a period. They found that the use of cool roof on steel ware house building was only likely to produce benefits of energy consumption, operational costs and reduced CO<sub>2</sub> emission. It was found that overall saving was maximum in hot/dry and hot/humid climate where the rejection of solar gain reduced cooling load. [1]

**Wong et al.(2016)** investigates and develops a thermal comfort assessment method for naturally ventilated industrial building. The data was collected through the field survey and there are two groups of data required i.e. objective data and subjective measurement data .The objective measurement measured the air temperature wind speed relative humidity and globe temperature near each occupant (respondent) and noted the activity and the clothing level of responded while the respondent did the subjective assessment. The subjective assessment was formulated into questionnaire form. The recommended Predicated Mean Vote (PMV)level as the minimum passing criteria is PMV -1 to 1. The PMV 0.8 is proposed for the higher-level passing criteria. Building industry consultant can propose innovative method to lower the debit without additional energy consumption.[2]

**Malil et al.(2015)** explored the concept of a feasibility study and economical assessment in a green building project.The benefit of preparation of financial feasibility study enabled the client to decide with considerable confidence whether or not the project is feasible and worth pursuing. They used direct observation method for the study. The environment demand related factor on the criteria of Green Building Index (GBI) are Energy Efficiency (EE), Indoor Environment Quality (EQ), Sustainable Site Planning and Management (SM), Material and Resource (MR),Water Efficiency (WE) & innovation. Similarly for economical assessment factor like saving in materials and energy, Saving in time, Saving in accident/damage etc .improved productivity, change in land use and land values, reduction of waste were considered From this paper for market and financial feasibility study, this project is visible to continue based on the factors of sustainability of the site fulfil the requirement by the authority market need and profitable investment to the clients.[3]

**Umar et al. (2014)** present the selection and eco-friendly material use for the construction of building .Building material are usually selected through the functional technical and financial requirement but in this paper they suggest that the building material are selected on the basis of recycle and reuse and sustainable production of product or use of green resources .A sustainable building material not just minimizes,transport costs ,carbon emission and in most cases material cost, it also offer employment and skill development for local labour.[4]

**Parashar& Parashar (2012)** studied the use of rat trap bond wall technique with insulated cavity wall and room with inclined roof approach having green cover for a residential building. The covering and cavity in wall is filled with wooden powder as insulating material and the outer surface of the wall protected from temperature and rainfall with tile covering. The observation in two conditions i.e. room with green roof and room with bare roof were considered and found the result that the average indoor temperature dropped between 0.6°C to 2.7°C for bare roof and average indoor surface temperature dropped between 4.8° C to 6.9° C with green roof during daytime.[5]

### III. CONCLUSIONS

From the above study we can conclude that sustainable development preserves our environment and avoid the depletion of the natural resources. It also improves the quality of our environment and provides many economic benefits as well, by using sustainable material, reducing energy consumption and improving water efficiency.It is found that green specification enhances the awareness of project team to gain access to resources necessary for sustainable construction.

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