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Optimizing Housing Solutions for Slums: A Study of Design, Material and Techniques

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NEED FOR TOPIC:

India's cities are overflowing with the urban poor. Slum development and migration are two unavoidable signs of urbanization. Slums are not a recent development; they have existed on ground for a very long time, though not exactly on paper. According to the 2011 Census, 13.7% of Indians living in urban areas were poor. People from struggling rural communities still move in great numbers to urban areas. India has a higher percentage of the urban population living in slums than the rest of the world according to a UN statistic. Between 2014 and 2050, 404 million more people are expected to live in urban areas across the country. Additionally, the latest three-year action plan produced by NITI Aayog to promote urbanization in the nation identifies affordable housing as a major challenge and places a strong emphasis on the expansion of social housing as a solution. Recognizing the need for inexpensive housing close to the city core, it suggests releasing underused or violated urban land owned by the federal and state governments. Slums do not exist officially and are neither reflected on maps, taxes are not collected and basic services, and infrastructure is rarely provided. As the urban poor continue to grow in number, there is a growing need to revisit the very causes that lead to formation of slums in urban areas. There is a rising recognition that government programs like housing schemes or direct provision alone are not sufficient to house urban poor. This implies a growing need to analyze the gaps between goals of social housing policies and needs and thoughtful choices of urban poor. While slum upgradation may not always be solution, but neither is slum resettlement in locations far- off from city core. An approach that asserts to understand the demands of slum dwellers and provide them with housing options accordingly is necessary.

ABSTRACT

The issue of slums is a global problem that requires immediate attention. The redevelopment of slums involves the demolition of old structures and building new ones using modern design, materials, and techniques. A study of these aspects is essential to ensure that the new housing is sustainable, affordable, and meets the needs of the residents. Design plays a crucial role in the redevelopment of slums. The new housing must be functional, aesthetically pleasing, and provide adequate living space for the residents. Materials used should be durable, cost-effective, and environmentally friendly. Techniques employed must be efficient and safe. By studying these elements, we can create better homes for those who need them most.

Introduction:

Slums are a significant problem in many urban areas worldwide. They are characterized by inadequate housing, poor sanitation, and a lack of access to basic services such as water and electricity. Redevelopment of slums has become an essential aspect of urban planning to provide decent living conditions to people living in such areas. This research paper aims to study the design, materials, and techniques for housing in slums. Slums are a common sight in many developing countries, and they often lack basic amenities such as clean water, sanitation, and electricity. Redevelopment of slums is an important issue that needs to be addressed to improve the living conditions of the people living in these areas. This presentation will focus on the study of design, materials, and techniques for housing in slum redevelopment projects. Background: Slums are a result of rapid urbanization and migration from rural areas to cities. In India, slums occupy around 5% of the urban land area, and about 65 million people live in such areas. Slum redevelopment programs in India have been undertaken since the 1950s, but the success rate has been low due to various factors such as lack of funds, political interference, and inadequate planning. In summary, the redevelopment of slums requires careful consideration of various factors including design, materials, techniques, community participation, and infrastructure. A holistic approach is necessary to ensure that the housing units are sustainable and provide a comfortable living environment for the residents.

Design Considerations

The use of natural materials such as bamboo, mud, and straw can provide insulation, reduce heat, and promote ventilation. The incorporation of green spaces and communal areas can also enhance the quality of life for residents. Designing housing for slums requires a different approach than conventional housing. It should be affordable, flexible, and adaptable to meet the needs of the residents. The design should take into account the local climate, culture, and social needs of the community. The use of natural light and ventilation can reduce the need for artificial lighting and cooling. The design should incorporate open spaces for community activities and provide access to basic services such as water, sanitation, and healthcare. The design of housing units in slums should be carefully planned to maximize space utilization and ensure the comfort of residents. It is important to consider the needs of the residents, including the number of family members, their age, and their occupations. The design should provide for natural ventilation, adequate lighting, and safe and easy access. The design of housing in slum redevelopment projects needs to take into account several factors such as space constraints, ventilation, natural lighting, and privacy.

One approach is to use modular designs that can be easily adapted to different site conditions. Another approach is to incorporate green spaces and community areas to enhance the quality of life of residents.

Materials and Techniques

The choice of materials and construction techniques plays a crucial role in the success of slum redevelopment projects. Local materials and traditional building techniques can be used to create affordable and durable housing. For example, compressed stabilized earth blocks (CSEBs) made from soil, sand, and stabilizers such as cement or lime can be used to build walls that are strong, durable, and environmentally friendly. Other techniques such as prefabrication and modular construction can also be employed to speed up the construction process. : Materials used in housing for slums should be cost-effective, durable, and easily available. Local materials such as bamboo, mud, and thatch can be used to build houses. The use of recycled materials such as plastic bottles and tires can reduce construction costs and waste. The use of prefabricated materials such as concrete panels and steel frames can speed up construction and reduce labor costs. : Materials used in housing for slums should be cost-effective, durable, and easily available. Local materials such as bamboo, mud, and thatch can be used to build houses. The use of recycled materials such as plastic bottles and tires can reduce construction costs and waste. The use of prefabricated materials such as concrete panels and steel frames can speed up construction and reduce labor costs.

Innovative construction techniques can be used to build housing for slums. The use of modular construction can reduce construction time and costs. The use of 3D printing technology can produce housing components quickly and precisely. The use of eco-friendly techniques such as rainwater harvesting and waste management can reduce the impact on the environment.

MATERIALS

-AERATED AUTOCLAVE CEMENT (AAC)

Autoclaves are machinery that adjust the temperature and pressure to alter the physical and chemical properties of the objects placed in them. AAC is made from gypsum, lime, quartz sand, water, and aluminum powder. It is then heated in an autoclave, where the necessary heat and pressure are applied to give the blocks structural integrity. They are heat-safe and lightweight, and thus used for both exterior and interior walls. The material is eco-friendly as it creates 30% less waste than normal concrete

-AEROCON PANELS

Made of two fiber-reinforced cement sheets, Aerocon panels are inorganic sandwich panels that are glued together. Environmental friendliness, speedier construction, no wet plastering, on-site curing, lightweight, high thermal insulation, fireproof, phenomenal sound decrease properties, water, and termite and climate-safe, movable, thin walls (space-saving), smooth finish, minimal foundation or ground preparation needed, and straightforward functionality are all attributes of the property.

-CEMENT CONCRETE HOLLOW BLOCKS:

Cement Concrete Block is a recently developed masonry unit of concrete. It works on the rule of densification of a lean concrete mix to make an ordinary formed, uniform, superior brickwork unit. They are a practical and better option

in contrast to consumed burnt clay bricks because of their great toughness, imperviousness to fire, fractional protection from sound, warm protection, small dead load, and high-speed construction.

Community Involvement

Community involvement is vital in slum redevelopment projects. Residents should be consulted and involved in the decision-making process to ensure that their needs and preferences are taken into account. In addition, training programs can be provided to teach local residents construction skills, which can create employment opportunities and empower the community to take ownership of the project. Community participation is crucial in the redevelopment of slums. This involves working with the residents to understand their needs and preferences, and involving them in the planning and construction process. This can help ensure that the housing units meet their requirements and are sustainable in the long term.

Infrastructure

Along with housing units, it is also important to provide necessary infrastructure such as water supply, sanitation, electricity, and healthcare facilities. This can help improve the overall living conditions of the residents and promote their well-being.

Challenges and Solutions

There are several challenges that need to be addressed in slum redevelopment projects. These include land tenure issues, lack of funding, and resistance from local authorities. To overcome these challenges, partnerships can be formed between government agencies, non-governmental organizations, and private sector companies. Innovative financing models such as microfinance and social impact investing can also be explored.

Conclusion

Inconclusion, slum redevelopment projects require a holistic approach that takes into account the needs of the community, the environment, and the economy. By incorporating sustainable design, local materials and techniques, community involvement, and innovative financing models, we can create affordable and dignified housing for those living in slums. Redevelopment of slums is not just about improving physical infrastructure but also about creating a sense of community and belonging for those who have been marginalized. It is our responsibility as global citizens to work towards a world where everyone has access to safe and decent housing. : Redevelopment of slums requires a holistic approach that involves the community, local government, and private organizations. The design, materials, and techniques used in housing for slums should be affordable, flexible, and sustainable. The success of slum redevelopment programs depends on effective planning, community participation, and political will. By providing decent housing to people living in slums, we can improve their living conditions and contribute to the overall development of cities.

REFERENCES

https://issuu.com/prafullamishra02/docs/best-affordable_housing_projects_

https://architecturenow.co.nz/articles/affordable-housing-issues-captured-in-new-book/

https://designcitylab.com/post/publications/book-review-how-to-build-an-indian-house

https://www.re-thinkingthefuture.com/designing-for-typologies/a2687-10-examples-ofaffordablehousing-designs-in-india/

https://www.huduser.gov/portal/casestudies/study-020321.html https://accommodationtimes.com/upgrade-slums-expand-rentals-to-ease-urban-housingcrisis-indeveloping-countries-report/