

# Case Report on ECO – Housing System

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**Abstract-Eco Housing / building, which is also known as a sustainable building is designed to meet some objectives such as occupant health; using energy, water, and other resources more efficiently; and reducing the overall impact to the environment. It is an opportunity to use the resources efficiently while creating healthier buildings that improve human health, build a better environment, and provide cost savings. All the development projects lead to over-consumption of natural resources. This leads to serious environmental problems. Green building concept deals with the optimum use of natural resources for the development of infrastructure. The low cost eco-friendly house is the modern construction method which uses locally available material and unskilled labor and also reduces the construction time. Similarly, use of recycled plastic, recycled aggregates and municipal wastes for the construction of pavement has considerable effect on the environment of earth. Another advanced method is the construction of low carbon building which uses sustainable materials like blended cement, compacted fly ash blocks, low energy intensity floor and roofing system, rammed earth walls and stabilized mud blocks etc. This ultimately results in reduction of green house gases which will help to reduce green house effect. This paper presents an overview of application of modern green infrastructure construction technology which makes a significant impact on conservation/proper utilization of resources like land, water, energy, air, material etc thereby reducing the overall cost of construction as well as adverse impacts of climate change.**

## 1. INTRODUCTION

Housing in India varies greatly and reflects the socio-economic mix of its vast population. Housing varies from palaces of maharajas in Rajasthan to modern apartment buildings in big cities to tiny huts in far-flung villages. There has been tremendous growth in India's housing sector as incomes have risen. The housing sector has strong backward and forward linkages to over 250 ancillary industries which include construction workers, builders, developers, suppliers, civil engineers, values, property consultants, furnishers, interior decorators, plumbers, electricians etc. Housing ranks fourth in terms of the

multiplier effect on the economy and third amongst 14 major industries in terms of total linkage effect. After agriculture, the housing and real estate industry is the second largest employment generator in India. The sector is labour intensive and, including indirect jobs, provides employment to around 33 million people. It is estimated that about 70 per cent of these are employed in the structure segment and the remaining 30 per cent in the real estate segment. According to industry estimates, the industry is expected to generate additional employment of 47 million, with the total number of persons employed in the sector reaching 83 million persons by 2022.

## 2. NEED FOR ENERGY EFFICIENT BUILDINGS:

The environmental impact of the building industry is significant. Buildings annually consume more than 20% electricity in India. Urbanized development shifts land usage away from natural, biologically-diverse habitats to landscape that is impervious and devoid of biodiversity- this has adverse effects on the occupant's health and well-being. Conversely, many developments happening in virgin land tend to disrupt ecological balance and natural habitat. Such far reaching effect on our natural environment and personal well-being necessitates action to minimize its impact.

Thus, energy efficient building practices have been evolved, which can substantially reduce or eliminate negative environmental impacts and improve existing unsustainable design, construction and operational practices. As an added benefit, green design measures also reduce operating costs, enhance building marketability, increase worker productivity and reduce potential liability resulting from indoor air quality problems. Studies of workers in green buildings reported productivity gains of up to 16%, including reductions in absenteeism and improved work quality – based on “people- friendly” green design. In other words, efficient design has environmental, economic and social elements that benefit all building stakeholders, including owners, occupants and the general public. Buildings therefore must be designed to, constructed and operated to minimize or eliminate adverse impacts, and enhance positive impacts. Breakthroughs in building design, science and technology are now available to aspiring energy efficient designers, builders, operators and owners, to help maximize both the economic and the environmental potential of their buildings.

3. WHAT IS A GREEN BUILDING?

A green building, also known as sustainable or high performance building, is a structure that is designed, built, renovated, operated or reused in an ecological and resource efficient manner. Though several definitions for sustainability are available, the definition suggested by the then prime minister of Norway, Gro Brundtland in 1987 – “meeting the needs of the present without compromising the ability of future generations to meet their needs” is considered as simple and effective.

Important features of a green building can be listed as:-

- a) Use of fly ash ready mix concrete or light weight concrete / cavity walls for insulation and sustainability.
- b) Use of roof insulation method like expanded polystyrene roof insulation or reflective painting etc.
- c) Recycling of wastewater for landscaping and use of fluidized aerobic bio-reactor sewage treatment plant.
- d) Landscaping with endemic plants which require less water and pesticides.
- e) Use of energy efficient lights like CFL and structures, maximizing use of natural light by design and orientation of building.
- f) All a/c to be CFC free.
- g) Rain water harvesting measures with zero drainage to municipal drains.
- h) Use of renewable energy like solar and wind energy sources.
- i) Installation of CO2 monitors in the buildings and regular check on them.
- j) Parking should be preferred to reduce heat island effects.
- k) Separate dustbins for recyclable and non-recyclable waste

A green building is so designed that it would use minimum energy of what is supplied to it by the grids. Instead it employs the harnessing of natural resources such as sunlight, wind, rain etc to meet its needs. Utmost care is taken that the energy generated and water harvested successfully meets the demands of the residents or employees. A green building is not only environmentally responsible but it also considerably reduces expenses in the long run and hence economically responsible.

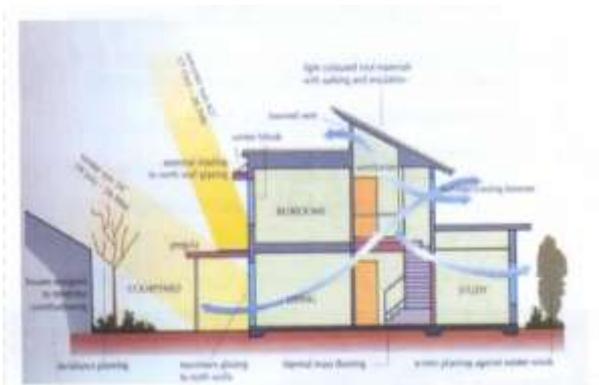


Fig: green building

4. RESULTS AND DISCUSSION

Points Achieved Eco-Housing Rating

POINTS-ACHIEVED	ECO-HOUSING RATING
1. 500	★
2. 500-600	★★
3. 601-700	★★★
4. 701-800	★★★★
5. >800	★★★★★

5. CONCLUSION

Eco-housing are healthy, energy-efficient buildings that increase natural light, incorporate high performance systems and improve air flow for occupants. Natural lighting insulated walls, heat reflective tiles and double glazed windows in the building results in substantial savings in energy consumption. The concept of eco housing rating has come in focus due to raising concerns about the effect of the constructional activities on the environment, the need of creating an energy efficient building with maximum utilization of natural resources like solar, wind energy, recycling of water have been felt. There are various rating practices used for green building

GRIHA (Green Rating for Integrated Habitat Assessment)

IGBC (Indian Green Building Council)

BEE (Bureau of Energy Efficiency)

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