

Advances in Science, Technology & Innovation
IEREK Interdisciplinary Series for Sustainable Development

Amira Osman · John Nagle ·
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The Urban Ecologies of Divided Cities

Advances in Science, Technology & Innovation

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The Urban Ecologies of Divided Cities

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Comparative Study of Asian Cities' Fabrics—The Morphological Approach

Beisi Jia

Abstract

The urban morphology and housing form in traditional cities in South and West Asia are important components of urban cultures, especially in the new developments in 'The Belt and Road Initiative' of China. Although western colonialism in modern history had strong impacts on the urban forms, the change is evolutionary and a gradual process of sustenance and mutation. The objective of this research is to reveal morphological characteristics through cross-cultural comparative studies of the self-built urban fabrics. On the basis of morphological theories and methodologies, four cities are selected and compared in terms of three spatial hierarchies, with the morphological patterns being independent of any paradigm.

Keywords

Morphological patterns • Comparative study • Asian cities

1 Introduction and Significance of Research

Asian civilisation has the longest history in the world. As home to the largest populations in the world today, Asia contains 15 of the world's 20 most populous cities, and these cities represent various ethnic, religious and social backgrounds (Khan, 1996). In the nineteenth century, European urban planning ideas, promenade streets, monumental vistas, garden cities and traffic efficiency in modern cities were confronted with diversities in urban living quality in Asia (Wang & Jia, 2019). High-density, low-rise, self-built

communities are growing rapidly in city centres and the surrounding suburban locations.

Since the late twentieth century, the regionalism approach has been limited to having architecture and segregated practices as isolated subjects from the urban context. Except in environmental studies, human perception and preferences related to these conditions are highly subjective and fuzzy (Tzonis, 2005). The fundamental aspects of quality from buildings, blocks, streets, neighbourhoods and districts as a whole are largely ignored. This study analytically investigates the morphology and spatial patterns of the area as systems rather than single buildings. The morphological characteristics of four highly dense, fast-growing cities with the popular self-built structures inherited and maintained in different backgrounds to enrich the understanding of the embedded social, historical and economic impacts (Table 1).

2 Methodology

Morphological research initiated from Conzenian constitutes a perception of the physical urban fabric as documents of civilisation and the urban landscape. According to Muratori-Caniggia, the various processes of change in urban residential districts not only affect the urban tissue and form but are also closely interrelated with the urban life and physical structure of cities (Wang & Jia, 2019). The morphological analysis is organised into three sections, each focusing on three spatial levels: urban network form, neighbourhood blocks and (typical) housing forms. Firstly, cities with different characteristics require different modes of organisation and management, leading to different patterns of streets/roads. Secondly, neighbourhood blocks with different characteristics are located in city districts, facilitating the connection and transition of fabrics. Thirdly, buildings are basic elements that shape the spatial relationship between the inside and outside, between individuals and communities and between income and land price.

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Table 1 Population density of the five cities

Cities	Population (persons)	Average population density (persons/km ²)	Population density in central area (persons/km ²)
Sana'a ^a	1,707,586	13,552	
Bagdad ^b	10,710,350	9,444	85,140
Jakarta ^c	10,562,088	15,906	
Hanoi ^d	7,588,000	2,269	38,896

^a Population of Sana'a 2022—Yemen (aznations.com)

^b Population of Baghdad 2022—Iraq (aznations.com)

^c Population of Jakarta 2022—Indonesia (aznations.com)

^d Home Page—english.hanoi.gov.vn; Population of Hanoi 2022—Vietnam (aznations.com)

3 Comparative Analysis

3.1 Urban Network Form

Historical Islamic cities exhibit similar patterns centred on the mosque, and the street network leads to the mosque from the city gates (Alsadoon, 2020). The water distribution system also contributes to the form of old cities. The rest of the cities are residential districts formed by communities and served with community facilities (Fig. 1).

The self-built communities in Sana'a remain relatively unchanged by modernisation, although it has undergone tremendous urban growth in the last half-century with low-income groups in suburban areas can be observed clearly from the random street networks and urban sprawl (Wa'el Alaghbari et al., 2008). The urban context in Baghdad, however, represents two contradictory extremes: a deteriorated and neglected historical centre and the large-scale peripheral modern neighbourhoods, in which the enormous scale of the grid design pattern has resulted in incomplete, dirty, unsecure public spaces (Alsadoon, 2020). Fast-growing Jakarta equipped with American-style

highways was left with large-scale self-built communities in between. As a result of these developments, modern Hanoi now contains different urban areas with distinct rural networks (Fig. 2).

3.2 Neighbourhood Blocks

The prototype of a neighbourhood (Hara) of Sana'a consists of a housing unit, a mosque, open space, a water fountain, a fruit and vegetable garden and a hot bath (Haidara & Talibb, 2013). The traditional city of Baghdad, which was cut through by a Western-style avenue in 1916 had elaborate narrow alleyways, internal passages and gateways (Fig. 3).

About 68% of Indonesians build their own houses (Andriyanto, 2018). Jakarta's neighbourhoods are characterised by Chinese shop houses along the streets and kampong houses behind the streets. A large, self-built community (or kampong) consists of about 10 sub-neighbourhoods (Dewi, 2016). Influenced by Chinese tradition, and the land division from agriculture, elongated plots are relatively deep in parallel patterns enclosed in traditional blocks in Hanoi (Fig. 4).



Fig. 1 Urban networks in comparison: small scale and organic pattern of Sana'a in contradiction with the large-scale grid system of modern suburban in Baghdad. **a** Sana'a. **b** Baghdad

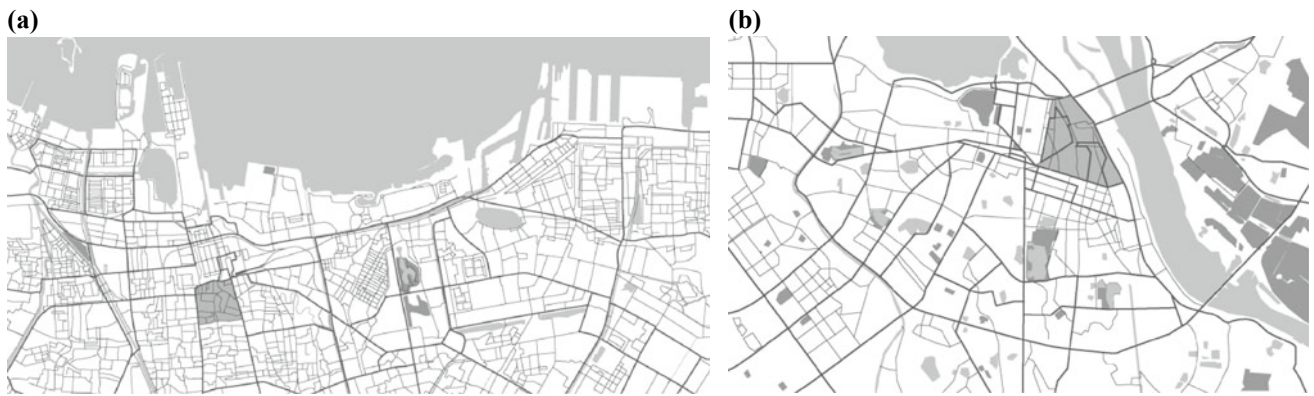


Fig. 2 Urban networks in comparison: the large urban sprawl driven by motor highways in Jakarta is in contradiction with Hanoi where the network is loosely distributed. The network is less dense compared with those in Sana'a and Baghdad, indicating a lack of formal infrastructure at the community level. **a** Jakarta. **b** Hanoi

Fig. 3 Comparison of street and blocks between the coherent pattern in Sana'a and the destruction of the old city in Baghdad by the modern avenue. **a, b** Sana'a (Photo source Posted by Mehri Petek in Pinterest <https://www.pinterest.com/pin/32228953558297840/>). **c, d** Baghdad (Photo source <https://twitter.com/iraqpic/status>)



Fig. 4 Comparison of streets and blocks: disorganised pattern in Jakarta in contradiction with the diversified urban fabric in and long and deep plot pattern generated by streets in the centre of Hanoi. **a, b** Jakarta (Photo source Dewi, 2016). **c, d** Hanoi (Photo source <https://www.dailysabah.com/gallery/vietnam-hanoi-the-city-of-tube-houses/images>)



3.3 Housing Form

Sana'a is marked by tall houses where several generations and branches of a family lived in one building (Fig. 5a). The first floors traditionally housed livestock. The top floor was the most prominent reception room of the house. Even today, houses are built by small contractors with craftsmanship that can last for millennia (Mehta, 2009). The buildings in the old city of Baghdad had two to three levels. The inner part of the house was protected against visual intrusion from the street or neighbouring buildings (Fig. 5b). The windows and balconies were projected from the street front side of houses, providing privacy (Alsadoon, 2020).

In Jakarta, kampongs *cluster* has houses that belong to informal workers. A small house consists of two floors (Fig. 6a). The ground floor is used for production, and the upper floor is used for the residence of craftsmen and workers (Andriyanto, 2018). Land plots in Hanoi are indeed very narrow, with some being only 2–3 m wide. These plots are a combination of three spaces: production, storage and dwelling houses (Kien, 2008). These townhouses were highly popular in the past and still represent a useful typological model for the construction of private dwelling in an urban setting (Fig. 6b1–b2).

4 Conclusion

Transformed from history, all these cities accommodate large populations characterised by informal economic and construction activities. The morphological patterns are inherited from history and therefore vary from modern ones. Their morphological characteristics are related but also different at all spatial levels. The urban networks are less organised, except for the grid pattern of modern plans in suburban Baghdad. Sana'a almost completely inherited the traditional urban patterns, and Jakarta is featured by modern highways stretching into large suburban areas. At the neighbourhood level, old Arabic cities are organised by religious and ethnic groups. In Hanoi, shopping streets are the dominant form and continue to intensify in terms of density. Jakarta has a mixture of housing types in all its super block communities. At the housing level, the type of tower houses in Sana'a differs considerably from the courtyard type of houses in Baghdad. Long and deep house types are continually maintained in Hanoi with increasing floors and heights to accommodate the population growth today.

The persistence of balance and conflicts between formal planning based on the decisions of the upper level of the

Fig. 5 Residential plans in comparison: small footprint tower houses in Sana'a leaving no room for courtyards are popular in houses in Baghdad. **a** Sana'a. **b** Baghdad

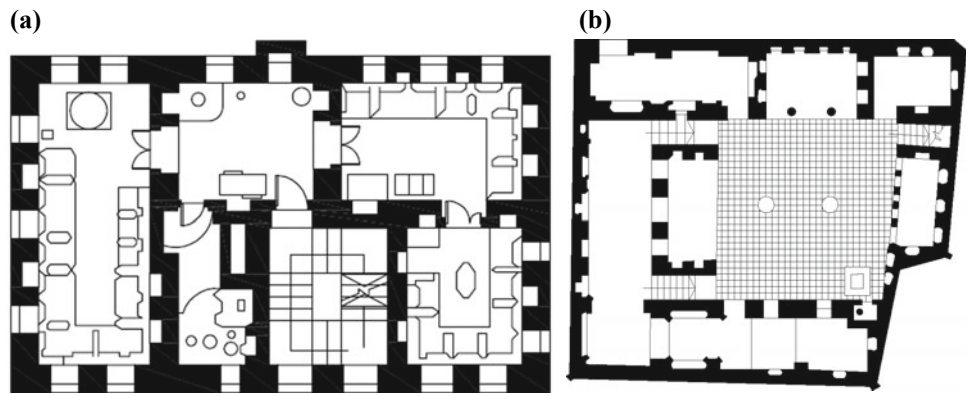
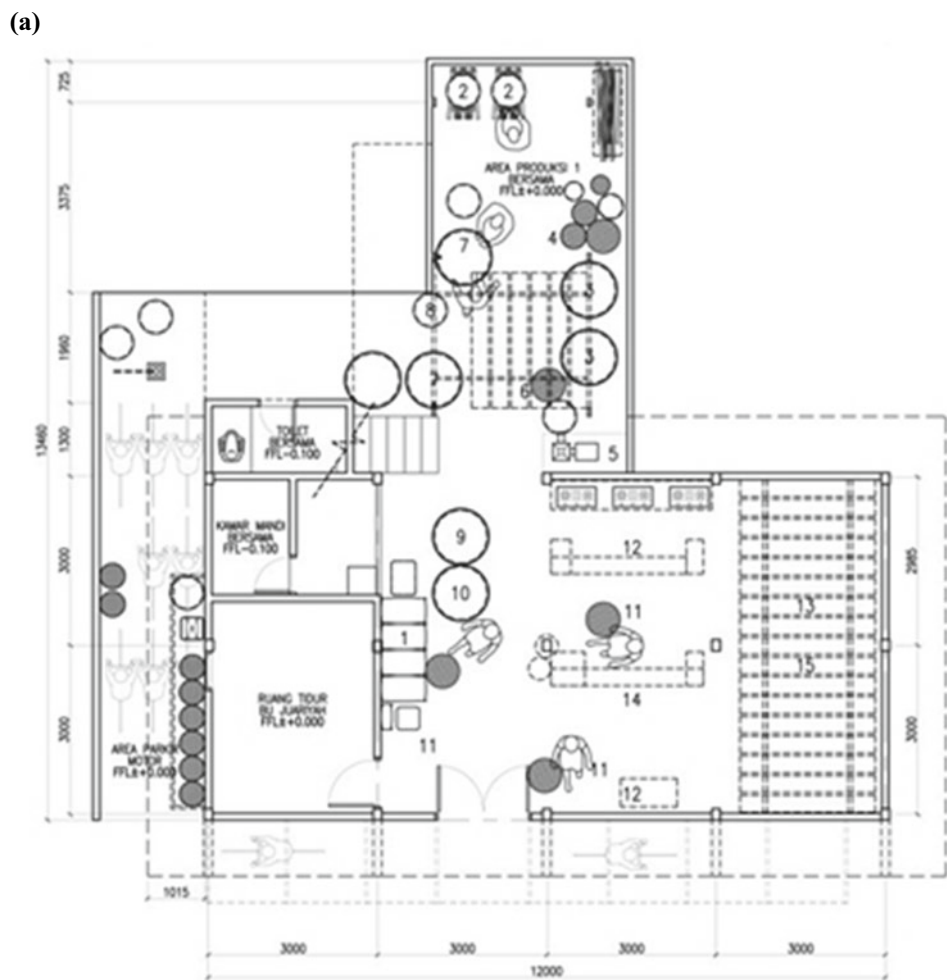


Fig. 6 Residential plans and sections in comparison: long and narrow shop houses constantly growing in heights in Hanoi in comparison with free-standing Indonesian kampong houses. **a** Jakarta (Drawing Source: Andriyanto, 2018). **b-1** Plan of a house in Hanoi. **b-2** Section of a house in Hanoi



cities and informal construction that initiates and dominates at the lower levels provides a context for understanding and developing a new and alternative post-modernism theory on urban architecture. The coexistence of planned infrastructure

and self-built communities in practice, which is largely ignored by existing paradigms, determines the future development and motivates further research.



Fig. 6 (continued)

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References

- Alsadoon, W. (2020). *Rebuilding Baghdad: A half-century of international urban plans for the historic capital of Iraq* (Doctoral dissertation, State University of New York College of Environmental Science and Forestry).
- Andriyanto, T. Y. H. (2018). Invisible housing—“Housing” as envisioned by the urban poor in Jakarta Mukti. In *E3S Web of Conferences* (Vol. 67, p. 04031). EDP Sciences.
- Dewi, S. P. (2016). *Gentrification process in Dki Jakarta province, Indonesia*. Technische Universität (TU) Darmstadt. E-Publishing-Service der TU Darmstadt. <http://tuprints.ulb.tu-darmstadt>
- Haidara, L. A., & Talibb, A. (2013). Adaptive reuse in the traditional neighborhood of the old city Sana’a—Yemen. *Procedia-Social and Behavioral Sciences*, 105, 811–822.
- Khan, H. U. (1996). Asian Architecture: diversity and eclecticism. *Contemporary Asian Architects*. Taschen.
- Kien, T. (2008). “Tube house” and “neo tube house” in Hanoi: A comparative study on identity and typology. *Journal of Asian Architecture and Building Engineering*, 7(2), 255–262.
- Mehta, D. (2009). *On Conservation and development: The role of traditional mud brick firms in Southern Yemen*. Georgia Institute of Technology.
- Tzonis, A. (2005). Redefining environmental quality. *Building Research & Information*, 33(3), 284–286.
- Wang, H., & Jia, B. (2019). Urban tissue of traditional Chinese and Southeast Asian port cities: The influence of maritime trade. *Journal of Chinese Architecture and Urbanism*, 1(1), 1–13.
- Wa’el Alaghbari, A. S., Ali, A. A. A., & Dolla, K. (2008). Factors influencing low cost housing in Sana’a—Yemen. In *Proceedings of the 2nd International Conference on Built Environment in Developing Countries (ICBEDC 2008)*.