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The image of informal settlements: A visibility mapping in the Global South

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ABSTRACT

In the Global South, the visibility and image of informal settlements in urban design, planning, and policy discourse have gained increasing attention in recent years, particularly in relation to the politics of upgrading. Informal settlements are often characterised by small grain size and self-built constructions. While these settlements house millions of inhabitants, they are hardly recognised in long-term urban development. This paper explores the visibility of informal settlements through extensive urban mapping across multiple case studies in the Global South. The analytical framework deployed in this study focuses on how, and to what extent, informal settlements are visible or invisible in relation to new town developments. This framework is then applied to mapping, revealing the dynamics of visibility across the selected case studies in Kunming (China), Abuja (Nigeria), and Jakarta (Indonesia). The study indicates that each case study involves certain patterns of visibility. In particular, different types of visibility are observed in the case study of Kunming. The settlement in Abuja appears largely exposed to clear view from public spaces, while in Jakarta the predominant type of visibility involves blocked and obstructed views. The findings of this article contribute to the growing body of knowledge on the visibility of informal urbanism under the influence of rapid urbanisation.

1. Introduction

When visiting almost any city in the Global South, one can observe that densely populated informal settlements are typically characterised by self- and/or collectively organised constructions and access networks. Informal settlements may emerge in different parts of cities, such as along highways, railways, or hillsides (Dovey & King, 2011). These areas may become entirely or partly visible to public and/or private gazes within cities (Kamalipour & Dovey, 2019), impacting the formation and transformation of place imagery across cities in the Global South (Kamalipour, 2024). The constructed images of informal urbanism raise a critical question: how should cities in the Global South be planned and designed? Cities have become key hubs for employment and opportunity, attracting significant population flows. Rural-to-urban migrants in the Global South are often accommodated through informal settlements, as the urban poor generally cannot secure access to formal housing. In cities such as Mumbai (India) and Guangzhou (China), informal settlements occupy only around 12 to 20 percent of the land but accommodate nearly half of the total urban population (Lin & De Meulder, 2012; Nijman, 2009). While enhancing the living environment has been a key agenda item of sustainable development, the fields of architecture, urban design, and planning have mainly focused on formal urbanism, where planning, design, and construction processes are generally controlled through top-down regulatory frameworks and fairly rigid forms of governance. Demolition strategies are often justified in the name of the "larger public interest" as local authorities compete to construct the so-called "world-class city" (Adama, 2020a; Dupont, 2008, 2011; Ghertner, 2011). Engaging with the challenge of understanding and addressing urban informality requires alternative modes of thinking, along with reimagined planning and design practices.

Exploring informal settlement in the context of the Global South has gained increasing scholarly attention over the last few decades. The notion of informality can be traced back to Hart's (1973) study on informal economic activities and income in the context of Ghana. Drawing on Dovey (2019) and Roy (2015), urban informality can be defined as a mode of spatial governance and production, incorporating a range of activities that generally take place outside, yet often in relation to, state control (Kamalipour, 2023). Researchers have shown that informal settlements are far from being simply chaotic (Turner, 1976; Turner & Fichter, 1972); rather, they can be characterised by processes of incremental development through various rules and norms (Alegría & Dovey, 2024; Arefi, 2011; Dovey et al., 2023; Kamalipour & Dovey,

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2020; Muñoz & Ramos, 2024a; Suhartini & Jones, 2023). The formation of informal settlements has also been associated with self-subdivisions and unauthorised land developments by farmers in peri-urban areas (Thinh & Kamalipour, 2022; Thinh, Kamalipour, & Peimani, 2024) and the informalisation of formal areas (Geyer, 2023; Mottelson & Jenkins, 2024; Van Oostrum, 2023).

It is crucial to recognise that differences in how institutions, organisations, governmental bodies, and researchers define informal settlements can result in ambiguity in classification (Shatkin et al., 2023). Dovey (2025) recently proposed that informality can be interpreted through seven "i's": illegal, insecure, inferior, irregular, illegible, incremental, and insurgent. According to Roy (2005), the state has the power to classify what is informal and what is not. Due to varying definitions and relevant agents, certain settlements might be considered informal in one context but not in another. Informal settlements are frequently used interchangeably with slums, especially in discussions of demolition and resettlement (Gilbert, 2007). However, informal settlements cannot simply be conflated with slums, as informal settlements and/or buildings within them may not exhibit the slum characteristics outlined by the UN (UN-Habitat, 2003). To avoid the terminological imprecision of "slum", this study adopts the view that informal settlements represent a mode of urban development (Dovey, 2019; Roy, 2015), in which buildings and access networks are incrementally transformed over time in response to the needs and/or desires of local inhabitants. This view enables a more sophisticated understanding of urban informality, recognising that informal settlements are by no means homogeneous in terms of physical characteristics and living conditions (e.g., Dovey & Kamalipour, 2018; McCartney, 2024; Taubenböck et al., 2018). Informal settlement involves self-organised practices of incremental development that shape place and provide affordable housing for those generally unable to access formal urban housing markets. With some exceptions, many informal settlements can be incrementally upgraded in their existing locations. Such *in-situ* and incremental upgrading requires a nuanced and informed understanding of the spatial characteristics of informal settlements and how different forms of informal urbanism work in relation to what can be considered the formal city in the Global South (Kamalipour, 2022; Muñoz & Ramos, 2025).

Despite growing concerns regarding the image of informality in the politics of upgrading, there is only an emerging body of knowledge exploring the visibility of informal settlements in the Global South. Informal settlements are often excluded from formal urban planning processes, remain invisible on authorised maps, and are generally overlooked by the state and the broader formal city (Kamalipour & Dovey, 2019; Robinson, 2002). Since Lynch (1960) established the importance of urban imagery and cognitive mapping, various studies have attempted to study the constructed images of cities. However, a significant gap remains: such studies have rarely focused on cities in the Global South. While scholars have pointed out that informal settlements could be recognised as a solution rather than a problem (Dovey, 2019; Turner, 1976; Turner & Fichter, 1972), it remains unclear how informal urbanism works in terms of the formation and transformation of the urban image and place identity. Researchers have also pointed out the systematic forgetting of informal settlements (Fernandes, 2004; Shatkin, 2004). While issues of image and visibility in relation to informal settlements can significantly impact the politics of upgrading (Peattie, 1992), only a few studies have explored the visibility of informal settlements across different contexts (e.g., Dovey & King, 2011; Kamalipour & Dovey, 2019).

The dynamics of the visibility of informal settlements in relation to the politics of development strategies remain largely underexplored, particularly regarding the constructed visions and representations of the modern city and new town development in peri-urban areas. In many cities in the Global South, urban planning models of new towns have been imposed or inspired by approaches from the Global North (Watson, 2009a). These new towns are often termed "eco-cities", "high-tech cities", or "smart cities" to reflect modernist visions of clean, functional, and ordered urban environments (e.g., Keeton & Nijhuis, 2019; Kusumaningrum & Rosyidy, 2024; Wang et al., 2010). Researchers have suggested that such urban planning models are generally part of the problem as they seem to exacerbate social and spatial exclusion (Firman, 2004; Shatkin, 2004, 2007; Watson, 2009a). The aim of this study is to explore the visibility of informal settlements in relation to urban development strategies in new towns. It is critical to note that visibility can be analysed in two main ways: (1) the constructed representations of informal settlements, which are often shaped by the cognitive images held by residents, urban planners, and local authorities (e.g., Agyabeng et al., 2022; Bandauko et al., 2022); and (2) the spatial visibility of the settlement (e.g., Kamalipour & Dovey, 2019). In this study, we primarily focus on the latter due to limited resources and data availability concerning the constructed representations of informal settlements in relation to decision-making processes in the context of urban development. The specific research questions are: How have urban development strategies in new towns concealed or revealed the spatial visibility of informal settlements? Do patterns of spatial invisibility among informal settlements share similarities across new towns in the Global South? Using urban mapping as a key research method, and drawing on case studies from recently developed towns in Kunming (China), Jakarta (Indonesia), and Abuja (Nigeria), this study explores the spatial visibility of informal settlements in the context of urban development.

2. The images of informal settlements and politics of upgrading

In the last few decades, various approaches and methods have been used to explore the spatial characteristics of informal settlements. With the availability of high-resolution satellite images since the early 2000s, previously invisible and/or underexplored informal settlements can now be mapped and tracked at different scales (e.g., Alegría & Dovey, 2024; Dovey et al., 2023; Kuffer et al., 2016; Muñoz & Ramos, 2024a; Taubenböck et al., 2018; Kraff et al., 2020; Thinh et al., 2023). Historical maps can also be used to track the transformation of informal morphologies over time (Han et al., 2017; Spolaor & Oliveira, 2022; Thinh & Kamalipour, 2024). While these approaches and methods allow for deeper engagement with urban informality, mapping informal settlements using aerial images and maps does not directly provide a more nuanced understanding of cities, as it often remains largely disconnected from the politics of upgrading (Wang et al., 2022). Shatkin et al. (2023) and Pratomo et al. (2024) illustrate how the term "informality" can be used and understood in various ways by different groups of residents, governmental bodies, agencies, and/or organisations to express their interests in territorial control. As such, there are growing concerns about how the visibility of informal settlements from public spaces impacts upgrading policies (Dovey, 2024; Dovey & King, 2011; Kamalipour & Dovey, 2019; Shatkin, 2004).

It has been shown that the mass media play a key role in mediating public perceptions of informality (Krstić, 2016). Local authorities can become embarrassed by negative images of informal settlements in the media. The places themselves are real, but the framing through which they are represented is often constructed based on certain criteria. When exposed to public gaze, informal settlements can be targeted for resettlement and redevelopment into newly designed neighbourhoods on the same site. Such acts of "pushing the poor out of sight" (Dupont, 2008, p. 86) or "crusades to clean up the city" (Davis, 2006, p. 104) commonly occur when the city hosts major tourist or political events. For example, when the World Bank and International Monetary Fund held international conferences in Manila (1976) and Bangkok (1991), informal dwellers near the venues were forcibly relocated (Greene, 2014). When Beijing was preparing for the 2008 Summer Olympic Games, the local government launched urban redevelopment projects targeting informal settlements (also known as urban villages) around the city (Shin & Li, 2013; Wong et al., 2018). Similarly, in India, the Commonwealth Games in 2010 became a catalyst for urban change, with local authorities prioritising the city's global image over addressing the economic and social

issues of informal areas (Dupont, 2011).

In the context of informal settlements, invisibility may offer limited protection for residents and informal livelihood practices by reducing exposure to authorities or external interventions. However, it can also allow the state to overlook its responsibilities and perpetuate neglect. Some informal settlements are located in highly visible areas, while others are hidden behind street façades, rows of formal buildings, or may even emerge within formal buildings and urban infrastructure (Dovey & King, 2012; Kamalipour, 2016; Thinh et al., 2023; Van Oostrum, 2023). Others may develop into large urban enclaves enclosed by gates and walls (Thinh et al., 2024; Moatasim, 2024). Thus, some forms of informality may become entirely or partly invisible, even to those living nearby or to visitors passing in close proximity. Very often, the state does not maintain accurate databases of buildings and populations in informal settlements (Zimmer, 2012). This invisibility can result in neglect within the cognitive maps of authorities and institutions responsible for the allocation of resources.

The issue of visibility is further complicated by globalisation. Due to the flexibility and mobility of capital, tourism and economic development seem to have placed emerging emphasis on the city image as a constructed brand. To create conditions attractive to capital and international enterprises, themed and privatised zones are created for modern complexes, including airports, shopping malls, high-rise towers, and modern housing enclaves. This rise in the perceived importance of the constructed image in urban development arguably means that informal settlements have become increasingly critical. Emerging middle-class networks of high-rise buildings, linked by elevated freeways and railways, can impact the visibility conditions of informal settlements located nearby. As a result, development strategies often aim to "beautify" the urban landscape by removing elements deemed disturbing to potential foreign investors (Dupont, 2011; King & Dovey, 2013). In Delhi, for example, photographs showing the poor living conditions of informal settlements were considered sufficient evidence to issue demolition orders, without investigation into their history, location, or size (Ghertner, 2011, p. 288).

The visibility of informal settlements is also influenced by slum tourism. Dominant images of cities generally exclude informal settlements, reflecting a tendency to conceal areas that challenge idealised notions of urban order and evoke perceptions of disorder (Iranmanesh & Kamalipour, 2025). Dovey and King (2012) shed light on the complex ethical issues concerning slum tourism. Informal settlements have often become spectacle places, where visitors may either feel shock at perceived misery or empathy for local dwellers' lived experiences (Jones, 2011; Jones & Sanyal, 2015). Slum tours of the khlong in Bangkok, the favelas in Rio de Janeiro, and Dharavi in Mumbai exemplify cases where visitors seek authenticity and the shock of the real (Dovey & King, 2012; Jones & Sanyal, 2015). Nevertheless, slum tourism is double-edged: it can reveal the generally hidden conditions of poverty while simultaneously contributing to what Roy (2004) refers to as the "aestheticization of poverty".

Visibility can also be explored through the digital visualisation of the living environment and surrounding landscape by local inhabitants themselves. In traditional participation models, a key issue is how to engage participants in balancing the needs of communities and top-down management. Very often, there is a disconnect between upgrading strategies and citizen participation in influencing urban development policy. Extreme cases, such as footpath dwellers, have often been neglected in the politics of informality (Banerjee, 2023). Recent studies suggest that new participation models emphasising technology and digital mapping of marginalised groups in informal settlements are critical to successful strategies (e.g., da Silva et al., 2024; de Araújo et al., 2018). In this regard, improved digital visibility, when combined with other strategies, has the potential to promote impactful change. Access to spatial information via digital mapping can also promote public participation by enabling inhabitants to visualise and explore key features of their communities and surrounding landscape.

While various studies have examined the physical characteristics of informal settlements using satellite images and/or historical maps, as well as their representations in the media, through slum tourism, and/or via digital visualisation by inhabitants, relatively little critical attention has been paid to how they are represented within the broader vision of the global city in the Global South (Dovey, 2024). Informal urbanism often becomes invisible and is frequently overlooked in urban development processes. Despite growing concerns about the relationship between aesthetics and the politics of upgrading (e.g., Peattie, 1992; Perlman, 1976; Roy, 2005), only a few studies have explored the visibility of informal settlements from spatial perspectives (Dovey & King, 2011; Kamalipour & Dovey, 2019). This article seeks to contribute to this emerging body of knowledge.

3. Research design and methods

This is an exploratory study, adopting a multiple case study research design and utilising comparative urban mapping as a key research method. In this study, urban mapping has been used as the primary method to explore the visibility of informal settlements in new towns. Accordingly, mapping is a form of knowledge production that integrates diagrammatic thinking with spatial representation to open up new ways of analysing and understanding the city (Dovey & Ristic, 2017; Pafka & Dovey, 2024). We adopted a typology of visibility introduced by Kamalipour and Dovey (2019) and applied it to map the visibility of informal settlements in three case studies in the Global South. These cases were selected to illustrate a range of urban development strategies in new towns in recent years. Specifically, the selection of case studies was based on: (1) the availability of relevant street view databases around informal settlements, (2) the availability of satellite images of informal settlements since the 2000s, (3) the availability of documented records of new town development and the spatial characteristics of informal settlements, (4) the consideration that case studies should be located in relatively flat areas to enable comparative analysis, and (5) the consideration that the selected case studies should be from different cities, countries, and regions, representing diverse conditions within the Global South. After reviewing a range of potential study areas, three case studies — namely Zijuncun in Kunming (China), Apo-Dutse in Abuja (Nigeria), and Pagedangan in Jakarta (Indonesia) — were selected to illustrate different types of visibility and urban development strategies.

In their study, Kamalipour and Dovey (2019) put forward a typology of spatial visibility based on three forms of visibility — "street view", "public overview", and "private overview"— distinguished by whether a formal gaze is an overview or a street view, and whether it is a private or public gaze. In this study, we propose expanding the "street view" visibility further to include different forms of spatial visibility, as illustrated in Fig. 1. Four new types of street view visibility have been developed: (1) "clear view", (2) "blocked view", (3) "obstructed view", and (4) "blocked and obstructed view". We argue that these four types of street view visibility illustrate different urban development strategies that are often used to control and/or manage the visibility of informal settlements. The "clear view" type may signify an "out of control" development (Sims, 2011), particularly when informal settlements emerge along key routes, riversides, and/or hillsides. The "obstructed view" type illustrates an attempt to create an illusion of formal order through soft landscaping, including trees and plants, often located along new roads. The "blocked view" type often occurs when informal settlements are subjected to rigid physical separation (e.g., through walls) from other parts of the area (Moatasim, 2024). For example, bamboo fences were used to hide settlements around event venues during the 2010 Commonwealth Games in Delhi (Nelson, 2009). The "blocked and obstructed view" type involves attempts to render informal settlements invisible through a mix of physical barriers, such as walls, and landscape design interventions, such as soft landscaping with trees and plants, as these settlements become surrounded by formal developments such as gated communities and theme parks.

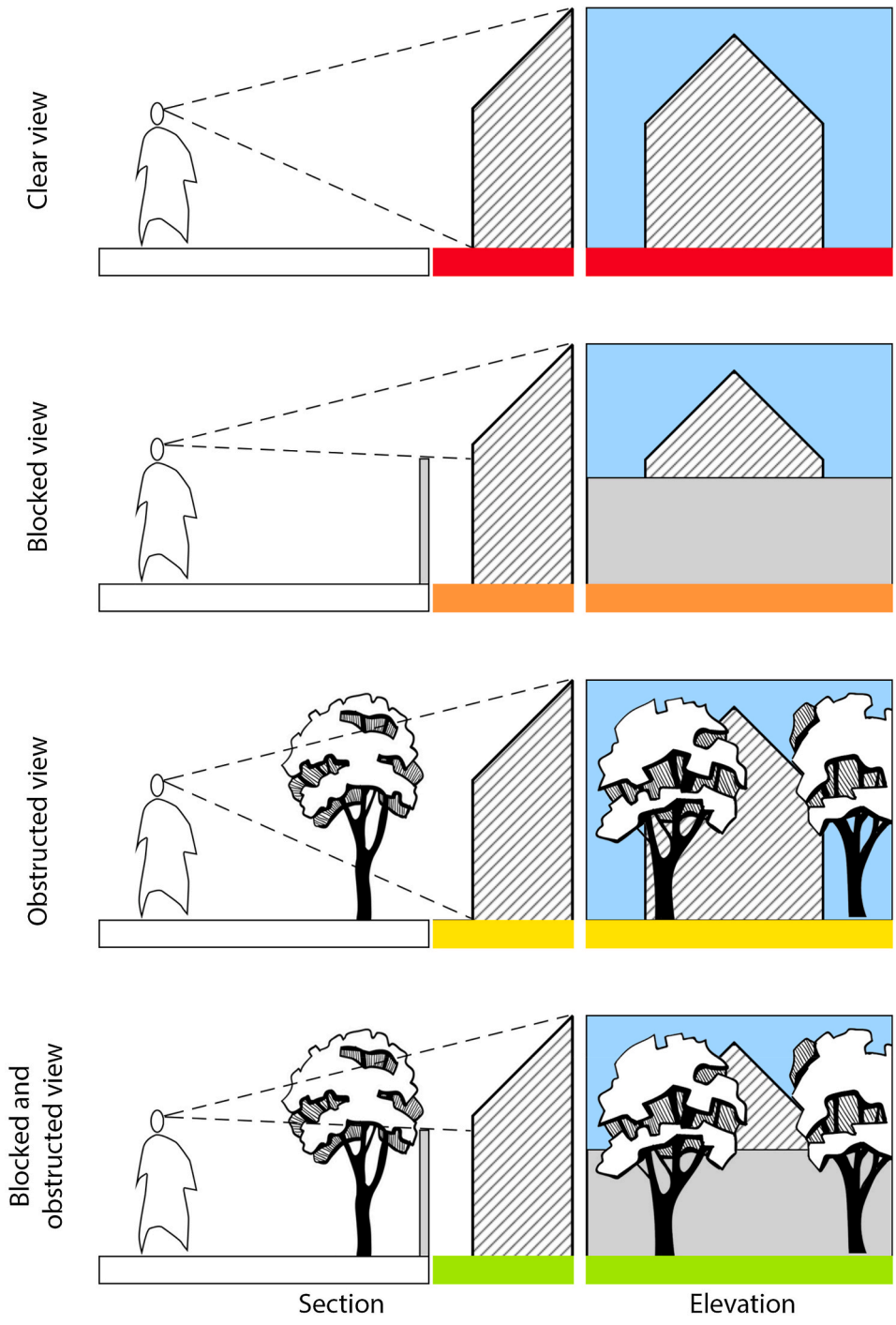


Fig. 1. A typology of street view visibility.

For mapping spatial visibility, we focused on the extent to which informal structures are visible from regional roads (the regional gaze), local access networks (the local gaze), and the private gaze. In planned cities in the Global South, regional and national roads such as expressways and ring roads often form super-blocks, while local roads generally connect different areas within these super-blocks. The regional gaze tends to be more broadly accessible to the public, and regional roads often provide relatively distant visibility. On the other hand, the local gaze generally offers a closer encounter, as speeds on local roads tend to be relatively low. It is important to note that the internal access networks within gated communities were excluded from the mapping process, although they appeared somewhat semi-public. The public overview was also excluded, as not all case studies feature elevated highways or public transport systems nearby. In addition, verifying the public overview was challenging due to the unavailability of street view data from key public transport areas in the selected locations. The private overview, with a range of about 300–400m, is associated with the presence of nearby formal high-rise buildings. Meanwhile, areas that are invisible to both street view and private overview have been highlighted.

While processing algorithms and models provide various advantages for image classification, their application may conflict with the terms and conditions of street view image providers (Helbich et al., 2024). In this study, all street views were manually inspected by a single

experienced researcher to analyse spatial visibility. It is important to note that there are certain challenges when classifying and mapping. To reduce possible errors during the mapping process, several rules were applied to map forms of spatial visibility. For each case study, comprehensive street panorama with a 360° horizontal view was observed along main alleys and streets at intervals of about 6–12m. All street views were captured during the early 2020s. The analysis focused on building façades visible from public spaces; therefore, parts of buildings may remain invisible. Mapping visibility in small alleys was avoided as street view databases are not always available for all case studies. Viewing distance also presents challenges, since certain building details become hard to recognise when observed from distances greater than 25 m. Only buildings along main streets and primary alleys were highlighted, although certain parts of buildings in narrower alleys remained recognisable in street view images. In some instances, different types of spatial visibility could be observed for the same building façade due to varying viewpoints along the street, particularly when the building is located near a road junction. In such instances, the typology of spatial visibility was determined based on the viewpoint closest to the midpoint of the façade. For each street view, we assessed whether the presence of trees or walls resulted from interventions by developers and built environment professionals. Isolated trees on the street or perimeter walls around self-built constructions, which were considered unrelated to formal urban design and planning processes, were excluded from the determination of spatial visibility. Meanwhile, a few newly constructed buildings appeared in satellite images but were not yet visible in street view due to infrequent database updates. For these, spatial visibility was determined using information from satellite images, taking into account building size, height, distance from the nearest road, and possible obstructions. In addition, certain elements, such as the ratios between building height and walls or between trees and building façades, can impact the spatial visibility of informal settlements. For example, most buildings in selected case studies in Abuja and Jakarta are one- or two-storey constructions and often remain hidden behind walls. By contrast, buildings in the selected case study in Kunming have several storeys, making them highly visible from both public and private gazes, even when partially obscured by trees or walls. These differences highlight how future studies could develop more nuanced typological approaches and more comprehensive mapping techniques to explore spatial visibility.

To illustrate the urban development process, the spatial transformations of the selected study areas were analysed using satellite images from the early 2000s. A frame of 1.5 km × 1.5 km, which covers an informal settlement and the surrounding urban areas within a superblock, was used for mapping in each case study. To analyse the regional gaze and the local gaze, information about regional and national roads was extracted from local urban planning documents and maps. Buildings, access networks, and the boundaries of informal settlements were extracted from historical satellite images dating back to the early 2000s. To illustrate the development of new towns and the spatial transformation of informal settlements, each case study was tracked across three different time periods, with intervals ranging from 9 to 13 years.

It is important to acknowledge that this study does not claim to provide a fully comprehensive, precise, or definitive mapping, particularly when addressing elusive and fluid notions such as visibility within the context of informal urbanism, which is continuously shaped by incremental adaptations and ongoing transformations. Although urban development processes can be reviewed in relevant reports and studies, available information is not sufficiently thorough to cover all aspects of visibility. Since this study does not collect data on the socio-economic or cultural conditions of the urban fabrics studied, addressing these aspects remains a task for future research using different approaches. The mappings of spatial visibility presented in this article should therefore be understood as indicative rather than definitive; no claim is made to absolute accuracy or consistency. They reflect a careful and considered effort within the scope of this study while acknowledging the inherent limitations, including the approximations involved in such analyses.

It is also important to note that the visibility of informal settlements is a much broader topic than the spatial visibility we focus on in this study. For example, some public perceptions of informal settlements tend to portray them as areas of decrepit housing, whereas for residents, informal settlements are often highly important in terms of belonging, identity, and community (Agyabeng et al., 2022; Bandauko et al., 2022). Informal settlements are among the most challenging environments in urban research (Kamalipour & Peimani, 2024). Exploring how images of informality are constructed and/or perceived by local inhabitants, urban planners, and local authorities is beyond the scope of this study, as is the investigation of their symbolic visibility, which could be further explored through methods such as content and discourse analysis. Spatial visibility could also be examined further with a focus on public/private interfaces and the appropriation of public spaces in informal settlements (Kamalipour, 2017; Muñoz & Ramos, 2024b; Van Oostrum, 2020). While the focus of this study is on informal settlements, future research could consider the visibility of other forms of informality, such as street vending (Kamalipour & Peimani, 2019; Thinh et al., 2025). Recent studies have also highlighted the importance of exploring relationships between different forms of informality (Dovey & Recio, 2024; Kamalipour, 2022). Investigating the dynamics of visibility across various forms of informality in relation to one another remains beyond the scope of this study but represents a significant direction for future research. While street view databases have been recognised as an important source for urban analysis (Biljecki & Ito, 2021), there are some restrictions concerning intellectual property for street view imagery in relevant databases, such as Google Street View, even for non-commercial use (Helbich et al., 2024). This includes bulk downloading and data-mining research. Further studies using different analytical approaches and open databases are needed to examine visibility in different contexts.

4. Case studies

4.1. Zijuncun (Kunming, China)

Kunming is the capital city of Yunnan province, China, where Villages-in-the-City (ViCs), or Chengzhongcun, are the predominant form of informal settlement in peri-urban areas (Gao et al., 2023; Thinh, Gao, & Pitts, 2024). As the provincial capital, Kunming has undergone rapid urbanisation and significant urban expansion in recent decades. During this process, various rural villages have been incorporated into the city. China has a dual land system (Thinh, Gao, & Pitts, 2024): urban land is owned by the state and managed by municipalities, while rural land is owned by collectives but cannot be freely sold on the land market. This dual land system creates an invisible boundary between peri-urban villages and urban areas. In the urban development process, all rural land must be converted into state-owned urban land before it can be used for development projects. However, due to the high compensation costs, the physical layouts of the village are often retained while newly developed constructions are built over farmland. In various large cities, urban villages are subject to redevelopment, especially during international events (Shin & Li, 2013; Wong et al., 2018). In 2007, it was estimated that there were approximately 288 ViCs in Kunming, occupying about 16 % of the total built-up area (Liu & He, 2010). Zijuncun (Coordinates: 24°57′7″N 102°46′20″E) is located about 9 km from the city core. Fig. 2 illustrates the morphogenesis of Zijuncun since the early 2000s. In 2000, the settlement featured two distinct structures: a historical core with a rather self-organised layout in the northeast, and a more regulated layout in the south and west. Single-storey courtyard houses were the main building type in the village, with plot sizes ranging from around 90 to 120 square metres. The village was surrounded by farmland and lakes. By 2010, due to urban expansion, several urban residential developments had emerged

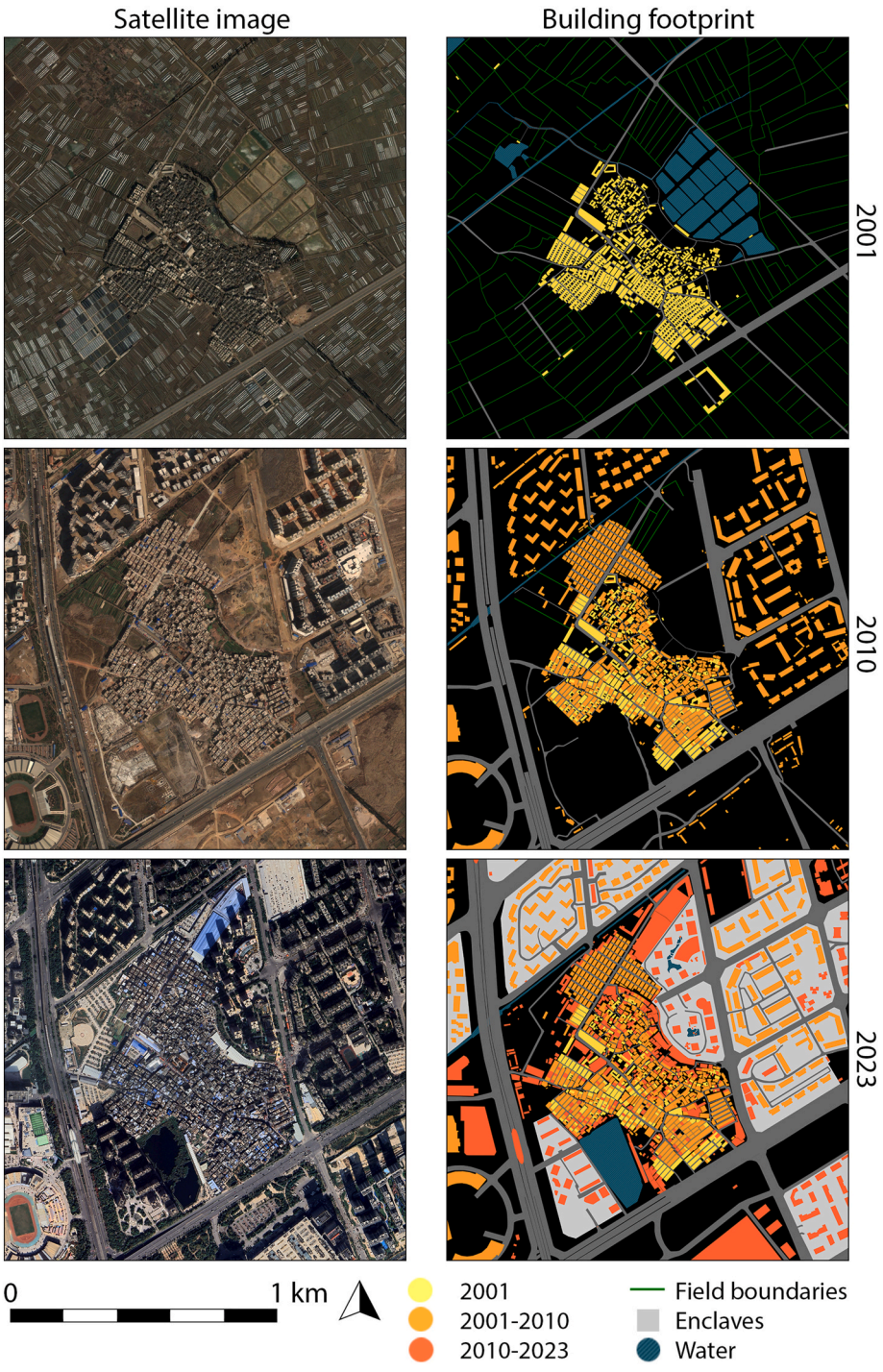


Fig. 2. Morphogenesis of Zijuncun, Kunming, China. Satellite images: Google Earth.

around the village. Within the village, a new building type appeared, characterised by several-storey residential structures that occupied entire plots. In the north and east, plots of about 100–150 square metres were developed. The newly developed alleyways were wide enough to accommodate two-lane vehicular traffic. By 2023, the settlement had become surrounded by gated communities and new urban developments.

Fig. 3 illustrates the spatial visibility of the settlement. The type of visibility varies depending on location. Buildings along the main alleyways within the settlement are clearly exposed, as there are no trees or walls (Fig. 4a and b). The surrounding communities and the village are separated by low fences, walls and trees, making the settlement easily distinguishable from adjacent neighbourhoods (Fig. 4c). The edges of the settlement are generally visible from both local and regional roads, though they are partially obstructed by a line of trees. Certain areas are both blocked and obstructed from view along regional roads, whereas in other areas, the village gates remain easily recognisable (Fig. 4d). As new roads built around the settlement provide opportunities for commercial activities, the street frontages are mostly mixed-use buildings, with shops at ground level and residential spaces above. Building heights vary, ranging from one to six storeys. Around the settlement, various high-rise apartment buildings have been developed; as a result, most parts of the settlement are visible from the private gaze.

Fig. 3. Mapping spatial visibility in Zijuncun, Kunming, China.

4.2. Apo-Dutse (Abuja, Nigeria)

Abuja has been the capital city of Nigeria since 1991. The city is distinctive in that it was built from scratch and envisioned as a symbol of national integration and unity (Obiadi et al., 2019). The 1976 master plan divided the city's development into four phases, creating a crescent-shaped urban structure, with phase I located at the centre (Abubakar, 2014). Each phase consists of 3–4 sectors, serving as a mini-city. At the time the master plan was created, it was estimated that there were about 500–600 indigenous settlements with organic layouts (Ismail et al., 2024; Abubakar, 2014). To accomplish the goal of relocating the Federal Capital to a geographically central area of Nigeria with relatively equal accessibility to all parts of the nation, indigenous villages were displaced to make way for the Federal Capital Territory (Obiadi et al., 2019). While the master plan aimed to resettle and relocate all local communities within and around the city, financial constraints led to the incorporation of various indigenous settlements into the city, where they have remained under the control of local communities (Gusah, 2012). Today, several such settlements continue to exist around the city, although their roles remain unclear within the formal urban planning process. The study area (Coordinates: 8°58′46.71″N 7°29′12.85″E) is located in the South of Abuja, about 9 km from the city centre. Fig. 5 shows the physical transformation of Apo-Dutse since 2000. The settlement experienced rapid expansion between 2004 and 2014. In 2004, only a few buildings were present, but over the following decade, the number of buildings increased significantly. A number of open spaces around the settlement were replaced by new urban developments, predominantly gated communities. By 2024, the settlement had continued to expand northward and westward and had become surrounded by gated communities.

Fig. 6 illustrates the spatial visibility of Apo-Dutse. During the urban expansion process, no new roads were built around the settlement; thus, it is directly surrounded by gated communities. A few unpaved paths with no trees (Fig. 7a, b, and c) are used as part of the local access network. As there are various cul-de-sac alleys, only certain parts of the settlement are visible from the main alleys, though it is less visible from the regional road. All buildings in the settlement are single-storey constructions, and their roofs can be recognised from the surrounding areas (Fig. 7d). There is no private overview, as the surrounding buildings are mostly detached and semi-detached houses.

4.3. Pagedangan (Jakarta, Indonesia)

Jakarta is the capital city of Indonesia, home to nearly 11 million people. Informal settlements, known as *kampung*, refer to densely populated areas that generally lack formal urban planning control

Fig. 4. Street views of the settlement in Kunming, China. Drawings by the first author, based on Baidu Maps.

(Ellisa, 2016; Kusno, 2020). The study area, Pagedangan (Coordinates: 6°17′38″S 106°38′41″E), is part of BSD City, one of the hotspots for large-scale residential projects targeting the middle class in the southwest of Jakarta (Kusumaningrum & Rosyidy, 2024). Indonesia has two systems of land laws: Western Law and *adat*, the indigenous customary law (Zhu & Simarmata, 2015). The former, introduced by Dutch colonisers, refers to land registered under the National Land Agency, while the latter has a semi-formal legal status. The dualism of land law encourages developers to develop large-scale residential projects in peri-urban areas as there are significant differences in market values between registered and unregistered parcels and nearly all *kampung* land is unregistered (Leaf, 1993). In Jakarta's peri-urban areas, a number of gated communities have been developed over the last few decades due to their high rates of return (Firman, 2004; Herlambang et al., 2018; Kusno, 2020). Many of these communities have formed superblocks, which include residential, commercial, and recreational facilities. Meanwhile, rising land prices in surrounding new urban projects encouraged *kampung* dwellers to negotiate for better deals and resist relocation projects. As the terms set by local residents were difficult to meet, the developer and local government eventually cancelled the relocation plans (Mulysari et al., 2017). As a result, newly built communities were generally developed over farmland, while the *kampung* was retained but separated by walls. Fig. 8 illustrates the spatial changes in Pagedangan. Significant transformations occurred between 2004 and 2013. In 2004, rural settlements, small lanes, and farmland dominated the landscape. By 2013, paddy fields had disappeared, and regional roads had formed superblocks around the study area. While the majority of buildings in the village remained, some parts of the *kampung* were converted into newly built residential and commercial developments. By 2024, new urban projects had been fully developed both around and within the block.

Fig. 9 illustrates the visibility of Pagedangan village. Unlike the other case studies, the visibility of the settlement is strictly controlled during the urban development process. Specifically, the village has been completely separated from surrounding constructions by walls and access networks (Smith & Thony, 2025). The access network within the settlement is narrow (Fig. 10a) and does not connect to other areas within the block. Separate entrances provide glimpses from regional roads (Fig. 10b) and serve as access points for local inhabitants. Although several new roads have been built around the area, this infrastructure is inaccessible from the village. Therefore, the visibility of incremental developments from the street view in Pagedangan is limited to surrounding roads. As the settlement is fully surrounded by gated communities, walls and gardens, the main types of visibility are blocked or obstructed views (Fig. 10c and d), particularly in certain areas (Fig. 9). In addition, because buildings in the village are only one- or two-storey constructions, the roofs are the only visible parts from public spaces. The majority of buildings in the gated communities are low-rise constructions, although some high-rises exist farther away. Therefore, only a few parts of the settlement are exposed to private overviews.

5. Discussion

"*A shopping mall, even if in violation of planning law, is legal because it looks legal. A slum, even if its residents have been formalized at their*

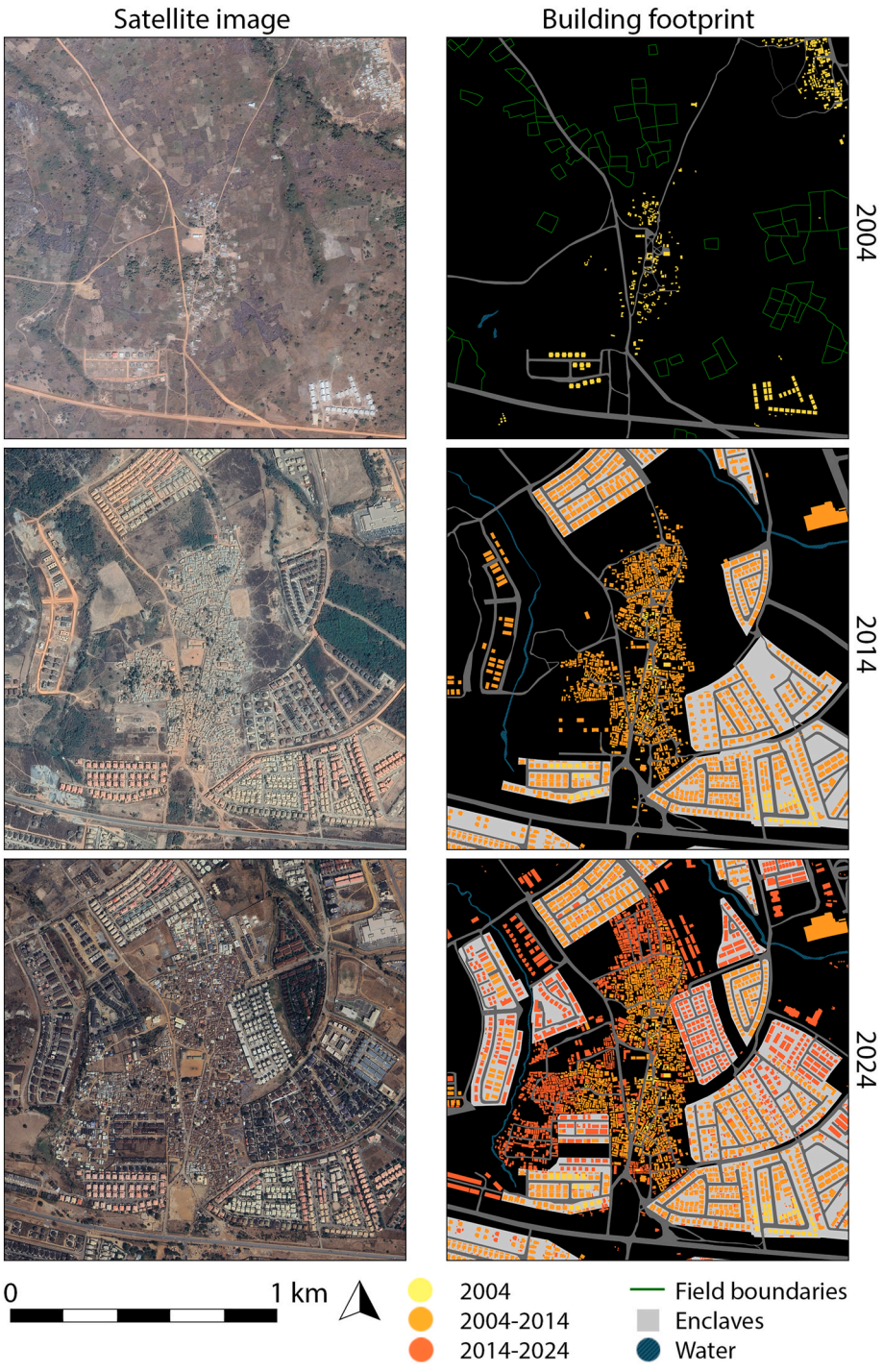


Fig. 5. Morphogenesis of Apo-Dutse, Abuja, Nigeria. Satellite images: Google Earth.

current location, is illegal because it looks like a nuisance" (Ghertner, 2011, p. 288).

In this paper, we analysed three case studies of peri-urban informal settlements and urban projects, each exemplifying different forms of superblocks. A key issue explored was the way in which the development of new urban projects in proximity to informal settlements is associated with the dynamics of spatial visibility. Informal settlements are often portrayed as out of place within the constructed imagery of the modern city; their aesthetics, images, and visual representations often signify a perceived failure of the state to establish what is considered order (Ghertner, 2011). The state seems to hold the authority to determine what can be tolerated based on the appearance of the urban environment and its constructed image. It appears to possess the power to legitimise, prohibit, provide, or withhold infrastructure and services, or to simply ignore them altogether (Roy, 2005). Understanding the role that the image of informality plays in relation to the politics of urban development is therefore critical for promoting alternative modes of urban planning (Roy, 2011).

Fig. 11 illustrates a comparative overview of the case studies. Unlike other forms of settlements that emerge around public spaces, hillsides, or riverbanks (Dovey et al., 2023), the case studies explored in this article generally have a strong rural background, having evolved from former village settlements. During the urban development process, the

Fig. 6. Mapping spatial visibility in Apo-Dutse, Abuja, Nigeria.

high cost of relocation has led to the retention of most settlements, while surrounding farmland and open spaces have been transformed into new urban areas, mostly gated communities. Buildings across all case studies illustrate incremental development as well as the replacement of old structures with new constructions, a pattern common to peri-urban areas in the Global South (Thinh, Kamalipour, & Peimani, 2024). Despite similar urban transformation processes, each case study exhibits a distinct pattern of spatial visibility. While clear views are easily observed along alleyways within the informal settlements, visibility from surrounding access networks varies. In Kunming, although all types of visibility can be identified from both regional and local access networks, obstructed views are commonly found around the edges of the settlement. In Abuja, the settlement is mostly visible from local access networks, while the regional access network allows only brief glimpses from passing vehicles; the predominant type of visibility here is clear view. In Jakarta, the strategy is associated with beautification — an attempt to create a sense of order in place by managing urban informality through physical separation using walls and soft landscaping. Thus, blocked and obstructed views are found along local roads, and only certain constructions and gates of the settlement (Fig. 10b) are visible from regional access networks.

To explain the differences in visibility patterns among the case studies, it is important to note that the dynamics of visibility are shaped by both macro-scale processes and urban practices that generally occur at the micro-scale, where everyday urban life unfolds (Kamalipour & Dovey, 2019). As illustrated in this study, the extent to which settlements are exposed to the public gaze varies depending on morphological characteristics, types of access networks, and the surrounding landscape. At the neighbourhood scale, the original access network within all case studies generally remains unchanged, although new alleys have emerged in Zijuncun (Kunming) and Apo-Dutse (Abuja). In Kunming, newly planned extensions can be seen in the north and southeast. In Abuja, despite initial plans to relocate indigenous communities, the studied settlement has undergone forms of expansion and has become a rather consolidated settlement during the urban development process. Due to this expansion, the settlements in Kunming and Abuja are relatively larger in size. Buildings in the ViCs of Kunming are also relatively taller than those in the other case studies, making them more visible from regional access networks. In contrast, the case study of Pagedangan (Jakarta) shows a reduction in the total residential area of *kampung*, due to land conversion into newly built urban areas by private developers (Kusumaningrum & Rosyidy, 2024). Therefore, this settlement is smaller than the others and is now almost entirely surrounded by gated communities.

In terms of urban design, there are clear differences in how the existing access networks of informal settlements connect with new roads

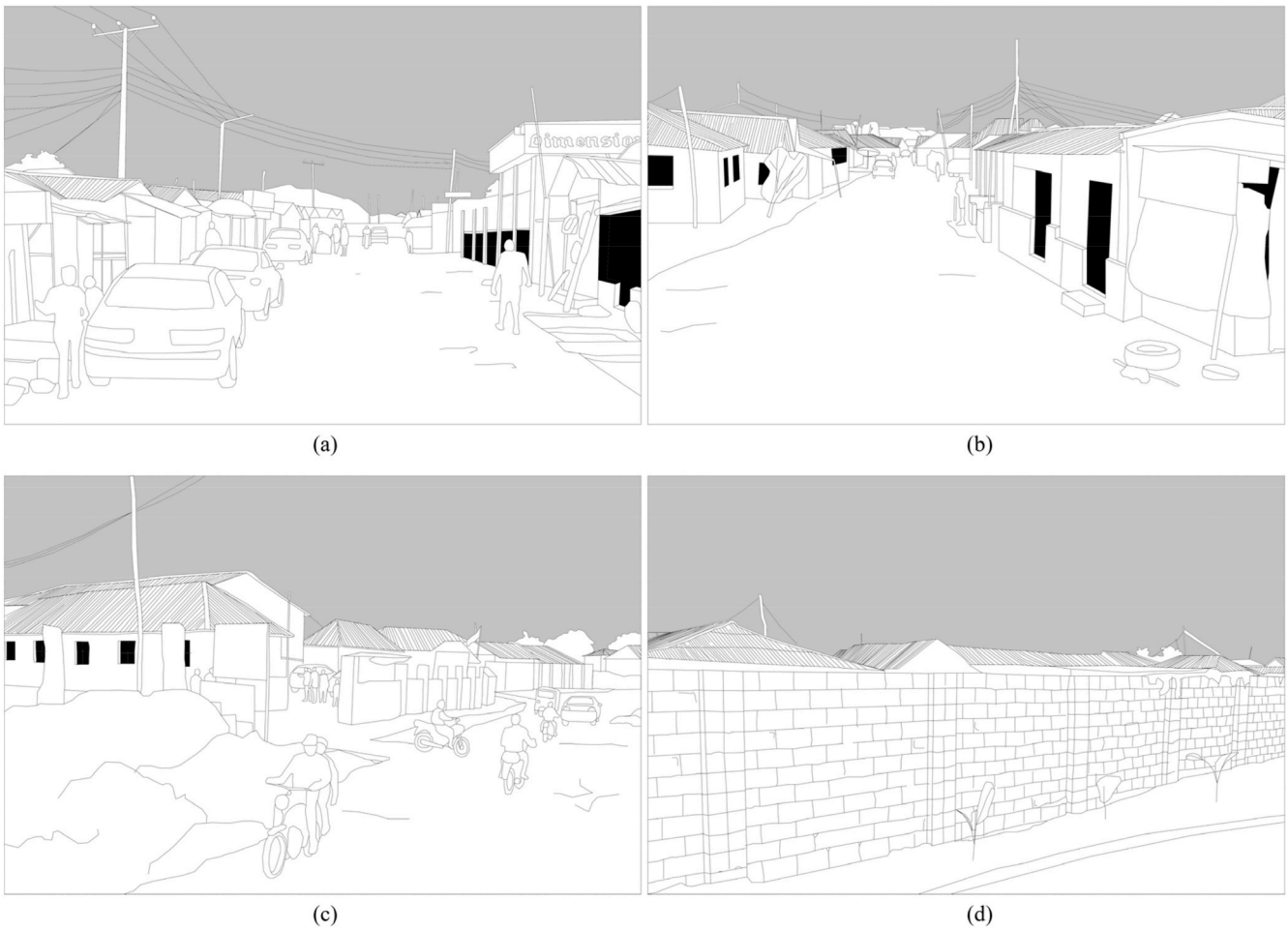


Fig. 7. Street views of the settlement in Abuja, Nigeria. Drawings by the first author, based on Google Street View.

in surrounding communities (Fig. 11 - top). In Kunming, it seems that there is almost no direct connection between the informal settlement's access network and that of surrounding areas, partly because Zijuncun is managed by the village committee and is scheduled for redevelopment in the near future (Thinh, Gao, & Pitts, 2024). In Abuja, several roads, which provide access to gated communities, are informally connected to the existing network in Apo-Dutse through small, unpaved paths. Informal settlements in Abuja have been blamed for blocking arterial roads during resettlement negotiations (COHRE, 2008, p. 54). In Jakarta, local resistance to relocation has allowed various *kampungs* to remain (Mulysari et al., 2017), although physical separation persists between these and surrounding communities. Although new roads have been constructed around Pagedangan, they do not seem to be accessible to *kampung* dwellers for reaching their homes. Regarding landscape design, all main streets in Kunming and Jakarta include rows of trees, while in Abuja, road design focuses primarily on basic infrastructure. In Kunming and Jakarta, the proximity of informal settlements to high-rise buildings exposes certain areas to private overviews, whereas in Abuja, there are no nearby high-rise constructions.

This study has illustrated different forms of spatial visibility across the three case studies. Although a growing body of research has explored the morphologies of informal settlements, most studies focus primarily on informal urban forms and their incremental adaptations, leaving the relationships between informal and formal morphologies underexplored. The findings of this study suggest that *where* and *what* informal settlements can be seen can play an important role in the politics of upgrading during urban development processes. It is also important to note that geographical conditions, building heights, settlement sizes, and social negotiations between inhabitants and developers can impact the dynamics and degrees of spatial visibility. Nevertheless, the patterns of spatial visibility identified in this study appear to reflect a constructed vision of what is considered a "modern" city in the Global South. The reviewed literature suggests that the politics of addressing informality often play a role in urban development plans, impacting if and/or how informal settlements are made visible or rendered invisible. Today, urban areas may represent two contrasting images: one deemed modern and desirable, and the other unintended and undesirable. The constructed images of modern and desirable cities in the Global South — often promoted by policymakers and urban planners — tend to draw on perceived modern cities such as Singapore, London, and/or New York, with an emphasis on global achievements while downplaying their own local challenges (Dupont, 2011; Shatkin, 2007, 2014). In contrast, the constructed images of unintended and undesirable cities, which are often characterised by self-organised settlements and layouts, are generally marginalised in formal urban planning processes. In Jakarta, Pagedangan has undergone significant spatial changes that have transformed the local landscape. The new communities are gated, with clearly marked boundaries and controlled access through designated entrances. In this strategy, while informal settlements may not be eradicated through eviction and demolition, their managed (in)visibility seems to allow the middle classes to maintain an illusion of a modern, formal city. In China, often due to their high visibility, ViCs have been widely condemned by the media, government, and even scholars (Liu & He, 2010). Although ViCs have strong rural backgrounds, they are generally regarded as non-places in formal planning processes due to their incremental development and perceived chaotic character,

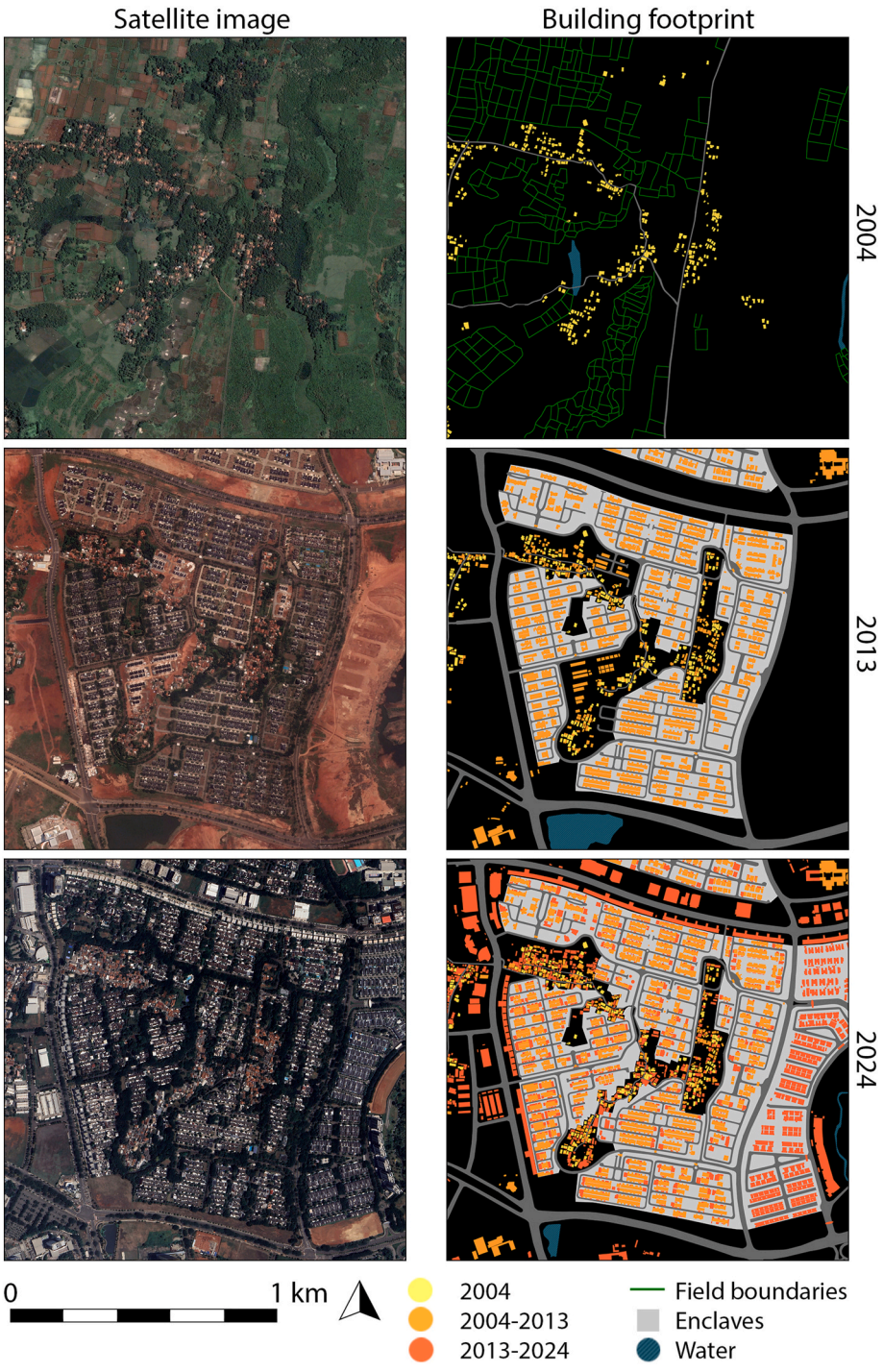


Fig. 8. Morphogenesis of Pagedangan, Jakarta, Indonesia. Satellite images: Google Earth.

suggesting that they should be replaced by new urban places that can enable socio-spatial identification with core national values and planning codes (Kochan, 2015). In Abuja, the city was planned to project an aesthetic appealing to a global audience; accordingly, informal settlements are considered targets for demolition in the master plan, as the elite classes desire a modernist vision of an orderly and beautiful city (Abubakar, 2014; Adama, 2020b). Therefore, no clear strategies have been used to control and manage the visibility of informal settlements within the urban development process.

A key question, which is an extended inquiry here, is how visibility can be used to transform the image of informal settlements. The aesthetic politics concerning informal settlements have long been highlighted in the literature (Peattie, 1992). In *Architecture Without Architects*, Rudofsky (1964) sheds light on the dynamics of human settlement production through self-organised activities. Despite this, in contemporary contexts, such characteristics are frequently misunderstood as chaotic or out of control (Sims, 2011). It is important to note that incremental development does not imply that the quality of buildings or living environments is poor. In fact, the morphological characteristics of informal settlements share various similarities with historical towns (Dovey, 2025; Venerandi et al., 2021). Hakim (2008) illustrates that the morphology of traditional settlements in the Mediterranean region was originally based on informal codes. Similar characteristics of order can be found in informal settlements (e.g., Arefi, 2011;

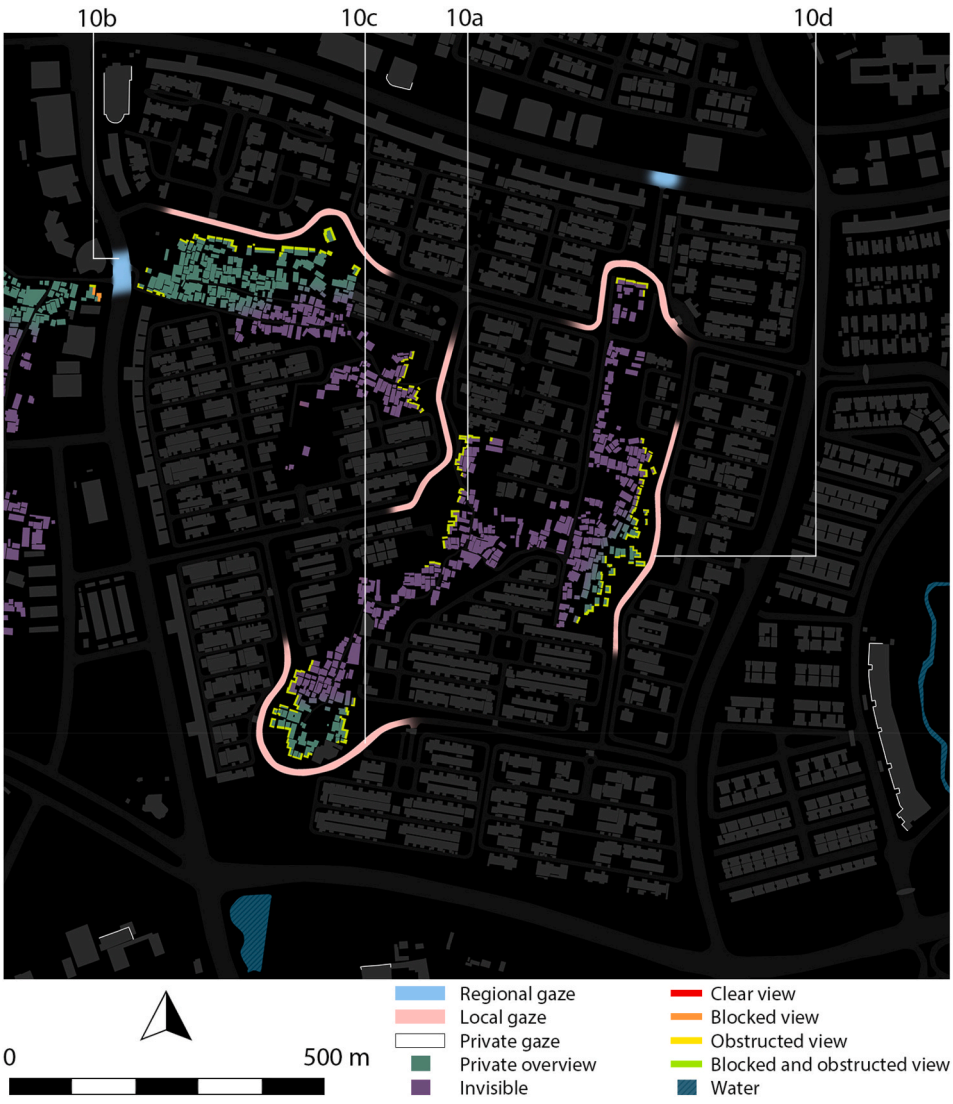


Fig. 9. Mapping spatial visibility in Pagedangan, Jakarta, Indonesia.

Kamalipour & Dovey, 2020); thus, informal settlements cannot simply be considered unplanned. The quality of buildings and living environments can improve over time. In the study areas in Kunming and Jakarta, newly constructed buildings in informal settlements have commonly been built using brick and concrete. In Abuja, to prevent redevelopment projects by state planning agencies, a place-making strategy has been employed by local inhabitants to improve their dwellings through incremental development (Ismail et al., 2024). Old mud buildings have been replaced with concrete and sand blocks. This strategy aims not only to strengthen land tenure security but also to challenge prevailing assumptions or justifications about the aesthetic aspects of informal settlements. As buildings are upgraded and modern facilities and infrastructure are installed over time, there is arguably no valid reason to simply classify these settlements as slums.

Due to globalisation, the images of the city often desired by elite classes and private developers have generally been constructed with reference to some perceived "Western" planning and design models, including gated communities and themed areas. Such "Westernization" and "Disneyfication" have raised critical issues about inequity in urban planning, such as conflicts between citizens and developers over the economic, environmental, cultural, and social implications of urban development (Shatkin, 2008). As a neo-liberal perspective has been adopted since the 1980s, urban upgrading has generally shifted from place-based strategies towards emphasising economic efficiency and the role of markets in developing infrastructure and services for the urban poor. Private developers generally tend to maximise profits through housing for high-income groups. Although informal settlements house nearly a third of the urban population in the Global South, they are often excluded from city branding and overlooked in urban planning processes (Hernandez & Lopez, 2011; Thinh, Kamalipour, & Peimani, 2024). Thus, it is pivotal to recognise the importance of informality, but it is also critical to realise how the visibility of informal settlements plays out in relation to the visioning and constructed images of a modern city.

Additional and alternative theoretical perspectives must be brought in to offer urban designers and planners a more nuanced understanding of current urban conditions and provide a framework for thinking about planning actions and design interventions, particularly in the context of what is considered the Global South. Several theoretical frameworks are useful here. Firstly, instead of focusing on Western models, Ong and Roy (2011) suggest that there are various models of "Being Global". Although the images of urban informality often carry negative symbolic capital, there are examples where informal settlements have been integrated into the urban structure through a worlding city brand (Bertelli, 2021). One fairly common strategy is using art projects in relation to place character and identity. In Indonesia, painting has been used to transform informal areas into what are commonly known as "rainbow

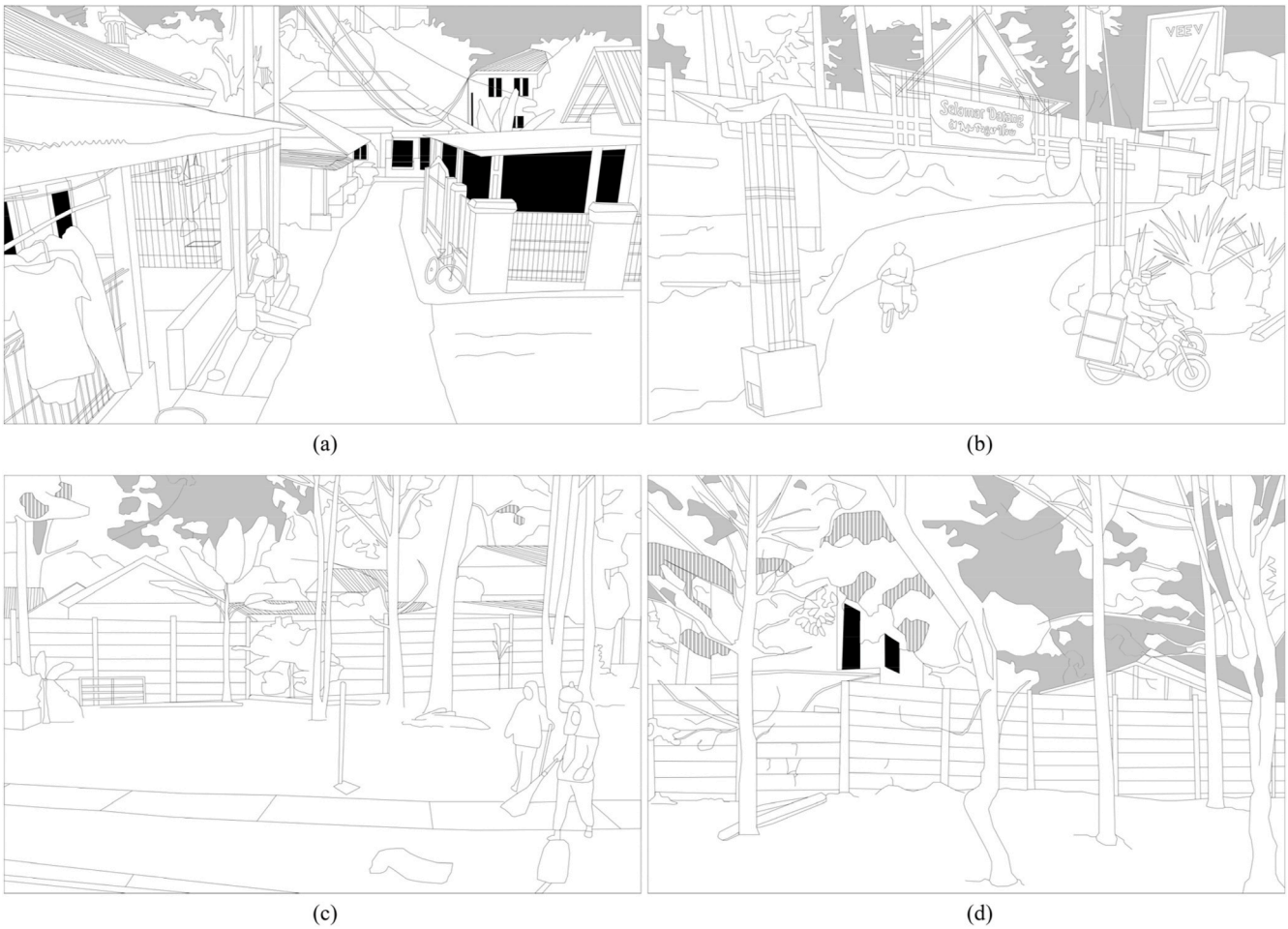


Fig. 10. Street views of the settlement in Jakarta, Indonesia. Drawings by the first author, based on Google Street View.

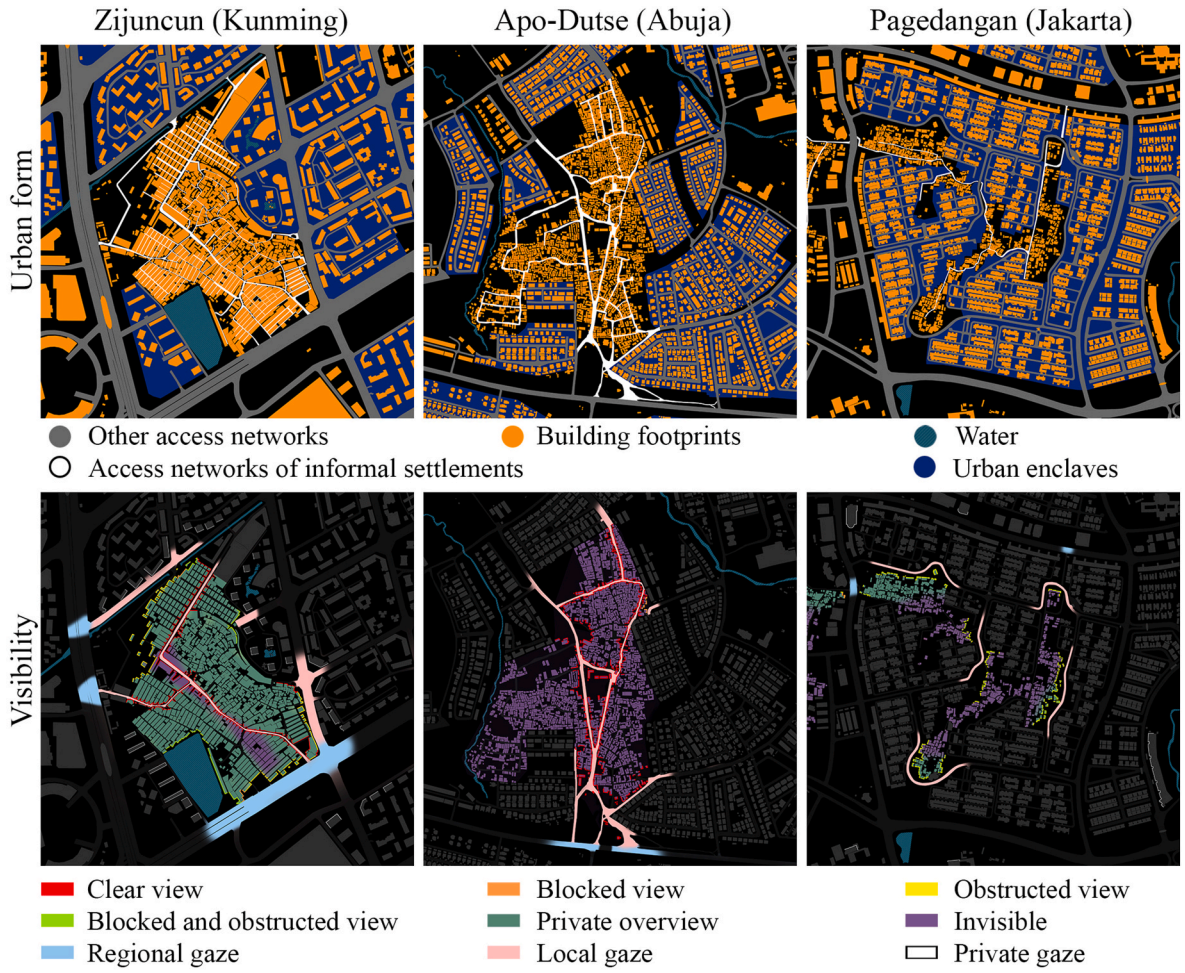
villages" (Irwandi et al., 2023). In China, while urban villages tend to be redeveloped into new neighbourhoods, Dafen Village in Shenzhen can be considered an example of how the visibility of an informal settlement influences the renewal process. Since Dafen Village is frequently represented in the local media as a cluster of painters, it soon gained the attention of local authorities, becoming a symbol of city development (Li et al., 2014; Wang & Li, 2017). The outcomes of such projects need to be examined, as not all art projects can transform place identity and foster an inclusive sense of community. Taking an urban project in Bogotá as an example, only communities along the cable car were selected for a macro painting project, while other communities were neglected (Kessler & Hernández-García, 2025). In Rio de Janeiro, although some favelas have been upgraded, they may continue to be represented as spaces of dirt, disease, and danger (Jones, 2011).

Secondly, while there is an extensive body of research on informal settlements, the spatial knowledge needed to be effectively pro-poor and inclusive in urban design and planning has not been given much consideration, as previous studies tend to primarily focus on the description of particular case studies. Watson (2009b) suggests that a central concern for planning is how to locate itself relative to conflicting rationalities. The current planning approach generally comprises a detailed land use plan to reflect the vision of an urban area in the future. In this process, zoning has been used in conformance with a master plan. Digital visualisation is also being used as a tool by developers to maintain property values and to exaggerate inequality (Watson, 2020). Meanwhile, urban upgrading projects have been driven more by political parties' desire for heightened public visibility than by community needs (Whitney & Sotomayor, 2025). For the urban poor, informal areas function as zones of resistance (Bandauko et al., 2022). Nevertheless, local participation in digital mapping to develop place character is still limited (da Silva et al., 2024). These dynamics point to the importance of learning from everyday encounters between different groups to shape urban development approaches that more effectively resonate with the lived realities of rapid urbanisation in the Global South.

6. Conclusion

Today, informal settlements are growing at an alarming rate, particularly in Africa and Asia, even though some efforts are being made to address their challenges. Based on the analysis of three case studies in Kunming (China), Abuja (Nigeria), and Jakarta (Indonesia), we suggest that the vision of becoming "modern" cities in the Global South could focus more on historical backgrounds and local conditions, rather than merely aspiring to idealised models derived from the Global North. Identifying more effective strategies to integrate informal settlements into the wider urban structure remains a significant challenge. There is a clear need for more comparative analyses of case studies from the Global South. Researchers, urban designers, and planners could further expand their understanding of the dynamics and politics of visibility, particularly when addressing informal urbanism across different contexts and scales.

This study has several limitations that point toward directions for future research. Given the diversity of urban contexts, policies, and types to be considered in relation to forms of urban informality, it is not entirely possible to claim that the lessons from one case study are directly applicable to another context. We recognise that maps are not



	Zijuncun (Kunming)	Apo-Dutse (Abuja)	Pagedangan (Jakarta)
Original landscape (2000s)	Farmland and homestead	Open space, farmland and homestead	Farmland and homestead
Current urban form (2020s)	1-7-storey constructions surrounded by gated communities and roads	1-storey constructions surrounded by gated communities and roads	1-2-storey constructions surrounded by gated communities and roads
Car access	Roads and large alleys	Roads and large alleys	Roads
Local gaze	Clear view in alleys, obstructed view in roads	Clear view	Blocked and obstructed view
Regional gaze	Mostly obstructed view	Clear view	Gates of the settlements
Private gaze	About 90% of settlement	N/A	About 30% of settlement

Fig. 11. Morphological characteristics of the case studies.

simply documents of data, but rather represent an analytical lens that can be useful for comparative studies. Typologies of visibility can serve as a valuable framework for exploring how informal settlements become invisible within formal planning processes. Future research could investigate potential conflicts between residents of informal settlements and developers during the implementation of integrated planning strategies. Further investigation is also needed into the meaningful participation of local communities in urban development, including art-based initiatives, particularly in relation to how such projects influence the transformation of place identity, character, and image in emerging urban developments.

CRediT authorship contribution statement

Ngo Kien Thinh: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis,

Conceptualization. **Hesam Kamalipour:** Writing – review & editing, Writing – original draft, Conceptualization. **Nastaran Peimani:** Writing – review & editing, Writing – original draft.

Declaration of competing interest

The authors declare no competing interests.

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