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Morphogenesis of forgotten places: A typology of villages-in-the-city in the Global South

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ABSTRACT

Sustainable integration of rural settlements into metropolises is one of the most challenging issues in the Global South. Due to rapid urbanisation, various villages, which often have underdeveloped infrastructure and amenities, have been incorporated into cities and have become Villages-in-the-City (ViCs). ViCs represent neighbourhoods that have not been designed by professionals, but they generally have strong social network and house millions of inhabitants. While the proliferation of ViCs within the cities of the Global South has been phenomenal due to their economic, spatial, and social integration with their urban environments, the morphogenesis of ViCs remains largely understudied. By analysing multiple case studies in the Global South using extensive urban mapping, the article puts forward a typology of ViCs characterised by their incorporation process. Four primary types, namely Separation, Oasis, Maze, and Sprawl, are illustrated based on two criteria: the relationship between ViCs and surrounding built-up areas, and incremental development within ViCs. The study raises an emerging question about the visibility of ViCs in relation to the politics of upgrading within cities.

1. Introduction

The phenomenon of Villages-in-the-City (ViCs) in peri-urban areas has long been a significant issue in informal urbanism and sustainable development in the Global South. It has been of particular concern to social critiques of built form because rural settlements in the peri-urban area typically serve as places of transition from agricultural communities to urban neighbourhoods. Although certain ViCs do not meet the criteria of UN-Habitat to be considered slums (UN-Habitat, 2003), they are hardly recognised as long-standing neighbourhoods due to their unregulated characteristics, as cities prioritise attracting investment and creating world-class environments (Jones, 2017; Liu & He, 2010; Wu et al., 2013). While scholars have raised concerns about issues such as regional identity, heritage, and socio-economic changes (Damayanti, 2018; Ghazali, 2013; Lathif, 2020), the morphologies and images of ViCs in the global South remain largely understudied. In this article, we borrow the term "forgotten places" introduced by Shatkin (2004), not because ViCs are not recognised by local authorities, but to address the inadequate attention to the typologies of ViCs during the city expansion process.

Recent studies (Dovey, 2019; Dovey & King, 2011, 2012; Kamalipour & Dovey, 2019; Shatkin, 2004) have illustrated that visibility and constructed images of informal settlements in urban planning discourse and media are important in the politics of upgrading. Images of urban informality often have negative symbolic capital; nevertheless, there are examples where upgrading projects in informal settlements include the transformation of place identity (Irwandi et al., 2023; Kamalipour, 2023b). This research is a preliminary step towards exploring the ways ViCs have been incorporated into cities and how their images play out in urban planning discourse.

Although the process of integrating villages and cities is a relatively recent phenomenon in the Global South, there is a scarcity of global definitions and comparative analyses of ViCs in the existing literature. This might be attributed to language differences, resulting in a range of terms being used to describe ViCs (Van Oostrum & Dovey, 2022). The terms *Urban Kampung* or *Kampung Kota* are frequently used in Indonesia and Malaysia to highlight rural settlements and squatters that exist outside the control of urban planning in metropolises (Anindito et al., 2019; Ghazali, 2013; Lathif, 2020; Octifanny & Norvyani, 2021). The term *Làng trong phố* is commonly quoted in newspapers and media to represent those village characteristics in Vietnamese cities (Thinh et al., 2024; Thinh & Kamalipour, 2022), while *Chengzhongcun* is frequently

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used to address rural settlements that are under the control of village collectives within Chinese cities (Chung, 2010; Lin et al., 2011; Wang et al., 2009). In Egypt, the term *Ashwaiyyat* has been used to illustrate various informal settlements, including informal built-up areas over farmland and villages, state land, and deteriorated historic cores (Bayat & Denis, 2000). There are also regional variations in each country in the Global South (Thinh et al., 2023; Van Oostrum & Dovey, 2022). As there are various similarities between ViCs and other forms of urban informality, which are typically identified by narrow alleys and self-built constructions over unused and/or hazardous areas or public spaces (e.g., Chung, 2010; Dovey et al., 2020; Dovey et al., 2023; Dovey & King, 2011; Gibert-Flutre & Imai, 2020; Thai et al., 2022), it is important to distinguish between them. ViCs have a strong rural background as they used to be rural villages (Chung, 2010; Jones, 2012; Lueder, 2018; Ren, 2020). In this article, the term ViCs is defined as erstwhile rural settlements, which have been surrounded by urbanised landscapes due to the growth of urban areas.

It has been shown that various compact and small-scale building layouts with a mix of old and new buildings are important for social and physical diversity (Jacobs, 1961). In ViCs, building designs are generally based on the interests of residents, reflecting their needs, household sizes, priorities, and lifestyles. While the buildings are incrementally developed, their quality can be improved over time through increased investment by local residents in housing to accommodate commercial activities (Funo et al., 2002; Thinh & Gao, 2021). Although the access network may appear irregular in informal settlements, it is often well-connected and fairly permeable (Kamalipour, 2020, 2023b, 2024; Kamalipour & Dovey, 2020). In addition, once public spaces in ViCs have been used as an extension of the home, residents and stakeholders feel a sense of ownership and invest time and money in maintaining, cleaning, beautifying, and protecting them (Kipper & Fischer, 2009; Lathif, 2020). These aspects seem to align closely with the principles put forward by sustainable agendas for community design. Although the terms squatter, slum, and shanty houses are frequently used to describe the built environment of urban poor areas, many ViCs can evolve *in-situ* over time to become well-serviced communities. While it is critical to avoid the aestheticisation of poverty, the dynamics and complexities of urban informality do offer lessons for urban planners and policymakers (Di Raimo et al., 2021; Roy, 2005; Roy & Alsayyad, 2004)

In this paper, we explore the built environments of ViCs in the Global South, which have received limited scholarly attention within the field of urban studies. While studies about ViCs primarily focus on several Chinese cities (Chung, 2010; Hao et al., 2013; Lin et al., 2011), the scarcity of comparative studies limits the capacity to make any generalised statements and facilitate the transfer of learned lessons and insights. We begin from the view that development strategies for ViCs rely on an understanding of how and the extent to which these settlements are visible within cities. Given the limited number of systematic literature reviews on ViCs in the Global South, the analysis presented in this article draws upon the authors' experiences supplemented by data sourced from satellite images, relevant studies, reports, historical maps, and planning documents. The key research questions in this paper are: (1) How do buildings, access networks, and boundaries of ViCs adapt in response to socio-economic changes and the rapid growth of cities? (2) Does the incorporation process of ViCs experience similar patterns across the Global South? (3) How does the visibility of ViCs link with urban development process and the politics of upgrading? The aim of this study is not simply to highlight distinct characteristics of ViCs in different regions; instead, it seeks to provide a better understanding of how informal urbanism works within ViCs in the Global South. The first goal is to develop a typology of ViCs to inform further analyses. The second goal is to understand the adaptation and transformation of buildings and access networks within ViCs in the context of rapid urban growth.

2. Visibility and morphologies of ViCs

2.1. ViCs as forgotten places in emerging metropolitan areas

Unlike various informal settlements that are located in marginal and/or unused places (Dovey & King, 2011), ViCs are often visible to the public and are popular destinations around city cores and peri-urban areas. However, despite serving as shelters for the urban poor, their invisibility in development plans and policies of upgrading during the city expansion process is noticeable. ViCs have played a significant role in the political and social imagination of national identity, with not all images of them being negative. At the beginning of the twentieth century, only about 10 per cent of the population in the Global South lived in urban areas, and various countries were perceived as nations of villages. Therefore, images of villages and rural lifestyles have become symbols of tradition and culture, and spaces of community and support (Fujita, 2010). "Kampung Boy", also known as "Lat" in comics, is an example of how representations of past rural communities have become part of the national identity of modern Malaysia (Rahman & Bahfen, 2014). Despite this, local authorities do not generally view ViCs as sites of heritage (Fujita, 2010; Ghazali, 2013). Much of ViCs around city cores are being envisioned as wasteful spaces as the demand for urban land has risen. Very often, the proposed redevelopment concept for ViCs is associated with modern building complexes and rows of trees, which create a sense of placelessness (Fujita, 2010; Jones, 2017; Lin et al., 2011).

The tendency to view informal settlements as forgotten places is growing in the Global South partly due to policy changes by local governments and urban specialists (Azhar et al., 2021; Davis, 2006; Shatkin, 2004). Based on principles outlined by the World Bank and International Monetary Fund, a neo-liberal perspective has emerged since the late 1980s, which views urban development as engines of manufacturing-led economic growth. This perspective marks a significant shift from place-based strategies towards increasing economic efficiency and highlighting the role of markets in developing infrastructure and services (Davis, 2006; Shatkin, 2004). Within this perspective, governments should focus on encouraging private-sector-led economic growth, and subsidies for services to the poor should be limited to enhance the role of the private sector. Yet, this approach raises various unpredicted issues such as inequality in housing access, unaffordable housing prices, and uneven development in delivering services to poor urban communities (Azhar et al., 2021; Setiawan, 1998). Meanwhile, due to the impacts of globalisation, various cities are racing to build world-class urban environments through large-scale projects. In this regard, the visions of modern cities are often associated with "the city beautiful" (Davis, 2006) to enhance competitiveness, while the images of ViCs are considered as representing backwardness (Cermeño, 2021; Fujita, 2010; Liu & He, 2010; Zhang et al., 2003). As the role of informal settlements is commonly perceived by planners as a temporary solution to current urban and housing problems, they are hardly recognised as desirable neighbourhoods in the long-term development (Setiawan, 1998). Consequently, in many cities, strategic planning for the integration of settlements during the city expansion process is poorly prepared or non-existent in master plans. For example, when Abuja was selected as the new capital of Nigeria in 1976, the master plan was created with an intention to relocate all local communities (Gusah, 2012). In Indonesian cities, resettlements and relocations of rural settlements are common during the development of new towns (Mulyasari et al., 2017). Despite that, due to conflicts with local inhabitants and limited resources, village settlements in these cities have been kept but poorly integrated with city infrastructure and the surrounding environment. In countries like China, India, and Vietnam, as there is lack of detailed planning for ViCs, local authorities do not have appropriate and adequate tools to effectively manage incremental growth (Kumar, 2015; Leaf, 2002; Liu & He, 2010; Nguyen et al., 2018). Such "out of control" development can also be observed in many African cities (Anane, 2022; Cobbinah et al., 2015;

Sims, 2011).

Such perspectives significantly impact the built environment in ViCs. Particularly, the majority of the urban poor live in ViCs because housing development frequently overlooks socio-cultural backgrounds and local needs (Thinh et al., 2024; Wu, 2016; Zhang et al., 2003). Some formal buildings built by developers are often designed to target high-income groups. Consequently, a portion of housing from the formal providers tends to be expensive and socially exclusive. The designs of new towns also undermine any flexibility and spontaneity in urban development, resulting in less diverse and functional spaces that are less resilient to socio-economic changes (Wu, 2016). Meanwhile, the rural population is moving to cities in search of livelihood opportunities. Due to the limited availability of affordable housing, the majority of rural-to-urban migrants have to live in informal settlements (Glaeser, 2011). For this reason, in cities like Guangzhou and Xiamen, ViCs account for only about 20 per cent of total construction areas, but house nearly 40 per cent of the total urban population (Lin & De Meulder, 2012; Tian et al., 2020). In order to deliver urban projects, planners may come into conflict with rural communities that occupy potentially valuable land for urban development. To facilitate the land requisition process, local authorities may allow villagers to reclaim property in village settlements. The majority of villagers, who lack skills and training, are unable to find jobs in the formal sector (Thinh et al., 2024). Villagers generally invest in home-based businesses and renting accommodation for the urban poor on remaining properties (Zhang et al., 2003). Buildings in ViCs theoretically must adhere to building regulations, but due to the lack of clear development strategies and planning details during the city expansion process, local officers lack effective tools to control and manage these areas (Nguyen et al., 2018; Zhang et al., 2003). To potentially maximise benefits, villagers often use different methods to expand their buildings through self-built activities, which may result in substandard living environments in ViCs.

2.2. Morphologies of ViCs

The typical characteristics of urban areas in the Global South include a mix of rural and urban elements (McGee, 1991). Unlike informal settlements in South America, which frequently occupy public and/or unused spaces, incremental developments in Asia and Africa have been developed on private plots in former rural settlements and farmland (Roy, 2005). Despite this, how urban forms are intermixed remains underexplored. Previous studies have attempted to classify ViCs into three types regarding locations and availability of farmland (Hao et al., 2012; Wang et al., 2009): full integration (villages that are fully surrounded by urban projects with no farmland left), villages in peri-urban areas (villages that are partly surrounded by urban projects and have a small amount of farmland), and initial transition (villages generally surrounded by farmland). Each type might be associated with overlapping changes, including expansion, densification, and intensification (Hao et al., 2012, 2013). The morphologies of traditional villages are characterised as low-density residential settlements surrounded by farmland during the initial formation process of ViCs. As incremental development on adjacent agricultural land is relatively easy and more feasible within the constraints of available resources, new constructions are built around village settlements, expanding the village. When there are limited spaces for expansions, there might still be room for more constructions since the built-up density of village settlements is still relatively low. Therefore, new buildings are constructed over yards and gardens. When developable land inside the village becomes scarce, continued pressure gives rise to vertical expansion, replacing traditional low-rise houses with multi-story buildings. By maximising the use of domestic spaces, the built environment in ViCs becomes extremely over-developed.

Although each village has its own distinct layout and characteristics, recent studies have revealed that ViCs share certain morphological patterns, including old cores and new expansions (Hao et al., 2013; Hareedy & Deguchi, 2010; Thinh & Gao, 2021; Van Oostrum & Dovey, 2022). The dynamics of mix between historical cores and expansions vary due to incremental development, self-division by villagers and land use policies in different places and times (Thinh et al., 2023; Thinh & Kamalipour, 2022). In China, cities like Guangzhou have developed a reserved land policy that requires a proportion of land to be returned to villages for commercial and local economic development during land requisition (Lin et al., 2011; Wang et al., 2009). Recent studies examining land-use changes within village settlements in the African context (Anane, 2022; Pinard, 2021) have highlighted incremental development over farmland and open spaces by villagers and local communities.

In summary, while various studies have examined ViCs from different perspectives, including stage of development, distinctions between old and new areas, and morphological patterns, the majority of previous studies tend to describe the poor built environment, while the integration process and incremental development during city expansions remain underexplored. It has been shown that urban mapping is not simply documenting data but a way to better understand the built environment (Dovey & Ristic, 2017; Pafka & Dovey, 2024). Despite this, urban mapping in the context of ViCs is relatively rare (Thinh et al., 2023; Van Oostrum, 2020). Significant gaps exist: (1) a limited understanding of how ViCs are being integrated into cities in the Global South; (2) a lack of systematic analysis of morphological dynamics within ViCs in different contexts. This paper helps bridge these gaps by analysing case studies in Asia and Africa, where rapid urbanisation and city expansions are taking place (UN-Habitat, 2022). In the following section, we introduce our research design, including the selection of case studies and mapping methods.

3. Research design

3.1. Case study selection

There are several criteria for the selection of case studies. Firstly, we applied a systematic approach to analyse the formation of ViCs in the literature and to identify socio-cultural and economic conditions in different regions/cities. Certain search engines such as Google Scholar, JSTOR and Scopus were used, with key words including “urban villages”, “peri-urban villages”, “villages-in-the-city”, and “villages within metropolitan areas”, as well as local terms specific to particular contexts such as “urban kampung”, “làng trong phố”, or “chengzhongcun”. Reports and relevant studies considered must be written in English and include certain key terms. Based on these reports, we reviewed and identified the morphological characteristics of ViCs in different regions/cities. Then, a case study was selected within the administrative boundaries of each city/region.

Secondly, while we attempted to explore the morphogenesis of ViCs in various contexts as much as possible, due to the dynamics of the urban landscape, not all types of ViCs are examined in this paper. To enable a comparative study, particular morphological conditions such as ViCs on hillsides, beaches, flood-prone areas, islands, or special conditions unique to particular cities, have been avoided. All case studies are situated in relatively flat terrains surrounded by farmland and/or open spaces in the early 2000s. Also, there are various types of villages, including nucleated, linear and dispersed villages. This paper mainly focuses on nucleated villages, where buildings are clustered and separated from the surrounding rural landscape. Linear and dispersed village settlements, where dwellings are built along roads, fields, canals, and open spaces are excluded from this study. In various cities, rural-to-urban migrants, who might come from similar regions, occupied unbuilt spaces and built village-like settlements and ethnic enclaves in peri-urban areas (Chung, 2010; Englund, 2002). Meanwhile, the development of new towns in rural areas contributes to the transformation of village settlements (Ingwani et al., 2024; Salleh & Choguill, 1992). In many cases, villages have also been reclassified as towns (Agergaard et al., 2021; Ibrahim et al., 2018; Kan & Chen, 2022). While

these settlements share certain similarities with ViCs, they have been excluded from the selection process.

Thirdly, since the sizes of ViCs can vary widely, spanning several square kilometres, we selected small village settlements with a common size of about 30–60 ha for analysis. Larger village settlements were not selected due to the integration processes possibly taking several decades, and their spatial transformation could be influenced by various planning policies during different phases of urban expansion.

Lastly, it is important that high-quality satellite images are readily available for the selected study areas. Although there are records of ViCs within urban areas, village settlements in various cities such as Shenzhen, Beijing, and Guangzhou in China (Chung, 2010; Hao et al., 2013; Lin et al., 2011), Delhi in India (Sheth, 2017), or Gaborone in Botswana (Nkambwe & Arnberg, 1996) have undergone rapid urban expansions and transformations prior to the availability of high-resolution satellite images since the early 2000s. ViCs in these cities and urban cores are excluded from this study. As a result, a total of 12 case studies (6 in Africa and 6 in Asia), which allow for tracking urban development and transformation of ViCs in recent years, are included in this paper (Table 1).

3.2. Mapping methods

In each case, a series of high-resolution satellite images was downloaded and aligned to create a multi-layered database. Previous studies have suggested three different stages of transformation in ViCs (Hao et al., 2012; Wang et al., 2009). Each stage may be associated with overlapping changes, including expansion, densification, and intensification (Hao et al., 2013). To examine these development processes, all studied areas were tracked for three different time periods (t1, t2, and t3) with intervals ranging from 5 to 13 years since the early 2000s to illustrate the transformation process.

Table 1
Study areas.

Case study	Name of villages	Coordination	Cities, Countries, Regions	Time periods
01	Abis	31°11′17″N 30° 0′28″E	Alexandria, Egypt, **Africa**	2001, 2009, 2022
02	Duase	6°44′0″N 1°34′6″W	Kumasi, Ghana, **Africa**	2001, 2013, 2023
03	Kpanvo	9°22′9″N 0°49′22″W	Tamale, Ghana, **Africa**	2001, 2010, 2022
04	Dubaidna Durumi 3	8°59′34″N 7°27′42″E	Abuja, Nigeria, **Africa**	2003, 2014, 2022
05	Roga Diko	12°59′39″N 5°11′56″E	Sokoto, Nigeria, **Africa**	2003, 2013, 2023
06	Keur Ndiaye Lo	14°45′10″N 17°15′14″W	Rufisque, Senegal, **Africa**	2006, 2013, 2024
07	Zhengbancun	24°38′42″N 118°13′55″E	Xiamen, China, **Asia**	2005, 2014, 2022
08	Zijuncun	24°57′08″N 102°46′22″E	Kunming, China, **Asia**	2001, 2010, 2022
09	Sohana	30°41′16″N 76°42′23″E	Chandigarh, India, **Asia**	2002, 2014, 2022
10	Jl. Tambun Selatan	6°10′7″S 106°57′51″E	Jakarta, Indonesia, **Asia**	2003, 2016, 2021
11	Bhangali	31°29′23″N 74°28′36″E	Lahore, Pakistan, **Asia**	2003, 2016, 2021
12	Làng Yên Xá	20°58′11″N 105°47′43″E	Hanoi, Vietnam, **Asia**	2002, 2009, 2024

In this study, we selected a framework of 1 km by 1 km for analysis. Each frame includes morphological characteristics of village settlements, extensions, and surrounding neighbourhoods. For each case study, we analyse spatial features, including (1) building footprints and (2) access networks. Building footprints and access networks are extracted from satellite images. As shown in Fig. 1, the distinctions of building footprints and access networks have been colour-coded in each map (please refer to the supplementary material for further details concerning all case studies).

There are several limitations in this study. Building footprints and access networks were detected on satellite images based on visual interpretation. While various methods exist to extract data from satellite images, visual mapping interpretation is considered more accurate than automated methods (Baud et al., 2010). This method is time-consuming, but it is also a learning process that reveals morphological patterns. Nonetheless, this approach carries risks (Kohli et al., 2012; Kraff et al., 2020a). Examples of uncertainties include vegetation obscuring objects of interest, narrow alleys or buildings, unclear roofing materials, shadows, and upper-level cantilevers. Also, imprecise geometric matching may occur due to differences in the sensor's viewing angle between studied times and varied quality of satellite images (Kraff et al., 2020b; Leichtle et al., 2017). As a result, misidentification might occur during the mapping process. Because the mapping process heavily relies on high-resolution satellite images, the findings may be influenced. Although socio-economic conditions can be reviewed in the literature, it was difficult to track tenure conditions, the legal status of buildings, and plot features across the study locations due to limited data availability. While building height can be estimated based on shadows, and relevant documents of building architecture gathered by observation (Kraff et al., 2020a; Taubenböck et al., 2018), there is no consistent street view database across the study areas. Thus, further morphological studies that focus on usage and appropriation of public spaces, functions, urban density, settlement boundaries, and/or plot divisions at different scales are required to corroborate the findings. The mapping of ViCs should not be simply reduced to spatial characteristics, but should also include interconnections with different aspects such as old/new, inside/outside, public/private, and informal/formal. This approach is related to assemblage thinking that covers multiple scales of analysis (Dovey, 2012; Dovey & Ristic, 2017; Kamalipour, 2022; Kamalipour & Peimani, 2015). While it is beyond the scope of our study to undertake a range of quantitative analyses, different analytical approaches, methods, and/or tools, focusing on morphological patterns and the distribution of access networks, land use, and spatial characteristics can be used for examining the built environment in ViCs across different contexts (e.g., Boeing, 2017, 2019; Stevens & Thai, 2024).

4. Results

4.1. Morphological changes during city expansion processes

There seem to be two primary processes of rural settlements becoming integrated into metropolises. The first is integration, where agricultural land is requisitioned and redeveloped into newly built neighbourhoods through large-scale projects, built by developers while village settlements are retained due to high compensation costs. This process often happens in planned cities where the conversion of agricultural land into urban areas is strictly controlled by the state. Examples of this process include case studies in Abuja, Hanoi, and Xiamen. The second is self-organising, where agricultural land is incrementally developed by villagers, newcomers, and informal developers. Such informal development can be observed in case studies in Alexandria, Kumasi, and Sokoto, which are experiencing rapid growth in urban population and urban built-up areas. In these case studies, buildings and access networks are co-developed over the studied periods. Small

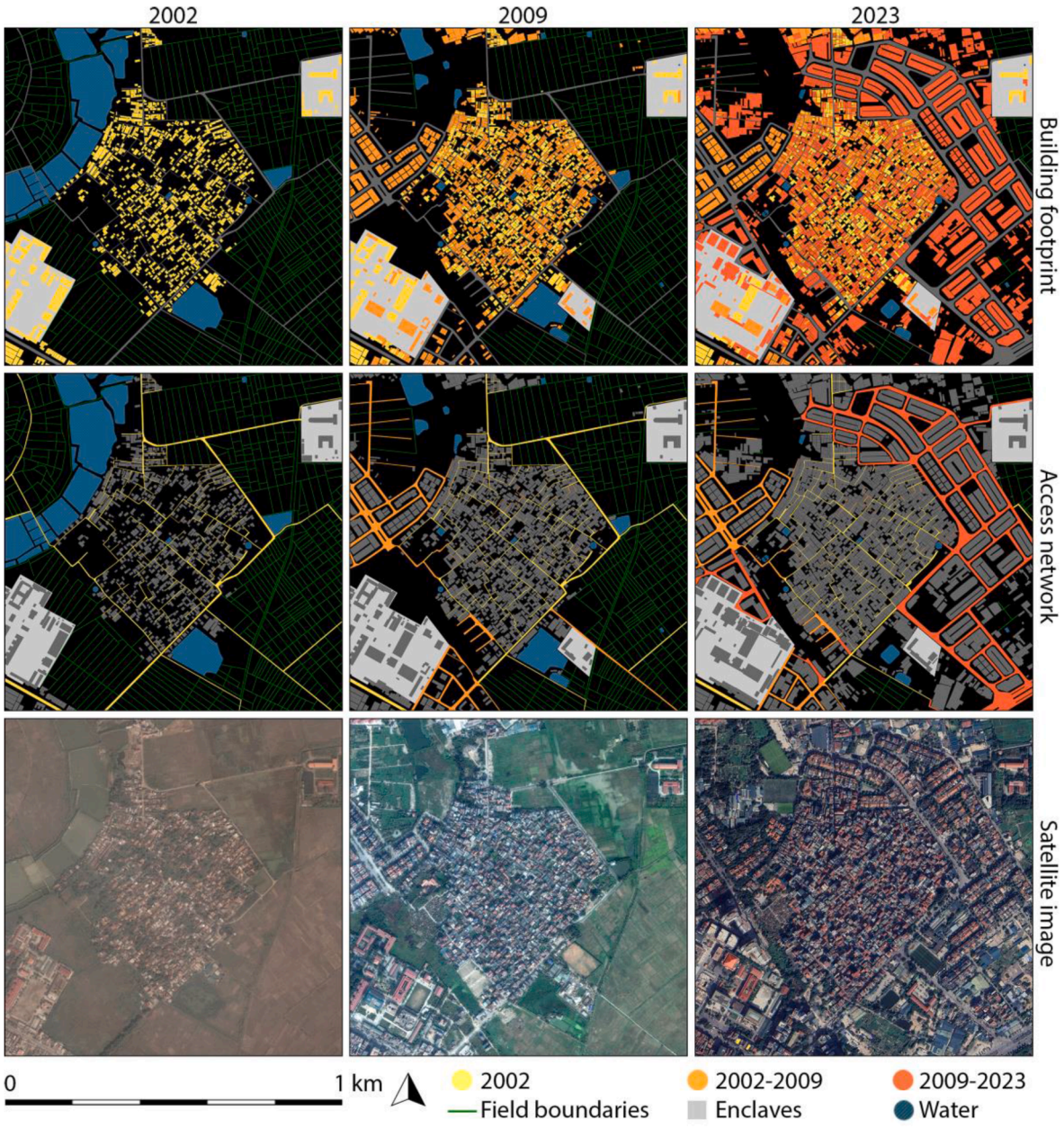

Fig. 1. Morphological transformations of a ViC in Hanoi, Vietnam. Satellite images: Google Earth.

buildings and pathways might be developed in the initial stage, which can then be upgraded, expanded, rebuilt, and widened over time.

The issues of land tenure are critical with regard to all these development practices. Our analyses here will only provide some generalisations. In Asia, a clear distinction between rural and urban areas can be observed in many countries. For example, in China, there are two types of land ownership: state ownership and collective ownership. Urban land is owned by the state and managed by the municipality; thus, the land use rights can be leased to users in exchange for payment. Meanwhile, collectives own rural land, but it is restricted from being sold on the general land market. Villagers obtain farmland use rights and residential plots from the collectives according to the Rural Households Responsible System. These land use rights can only be transferred among villagers or rented to outsiders (Wang et al., 2009). In other countries like India and Vietnam, there is no distinct separation of state and collective ownership like China; nevertheless, the state plays a monopolistic role in the supply of urban built-up areas, and the conversion of rural agricultural land into newly built areas must be authorised by the state (Thinh et al., 2023; Van Oostrum & Dovey, 2022). Due to high compensation rates, rural settlements are generally retained during the urban expansion process and become large pockets of informal settlement in the city (Figs. 2 and 3). While the distinction between state-controlled development over rural landscapes is widely seen as a key driver for the formation of ViCs in Asia, the integration process of village settlements into African cities seems to be mainly due to incremental development by villagers. In the majority of African countries such as Senegal, Ghana, and Nigeria, there are two land ownership systems: state land and customary land, which were inherited from the colonial period (Anane, 2022; Cobbinah et al., 2015; Mireku et al., 2016; Pinard, 2021). Development over farmland in Africa is influenced by negotiations between urban planners and local communities. Very often, villagers incrementally convert farmland into built-up areas without following a planning framework.

In the field of urban morphology, three elements — buildings, plots, and blocks or streets — are considered at different scales to explore urban fabrics (Marshall, 2009). In the context of ViCs, there are two

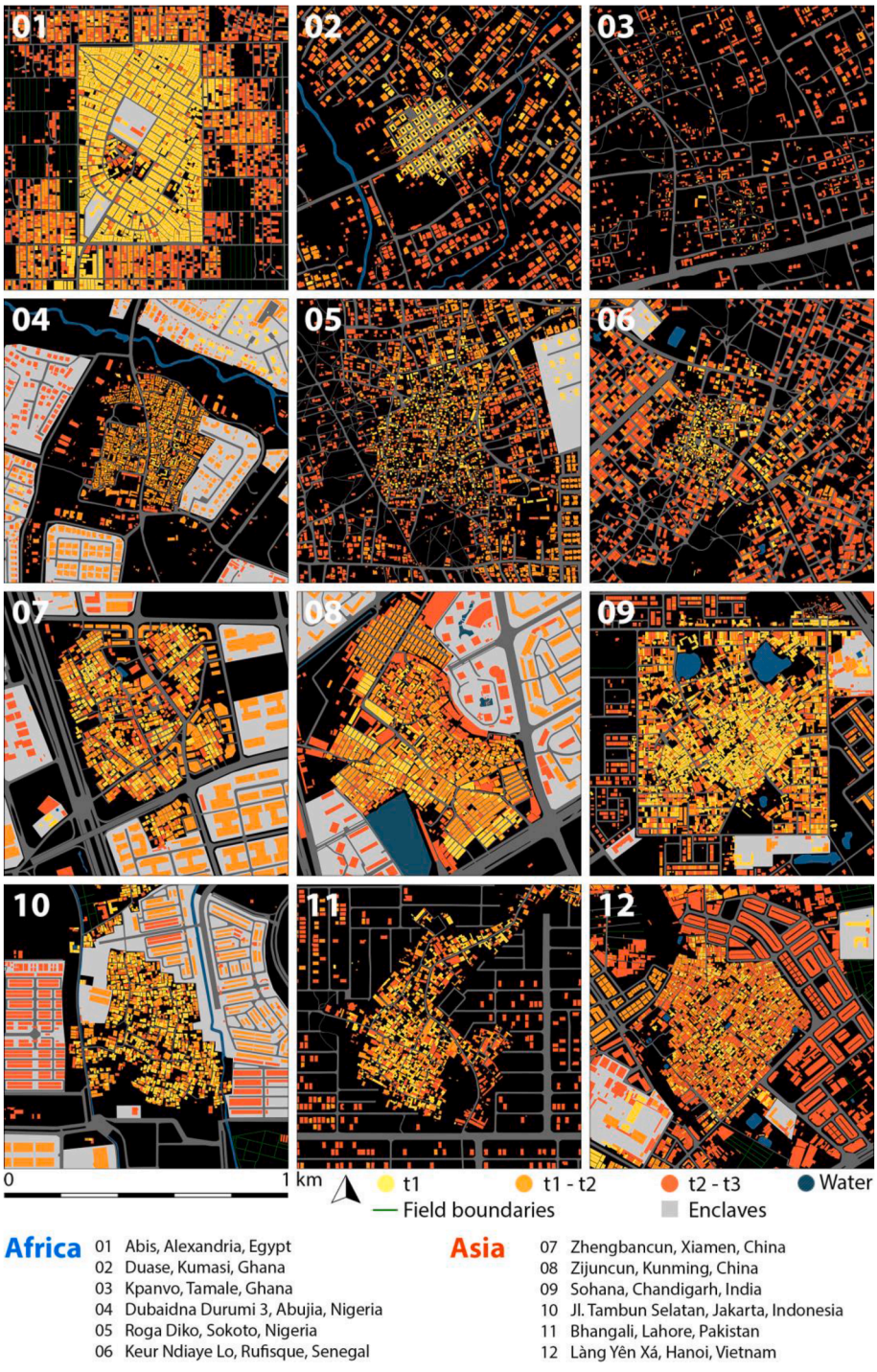

Fig. 2. Building footprints of case studies in t3.

main modes of housing transformation: (1) incremental growth and (2) total replacement of traditional housing forms by new ones. Generally, there are three types of traditional housing typologies in rural settlements. The first one is circular house, commonly found in Tamale (Ghana) while the second is the rectangular courtyard house, observed in many contexts, such as Kumasi (Ghana) and Kunming (China). The third is the house surrounded by large gardens, walls, and fences. Each type of traditional house is designed in response to the local climate, available materials, and rural living style. Over time, new building typology that covers the majority of housing plots can be seen in all case studies. During the early 2000s, the majority of buildings in ViCs were low-rise constructions. In the 2020s, several storey constructions have been built around the village core, over gardens, yards, and open spaces. The rate of building change in the village core varies depending on typologies and original structures, but there is a mix of old and new buildings in all case studies (Fig. 2). In case studies in Alexandia and Kumasi, the majority of buildings from the early 2000s remain unchanged, while original buildings in Tamale, Abuja, and Hanoi are commonly replaced by new housing typologies. For example, a new housing form, known as the "tube house", is commonly found in ViCs in Vietnam (Thinh et al., 2023) while new rectangular houses have replaced traditional circular houses in Tamale. In informal settlements, housing is incrementally developed using somewhat temporary materials (Dovey et al., 2023), but in ViCs, buildings are built using relatively

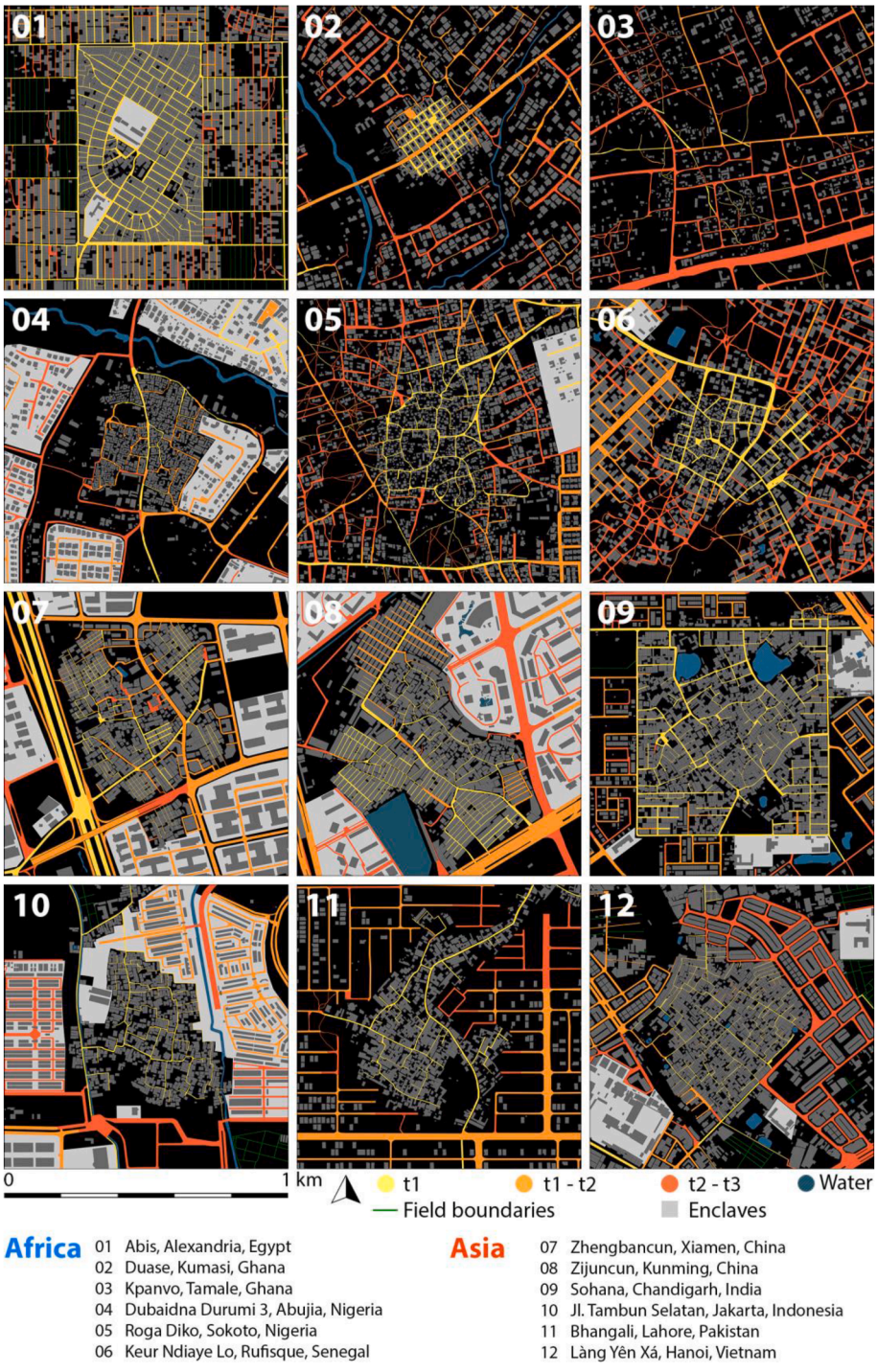

Fig. 3. Access networks of case studies in t3.

durable materials such as bricks and concrete. Although there are no height limits in many case studies, the common number of storeys is about 1 to 3 in Africa and 2 to 5 in Asia (Fig. 5), largely because lower storeys are not planned for load bearing.

Previous studies have shown that pre-existing access routes, field boundaries, and types of urban projects have significantly influenced urban forms around and within village settlements (Dovey et al., 2023; Seo & Lee, 2019; Thinh et al., 2023; Thinh & Kamalipour, 2022). Except for the case studies in Alexandria and Kumasi, the patterns of housing and access networks in the other case studies demonstrate organic layouts, influenced by historical landscapes and high ground against flooding. Generally, the majority of the new access networks were built over farmland, while the access networks within the village settlements often remain unchanged. The only exception seems to be the case study in Tamale, where the original access network in the village has been completely replaced by new grid access networks. Access networks in the village core tend to be cul-de-sacs and narrow alleys, while access networks in extension areas frequently illustrate some form of planned layouts (Fig. 3). The width of new access networks is generally large enough for two lanes of cars (Fig. 5). If surrounding communities were developed by developers, there are two types of newly built neighbourhood: (1) urban enclaves such as gated communities (e.g., case studies in Kunming, Xiamen, and Jakarta) and (2) non-gated residential areas (e.g., case studies in Chandigarh and Hanoi). In the first type, there

is limited access to newly designed communities from village settlements, while in the second type, there are some connections between village settlements and surrounding areas. In the cases of Abis (Alexandria) and Roga Diko (Sokoto), development over farmland is subdivided by villagers and informal developers; therefore, field boundaries might become new access networks or part of plot boundaries.

During the integration process, the most common change in study areas is building density. Due to the development of new urban areas and the expansion of villages, the building density in terms of gross coverage increased from 2.1 to 8.7 times between t1 and t3 in African case studies, and from 1.9 to 4.6 in Asian case studies (Fig. 4). The difference is partly due to the low-density of building coverage in African case studies during the early 2000s. In many case studies, such as Abis (Alexandria, Egypt), Kpanvo (Tamale, Ghana), and Bhangali (Lahore, Pakistan), the building density is likely to increase as various housing plots and open spaces in the studied areas remain empty. Building sizes vary depending on locations and types of surrounding urban projects. In African cities, although the expansions are incrementally developed by villagers, the housing sizes in extension areas are generally larger than those in the village core. Particularly, the size of housing in extension areas might reach 380 square metres, while the size of a plot might reach 1200 square metres. On the other hand, in the village core, the density of buildings is relatively high while the plots are quite small. As a result, most of the buildings in the village core cover all the housing plots. While the coverage of access networks is increasing over time (Fig. 4), all studied areas do not have the recommended 30 per cent of land coverage for access networks, as suggested by UN-Habitat (2014) for sustainable neighbourhoods.

4.2. Types of ViCs

Based on the analysed data, we have presented our findings regarding the characteristics of ViCs following two criteria: the relationships between ViCs and surrounding built-up areas, and incremental developments within ViCs. In what follows, we suggest a number of spatial types concerning incremental adaptations of buildings and access networks, as well as the relationships between village settlements and newly built neighbourhoods over farmland and open space (Fig. 6).

Separation: This type is characterised by ViCs being physically surrounded by walls, fences, and/or gates. During the development process, villages generally rejected relocation proposals from developers due to inadequate compensation; thus, the village settlements have been retained during the development of new towns (e.g., case studies in Jakarta, Indonesia, and Abuja, Nigeria). A key characteristic here is that most newly built areas are designed as large zones filled with gated communities, central business districts, and industrial areas that shape

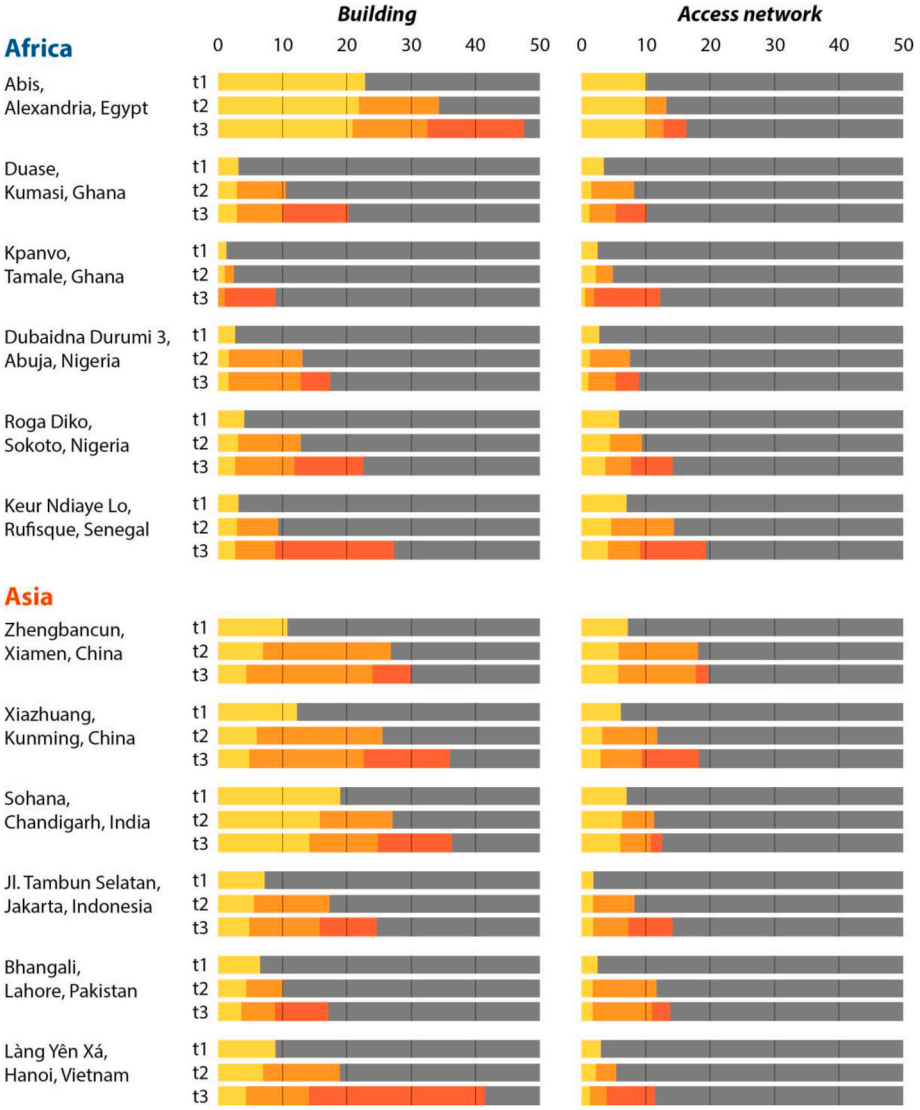

Fig. 4. Buildings coverage and access network coverage (%).

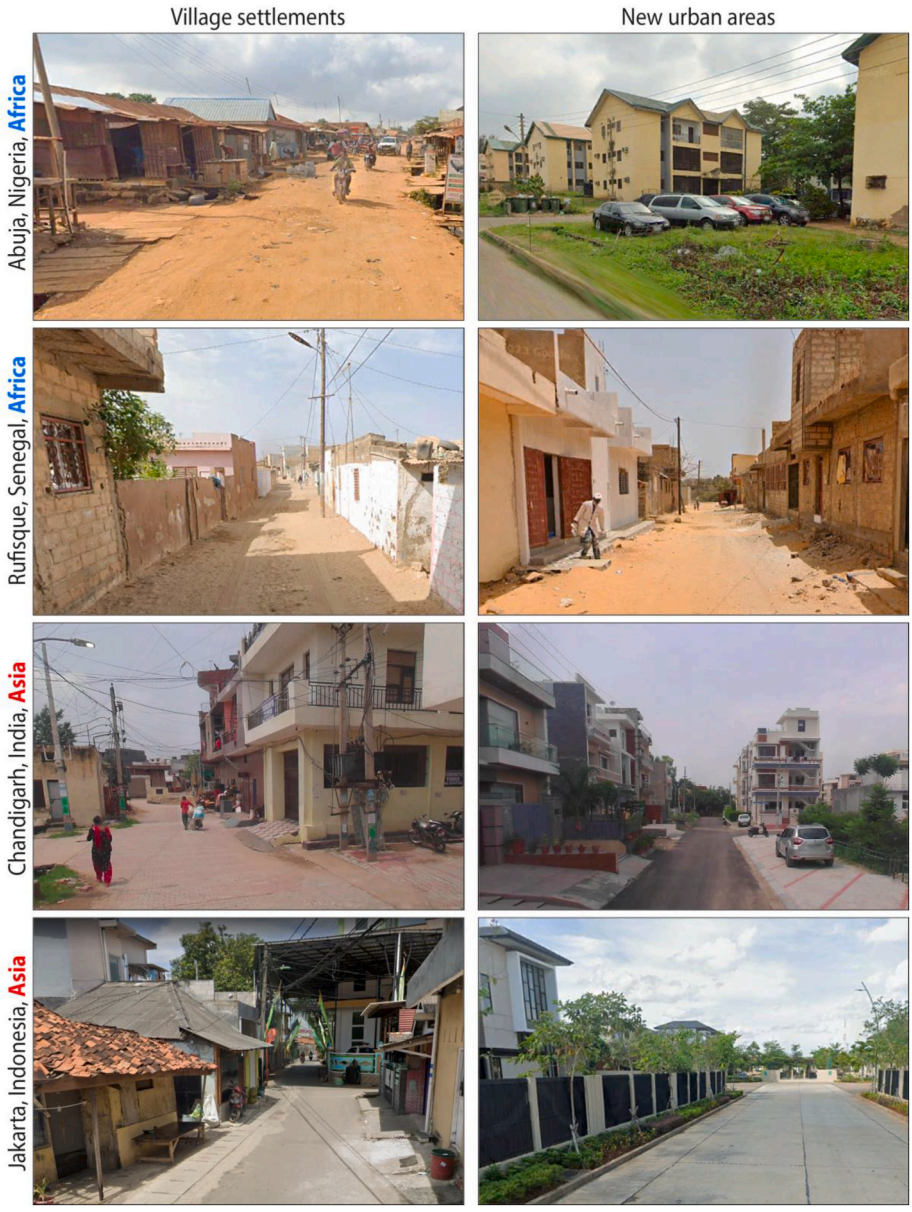

Fig. 5. Typical streetscapes of ViCs and new urban areas in Nigeria, Senegal, India, and Indonesia. Source: Google Street View.

the boundaries of village settlements (Cermeño, 2021; Mulyasari et al., 2017). Consequently, there is no direct connection between newly built areas and ViCs. The primary issue of this type is that the infrastructure and services within ViCs are poorly constructed and generally lack coordination with surrounding infrastructure and facilities. This type remains largely invisible, even to people who frequently pass nearby, although incremental development can still be recognised through high-rise buildings and satellite images.

Oasis: This type is characterised by ViCs being physically surrounded by new alleys, roads, and/or highways (e.g., case studies in Chandigarh, India, and Hanoi, Vietnam). Although the network of roads/alleys has been upgraded and built around the village boundaries to connect ViCs with the newly built urban areas, different morphological patterns between ViCs and newly built neighbourhoods can be easily recognised (Chalana, 2015; Thinh et al., 2023). The advantage of this type is that villagers can use infrastructure in surrounding areas, and they can provide some services for newcomers (Labbé & Boudreau, 2015).

Maze: This type emerges when the rural characteristics of a village undergo a complete transformation into newly formed informal areas (e.g., the case study in Tamale, Ghana). Often, farmland and existing settlements are converted into new layouts of residential areas, subdivided by farmers and informal developers. The visibility of ViCs, therefore, blends with other forms of informality. As there is an intermix of fairly self-organised layout in ViCs and newly built informal areas, there is no clear boundary between former rural settlements and informal subdivisions over farmland and open spaces. Incremental developments over ViCs and farmland commonly result in large clusters of informal morphologies in peri-urban areas. This type of informal development is easily recognisable from satellite images and high-rise buildings.

Sprawl: This type refers to ViCs, in which the original characteristics of nucleated villages remain largely unchanged, although the farmland has been incrementally developed by villagers and informal developers. The village settlements experience minor changes due to distinct historical morphologies. Examples of this type include case studies in Kumasi, Ghana, and Alexandria, Egypt. In Kumasi, there are two types of residential areas: the village core filled with courtyard housing based on traditional layouts and new residential areas filled with bungalows

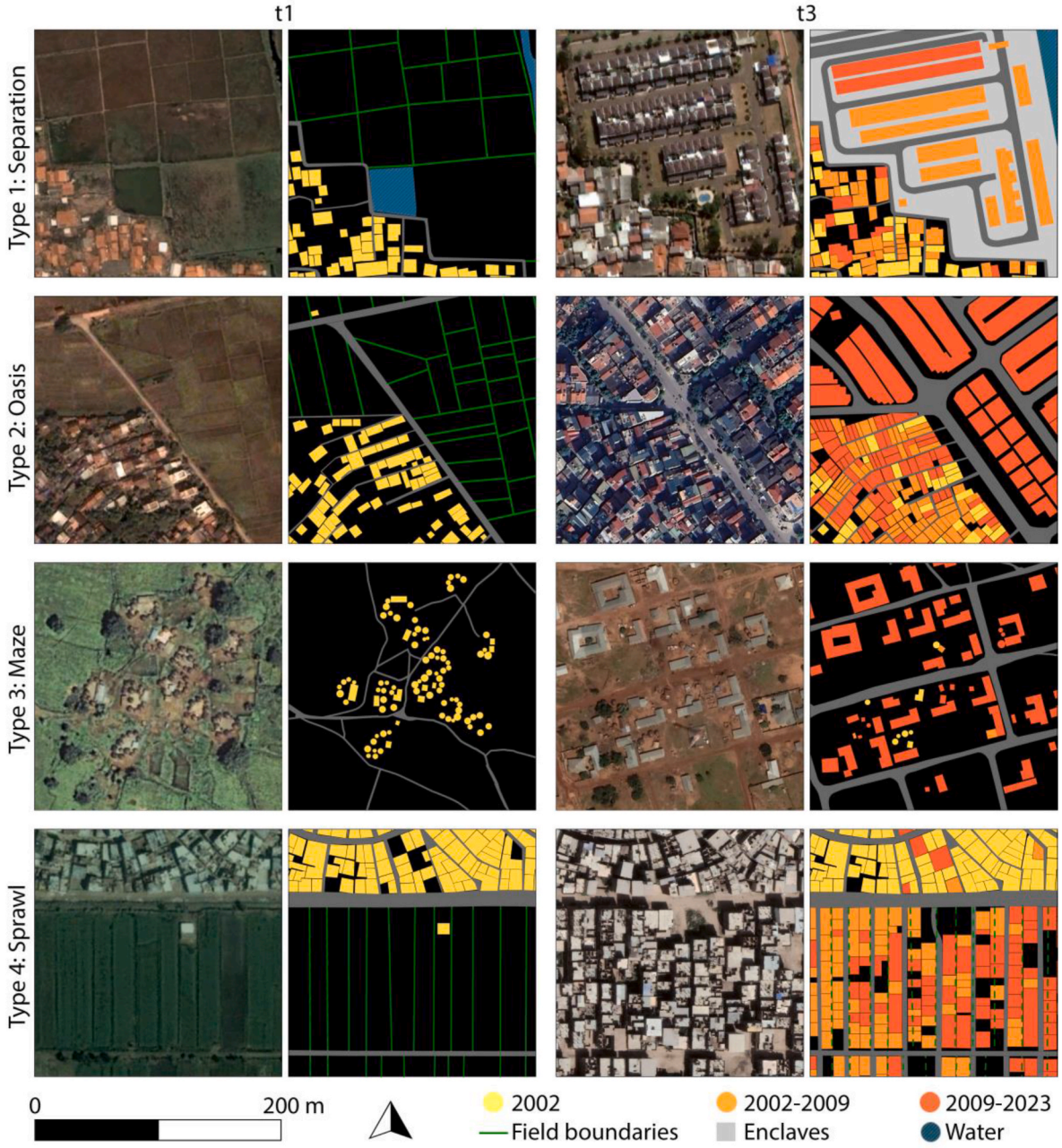

Fig. 6. A spatial typology of ViCs and surrounding landscape. Satellite images: Google Earth.

(Anane, 2022). The layout of bungalows is based on informal subdivision by the traditional authority. In Egypt, farmers living on the fringes of urban areas would divide an agricultural strip into small plots of around 80–150 square metres and offer them for sale through word of mouth. A narrow strip of 2–4 m would be reserved for access networks on the edge of the strip. This process of incremental development generally takes place at the edge of villages while the structure of the village core remains unchanged (Hareedy & Deguchi, 2010; Sims, 2011).

The types of ViCs outlined in this section are not exhaustive and/or mutually exclusive; rather, they illustrate a range of typological conditions that can help to better understand informal urbanism in the Global South (Fig. 7). As the morphological conditions of ViCs can be classified in different ways, there is no claim that these types are fixed. The built environment in ViCs and the surrounding landscapes is fluid, with infrastructure and services potentially being upgraded through collaborations between local communities, authorities, and non-governmental organisations. As one type might be transformed into another due to changes in politics and city development strategies over time, all ViCs can be considered hybrids. For example, case studies in Kunming and Xiamen (China), were surrounded by newly built gated neighbourhoods, expansions of villages, and roads/highways; therefore, they might share elements of Oasis. Nonetheless, the suggested types can provide a better understanding of how the morphologies and adaptations of ViCs play out.

5. Discussion

Thus far, the study has illustrated the process of incorporation and presented a typology of ViCs, aiming to reflect on how their morphologies have transformed. It is predicted that the number of informal settlements will increase in Asia and Africa in the next few decades

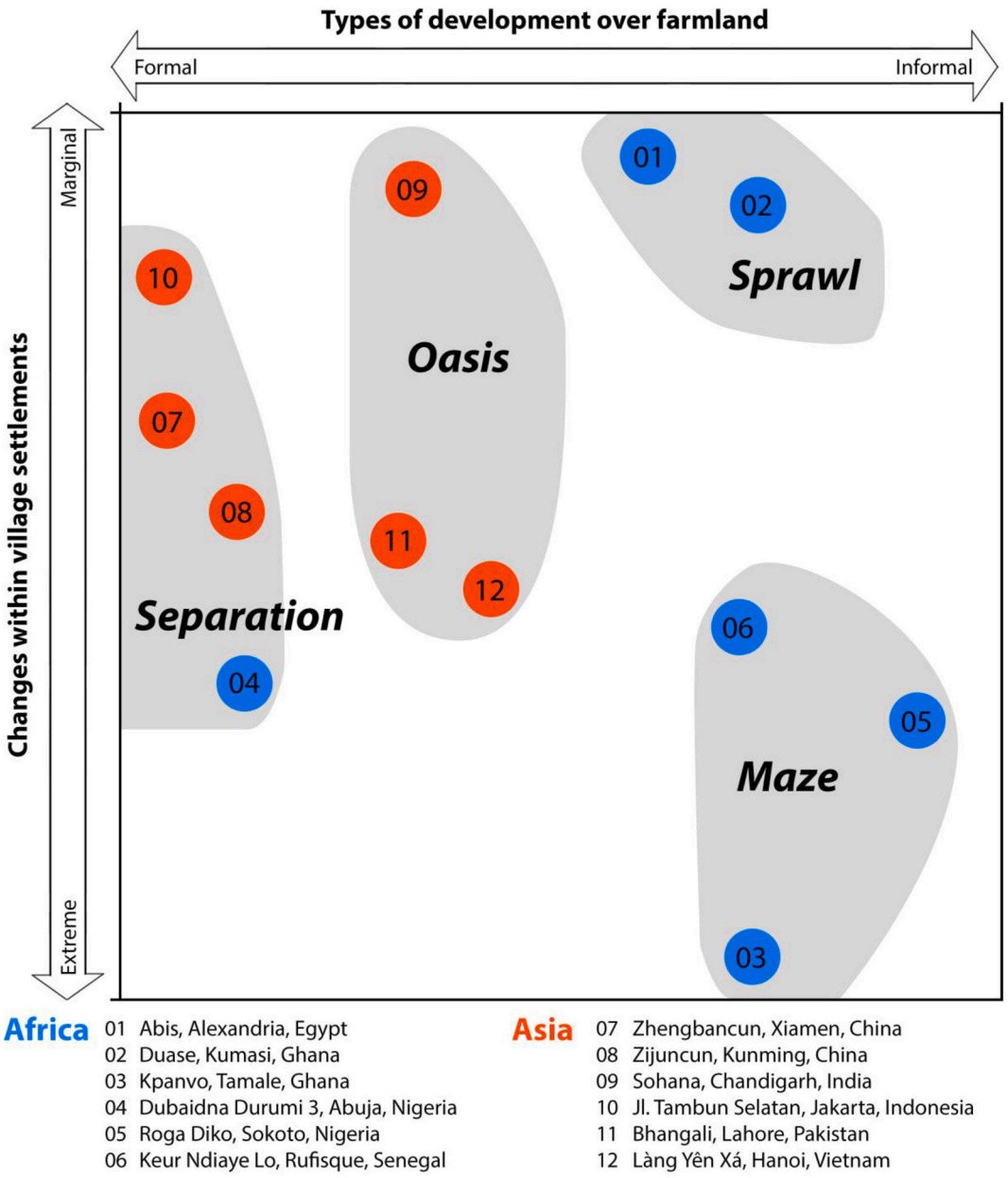

Fig. 7. Types of ViCs during city expansion processes.

(UN-Habitat, 2010, 2022). Informal settlements have often been neglected and remained off the maps, partly due to the lack of cadastral records and the complexities of mapping forms of informality (Kamalipour, 2023a; Kamalipour & Dovey, 2019; McCartney & Krishnamurthy, 2018; Robinson, 2002). While recent studies have examined the morphologies and dynamics of informal settlements (Dovey & Kamalipour, 2018; Dovey & King, 2011; Iranmanesh & Kamalipour, 2023; Kamalipour, 2016; Kamalipour & Iranmanesh, 2021; Kraff et al., 2020a; Sims, 2011; Taubenböck et al., 2018; Thinh & Kamalipour, 2024), the incorporation process of ViCs has remained understudied. In the introduction of the book *Urban informality*, Roy and AlSayyad (2004, p. 2) argued that informal development within agricultural land has become the largest source of urban informality since the 1980s. It is important to differentiate incremental development over farmland and villages from other forms of urban informality. In this study, we have highlighted key morphological characteristics of ViCs using available databases. The information presented in this paper is not comprehensive, covering all aspects of ViCs. Only a few studies (Myers, 2018; Thinh et al., 2024; Van Oostrum, 2021; Van Oostrum & Dovey, 2022) have comparatively explored the morphological characteristics of ViCs in the Global South. This presents a critical challenge for policymakers and planners in developing more nuanced, considerate, and effective policies and design interventions. The main findings of this paper are summarised and discussed in the following paragraphs.

Gilbert (2007) illustrated that in urban areas, where the quality of housing and the living environment gradually improves, areas that do not change may become "slum" due to neglect. This description seems applicable in the context of ViCs. In the face of rapid urbanisation, housing constructions and access networks in ViCs have been transformed in response to local needs with little or no support from development policies. Generally, villagers are unable to secure formal sector jobs due to limited skills and education, leaving them with a few options for earning a living (Thinh et al., 2024). Meanwhile, rapid urbanisation has strained state resources, undermining the government's capacity to effectively regulate rural settlements. As housing for rural-to-urban migrants and the urban poor does not generally meet their needs,

villagers have incrementally transformed their living spaces to address these gaps. The term "informality" in ViCs does not simply stem from ownership rights but also from the informal conversion of agricultural land into residential plots and the disregard for existing regulations about the construction sizes and standards. Due to densification and intensification, building coverage among village settlements and surrounding areas is relatively high, and ViCs increasingly become visible concerns due to a lack of investment, effective management, and upgrading strategies. Such informal development could be addressed with improved intervention policies that effectively support incremental transformations (Nassar & Elsayed, 2018; Sims, 2011).

It has been discussed that the visibility of informal settlements is often significant for upgrading strategies (Dovey & King, 2011; Kamalipour, 2024; Kamalipour & Dovey, 2019). While the living environments in ViCs are frequently viewed as being out of order (Chung, 2009; Zhang et al., 2003), they can enable a strong sense of place, social connection among residents, and a vibrant setting. Thus, it is important to understand how the images of informal settlements are represented in the media and urban planning discourse (Iranmanesh & Kamalipour, 2024). Among the sample, we found that the majority of ViCs in Africa have a lower density of buildings and access networks compared to those in Asia. Also, the incorporation process of ViCs in Africa primarily takes place due to incremental developments over farmland, whereas in Asia, ViCs are generally surrounded by planned communities. Four morphological types of ViCs have been identified: Separation, Oasis, Maze, and Sprawl. These types illustrate different degrees of visibility to the public gaze within cities. The Separation and Oasis types can be easily recognised due to the morphological contrast between planned and unplanned areas. On the other hand, in the Maze and Sprawl types, ViCs are commonly mixed with other forms of informality due to incremental developments over time, becoming large pockets of informal settlements. For example, Dharavi, a fishing village during the nineteenth century, is frequently described as Asia's largest slum (Jones & Sanyal, 2015). In Egypt, various informal areas developed over farmland and around rural villages are visible even from a long distance from the formal city (Sims, 2011).

The issue of visibility is further complicated by globalisation. Increasing economic linkages between nations and regions may result in competition to build world-class cities. To attract investment, the modern city image is frequently associated with high-rise towers, and the construction of mega urban projects while ViCs are often seen as potential areas for redevelopment (Gusah, 2012; Thinh et al., 2024). In many cities, due to their exposure to the public view, ViCs become targets for renewal projects, particularly when the cities host international events. Local authorities may feel embarrassed by negative narratives in the mainstream media, which often present ViCs as repositories of poverty, backwardness, crime, and/or misery. When Beijing was preparing for the 2008 Summer Olympic Games, the local government launched various projects with the aim of redeveloping all ViCs around the city before the Games (Shin & Li, 2013; Wong et al., 2018). Similarly, after Guangzhou successfully bid to host the 2010 Asian Olympic Games in 2004, the redevelopment of Liede village, which is less than 2 km from the main venues, became inevitable (Zhao et al., 2021). Although redevelopment projects are frequently reported in Chinese cities, such redevelopments and resettlements can also be observed in many places throughout the Global South (Fujita, 2010; Gusah, 2012; Jones, 2017).

It is important to note that the image of ViCs is not always negative. The story of Dafen village in Shenzhen is an example of how the visibility of ViCs influences the renewal process (Li et al., 2014; Wang & Li, 2017). Since Dafen village frequently appeared in local media as a cluster of painters, it soon garnered the attention of local authorities, becoming a developmental model and symbol of the city's advancement. The issue of visibility in ViCs is also related to the tourism industry. Tours of fishing villages in Mumbai are examples where visitors seek to explore new experiences about local culture and search for authenticity. In Indonesia, various urban kampungs undergoing redevelopment have turned into "rainbow villages" through collaborations between local communities and artists (Irwandi et al., 2023). Common strategies include using art themes and colourful painting on roofs and walls. While the long-term outcomes of such strategies still need to be investigated, they help to illustrate how the visibility of ViCs can impact urban transformations.

6. Conclusion

While various studies have focused on informal settlements in the Global South, understanding how informal urbanism works remains a critical challenge. Under the influence of globalisation and modernisation, the constructed images of ViCs frequently clash with the surrounding urban landscapes. While the visual branding of certain identities is often associated with traditional villages and historical landscapes, ViCs are rarely recognised in this regard. In this study, we have explored the morphological characteristics of ViCs using multiple case studies from the Global South. The selected areas are primarily used as illustrations; thus, this study does not claim that the outcomes represent the spatial characteristics and morphological conditions of ViCs across all selected cities, countries, and/or regions. As this study primarily used articles written in English to review and select ViCs in different cities/regions, potential study areas, which are recorded in other languages might have been excluded. Selecting case studies may also carry a risk of bias as various morphological conditions might exist even within a single city/region (Kamalipour, 2016; Kamalipour & Peimani, 2024; Thinh & Kamalipour, 2022). The initial aim of this study was to explore how the morphological characteristics of traditional rural villages have been transformed and incorporated into the urban environment. While socio-economic conditions can be reviewed in the literature, further detailed analysis is needed to investigate the relations between these factors and morphological conditions, typology, and proximity to services. Meanwhile, ViCs in many countries remain understudied compared to those in certain cities in China. The existing body of knowledge can be further developed by undertaking more theoretical and empirical research focusing on comparative studies across different contexts. Such studies can enrich the emerging body of knowledge by shedding light on key differences and similarities in a global context. Future studies can help answer the following questions: How are different types of ViCs distributed across cities in the Global South? How are the morphologies of ViCs incorporated in relation to mega-blocks? How and to what extent are ViCs visible from key viewpoints across cities? How do planning strategies and the political economy influence the images of villages in urban renewal projects? What is the role of local communities in the planning process, and how can they transform the visibility and image of ViCs?

CRediT authorship contribution statement

Ngo Kien Thinh: Writing – review & editing, Writing – original draft, Visualization, Investigation, Formal analysis, Data curation, Conceptualization. **Hesam Kamalipour:** Writing – review & editing, Writing – original draft, Methodology. **Nastaran Peimani:** Writing – review & editing, Writing – original draft.

Declaration of competing interest

We declare that this manuscript is original, has not been published before and is not currently considered for publication elsewhere.

We know of no conflicts of interest associated with this publication, and there has been no financial support for this work that could have influenced its outcome. I confirm that the manuscript has been read and approved for submission by all the named authors.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.habitatint.2024.103184.

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