

INFORMAL SETTLEMENTS IN LATIN AMERICA: DEFINITIONS, DETERMINANTS, AND URBAN DEVELOPMENT PATHWAYS

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Abstract: *This paper explores the phenomenon of informal settlements within the Global South context, the paper provides a comprehensive conceptual review of key definitions, characteristics, and determinants of informal settlements, emphasizing the legal, socio-economic, and spatial dynamics that shape these areas. Additionally, it examines the implications of informal urbanism on green infrastructure, a growing area of interest in sustainable urban development. Through this exploration, the study aims to offer a nuanced understanding of the challenges and opportunities presented by informal settlements in the region, emphasizing the need for context-specific solutions and adaptive and in-situ governance strategies.*

Keywords: *informal settlements, urban informality in Latin America, urban green spaces, sustainable development.*

1. INTRODUCTION

Informal settlements are prevalent in many parts of the world, particularly in developing countries, including Latin America and the global south. Grajeda and Ward [1] mentions that in the 1980s, self-built settlements comprised between 10 and 60 percent of the built-up area in most latin american cities and approximately 14% of the total population living in informal conditions, a situation that continues to worsen [2]. Rapid urban growth, along with insufficient affordable housing, has driven the widespread emergence of informal settlements across Latin America. While informality has historical roots in the region's colonial past, it was the accelerated urban expansion of the twentieth century that deeply entrenched it, turning informal development into the primary way for low-income populations to secure access to urban land [3]. Therefore, a significant portion of the what is consider urban poor lacks proper housing [4]. These areas, often labeled as slums or squatter settlements, are defined by their lack of secure tenure, limited provision of basic services, and noncompliance to building regulations [5]. The purpose of this study is to identify the main definitions and characteristics of informal settlements within the Latin American context shocasing its implications on urban development and green infrastructure. And as a conclusion, to emphasize the need for context-specific solutions and adaptive and in-situ governance strategies.

1.1 Methodological Approach

This paper adopts a conceptual and synthetic approach, drawing on academic literature, and empirical studies focusing on informal settlements in Latin America. The aim is to clarify key definitions, analyze determinants, and critique the implications for urban development and green infrastructure.

2. DEFINITIONS AND CHARACTERISTIC OF INFORMAL SETTLEMENTS

There are few terms to idenitify informality in the urban context, there is complex relationship between these terms and while they are often used interchangeably, they have distinct meanings and implications [6]. Evethough

they have different connotations, there is a confusion surrounding terms like "slums," "squatter settlements," and "informal settlements." However, Gulyani and Bassett [7] suggests that focusing on the physical characteristics of settlements (i.e., living conditions) provides a clearer understanding. It's vital to recognize their unique typologies and the variety of processes they represent [6].

2.1 Definitions and characteristics

The terms squatters, slums, and informal settlements are commonly used to describe aspects of informal urbanism. Although these concepts share similarities, the physical forms of informal urban development are labeled and defined differently across diverse countries [2]. Among them, slums (English), barri-das (Peru), campamentos (Chile), villas miseria (Argentina), Kachi Abadis (Pakistan), kampung (Indonesia), shanty towns (English-speaking Africa), favela (Brazil), bidonville (French-speaking Africa), and so on. While informal settlements are typically defined as residential areas where residents lack secure tenure, access to basic services, and compliance with building regulations, encompassing conditions from squatting to informal rentals [5]. The concept of informality is more widely understood in the literature, primarily through its legal dimensions [2]. Therefore, while the physical characteristics of informal settlements may differ depending on the location, a common underlying feature is the lack of legal recognition and formal urban planning. In English, several terms are commonly used to describe these areas (Table 1). 'Slums' typically refer to the most deprived and excluded forms of informal settlements, often marked by extreme poverty, deteriorated housing conditions, and high exposure to environmental hazards. 'Squatter settlements' are specifically related to tenure, describing areas where individuals or groups occupy land or buildings without legal authorization [5]. These are frequently linked to mass migration and the unmet need for affordable housing in the Global South. The term 'informal settlements' itself is broader, encompassing a wide range of meanings and interpretations that vary significantly depending on the context [8]. Although some countries might view "informality" as a distinct sector, it's essential to recognize that informality is a multi-faceted phenomenon that crosses boundaries, particularly with globalization. For example, informal housing and land markets are not only prevalent in poor communities but also extend to middle and upper classes in various parts of the world, emphasizing the need to move beyond the simplistic "formal vs. informal" dichotomy and delve into the complexities of how informality operates as a mode, revealing its varying manifestations across different countries [9].

Term	Definition	Distinct Features
Informal Settlements	Areas with housing built outside formal planning or legal frameworks.	Broadest term: covers various legal statuses.
Slums	The most deprived informal settlements, marked by extreme poverty, poor housing, high exclusion.	Emphasis on deprivation, hazard exposure.
Squatter Settlements	Areas occupied without formal legal authorization.	Defined by lack of tenure security.

Table 1: Definitions summarized and synthesized from Gulyani & Bassett (2007), UN-Habitat (2003, 2015), Grajeda & Ward (2021), and author synthesis of comparative literature. Source: author.

3. DETERMINANTS

There are numerous determinants that characterize informal settlements, which manifest on different scales ranging from a basic need for shelter to economic and geopolitical perspectives. These drivers are rooted in historical patterns of inequality, migration, inadequate housing policies, and governance shortcomings. The following discussion examines some of the major influences with the aim of providing a overview of the complexities associated with informality in Latin American context.

3.1 Labor, informal housing and poverty

Access to adequate housing remains a major challenge in Latin American cities, where formal markets often exclude low-income populations. Informal settlements have become the primary response to the region's growing housing deficit [10]. While such settlements are often seen as centers of employment and wealth creation, they are often largely residential in nature, with residents working in service sector jobs in the city [11], this suggests a complex relationship between poverty and informal settlements, where residents may be both contributing to and experiencing poverty within these areas. The proliferation of low-rise informal constructions in Latin American cities is driven by low-income residents who face high commuting costs to formal employment centers [12]. Furthermore, poverty is not just a characteristic of slums, but a cause and consequence of slum conditions. Slums conditions create barriers to human and social development, further perpetuating poverty and social exclusion [5]. This is further aggravated by the fact that the poorest families in an urban area may seek temporary housing in informal settlements, primarily driven by the need for affordability and flexibility [13]. These families may choose to live in makeshift shelters that are easily transferable to maximize income-earning opportunities, often through informal labor, in the central city areas. In addition, families with a more stable income, the need for a permanent residence in an informal settlement may become more noticeable, driven by the desire for a stable living environment and the chance to build a home. Therefore, residents often develop their own housing solutions without government planning or support [13].

3.2 Regulation and tenure

Even though formal tenures are assumed to be more secure, the actual security of a tenure, regardless of its legal status, depends on the actions and attitude of the state [7]. Nevertheless, regularisation of informal settlements often leads to gentrification, suggesting that it's not always the most appropriate approach to providing secure tenure [14]. In addition, the lack of regulatory enforcement and easy access to rudimentary technologies create incentives for housing production outside of regulations [15]. Government intervention to provide services and legal title (regularization) has become common, along with self-help and mutual-aid activities from residents themselves arguing that houses represent significant assets that can be sold or bequeathed to heirs [1]. Moreover, common understanding of tenure legalization and in situ upgrading, often overlooks the physical conditions of settlements. Therefore, the most suitable tenure option for any given informal settlement in Latin America will depend on the specific context, including the land ownership situation, residents' needs, and the local legal framework [11].

4. SOCIO-ECONOMIC AND POLITICAL FACTORS

4.1 Socio-Economic Conditions

Informal settlements are associated with various forms of deprivation, including insecure land tenure, low standards of urban services, and non-durable housing structures. The decision to reside in informal settlements is driven by a complex interplay of factors, including the lack of affordable housing options in the formal market, and the potential for future appreciation in property value, despite the inherent risks associated with informal settlements.[16]. Poverty is not homogeneous but rather displays heterogeneity in the urban space. This heterogeneity leads to the grouping of poor households based on their "portfolio of assets", creating distinct neighborhoods with varying degrees of social isolation. This phenomenon is attributed to the economic and social forces pushing poorer residents together, while those who can leave do so, leaving behind those with limited resources [17]. However, informal settlements are frequently portrayed as areas of extreme poverty and danger, this view is often exaggerated and lacks perspective. They are spaces of extreme wealth and poverty, comfort and misery, cosmopolitanism and communalism, community and alienation, massive recreation and boredom, hygiene and disease, hope and despair. These generalizations lack nuance and distort the realities of socio-economic conditions in diverse urban environments.[18]. The critics come into generalized solutions, arguing that there is no one-size-fits-all approach to improving socio-economic conditions in slums. It cautions against assuming that decentralization, democratization, or mortgage market expansion will automatically improve living standards, indicating that more nuanced and realistic understanding of these complex urban environments should be studied [18].

4.2 Political Context

The political climate in Latin America often fails to recognize the needs and rights of these settlements, leading to a perpetuation of their precarious existence [3]. Moreover, the political system of a country is a major factor that affects the development of extra-legal development, along influence on economic development, the size and growth

of a city, the availability, quality and ownership status of unsettled land, and the government's ability and willingness to enforce the law and implement its policies [14]. Furthermore, the context in the global south is referred to the government's failure to provide affordable land and housing for migrants, especially in rapidly urbanizing areas, forcing many to settle in unauthorized zones due to economic pressures and a lack of formal options. These factors, often driven by bureaucratic decisions that fail to address the needs of the urban poor, create a cycle of displacement, limited housing options, and a reliance on unauthorized settlements [19]. Moreover, "occupancy urbanism" which analyzed how informal occupations shaped urban space, economies and social dynamics, is a form of political agency used by squatters and slum-dwellers to secure land tenure and access to public services. This indicates that the political landscape surrounding informal settlements is not just about established political structures, but also about the everyday struggles of residents to gain control over their living spaces [8].

4.3 Community Organization and Social Networks

The failure of top-down development approaches has led to a shift towards participatory development [10]. Organizations are often established to defend the community and advocate for its interests to the government [3]. Family and kinship relationships are strong, providing a degree of crisis insurance. Community organizations and social networks play a crucial role in the success of self-help housing initiatives[11]. In addition, green infrastructure project implementation usually requires significant community involvement and participation. [20]. Strong collaborations between community organizations, researchers, government agencies, and other stakeholders are needed to ensure and prioritize local interventions in the planning process [21].

4.4 Green infrastructure projects in informal Latin American communities

Some initiatives address urban green space degradation by actively involving local communities. In Brazil, the Manguinhos initiative exemplifies a large scale urban agroecology project in one of Rio de Janeiro's most marginalized favelas. Since 2012, this public-private partnership has transformed a kilometre-long stretch of degraded land beneath high voltage lines into South America's largest urban garden. The project involved extensive land restoration, the installation of water infrastructure, and the creation of over 300 organic garden beds. It employed over 20 local residents, providing stipends, agroecological training, and fresh produce, alongside a volunteer led section focused on community food distribution.[22]. Another example is in Colombia, the Alto Fucha initiative represents a community led agroecological project in the contested Eastern Hills of Bogotá. The project emerged in response to long-standing pressures from institutional and private actors seeking to displace local residents through urban planning policies. Through participatory action research, it engaged children and adolescents in building the "Ecoterritory" a model of sustainable habitability based in environmental care and territorial defense. The project introduced composting, rainwater harvesting, and seed recovery practices, while integrating environmental popular education to foster collective identity and ecological awareness. It emphasized care for life, community solidarity, and everyday practices that link agroecology to the defense of territory and the right to remain.[23]. In Argentina, the Villa 31 slum upgrading project illustrates a participatory urban intervention that integrates green space rehabilitation within a broader urbanization strategy. Rather than demolishing the existing built environment, the project focuses on enhancing it rehabilitating public parks and proposing new ones. The inclusion of green infrastructure forms part of the physical upgrades aimed at creating a more livable and sustainable community [24].

Case	Place	Type of intervention	Participants	Outcomes
Manguinhos Urban Gardens	Brazil- Rio de Janeiro- Manguinhos favela	Urban Agroecology Intervention	Municipal,community,NGO, Private Sector	Transformation of a dump into community vegetable garden. Restoration of degraded land. Production of organic food. Development of inclusive green infrastructure.
Alto Fucha Community Gardens	Colombia - Bogotá- Eastern hills	Urban Agroecology Intervention, Sustainable habitability	Local collectives, researches, community, university	Creation of community gardens with collective identity. Separation and composting of household waste. Harvesting of rain and river water. Recovery and exchange of native seeds. Strengthening of local belonging and territorial identity. Identification of social issues and creation of support networks.
Villa 31 Upgrading	Argentina - Buenos Aires- urban slum	Urban upgrading/participation	Community, government, stakeholders.	Creation of new green and public spaces. Creation of a representative participation system with elected delegates. Active community involvement in planning and design stages. Foundation established for future participatory upgrading efforts

Table 2: Examples of community self-organization and green infrastructure projects in informal settlements in Latin America. Source: author.

5. CHALLENGES AND IMPACTS

5.1 Urban Planning and Infrastructure

To provide infrastructure is sequential, first comes planned infrastructure, and then remedial infrastructure is added to serve informal settlements[15] The growth of infrastructure often lags behind urban growth, which leads to scarce infrastructure at the city periphery. This is particularly relevant in developing countries where rapid urbanization often outpaces infrastructure development. Furthermore, the lower level of infrastructure is directly connected with the spatial size of the city, this is because the cost of connecting to infrastructure increases with distance from the city center, leading to a greater allocation of land for informal housing, which tends to be low-rise and less dense, the extension of informal settlements can be quite spread, accounting for a significant portion of urban growth, often exceeding the areas designated for development in official plans[15]. Additionally, informal settlements can lead to a lack of efficient public utilities and a decline in the quality and value of housing for low-income residents[13]. There is a huge importance of infrastructure improvements as a key aspect of settlement upgrading in urban Planning, upgrading isn't just about water or housing but also involves social and economic activities to revitalize the area.[5] . The investment in infrastructure, like water treatment works, can be seen as a temporal fix to address the overaccumulation of capital, particularly in the Global South. However, there are some actors involved, an example are NGOs which often are advocating for infrastructure development in informal settlements [25]. Their investments, while meant for the public good, can often lead to increased speculation and benefit private developers. This, in turn, can result in increased rents and tenure insecurity for residents of informal settlements [25].Furthermore, urban planning often assumes that all residents need better and larger housing, often proposing multi-story buildings or relocation to less central areas. This approach can negatively affect livelihoods, particularly in cases where housing serves a dual purpose of dwelling and commerce which often provide important social support systems and access to shared spaces[10, p. 8]. This suggests that while such interventions may be intended to improve conditions, they can have consequences of displacing lower-income residents and benefiting property owners. Governments play a significant role in developing strategies to promote sustainable urban development and address the housing needs of the poor, while recognizing the need for market forces and community participation [4].

5.2 Green Infrastructure

Informal settlements often arise in areas with ecological significance, such as along rivers, on steep hillsides, or within wetlands, due to the unavailability of suitable land for formal development. The location can lead to negative impacts of the environment but also presents opportunities for utilizing these green spaces. Residents in informal settlements often engage in agricultural cultivation within their communities, creating gardens and utilizing open spaces for food production [26]. Furthermore, informal settlements often have a higher proportion of green structures compared to other residential areas, leading to lower land surface temperatures. This suggests that informal settlements could potentially benefit from green infrastructure, as it can help mitigate the urban heat island effect and improve the overall urban environment.[27]. However, cautions that green infrastructure projects can sometimes exacerbate existing socio-spatial inequities in informal settlements, leading to what they call "landscapes of pleasure and privilege." designed for the benefit of wealthier residents or tourists, while neglecting the needs of the original inhabitants [28]. Green Infrastructure offers many advantages over traditional "gray" infrastructure. These include its ability to provide multiple environmental services, its adaptability to various scales, and its ability to promote social cohesion[29] It can be vital to provide services to the communities and is a nature-based solution to address various societal challenges including climate change. It can be adapted to different territorial scales, from continental scales to smaller dimensions with value for local communities [29]. Additionally, it is increasingly recognized as a vital component of sustainable cities and achieving the Sustainable Development Goals (SDGs). This is particularly relevant to SDG 1, aiming to reduce poverty [30]. The significance of green infrastructure in urban settings underscores the necessity for efficient tools to evaluate their value in guiding planning decisions [31].

5.3 Environmental and Health Impacts

Rapid urban expansion has profound implications for social, economic, and environmental issues, e.g. energy consumption, greenhouse gas emissions, climate change, spatial fragmentation, socioeconomic segregation, and loss of agricultural land [32], the rapid influx of people into these settlements often leads to the overburdening of existing infrastructure and the degradation of the surrounding environment, urban expansion often leads to the development of urban corridors, which can contribute to environmental degradation and health risks[5], [25]. Furthermore, there are health threats associated with slums and inadequate housing conditions characterized by a lack of basic amenities and services such as lack of access to clean water, sanitation, and healthcare facilities [4], [5]. Green infrastructure appears as a valuable solution that can provide positive environmental and health impacts [29], [33]green spaces have a positive impact on mental well-being and cognitive function, potentially reducing stress and improving overall health [34] and it can help alleviate the impacts of climate change, such as flooding and the heat-island effect [34]. However, certain aspects of the natural environment can negatively impact physical and mental well-being in informal settlements [26]. Vegetation patches can increase the risk of infectious diseases like diarrhea, wetlands can attract mosquitoes and other insects, which can lead to health problems like malaria, regarding to urban agriculture in informal settlements, the crops can be contaminated through irrigation with greywater from polluted drainage channels or streams, among many more [26]. Green infrastructure offers promising solutions to mitigate issues and enhance overall well-being, though careful consideration is needed to address potential negative impacts in informal settlements.

6. FUTURE DIRECTIONS AND RESEARCH GAPS

6.1 Emerging Trends

The 21st century urbanisation in developing countries is marked as a paradox, where much of urban growth is taking place in the developing world, but planning theories remain rooted in the developed world.[9] One of the most important trends is the increasing importance of cities as centers of power and economic, tertiary economic activities and nodes of interconnection in networks of flows in and between cities., urban development as being shaped by globalization, economic forces, and a shift away from centralized planning towards market-driven approaches make more challenging to address implications in inequality, affordability, and environmental sustainability [35].

The migration with the aim of employment, affordable housing, the idea of progress associated with ownership among many more produce urban peripheries which are often denser and more fragmented than the urban cores, with a higher concentration of informal housing and services and contributes to urban segregation [2], [12], [16], [36]

However, informality is no longer seen solely as a negative aspect of urban development, urban development consists of a blending of formal and informal practices and how they interact with each other[37]. Furthermore, a relational and intersectional approach is needed to ensure that the needs and aspirations of all residents are considered

[10].

6.2 Research Gaps

In the context of sustainable cities, it is imperative to examine green infrastructure; for instance: how poor urban dwellers in informal settlements relate with green spaces and natural ecosystems [38]. or quantify the supply and demand for Urban Ecosystem Services in Latin American countries to understand how they can be valued in both equitable and relevant ways.[38]. There is a need for comprehensive monitoring of urban green and its ecosystem services [39] The research gaps encountered: lack of systematic research, limited focus in America Latina urban expansion, need for empirical data to inform urban growth scenarios, inefficient land-use policies, lack of historical analysis transformations and studies grounded in local realities [36][32][40][13].

7. CONCLUSION

The article describes informal settlements as complex and multivariant ecosystems that are transversally attached with socio-economic dynamics. While physical characteristics may differ across locations, a common feature of informal settlements is the absence of legal recognition and planning. The term "informal settlements" thus captures a broad spectrum of living conditions and arrangements existing in the specificity of the place. The phenomenon of these spaces in the global south indicates the urgent need for integrated and adaptive urban governance strategies. As evidenced by their prevalence and the complex web of socio-economic factors driving their existence, informal settlements represent a critical challenge for urban development. Addressing these challenges requires not only acknowledging the diverse definitions and characteristics of informality but also understanding its profound implications on infrastructure, environment, and public health. Green infrastructure emerges as a crucial component in mitigating these challenges, offering potential solutions to enhance environmental resilience and improve the well-being of residents. Moving forward, effective policies and interventions must be context-specific, empowering communities while balancing economic development with environmental sustainability to promote inclusive and resilient cities in the face of rapid urbanization.

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