

# A COMPREHENSIVE REVIEW ON LOW COST BUILDING SYSTEMS

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**Abstract** - *Low Cost Housing is a different concept which deals with effective costing and following of techniques which help in reducing the cost construction through the use of faraway available materials beside with and technology improved skills without losing the power, performance and life of the structure. There is huge misconception that low cost housing is suitable for only subnormal works and they are built by using cheap building materials of low quality. The fact is that Low cost housing is done by proper management of resources. Economy is also achieved by postponing finishing works or implementing them in phases. Cost of reduction is achieved by selection of more efficient material or by an improved design. Construction of low cost housing by using the low cost construction materials increases the access to buildings by low income group peoples. Advantages of low cost building materials are pollution prevention, Reducing Energy Consumption and use of Natural materials, Use of Local material, Energy Efficiency, Use of non-toxic building materials, Longevity, durability and maintenance of building material, Recyclability and reusability of building material and Biodegradability. The reviews on various low cost building designs and management are presented in this paper.*

**Key Words:** -Low cost, Building materials, Construction.

## 1. INTRODUCTION

Low cost housing can be achieved by use of efficient planning and project management, low cost materials, economical construction technologies and use of alternate construction methods available. The profit gained from use of such methods can decrease the cost of construction and make the low cost housing accessible to all. Affordable housing is a general term used to define housing that is affordable to lower or middle income households. Low-cost housing projects are characterized by an increasing demand mainly due to urbanization. The selection of building materials

should meet the needs of local circumstances to improve value of life for the most desired ones by building innovative structures and/or by refining existing structures. Sustainability regarding urban housing intends to progress new approaches to succeed human settlements and integrate energy and environmental issues.

To achieve a sustainable housing project is required a balance of environmental, economic and social issues with technical issues. Findings show that up to 60 % of the total cost of a low-income housing project is allocated to engineering project and construction materials. Moreover, walls organize up to 50% of a total cost of resources and up to 45% of total building time. Material source, manufacture techniques and labour requirements all have major impacts on the selection of wall building material. The main objective of this paper is to give detailed review on low cost building design, planning, selecting proper building material and construction.

## 2. REVIEW ON LOW COST BUILDING

**VivanW.Y.Tam (2011)** carried out study on cost effective of using low cost housing Technologies in construction, it is observed that construction methods of foundation, walling, roofing and lintel are compared. Strength and durability, safety and mental satisfaction are factors that assume top priority during cost reduction. It is found that about 26.11% and 22.68% of the building cost can be saved by consuming low cost housing technologies in assessment with the traditional construction methods.

**Kuo-Liang Lin (2011)** carried out study on Human Resource allocation for remote construction projects, it is observed that when allocating human resources for the management team of distant projects

sites, these firms have the strategies between assigning regular staff and hiring local temporary employees. This paper first proposes a decision making model for human resource allocation in remote construction cost. The case study results show that regular project administrators, who are able to reduce managerial flaws and cut down project losses, are favored over local ones.

**F.Pachecotorgal et al (2012)** carried out study on Earth construction and Building materials, it is observed that in this paper earth construction has a major expression in less developed countries, on the other hand the mimetic temptations near more poisoning construction techniques based on reinforced concrete and bricks that fired up are likely to favor a change near a clear unsustainable design. In order to disclosure and highlight the importance of earth construction this article reviews some environmental benefits such as non-renewable resource consumption, waster generation, energy consumption, carbon dioxide emissions and indoor air quality.

**Tomas.U.Ganiron et al (2014)** carried out study on Prefabricated Technology in a modular home, it is observed that one of interesting perceptions in the study is that prefabricated components has a significance change in the terms of a construction cost as relate to the old-fashioned methods due to the materials and fast band short time duration of construction.

**Swaptikchowdhury et al (2013)** carried out study on Prospects of low cost housing in India, it is observed that in this paper alternative construction materials mainly natural material such as bamboo, straw, usage of Bagasse –cement boards and panels, bagasse –PVC boards, Coir-CNSL board, Jute coir composites, coconut and wooden chips roofing materials, Manmade materials like fly ash, aerocon panels, ferro cement, rice husk were studied and the potential of these materials to be used as alternate building materials is brought out.

**R.Caponetto et al (2013)** carried out study on Ecological materials and technologies in low cost building systems, it is observed that the high recyclability of natural materials that can be used in low cost building associated with construction techniques capable of exploiting the principles of bioclimatic architecture for liveliness needs allow us to create building environmentally conscious and responsible. At the same time the project of a special block was developed to meet the needs of sustainability and ease of construction.

**Sengupta Nilanjan et al (2013)** carried out study of appropriateness of cost effective building construction technologies, it is observed that this paper studied the acceptability and adaptability potential of different cost effective building constructions through field survey, literature study and technical calculations and tried to find out the most appropriate one among those.

**Mohannad sharif zami et al (2010)** carried out study on Economic benefits of contemporary earth construction in low cost urban housing state, it is observed that stabilized earth is an alternative building material on each continent and in each age. This article reviews and argues the economic benefits of using earth as a building material and describes the associated construction techniques for urban housing provision in developing countries.

**John M.Hutcheson (2011)** carried out study on project management of low cost housing in developing countries, it is observed that the study of this paper include designs, cost control systems, communications , contract law and planning. An appreciation of the evidence compounded from the problems portrayed throughout the paper leads to decisions of the need for simplifications of designs, the impact of inadequate local support and hence the need for detailed and complete advanced planning. In addition the conclusions stress the need for the careful collection of self-supportive teams of multi-disciplined professionals and sub professionals.

**Iwuagwu ben ugochukwu et al (2015)** carried out study on Local building materials, it is observed that the paper recognizes the problem of inadequate housing as a critical challenge to sustainable urban growth and cities development. Extensive use of recycled materials help conserve restores and preserves the ecosystem. Green buildings wastes management ensures resources and energy efficiency. The closeness of materials saves cost and decreases pollution by fuel through transportation.

**David William Dobson et al (2013)** carried out study on Sustainable construction, it is observed that the objective in this paper were to found if there is a belief within the commerce that sustainability means increased cost and to investigate whether using sustainable construction methods save money by reducing a building carbon output and running costs. Following the literature survey, a questionnaire survey has been carried out to canvas opinions within industry. This paper will benefit customers and designers as they can see how integrating sustainability into new buildings will enable big savings on utility and maintenance costs once the building is operational.

**Bredenoord J (2016)** carried out study on sustainable Housing and Building Materials for Low-income Households; it is observed that sustainable goals for low-cost housing and applications are achievable. Measures concerning the physical development of neighborhoods, such as urban density and connectivity are equally as important as measures concerning community development. The final comprise support for community built organizations, small housing cooperatives (or similar forms of cooperation) and individual households – or small groups – that build and increase their houses incrementally. Adequate design and social organization and support are preconditions for achieving sustainability in incremental housing.

**Preetpal Singh et al (2016)** carried out study on Low Cost Housing: Need For Today's World; it is observed that Construction cost in India is increasing

at around 50 per cent over the average inflation levels. It have enumerated increase of up to 15 per cent all year, mainly due to cost of basic building materials such as steel, cement, bricks, timber and other inputs as well as cost of labour. As a result, the cost of building by means of conventional construction materials and construction is becoming beyond the affordable limits particularly for low-income groups of population as well as a big cross section of middle - income groups. So, there is essential to adopt cost-effective construction methods either by up-gradation of traditional technologies using local resources or applying current construction materials and methods with well-organized inputs leading to economic solutions. By using Low Cost Housing Technologies, we can reduce approx. 25% of the total cost of housing.

**Felix Raspall at al (2016)** carried out study on Building from End-of-Life: An Alternative Approach for Low-Cost Urban Housing, it is observed that Our research investigates the possibilities of beating into the life cycle of construction materials as a basis of unexploited construction components for low-cost housing. In the informal city, a market of salvaged materials is already in place. Though, in the urbanized world, reuse practices in construction are characteristically dismissed. This research contributes with strategies to secure very low-cost housing units consuming reused construction components, focused on the functional, aesthetic and economic aspects.

**Rinku Taur et al (2009)** carried out study on Low Cost Housing, it is observed that, This paper goals to argument out the various aspects of prefabricated construction methodologies for low cost housing by highlighting the different prefabrication techniques, and the economical advantages accomplished by its adoption. In a building the foundation, walls, entries and windows, floorings and roofs are the most important components, which can be analyzed individually based on the needs thus, improving the speed of construction and dropping the construction cost. The major current methods of construction systems considered here are namely, structural block walls, mortar fewer block walls, prefabricated roofing

components like precast RC planks, precast hollow concrete panels, precast concrete/Ferro cement panels are considered.

**B Bakhtyaret al (2009)** carried out study on A Review on Low Cost Housing Process in Malaysia, it is observed that, The results confirmed that making balance between low income obligations and developer's profit-making is the key element for building more LCH in the country.

**Dhiraj B Tapkir et al (2012)** carried out study on Study And Analysis Of Low Cost Housing Based On Construction techniques, it is observed that, there are three factors that affecting the cost of house ie., time, materials used and techniques. In this paper different methods were discussed for cost control and reduction.

**Ali Haider Jasvi1 et al (2015)** carried out study on Sustainable Use Of Low Cost Building Materials In The Rural, it is observed that, The main challenge is to use the materials in structural constituent for low cost housing and their adaptation to influences like – technical, social, ecological, physical – through different products. It encounters the idea about the need of housing in country side India and explains different uses of materials and the techniques of building construction for LIG people, urban poor's in different aspects of building. It covers the use of local materials in the building to reduce cost and it makes affordable houses for low income people.

### 3. CONCLUSIONS

Housing is one of the basic needs of mankind in terms of safety, security, self esteem, social status, cultural identity, satisfaction and achievement. After analyzing various methods for low cost building systems, the best method to adopt is using natural materials, renewable materials, eco friendly building materials used, using locally available materials and minimizing the resource allocation and innovative methods can implemented to reduce the cost and to achieve sustainable and Green building.

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