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# Interior Design Patterns and Sustainable Housing Solutions: Insights from a Slum Community in North-West Delhi, India

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## Abstract

*This scholarly investigation embarks on an in-depth analysis of the multifaceted and complex realm of urban informality, with a particular focus on the intricacies involved in the construction of residential spaces within informal settlements. At the heart of this study lies the transformative urban phenomenon predominantly witnessed in the developing world during the early 21st century. This era has marked a paradigm shift in urban informality, transcending its previous association exclusively with impoverished communities. Informality has now emerged as a predominant and influential model in the landscape of metropolitan urbanization. Significantly, informal settlements have burgeoned into pivotal residential areas, accommodating an ever-increasing portion of the urban populace. These settlements are primarily inhabited by individuals migrating from rural areas in pursuit of enhanced life prospects, thus contributing to a marked population shift. According to the United Nations, approximately one billion people, or nearly a quarter of the world's urban population, reside in informal settlements, highlighting the urgency and scale of this global issue. The ongoing trend of urbanization places immense strain on urban infrastructure and resources. One of the most pressing challenges is ensuring the availability of adequate space and affordable housing for these migrants. Many rural migrants, constrained by limited financial resources and often possessing insufficient savings, are unable to afford housing within formally planned and developed areas. Consequently, they resort to residing in informal settlements, which have become vital components of the urban economic fabric. This research project delves into the nuanced and formidable challenges encountered by these poor migrants as they endeavour to create homes in urban settings. The study aims to provide a thorough understanding of the process involved in acquiring and constructing a home within these informal environments. It also seeks to shed light on the myriad struggles and complexities that are intertwined with this endeavor. An essential element of this inquiry is the examination of the residents' remarkable ingenuity in managing and adapting their living spaces. This includes innovative approaches to space optimization, strategic arrangement of furnishings and furniture, and the adept use of everyday utility items to enhance their living conditions. To ground this research in tangible experiences, Ekta Camp has been chosen as a focal case study. This informal settlement, designated as a notified slum in the 2010 census, offers its residents access to basic services, though they lack formal land rights. By conducting a detailed exploration of the living conditions, experiences, and adaptive practices of the inhabitants of Ekta Camp, this study makes a significant contribution to our understanding of informal settlements. The insights gleaned from this research are poised to influence broader discussions on sustainable and inclusive housing strategies. Moreover, the findings hold the potential to inform future policies and planning in formal housing and urban development, offering innovative and practical solutions that can be applied to similar contexts globally. This research underscores the importance of re-evaluating and re-envisioning housing policies to better accommodate and integrate the growing population in informal settlements, thereby contributing to the creation of more equitable and sustainable urban landscapes.*

***Keywords:*** *Informal settlements, Incremental housing, Sustainability, Interior Design, Slum Communities, Resourcefulness.*

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## 1. Introduction

The 21st century has heralded unprecedented urban transformations, reshaping the landscapes of cities across the developing world. At the forefront of these transformations is the burgeoning phenomenon of urban informality. Once confined to the margins of society and primarily associated with impoverished informal settlements, informality has transcended its initial connotations. It has seamlessly woven itself into the fabric of metropolitan urbanization, challenging entrenched paradigms of housing, community development, and urban planning. Urban informality is no longer an outlier but has become emblematic of a pervasive global trend, redefining the contours of urban growth and societal evolution. This shift towards informality is not merely a byproduct of urban expansion but a critical response to the multifaceted crises of affordability, accessibility, and sustainability that confront modern cities. Traditional housing models and urban planning frameworks often fall short of addressing the complex needs of a rapidly urbanizing population, particularly in regions where economic disparities and social inequities are stark. Informal settlements, therefore, emerge not just as spaces of necessity for the disenfranchised but as vibrant ecosystems that foster a unique blend of resilience, creativity, and community-driven innovation. The rise of informal settlements is inextricably linked to the massive rural-to-urban migration observed in the developing world, driven by individuals and families in pursuit of better opportunities and a higher quality of life. According to recent estimates by the United Nations Human Settlements Programme (UN-Habitat), approximately one billion people, or nearly one-quarter of the global urban population, reside in informal settlements. These figures underscore the pressing need to reconceptualize our approach to urban development, making it more inclusive, adaptive, and sustainable. Central to the discourse on informality is the critical role of interior design and spatial arrangement in enhancing the livability and sustainability of informal housing. Innovative interior design solutions tailored to the unique challenges of informal settlements can significantly improve residents' quality of life. By optimizing limited space, ensuring flexibility, and incorporating sustainable materials and practices, interior design becomes a pivotal tool in transforming informal dwellings into functional, comfortable, and dignified homes. Such interventions not only address immediate housing needs but also contribute to the broader agenda of sustainable urban development, emphasizing the importance of human-centric and context-sensitive design principles. As we delve deeper into the intricacies of urban informality, this research seeks to unravel the complex tapestry of challenges and opportunities that define informal settlements. By focusing on the lived experiences and adaptive strategies of residents in North-West Delhi's Ekta Camp, this study aims to contribute valuable insights into the potential of interior design as a catalyst for positive change in informal housing. In doing so, it aspires to inform and inspire a new generation of housing policies and urban development strategies that are equitable, sustainable, and responsive to the diverse needs of urban populations worldwide.

### 1.1. Research question

How do residents of Ekta Camp, a notified slum in Delhi, design and construct their homes, and what interior design patterns and material usage do they employ to create sustainable and functional living spaces?

### 1.2. Research Objectives

In pursuit of a comprehensive understanding, this research paper is guided by the following specific objectives:

1. To explore and document the interior design patterns employed by residents of Ekta Camp, with a specific emphasis on space utilization, furnishings, and materials.
2. To analyze the practice of incremental housing within Ekta Camp and how residents adapt and extend their homes over time.
3. To assess the sustainability practices and resourcefulness of Ekta Camp's residents,

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focusing on principles such as "reduce, reuse, recycle."

4. To identify the challenges faced by Ekta Camp residents in acquiring and constructing homes and consider socioeconomic and environmental factors that influence these processes.
5. To propose solutions and insights derived from Ekta Camp that can be applied not only to other slum communities in Delhi but also to inform formal housing, promoting sustainability, and resource-efficient living. Provide an overview of the literature relevant to your research [1].

In summary, the purpose of this study is to comprehensively investigate the interior design patterns, material usage, and housing practices within Ekta Camp, a notified slum in Delhi. By doing so, we aim to not only gain a deeper understanding of how residents of Ekta Camp create sustainable and functional living spaces but also to extract valuable insights and propose innovative solutions that can be applied to other slum communities in Delhi and inform formal housing practices. Through this research, we seek to contribute to the broader goal of promoting sustainability, resource efficiency, and the 'less is more' concept, fostering environmentally responsible and affordable housing solutions for a more sustainable future [2].

## 2. Literature Review

### 2.1. Urban Informality and Informal Settlements

The lexicon of urban development offers a precise characterization of informal settlements, as meticulously defined by UN-Habitat [3]. These settlements constitute residential zones where a consortium of housing units has materialized upon land over which the inhabitants possess no legal tenure, or conversely, upon land they occupy illicitly. In tandem, informal settlements emerge as the embodiment of urban development disengaged from the stricture of prevailing planning and construction ordinances, akin to the realm of unauthorized housing. These habitats, conceived because of economic exigencies and juxtaposed with the unattainability of formal housing, are, for the most part, impermanent or semi-permanent structures [4]. The iniquity lies in the dearth of elementary services, comprising potable water, electrical provision, sanitation facilities, waste disposal infrastructure, road networks, and recreational spaces, which inexorably diminishes the quality of life within these precincts. These settlements, these manifestations of urban informality, are, in their essence, an articulation of the state's perennial incapacity to offer affordable housing solutions, and simultaneously, the resilient attempt of itinerant masses to secure shelter within the bustling metropolis.

### 2.2. The Global Prevalence of Informal Settlements

This global display of urban informality resonates far beyond the confines of any singular nation or territory. It is a phenomenon of global ubiquity. It is paramount to underscore the veracity of this assertion. Informal settlements are not the exclusive domain of developing nations alone; rather, they cast their shadow over the urban landscapes of economically developed countries as well. This inexorable presence of informal settlements looms larger in developing countries such as India, China, and South Africa, among others, where they claim 43 percent of the entire urban populace. A noticeable contrast is discernible in the advanced economies of Germany, Italy, and Denmark, where the proportion hovers at a mere 6 percent. In the context of India, a nation perpetually grappled by the exigency for sustainable urbanization, the phenomenon finds resonance in the form of 17.4 percent of the urban population residing within slum precincts. According to the Census of India 2011, this accounts for a staggering 93 million individuals, or 7% of the total population of 1.21 billion. The ensuing years have witnessed a noteworthy spike, with the 2016 census documenting a tally of 102.7 million denizens of these precincts. An in-depth perusal of census data further reveals the profound entrenchment of slum living within the urban fabric of India's metropolitan cities, with percentages as daunting as 41.3% in Greater Mumbai, 29.6% in Kolkata, 28% in Chennai, and approximately 15%

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in the national capital, Delhi. These statistics bear witness to the inflexible growth of informal settlements and underscore their burgeoning presence, as each year ushers in a throng of aspirants who hold dreams of an improved life within the urban ambit [5].

### 2.3. The Emergence of Informal Settlements

India's economic pivot from rural dominance to urban-oriented energy has provoked a veritable migration of the rural population towards the promises of the city. Cities offer a nexus of allurements: the allure of superior employment prospects, the promise of superlative educational facilities, elevated living standards, and an expansive economic panoply. Simultaneously, urban expansion and economic dynamism necessitate a concomitant surge in infrastructure development to accommodate the swelling population [6]. However, a dichotomy becomes apparent in this narrative, as the economic gains vital for sustainable development should ideally synchronize with the requisite expansion of urban infrastructure and services. As the urban agglomerations burgeon and the populace surges forth, a dearth of affordable housing solutions compels the urban neophyte to seek domicile within rudimentary abodes. Failing to procure an expanse within the planned colonies, often on account of meager financial resources, the aspirant urbanite finds solace in the frugal comforts of shanty towns, squatter colonies, and informal settlements, christened as JJ Colonies, bastis, slums, and camps. This organically nurtured urbanization is emblematic of the resourcefulness that is unleashed within the constraints of insufficient urban spaces. Slums are emblematic of an inexorable outcome—a shelter constructed through the lens of necessity and enriched by creative adaptability [7]. The presentation of informality within the urban ecosystem is typified by the ample spectrum of locally available construction materials, spanning mud, bricks, plastic sheets, tarpaulin, and other recycled resources, as residents ingeniously strive to materialize the dream of a dwelling place. These diverse settlements may vary in dimensions, ranging from 100 to 300 square feet and encompassing single-story edifices. This expansion and creative repurposing of limited living quarters extends to the multi-use of communal spaces, the malleability of open areas adjacent to residences, and the adept management of shared spaces among neighbours. The resilience of slum-dwellers is magnificently epitomized in their ability to synthesize multiple functions within a single spatial allotment, thereby ensuring that each area is optimally harnessed for varied purposes. Notably, communal spaces effortlessly metamorphose into play zones for children during the daytime, safe havens for vehicle parking at night, and versatile venues for ceremonies, weddings, religious observances, and social gatherings [8]. A profoundly nuanced understanding of spatial dynamics is observable in these habitats, encompassing communal living spaces, cooking zones, and family interaction hubs, where functionally distinct spaces in the Western idiom are unified into singular spaces for necessity, revealing a mastery of spatial pragmatism. An acute sense of utility underscores the way inhabitants judiciously navigate the constraints of limited living spaces, elucidating an ingenuity for optimizing available resources and advocating for sustainable spatial practices. The inhabitant's profound engagement with the shared and communal realm emerges as an emblem of endurance against the backdrop of unattainable formal housing and sparse resources [9].

### 2.4. Issues and Concerns of Informal Settlements

The involved complexities of informal settlements unveil a matrix of afflictions that besiege the residents. Foremost among these afflictions is a spatial conundrum—constrained in both quantity and quality. These inhabitants are denied the privilege of selecting their place of habitation and are compelled to adapt to whatever spatial constraints are at their disposal. Unlike their counterparts in formal housing, who can avail themselves of dedicated spaces for slumber, ablutions, culinary pursuits, and leisure, these denizens, stripped of such privileges, ingeniously choreograph multifunctional living spaces. The absence of proper sanitation, potable water

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distribution, and paved roads is stark, an issue exacerbated by a chronic dearth of electricity and secure environments for women and children. The omnipresent spectre of eviction looms large, given the absence of legal title deeds, rendering these dwellers perennially susceptible to societal predators. This menacing confluence of factors conspires to shape an environment marked by instability and insecurity [10].

1. Financial hardships plague slum-dwellers, who find themselves mired in economic precarity, bereft of financial security, and facing the constant threat of eviction, where even minor medical contingencies may precipitate catastrophic financial crises.
2. Social injustice is an endemic feature of the slum landscape, manifesting as inequitable spatial provisions and a consequent denial of full societal stature despite their pivotal contributions to the regional economy.
3. Denied government identification and its corresponding amenities, these residents are stuck within a city that denies their civic enfranchisement.
4. The dangers that surround this population take the form of impoverished infrastructure provisioning, and the lack of basic amenities, from sanitation facilities and potable water to waste collection and electricity distribution.
5. The densely packed dwellings that characterize informal settlements give rise to a proliferation of ad hoc construction and vulnerabilities to both natural and human-made catastrophes, such as fires and flooding. Collectively, these elements conspire to craft an environment beset by instability and fraught with insecurity.

### 2.5. Identifying Gaps in the Literature

The current state of the literature regarding informal settlements presents several notable gaps that require diligent examination. These gaps in the literature are poised to shape the track of our research:

#### 2.5.1. Interior Design Patterns in Informal Settlements

A notable omission within the existing literature pertains to the exploration of interior design patterns within informal settlements. Most of the previous research predominantly emphasizes the external spatial configurations and structural compositions, leaving the interior dimensions uncharted. Our study seeks to rectify this by delving into the spatial intricacies that unfold within informal settlements, shedding light on how residents have ingeniously navigated the challenges of constrained living spaces, addressing concerns that encompass furnishings, furniture, and utility objects.

#### 2.5.2. Material Usage and Sustainable Practices in Informal Settlements

The current discourse predominantly centers on the socio-economic facets of informal settlements while largely overlooking the ecological and environmental dimensions. Our research aims to bridge this gap by scrutinizing the choice of construction materials, their ecological implications, and the emerging sustainability practices that are organically taking root within these communities.

#### 2.5.3. Lessons for Formal Housing and Sustainable Urban Development

An underserved dimension in the current literature is the exploration of the potential for transferring insights from informal settlements to formal housing and broader sustainable urban development. Our study will transcend the confines of informal settlements, elucidating how the lessons learned within these communities can be harnessed to ameliorate formal housing conditions and promote sustainability within the broader urban context.

## 3. Site introduction

Over time, a multitude of migrants, accompanied by their families, children, and relatives, have made their way to Ekta Camp in pursuit of livelihood opportunities. Situated in the North-Western part of Delhi, precisely in Pitampura, Ekta Camp holds the status of a legally notified slum, offering its residents a limited array of essential services and amenities [11]. Among these provisions are portable toilets, community facilities, access to electricity, and possession of crucial legal documents such as

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voter ID cards, Aadhaar cards, ration cards, and more. Comprising a total of 665 houses, Ekta Camp accommodates a diverse population. Approximately 20% of the residents opt for rental arrangements, contributing monthly sums ranging from Rs1200/- to Rs2000/-, while the remaining 80% proudly own their dwellings. The houses within this settlement span a spectrum from temporary and semi-permanent structures to those embodying a more permanent architectural form. This dynamic mix of housing types reflects the multifaceted nature of Ekta Camp's residential landscape.

### 3.1. History of the Area

In 1984, precisely 33 years ago, Ekta Camp came into existence, as disclosed by the former Pradhan, Mr. Joginder Narayan, during an interview I conducted. The origins of this settlement trace back to a community of cow herders who inhabited the site [12]. Initially, their livelihood revolved around selling milk to nearby residential colonies. Over time, these cow herders, without official authorization, began selling parcels of land to other migrants from their village, enabling the construction of additional houses. In its nascent stages, Ekta Camp also served as a residence for a group of JCB workers. Taking advantage of the vacant Delhi Development Authority (DDA) land, they found a convenient space to park their JCBs and construct temporary dwellings. The absence of authoritative interference in this empty land facilitated the gradual transformation of the area into a thriving settlement [13]. As recounted by Mr. Joginder Narayan, the former Pradhan, in our interview, the camp derives its name from a woman who played a pivotal role in the community. Recognized for her active involvement and leadership, she made significant decisions for the camp residents, contributing to the shaping and identity of Ekta Camp over the years.

### 3.2. Location Analysis

(Refer Figure 1) Nestled amidst the vibrant expanse between Rohini and Pitampura in North Delhi, Ekta Camp stands near densely populated residential colonies. The strategic location positions it as a hub for potential earning opportunities, avoiding the outskirts of the city while maintaining seamless connectivity to urban amenities. Residents benefit from nearby facilities such as public parks, government schools, and hospitals. The camp boasts accessibility situated 2 km from Pitampura Delhi metro station on the red line, 1.5 km from Badli metro station on the yellow line, and a mere 2 minutes' walk from Haiderpur bus stand, serviced by buses 883, 891, and 982. Enriching the community fabric, Ekta Camp is adorned with religious structures like Durga Mandir, Bajrang Bali Mandir, Bada Mandir (Hanuman Mandir) Samadhi Wala, and Peer Baba Dargah. These sites serve not only as religious landmarks but also as focal points for social gatherings during festive seasons and government-sponsored workshops. For education, young children attend Sarvodaya Vidyalaya in FU Block Pitampura or MCD Primary School (Co-ed) in EU Block Pitampura. Some also opt for private institutions like S.D. Public School and Abhinav Public School, are conveniently located within walking distance from the camp. In times of medical need, residents have access to Dr. Baba Saheb Ambedkar Hospital in Rohini Sector 6, with emergency cases directed to Max Hospital in Shalimar Bagh and Santom Hospital in Prashant Vihar.

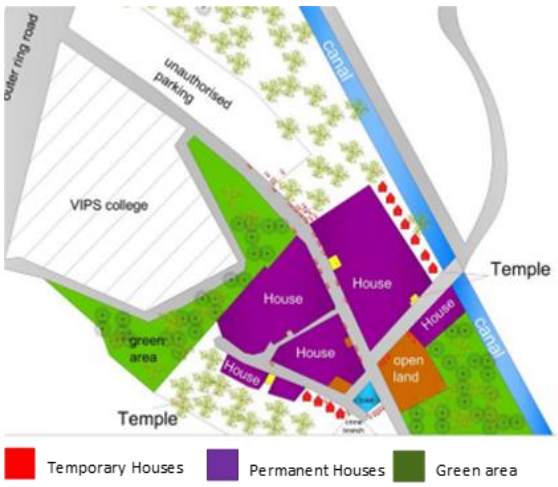


**Figure 1 Location Map**

### 3.3. Demographic Information

According to the 2018 voter list, Ekta Camp is home to 1189 residents, comprising 688 males and 501 females. However, former Pradhan Mr. Joginder

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Narayan suggests a larger population of around 5000 people. The majority (80%) hail from Bihar, with another 20% originating from Uttar Pradesh, along with a few families from Haryana. Occupationally diverse, residents engage in a variety of means to sustain their livelihoods. Earnings, largely unmonitored, range widely from INR 200 to 800 per day, encompassing roles such as cleaning, day labor, and selling miscellaneous products. The male demographic is prominently represented in rickshaw driving and construction-related jobs, while females often work as domestic helpers or staff at Max Hospital, situated a mere 10 minutes away. The younger generation diversifies further into roles like housekeeping at nearby hotels, factory assistance, salon work, and similar occupations [14].

### 3.4. System Map

(Refer Figure 2) This map delineates the intricate network of stakeholders pivotal to Ekta Camp, detailing their interconnections. At the forefront, encapsulated within the initial circle, are the non-governmental entities actively engaged with the camp. These organizations are instrumental in the housing construction process, maintaining a reciprocal relationship with the community. The subsequent tier highlights the formal stakeholders, including entities such as the Municipal Corporation of Delhi (MCD), TATA Power, and the Delhi Jal Board (DJB), responsible for provisioning essential services like water and electricity to the camp. The outermost layer encompasses senior authorities, whose primary responsibilities include mediating amongst various stakeholders and formulating prospective resettlement initiatives for Ekta Camp [15].

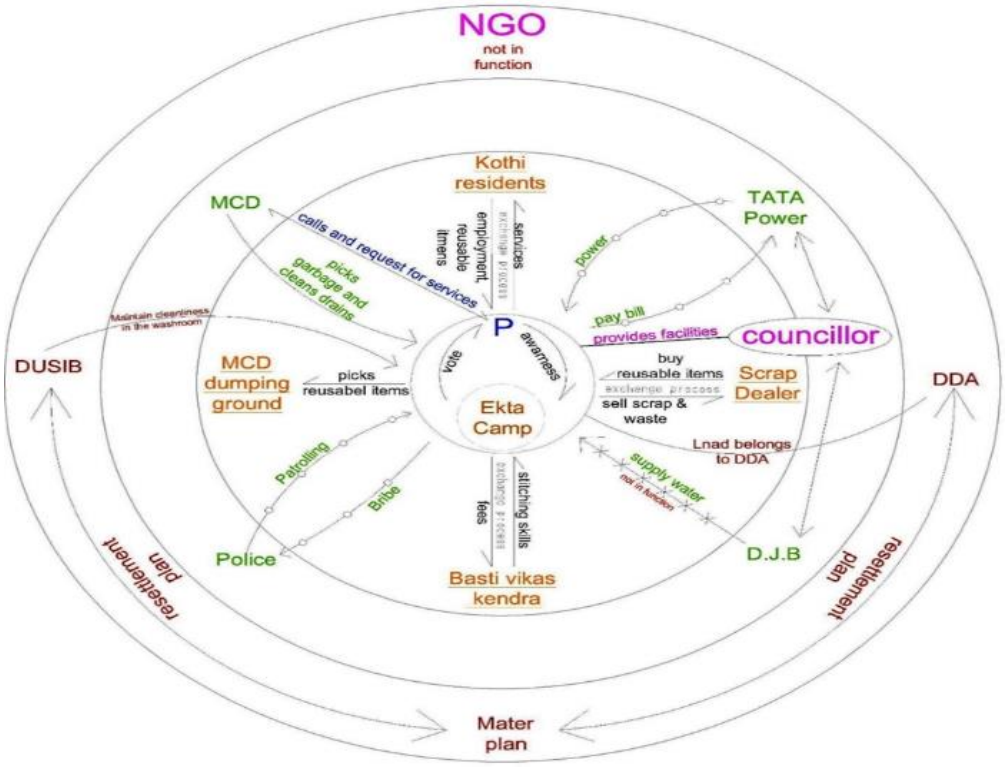


**Figure 2 System Map of The Ekta Camp**

### 3.5. Mapping the Community

To grasp the core aim of our study, which delves into how inhabitants of these informal settlements construct their dwellings, their conception of 'home,' and the challenges they face in building a house, we undertook three distinct mapping exercises:

1. **Evolution of Built Space:** This involves tracking how a given space evolves into a structured living area.

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2. **Construction Materials:** An analysis focusing on the materials used for various structural components such as walls, doors, ceilings, roofs, windows, and storage solutions.
3. **From House to Home:** Exploring the process through which a structure transitions into a place that residents consider their home.

### 3.5.1. Built and Spatial Transformation

In informal settlements, the construction of a dwelling is typically a gradual undertaking. Residents initially settled on a plot of land, erected basic shelters, and progressively added infrastructure, eventually gaining legal ownership of the land (Ralegaonkar, March 2017). Given that many inhabitants are daily wage earners, accumulating substantial savings for outright home purchases is challenging. Consequently, they adopt a phased approach to homebuilding, starting from rudimentary, rent-based accommodations. Over time, they amass building materials and funds, enabling them to acquire and incrementally upgrade a dwelling within the settlement. Investment in home expansion and enhancement is made judiciously, based on personal priorities and a calculated understanding of eviction risks. A common time for renovations within Ekta Camp is between November (post-Diwali) and December (pre-marriage season) when building materials and home furnishings are more readily available and affordable. This is because residents of formal settlements typically undertake their home refurbishments during these periods, leading to an abundance of discarded materials. Inhabitants of informal settlements seize this opportunity to procure these materials at reduced costs, either directly from former users, scrap dealers, construction sites, or landfills. The accompanying photographs depict the external facades of various homes within the camp, illustrating the diverse stages of development and the amenities incorporated. The following pictures are of the external facade of the houses, which show the different stages of the houses in the camp, and the facilities available in them.

**Stage- 1**

This represents the initial and most fundamental phase of housing within an informal settlement, where an individual sets up a basic shelter upon arrival, equipped with only the essentials. During this phase, the primary challenge for the resident is securing employment and a stable income. At this point, the dwelling offers minimal amenities, with perhaps only a designated sleeping space available (Figure 3).

**Figure 3 House at Stage 1**

**Stage- 2**

At this stage (Figure 4), residents begin to establish a sense of privacy and delineate the boundaries of their dwelling, using a combination of materials they have collected or purchased. Typically, only the male members reside in these slightly improved conditions. As they transition to the next phase, they often bring their families to join them. In these homes, inhabitants start to cook on traditional mud stoves and create designated areas to store their personal belongings [16].

**Figure 4 House at Stage 2**

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**Stage-3**

During this phase (Figure 5), the dwelling evolves into a more permanent structure with a defined location. The home is equipped with basic amenities, including a dedicated cooking area and storage space. It's at this point that other family members join and begin living in the house, making it a more cohesive family unit [17].

**Figure 5 House at Stage 3**

**Stage-4**

At this stage (Figure 6), the structure evolves into a permanent home, incorporating modern materials and additional functional spaces like a temple area and extra rooms. The expansion accommodates cultural practices and the needs of extended family members from the village, enriching the household's dynamics. This phase signifies the transformation of the dwelling into a true home, reflecting the residents' aspirations and cultural values, and marking a significant milestone in their journey within the informal settlement.

**Figure 6 House at Stage 4**

**Stage-5**

In the final stage (Figure 7), the dwelling becomes a fully permanent structure, potentially expanding from two to three rooms and possibly extending from the ground floor to include a first floor. This phase features a range of amenities, such as individual rooms offering personal space, a separate kitchen, designated wet areas, and various utility spaces, catering to the comprehensive needs and comfort of the residents. This development epitomizes the culmination of the inhabitants' efforts, transforming the dwelling into a well-equipped and comfortable home within the informal settlement [18].

**Figure 7 House at Stage 5**

This study employs exploratory research methods, blending quantitative and qualitative approaches to gather data through interviews, community workshops, mapping exercises, and action research. Conducted in various segments, each with a distinct focus, the research collected comprehensive data from 50 dwellings representing different types of housing within the camp. The distribution of these dwellings across the developmental stages is as follows: Figure 8 in stage 1, Figure 9 in stage 2, Figure 10 in stage 3, Figure 13&14 in stage 4, and Figure 11&12 in stage 5. The demographic composition of the households varies by stage. In stages 1 and 2, typically only the middle generation resides in the camp, with other family members remaining in their village. By stages 3 and 4, both the second and third generations are present in the

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camp, while grandparents often stay in the village. Stages 4 and 5 are unique in that they accommodate all family members either within the same dwelling or in adjacent units, addressing spatial limitations. The progression through these stages is marked by significant changes within the household. There's a shift from temporary, local materials to modern construction methods. The number of rooms and specific areas like kitchens evolve, from a simple corner set up in stage 3 to a fully separate kitchen by stage 5. The presence of legal documentation, including voter IDs, Aadhar cards, ration cards, and driving licenses, also increases with each stage. This mapping exercise reveals a nuanced five-stage transition from temporary shelters to permanent homes in Ekta Camp, an informal settlement. Each stage brings new facilities, spaces for additional family members, and a gradual enhancement of living conditions, illustrating the complex journey toward permanence and stability in these communities [19].

**Figure 8** Types of Houses in Ekta Camp

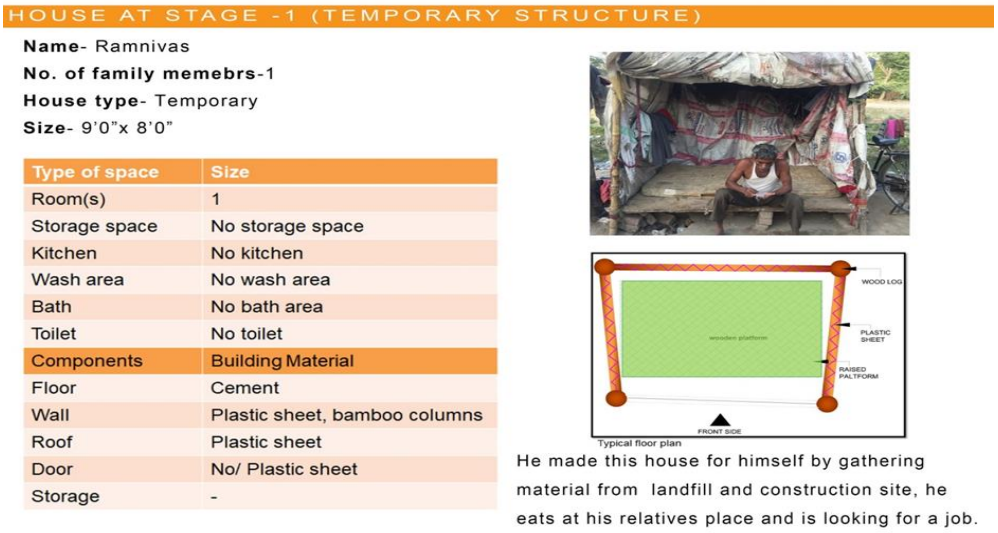


**Figure 9** House at Stage 1 in Ekta Camp

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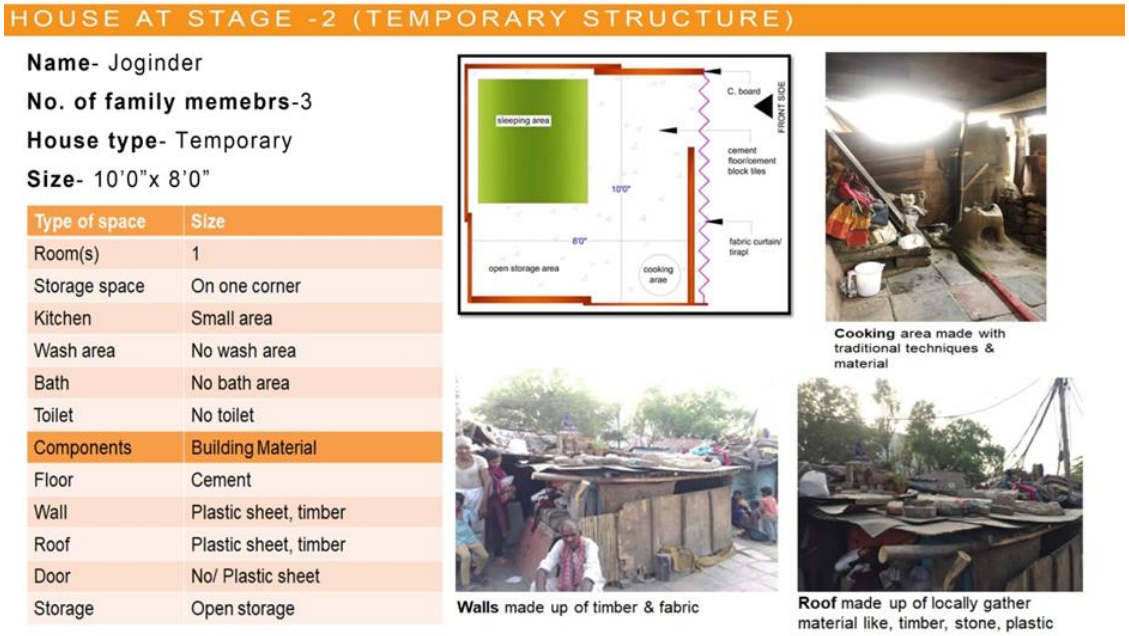


**Figure 10** House at Stage 2 in Ekta Camp

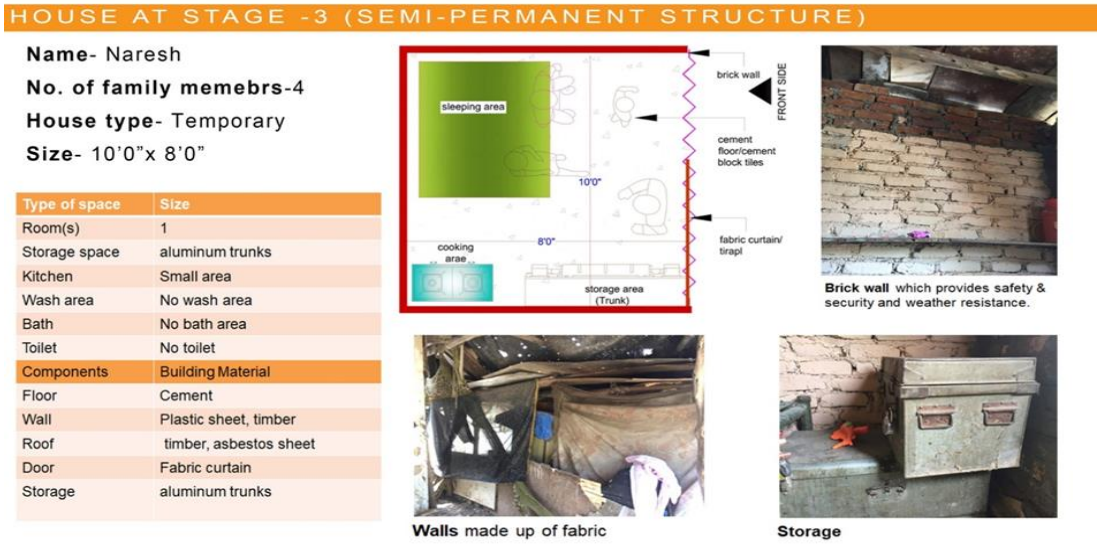


**Figure 11** House at stage 3 in Ekta Camp

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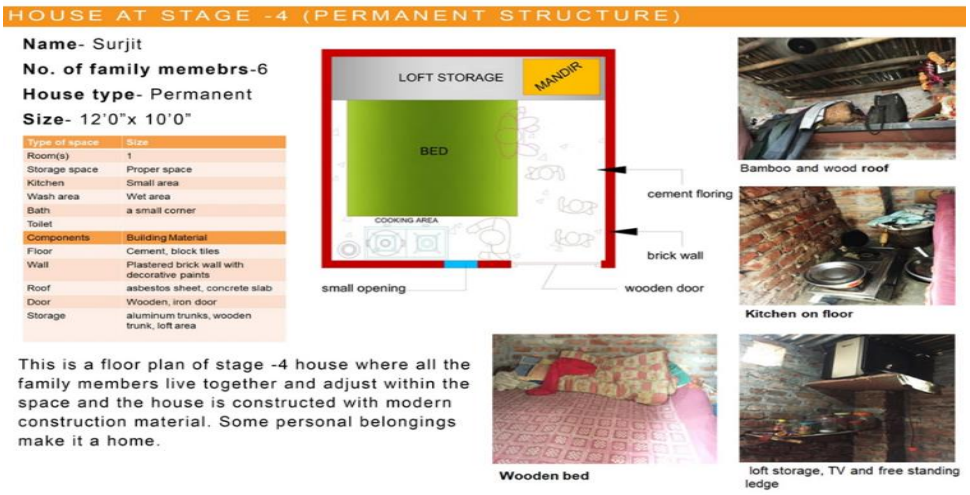


**Figure 12** House at stage 4 in Ekta Camp

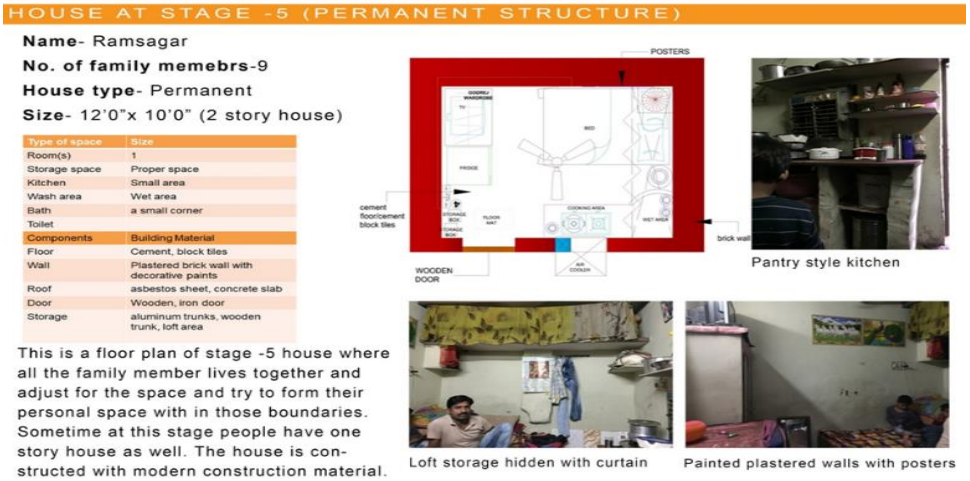


**Figure 13** House at stage 5 in Ekta Camp

| Stages/ Particulars | Stage-1 | Stage-2 | Stage-3 | Stage-4 | Stage-5 |
|---|---|---|---|---|---|
| Time | 2-3 days | Approx. 1 month | Approx. 10 months-1year | Approx. 2-3 years | Approx. 5-6 years |
| Approx. expenses | N.A. | Rs.4,000-Rs.5,000 | Rs.12,000- Rs.20,000 | Rs.30,000- Rs.50,000 | Rs.1-2.5 Lakh |
| No of family members | 1 person (father) | 2 people ( husband and wife) | 3-4 people ( father, mother and elder son) | 5-6 Parents and all children's | 7-9 all the family members ( grandparents, parents and children's) |
| NO of generation living in a single dwelling | 1 Generation (only second generation) | 1 Generation (only second generation) | 2 Generations (second & third generation) | 3 Generations (First, second & third generation) | 3 Generations (First, second & third generation) |
| Personal belongings | N.A. | Radio | Family photographs, TV, Radio | Family photographs, TV, Radio, Personal space, fridge | Family photographs, TV, Radio Personal space, fridge, air cooler |
| Legal documents | N.A. | N.A. | Voter ID, Electricity meter, water meter | Voter ID, Electricity meter, water meter Ration Card , Adhar Card | Voter ID, Electricity meter, water meter Ration card, Adhar Card, Driving license. |
| spaces | Sleeping area | Sleeping area Cooking area | Bed for sleeping Cooking area Wet area storage | Bed for sleeping Kitchen Wet area storage Puja space Entertainment space | Drawing room/ Living are Kitchen Bath area storage Puja space Entertainment space one more floor |

**Figure 14** Stage Analysis

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Predominantly employed as daily wage workers, the residents of the informal settlement face challenges in accumulating sufficient savings to purchase a home outright. Consequently, they adopt a phased approach to homebuilding, initiating with rudimentary shelters on a rental basis. Gradually, they amass building materials, save funds, and secure a dwelling within the camp for incremental renovations. The research sheds light on their construction techniques, the variety of building materials utilized, and the sources from which these materials are procured. Notably, the study reveals the residents' inherent practices of reusing and refurbishing materials, contributing to a minimal carbon footprint. The findings advocate for the encouragement and recognition of these environmentally beneficial practices, emphasizing their significance for ecological sustainability.

### 3.5.2. Building Material

(Refer Table-1) To decipher the construction styles and materials employed, an in-depth analysis was conducted on 50 houses spanning various stages from temporary to semi-permanent and permanent dwellings. This investigation provided insights into the constraints and budgetary limitations faced by residents during the transition from temporary to permanent housing. The study meticulously documented the materials used in different structural components such as flooring, ceilings, walls, storage solutions, ladders, doors, and windows, offering a comprehensive understanding of the construction practices within the settlement.

**Table 1 Different Building Materials**

| | | |
|---|---|---|
| **1** | **External walls** | • 9”, 4.5”, 18”,1’ thick brick wall finished and unfinished with cement plaster and paint<br>• Wooden (commercial board or other locally gathered waste timber)<br>• Plastic walls supported with tree trunks or bamboo |
| | **Internal walls** | • 4.5” thick brick wall finished and unfinished with cement plaster and paint<br>• Brick and fabric curtain partitions |
| **2** | **Flooring** | • Cement flooring<br>• Cement block tiles |
| **3** | **Roof** | • Red sandstone slab supported on L and T iron bars.<br>• Fiber sheets supported on bamboo.<br>• wooden board supported on bamboo or timber logs.<br>• Corrugated steel roof sheets supported on bamboo.<br>• asbestos sheets<br>• plastic sheets (Tirpal, plastic sack bag)<br>• Locally gathered various materials like brick, timber, plastic etc. |
| **4** | **Doors** | • wooden batten door<br>• wrought iron door<br>• fabric curtains<br>• commercial plyboard |
| **5** | **windows** | • wooden windows<br>• only small openings in the walls for ventilation or exhaust fan |
| **6** | **ladder** | • wrought iron stairs<br>• wooden ladder<br>• locally sourced and gathered wooden bars and assembled them in the form of a wooden ladder |
| **7** | **Storage** | • Trunk<br>• Loft<br>• Space under bed |

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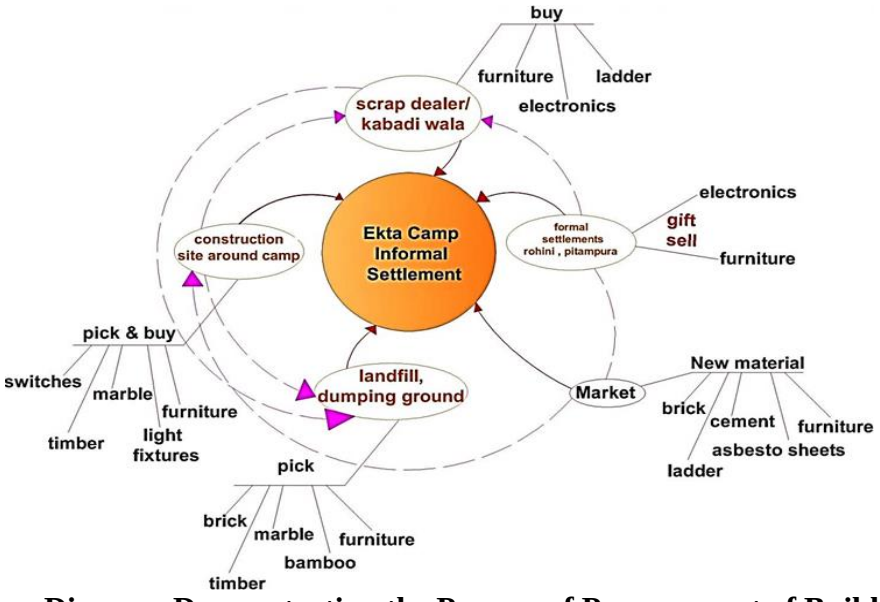


**Figure 15** **Flow Diagram Demonstrating the Process of Procurement of Building Material**

(Refer to Figure 15) This detailed diagram provides a comprehensive overview of the procurement network for building materials and home furnishings within the community. It outlines the specific locations, vendors, and informal networks from which residents acquire or reclaim items for their homes. This map not only identifies the various sources, including local markets, scrap dealers, and construction sites but also delineates the relationships and transactions involved in obtaining these essential materials, offering a vivid snapshot of the resourcefulness and connectivity of the settlement's inhabitants in sourcing their construction and furnishing needs.

**Table 2** **Material Analysis Stage-Wise**

| Stages/ Particulars | | Stage-1 | Stage-2 | Stage-3 | Stage-4 | Stage-5 |
|---|---|---|---|---|---|---|
| Building material | *walls* | Plastic sheets | Plastic sheets timber (commercial board or ply) | brick walls timber | plastered brick walls | plastered brick walls with paints |
| | *flooring* | N.A | Cement or cement block tiles | Cement or cement block tiles | Cement or cement block tiles | Cement or cement block tiles |
| | *Roof* | Plastic sheets | Plastic sheet timber | Plastic sheet timber | L & T iron bar<br>Asbestos sheet | L & T iron bar<br>Asbestos sheet |
| | *windows* | N.A | N.A | N.A | small opening<br>wooden window | wooden window |
| | *Door* | N.A | fabric/ Timber slider | fabric/ Timber slider | wooden batten door<br>Wrought iron door | wooden batten door<br>Wrought iron door |
| | *Ladder* | N.A | N.A | N.A | N.A | wrought iron stairs<br>wooden ladder<br>locally sourced and gathered wooden bars and assembled in the form of wooden ladder |

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The collected data elucidates a strategic utilization of a heterogeneous mix of construction materials by the inhabitants of the informal settlement, a testament to their inventive resilience in the face of urban living constraints (Table 2). These constraints include prohibitive costs associated with city life, the inaccessibility of formal housing markets, and a pervasive scarcity of conventional building resources. In response, the community members resourcefully leverage locally sourced materials, such as mud, bricks, plastic sheets, tarpaulin, and an assortment of recycled substances, to erect their dwellings. The roofing solutions observed within the settlement frequently comprise temporary yet functional materials like tin or tarpaulin, emblematic of the incremental nature of housing construction prevalent in such communities. This phased approach to building allows for gradual improvement and expansion as resources become available, reflecting a pragmatic adaptation to the economic realities faced by the residents. Moreover, the innovative application of alternative materials evidences a deep understanding of the functional properties required to mitigate environmental and privacy concerns. Plastic sheeting, for instance, is employed to waterproof roofs, effectively safeguarding the interiors from rainwater ingress. Similarly, the construction of wooden walls not only demarcates personal space, providing much-needed privacy but also contributes to the creation of a sheltered environment resilient to adverse weather conditions. The strategic incorporation of ventilation openings or spaces for exhaust fans within these makeshift walls further underscores the community's ingenuity in enhancing living conditions through improved air circulation and temperature regulation. This adaptive construction methodology highlights the community's adeptness at optimizing limited resources to create habitable spaces, underscoring a collective ingenuity that navigates the complexities of urban survival within the margins of formal housing systems.

### 3.5.3. Transition of House to a Home

This segment of the research delves into the conceptual transformation of a mere physical structure into a 'home', as perceived and experienced by the inhabitants of informal settlements. It investigates the nuances of how a dwelling, initially selected out of necessity and equipped with the most basic amenities, evolves into a space imbued with personal significance and emotional attachment. The study seeks to uncover the pivotal moments and elements that contribute to this metamorphosis, exploring the deeply personal and varied interpretations of 'home' among the residents of Ekta Camp. Key factors identified in the transition from house to home include:

- **Proximity of Family Members:** The physical presence and closeness of family members, whether within the same unit or in adjacent dwellings, but within the same vicinity, play a crucial role in fostering a sense of home.
- **Artifacts and Home Furnishings:** Personal touches like family photographs, painted walls, and decorative furnishings add layers of personal identity and comfort to the living space, contributing to its homeliness.
- **Designated Spaces:** The allocation of specific areas within the dwelling for individual activities, such as a private bedroom, a dedicated space for prayer or 'Puja', and a distinct kitchen area, significantly enhance the functional and emotional value of the home.
- **Personal Objects:** The presence of items like televisions and radios not only serve entertainment purposes but also act as markers of personal space and leisure, enriching the living experience.
- **Furniture:** Practical and aesthetic furniture pieces such as dressing tables, sofas, and beds elevate the comfort and functionality of the space, reflecting the residents' aspirations and tastes.
- **Legal Documents:** Possession of legal documents bearing the address of the dwelling, such as Voter IDs, Aadhar Cards, Ration Cards, Driving Licenses, and

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Electricity Meters, legitimizes the occupants' claim to the space, reinforcing the sense of permanence and belonging.

This comprehensive analysis underscores the multifaceted and dynamic nature of 'home' as a concept that extends beyond physical boundaries to encompass emotional, social, and legal dimensions. Through this exploration, the study highlights the profound ability of individuals to transform their living environments, regardless of their initial conditions, into spaces that resonate with personal meaning, security, and identity.

## 4. Research Finding

The comprehensive analysis conducted in this study sheds light on the intricate and multifaceted nature of housing development within informal settlements. The findings, drawn from a thorough examination of living conditions and construction practices, elucidate a spectrum of insights:

1. **Advanced Housing Stages Resembling Formal Housing:** Dwellings that have reached the final stage of development exhibit characteristics akin to Entry-Level Scheme (EWS) housing, featuring a structured floor plan that includes distinct living spaces such as a living room, bedroom, and kitchen, akin to 1BHK or 2BHK configurations.
2. **Adoption of Modern Construction Materials:** In the process of reconstructing their homes, residents progressively opt for contemporary building materials that offer enhanced durability and resistance to environmental factors, signifying an evolution towards more resilient housing solutions.
3. **Aesthetic Considerations:** There exists a pronounced desire among the inhabitants to beautify their living spaces, manifesting in the application of vibrant wall paints and the adornment of interiors with posters and decorative items, underscoring a keen sense of aesthetics and personal expression.
4. **Innovative and Economical Solutions:** Faced with the challenges of limited resources and budget constraints, the community demonstrates remarkable ingenuity in seeking out alternative and cost-effective solutions to address their housing needs, reflecting a proactive approach to problem-solving.
5. **Utilization of Reusable Materials:** The practice of employing a diverse array of reusable items, particularly in terms of furniture and home furnishings, is prevalent, highlighting a resourceful use of available materials to enhance the functionality and comfort of their dwellings.
6. **Sustainable Practices:** The community engages in recycling, refurbishing, and remanufacturing processes, evidencing a conscious effort to minimize waste and reduce their environmental footprint, thereby contributing to sustainable living practices within the constraints of informal settlement conditions.

These findings underscore the residents' capacity for adaptation and innovation in the face of adversity, revealing a dynamic interplay between necessity, resourcefulness, and the aspiration for improved living standards. The study highlights the transformative potential inherent in informal settlements, where the evolution from rudimentary shelters to more permanent and aesthetically pleasing homes reflects not only physical reconstruction but also a profound reimagining of space and community identity.

## 5. Discussion

### 5.1. Interpretation of Results in Context

The empirical evidence derived from Ekta Camp significantly contributes to the corpus of knowledge surrounding informal settlement housing practices. The gradational construction methodologies, underscored by an acute aesthetic sensibility and judicious spatial management, corroborate and extend existing literature by illustrating the residents' capacity for architectural self-determination. This agency, manifested in the eclectic use of both conventional and non-traditional materials, alongside pronounced sustainable practices, reiterates the sophistication inherent in informal urban habitats. Such findings not only

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enrich the understanding of informal settlements but also challenge preconceived notions by showcasing the deliberate and thoughtful approaches adopted by the inhabitants in the face of limited resources.

### 5.2. Broader Implications of the Findings

The research elucidates the intrinsic potential of informal settlements to inform sustainable urban development paradigms. The indigenous strategies of sustainability, characterized by adaptability and community-centric solutions, invite a critical re-examination of entrenched urban planning and housing policy doctrines. The insights gleaned from this study advocate for the integration of the innovative, bottom-up housing strategies observed in Ekta Camp into broader housing frameworks, thereby contributing to the development of more equitable, sustainable urban ecosystems.

### 5.3. Recommendations Derived from the Research

Considering the findings, the study posits several recommendations:

1. **Incorporation into Policy:** Advocate for the assimilation of grassroots housing innovations into mainstream housing policy frameworks, with an emphasis on incremental construction and the valorization of community engagement and material reuse.
2. **Enhancement of Sustainability Initiatives:** Promote the formal recognition and support of sustainable practices prevalent within informal settlements through institutional collaborations, aiming to amplify these practices through educational and community-led initiatives.
3. **Adaptation of Design Principles:** Propose the formulation of flexible design principles that encapsulate the spatial and material ingenuity characteristic of informal settlements, tailored to meet the diverse exigencies of urban dwellers.
4. **Facilitation of Dialogues:** Recommend the establishment of dialogic platforms to foster exchanges between informal settlement communities and urban planning entities, thereby bridging indigenous knowledge systems with formal urban development strategies.

### 5.4. Study Limitations and Considerations

This investigation acknowledges its limitations, most notably the concentration on a singular informal settlement, which may not comprehensively represent the heterogeneity of informal housing practices across diverse urban landscapes. The quantitative dimension of this study, constrained to 50 residential units, while offering invaluable insights, delineates the scope of generalizability of the findings. Future research endeavors should aim to broaden the empirical base, encompassing a wider array of informal settlements to enhance the robustness and applicability of the derived conclusions. In summation, this scholarly inquiry into the housing dynamics of Ekta Camp not only augments the academic discourse on informal urban settlements but also posits a recalibration of conventional urban development strategies. By valuing the empirical realities and innovative capacities of informal settlement dwellers, there exists a formidable opportunity to cultivate urban environments that are resilient, inclusive, and attuned to the principles of sustainability.

## Conclusion

The research conducted on the Ekta Camp, a notified slum in North-West Delhi, India, offers a comprehensive exploration into the adaptive and innovative housing strategies employed by its residents amidst the constraints of informal settlement living. Through a detailed examination of interior design patterns, material usage, and the incremental nature of housing development, this study illuminates the resilience, resourcefulness, and ingenuity inherent within the community. The findings reveal a nuanced progression of dwellings from basic shelters to more permanent structures, mirroring formal housing in their later stages with distinct living spaces and improved amenities. The adoption of modern, durable construction materials and a keen aesthetic sensibility, alongside the strategic use of space and the incorporation of sustainable practices such as recycling and refurbishing, underscore a collective aspiration towards enhanced living standards and

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environmental responsibility. This research underscores the critical role of interior design and spatial arrangement in improving the quality of life within informal settlements. The creative optimization of limited space and the use of everyday utility items demonstrate the residents' adeptness in transforming their dwellings into functional, comfortable, and dignified homes. Furthermore, the transition from a house to a home is marked by factors such as the proximity of family members, personalization through artifacts and furnishings, and the establishment of designated spaces for individual and communal activities. The study's insights into the housing dynamics of Ekta Camp hold broader implications for urban development and housing policy. They advocate for the integration of grassroots innovations into formal housing strategies, emphasizing the potential of informal settlements to contribute to sustainable urban development. Recommendations include the incorporation of these practices into policy frameworks, the promotion of sustainable initiatives, the adaptation of design principles to reflect the ingenuity observed in informal settlements, and the facilitation of dialogues between communities and urban planning entities. Despite its focus on a single informal settlement, this research contributes significantly to the academic discourse on informal urban habitats, challenging conventional approaches to housing and urban planning. By acknowledging and valuing the empirical realities and innovative capacities of informal settlement dwellers, there is a formidable opportunity to foster more resilient, inclusive, and sustainable urban environments. This study not only enhances our understanding of the complexities and potentialities of informal settlements but also calls for a reevaluation of urban development strategies to better accommodate and integrate the growing populations in such communities. The insights derived from Ekta Camp provide valuable lessons for the development of housing policies and urban planning practices that prioritize sustainability, resource efficiency, and the well-being of all urban residents.

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