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Planning of Affordable Housing for Slum Rehabilitation – A Review Approach

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***Abstract:** This has been mainly attributed to shortage of public funds. However, some urban areas in these countries exhibit vibrant real estate markets that may hold the potential to bear the costs of regenerating slums. This paper sheds light on an innovative hypothesis to achieve slum regeneration by using waste products or affordable materials. The study seeks to answer the question "How can urban public policy facilitate slum regeneration, increase affordable housing".*
***Keywords:** Affordable Housing, Slum Rehabilitation, Zero Waste Concepts.*

I. INTRODUCTION

The increasing population and urbanization, there is an increased demand for shelter. This demand has led to an increase in demand for construction materials.This excess demand compared to the supply is causing lack of cement and other construction materials, leading to an increase in construction costs and depletion of natural resources. Disposal of large quantities of industrial waste on land is posing a great threat to the environment, leading to cause some serious geo-environmental issues of pollution of land, water, and air.

According to an estimate, by the year 2025, the annual generation of solid waste is likely to reach 19 billion tons. Government has also taken initiatives such as fly ash mission for increasing the use of fly ash for various applications. Non availability of good quality raw materials started affecting the quality of products, for example, the quality of bricks in urban areas. Presently, fly ash is available at almost 40%-50% less than the cost of ordinary Portland Cement, and GGBFS is about 50%-60% of the cost of ordinary Portland cement. Increased use of these materials in cement composites will not only reduce the overall cost of the material but also help the end user in Leadership in Energy and Environmental Design (LEED) certification [1].

Materials used in construction like: Fly ash, Ready mix plaster, Masonry bricks and blocks, Wall panels, Micro-concrete and repair material, Grout material, Tile base material, Tile adhesive material .

The activity of utilizing waste from one industry, converting it into useful raw material, and using it in a best way to solve a range of environmental waste problems is an excellent Example of sustainable waste management. This will help in reducing the liabilities in land occupied by all these industrial wastes. Blending supplementary cementations 9.3 Concluding remarks 195 materials to produce blended cements and cement composites will not only reduce the raw material required for manufacturing cement but also help to conserve the environment. Reduction of cement content in cement composites will reduce carbon emissions and energy consumption in cement production [2]. The disposal of plastic wastes is major environmental concern worldwide. The plastic segregation at the source itself is the most important step in managing plastic waste Low-cost housing can be considered affordable for low and moderate-income earners if household can acquire a housing unit "owned or rented" for an amount up to 30% of its household income. In developing countries such as India, only 20% of the population are high-income earners, who are able to afford normal housing units. The low-income peoples are not able to afford the housing facility [3].

A low-cost house is designed as anyone who have low income can afford it, or with the any other house with regard to foundation, structure and strength. The cost of house can be reduce with the use of locally available building materials and techniques that are durable, economical and accepted by the user that not require costly income . By working together, it is possible to create more affordable housing options and ensure that everyone has access to safe and affordable housing. One important consideration when introducing affordable housing is ensuring that the housing units are of high quality and meet basic health and safety standards. This includes adequate ventilation, sanitation, and access to clean water and electricity. It also involves providing safe and accessible living environments that are free from environmental hazards. Another important consideration is ensuring that affordable housing is located in areas with access to public transportation, employment opportunities, and community services such as schools, healthcare facilities, and recreational spaces. This can help reduce transportation costs and improve quality of life for residents [4].

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To make affordable housing more accessible, governments may also implement zoning regulations and land use policies that require a certain percentage of new developments to be designated as affordable housing units. This can help ensure that low-income households have access to affordable housing in areas with high housing costs and limited availability. In India the population growth and urbanization is protected to 2.5 billion people to the world's urban population in 2015 with nearly 90% of the increasing concentrated in Asia and Africa.

II. LITERATURE REVIEW

A. General Introduction

A literature review is a document or section of a document that collects key sources on a topic and discusses those sources in conversation with each other (also called *synthesis*) it involves an in-depth analysis of scholarly articles, books, and other published sources related to the research question.

1) Use of Industrial Waste for Value Added Products (2023)

Non-availability of good quality raw materials started affecting the quality of products, for example, the quality of bricks in urban areas. A lot of construction and demolition debris are occupying valuable land in urban areas. Moreover, the increase in industrial production increased waste generation many-fold. This not only created the problem of disposal without any environmental hazard but also started polluting water resources and air. This is leading to lot of health issues and has started affecting the climate. In this chapter, we will examine the various wastes generated and its utilization for value-added products Cement is the most abundantly used material per capita after water. This use of cement is highly energy intensive and produces lot of greenhouse gases. Hence, for sustainable development, an attempt should be made to reduce consumption or reduce the natural raw materials used in its production. Use of the following industrial wastes in cement and its composites will be of immense help in achieving this objective.
The activity of utilizing waste from one industry, converting it into useful raw material, and using it in a scientific way to solve a range of environmental waste problems is an excellent example of sustainable waste management. This will help in reducing the liabilities in land occupied by all these industrial wastes. The disposal of plastic wastes is a major environmental concern worldwide. The plastic segregation at the source itself is the most important step in managing plastic waste.

2) A localized Adaptive Comfort Model for Free-running Low-income Housing in Mumbai, India (2023)

Despite the significance of low-income housing in the national policy and efforts geared toward creating thermally comfortable homes, thermal comfort research within the Indian Li-H is scant. Investigating thermal comfort conditions within Li-H of India to identify optimal comfort ranges, particularly in urban megacities where the demand for affordable housing is rapidly increasing, is central to the national goals of improving built environment sustainability as well as the health and well-being of urban low-income dwellers. This study aims to bridge this gap by proposing a bespoke Li-H adaptive comfort model for the Indian context. The major objectives of this study are as follows.

a) To evaluate thermal sensitivity and comfort temperature ranges for low-income dwellers.
b) To analyze the occupant factors that affect thermal comfort conditions.
c) To propose an adaptive thermal comfort model for low-income populations for improving building design and operations.

Mumbai being one of the largest and most densely populated urban areas in the world has been unable to cope with the rapid increase in its population. Over half of the city’s population, 9 million have been living in the slums under impoverished circumstances. The recently launched Mumbai Climate Action Plan identifies thermally comfortable affordable housing and energy equity as the key priority areas for achieving net-zero targets in the building sector.

3) Effective Management of Slums Case study of Kalaburagi city, Karnataka, India (2020)

Housing is one of the basic needs of human beings, next to food and clothing. It is an essential element in the overall socioeconomic development of a country and its citizens, and for the satisfaction of social and cultural aspirations of people. The problem of housing shortage confronting us today seriously threatens to upset the political and social order since, with each successive Five Year Plan, the gap between demand and supply has only been widening. It is expected that by the year 2051, the population of India will be almost equally distributed between urban and rural areas, with major cities and metro cities attracting a major portion of the country's rural population, thus aggravating the demand for urban housing. As the report of the Technical Group shows, the shortage of housing is most acutely felt by the lower economic strata of the population.

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According to the report, the estimated housing shortage works out to be 10.49 million for Economically Weaker Section (EWS) households, which is 56.18% of the total housing shortage in urban India. Similarly, for Low Income Group (LIG) households, the shortage works out to be 7.36 million, which constitutes 40% of the total shortage. In order to improve the quality of life in urban areas, it is of critical significance that the housing stock is improved through urban renewal, in situ slum improvement and development of new housing stock in existing cities as well as new townships.

'Kalaburagi' (Formerly Gulbarga), which means a stony land in Kannada, is a growing city situated in the north-eastern part of Karnataka State.

It is the administrative headquarters of Kalaburagi District. Kalaburagi city has an area of 64.00 km2 . Kalaburagi is known for its historical monuments built during the reign of the Bahamani kings. More importantly it is a commercial hub for the Hyderabad-Karnataka region.

4) Insecure Property Rights (2020)

In 2011, 12.4% of India's urban housing stock, or 11.1 million dwelling units, were empty. It is perplexing that there are a lot of abandoned homes, high housing costs, and a severe 18.8 million-unit housing shortage. Cities in China and Mexico also have a lot of open positions. 3 Cities all across the world are experiencing a serious scarcity of housing, therefore the problem of vacant housing - the ostensible reverse of a shortage has received attention. We demonstrate how insecure property rights contribute to India's paradoxical high rate of empty houses in the face of a severe housing need. A rental agreement between a landlord and tenant is a distribution of rights in an efficient market. The Census of India is the main source of information about empty homes. The instruction handbook for House listing and Housing census enumerators defines unoccupied houses for the 2001 and 2011 censuses as follows: "If a Census house is found vacant at the time of House listing .The Census of India offers information on tenure as well, classifying inhabited homes as owned or rented. The pro-tenant rent control and the underdeveloped governmental capacity for contract enforcement are two potential causes of urban empty housing in India that are examined in this study. The district serves as our observational unit. Counties are compact We discover two explanations for vacancy rates: the extent of the infrastructure for contract enforcement and pro-tenant rent control regulations. In order to show a connection between pro-tenant rent control laws and vacancy rates in districts between 2001 and 2011, we take advantage of changes to the rent control laws in the Indian states of West Bengal, Karnataka, Gujarat, and Maharashtra. Our findings indicate that a pro-landlord policy change that eases rent adjustments may be able to lower housing vacancy by as much as 2.8 percent.

5) The Potential and Current status of Earthen Material for Low-cost Housing in Rural India (2020)

The rural economy in India constitutes 46% of the national income, which is significantly higher than in many other countries in the world. In the outcome of a survey carried out by the World Bank, providing better opportunities to low-income families in rural areas was considered important to achieving shared prosperity in India, and it has been prioritised over providing opportunity to low-income families in urban areas. The government of India is actively working towards the provision of houses in rural areas under the scheme of 'Pradhan Mantri Awaas Yojana -Gramin (PMAY-G)'. To achieve PMAY-G's aims of housing for all by 2022, the government has identified (in 2016) a need for 29.5 million houses for low-income rural households by 2022. With 10 million claimed to be built so far (2018), the implementation is far from the announced goal.

6) Methods of using Low Cost Housing (2018)

To maintain good health, a person needs a suitable place to call home for the duration of their lives. One significant aspect of one's existence is this. Contrary to popular belief, India does not have a wide variety of housing options. adequate according to estimates provided by the Indian Government's Ministry of Housing and Urban Poverty Alleviation. With a population growth rate of 1.64% annually compared to the global population growth rate of 1.23% over the past ten years, there will be a high demand for housing in the years to come. The Pradhan Mantri Awas Yojana , also known as the Prime Minister Housing for All Mission, was launched in 2015 with the goal of giving everyone access to housing by the 15th of August 2022.

The goal is to construct 20 million homes .Seeing the significance of affordable housing in nations with a wide range of living standards and a large population to serve considering the availability and usage of natural resources in construction, the possibility of affordable housing needs to be thoroughly investigated. To estimate the cost decrease, several investigations have been pilot projects. If only roofing and walling were examined separately for low-cost solutions, savings would have been 26.11% and 22.68% Prefabrication and partial prefabrication are concepts that have been implemented for quicker construction, higher quality components, and cost and material quantity savings.

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Several of the frequently used building methods and materials for walls and roofs have been detailed in more detail. Overview of various methods used to modify specific designs and materials utilised To cut costs without sacrificing the strength of the building, many strategies are used for various building components .Inside a wall-Rammed earth, regular bricks, soil cement blocks, hollow clay blocks, dense concrete blocks, small, medium, and room-size panels, among other materials, are all utilised in the construction of walls. Although bricks are still the foundation of the construction industry, the quantity of bricks used in actual construction.

7) Slum Development Zero Waste Concept (2016)

Unfortunately, slums are increasingly posing a serious threat to the entire world, especially developing nations. Slums keep expanding uncontrollably due to rising inequality and an uneven distribution of resources. At least 1 billion people, or 18% of the world's population, reside in densely populated parts of inner cities and in illegal slum settlements, often known as slums that surround major cities in less developed nations.

Slums have long been viewed by politicians and planners as lacking in any sort of physical or social quality. Home-less people were frequently characterised as dirty, criminal, unproductive, and indecent. The official position was that these squatter camps should be demolished and replaced with mass-produced, minimally liveable dwelling units constructed in accordance with tightly enforced urban plans. This approach has been shown to be ineffective because it just encouraged the growth of new slums because the living conditions of slum dwellers remained the same and they continued to lack any sense of loyalty.

8) Cost Effectiveness using low cost Housing Technologies (2011)

Low cost housing is a new concept which deals with effective budgeting and following of techniques which help reducing construction cost through the use of locally available materials along with improved skills and technologies without sacrificing the strength, performance and life of the structure. Low cost housing technologies aim to cut down construction cost by using alternatives to the conventional methods and inputs. It is about the usage of local and indigenous building materials, local skills, energy saver and environment-friendly options.

It is found that cost-effective and alternative construction technologies, which apart from reducing construction cost by the reduction of quantity of building materials through improved and innovative techniques, can play a great role in providing better housing methods and protecting the environment. It should be noted that cost-effective construction technologies do not compromise with safety and security of the buildings and mostly follow the prevailing building codes. The construction methods of walling and roofing are selected for the detail cost analysis based on available resources from the interviews. Table 1 and Table 2 summarise the cost analysis of the traditional construction methods and the low cost housing technologies in the case studies for walling and roofing respectively. It is found that about 26.11% and 22.68% of the construction cost, including material and labour cost, can be saved by using the low cost housing technologies in comparison with the traditional construction methods for walling and roofing respectively.

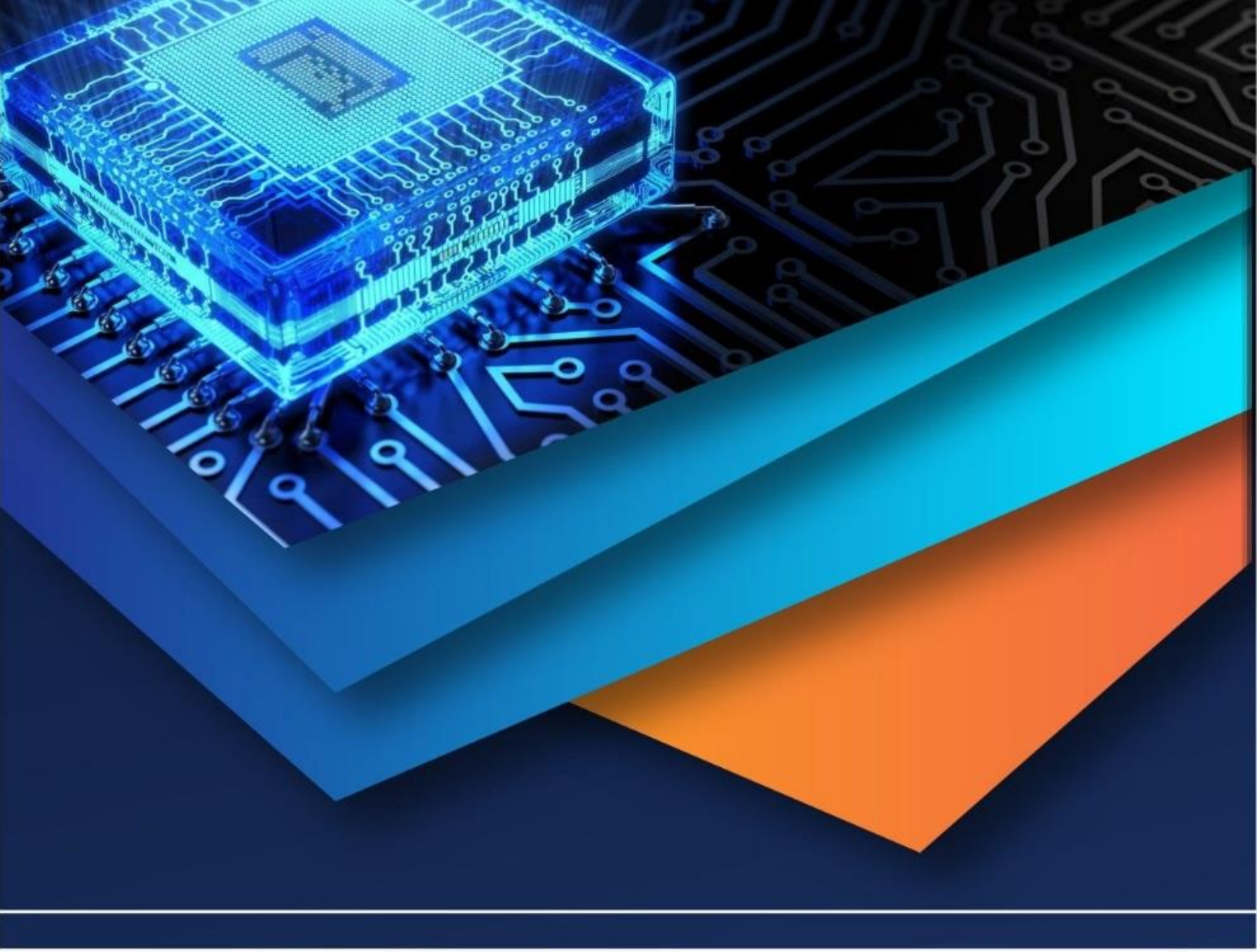
III. CONCLUSION

Living in the slums is a challenging life, and lack of land tenure and fear of evictions do not make that life easier. Although there is a will to improve people’s lives, many suffer because their opinion is not taken into consideration. As the years have passed, the slums have only gotten bigger.

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