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# **Economies of entrepreneurialism and political agency: Urban informality as a design paradigm for resilient future cities**

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**ABSTRACT** | Today, the world faces a multitude of complex societal issues, that need urgent attention for enhanced quality of life and resilient futures. With the help of a study on the daily mobilities of urban marginalised women (UMW) supported by state-of-the-art literature, this paper presents insights into the aspects of urban informality that can inform the design and planning of future cities capable of surviving the situations of crises. By adopting a combination of new technologies along with mobile methods and ethnography, this research centres around the everyday travel experiences of the urban marginalized women from the peri-urban areas of New Delhi who contest their right to access stationery and mobile public spaces. Following the elements of qualitative research, this study examines the socio-spatial environment comprising the daily mobilities of UMW to reveal certain conditions of informality that enable their access and participation in socio-economic activities. In doing so, the paper highlights the significance of various infrastructures emerging from the social conditions of doing things together (social interdependence), belonging to a community and the aspects of self-organisation that are crucial for the sustained functioning of cities. Moreover, it presents a perspective for designers to identify and embrace temporary ways of existing and operating towards resilient cities of the future. With the help of the findings from this study, this paper presents urban informality as a design paradigm for various systems and services of future resilient cities that are more equitable and inclusive, and at the same time adapt to the dynamic uncertain situations of crises by being flexible, adaptable and leaving spaces for the emergence of bottom-up citizen-led initiatives.

**KEYWORDS** | **DESIGN WITH PERIPHERIES, URBAN INFORMALITY, RESILIENT CITIES, SOCIAL DESIGN, DESIGN FOR AGENCY**

## 1. Introduction

In recent years, there have been several incidents of crisis where informal arrangements constituted by the actors or people have been able to mitigate uncertain situations, such as during the coronavirus pandemic<sup>1</sup> or in case of issues related to migration (Ukraine, Syria), where the existing formal structures or the national governments have been unsuccessful. This questions the proper functioning and sustenance of formal service systems within the cities established by the policymakers, and at the same time brings attention to the potential of informal, bottom-up processes initiated by the inhabitants for their survival. This phenomenon where citizens act together to make use of the available resources to address their needs can be linked to 'subaltern urbanism' or urban informality. According to Roy (2011), subaltern urbanism provides a perspective focused on the habitation, ways of life and politics within slums or peripheral areas of megacities. In recent studies, the notion of peripheries signifies the physical space on the fringe of the megacities, the in-between, that is constantly evolving and lies between the urban and the rural, also referred to as the peri-urban interface that presents the space for making and remaking of urban life (Simone, 2010a). This implies that the notion of peripheries goes beyond the topographical space and also reflects the various discontinuities, hinges or relationships that emerge within the socio-urban territories (Simone, 2010a). These peripheral areas or regions of megacities also known as Third World slums, from the Global South are considered to be outside the notions of developmentalism (Robinson, 2002) but at the same time reflect their various survival abilities (Roy, 2011) where the inhabitants have devised their own creative ways to function as a response to the negligence of the state (Roy, 2011). It is emphasised by Roy that subaltern urbanism reflects two main subjects of attention, namely, economies of entrepreneurialism and political agency (Roy, 2011). Through the study of everyday mobilities of urban marginalized women (UMW), in the peri-urban areas of New Delhi, characterized by aspects of exclusion, this paper presents insights that would enable the design and planning of future resilient cities through equitable and inclusive service systems that provide spaces for emergence of alternate bottom-up processes to meet the needs of people. This paper presents urban informality as a value for the design and planning processes and brings debates on spaces of poverty, access, agency and politics to the forefront.

## 2. Understanding informality (subaltern urbanism)

Within the context of modern Indian historiography, the notion of subaltern emphasised to depict power, domination and relationships signifying inferiority and dependency (Sarkar, 1984) along with a space of indifference (Spivak, 2005). However, Guha (2005) argues that the concept of subaltern represents the politics of the inhabitants and should be understood as an agent of change. The survival actions explored by people of the Third World megacities are described by architect Rem Koolhaas as inventive measures characterised by experimental responses and reflect a 'culture of make-do' (Patteeuw, 2003, p. 116) that engender significant systems based on alternative ways of functioning, aspects of self-organisation and provide spaces of deregulated actions (Godlewski, 2010). Similarly, for De Soto (2001) the Third World slum reflects an economy of the people, rich in assets that represent many of such self-organised mechanisms that could be understood as valiant entrepreneurial experiments. Several scholars argue that the urban peripheries present settings for critical contestation of citizenship and practices of hegemony (Holston & Caldeira, 2008; Roy, 2011; Simone, 2007). Within the context of political agency, Gidwani (2006) repudiates the argument on probable connections emerging between the different vulnerable inhabitants of the urban peripheries.

The informal sector is most prevalent in cities of developing countries since these cities are experiencing huge urban growth (Roy, 2005). These cities are reminiscent of complex machines that comprise interwoven layers of human beings and physical materials that further produce social, cultural, political, economic and environmental relations (Simone, 2010b). In developing an alternate way to understand cities, Castells (1985) relates it to urban social change where he emphasises the notion of collective actions signifying the presence of multiple acting forces in its production. In doing so, Castells (1985) presents a critique of the Marxist theory that fails to consider important issues, for instance, related to feminism and culture, that may help to understand the urban as a critical element related to aspects of urban social change. Castells (1985) presents a definition of urban social change as contemporary social and urban movements that are characterised by a culture representing communities and that lay emphasis on political self-determination (Mayer, 2006). It is further elaborated by Castells that the existing hierarchical structures that comprise the urban, undergo transformation leading towards a kind of reorganisation of the society based on values signifying democratic participation and decentralisation as its critical elements (Mayer, 2006).

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<sup>1</sup> In early 2021, during a major Covid break out in India, most government-run and other formal systems in healthcare and other logistics sectors collapsed at the time of an unexpected situation of crisis. During this time, several informal and non-hierarchical systems emerged that were formed by the people and for the people to support one another.

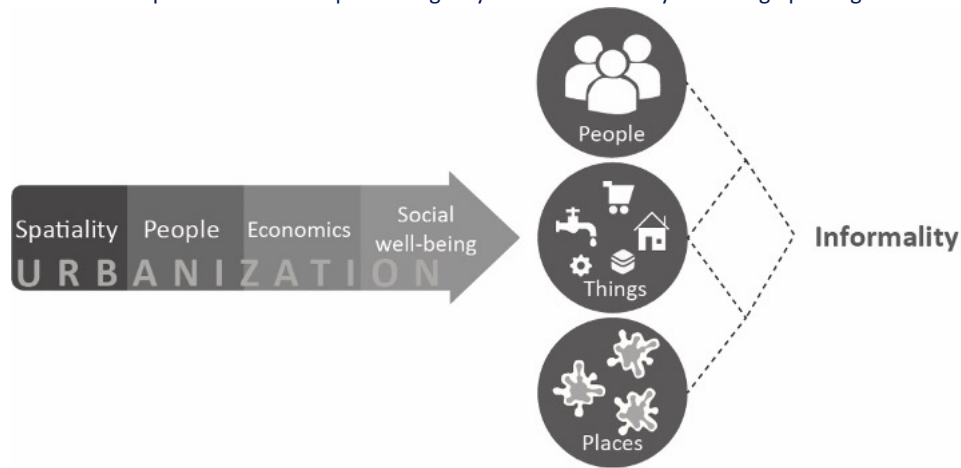


Figure 1: The socio-technical aspect of urbanization produces productive relationships among people, things and places. This inter-relationship gives rise to 'informality' which is an integral component of urbanisation. Source: Adapted from Simone (2010b).

In the case of developing countries, a flexible model of governance, signifying the concept of political agency (Guha, 2005; Roy, 2011) is based on self-initiatives of the individuals and gives rise to bottom-up solutions addressing various issues of the society. However, the recognition of such informal self-organised models as a comprehensive social or political force is often doubtful, yet such actions present opportunities to the inhabitants of the city for negotiations, collaborations, exchanges and strategic planning (Brown et al., 2010; Grant, 2009; Lewinson, 2007; Lindell, 2010; Mohan, 2008). The daily work or activities allow the inhabitants to be actively engaged in each other's lives to create and sustain relationships with their neighbours, co-workers and extended family members. These relationships with the city and other people enable the inhabitants to create a map of their own whereby they identify and categorise safe and unsafe places, the belongingness to those spaces and the connection between different spaces (Simone, 2010b).

Often, the survival techniques, which emerge from socio-economic or geographical reasons, give the cities an alternative mechanism to co-exist and maintain a balance in urban city life. These solutions to urgent or otherwise unsolved problems of urban cities are defined as idiosyncratic innovative paths, that is, a structural or behavioural characteristic unique to an individual or group (Srinivas & Sutz, 2008). In such contexts, the relationships of individuals with one another and with their social, economic, and political environments are of utmost importance. Most cities of developing countries generate a conglomeration of social activities that either align themselves or strive their way through city governance and policies. The deficiencies of certain kinds of infrastructure in cities give way to other possibilities relating to policy interventions and governance that are more flexible (Simone, 2010b). In these contexts, flexibility and uncertainty are considered inherent parts that transform into crucial resources for survival. Adding to this, Bayat (2007) asserts that besides flexibility, the informal life is signified by aspects of 'doing things on your own', negotiations and describes it as a continuous process that involves a struggle for the vulnerable to survive and for self-development.

The concept of informality is also supported through understanding 'resilience'. The cities characterised by adaptive and flexible systems through the capacities emerging from the constantly evolving social learnings (knowledge of people) enhance their chances of being more resilient in situations of crises comprising complex societal issues (such as social inequalities, migration, climate change etc.) (Davoudi et al., 2013). Holling (2001) argues that (identifying) human capacity(ies) is an important characteristic of social systems specifically for foresight and intentionality. This is supported by different ways and means (or appropriation) to enhance their ability to strategise and plan. Identifying potential vulnerabilities and 'other' ways to function (opportunities) within the social learning processes enhances the likelihood of societal transformation (Davoudi et al., 2013). Thus, resilience is more than resisting the forces. It includes focusing on critical issues such as the intentionality of human actions, the purpose of resilience, the non-linear approach that diffuses the boundaries imposed by existing systems and the questions of power and politics (Davoudi et al., 2012, 2013). This paper presents the findings of a study from the Global South (New Delhi) to discuss the concept of informality as a significant design paradigm through the daily mobilities of urban marginalised women.

### 3. Self-organisation through available infrastructure

Most peripheral areas of the cities of the Global South lack resources, political will and technical capacity, but they demonstrate the ability to build a connection between individual households and other economic, cultural and religious activities to support their livelihoods (Simone, 2010b). To perform these activities, the participation of individuals is important within the larger networks. According to Piermay and Schler (2003), as cited in Simone (2014), such arrangements give rise to unique, but dynamic interaction patterns including

exchange and socialising. Roy (2011) emphasises two main themes of focus in relation to informality, namely, economies of entrepreneurialism and political agency. These attributes contribute towards new possibilities of citizen participation for bottom-up urban governance practices, and is termed by Botero and Saad-Sulonen (2010) as 'infrastructuring'. According to Simone (2004), the social infrastructure that comprises the inhabitants of territories forms an important core of cities. Blommaert and Klinenberg argue that social infrastructure enables different connections within the groups, and it can facilitate various interactions, including contrasting thoughts (Blommaert, 2014; Klinenberg, 2018). Emerging from everyday economies, behaviours such as reciprocity, negotiation and cooperation highlight the bottom-up initiatives of participation in contrast to an unintentional dominant top-down design approach (signifying colonialism, capitalism or heteropatriarchy) (Costanza-Chock, 2020). According to De Soto (2001), the insurgence of the grassroots against the state power epitomises the informal and signifies bold and risky ways of doing things on your own. This aspect can be related to community-led design that focuses on civic participation leading towards democratic outcomes (Alexiou et al., 2013).

Several social aspects like social norms, social trust and social networks comprise what is known as social capital (Durlauf & Fafchamps, 2003) which has characteristics like flexibility and openness as critical components (Star & Bowker, 2006) and grows with every act of participation and sharing of acquired knowledge (Star & Ruhleder, 1994). It is understood that in the case of informal economies, social networks and personal relations help in the formation of several mini and micro-economic activities. Moreover, in some cases, these social networks aid in providing access to certain favourable resources for entrepreneurs (Meagher, 2005). The collaborative initiatives involving different users is explained by Bollier and Helfrich (2014) as an act of design, which paves the way for a 'commons culture' (Bollier & Helfrich, 2014), that is, through social relationships and shared knowledge. Botero et al. (2010) discuss 'infrastructuring' as a shared resource where it is crucial to consider 'when' something is being considered as an infrastructure or a resource by its users. It is not just the resources and context that are important; it is crucial to consider the right time and use of these resources by its users (Marttila et al., 2014). Different kinds of infrastructures, including social, physical and institutional, affect the emergence of bottom-up initiatives and how these can be appropriated under different situations or contexts (Pipek & Wulf, 2009). Several studies (Star & Bowker, 2006; Star & Ruhleder, 1994) have highlighted significant features of these informal emerging resources, such as the inter-relationship and connectedness with other social, spatial and technological structures, their spatial and temporal reach and the non-obvious arrangements between people, spaces and things that go unnoticed. The formation of new infrastructures does not take place from nothing; it results from acts of negotiations and contestation (Star & Ruhleder, 1994) between different entities involved.

## 4. Context of the study

This study focuses on urban marginalized women (UMW) living in the peri-urban areas, also known as, informal settlements, of New Delhi in India. Most people living in the informal settlements of these peri-urban areas are migrant poor who have travelled from neighbouring states of Delhi in search of work. Among the various groups of women in India, the most vulnerable are the UMW. This group of women are marginalized from two perspectives. First, because they belong to the socio-economically weaker section of society and second, they are women. Besides experiencing exclusions at a household level, women from marginalized communities also face several other challenges at the city level. These women are primarily employed in the semi-formal or informal sector<sup>2</sup> and often cannot afford to use any transport mode but walking. A study conducted by Bostock (2001) on low-income women also presents the numerous problems women face while walking, including fatigue, stress and psycho-social effects. According to Uteng (2012), the cultural aspect plays a crucial role in the positioning of gender with respect to mobility, namely, access to outer space and kinds of activities. Several studies highlight the impact of risks associated with travelling on public transport modes, such as sexual harassment and travel behaviour of women, where women tend to self-exclude themselves from certain activities hence limiting access to social, leisure and economic activities (Anand & Tiwari, 2006; Murray, 2016). Fear of space is one aspect of risk aversion that is related to the interaction of women with urban space (Pain, 1994). Due to this reason, they tend to return home early and thus lose out on employment opportunities (Tanzarn, 2008). However, Tulloch (2000) states that many factors contribute to risk experience and depend on spatial and social contexts.

## 5. Methods

This study uses a combination of new technologies along with mobile methods and ethnography to focus on the daily mobilities of UMW. The participants for the study were recruited by establishing contacts with two

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<sup>2</sup> The formal economy is marked by regular work, is legally sanctioned and is regulated through state intervention (Hart, 2006; Portes & Schauffler, 1992). Institutions that do not fall in the formal policy regulated environments and are more ephemeral and, not easy to categorise or define (Demant Frederiksen, 2015; Kelsall, 2011) may be called the informal sector, informal arrangements or informal economy.

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NGOs in Delhi that work with issues related to women or women empowerment<sup>3</sup>. The study is divided into two main phases. The first part of Study I requires understanding the socio-demographic conditions of the participants through the means of unstructured interviews. The second part of this study shifts the focus of the interviews towards developing a cohesive understanding of their daily routines. In-depth interviews are used as a preliminary method to understand the socio-demographic characteristics of the participants living in urban peripheral settlements of New Delhi. Subjective and experience-related questions, such as the description of their daily routines and travel experiences were asked during the ethnographic interviews. It was ensured that the interviews were conducted one-on-one and in private to make the participants feel comfortable so that they could share their experiences freely. These interviews also included a detailed explanation of their daily travel patterns. Through this description, information regarding their travel patterns was extracted for further inquiry.

Further, in Study II, mobile methodology is used for collecting information about the participants' daily movement through GPS path tracking. The second part of the study collected data focusing on the path travelled by the participants for a period of two weeks. This study adopted the use of phone GPS and Google Maps timeline. To identify underlying themes and categories abductive approach to constant comparative analysis is applied for unstructured interviews. Mapping is used as an interpretive analysis method for GPS travel path data. This study adopted the use of phone GPS and Google maps timeline. This study was conducted during the Pandemic, with restrictions on mobility and social gathering. Thus, based on the availability and knowledge of the participants, appropriate tools (WhatsApp and Google Maps Timeline) are used during the field study<sup>4</sup>. Interviews are conducted through both face-to-face interviews and voice calls using WhatsApp<sup>5</sup>. The researcher educated the participants with the help of screenshots and voice calls on how to turn on the GPS location on their smartphones and how to share their current location on WhatsApp. Along with this, travel diaries are also filled out for each participant<sup>6</sup>. These methods helped to identify the characteristics, motivations and barriers that affected the movement patterns of the participants. This process gave the researcher a broad idea of the different journeys performed by the participants. Travel diary, along with the GPS tracking method, helped in the data triangulation that allowed the study to investigate small but important factors related to the daily travel routines of the participants. To identify underlying themes and categories abductive approach (where codes emerge gradually) to constant comparative analysis or coding is applied for unstructured interviews. However, manual mapping is integrated into the analysis method to avoid overshadowing of the computer software, which could miss finer details of the data (Silverman, 2015). Mapping is used as an interpretive analysis method for GPS travel path data.

A group of 20 women participants were interviewed for this study. The data relating to travel patterns were gathered for 14 participants through their Google Maps Timeline<sup>7</sup>. All participants reside in informal settlements towards the outer periphery of Delhi and belong to the lower-income section of the society. Their age varies from 19–46 years. In terms of occupation, 17 participants are employed full-time, and the rest are involved in either part-time or informal jobs or are pursuing education or some other course or training. Few other women are associated with the NGOs where some of them work as 'mobilisers' (social workers) and others are taking driving lessons. Besides travelling for these purposes, for some women, their daily travel also includes attending to daily reproductive responsibilities such as picking up or dropping children at school, grocery shopping, etc. The daily mobility of these UMW is characterised by travelling long distances and therefore is accompanied by increased travel time and travel cost. In absence of direct connectivity between their home location and workplace, they need to include multi-modal trips within a single journey to accommodate for spending less money on travel-related activities. In most cases, the last mile of their journeys is completed with the help of informal modes of transport and walking.

## 6. Findings

This study focuses on the daily mobilities of UMW to highlight emerging aspects of informality towards future resilient cities.

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<sup>3</sup> Azad Foundation is an NGO that mainly works towards the capacity building by providing driving training to women from resource-poor communities. It has its centres in north, south and east Delhi. The other NGO is CEQUIN India, located in southeast Delhi in Jamia Nagar and promotes equal rights for women and girls.

<sup>4</sup> While conducting preliminary research it was found that not all UMW owned a smartphone. Thus, the selection of participants was based on the availability and access to smartphones (with Internet and WhatsApp).

<sup>5</sup> The data collection process began in February 2020 through face-to-face interviews. After interviewing fourteen participants and obtaining GPS data for five participants, the field study came to a halt in the second week of March 2020. During the total lockdown in New Delhi, India, people's mobility was affected the most and thus it was difficult to pursue data collection with the existing approach involving face-to-face interactions.

<sup>6</sup> In this case, there were limitations concerning the literacy level of the participants and thus the researcher filled out the travel diary during face-to-face interaction with the participants.

<sup>7</sup> Due to lack of technical knowledge and issues related to availability of smartphones, the GPS data could not be collected for all the participants.

## 6.1 Social interdependence

The study reveals that social interdependence is one of the main characteristics of informal settlements (also see sections 2 and 3). It means that people within these societies consider themselves dependent on others for various reasons without any economic benefits to any person or group. Specifically, it is observed that UMW appropriate their ability to engender social interdependence as a means to evade incidents of sexual harassment to carry out their daily mobility.

It is mentioned by many participants that they find walking one of the most unsafe travel options. The study shows that it is quite common for women to experience incidents related to sexual harassment or eve-teasing while walking. Moreover, these incidents take place mainly on the inner streets and are more common after dark, where there is presence of fewer people on the streets and inadequate lighting on the streets. To cater to this issue, UMW prefer travelling in groups of two or more. Thus, social interdependence forms a critical component that impacts the accessibility of UMW to public spaces.

*I have a friend who goes with me. She lives nearby and we work in the same office.*  
Daksha, 20, tele-caller

*Two of us go from this area. We meet in the morning at the nearby junction to travel ahead.*  
Rima, 24, social worker

Besides addressing other tangible travel-related issues such as cost, these informal arrangements act as safety nets for their travel journeys. These safety nets are formed through temporary collaboration between known and unknown female co-passengers who need to travel in the same direction (see interview quotes above). This highlights that the aspect of interdependence is not limited to their enclosed social network but expands to include other unknown women co-travellers to form groups while performing the act of travel.

The study also reveals that the women from these communities often make use of their social connections. For example, in absence of support from their families, many women depend on their neighbours to help them with basic but necessary tasks, such as childcare, which enable them to participate in the socio-economic activities to contribute to the finances of their respective families (see interview quotes below).

*If I could not get back by 1.30, I'd tell my neighbour and she'd pick my daughter from the school transport.*  
Bitti, 33, taking driving lessons

*I tell ma'am at work that I have to pick my child, then I am able to leave a bit early.*  
Tanu, 28, healthcare worker

*I have such wonderful neighbours. He is like my brother who has a tailor shop. He keeps my shop's keys. So, whenever he opens his shop in the morning, he also opens my shop by 12 pm. If there's a customer, he puts me in touch on the call. Otherwise, he tells them that I will be available in the evening. So, I come by 3–4pm. as my kids return from school at 2 pm.*  
Rubi, 34, entrepreneur

Thus, these women try to get the maximum out of the available resources to put to advantage their capacities to facilitate social capital (see section 3) through spontaneous yet systemic informal networks to carry out their daily mobilities and thus participation in socio-economic activities.

## 6.2 Self-organisation

The findings highlight that certain formal mobility systems, such as radio taxis and *auto-rickshaws*, are used as informal mobility arrangements by UMW, especially during their return journeys from work. This system emerges within the formal urban context and is driven by informal collaborations between women and acts as an option that meets their travel needs.

*We travel together as it gets late (dark) and then we feel safe to travel together. We didn't know each other earlier. It is through our daily travel on the same route that we got to know each other.*  
*At times, when we are four-five of us together then we hire a private auto and share the cost. Sometimes we also get into these idle Ola or Uber cabs that make a halt at the bus stop.*  
Pulki, 30, beautician

The above interview quote highlights that the women get acquainted with each other through their daily travel routines and enter into unvoiced informal arrangements with each other to self-organise safe and low-cost travel options for themselves. They make use of available resources such as their cumulative physical presence along with the social and collaborative forces that are guided by informality. It is also observed that in the realisation of these alternate options a significant role is played by modern resources accessible to them through ICT, such as smartphones and instant messaging applications to coordinate and self-organise into groups.

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*We don't even need to stop them, if they see any girl or woman standing and waiting on the road (for a bus or rickshaw), these cab drivers stop on their own and start calling out if she needs to go in that direction. These cabs stop for both men and women. And in the morning sometimes there are auto-rickshaws that are available on sharing basis.*  
Madhu, 46, social worker

It is understood that when off-duty (or when the taxis are unoccupied), the drivers of the app-based taxis halt at specific transit points where they usually find passengers travelling in the same direction as theirs. Although anyone waiting at the transit point can make use of this informal system, yet because of safety concerns this system is availed by UMW when they are travelling in a group. It is observed that these decisions need to be quick and spontaneous because they are being taken 'on the move'. This informal arrangement gives UMW an alternate way to travel in a specific direction by spending less money. It is noted that an informal agreement is formed between the driver of the radio taxi and passengers waiting at the transit nodes and is based on aspects of mutual understanding of each other's needs (such as earning extra money for the driver and low-cost travel mode for UMW). These collective capacities enable UMW to plan and make decisions (agency) for their travel journeys on a daily basis. These arrangements demonstrate unsaid rules of cooperation and trust among women who initiate these services for themselves by having empathy and care towards one another. More importantly, these arrangements allow them to plan and design their travel journey with the ability to exercise decision-making for themselves.

### 6.3 Sense of community guided by socio-spatial infrastructure

UMW also shared different experiences while travelling within their home settlements, i.e., informal settlements. The findings from the study highlight that the internal streets of the informal settlements represent a diffused territory through the amalgamation of public and private spaces (Figure 2) that support the daily activities within these settlements. The weekly markets (similar to pop-up kiosks) within the informal settlements that support commercial transactions also help to stimulate a range of social activities, thus transforming the street into a vibrant public space – making it comfortable for UMW to walk through. Specifically, the daily needs shops or activities that mainly involve women's participation, such as buying vegetables and groceries, enhance women's involvement in various socio-economic activities.

*I feel safe walking back home on Fridays because there is a Friday market on the way, and there are many people around.*  
Neelu, 23, beautician



Figure 2: The streets are an extension of household and other social activities. Source: Participants

Additionally, the built environment and socio-cultural aspects of the informal settlements create 'in-between' spaces (between the public and the private) and make the presence of many people evident on the streets, ensuring the appropriate conduct of everyday activities within these settlements. The access to walking within the neighbourhood is greatly supported by the urban infrastructure of the informal settlements and thus enables women to perform their complex daily activities (Jurczyk, 1998).

*From there I have to take the alleyways, so I walk from there. Because I have to pick my son from his school, do some shopping, buy stuff for the house and then come home - I always prefer taking the alleyways (short-cut).*  
Naina, 30, healthcare worker

Many women use the interconnected street network of the informal settlements for walking because of



issues related to time as well as safety. The presence of people acts as 'eyes on the streets' and ensures a sense of everyday security to these UMW while walking. This draws attention to the significance of the social infrastructure that arises from the density of the informal settlements and reflects on an environment where things (people, spaces, activities, objects) are always acting on one another to create various permutation and combination of infrastructures. It is also highlighted through the findings that mixed land use within these informal settlements enables the participation of women in various socio-economic activities and their access to public space (encouraging other women) without any fear and hesitation. The next section discusses the findings to highlight the elements of informality that inform design practices towards resilient cities of the future.

## 7. Discussion

The findings of the study present 1) social interdependence, 2) self-organisation and 3) sense of community guided by socio-spatial infrastructure as significant elements of informality. Informality as a concept is not limited to the physical infrastructure but also builds through the sociality of the urban. The findings reveal that the various connections that are formed among women and other infrastructures bring focus towards the importance of the affordances and capabilities emerging from social interdependence, adaptability, flexibility, trust, reciprocity and offering unstated support to each other. These foster mechanisms that can help to take care of the void left in the (formal) services of the cities (in this case public transportation system). This findings from this study focus on infrastructures managed and organised by actors themselves (Botero & Saad-Sulonen, 2010), that is, facilitated by elements of adaptation, negotiations and rules that are created by the actors for themselves. These are critical factors that align with the concept of evolutionary resilience (Davoudi et al., 2013).

Moreover, the aspect of participating in the decision-making process and designing their own services (mobility) provides confidence and sense of ownership to the people. Such informal arrangements are not fixed in any way but are rather fluid and emerge in uncertain situations and with presence of different kinds of available resources. Marttila et al. (2014) discuss these as critical elements towards participatory design practices signifying importance of tangible and intangible common resources. Thus, from a design perspective, the idea is not to integrate any specific arrangement into the existing formal systems or services of the city. We recommend that the existing (formal) systems should be flexible (not rigid and top-down) and leave space for the actors to design their own temporary services based on their collective needs. This approach would provide autonomy to the actors and enable democratic decision-making processes. The findings highlight the role of city infrastructure should be to support and enhance the formation of social connections and interactions between actors so that alternative options for different services can emerge. The existing urban infrastructure and services (of mobility) need to be adaptive to provide room for mediation of different kinds of social spaces that may emerge during everyday routines of actors. A flexible approach to the design and planning of (mobility) service-systems will aid towards the possibility of the emergence of in-between arrangements that are citizen-driven and thus equitable.

Through this study, we also point towards the changing role of designers to the one that focuses on creating conditions for emergence of bottom-up citizen-led initiatives. That is, instead of designing rigid systems and services within a city, the focus should be on leaving space for dialogue and negotiations to take place (Nthubu et al., 2022) for unimagined, unidentifiable infrastructures to emerge. Thus, this paper presents the need to identify, acknowledge and embrace bottom-up collaborations and non-hierarchical arrangements to be resilient towards the complex societal issues the world is facing today.

## 8. Conclusion

With the help of a study on the daily mobilities of urban marginalised women (UMW) supported by state-of-the-art literature, this paper presents insights into the aspects of informality to inform the design and planning of future cities capable of surviving the situations of crises. Sense of community, social interdependence and self-organisation emerge as significant elements of informality that enable citizen agency, flexibility and adaptation in uncertain situations (or such as due to lack of resources). The study also highlights the significance of appropriating available (tangible and intangible) infrastructure (as discussed in section 2) which leads towards community-led design and democratic outcomes (Alexiou et al., 2013). This paper highlights the significance of citizen agency to be considered within the design of future cities. Moreover, it presents a perspective for designers and planners to identify and embrace temporary ways of existing and functioning for more resilient cities of the future.

This research focuses on New Delhi as one case example for the study on socio-spatial mobility of UMW, however, it opens up further avenues of conducting similar research in other metropolitan cities where urban informality forms a significant aspect of everyday life of its inhabitants, such as, within the metropolitan regions of South Africa, Bangladesh, Pakistan, Sri Lanka, Nepal, Argentina, Colombia, Brazil and other Latin American cities, to name a few. The findings of the study that highlight informality as a design paradigm open up a broader discussion around access to resources for more open and equitable service systems other than

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