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Sustainable Slum Development

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Abstract: *The rapid urbanisation of the previous century increased the number of slum communities, which had a variety of negative effects and is today considered a severe problem for developing countries. This research highlights the difficulties of slum development that must be overcome to increase the potential and capacities of slum dwellers. By giving people the opportunity to participate in a "Learn to Earn Program," the slum will stop being a drain on the economy and instead become a driver. Slums are becoming an inescapable fact of life in many nations, especially in emerging nations. Although there are many slum upgrading strategies and techniques to alleviate urban poverty in emerging nations, the issue is only projected to become worse. In fact, the number of slum inhabitants has increased. Other governmental strategies that attempted to remove slums failed to consider the resources and opportunities that slums present. This is a reference to the requirement to modify the methods used in the development processes. Slums have negative effects on the environment and natural resources in addition to the issues they bring to humans. From this perspective, sustainable development is the primary means of achieving a genuine boom in the developing world, which confirms the necessity of improving slums holistically. As a result, this article embraces the idea of investing in the community's good features while also creating a comprehensive framework based on the three sustainability pillars of the economy, society, and environment.*

Keywords: Sustainable slum, urban slum, neighbourhood, decentralisation, planners.

I. INTRODUCTION

The development of slum dwellings is covered in this chapter. In the study literature, the reasons for expanding slums are addressed, and the characteristics of slums are also given. These slum characteristics and resources spark a debate about how to make slum existence sustainable. The conventional approach to the modernist approach, sustainable policy for the betterment of slums, and self-regulatory actions among residents of slum regions are all hot topics of discussion among scholars who are working on the sustainable development of slums. An overview of three theories found in the literature that address the complex issues of slum living and its sustainable development is provided. Critical discussion is also had on the many strategies that may be used to make slum living more sustainable.

II. METHODS

Many of the measures adopted to solve the problems in slums did not consider the resources supplied by these slums, and many slums have shown difficulty dealing with them for a variety of reasons, including a lack of land, financing constraints, and/or the challenge of providing infrastructure. Furthermore, many measures that have been put into place as part of various slum development projects neglect to consider sustainability over the long term. The purpose of this essay is to implement the sustainability plan, which has three pillars, by identifying these unofficial groups and participating in their positive aspects. The study initially discusses the benefits of slum communities to leverage their vibrant traits to go toward this aim. Second, the analysis is built on a strategy that considers the economy, society, and environment as the three pillars of sustainability. Many poor countries are the source of these efficient methods. Successful strategies have been derived from Egypt, India, the Philippines, Brazil, Nepal, Indonesia, and Kenya. Case studies were chosen to examine every aspect of the study methodology that resulted from the three pillars of sustainability. Each case study provides one or more aspects for the technique to be covered by the sum of all the instances.

III. A CAUSAL MODEL OF ACCESS TO HOUSING POLICIES IN URBAN SLUMS

The examination of policies regarding shanty town residents' access to housing uses the system dynamics technique. This approach considers the interdependence of the various elements contributing to a problem. This dependency causes feedback loops to arise. Additionally, this technique enables the inclusion of nonlinear interactions as well as temporal gaps between the causes and consequences of a given policy.

A causal diagram has been created using the Vensim DSS programme, version 6.0b, to make the most of these features. This processing has been built on the systems archetype of counterproductive remedies or fast fixes that don't work [1]. This archetype is predicated on the idea that every choice has immediate and long-term effects. These results frequently conflict. The immediate issue is resolved if a quick fix is used, but the long-term issue will worsen due to the unintended consequences of this solution.[2]

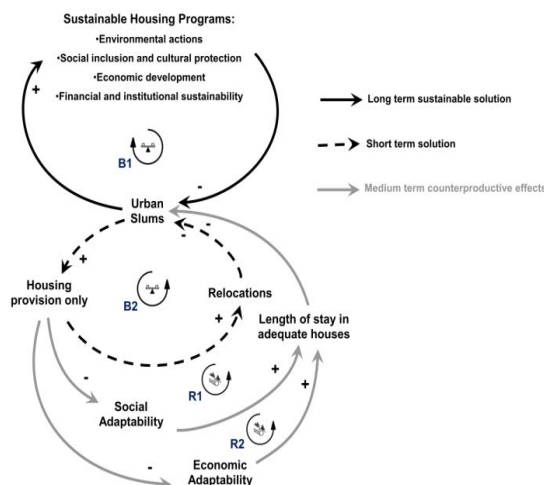


Figure 1 Causal model with the effects of access to housing policies in urban slums.

IV.SLUM

According to UN-HABITAT, a "slum" is a region that exhibits several traits, including being overcrowded, having inferior housing structures, having insecure housing situations, and not having enough access to safe drinking water, sanitary facilities, or infrastructure. Furthermore, one characteristic of these settlements is the absence of necessary civic amenities like sidewalks, streetlights, and paved roads to reach the emergency. Similar barriers prevent the general public from entering hospitals, schools, and other public buildings. Poor living conditions, unemployment, and urban decline are common characteristics of slums. In the past, they have been linked to societal issues like crime, drug abuse, and high rates of mental illness. As a result of malnutrition, unsanitary living circumstances, and a lack of access to basic medical care, they also have significant disease rates.[1]

Slums in Figure: Slums are home to a quarter of all urban inhabitants globally, according to [1]. 863 million people, or one-third of the population of developing nations, are estimated to reside in slums around the globe, according to UN-Habitat estimates. According to the same report, more than half (61.7%) of Africa's urban population resides in slums. In Asia, which is currently home to half of the world's urban population, 30% of the urban population lives in slums, according to the State of the World Cities Report [3]. Even though the percentage of people living in slums has decreased in the developing world from 39% in the year 2000 to 32% in 2010, showing that some countries are improving the lives of the urban poor, the number of slum dwellers has increased significantly and is expected to do so in the near future.

Causes of slums: Industrialization and rapid urbanisation have caused slums to grow. Slums are expanding due to urbanisation, land prices that are high, a shortage of cheap housing, and these issues [4]. A major lack of political will, ineffective policies, bad administration, fraud, unethical regulations, dysfunctional land markets, and financial institutions that don't cooperate all contribute to slums. All of these flaws exacerbate the misery of individuals who are already very poor and obstruct the tremendous potential for personal development that urban life offers.

The Positive Aspect of Slums: Many individuals who see slums as a problem that has to be eradicated agree on all the negative aspects of slum life but frequently fail to see the advantages. It's important to consider the good, vibrant, and active aspects of slum communities. Despite being hives of entrepreneurial activity, these urban neighbourhoods' residents are less likely to notice changes in their standard of living due to their less developed physical environment. Even if they have the opportunity to make a large contribution to local capital development through self-built dwellings, their lives are insecure due to the lack of even the most minimal government involvement, which would encourage and support private investment. However, for residents and job seekers, slums are desirable metropolitan areas.

In emerging countries, slums are often where the city's major workforce dwells. Slum dwellers significantly boost the border economy by providing the government sector with a range of necessary goods and services. The informal economy makes a sizable financial contribution to the country. According to economists in the informal sector like Hernando De Soto [5] the poor are sitting on enormous amounts of dead capital.

WHAT IS SLUM UPGRADING?

Slum upgrading is an all-encompassing method designed to stop a neighbourhood's downward trends. Trends in the legal (land tenure), physical (infrastructure), social (crime or education, for example), or economic spheres may be all deteriorating. Improvements to slums go beyond housing, drainage, and water. It entails starting the institutional, social, economic, and communal reforms that an area needs to change. Residents, community organisations, businesses, and, if required, local and federal authorities should all collaborate to finish these initiatives. [6] As part of these initiatives, basic utilities are typically supplied, such as houses, roads, paths, drainage, access to clean water, sanitation, and sewage disposal. [6] In upgrading, access to healthcare and education is typically mentioned. In addition to providing basic services, legalising or regularising properties and giving individuals secure land tenure are important parts of slum improvement. The ultimate aim of neighbourhood improvement projects is to create a dynamic that fosters neighbourhood pride, a sense of entitlement, and outside investment.

A. Why is Slum upgrading Important?

The human right to live in reasonable conditions and with basic dignity serves as the primary justification for slum rehabilitation. On another level, it's critical to renovate current slums and stop the growth of new ones. Governments run the risk of losing control of the populace if slums deteriorate and become hubs for disease and crime that affect the entire city. [3] A city gains from slum improvement by:

- 1) *Encouraging Diversity*: Slum upgrading addresses the main problems that slum residents confront, including illegality, marginalisation, precarity, and barriers to services, financing, land, and social protection for vulnerable populations, including women and children.
- 2) *Promoting Economic Expansion*: Through upgrading, the vast untapped potential of slum residents who have skills and a strong desire to contribute more to the economy but are constrained by their status and marginality is realised.
- 3) *Dealing with Issues with the Entire City*: It tackles local issues by slowing environmental deterioration, improving sanitation, lowering crime, and attracting investment.
- 4) *Increasing the Quality of Life*: Greater civic engagement, political voice and representation, better living conditions, and increased safety and security emerge from the improved neighbourhoods and general quality of life in the city.
- 5) *Providing a Place for the Homeless to Stay*: The most economical solution is to provide very large numbers of urban poor people with shelter.

B. Sustainable Development Of Slum Living

To solve the serious environmental issues of climate change, global warming, and resource depletion caused by human activities, sustainable development must be promoted. To improve slum living, a complex strategy incorporating ties in the economic, environmental, social, and cultural sectors is required. [3] They are in line with the objective of sustainable urban slum development, which is to create economically successful urban neighbourhoods that are admired for their accessibility to essential facilities and suitable urban environments on a cultural and social level. Giving slum people control over their neighbourhoods is crucial for the sustained development of slum life. The notion that sustainable development is a crucial instrument for poor nations to achieve significant achievements supports the necessity for building slums responsibly.

V. CASE STUDIES

A. Case Study: Mumbai, India

Every day, ten million slum residents in Mumbai, India, go without access to potable water. The Slum Water Program (SWP), a community-driven, decentralised comprehensive water programme, was developed by Reach Out Water Solutions (ROWS) to better serve the decentralised water infrastructure needs of Mumbai's slum inhabitants. Quantity, quality, access, and management are the fundamental four elements of an effective, long-term water solution. This approach directly addresses the anticipated water needs of customers, resulting in a product that saves the user's time, improves his health, and provides him with the maximum amount of water while reducing the user's current water cost. According to the project's administrators, the SWP serves as a template for self-sustainability and cost recovery in slums all over the world.

It was swiftly deployed within Mumbai's present decentralised service delivery structure, is flexible enough to accommodate future changes in slum settlements, and offers a sufficient supply of clean and affordable water. The SWP is a simple solution that requires the involvement of many parties in order to deal with the complicated problem. Community members, community-based organisations (CBOs), Reach Out Water Solutions (ROWS), the sponsor, the Brihanmumbai Municipal Corporation (BMC), the contractor, and politicians are some of these parties. [7]

B. Case Study: Sanergy Project, Nairobi, Kenya

As co-founders of the social venture Sanergy in Nairobi, Kenya, two MIT Sloan School of Management students have created an integrated waste management strategy. Sanergy seeks to enhance sanitary conditions while also giving slum people in Kenya work and financial gain. The concept recommends developing a sustainable sanitation cycle that benefits human health, society, the environment, and the economy [8]. The model entails four steps: (1) establishing low-cost sanitation centre networks throughout slums, (2) franchising their distribution to local business owners, (3) using a low-cost infrastructure to collect the generated waste, and (4) converting it into electricity and fertiliser, and then selling the former to commercial farms. Energy achieved local participation and economic empowerment, created 771 jobs, including those for the Sanergy team and Fresh Life Operators, produced profit returns from the sale of energy and fertiliser producers, and decreased reliance on synthetic fertilisers and non-renewable energy sources. describes SYNERGY's systems-based strategy for resolving the sanitation challenge.

C. Case Study: The Floating Waste Bank Project, Jakarta, Indonesia

The unique movable floating devices that move on the water's surface to collect garbage from damp slums should be mentioned in the context of the SWM. Along with collecting garbage, the Floating Waste Bank initiative educates households on waste recycling, how to make money from selling waste, and how to avoid dumping waste into rivers. The units were created by Cordaid using a mix of the Waste Bank and Floating City Apps models. The same concept may be used in a variety of contexts, including sanitation, healthcare, and education.

VI. SUSTAINABLE POLICIES FOR SLUM IMPROVEMENT

The efforts of John F. C. Turner appear to be the beginning point for slum remediation in emerging countries. Based on first-hand observations in Latin America, he wrote in *Freedom to Build* that the solution to slum issues was not their total elimination but rather the improvement of the environment. Only if the governments could enhance the sanitary conditions and quality of the environment in slum areas would the residents, with their resources and organisational knowledge, improve their homes, especially when encouraged by the security of tenure and accessibility to financing. [6]

The majority of cities are currently improving based on sustainability ideals, as has been observed throughout the past five decades of improving settlements. In the 1980s, this resulted in the regulation of land tenure, services, and financing for housing, and in the 1990s, it led to integrated approaches with plans and programmes to improve infrastructural facilities. Previously, policy reforms based on the acquisition of land, land banks, and traditional housing activities were implemented.

A. Social Sustainability In Slum Living

The goal of social sustainability is to ensure that all groups living in slum areas participate equally in all stages of development operations. Four logical and compatible interferences—participation, social inclusivity, empowerment, and community mobilization—can be used to achieve social sustainability. Social sustainability can be achieved by enhancing activities that give slum dwellers a sense of belonging to society and a sense of being valued as citizens with equal access to necessities of life. Engagement of residents in the urban slum design of their communities to ensure that their basic needs and wants are met is the link between social sustainability and participation. From a social perspective, effective and sustainable development must take informal dwellers into account as collaborators rather than as just beneficiaries of the development process [9]. Environmental Protection in Slum Housing Maintaining the ecosystem is a complex issue that involves striking a balance between several factors. These considerations cover energy-related topics like waste reduction, the use of renewable energy sources, the plan and programme for energy efficiency, the location of locally available materials, reuse, and recycling, as well as the prevention of pollutants and toxins, rainwater harvesting, and waste disposal safely. It is claimed that the main causes of poor environmental health among slum residents are poverty, symbolised by poor access to clean water, poor sanitation, inefficient disposal of waste materials, air pollution, and overpopulation. A fundamental requirement for achieving the current development goals to reduce poverty is to improve the health and living conditions of the billion people living in slums worldwide.

B. Environmental Sustainability In Slum Living

Maintaining the ecosystem is a complex issue that involves striking a balance between several factors. These considerations cover energy-related topics like waste reduction, the use of renewable energy sources, the plan and programme for energy efficiency, the location of locally available materials, reuse, and recycling, as well as the prevention of pollutants and toxins, rainwater harvesting, and waste disposal safely. It is said that the primary reasons for poor environmental health among slum residents are poverty, exemplified by low access to clean water, poor sanitation, improper disposal of waste items, air pollution, and overcrowding. A crucial requirement for achieving the current development targets to reduce poverty is to improve the health and living conditions of the billion people living in slums worldwide. [10]

C. Economic Sustainability In Slum Living

The primary means of alleviating poverty is economic advancement. Slum economies play a significant part in meeting the needs of residents in slum regions all over the world for a means of subsistence. With their sizeable share of the formal workforce, they have also made significant contributions to the development of urban economies. They have helped to provide urban services like rubbish collection and the creation of both local and global markets. Giving the underprivileged respectable work that provides both a stable source of income and economic power is crucial. [3] From a societal perspective, it is crucial to improve access to development in terms of economic status, personal well-being, and the eradication of poverty via labour. The only useful asset that poor people may use to improve their living situations is their work. Therefore, creating work opportunities is quite beneficial in achieving poverty reduction and long-term economic growth. It will successfully help to achieve the sustainable development plan's objectives. Employment, social security, and the right to work are typically addressed in strategies for reducing poverty along with equity, safety, and self-esteem.

VII. CONCLUSIONS

The concept of sustainable development of slum living highlights issues with living and helps slum dwellers and city planners understand the benefits of slum settlement patterns and create social capital that is prevalent in urban settings. Instead of periodic government involvement, slums can flourish sustainably via the continuation of self-sustaining activities.

The case studies clearly show that while slum dwellers lack the resources to address environmental and health issues, they have a tremendous deal of capacity to manage their own economic and social difficulties. To ensure that the slums' sustainability goals are met, the state's primary responsibility is to provide the political and administrative will by pooling resources, coordinating tasks, and creating a master plan based on decentralisation. This involves empowering people (including the least-represented groups), NGOs, and businesses within a formal framework. Achieving sustainable development is based on a decentralisation strategy. It is important to alter state policy to allow for greater individual control over the course of development and to lessen the heavy influence of institutions and governors. Additionally, a key step in sustainable development is empowering the local and civic communities. The challenge is to assist these groups through the activation of decentralisation in the decision-making process. Civil society organisations are present in the majority of communities and successfully function in community development.

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