Mapping the Spatiality of Informal Street Vending

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Abstract

The public realm in cities of the global South comprises a mix of formal and informal economies and activities competing for space and visibility. While often seen by the authorities as marginalised and damaging to the larger-scale off-street market, street vending cannot be simply wished away as it contributes to the emergence of vibrant urbanity and economic productivity. Drawing on empirical research in a case study in Tehran and using observation, fieldwork notes, photography, archival records, and urban mapping, this paper focuses on mapping forms of informal street vending to explore the spatiality of street vending in relation to pedestrian flows, public/private interface, and functional mix. The paper contributes to how the built environment professions can more effectively engage with transforming places to enable opportunities for a range of informal activities to emerge and possibly thrive in public space.

Keywords
Informality; Public Space; Public/Private Interface; Street Vending; Functional Mix; Pedestrian Flows; Retail; Typology; Urban Mapping

Introduction

About two-thirds of the world's working population was projected to be involved in the informal sector by 2020 (Neuwirth, 2012). Informal street vending is one of the most omnipresent forms of urban informality in cities of the global South, which is pivotal to the economic livelihood of the urban poor for whom they create employment and entrepreneurial opportunities. Although informal street vendors often have no permanent places for their business, they are seen as the most visible yet contested domain in the urban informal economy (Bhowmik, 2010b). While the entrepreneurial activities of informal vendors have the capacity to stimulate face-to-face encounters in the public space and bring vitality to streetlife (Bromley, 2000; Kamalipour & Peimani, 2019), they are often viewed as "intruders on public property as a nuisance" (Bhowmik, 2010b, p. 1). In many cases, authorities and/or the elite perceive informal street vending as a hindrance to the transformation of cities into modern, tourist friendly "Millennium Cities" (Gillespie, 2017).

As informal street vendors establish their autonomous subsistence activities in busy urban spaces, their access to, use and appropriation of the public realm generally come into conflict with the prerogatives of the authorities, which often see the agency of such urban disenfranchised groups as marginal (Boonjubun, 2017; Bromley, 2000; Hunt, 2009; Polakit & Boontharm, 2012) and out of order (Donovan, 2008; Rukmana, 2011; Yatmo, 2008). Street vendors were also historically opposed by city officials in the name of "aesthetics", "public health", or inhabitants' rights to "unobstructed

movement" on Western sidewalks (Loukaitou-Sideris & Ehrenfeucht, 2009, p. 129). This view has given rise to a widespread narrative of legitimacy that the state often uses to enforce repressive practices and heavy-handed crackdowns, particularly in the face of the increasing urbanisation of poverty within cities in the developing world (Donovan, 2008; Hanser, 2016).

The past decade has seen a growing interest in studying informal street vending, primarily motivated by the need to address political and socio-economic inequalities. Developing a sophisticated understanding of the dynamics of informal street vending has also been fundamental in the context of the Sustainable Development Goals. Yet, very little is known about the relations between the spatial logic of informal street vending and the sustenance and survival strategies of vendors. We begin from the view that exploring the spatiality of informal street vending matters as it can provide a sophisticated understanding of how different forms of informal street vending play out in the public realm. Such an understanding can inform the development of spatially grounded, contextually responsive and appropriate intervention strategies when it comes to addressing the dynamics of informal street vending and/or (re)designing the public realm.

In this paper, we build upon and contribute to the emerging scholarly focus on exploring the spatial dynamics of informal street vending in relation to the built environment. The key questions raised in the relevant literature include what relationships emerge between informal street vending and certain aspects of urban morphology and how the design of public space can encourage or constrain the everyday activities of street vendors. Drawing on extensive urban mapping and empirical research in the case study of Saadi in Tehran, we map different forms of street vending and further explore the spatiality of informal street vending in relation to pedestrian flows, public/private urban interface, and functional mix to address the following questions: How are the street vendors' use and appropriation of public space related to the flow of pedestrians, retail edges and functional mix? How can urban mapping serve as a tool for unravelling the spatiality of street vending in the public realm? In what ways certain forms of street vending can transform the underused urban edges of public space and contribute to the emergence of urban intensity? What are the roles of spatial visibility, catchment area and gender in enabling or constraining the use and appropriation of public space by informal street vendors?

Informal Street Vending

Forms of informal urbanism—ranging from informal settlements to informal street vending and transport—have become integral to the ways in which many cities work, particularly in the context of what is constructed as the global South. The idea of informality as "a mode of producing and regulating space" (Roy, 2015, p. 820) dominates the overall practices of urbanisation. This is primarily linked to how certain forms of urban informality work as resources to address the pressing challenges of poverty, inequality and unemployment (Kamalipour & Peimani, 2021). The dualism between the informal and formal overrides synergies and alliances between the two sectors and defies the value of informality. The term "informal" is largely labelled as a stigmatised word characterised in terms of lack. Informality is commonly interpreted simplistically as poverty, marginality, detrimental to the "image" of the city (Bromley, 2000) and "a product of subcultures at the lower end of economic and political power" (AlSayyad & Eom, 2019, p. 271) rather than a set of transactions that connect different spaces and economies to one another (Roy, 2007). The definition of informal street vending is linked to two key themes of legality and location of the trade, among others, as they emerge partially outside the regulatory environment and most likely within those urban spaces that are publicly accessible (Brown, Lyons, & Dankoco, 2010). Street vending plays a key role in urban informal economy by providing job opportunities, generating income for the urban poor, and filling the gaps of formal urban development by negotiating space and visibility in the public realm (Kamalipour & Peimani, 2019; Peimani & Kamalipour, 2022b). Hence, street vendors can broadly be defined as those groups in flux who largely operate beyond state control, offering goods or services to the public in the absence of a permanent tenancy on a built-up structure.

Spatiality of Street Vending

There has been a growing scholarly interest in exploring the spatial logic of informal street vending. Charman and Govender (2016) suggest using the "relational economy of informality" as a theoretical lens to explore various socio-spatial dimensions of street vending. They argue that the outcomes of the economic development in global South cities such as Johannesburg are socio-spatial processes that influence the distribution and form of street vending activities and shape the interactions between vendors and other agents, including customers, pedestrians, storekeepers, and informal taxis, among others. More particularly, three aspects of the spatial logic of the relational economy including "the flexible agility of entrepreneurship", "the unseen organisational logics", and "the inclusivity of the environment" have been outlined as insightful in reimagining current approaches to managing informal street vending (Charman & Govender, 2016). Pavo (2020) expands Lefebvre's notion of "conceived space", noting that street vendors are among those sectors that contribute substantially to the (re)designing of the public space. This was evidenced in the aftermath of the 2016 bombing incident in Roxas night market in Davao City (Philippines) where street vendors were changed into symbols of resilience against terrorism, reclaiming the market space from terror and insecurity.

The relationships between the spatiality of street vendors and their survival strategies have been studied in the recent literature. Examples of these strategies include the capacity to strategically operate in multiple locations to access a greater number of customers and minimise the risk of confiscation of goods (Tawodzera, 2019). In another study in Vadodara (India), Dalwadi (2010) found that vendors' spatial distribution in terms of number, typology and magnitude is linked to the patterns of functional mix, street width, population density, and the income level of the surrounding population, among others. One of the key survival strategies adopted by street vendors is their spatial clustering in large groups at public transport stops, street corners, public lands and roadsides (Kazembe, Nickanor, & Crush, 2019). Such defensive strategies have particularly been common among those street vendors who operate outside the open markets, with the aim of making it more difficult for the police to eliminate vendors from the public realm.

Street vending contributes to the kinaesthetic experience of the street, walkability and lively outdoor atmosphere in the public realm (g'-Ling & Aminuddin, 2019). There has been empirical research on the spatiality of street vending in Addis Ababa (Ethiopia), which demonstrates that the average pedestrian density varies depending on the pedestrian flow, presence of customers interacting with street vendors, width and location of vending stalls, and width of sidewalks (Hagos et al., 2020). In their study of the modalities of street vending in the planned modernist city of Islamabad, Moatasim (2019) focuses on the question of how the architectural forms, aesthetics and spatial practices associated with street vending relate to the long-term sustenance of ordinary informal spaces. Using the idea of "long-term temporariness", it has been argued that the sustained existence of street vendors is reliant on the routine maintenance of the links between their materiality and temporality. The links between permanence and provisionality can be seen in both the everyday spatial practices and official policies related to street vending (Moatasim, 2019). In their empirical study of spatial governmentality in Guangzhou, Huang, Xue, and Wang (2019) argue that the key questions for policy makers to consider are whether and to what degree the formalisation approaches by designating permitted places have taken into account the spatial/non-spatial attributes of street vending. For instance, street vendors need not only a workspace but also a relational space that enables them to actively establish subtle spatial links with their customers – these links are crucial to vendors' business (Huang et al., 2019). Martínez, Short, and Estrada (2018) discuss that governments face critical challenges in understanding and integrating public space policies and enhancing the links between the local authorities' spatial design for the city and vendors' spatial responses. As such, it is argued that policy interventions should acknowledge the diversity and segmentation of street vendors that vary spatially. A deep analysis of the spatiality of street vending particularly in relation to the flow of potential customers and built environment features is then important for future urban design and policy interventions.

The ways in which informal street vendors push the boundaries of formal codes and encroach on public thoroughfares in self-organised ways are dependent on a mix of issues, including their spatial visibility and access to public space, as well as the degree to which their activities are tolerated by the authorities (Kamalipour & Peimani, 2019). While street vendors benefit from the everyday spatial visibility and keeping pedestrian flows open, their excessive competition and congestion caused by heavy pedestrian traffic can escalate to the point that can become a disincentive to their livelihood (Bromley, 2000). This resonates with what Bouhali (2018) suggests that despite the importance of vendors' spatial visibility to the reshaping of the public space and commercial landscape, it can cause serious damage to their everyday livelihood. Informal street vendors that are spatially exposed can easily be targeted for violent interventions (e.g., massive eviction), particularly in the cities hosting major tourist or political events.

Urban Mapping

The capacity of urban mapping to produce spatial knowledge (Dovey et al., 2018) can be harnessed in street vending research (Kamalipour & Peimani, 2021). To understand the dynamics of street food vending activities, Swai (2019) maps downtown streets with open restaurants in Dar es Salaam focusing particularly on the functional mix, street width and spatial qualities of vending places such as design and materials and the like. The findings show that the street food vending activities contribute substantially to urban vibrancy, vitality and safety in downtown streets. Charman and Govender (2016) adopt mapping and cross-sectional drawings as part of their extensive methodological framework to investigate the spatial distribution of local micro-enterprise activities including street vendors, retail businesses, recreational facilities among others within 200 metres distance from the selected street transects (e.g., high street intersection, transport node, neighbourhood street) in Ivory Park, Johannesburg. A key finding in this study indicates that street-based activities such as street vendors thrive from their flexible agility of entrepreneurship to appropriate strategic locations and position themselves in proximity to the flow of pedestrian movement. Urban mapping was adopted as a tool in another study to explore socio-spatial appropriations of street vendors in Valparaíso (Ojeda & Pino, 2019). The study contributes to the literature on the spatiality of street vending, arguing that informal street vendors' dispute over the use of public space is linked to the form and size of the vending stalls and their associated locations.

Types

In the existing literature on informal street vending, several studies engage with the question of type. Dalwadi (2010) suggests that each street vending type has particular spatial requirements, which should be treated critically within any formalisation attempts. Common typologies of street vendors have been developed based on the key criteria of mobility and flexibility within the public space. For instance, Adama (2020) categorises street vending into two groups of highly mobile with a capacity to adopt spatial/temporal tactics and less mobile groups with a capacity to shape informal relations and networks. In another study, the key focus has been on the extent to which street vendors' use and appropriation of public space become permanent, with the four main types of permanent, semi-permanent, semi-mobile, and mobile (Israt & Adam, 2017). In another study of informal food vending, Kazembe et al. (2019) outline four main types, which include those selling food in marketplaces, street vendors, those selling from tuck shops with fixed structures in informal settlements, and mobile vendors who sell food door-to-door.

While there has been an emphasis on the importance of studying the typology of street vending to enable a more effective allocation of physical space to such activities (Bhowmik, 2010b), there has been a limited scholarly focus on how different types of informal street vendors play out within the public realm in relation to the micro-scale design of public space, urban morphology and adaptation. Polakit and Boontharm (2012) discuss how the use of public space by mobile vendors in public space are primarily influenced by street hierarchy and different modes of transport. Drawing on the concept of "proxemics" (Hall, 1966), Dovey (2016) introduces a spatial typology, ranging from

those street vendors using fixed and semi-fixed elements to those using mobile ones. Another typology is developed by Kamalipour and Peimani (2019) and further adopted in this paper as a tool for mapping and analysing the spatiality of different types of street vendors in relation to certain morphological properties, particularly the edges of public space. Incorporating six different conditions, this spatial typology is developed based on the two main criteria, including the degree of mobility within public space (i.e., the degree to which street vendors can move within public space) and proximity to public/private urban interface (i.e., how street vendors position themselves in relation to the edges of public space). They further articulate the question of how public/private urban interfaces enable or constrain access, penetration of the public gaze, pedestrian flow, appropriation, and social exchange.

Street Vending in Tehran

There have been limited surveys on the actual number of informal street vendors in Tehran to date. Nevertheless, the substantial emergence and current condition of street vendors should be analysed in the context of the country's economic stagnation (starting in 2008) and the imposed international economic sanctions (Taheri Tafti, 2020). The most severe sanctions were imposed in 2012. Iran's economic performance has been hindered drastically by high inflation and unemployment, particularly among young people and low foreign investment (Ilias, 2010). The economic recession in Iran has particularly hit women and the young population, and the economy's capacity to absorb new workers into the formal labour market was markedly reduced (Salehi-Isfahani, 2011). While Iran's formal labour market preserved more employment opportunities for older workers, young entrants had to wait longer for regular jobs in the formal sector or had to take up jobs in the informal sector. Recent evidence from 386 street vendors in Tehran shows that 36 percent of them were skilled workers prior to taking up the job of vending, and 21 per cent of them were factory workers or simple labourers (Saghafi, 2015). They join the informal sector mainly for two most probable reasons: the skill deficit among the young, educated people lowers their chances of entering the formal labour market, and their earnings from informal street vending tend to be considerably higher than those offered in the formal sector. Many street vendors, mostly without other occupations, strive to earn a living by using and appropriating Tehran's public spaces, including sidewalks, main streets and squares. While rarely treated with dignity and tolerance, the collective practices of using and appropriating the public realm by street vendors have reconfigured the urban landscape and streetscapes of many Iranian cities.

There is a gender dimension to the ways in which informal street vendors play out in Tehran's urban spaces. According to Taheri Tafti (2019), women's involvement in street vending is often negotiated within the dominant system of gender norms and ideologies. It has been argued that only a limited number of female vendors set up their business in certain public open spaces with a high density of potential female customers and their vending activity is often limited to the women-only metro carriages due to the gendered norms and constraints in public space (Peimani & Kamalipour, 2016). It is important to note that this view is being adapted in the current climate of economic decline (Taheri Tafti, 2019). According to Fadaee and Schindler (2017), women vendors are more likely to experience harassment by the authorities and male passers-by in the public open spaces compared to women-only metro carriages. However, this argument is somewhat contradicted in another more recent study of street vending in Tehran (Taheri Tafti, 2019), which found that despite the significantly low presence of women vendors on busy sidewalks, their activity in prime locations of the city is geared to their ability to build alliances with shopkeepers and negotiate their claims to urban spaces with other street vendors. Unlike many other global South cities (particularly those in the South Asian and Southeast Asian context), there were almost no trade unions, vendor associations, and NGOs working in Tehran at the time of data collection (September and October 2014).

While street vendors in Tehran strive to establish autonomous subsistence activities in the uncertain hostile climate based on self-reliance, adaptation, flexibility and negotiation, their daily practices are hardly tolerated by the local municipalities as the key agents responsible for implementing urban policies regarding street vending (Izadi, 2016). Authorities often wage "a protracted war of attrition against the street vendors" (Bayat, 1997, p. 54). Many shopkeepers may also actively join authorities in heavy-handed crackdowns. According to recent data, shopkeepers consider the cheaper sale of goods by vendors, disruption of customer traffic, loss of their customers caused by vendors, and how vendors are making their business place ugly as the primary sources of tension between them and street vendors (Saghafi, 2015). Street vendors are also harassed by the urban middle class, and they are often blamed for many city problems, including traffic problems, blockage of pavements, antisocial behaviour, and depressed real estate values. Severe confrontations between vendors have been evidenced during the last years, due to which many vendors were attacked and then forcibly evicted by municipality officials from their territories in Tehran's key public spaces (Afshang, 2019). Such confrontations among multiple actors – street vendors, civic authorities/shopkeepers/urban middle class – with conflicting desires and interests are enmeshed in the politics of urban place in the Islamic Republic of Iran.

Many public spaces in Tehran have concurrently witnessed clampdowns on street vendors. This is linked to the fact that the state continues to fail to understand the need for sensible urban planning and policy responses that recognise street vending as legitimate work. Such interventions have left the disfranchised in what is called "permanent temporariness" (Yiftachel, 2009, p. 90). According to a survey from 2015, 88 percent of street vendors in Tehran noted that they have entered into a confrontation with the municipal officials, which resulted in the seizure or confiscation of goods in 67 percent of cases, 15 percent relocation or leaving, and 18 percent reconciliation with the municipal official or paying the fine (Saghafi, 2015). To justify episodic crackdowns and forced evictions, the state functionaries have often adopted the simplistic discourse of the obstruction of thoroughfares (*sadd-e ma'bar)* and rights of pedestrians*,* using an Islamic rhetoric (Taheri Tafti, 2020). In Islamic cities, this rhetoric indicates that "any public thoroughfare should not be obstructed (by temporary or permanent obstruction)" (Hakim, 1986, p. 20). While there was limited specific laws regarding Tehran's street vendors at the time of data collection (TasnimNews, 2016), the Islamic rhetoric was followed, where applicable, by the state to frame its exclusionary policies and practices on informal street vending such as random crackdowns, issuing a banning zone in the city's busy public spaces and setting up weekly markets in the areas with low pedestrian flows, albeit by charging high rents. As argued by Taheri Tafti (2019, 2020), such framing of policies about street vending in Tehran is not consistent with many other cases reported in the existing literature which outlines the creating of a 'modern' and world-class city as the dominant discourse adopted by the authorities to cleanse street vendors from the public realm.

Repressive actions of eviction and harassment in the name of addressing the obstruction of thoroughfares have been publicised in the press and presented through videos, many of which have gone viral on different social media platforms (Afshang, 2019). Other sorts of obstruction of thoroughfares by storekeepers or construction companies have hardly been the subject of any heavy-handed reaction (Taheri Tafti, 2019). This has given rise to the public's anger and growing concern regarding the ways in which civic authorities continue taking harsh measures against street vendors who need any possible income to make ends meet. While street vendors are frequently harassed and evicted by the authorities and their goods are often confiscated or even destroyed, they continue their make-shift arrangements in the public realm and carry on their cat and mouse game with municipality and police agents chasing them away.

Case Study Selection

This paper deploys a case study approach to enable learning from rapidly urbanising cities of the global South that can contribute to the existing debates on the spatiality of street vending. Adopting an "information-oriented" approach to case study selection (Flyvbjerg, 2006), the paper selects the study area of Saadi in Tehran (Iran) as a "critical" case study in the Middle East where informal street vending has become one of the most omnipresent forms of informality in urban public space, comprising a pivotal segment of the labour force. Figure 1 shows the location of the selected case study on the map of the metropolitan Tehran along with a map of Building footprints, lots, and street network. The case study of Saadi lies in the historic urban core, less than two kilometres away from the city's Grand Bazaar. Centred on the Saadi metro station, the study area mainly includes commercial, retail, industrial, cultural, official, and residential uses, most of which operate at the city scale. The staging of urban development and the overlap of different layers over time have resulted in a mix of functions, lot sizes and building densities as well as irregular access network with various block shapes and numerous dead-ends. The two main streets (Saadi and Jomhouri) in the study area have been lined with various formal and informal flows of exchange and interaction since the time streets were formed as commercial strips in the 1930s. These two streets have been among the critical urban spaces, hosting a large number of pedestrians and different types of informal street vendors using the public realm to sustain livelihood. The selection of the case study from a major transit node relates to the idea that street vendors strategically locate their businesses in the areas with a considerable flow of potential customers (Bhowmik, 2010b; Kamalipour & Peimani, 2019; Tawodzera, 2019). Accessibility to the field was also among the key case study selection criteria.

25km x 25km   1km x 1km

Figure 1. Case study location in metropolitan Tehran (left). Building footprints, lots, and street network (right).

Research Methods

Non-participant direct observation, fieldwork notes, photographic survey, archival records, and urban mapping were the key research methods in this study. Direct observation is a primary and informative method since it can help deduce patterns (Habraken, 1998). As Gehl and Svarre (2013) point out, direct observation adds a dimension that interviews with various actors about their everyday actions in public space and their motives could never capture. The lack of publicly accessible and reliable data on the study area increased the importance of non-participant direct

observation as a primary diagnostic tool. As such, the study primarily relied on on-ground observation to collect data on the functional mix, retail edges, and volume of pedestrian flows within easy walking distance of about 500 metres from the selected transit node. Walking on site, undertaking direct observation and photographic survey for a long cohesive period in the field played a significant role in unravelling the spatiality of street vendor activities. Observing and documenting clues and physical traces were also among the critical research methods in this study, particularly for those activities that took place when the researchers were not present (Zeisel, 2006). In contrast to those methods that depend on self-reporting, non-obtrusive physical traces observation and documentation did not have the issue of reactivity, whereby street vendors and public space users alter their behaviour or performance due to the awareness that they were being observed. Special events and weekends were avoided to capture typical conditions.

In this paper, we particularly harnessed the capacity of urban mapping as a form of spatial knowledge production (Dovey et al., 2018). Similar to informal settlements, forms of informal street vending have largely remained unmapped and invisible on official maps (Kamalipour & Dovey, 2019; Kamalipour & Peimani, 2021). We empirically tested the typology of informal street vending developed by Kamalipour and Peimani (2019) as a key tool to investigate the spatial distribution of different forms of informal street vending in relation to pedestrian flows, functional mix and retail edges (Table 1). Hence, we identified and mapped six types of street vending, including detached/unfixed, detached/semi-fixed, detached/fixed, adjacent/unfixed, adjacent/semi-fixed, and adjacent/fixed, based on the criteria of mobility and proximity to public/private interface. Adopting the live/work/visit triangle (Dovey & Pafka, 2017), the study documented and mapped patterns of functional mix as a generator of synergies between different uses. As the spatiality of street vending is linked to the intensity of streetlife (Brown, 2006; Dovey, 2016; Kamalipour & Peimani, 2019), we captured and mapped the volume of pedestrian flows across the study area. The study accumulated direct observation and counting of pedestrians passing the specified street sections (about 50 metres from each intersection) during the midday peaks on weekdays. The midday rush hour (12pm-2pm) represents Saadi's peak of streetlife when there is a broad range of stationary activities (Peimani, 2017). It is important to note that the peak of streetlife across the city depends on the location and season of the observational fieldwork as in many street vending hot spots in Tehran, the peak is in the evening (6pm onwards). The total pedestrian flows in both directions were recorded without taking into account stationary activities. A 10-minute period was selected as a random sample (Gehl & Svarre, 2013) to compare the peak time pedestrian flows using a smartphone app. The observation indicated that the manual counts in the areas with a markedly higher volume of flows could face challenges in delivering the counts of more than 600 pedestrians over a 10-minute period. To overcome such challenges, the pedestrian flows were counted separately in each direction. The observational fieldwork was carried out between September and October 2014. The first months of autumn were selected to avoid periods of unfavourable climatic conditions. This timeframe for fieldwork incorporated a mild climate (i.e., without rain and strong wind) to minimise the short-term distortions or interruptions of pedestrian flow and street vendor activity documentation. We also avoided large crowds caused by annual rhythms (e.g., the Nowruz Persian festival) or certain events (e.g., religious demonstrations), which impact the everyday pattern of activities and pedestrian movements. Comparative analysis of street vendor activities over time (i.e., time of day, week and year with different weather conditions and temperatures) was beyond the scope of this paper. The empirical data was further supplemented by analysing secondary data, including relevant archival records, newspaper articles, policy documents, regulations, and electronic sources about the dynamics of street vending in Tehran's public spaces.

Table 1. Summary of primary concepts/aspects and variables in the study.

Primary concepts/aspects	Variables
Functional mix Mapping urban attractions as generator of synergies between different uses (Dovey & Pafka, 2017; Hoek, 2008)	Live, visit, work uses
Street life Capturing the spatio-temporal patterns of pedestrian flows as a key condition to maintain street life vitality (Gehl & Svarre, 2013; Peimani & Kamalipour, 2020, 2022a)	Volume of pedestrian flows
Street vendor typology/types Mapping different types of street vendors according to certain criteria/characteristics is crucial to understand the spatiality of street vending (Kamalipour & Peimani, 2019; Ojeda & Pino, 2019)	Mobility within public space, proximity to public/private interface
Street vendor locations Analysing the positioning of street vendors at certain locations as one of the key elements to understand the socio-spatial patterns of street vending (Charman & Govender, 2016; Peimani & Kamalipour, 2022b)	Spatial distribution of street vendors
Street vendor gender Understanding the role of gender in relation to street vendors' activities, experiences and their adopted spatial/temporal/relational tactics to maintain access to public space (Adama, 2020; Peimani & Kamalipour, 2022b)	Female and male street vendors
Edge effect The edges and transition areas between buildings and public spaces as key places for a range of potential activities (Gehl, 1987)	Storefronts

Analysis and Findings

Figure 2 shows the analysis of different types of informal street vending in the study area of Saadi in relation to the functional mix, midday-peak volume of pedestrian flows and retail edges. Forms of urbanity in the study area are primarily infused with a mix of informal appropriations, including the more or less temporary territorialisation of footpaths, station entries, stairs, doorways, street furniture, and the like. Our field observations indicate a high level of competition between the formal market and informal street vending in the main streets where different types of street vendors compete for the use of the same space. Footpaths are often characterised as haphazard and disorganised with a range of informal activities encroaching into the public realm (Figures 3a,b). Street vendors set up their small businesses as people sit and watch activities, and women interact with strangers and vendors on the pavements (Figure 3c). Field observation suggests that the most common goods and items that are sold include clothing, food, home décor, cosmetics, fashion accessories, shoes, and toys, among others. Transgressing formal codes, retailers often put their goods and services on view in proximity to the store entrances and pedestrian spaces (Figures 3a,d). Figure 3e shows how street vendors' activities can loosen up the formal space. The vendor appropriates nearly the entire width of a footpath to draw the attention of passers-by and customers shopping at nearby stores.

Our mapping of functional mix, volume of pedestrian flows and retail edges shows that the spatial distribution of street vendors is geared to the volume of pedestrian flows, which is in turn mediated by urban attractions. Informal street vendors strategically locate their business in places with dense pedestrian flows (yellow patches) including the areas in proximity to the station entrance (with ease of transporting stock and access to people using public transport services) as well as the areas with greater mixed uses of visiting and working (green patches on the map). In the areas with a dominance of retail edges, street vendors often take advantage of favourable business opportunities that the formal storekeepers have created. Nevertheless, streets are almost empty of street vendors in the monofunctional residential or work areas (red and blue patches) where retail edges are negligible, and the volume of pedestrian flows is very low (dark patches).

Our field observation suggests the degree to which different forms of informal street vending claim their temporary spatial rights to public space is linked to their "catchment areas" – their associated spatial territories that attract a pool of potential customers. In this sense, the more semi-fixed and unfixed vendors move and manoeuvre within public space, the smaller their catchment areas become (often less than one metre for unfixed types). While the unfixed and semi-fixed types of street vending (i.e., 154 out of 176 street vendors in Saadi) have smaller catchments compared to those fixed types (i.e., 22 out of 176 street vendors), their greater capacity to move within the public space can enable them to attract the attention of passing pedestrians and maintain a continuous encounter with them. This has been a key to sustaining livelihoods among the detached/unfixed vendors of the north-western edge of the study area, known as Tehran's informal currency exchange hub. Male vendors stand, sit on their motorcycles, or the entrance steps to buildings or wander around, getting into contact with customers who wish to buy or sell currencies. As is evident in the main north-south and east-west streets of the study area (Figure 2), unfixed and semi-fixed types of street vending may not only support but also benefit from the greater capacity of the detached/fixed vendors in attracting pedestrian flows and potential pockets of activity due to their larger catchment areas. This is evidenced in those areas with the greater mix of different types of unfixed, semi-fixed and fixed vendors which is also linked to greater volume of pedestrian flows (Figure 2).

The catchment areas are critical to the ways in which street vendors can survive and possibly thrive as they provide a set of opportunities for interaction and exchange in Saadi's public spaces. To put it differently, street vendors' activities and their associated catchments work as an external stimulus that links people and prompts strangers in the public realm to chat to each other "as if" they were not – this is what Whyte (1980, p. 94) calls 'triangulation'. According to our observation, while the increased overlaps between the catchment areas and pools of passers-by can play an important role in the sustenance of street vendors, the overlapping catchments can lead to conflict and socio-spatial disputes over public space. This was evidenced between the fixed types of street vendors and retail edges, where the excessive attraction of stationary activities to the more adjacent/fixed types was likely to block the visibility of the formal shops. Nonetheless, it is important to note that the relationship between informal street vendors and retail edges might not always be a form of conflict as they both have a common interest in keeping pedestrian flows open to benefit from high spatial visibility in the public realm. While the less fixed types of street vendors can benefit from the emergent pockets of activity produced by other more fixed types of vendors, they have the capacity to avoid possible conflicts by offering different type of goods or working as gap fillers between the catchment areas of the more fixed vending types.

Table 2. Street vending profile in Saadi

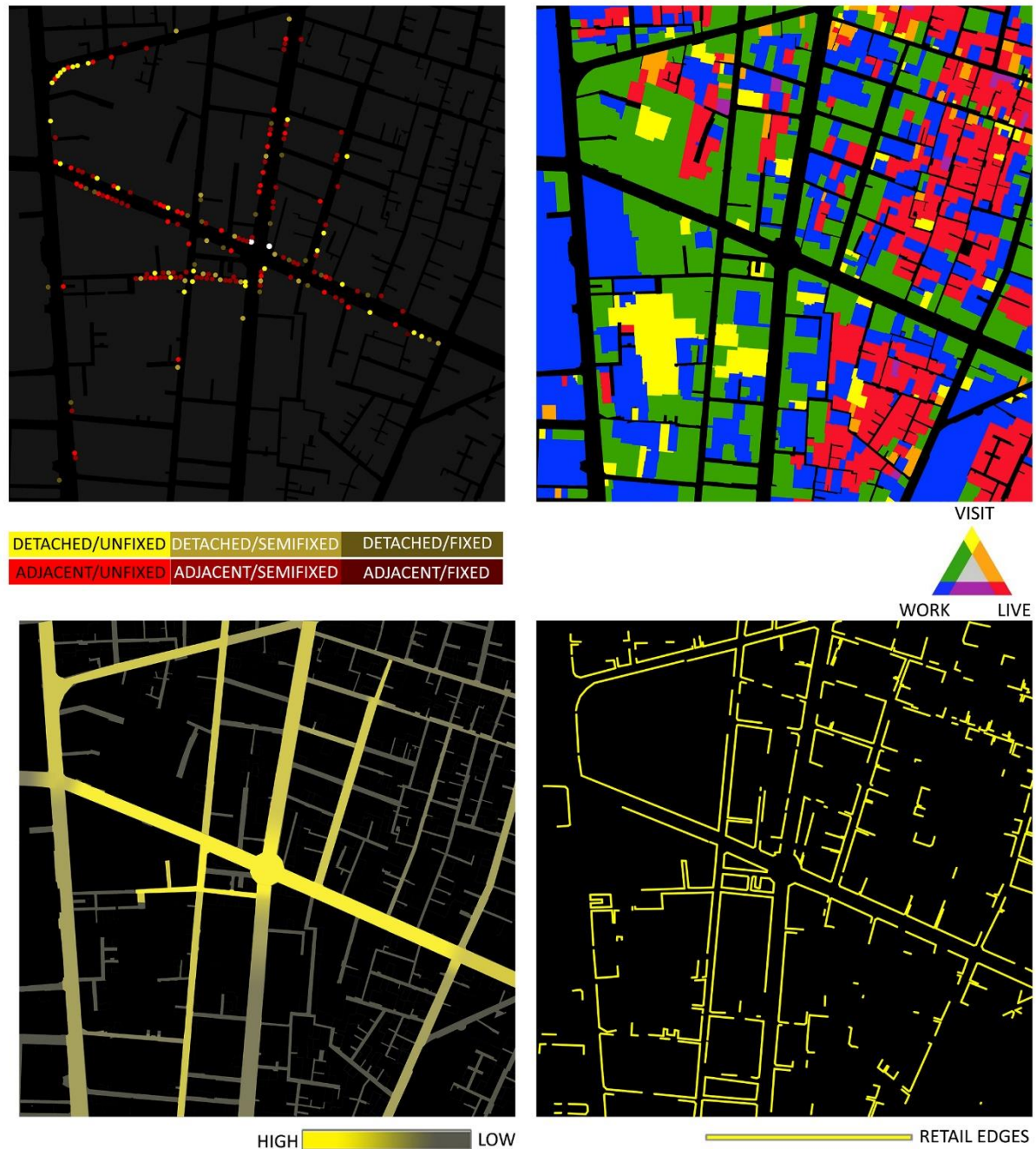| The number of female and male street vendors	
Female	0
Male	176
The number of each informal street vendor type	
Detached/Unfixed	28
Detached/Semi-fixed	19
Detached/Fixed	21
Adjacent/Unfixed	38
Adjacent/Semi-fixed	69
Adjacent/Fixed	1

Figure 2. Mapping different types of informal street vending in Saadi (top left); the midday-peak volume of pedestrian flows (bottom left); retail edges (bottom right); functional mix (top right).

Figure 3 includes instances of how informal street vendors can reconfigure the existing urban landscape of Saadi and enhance the vitality of streetscapes. This further outlines the spatial importance of informal street vending as a micro-scale design intervention in transforming and revitalising the underused edges of the public realm. This also resonates with Pavo's (2020) argument that the spatiality of street vending can contribute to the (re)designing of the public space. However, informal street vending in Saadi has not often been treated with tolerance and dignity (Shahrvand, 2016), particularly due to its constructed negative symbolic capital as well as its impact on the image of an "ordered" city. This discourse of informal street vending is often adopted by the state to justify hostile interventions –forced evictions. Addressing such matters brings to the fore the importance of understanding the spatial dynamics of image and visibility in the public realm, which is

also linked to underlying social and/or economic struggles that the urban poor undergo to earn a living in public space.
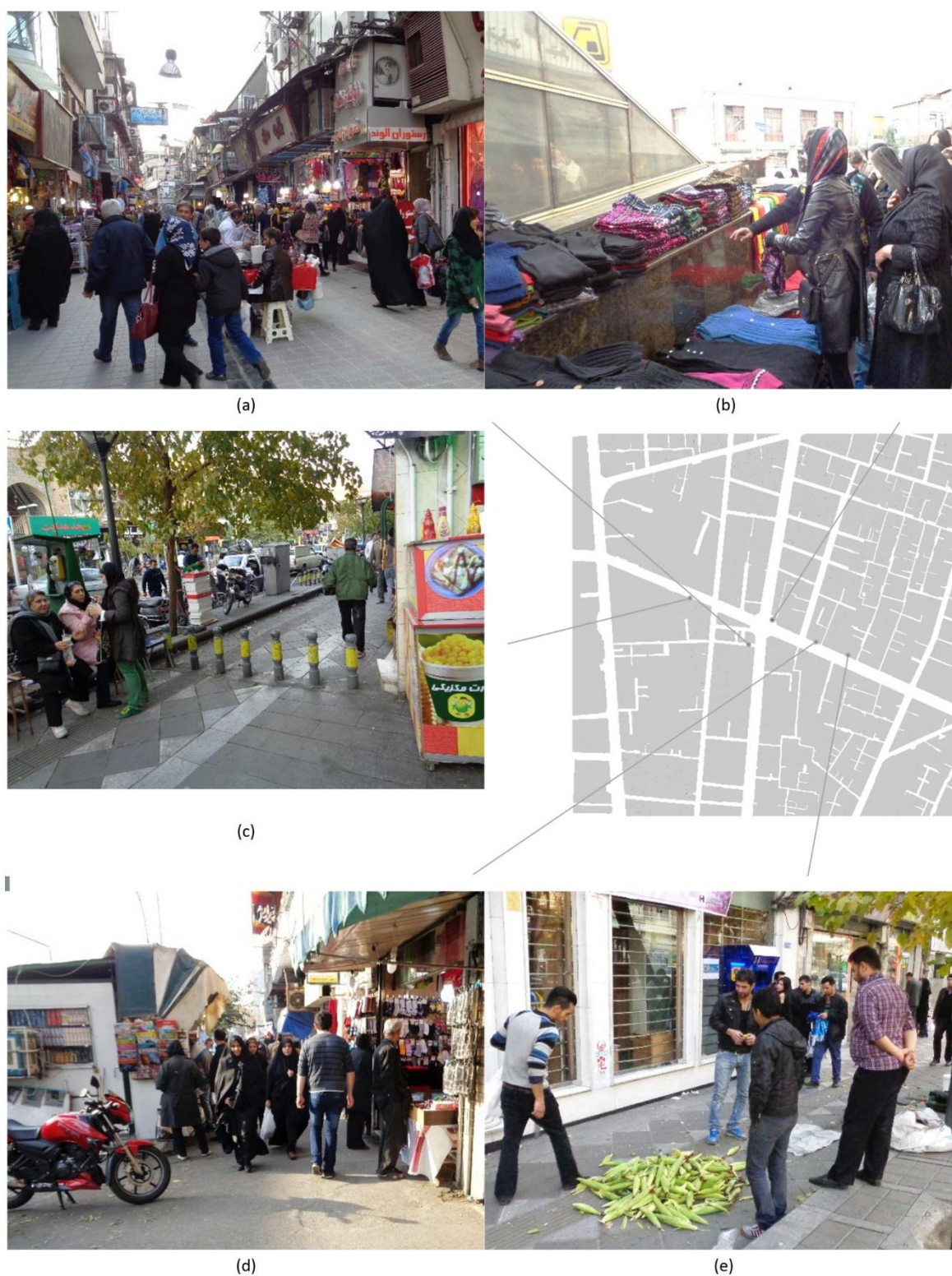

Figure 3. Street vending in the study area.

The spatial visibility of informal street vendors plays a contradictory role as it can work both for and against the ways in which their activities are enabled or constrained within the public realm. The concentration of informal street vendors in locations with dense pedestrian flows (Figure 2) shows that street vendors benefit from high levels of exposure to the public gaze as they can attract more potential customers. They might also be threatened by high visibility in public space as it can expose them to the risk of repressive practices and forced evictions. Observation suggests the less fixed types of street vending have more adaptable capacities to negotiate the dynamics of their visibility in public space, access more customers, reduce the risk of confiscation of goods and escape street cleansing operations. The type, size, and number of goods can be considered as the primary trade-offs in this regard. For example, the capacity of the more unfixed types of street vendors to manoeuvre within the public realm is closely geared to the type, size, and number of goods they can offer to potential customers.

The visibility of street vendors in public space is also related to their capacity to advertise their goods and services. The common advertisement methods among different types of street vendors often range from verbal to visual or a mix of both. These methods may change depending on the type of food, goods and services offered by different types of street vendors. For example, the detached/unfixed informal street vendors providing currency exchange services in the north-western part of the study area use verbal forms of advertisement since visual forms may put the survival of their business at the risk of unintended identification and eviction. Other forms of street vending selling goods such as clothes, street food, and perfume often use a representative sample of the goods as a form of direct advertisement to possibly catch the eye of the passers-by and further attract potential customers within the public realm.

The empirical evidence from Saadi's public spaces shows that the spatiality of informal street vending has a gender dimension, which resonates with the arguments made by Fadaee and Schindler (2017); Taheri Tafti (2019). Women vendors are among the least spatially visible groups in the public spaces of Saadi (table 2). According to our observation, they often use quasi-public spaces such as the women-only metro carriages (with a high concentration of female passengers) to earn livelihoods despite the social stigma associated with women pursuing street vending (Saminia, 2011). This type of vending in the metro is often detached/unfixed, enabling the related vendors to easily escape cleansing practices once the municipality officials enter the carriages. However, the range and volume of items sold (e.g., food, clothing, accessories, cosmetics and home décor) in this type of street vending are quite limited. A key advantage of this type of vending (detached/unfixed) among women is their enhanced capacity to make use of the areas that are not easily accessible to other types of vendors. This is also linked to the fact that female vendors take advantage of the limited ability of municipal officials (i.e., who are mostly men and cannot often enter the carriages reserved for women) to enforce control over such women-only spaces.

Concluding Discussion

Drawing on empirical research from the Saadi case study in Tehran, we explored the spatiality of street vending as a significant gap in the relevant literature to provide a better understanding of how forms of informal street vending work in public space, particularly in relation to pedestrian flows, functional mix, and retail edges. This paper has been among the first attempts to empirically test the previously developed typology by Kamalipour and Peimani (2019) to explore and map the spatiality of street vending according to the key criteria of mobility in the public realm and proximity to public/private urban interfaces. We explored the capacities of different forms of street vending concerning the spatiality of the dynamics of access, use, visibility and gender in the public realm. We also discussed how catchment areas work in relation to different types of street vending and reflected on how certain forms of street vending can transform the underused edges of the public space and contribute to the emergence of urban intensity.

Our field observation and mapping provided empirical evidence to show how different types of street vendors in Saadi adopt spatial tactics such as increasing potential overlaps between their catchment areas and pedestrian flows to remain competitive in the market. Our findings also pointed to the ways in which such conditions could enable social interaction and exchange opportunities for different users of public space. Moving smoothly in the public realm and changing the types of goods sold among the less fixed types of vendors are seen as commonly adopted tactics to avoid conflicting socio-spatial interactions due to increased overlaps between different catchment areas. To put it differently, emerging spatial conflicts between different types of informal street vendors may give rise to further exclusion of the more vulnerable and marginalised types unless the semi-fixed and unfixed vendors change the type of goods and services they offer or work as fillers to manoeuvre between the emergent pockets of activity within the catchment areas of the fixed types of street vendors.

Our findings suggested that adjacent types of informal street vending can work as a temporary design intervention at the micro scale, contributing to the vitality of the public realm by activating and revitalising those impermeable edges produced through formal processes of urban development. Hence, these types of street vending can radically change the inactive public/private interfaces through tactical practices of urban transformation. This resonates with g'-Ling and Aminuddin's (2019) argument that street vending contributes to the kinaesthetic experience of the street and lively outdoor atmosphere in the public realm where opportunities are afforded for interaction and social encounters among vendors, merchants, and customers with different interests. We also found that the appropriation of the impermeable public/private urban interface can enhance the spatial visibility of vendors, which is geared to the capacity of the edges of the public space to provide a visual framing in the form of a blank background. Nevertheless, we argue that such adaptive capacities of adjacent types of informal street vending can generate a destructive condition if they escalate to excessive appropriations of the public realm and blockage of pedestrian flows. According to our field observations in Saadi, such escalations can become exclusionary even in the absence of state interventions as they can create forms of monopoly and collective privatisation of the public realm.

This study has been among the early empirical attempts to understand the spatial logic of informal street vending particularly in relation to pedestrian flows, retail edges, and functional mix, which we argue is necessary to speculate on the prospects for formalisation and the adaptations and challenges one might expect as it unfolds. Failing to gain such an understanding has resulted in recent simplistic "urban management" practices such as identifying and organising informal street vendors along with providing land in day markets and issuing licenses for their trade (BaharNews, 2020). Evicting the more fixed street vendors (detached/fixed and adjacent/fixed types) from public spaces and placing them in night markets, day markets, or parking markets might dilute some location-specific issues according to the viewpoints of the authorities and some shopkeepers. However, these attempts may pose severe challenges in terms of the absence of clientele and overall business potential in the new place (MashreghNews, 2019). We also reflected on how the authorities have often adopted the somewhat simplistic discourse of the obstruction of thoroughfares (*sadd-e ma'bar*) to address informal street vending (Taheri Tafti, 2020). We indicated that while thoroughfare blockage might be seen as a performance-based code, it can be used in a range of ways to justify exclusionary interventions and ruthless evictions.

There has been limited scholarly focus on exploring the question of type in relation to the spatiality of informal street vending. The typology we adopted in this paper has been useful in understanding the spatial dynamics of different forms of street vending with a particular focus on the characteristics of mobility in public space and proximity to public/private interface. There is a possibility to extend this typology by adding certain dimensions including the use of technology, temporality and type of goods being sold in future research. Selecting between a single case study and multiple case studies is often associated with the discussion of the relations between depth and breadth. In this study, we have put more emphasis on depth rather than breadth by focusing on a

single case study to map and explore the spatiality of different types of street vending. Undertaking comparative research that draws on multiple case studies across various contexts remains a task for future research.

We found that women are one of the minority groups of street vendors, and their limited unfixed type of vending in the quasi-public spaces (e.g., metro carriages) is relegated to areas with the dominance of potential women customers. They often end up using inferior spaces, which have clear parallels with what happens even in those global South cities where women constitute the majority of street vendors (Bhowmik, 2010a). Female vendors are often bounded by a range of constructed socio-cultural and/or gender norms. As discussed by Taheri Tafti (2019) despite their low presence on busy public spaces and prime locations of Tehran, female vendors' activities (i.e., particularly given the current climate of economic decline) often rely on their ability to shape alliances with shopkeepers and to negotiate their spatial rights with other vendors. Exploring the relationships between gender and spatiality of street vending in the quasi-public spaces (e.g., metro carriages) was beyond the scope of this paper. Nevertheless, a key area for future research is to investigate the role of gender in relation to street vendors' everyday activities, experiences and spatial/temporal tactics in coping with different forms of intervention such as eviction, relocation and/or formalisation.

In this paper, we further harnessed the capacity of urban mapping as a form of spatial knowledge production (Dovey et al., 2018) to unravel the materiality and spatiality of different forms of street vending in a case study. This paper contributes to the growing interest in investigating the dynamics of street vending using on-site observation, photographing and mapping as the key research methods. It is important to note that mapping street vendors and their patterns of use and appropriation of the public realm can become arguably paradoxical as it renders the spatial distribution of street vendors. While the use of mapping as a tool can be helpful to better understand vendors' everyday tactics and survival strategies, particularly in relation to the built environment features and urban public life, it can expose vendors to forms of repressive actions such as hounding, harassment and eviction often practiced by the local gangs, land mafia and state functionaries. Ordinary practices of street vendors may also become subject to surveillance and forms of control as they become spatially visible. At stake here is that the prevailing forms of surveillance and control can make street vendors perform "as if" they are under the surveillance of the relevant authorities at all times. The possible impacts on the performance of street vending in relation to streetlife intensity under such circumstances can be further explored in future research.

Acknowledgments

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