

Limitations, Challenges, and Solutions to Housing Construction in Informal Settlements

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Abstract

Our study aims to understand the problems of informal settlement builders to improve housing construction through sustainable construction practices and build more sustainable communities. The research combined several qualitative approaches, including desk research, focus group discussions, key informant interviews and site observations at Ocean View and Khayelitsha informal settlements. The study found that the significant challenges of informal settlement builders, amongst others, include lack of access to quality materials, lack of formal training and unwillingness of customers to change. The study recommends a thorough consideration of the material procurement strategies and supply chain adaptability for alternative building materials, short vocational and apprentice training programmes or courses for informal settlement builders, mentorship, and a general overhauling of communal mindsets of informal settlement dwellers through networking for reflection, awareness, and growth. The study is qualitative, and a survey approach can be used to rank the challenges for prioritizing solutions.

Keywords: Building construction, Challenges, Informal settlements, Sustainable Communities, Sustainable construction.

1. Introduction

As of 2020, about 1.1 billion people live in informal conditions in urban areas, and an additional 2 billion are expected to join over the next 30 years (UN System Factsheet,

2023). Eighty-five per cent of slum dwellers are concentrated in Central and Southern Asia (359 million), Eastern and South-Eastern Asia (306 million) and sub-Saharan Africa (230 million). The informal settlement is one of the biggest challenges facing developing countries in recent times; the phenomenon is increasing daily, downgrading the quality of life and eradicating urban fabric (El Menshawy & Shafik, 2016). Empirical studies have shown that rapid urbanization over the past two decades has produced considerable challenges of an ever-increasing urban housing deficit, social exclusion and the emergence and growth of informal settlements across the cities of South Africa (Ziblim, Sumeghy and Cartwright, 2013).

The latest statistics of informal settlement dwellers in South Africa stand at 16.6% in 2022 (Stat SA, 2023), and one in five people in South African cities now live in informality (DAG, 2023). The UN SDG Goal 11 focuses on making cities and human settlements inclusive, safe, resilient, and sustainable (UN, 2020). As such, there is a need to garner efforts to achieve this goal. As the DFID (2000) has noted, *“Informal Settlements can only be sustainable when they cope with and recover from stresses and shocks and the concept can be achieved by maintaining or enhancing their capabilities and assets...”*

Globally, different efforts have been channelled towards the challenges in informal settlements and building more affordable and sustainable informal settlement communities. Specifically, examples in South Africa include providing RDP and GAP housing and different support from the Government and Non-Governmental organizations (El Menshawy & Shafik, 2016; Huchzermeyer & Karam, 2006). However, a significant solution gap is in understanding the limitations and challenges of the informal builders, self-builders, and those involved with participatory design and construction in informal settlements. As Lizarralde and Root (2008) have noted, there is a need to recognize that the informal sector already plays a fundamental role in the building industry, and further inclusion of the informal sector in the construction industry is essential.

This study understands the limitations and challenges of housing construction in informal settlements to provide recommendations for more sustainable construction and communities. It is essential because such understanding will provide valuable



insights for the builders, policymakers, practitioners, and stakeholders involved in informal settlement housing, urban planning, and development. It will also inform the design and implementation of policies, programs, and interventions to address housing deficits, improve building standards, and promote inclusive and sustainable urban development. The following section gives an overview of the informal settlement market and the nature of construction.

2. Literature Review

2.1. The Informal Settlement Housing Market

Informal settlements are urban neighbourhoods or districts that develop and operate without the formal control of the state, co-existing but not synonymous with 'squatter' settlements and 'slums' (Dovey & King, 2011). The DHS (2016) noted that informal settlements are places of multiple deprivations, and the national averages on key development indicators revealed poor levels of health and nutrition, high unemployment, and under-employment levels, as well as high levels of risk and vulnerability. The significant characteristics of informal settlements include lack of basic services and inadequate infrastructure, lack of security and vulnerability to disasters. Lizarralde and Root (2008), in their housing pyramid shown in **Figure 1** below, suggested that the urban housing market in developing countries reflects the contrasting participation of two delivery systems: the informal and the formal sectors.

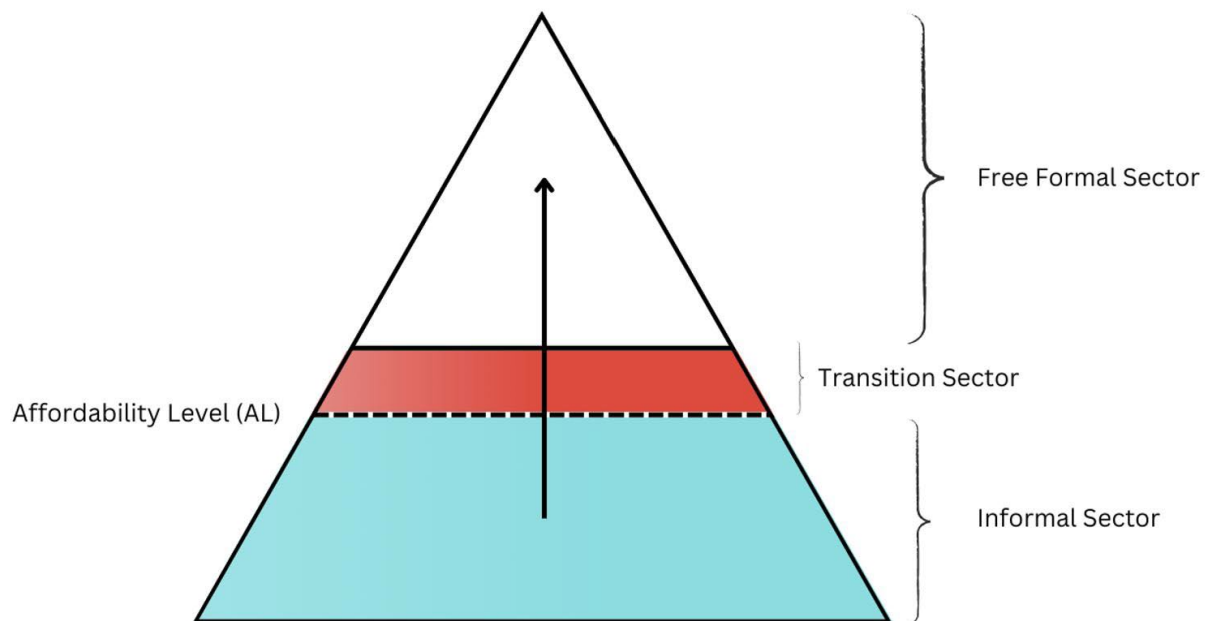


Figure 1: The urban housing market of developing countries

Adapted from
(Lizarralde and Root, 2008)

There is also the possibility of climbing the housing ladder from informal to formal sectors, which usually depends on the availability of products across a wide range of prices. As Merrill et al. (2021) have shown, informal households' choices of building their home are significantly impacted by the cost and availability of materials and construction services they can access. This contrasts with what it obtains in the formal and transition sectors, where there is direct delivery of houses by the Government or developers, which is then purchased when already completed.

2.2. Informal Housing construction techniques

The extant literature reveals different kinds of Housing construction techniques in informal settlements, mainly characterized by flexibility, adaptability, and resilience as residents navigate resource constraints, land tenure insecurity, and other challenges (Venter, Marais and Morgan, 2019). This alludes to Ferlito et al. (2019) that using affordable, locally sourced building materials for sustainable, affordable housing is a good development strategy. Cost-effectiveness and affordability are primary concerns for builders in informal settlements, while sustainability, energy efficiency and disaster resilience are not a significant consideration.



The standard construction techniques for informal settlement housing found in the literature include improvised and self-help construction, incremental construction, use of local and recycled materials and participatory design and construction (Ndlangamandla & Combrinck, 2020; Moreno et al., 2019; Dakhli & Lafhaj, 2018; Lombard, 2014). Informal settlers mostly rely on their self-help construction methods, which they use to build with the help of family members, friends, and neighbours to reduce labour costs. In addition, they frequently use locally available and recycled materials such as wood, bamboo, corrugated metal sheets, salvaged building materials, and plastic bottles filled with sand for construction to minimize costs. Some informal settlements engage in participatory design and construction, where residents collaborate to provide housing solutions to meet their needs. These settlements are sometimes constructed in room-by-room accretions (Dovey et al., 2020).

2.3. Challenges of Informal Settlement Builders

The literature shows that informal settlement builders face several limitations that hinder their ability to construct safely, durably, sustainably and economically. The following is the summary of the challenges of informal settlement builders found in the literature: Mathiba (2019), Venter, Marais and Morgan (2019) and Ehebrecht (2014):

1. Limited access to resources: Informal settlement builders often need more financial resources, materials, tools, and construction equipment. This limited resource access can restrict their ability to build structurally sound and resilient housing.
2. Lack of technical expertise: Many informal builders need more formal training and technical expertise in construction techniques, building codes, and safety standards. This lack of expertise leads to the construction of substandard and unsafe housing, posing risks to occupants' health and well-being.
3. Access to formal markets: Informal builders may need help accessing formal construction markets, contracts, professional development and advancement opportunities. Discrimination, lack of recognition, and exclusion from formal construction sectors can limit their ability to access higher-paying jobs and expand their businesses.
4. Limited capacity for innovation: Due to a lack of awareness, training, and access to information, informal builders may need more capacity for innovation

and adoption of modern construction technologies and practices. This can constrain their ability to improve building techniques, enhance efficiency, and adapt to changing market demands.

5. Informal land tenure: Informal builders often operate in areas with insecure land tenure, where they may face eviction, displacement, or legal challenges to their right to occupy and build on the land. Informal settlements built on insecure land tenure may need more access to essential services and infrastructure, making building and maintaining safe and livable housing difficult.

3. Methodology

The research combined several qualitative approaches, including desk research, focus group discussion, key informant interviews and site observations at Ocean View and Khayelitsha informal settlements. The research began with reviewing publicly available data about informal settlement housing and construction. The focus group discussion was carried out on the 8th of May 2024, and the site visit on the 13th of May 2024. Two heads of communities who self-built their home in the Ocean View informal settlement were also interviewed during the site visit. Participants signed an informed consent form, and the process was facilitated by a community member who mediated for clarity at different intervals to ensure smooth running. A combination of structured questions was asked relating to the construction process and the challenges faced before and during the process. Further, the opportunity was given to participants to ask questions for clarity, and participants sought permission to voice-record the focus group and photographs of structures built.

4. Findings and Discussion

4.1. Types of Informal Housing

The participants highlighted different types of informal houses they built, often noted as “Shacks”, “Wendy houses”, “Bungalows”, or “Hockey homes” by the builders. “Temporary” or “permanent” are the two main types of informal housing, according to the informal builders. Exists depending on clients' requirements and resources. While the temporary structures are prefabricated and movable, often used in backyards or informal settlements, and are without permanent foundations, the permanent structure is built on site with a foundation. The photographs taken at the Kyelitsha and Ocean View informal communities are shown in Figure 2 and Figure 3 below.



Figure 2: Temporary Shack structure



Figure 3: Permanent Shack structure

Table 1 below presents the different sizes and associated costs of the shacks erected in Khayelitsha, irrespective of whether they were permanent or temporary. The interview did not provide information about the cost of the 10m shacks. According to the conversations with the participants, the cost of the shacks is not significantly affected by the profile of the sheets but rather by the thickness. Nevertheless, the price of the shacks may fluctuate based on the thickness and configuration of the metal sheets used for both the walls and roofs.

Table 1: Types and costs of shacks

SIZE	COST	NOTES
3 x 3m	R 4500	The cost of the shacks depends on the thickness and profile of the metal sheets used. Thickness of the sheets start from 0.3mm thick
4 x 4m	R 5000 – R 5500	
10m	R 10000	
TOOLS		
Saw	Hammers	Scissors

4.2. The Construction Process

Participants explained that the construction process is simple and involves laying a foundation, assembling a wooden or metal frame, and installing the walls and roof. This was also observed during the case study visit to construct a shack at Khayelitsha. The construction of a 3mx3m shack was completed from scratch in less than 3 hours. The process commences by evaluating the client's requirements and the site's prevailing conditions. The materials utilized consist of timber and metallic sheets. Structures can be prefabricated and assembled on-site or built entirely on-site. The duration of construction can vary between one and three days, contingent upon the dimensions and intricacy of the structure. For example, constructing a standard dwelling for a household of five can be accomplished in three days, irrespective of the material being wood or metal. The team typically comprises four individuals, with the chief builder being one of them.

The assembly process is expeditious, typically taking only one day on-site, depending upon the dimensions and materials employed. According to the builders, the shacks are seldom built on site but are instead installed at the site. The 10m shacks are not prevalent in Khayelitsha, and the local builders said they must familiarize themselves with constructing such structures. The Key informants at Ocean View settlement revealed that their construction was self-built, on an incremental basis, i.e. depending on the availability of materials, which they often must source for in their environment. They explained that the residence was originally a one-bedroom hock, and they have successfully expanded their home by adding two additional extensions to the property, as shown in Fig.4 below. Figure 4 illustrates the progression of upgrades to the living

space, starting from one-bedroom hocks on the far left, then adding second hocks in the middle, and finally extending the two hocks with concrete blocks and a rubble room



Figure 4: Hocks extension showing incremental progression on the far right.

4.3. Common challenges and limitations of informal settlement builders.

The informal settlement builders in this study shared several limitations with the researchers who consent to the extant literature. Some of these challenges were also witnessed during the site visit. These challenges are itemized below:

4.3.1. Access to construction site

Challenges arise when transporting materials to the site, especially in crowded settlements. Conveying materials, particularly in densely populated areas with restricted access, frequently obstructs movement, and there is a need to transport materials across adjacent houses. Disputes often arise with neighbours regarding access, which affects completing the work on time. Mathiba (2019) and Ehebrecht (2015) advocated for Government services in informal settlements, concluding that such provision is necessary to fast-track development.

4.3.2. Access to construction materials

This study found that local builders use what is readily available, affordable, and within their reach. This agrees with the literature (Ndlangamandla & Combrinck, 2020; Moreno et al., 2019; Dakhli & Lafhaj, 2018). However, when probed about alternative building technologies for upgraded housing options, such as Sandbags and MIBT, they need to be more knowledgeable about where they can be obtained.

4.3.3. Labour Coordination and Training

As already noted by Mathiba (2019) and Ehebrecht (2014), the participants in this study cared less about safety practices. However, in contrast to the literature, their limited formal training and technical expertise in construction techniques and building codes did not affect their precision. The local informal builders also noted that they only managed to get by in profit-making, suggesting their lack of business skills.

5. Conclusion and Recommendations

This study has shown the different approaches to informal settlement housing from a qualitative viewpoint. The approach to the study was engaging and enriching, helping the researchers experience the construction methods and challenges of the local builders firsthand. Based on the findings of this study, the following recommendations are made to address the challenges and limitations of informal settlement builders:

- i. Prioritize providing essential services such as good road networks for easy access to the informal settlement communities, local suppliers and builders.
- ii. Expand the Alternative Building Technologies (ABTs) market around informal settlements. There appears to be little or no information available to the local builders on where to get what on ABTs
- iii. Comprehensive and integrated training programs that address a range of skills and knowledge areas, especially in safety practices, business management, and entrepreneurship, are needed.
- iv. Avail informal settlement builders with information and opportunities to refine their skills for more structurally durable and aesthetically pleasing structures.



6. Research limitations and future directions

This study, like any other, has limitations. The few samples of the study limit the findings of this study. As such, a wider population is needed for the study. Future studies should use survey methods to cover more samples. For instance, ranking the challenges of the informal settlement builders can be conducted to prioritize the solutions provided. In addition, this study is limited to only two cases: Ocean View and Khayelitsha informal settlements; analyzing more case studies and best practices from different contexts would provide practical insights into successful housing construction initiatives in informal settlements. This would help to identify further lessons learned and transferable strategies for addressing housing challenges.

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