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Planning with self-organised initiatives: from fragmentation to resilience

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Summary

Over the last half century, the Global South has faced a strong rise in the rate of urbanisation. Although this process differs from region to region, rapid urbanisation has created many challenges for countries in the Global South. Brazil is no different. The largest country in South America has jumped from an urban population of 44.67% in 1960 to 84.36% in 2010, according to the Brazilian Institute of Geography and Statistics (IBGE, 2018). While urban growth is relatively stable in Brazil today, the challenges that came with the rapid increase will be felt for many years to come. One of the main challenges was created due to this urban growth not being organised. The main growth in the cities was due to an opportunity-led development, which produced an extremely unequal urban fabric with spatial discontinuities and left-over spaces. Planning institutions have attempted to overcome this spatial fragmentation problem, but have faced many difficulties.

This thesis demonstrates that spatial fragmentation in Brazilian metropolises is not only related to spatial discontinuities, but also to socioeconomic inequalities. This means that the physical connection between disconnected spaces does not necessarily create social connections between segregated groups. Walls in Brazil are not only physical but also social. This thesis investigates self-organised initiatives as possible entities to dismantle these invisible walls. Such initiatives help to create social connections between highly diverse groups in the public spaces of cities which have a high level of socioeconomic inequality. The cases of São Paulo, Rio de Janeiro and Brasília reveal a growth in the integration level from functional to symbolic, and even to community level in areas where these self-organised initiatives have been active. This increase in social connection between highly diverse groups has a positive impact on the resilience capacity of the urban system, improving the capacity for closer cooperation in the face of unexpected change.

The thesis begins by analysing the spatial fragmentation of Brazilian metropolises and how this relates to resilience. Chapter 2 develops the concept of 'porosity' as a metaphor for these spatial discontinuities in the Brazilian metropolitan context. Data from IBGE was used to create a porosity index and generate a comparative perspective on all of the Brazilian metropolises. The index reveals that cities have very different factors composing their porosity, which in turn create different threats and opportunities regarding the resilience capacity of each city. Certainly, it is important to recognise the particularities of each context, and in this way the porosity index provides a starting point for understanding the spatial fragmentation occurring within Brazilian metropolises. Chapter 3 focuses on the two metropolises with the highest

porosity index, Belém and Manaus, to examine how urban policies may affect their spatial fragmentation. The thesis uses the federal government's Minha Casa, Minha Vida (MCMV) social housing programme to investigate the relationship between such programmes and spatial fragmentation. Using GIS-generated maps, it was possible to visualise the pattern of each case of fragmentation and overlap these with the location of the developments in the MCMV programme. The chapter reveals that despite reducing the housing deficit for the low-income segment, the MCMV programme is having a strong negative impact by raising the level of spatial fragmentation already present in both metropolises.

In Chapters 4 and 5, the relationship between spatial fragmentation and self-organised initiatives is analysed. Using cases from São Paulo, Chapter 4 investigates how spatial fragmentation is influencing the work of such self-organised initiatives. It shows that the spatial fragmentation of São Paulo has a strong polarised structure, with the city centre as the main pole. Fragmentation in São Paulo is based on a dichotomy between centre and periphery that also influences where self-organised initiatives operate. Nevertheless, as Chapter 5 demonstrates, the initiatives studied are able to integrate people from extremely diverse socioeconomic contexts, even when being limited by spatial fragmentation. This social disconnection in contexts of inequality is one of the underlying forces driving spatial fragmentation in Brazil. In this sense, this integration capacity of self-organised initiatives is an important resource to tackle fragmentation in Brazilian metropolises and has been attracting the interest of urban planners.

While there is a lot of potential for self-organised initiatives to be integrated into planning strategies in Brazilian metropolises, this is still not being explored by public authorities in the cities studied. The interaction between self-organised initiatives and public institutions is generally problematic and conflictual, despite the participation of some public servants in these initiatives. Much can be done to improve the relationship between self-organised initiatives and public authorities, and this conclusion led to the key recommendations of this investigation. The thesis also points to the active participation of urban planners in these initiatives, with even those who perform technical functions in public institutions becoming active. The results of Chapter 5 show that planners demonstrate a strong belief in the work of self-organised initiatives and their positive impact. Their engagement calls for further examination of the role of planners in such initiatives and their impact in other areas beyond spatial fragmentation.

Despite being scientifically well grounded and having societal relevance, doctoral theses are frequently forgotten in the repositories of universities. With this in mind, this thesis aimed to not only be scientifically sound but to also have a strong societal impact. In addition to publishing articles as part of the thesis, I also explored other

methods to improve its societal impact, making the research available on two open online platforms: the Global Urban Lab and the Rethink the City MOOC. The former aims to synthesise the findings and discussions of research in a manner accessible to the general public, while the latter aims to apply the research in planning education. Education can be an efficient tool to generate societal impact based on doctoral research, especially if connected to a massive educational tool such as a MOOC. The Rethink the City MOOC is presented here as a case study on how to generate societal impact by combining doctoral research and online education. The challenges and process of developing the Rethink the City MOOC are discussed in Chapter 6, which also presents some of the satisfactory results from the course, with 17,278 participants registering for the first two editions. This experience demonstrates how much impact doctoral research can have when aligned with online education.

Samenvatting

In de afgelopen halve eeuw heeft het Globale Zuiden een sterke toename gekend in de snelheid van verstedelijking. Hoewel dit proces verschilt van regio tot regio, heeft snelle verstelijking veel uitdagingen voor landen in het Globale Zuiden gecreëerd. Brazilië is daarin niet anders. De stedelijke bevolking in het grootste land van Zuid-Amerika is volgens het Braziliaanse Instituut voor Geografie en Statistiek gestegen van 44,67% in 1960 naar 84,36% in 2010 (IBGE, 2018). Hoewel de stedelijke groei in Brazilië vandaag relatief stabiel is, zullen de uitdagingen die gepaard gaan met die snelle toename nog vele jaren voelbaar blijven. Een van de belangrijkste uitdagingen vloeit voort uit het feit dat deze stedelijke groei niet georganiseerd was. De groei in de steden vond plaats als een opportunistische ontwikkeling, die een extreem ongelijk stedelijk weefsel met ruimtelijke discontinuïteiten en overgebleven ruimtes opleverde. Planningsinstellingen die het probleem van ruimtelijke fragmentatie probeerden op te lossen ondervonden daarbij vele moeilijkheden.

Dit proefschrift toont aan dat ruimtelijke fragmentatie in Braziliaanse metropolen niet enkel gerelateerd is aan ruimtelijke discontinuïteiten, maar ook aan socio-economische ongelijkheden. Dit betekent dat een fysieke verbinding tussen versnipperde ruimtes niet noodzakelijk sociale verbindingen tussen gesegregeerde groepen creëert. Muren zijn in Brazilië niet enkel fysiek aanwezig, maar ook sociaal. Dit proefschrift onderzoekt zelfgeorganiseerde initiatieven als mogelijke actoren om deze onzichtbare muren te slopen. Dergelijke initiatieven helpen om sociale verbindingen te creëren tussen zeer diverse groepen in de publieke ruimtes van steden met een grote socio-economische ongelijkheid. De cases in São Paulo, Rio de Janeiro en Brasilia tonen een groei in het integratieniveau van functioneel tot symbolisch, en zelfs tot het gemeenschapsniveau in gebieden waar deze zelfgeorganiseerde initiatieven actief zijn geweest. Deze toename in sociale verbinding tussen zeer diverse groepen verbetert de capaciteit voor nauwere samenwerking bij onverwachte veranderingen, wat een positieve impact heeft op de veerkrachtcapaciteit van het stedelijke systeem.

Dit proefschrift begint met een analyse van ruimtelijke fragmentatie in Braziliaanse metropolen en hoe deze zich verhoudt tot veerkracht. Hoofdstuk 2 ontwikkelt het concept ‘porositeit’ als een metafoor voor deze ruimtelijke discontinuïteiten in de Braziliaanse metropolitaanse context. Data van IBGE werd gebruikt om een porositeitsindex te ontwikkelen en een vergelijkingsperspectief voor alle Braziliaanse metropolen te genereren. Die index toont aan dat de porositeit van steden bepaald wordt door heel verschillende factoren, die op hun beurt verschillende bedreigingen en kansen creëren voor de veerkrachtcapaciteit van die stad. Het is inderdaad van

belang om het unieke karakter van elke context te erkennen, en in die optiek biedt de porositeitsindex een startpunt om de ruimtelijke fragmentatie die plaatsvindt in Braziliaanse metropolen te begrijpen. Hoofdstuk 3 focust op de twee metropolen met de hoogste porositeitsindex, Belém en Manaus, en onderzoekt hoe het stedelijk beleid de ruimtelijke fragmentatie kan beïnvloeden. Dit proefschrift maakt gebruik van het sociale huisvestingsprogramma Minha Casa, Minha Vida (MCMV) van de federale overheid om de relatie tussen dergelijke programma's en ruimtelijke fragmentatie te onderzoeken. Met behulp van GIS-gegenereerde kaarten was het mogelijk om het fragmentatiepatroon in elke case te visualiseren en deze te overlappen met de ontwikkelingslocaties van het MCMV-programma. Dit hoofdstuk toont aan dat het MCMV-programma, hoewel het het huisvestingsdeficit voor het lage inkomenssegment vermindert, een sterk negatief effect heeft doordat het de graad van de reeds aanwezige ruimtelijke fragmentatie in beide metropolen versterkt.

In hoofdstukken 4 en 5 wordt het verband tussen ruimtelijke fragmentatie en zelfgeorganiseerde initiatieven geanalyseerd. Aan de hand van cases uit São Paulo wordt in hoofdstuk 4 onderzocht hoe ruimtelijke fragmentatie het werk van dergelijke zelfgeorganiseerde initiatieven beïnvloedt. Het laat zien dat de ruimtelijke fragmentatie in São Paulo een sterk gepolariseerde structuur heeft, met het stadscentrum als de belangrijkste pool. Fragmentatie is er gebaseerd op een dichotomie tussen centrum en periferie die tevens beïnvloedt waar zelfgeorganiseerde initiatieven actief zijn. Zoals aangetoond in hoofdstuk 5, zijn de bestudeerde initiatieven niettemin in staat om mensen van extreem verschillende socio-economische contexten te integreren, zelfs als ze beperkt worden door ruimtelijke fragmentatie. Deze sociale versnippering in contexten van ongelijkheid is één van de onderliggende krachten die ruimtelijke fragmentatie in Brazilië aansturen. In die zin is de integratiecapaciteit van zelfgeorganiseerde initiatieven een belangrijk middel om fragmentatie in Braziliaanse metropolen aan te pakken en dit heeft de interesse van planologen gewekt.

Hoewel er veel potentieel is om zelfgeorganiseerde initiatieven te integreren in planningsstrategieën in Braziliaanse metropolen, wordt dit nog steeds niet onderzocht door overheidsinstanties in de bestudeerde steden. De interactie tussen zelfgeorganiseerde initiatieven en overheidsinstellingen is over het algemeen problematisch en conflictueus, ondanks de deelname van sommige ambtenaren aan deze initiatieven. Er kan veel worden gedaan om de relatie tussen zelfgeorganiseerde initiatieven en overheidsinstanties te verbeteren, en deze conclusie heeft geleid tot de belangrijkste aanbevelingen van dit onderzoek. Dit proefschrift wijst ook op de actieve deelname van planologen aan deze initiatieven, waarbij zelfs diegenen die technische functies in openbare instellingen vervullen actief zijn. De resultaten van hoofdstuk 5 tonen aan dat planners sterk geloven in het werk van zelfgeorganiseerde initiatieven en hun positieve impact. Hun engagement vraagt om verder onderzoek naar de rol van

planners in dergelijke initiatieven en hun impact op andere gebieden dan ruimtelijke fragmentatie.

Hoewel proefschriften wetenschappelijk onderbouwd zijn en maatschappelijke relevantie hebben, worden ze vaak vergeten in de archieven van universiteiten. In deze dissertatie is daarom gestreefd om naast een wetenschappelijk kwaliteit ook een sterke maatschappelijke impact te hebben. Naast het publiceren van artikelen als onderdeel van dit proefschrift, is de maatschappelijke impact verbetert door het onderzoek beschikbaar te maken op twee open online platforms: het Global Urban Lab en de MOOC Rethink the City. Het eerste platform streeft ernaar om bevindingen en discussies in onderzoek samen te brengen en te ontsluiten voor het brede publiek, terwijl het laatste platform onderzoek toepast in planningsonderwijs. Onderwijs kan een efficiënt middel zijn om maatschappelijke impact te genereren op basis van doctoraal onderzoek, vooral als het verbonden is met een educatieve tool met een groot bereik zoals een MOOC. De MOOC Rethink the City wordt hier voorgesteld als een case study over het genereren van maatschappelijke impact door doctoraal onderzoek en online onderwijs te combineren. De uitdagingen en het ontwikkelingsproces van de Rethink the City MOOC worden besproken in hoofdstuk 6, dat ook enkele van de positieve resultaten van de cursus presenteert, waarvoor in de eerste twee edities 17.278 deelnemers zich hebben ingeschreven. Deze ervaring toont aan hoeveel invloed promotieonderzoek kan hebben wanneer het is afgestemd op online onderwijs.


BIO
RITMO

1 Introduction

§ 1.1 Why planning with self-organised initiatives?

Brazilian planning authorities have faced many criticisms over the last half century. Even Brasília, the new modernist capital, established in 1960, has been heavily criticised in recent decades (Ferreira Nunes & Bandeira, 2004; Fragomeni, Fonseca, & Brandao, 2016; Gehl & Rogers, 2013; Holston, 1993). It is common to associate Brazilian metropolises with violence, chaos and inequality. These negative images are not only imbedded in the popular mind, but are also reflected in well-known research. São Paulo has been framed as the 'City of Walls' (Caldeira, 2000) and Rio de Janeiro has been referred to as part of the 'Planet of Slums' (Davis, 2006). While both cities face challenges that go beyond urban planning, it is fair to assume that planning has been unable to cope with the changes both cities faced in the last half century. The southeast region of Brazil, for example, where the two biggest cities are located, grew from an urbanisation rate of 57% in 1960 to 92.95% in the last census in 2010 (IBGE, 2018). This urban growth did not occur in an orderly fashion. Cities developed without strategic coordination, mainly driven by the economic opportunism of the moment, which resulted in an uneven and disconnected urban patchwork. The result of this opportunity-led development is the well-known fragmentation and inequality represented by the walls and slums described by Caldeira and Davis. In this thesis, fragmentation refers not only to the difference in the spatial characteristics of distinct areas of a city, but also to the lack of connection between those areas: the lack of interdependence. Fragmentation, therefore, involves more than mere diversity within an urban system. The diverse urban patchwork of Brazilian cities is not only based on the spatial disconnection between autonomous areas, but also on the systematic inequality of Brazilian metropolises.

Despite the notorious challenges being faced, there are also interesting positive phenomena occurring in Brazilian urban environments that are worthwhile investigating. The incapacity of public authorities to cope with the rapid changes has also forced citizens to work together to overcome some of these challenges. Civil society in Brazilian metropolises has demonstrated its resilience. While public space in Brazilian cities has often only been created in the left-over space between, for example, infrastructure, informal settlements and gated communities, citizens have mobilised

themselves to improve these spaces. Brazilian metropolises have become a fertile ground for active citizens to start improving their streets, squares and neighbourhoods without waiting for public authorities to step in. Many initiatives emerged in contexts where citizens have had to adapt to unfavourable circumstances. These are known as the bottom-up, grassroots or 'do-it-yourself' practices of urbanism (Kee & Miazzo, 2014; Newman et al., 2008), referring to initiatives in which citizens organise themselves and take the lead to improve the public utility of these left-over unused spaces. These initiatives are not part of traditional urban planning tools; however, they are influencing the way urban planning is being practised in Brazilian fragmented metropolises. Nevertheless, while these self-organised initiatives are actively shaping public space, there is still a lot that needs to be understood about how they work.

In the literature on resilience, ranging, for example, from physics (Haken, 1983; Heylighen, 2008) to urban planning (Eraydın & Taşan-Kok, 2013), self-organisation is mentioned as an important element for a resilient system. Accordingly, the self-organised initiatives in Brazilian metropolises can be seen as a resilient aspect of the city, particularly the capacity of citizens to act when government fails. Resilience is usually related to a specific impact or threat, and claiming that self-organised initiatives increase resilience capacity in general is imprecise without considering the specific context to which the initiatives are responding. Therefore, the research in this field considered whether some of the self-organised initiatives were acting as possible resilient responses to the spatial fragmentation of Brazilian metropolises. Based on the Resilience Thinking in Urban Planning framework (Eraydın & Taşan-Kok, 2013), the analysis focused on developing an understanding of the relationship between self-organised initiatives and fragmentation. There is much to be understood about how such self-organised initiatives operate, influence and are influenced by these fragmented and unequal urban environments. While inequality is a concept that is often examined in socioeconomic terms, unequal urban environments reflect this inequality in spatial terms. Unequal urban environments refer to urban areas where socioeconomic inequality is high. In the case of fragmented Brazilian metropolises, this inequality is verified by the stark contrast between well-off and marginalised communities, which is often symbolised by the coexistence of gated communities (*condomínios*) and informal settlements (*favelas*).

The fragmentation component is important because conventional planning strategies have struggled to develop social connections in such areas of fragmentation and inequality. The walls that exist in Brazilian cities are not only physical but also social. It is especially difficult to create public spaces that serve and promote interaction between groups with diverse socioeconomic status. Public space is referred to here as open spaces that can be freely accessed by anyone, mainly consisting of public squares and streets. Closed public spaces such as community or commercial centres were not

considered in this thesis as they follow other dynamics of interaction. The successful creation or renewal of public space not only depends on a good physical design or adequate infrastructure, but also on the capacity of the project to tear down these social 'walls' and connect the diverse population physically and socially. It is in this specific aspect that self-organised initiatives emerge as an instrument to enable these social connections. Public spaces in Brazilian metropolises are the physical grounds on which self-organised initiatives carry out their activities. Nevertheless, it is still not clear how they manage to operate in unequal and fragmented environments. Several questions can be posed in this regard: How do self-organised initiatives foster social connections and carry out their work? To what extent do self-organised initiatives develop social connections between extremely diverse groups that are spatially fragmented? To what extent do self-organised initiatives reduce spatial fragmentation and increase resilience by connecting diverse groups? Furthermore, how do planning professionals and institutions interact with them? Does urban planning play a role in self-organised initiatives? How can planning education also involve self-organised initiatives and have a stronger societal impact? These are the initial questions driving this research and which the thesis will address in the following chapters.

§ 1.2 Relevance and Aim

This research adds to the studies on resilience thinking in urban planning by closing the gap between self-organisation and spatial fragmentation. Moreover, despite the vital significance of resilience nowadays, research on this topic is lacking in the Brazilian academic environment, which still mainly focuses on resilience as a reactive strategy in relation to natural disasters. The development of an analysis with a different perspective on Brazilian urban resilience capacity (considering not only physical influences, but also economic, political and above all social influences) is strategic for the future urban development of the country. In addition, resilience approaches have also been criticised for operating as a means of immunising citizens, such that they accept larger doses of inequality and degradation in such environments in the future (Kaika, 2017). In this respect, this thesis also contributes to the development of a different perspective, searching for constructive opportunities to use resilience as a solution to problems of inequality. Resilience thinking also opens space for the development of optimistic scenarios for the future, since it is not only based on the shortfalls of the system but also on the opportunities that they generate.

The debate around self-organised initiatives is also fundamental because these initiatives are commonly present in many Brazilian cities, where public authorities are not able to efficiently respond to local urban challenges. Naturally, it is not reasonable and sustainable to expect that civil society can solve all of its problems alone; however, when necessary transformations do not take place, civil society can create its own solutions. When these solutions emerge systematically, they may become learning practices. Self-organised initiatives are extremely active, and urban planning research should not ignore their influence on contemporary cities in the Global South. After shedding some light on how these initiatives work, especially in fragmented and unequal cities, the research aims to develop a set of policy recommendations to support decision-makers and public authorities to develop a more productive and cooperative approach to working with self-organised initiatives..

Furthermore, this study aims to contribute to planning education as well as contribute to academic research. The use of doctoral research in online education is relatively uncommon; however, there is great potential for using online education as a platform to discuss and disseminate the results of doctoral research. It is vital to offer alternative perspectives in planning education (Roy, 2011), and the research produced by doctoral candidates can contribute to increasing this diversity if distributed openly using online tools. The plan was to contribute in this way by presenting the theories and case studies developed in the research in the Rethink the City MOOC. This course was developed based on the research material, as a tool to connect the researcher with local practitioners in Brazil and to increase the societal impact of the study. This aim is aligned with the idea that it is necessary to develop closer connections between education and practice (Taşan-Kok & Oranje, 2017). Open and online courses offer practitioners possibilities for taking part in projects, as was confirmed by the high number of professionals involved in the Rethink the City MOOC. Additionally, the course served to demonstrate how self-organised initiatives can be used positively in education and planning practice. The course was relevant because it not only created the possibility of learning from the research developed at TU Delft, but also the possibility of learning from the examples and case studies concerning the Global South. As well as offering this opportunity, the Rethink the City MOOC was itself a case study undertaken to investigate how doctoral research can have a strong societal impact through direct association with online planning education.

§ 1.3 Self-organisation and Resilience Thinking

Several authors in the field of urban sociology and planning theory have addressed the relationship between inequality and planning (Bauman, 2011; Caldeira, 2000; Castells, 2002; Fainstein, Gordon, & Harloe, 1992; Harvey, 1996; Maricato, 1996; Rolnik, 2010; Santos & Dias, 1982), especially after the consolidation of the neoliberal economic model in the 1990s. Notwithstanding, further investigations using resilience thinking in planning related to this unequal fragmentation are still lacking. Resilience thinking in planning brings a new perspective to planning theory (Eraydın & Taşan-Kok, 2013), which could deal with complex urban systems such as those present in Brazil. One of the advantages of this approach is its efficacy for understanding, managing and governing complex linked systems consisting of people and nature (Folke et al. 2004). In this sense, resilience thinking provides a different strategy compared to traditional planning practices, as it deals with the challenges faced by complex urban systems, not as problems to be solved but as opportunities to develop new tools to create positive outcomes, such as self-organisation, diversity and interdependence (Eraydın & Taşan-Kok, 2013).

The use of resilience thinking in planning is relatively new and can be addressed from very distinct perspectives. In this study, the concept of urban resilience is developed based on the idea that social and spatial continuity increases the adaptive capacity of the city by creating better opportunities for self-organisation. In Brazil, the issue of resilience is mainly related to the capacity of urban systems to cope with natural disasters. Nevertheless, resilience thinking can also be related to economic, social, cultural, environmental or any other factor associated with urban planning challenges. The present research uses a social perspective to focus on the urban resilience capacity of Brazilian metropolises to cope with fragmentation using self-organised initiatives.

Spatial fragmentation has become a common issue in contemporary complex metropolitan contexts. Disconnected areas have exposed spatial and social voids that diminish the adaptive capacity of a region. Cities with loose spatial and social ties are enormously vulnerable to external disturbances. In an extreme scenario, a completely disconnected system is not capable of establishing minimal communication or mutual relations, and is not able to respond to potential risks. Economic growth and social progress in Brazil, especially in metropolitan areas, have reinforced fragmentation due to strong opportunity-led development. Contemporary Brazilian metropolitan systems have increasingly faced problems associated with extreme spatial fragmentation, including isolation, segregation, spatial deformities and social disintegration. A system with a high adaptive capacity, a fundamental characteristic of a resilient system, will exhibit self-organisation, flexibility, social cohesion and potential for change (Eraydin

& Taşan-Kok, 2013). In this research, self-organisation is analysed as an important aspect to promote resilience thinking in planning.

The governmental response is currently criticised for amplifying spatial fragmentation through inefficient urban policies. It is important to highlight that there is a traditional lack of investment in the development of strategic urban plans in Brazil. A participatory approach is often observed during the creation of master plans; however, they still fail to address distortions. The inclusion of civil society in the creation of a strategic urban plan does not guarantee their efficiency. Moreover, this traditional urban planning, which uses a participatory approach, tends to fail for some fundamental reasons. Firstly, the failure may occur because the urban plan is principally a response to a pre-existing disruption, meaning that such plans are mainly strategies to minimise the impact of the disruption, without the application of long-term resilience thinking. Secondly, these traditional urban interventions create new activities and new planned areas, but with vague connections between new communities and constantly transforming old spaces. Furthermore, these traditional urban planning methods do not tackle the adaptive capacity of the city itself, and thereby maintain the existing level of resilient capacity, perpetuating the same exposure to risks. In addressing these kinds of issues, this research intends to acknowledge the traditional difficulties present in the Brazilian context and focus on planning mechanisms that could be objectively implemented and which would have a direct impact on the adaptive capacity of Brazilian metropolises.

§ 1.4 Brazilian Urban Development and Self-organised Initiatives

Brazil's rate of urbanisation rapidly increased from 44.6% in 1960 to 84.46% in 2010 (IBGE, 2015b). This accelerated urbanisation was also accompanied by a population increase of 270% in the same period (IBGE, 2015a). These changes fundamentally influenced the country's metropolises, and public authorities faced difficulties coping with this urban growth in an orderly manner. Although all metropolitan areas have master plans at the municipal level, they do not guarantee an effective implementation process. Public authorities have simply not been able to cope with such challenging urban changes. As a result, a 'patch-work' form of development has emerged, where different areas are not connected to each other, and where development mainly took place according to market opportunities. This opportunity-led form of development (Taşan-Kok, 2004) is still increasingly expanding in metropolises today. For example, MCMV, the current national social housing programme, perpetuates this logic.

While the government provides finance for those on low incomes to buy a house, the purchasers are required to buy directly from private companies that take a market-oriented perspective, and they mainly provide buildings on cheap land in sub-optimal locations to maximise their profits. This process creates a patchwork urban context that is highly fragmented and which does not conform to a general urban development strategy.

According to Caldeira (2000), the city of São Paulo is an extreme example of spatial disconnection, which creates an inefficient urban system characterised by rigidity and violence. The author refers to São Paulo as the 'city of walls'. In this sense, it is clear that this physical fragmentation has a direct connection to the social structure of the city. In a city with extreme social inequality, walls not only separate spaces but also people.

It is incorrect to believe that Brazilian metropolises have weaker social connections or that they do not rely on social networks. According to the Better Life Index of the OECD, 90.1% of people in Brazil have friends or relatives who they can count on in times of trouble, which is higher than the average of 88.6% from the developed countries of the OECD (OECD, 2017). From gated communities to '*favelas*' (informal settlements), social networks constitute an important factor in overcoming the lack of services that would traditionally be offered by the state, and which range, for example, from garbage collection to public transport. Brazilian metropolises seem to be a fertile ground for these spontaneous, bottom-up and self-organised initiatives relying on social networks. In this context, such initiatives have a significant impact on urban planning.

From a traditional top-down planning perspective, these self-organised initiatives can be seen as an anomaly or as pointing to a failure of an overall planning strategy. Nevertheless, other perspectives are also emerging. These initiatives in which citizens take the lead rather than the government and act in a bottom-up or grassroots manner are also understood as a kind of 'do-it-yourself' urbanism (Kee & Miazzo, 2014; Newman et al., 2008). In many metropolises of the Global South, especially in contexts where public authorities are inefficient, they now constitute an important resource. In Brazil, they are not only more present in urban planning than in the past, but are also increasingly counting on the active participation of urban planners.

§ 1.5 Conceptual Model

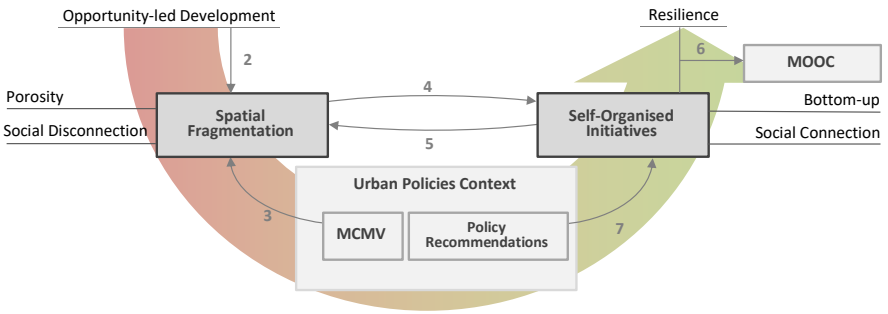

FIGURE 1.1 Main concepts related to Chapters 2-7

The main concepts of this thesis are *spatial fragmentation* and *self-organisation* (Figure 1.1). Self-organised initiatives relate to the capacity of social entities to govern themselves autonomously (Kooiman & van Vliet, 2000). Spatial fragmentation refers to a negative aspect of porosity. With social disconnection, it may lead to the formation of vulnerable nodes in urban space. According to Stavrides (2007), urban porosity is the result of threshold areas and in-between (or unused left-over) spaces that loosen the borders of strict spatial and social structures.

Another important concept that will be discussed in this study is *opportunity-led development*, which, among other things, reflects a shift in planning regimes from the control of urban development to enabling piecemeal development that is encouraged due to the financial benefits it brings to municipal governments. Such opportunity-led development leads to fragmentation in cities within a system where private interests overtake public interests (Taşan-Kok, 2004). Another important term is *resilience*, considered as 'the capacity of a system to absorb disturbance and reorganise while undergoing change (...) to retain (...) the same function, structure, identity, and feedbacks' (Walker et al., 2004; see also Wardekker et al., 2010). A resilient system has the ability to survive, adapt and transform itself (Ludwig et al., 1997). *Social connection* in this study refers to meaningful and constructive encounters between diverse groups. This concept is closely connected to the theoretical debate in sociology and development studies related to social cohesion. However, social connection is more specific and relates directly to meaningful and constructive encounters, while social cohesion has a broader definition and refers to distinct social dimensions, such as wellbeing, a sense of belonging, the

fight against marginalisation, the building of trust and upward mobility (OECD, 2012). Although there is a direct relationship between social cohesion and social connection, this research will focus on the concept of social connection, since it provides a more focused theoretical basis for the investigation. In addition to the concepts discussed, MCMV is the abbreviation for the social housing programme of the Brazilian federal government called Minha Casa, Minha Vida, which is used as a case study to examine how federal urban policies may affect fragmentation. Finally, MOOC stands for Massive Open Online Course, a platform on which some of the results have been published. As well as the definitions presented here, the concepts will be further developed below in relation to the specific context analysed.

§ 1.6 Methods, Fieldwork and Case Study of Societal Impact

The thesis uses mixed methods and takes a critical realistic approach, where the observation of reality is the central strategy in developing an understanding and providing recommendations for action (Price & Martin, 2018). Nevertheless, conducting the research based at TU Delft, a long way from the reality being studied, had its particular challenges. The fieldwork had to be well prepared in advance, since the time in Brazil was limited and the financial costs of a second trip were too high. The preparation for the fieldwork took six months, while the fieldwork in Brazil extended over two months, from the beginning of July until the end of August 2016. The fieldwork took place in Brasília, Rio de Janeiro and São Paulo. It generated the opportunity for field observations and to conduct in-depth interviews. In total, 12 self-organised initiatives were part of the research, and 28 in-depth interviews with experts, public servants and members of self-organised initiatives were conducted. Due to time constraints, three additional in-depth interviews were conducted via videoconference. The fieldwork primarily generated the data for Chapters 4 and 5.

While Chapters 4 and 5 are based on qualitative methods, Chapters 2 and 3 use quantitative methods; however, each chapter has its own particular focus. Data from the Brazilian Institute of Geography and Statistics (IBGE) were utilised in Chapter 2 to develop the macro analysis around the concept of porosity with the aim of developing a comparative porosity index, which is related to the spatial fragmentation of Brazilian metropolises. Chapter 3 also used quantitative methods, which mainly served to create maps supporting the analysis of the spatial fragmentation generated by the MCMV social housing programme. Chapter 3 also used data from IBGE, along with additional

data on urban wellbeing from the Observatory of the Metropolises, as well as some data about travel times available from Google.

Furthermore, the thesis used the Rethink the City MOOC as a case study on how research can generate societal impact through online education in urban planning. The MOOC was initially considered a method of connecting the researcher with local stakeholders in Brazil. One self-organised initiative participated in the MOOC by presenting their work. However, in addition to expanding the network generated through the fieldwork, the course was found to be an effective method of generating societal impact even beyond the Brazilian metropolitan context. Chapter 6 elaborates on the MOOC case study, revealing its challenges and its potential for societal impact.

The different methods used were the result of the initial strategy to develop a more comprehensive perspective on the theory and spatial implications of the fragmentation of Brazilian metropolises, before focusing on the operation of self-organised initiatives in the fragmented environments under study. This resulted in the development of a mixed methods analysis, where quantitative methods were applied and then followed by qualitative methods. Each chapter has its own methodology, which will be explained in more depth in each chapter.

§ 1.7 Research Question, Sub-questions and Structure

This thesis studies self-organised initiatives as a constructive factor for regenerating spatially fragmented cities that exhibit strong social inequalities. From this perspective, the capacity of planning strategies to work with self-organised initiatives within fragmented and unequal cities constitutes a vital challenge, especially in contexts where opportunity-led development is commonly observed, such as in Brazil. The thesis addresses the ways in which urban planning can promote self-organised initiatives in order to stimulate social connections and increase resilience capacity to counteract spatial fragmentation. On this basis, the thesis addresses the following question: *To what extent can resilience towards spatial fragmentation be enhanced by self-organised initiatives?* The dichotomy between fragmentation and self-organisation is the main focus of this study, as shown in Figure 1.1. The thesis sheds some light on how these two elements interact with each other using cases studies from Belém, Brasília, Manaus, Rio de Janeiro and São Paulo. Each chapter of the thesis and its respective relationship to the concepts are indicated in Figure 1.1.

In Chapter 2, the thesis aims to provide an understanding of the spatial fragmentation of Brazilian metropolises. It investigates the notion of spatial discontinuity and develops the metaphor of porosity, considered as one aspect of the spatial fragmentation of Brazilian metropolises. These empty spaces left over from development can work as a double-edged sword, both fragmenting areas and providing empty space, which makes it important to understand how they relate to the fragmentation of Brazilian metropolises and affect the resilience of communities. This chapter will answer the following question: *Do spatial discontinuities create opportunities for resilience?*

Chapter 3 develops on the notion of fragmentation by attempting to understand how public policies contribute to increase spatial fragmentation in Brazilian metropolises. This chapter uses the MCMV social housing programme in the metropolises of Manaus and Belém as a case study for how urban policies can affect fragmentation. *The chapter investigates the extent to which the MCMV programme is reinforcing existing spatial fragmentation in both cities.* We observed how a policy designed at the federal level can impact fragmentation at the municipal level.

Chapter 4 investigates the impact that spatial fragmentation has on self-organised initiatives. The study focuses on the case of São Paulo and uses a qualitative approach to understand how the fragmentation of the largest metropolis of Brazil is influencing the manner in which self-organised initiatives operate. The main question here is: *To what extent does spatial fragmentation influence self-organised initiatives?*

In Chapter 5 the relationship discussed in Chapter 4 is inverted, with the aim being to understand how self-organised initiatives are influencing fragmentation – more precisely attempting to understand how these self-organised initiatives are transforming these fragmented contexts in the city of São Paulo. Additionally, the active participation of urban planners in these self-organised initiatives was observed, which created the opportunity to explore the role of planners and planning in relation to these initiatives. The main question of this chapter is: *To what extent can self-organised initiatives promote social connection in the public spaces of highly fragmented and unequal urban contexts?*

Chapter 6 focuses on the capacity of the research to exert societal impact as an educational tool. The aim is to analyse the potential impact of presenting the research in an online planning education platform. An online environment is an efficient tool to spread the word about research results; however, this does not necessarily translate into engagement with a broader audience. Just as theses can end up forgotten on a library shelf, they can also be forgotten on the internet. The exposure of the research in this online educational environment attempts to facilitate the outreach of the work to

a broader audience. The chapter analyses the case of the Rethink the City MOOC, where the research was presented, along with the work of one self-organised initiative in São Paulo. The MOOC serves as an example of how online education is not only changing planning education, but also how research can increase its societal impact. The main question here is: *How is this new learning experience being developed, delivered and impacting planning education?*

The final chapter of the thesis presents the main findings of each chapter, develops some policy recommendations on how planning institutions can work with self-organised initiatives in a more productive way, and points to some avenues for future research.

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MURO É
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2 Brazilian urban porosity: Treat or threat?

This chapter was published as an academic article in the Urban Design and Planning Journal of the Institute of Civil Engineering, co-authored by Professor Tuna Taşan-Kok from the University of Amsterdam and Professor Willem Korthals Altes from TU Delft (Pessoa, Taşan-Kok, & Altes, 2016). As indicated in Figure 2.1, the chapter focuses on the spatial discontinuities of Brazilian metropolises generated by an opportunity-led development. It elaborates on the metaphor of 'porosity' as an important aspect in generating positive or negative impact on the resilience of an urban system.

Abstract

Urban areas have spatial discontinuities, such as disconnected neighbourhoods, brownfield areas and leftover places. They can be captured by the metaphor of urban porosity. This article aims to highlight potential social consequences of urban porosity by creating a "porosity index". We argue that these areas can provide capacity for flexibility, fluidity, and absorption in major cities, but that they can also be a source of fragmentation, disconnection, and isolation between different social groups, eroding the adaptive capacity of metropolitan systems. Porosity may thus have both positive and negative influences on the resilience of urban systems. Brazil's rapid process of urbanisation over the last 50 years shows both these sides of porosity, which create treats and threats for its urban systems. This paper develops an analytical framework within which to study how porosity manifests itself in Brazilian metropolises, which helps to identify porosity in contexts of urban growth and decline. It uses statistical data from IBGE relating to 12 Brazilian metropolises to generate the proposed porosity index. Additionally, the paper discusses the added value of the concept of urban porosity in addressing urban resilience and briefly elucidates the issues and opportunities caused by discontinuities in the urban fabric in Brazil's metropolises.

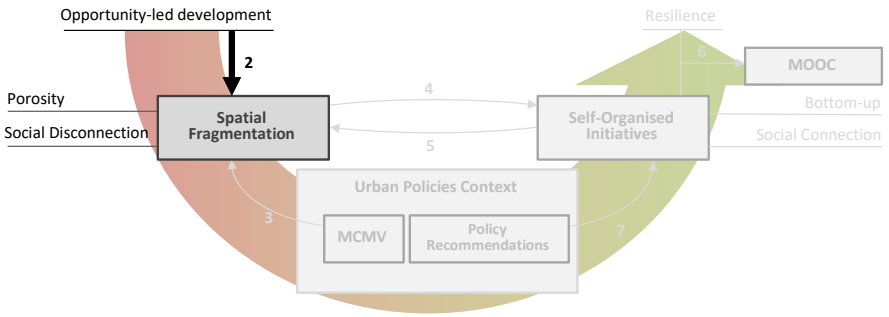

FIGURE 2.1 Conceptual relation of Chapter 2

§ 2.1 Introduction

Brazil's urbanisation rate jumped from 44.6% in 1960 to 84.5% in 2010 (IBGE, 2015b), an increase that was accompanied by an absolute population increase of 270% (IBGE, 2015a). This rapid process of urbanisation has brought about a fundamental change in Brazilian metropolitan systems. Planning authorities have been challenged beyond their ability to cope with the speed of urbanisation. Major cities' master plans have repeatedly failed to guide the process. These changes have caused a severe impact to the metropolitan environment that cannot be solved by existing planning practices. As a result of accelerating urbanisation and urban growth, and increasing opportunity-driven urban development, a "patch-work" pattern of development has emerged: different areas have developed, without necessarily being connected to each other, leaving many "in-between" zones in the urban spatial structure - a phenomenon which we will call "porosity".

Porosity can serve as a metaphor to describe these threshold areas in a discontinuous metropolitan context, and it is particularly common in Latin American cities. As in material science, porosity can provide flexibility, fluidity, and absorption capacity, but at the same time it can also promote fragmentation, disconnection, and isolation. The metaphor of porosity helps us to address a phenomenon of which, despite its increasing prominence and influence in Latin American urban areas, has not yet been the subject of significant scholarly reflection. Within this framework, and using empirical sources, we aim to evaluate how porosity may be a source of positive and negative effects (or as we call them, treats and threads) on the resilience of urban systems. Porosity can have

both a social and a spatial impact. The "left-over" spaces can provide space for flexibility, fluidity, and absorption capacity in large cities, enhancing spatial and social connections in the built environment. On the other hand, they can also contribute to fragmentation, disconnection, and isolation between different land-use areas and different social groups, eroding the adaptive capacity of metropolitan urban systems in the case of unexpected changes or disasters. However, we also argue that the resilience of a system depends on enhancing the positive dimensions of porosity and minimising its negative dimensions. In order to do this, the main challenges and opportunities of porosity in a given urban space need to be defined. What is a challenge in one urban system may become an opportunity in a different system. The focus of this study is on Brazil, but it can serve as a basis for further comparative debate with other Latin American countries, and even beyond Latin America too.

The present article aims primarily to address how porosity influences Brazilian metropolises, especially the adaptive capacity of urban systems and their resilience. However, it does not aim to elaborate on the reasons for the emergence of the phenomenon of porosity in the first place. A resilient system is better able to absorb impacts and to continue to function, but because porosity is a "double-edged sword", it is still not clear how porosity may affect resilience overall. Especially in Brazilian metropolises, where there is a high degree of spatial discontinuity in the urban fabric, it is strategically important to understand porosity. How can the positive aspects of porosity be reinforced and the negative aspects minimised? How can a metropolis in Brazil use its porous condition strategically in order to enhance resilience? What opportunities does porosity bring with it? These are some of the concerns addressed in this study. However, the paper's main focus is to understand the extent to which porosity can influence the adaptation of the urban society as a whole to a range of disturbances, even though it is characterised by spatial discontinuity?

Despite the limited scope of this article, it aims to contribute to the debate on social aspects of urban porosity by creating a "porosity index" by perceiving urban growth, which is measured in terms of economic, demographic and residential growth, and to urban decline, which is measured in terms of segregation (the incidence of slums or gated communities) and the lack of socio-spatial identification, as the main driving forces of porosity. We analyse data from the Brazilian Institute of Geography and Statistics (IBGE) gathered from 12 Brazilian metropolises - namely, São Paulo, Rio de Janeiro, Brasília, Manaus, Belém, Fortaleza, Recife, Salvador, Belo Horizonte, Curitiba, Goiânia and Porto Alegre (IBGE, 2008, p. 11). We will first introduce the concept of porosity, in the following section, and then tackle its possible links to resilience in the subsequent section. After defining the challenges posed by Brazilian urban porosity, we will provide an analysis using the statistical data. The paper concludes with a discussion on resilience in porous urban systems.

§ 2.2 What is porosity?

In order to understand porosity, it is essential to consider the different aspects of porosity and the theoretical debate over the concept. In the past, the metaphor of porosity was not used frequently in urban studies, and on those occasions when it was used, it had no fixed meaning. In other words, the metaphor has been associated with a range of phenomena.

In 1924 the German philosopher Walter Benjamin when writing on Naples, used porosity as a metaphor for the spatial experience of that city. However, the porosity described by Walter Benjamin does not refer to the concept of open or empty spaces, or voids, but rather to the open possibility of encounter, the labyrinthine configuration of space, and the chaotic and unreadable spatial configuration. Furthermore, Benjamin's porosity goes beyond the strict notion of space and also embraces cultural and social aspects.

Porosity results not only from the indolence of the Southern artisan, but also, above all, from the passion for improvisation, which demands that space and opportunity be at any price preserved. Buildings are used as a popular stage. They are all divided into innumerable, simultaneously animated theatres. (...) Porosity is the inexhaustible law of the life of this city, reappearing everywhere. A grain of Sunday is hidden in each weekday, and how much weekday in this Sunday!!! (Benjamin, 1978, p. 170).

So, Benjamin's concept of porosity goes beyond spatial experience and includes what can be called the "local Neapolitan lifestyle". Contemporary authors commonly invoke Benjamin's concept of porosity, which can be seen in the recent work of Paola Viganò.

Porosity is a transversal and transcalar concept: ecological (pertaining to the ground, the water problem, of exchange and connectivity), concerning mobility and social issues (democratic accessibility in general), epistemological (the city as a sponge; models of isotropy vs. hierarchy). At the same time it is a precise mathematical concept translated into metaphorical and evocative possibilities for movements. (Viganò, 2013, p. 424).

Viganò's dissection of porosity into four distinct spheres (ecological, mobility/social, epistemological and mathematical) proposes a clearer identification of the kind of porosity that is being discussed. Within this structure, the porosity addressed in the present article relates to the social issues caused by spatial discontinuities.

Another approach is to analyse porosity as an aspect of urban morphology. Luc Adolphe (2001) has created a porosity coefficient, using the volumes of open spaces and

built spaces in a city as variables. This coefficient may play a role in understanding the environmental performance of urban areas, such as the airflow patterns in an urban area.

For Bernardo Secchi, porosity is mainly associated with a phenomenon that he defines as "the disappearing industrial city" in Europe (Secchi, 2007). This is mainly the consequence of a shrinking population, a rapid increase in the amount of wasteland and structural economic change, whereby old industrial zones - which he calls "outdated infrastructure" - suddenly become empty. This is fundamentally different from Brazilian porosity, since it stems from demographic and economic decline, while in Brazil porosity emerges through just the opposite factors - population increase and economic growth. This aspect will be discussed in a subsequent section.

Stavrides (2007), who also refers to Benjamin, uses porosity as a metaphor for the fuzzy boundaries between public and private spaces in Naples. According to Stavrides, this is because porosity promotes the loss of the strict notion of spatial and social order. Porous areas are threshold areas that "...both symbolize and concretize the socially meaningful act of connecting while separating and separating while connecting" (Stavrides, 2007, p. 176). Stavrides thus also stresses the duality present in the metaphor of porosity, which this article aims to address.

Keeping these various approaches in mind, our understanding of porosity includes both the social and physical dimensions as we focus on the resilience of metropolitan systems in Brazil and argue that this capacity can be enhanced by porosity zones. Although porosity is usually associated with physically undeveloped or underutilised spaces, our definition of porosity integrates both social and spatial aspects. The concept of porosity in this article, then, refers not only to under-utilised in-between places within densely built-up areas, but also to areas that have the capacity to facilitate the co-existence of places and people due to their location, physical qualities or social infrastructure to accommodate connectivity and self-organisation capacity, as we will explain in more depth in the following section. For example, porous areas in cities may provide spaces for the co-production of needs such as food or shelter or spaces for interaction. Thus, we build on the social aspects mentioned by Viganò and the ideas on the capacity for spatial connectedness mentioned by Stavrides. As stated previously, porosity brings some opportunities with it and the advantages of porosity can be strategically promoted to enhance spatial and social connections in the built environment. As Stavrides affirms, in "...architecture, we usually imagine humans delimiting a territory by marking boundaries. In the rich complexity of city life, however, architecture becomes above all the art of creating passages" (Stavrides, 2007, p. 175). This can be understood as a new method by which to enhance resilience in a complex metropolitan system.

§ 2.3 Porosity and urban resilience: a two-sided relationship

Keeping in mind that porosity refers to spatial fragmentation and discontinuity, the essential question here is whether a porous system can also be resilient. In other words, to what extent do spatial discontinuity and fragmentation influence the urban social system to adapt itself to the new situations created by external effects such as economic, ecological or social crises, and small-scale or large-scale changes – whether foreseen or unforeseen. If spatial discontinuity leads to social segregation between different groups, to what extent does porosity influence the adaptation of an urban society as a whole to various disturbances?

To start addressing this question, it is important to have a better understanding of resilience. Resilience is 'the capacity of a system to absorb disturbance and reorganise while undergoing change (...) to retain (...) the same function, structure, identity, and feedbacks' (Walker, Holling, Carpenter, & Kinzig, 2004; Wardekker, Jong, Knoop, & Sluijs, 2010). A resilient system is able to survive, adapt and transform itself (Ludwig, Walker, & Holling, 1997), and although it may be changed or influenced by a disaster, it is able to reorganise and reform itself (Taşan-Kok, Stead, & Lu, 2013). In this sense, porosity can impact on resilience in several ways.

In the literature on resilience, various attributes are defined as the characteristics of resilient urban systems (Eraydin, 2010; Taşan-Kok et al., 2013). According to Godschalk (2003), these attributes include redundancy, diversity, efficiency, autonomy, strength, interdependence, adaptability and collaboration. In fact, a resilient city is expected to adapt to uncertainty through the required combination of these attributes (Fleischhauer, 2008; Godschalk, 2003). Walker and Salt (2006) refer to these characteristics as "qualities" and they also add a social dimension. In their opinion, some of the main qualities include diversity, ecological variability, modularity, acknowledging slow variables, tight feedback, social capital, innovation, overlap in governance and ecosystem services. Since this article aims to discuss the social impact of porosity, we focus on the ideas of social continuity and connection (or in a broader sense, social cohesion), which play an important role in the capacity of the system to cope with uncertainties, since these qualities help communities to easily communicate and organise themselves. Taşan-Kok and Stead (2013) argue that segregated communities have less chance of cooperating and coordinating their action when this is needed. Socio-spatial segregation may also limit the democratic participation of various groups in common action and adversely affect the learning process of adapting to unexpected or expected conditions in the development process, which is an extremely important aspect of the capacity for self-organisation and resilience.

Porosity can be linked to fluidity and flexibility, but at the same time to fragmentation and disconnection. As the title suggests, porosity can "cut both ways" in relation to urban resilience. A highly porous environment can either promote or undermine resilience. This dual relationship will be discussed further in the following sections, but looking specifically at the case of Brazil, it can be argued that spatially discontinuous systems can be socially resilient, if, despite the limited opportunities for interaction between different groups, urban society still manages to cooperate, communicate, and organise itself to address the various negative influences involved. In that respect, the social resilience approach allows us to keep an open mind about the possible positive aspects of spatial discontinuity when society, despite the limited opportunities for self-organisation, is still able to go on functioning. The next section will address some of the specific characteristics of porosity in Brazilian urban areas, keeping this perspective of resilience in mind.

§ 2.4 Urban porosity in the context of growth: the Brazilian case

Porosity can occur both in situations of decline and in situations of growth. Decline can result in voids in an urban system when functions cease to exist. Bernardo Secchi (2007) has reflected on the structural changes witnessed in many European cities due to shrinking populations and industrial decline. Disused industrial sites in Europe lead to porosity and can also contribute to spatial fragmentation. Secchi (2007) points out how many European cities have responded to this process of decline and looked for answers to the social and economic problems of the 1980s by filling these urban voids with new functions such as museums, theatres, congress and exhibition halls, office buildings and sport facilities, airports and shopping malls. In that sense, filling urban voids is very closely related to creating new functions for spaces that were previously designated for a different purpose. In other words, the decline of a specific economic activity creates porosity that can be counterbalanced by redeveloping the same space to accommodate new and different functions. This is one of the reasons why in Europe, for example, it is possible to find old church buildings that have been converted into bookshops or nightclubs. These voids in the system also appear in many other older industrial areas such as the American North-East and Mid-West, where vacancy is an important issue (Bowman & Pagano, 2004), and in Japan (Dixon, Otsuka, & Abe).

Alternatively, porosity can also occur in a context of growth, as in Brazil, where growth has occurred in the context of intense opportunity-driven urban development. In that sense, porosity in Brazil is more closely related to the well-known fragmentation of the

urban structure of developing countries (Balbo, 1993; Balbo & Navez-Bouchanine, 1995; Coy, 2006; Jaramillo, 1999). There are, then, some major differences compared to the porosity that can occur in a context of decline.

When porosity is a consequence of economic decline, it is naturally viewed as a problem that needs to be resolved. Porosity can be seen as a limit on the space available for investment in the built environment due to its close link with economic development. Porous spaces thus need to be redeveloped, regenerated or given a new function to secure investment. When porosity is the result of growth, as in Brazil, it is not seen as a problem to be resolved, but as a side-effect of development, which is viewed in a positive light. The question remains of whether it is an inevitable side-effect of growth or whether porosity can be managed through planning or urban governance in such a way that it can be deemed an independent phenomenon.

Specific to the Brazilian case is the emergence of impenetrable areas, where access is restricted to a specific group. As mentioned by Stavrides (2007), gated neighbourhoods and impenetrable "*favelas*" (slums) have an extremely low porosity, in the sense that they are rigid spatial configurations with controlled access and low connectivity with the rest of the city. The status of "unporous" zone does not, in itself, mean that these zones reduce the porosity of the system as a whole; however, in Brazilian metropolitan areas, slums and gated communities promote extreme spatial fragmentation and disconnection, which both have an adverse effect on urban porosity. In the specific case of Brazilian porosity, since gated communities and slums are widespread phenomena, they represent a fundamental variable by which to measure the adverse effects of porosity. One of the challenges of analysing porosity in the Brazilian context, then, is to assess the influence of these two phenomena in terms of the effects of spatial discontinuity.

The role of the state in urban development must also be mentioned. In Brazil the public sector has historically provided limited support for the development of services in the city while claiming to control and produce everything (Balbo, 1993). This historical characteristic is changing in contemporary Brazilian metropolises, since today the state has more resources to devote to urban development and city services. Nevertheless, the previously limited capacity of the public sector influences the way in which porosity is managed today, since public authorities still do not know how to tackle this issue more efficiently or how metropolitan development could prevent the adverse effects of porosity. The lack of any tradition of regulating or managing porosity strategically is, therefore, a challenge. Meanwhile, porosity continues to influence the urban economy.

The influence of urban planning on porosity must also be considered. Some argue that porosity in developing countries is mainly the consequence of a lack of planning.

Nevertheless, this approach is based on a traditional analysis that planning has the power to solve these spatial issues through a top-down approach. Top-down planning, however, has many limitations. The existence of negative aspects of porosity even in highly controlled and planned Brazilian cities, like Brasília, highlights the limits of planning as a tool. The Brazilian capital, a completely planned city that retains its master plan structure even today, is a notable example of spatial discontinuity and social inequality. Nor, in its suburbs, was the master plan able to create connections between old and new neighbourhoods. In Brazil, then, porosity is not purely the result of a lack of planning. Balbo and Navez Bouchanine, for example, ask whether fragmentation in developing-world cities is an accidental outcome of a lack of planning or is simply how the urban society and economy tends to cope with the constraints of underdevelopment. This perspective adds the notion that, in order to confront the difficulties of urban areas in developing countries, a more chaotic but flexible environment may, in fact, be preferable to a planned and rigid approach. Thus, the flexibility provided by porosity may be an opportunity for resilience, though it may also be a source of challenges such as opportunity-led development.

Keeping these challenges and opportunities in mind, it should be emphasised that much of the concept of porosity remains undefined. It is a metaphor and consequently rather imprecise. In order to study all aspects of porosity, it is essential to wrestle this concept to the ground in a way that will make it possible to operationalise research and measure results in a way that goes beyond figurative expressions.

§ 2.5 The Brazilian porosity framework

To study the level of porosity in Brazilian urban environments and how this relates to growth, a framework was developed based on data from the IBGE's two last national censuses (2000 and 2010). This data allows us to assess the development of some aspects of porosity in Brazilian metropolises. We would like to stress, however, that other variables could be added to improve and expand this model, in order to make it more compliant with the metaphor of porosity. For example, IBGE does not measure the number of apartments located within gated communities, it only measures the number of houses. Such data would also be crucial to improving the index, but may also make it more difficult to follow the development of porosity, as no recurrent sources can be found to measure development over time.

The variables have been selected on the basis of the challenges and opportunities highlighted in the previous section. The data used are tailor-made on the basis of what is nationally available. This is consistent with the general tendency in the social sciences that, since many data are nationally based, the scientific measurement of society is also nationally based. Specifically, our analysis of the figures will look at the degree to which Brazilian porosity relates to growth. Additionally, since further studies will be needed to assess how each variable may promote more or less urban porosity in relation to other variables, this first version of the porosity index was generated using the same weighting for all variables. Using this strategy, the research aims to produce an index that can serve as a basis for a retrospective comparative analysis of how porosity influences each metropolis. The aim of the research is not to translate the spatial/social concept of porosity into an index in itself. Rather, the porosity index serves more as an analytical tool than as a final product of the research in question. Moreover, the proposed analysis is part of ongoing research that will address the characteristics of urban fragmentation and spatial discontinuities in the above-mentioned cities in greater depth at a later stage, in order to validate the model.

TABLE 2.1 Selected variables in 12 Brazilian cities (IBGE's national census 2000 and 2010)

Metropolis	Dwellings without street / number identification	Houses in Gated Communities	Dwellings in Slums	GDP 2000 (x1000 Reais of 2000)	GDP 2010 (x1000 Reais of 2010)	Population in 2000	Population in 2010	Dwellings in 2000	Dwellings in 2010
São Paulo	232,103	51,439	355,756	160,285,568	443,517,625	10,434,252	11,253,503	2,984,416	3,576,864
Rio de Janeiro	283,579	145,328	426,965	76,730,775	190,017,531	5,857,904	6,320,446	1,801,863	2,146,322
Brasília	257,454	24,496	36,504	46,474,890	149,906,319	2,051,146	2,570,160	547,465	774,922
Manaus	181,308	18,214	72,762	14,094,080	48,435,925	1,405,835	1,802,014	326,837	461,483
Belém	176,346	30,993	193,557	6,464,402	17,998,495	1,280,614	1,393,399	296,195	369,177
Fortaleza	234,210	41,256	109,122	11,146,470	37,130,892	2,141,402	2,452,185	525,991	711,470
Recife	120,476	6,844	102,392	9,811,668	30,176,875	1,422,905	1,537,704	375,857	471,210
Salvador	112,955	18,277	275,593	12,282,966	36,480,991	2,443,107	2,675,656	651,008	860,410
Belo Horizonte	134,157	24,185	87,763	15,688,063	51,467,872	2,238,526	2,375,151	628,334	762,752
Curitiba	35,161	22,439	46,806	16,391,052	53,463,889	1,587,315	1,751,907	470,964	576,211
Goiânia	21,662	8,249	1,066	7,934,265	24,445,668	1,093,007	1,302,001	316,333	423,297
Porto Alegre	164,697	15,278	56,024	16,510,641	42,947,485	1,360,590	1,409,351	440,365	508,813

Note: 1 Real of 2010 = 2.0118 Reais of 2000

To analyse porosity, we used both input variables (to define growth) and output variables. As input variables, we selected population growth (at the level of the metropolitan municipalities, between 2000 and 2010); economic growth (GDP in real terms per head of the population in the metropolitan municipalities); and growth in the number of dwellings (per municipality between 2000 and 2010) (see Table 2.1). This was to provide an insight into the phenomenon of rapid urbanisation. As output variables, we selected the share of segregated houses in slums (the IBGE uses the technical term "subnormal agglomerates") and in gated communities, which is a specific characteristic of porosity in Brazil and is a crucial aspect of porosity. Housing configuration can enhance the negative side of porosity. Moreover, the share of dwellings without a street or number also relates to the social and spatial aspects of porosity mentioned by Walter Benjamin on his visit to Naples in 1924. He refers to the urban labyrinth in which people move around based on less concrete references than a structured numerical system, as in Naples. The high number of dwellings without identification or street names gives a strong signal of how residents interact with their neighbourhood. Even though other aspects of the social perspective of urban porosity could be taken into account, this is fundamental to highlighting the difficulty of having comparable social data that relates to spatial issues from various metropolises. In that sense, the research includes data on dwellings without identification because it was one of the indicators measured using the same criteria in a different metropolitan context in the 2010 Brazilian national census. Moreover, the output porosity index creates an opportunity for further improvement using data from other social dimensions of porosity.

TABLE 2.2 Porosity Index (based on IBGE census data)

Metropolis	Population growth (2000-2010)	Real GDP growth per head (2000-2010)	Dwellings growth (2000-2010)	Growth as input for porosity	Houses in Gated Communities	Houses in slums	Dwellings without street/ number identification	Output Porosity
	a	b	c	(a+b+c)/3	c	d	e	(c+d+e)/3
São Paulo	0.08	0.28	0.20	0.16	0.01	0.10	0.06	0.06
Rio de Janeiro	0.08	0.14	0.19	0.11	0.07	0.20	0.13	0.13
Brasília	0.25	0.28	0.42	0.23	0.03	0.05	0.33	0.14
Manaus	0.28	0.33	0.41	0.25	0.04	0.16	0.39	0.20
Belém	0.09	0.27	0.25	0.17	0.08	0.52	0.48	0.36
Fortaleza	0.15	0.45	0.35	0.27	0.06	0.15	0.33	0.18
Recife	0.08	0.41	0.25	0.22	0.01	0.22	0.26	0.16
Salvador	0.10	0.35	0.32	0.22	0.02	0.32	0.13	0.16
Belo Horizonte	0.06	0.54	0.21	0.25	0.03	0.12	0.18	0.11
Curitiba	0.10	0.47	0.22	0.23	0.04	0.08	0.06	0.06
Goiânia	0.19	0.29	0.34	0.21	0.02	0.00	0.05	0.02
Porto Alegre	0.04	0.25	0.16	0.13	0.03	0.11	0.32	0.15

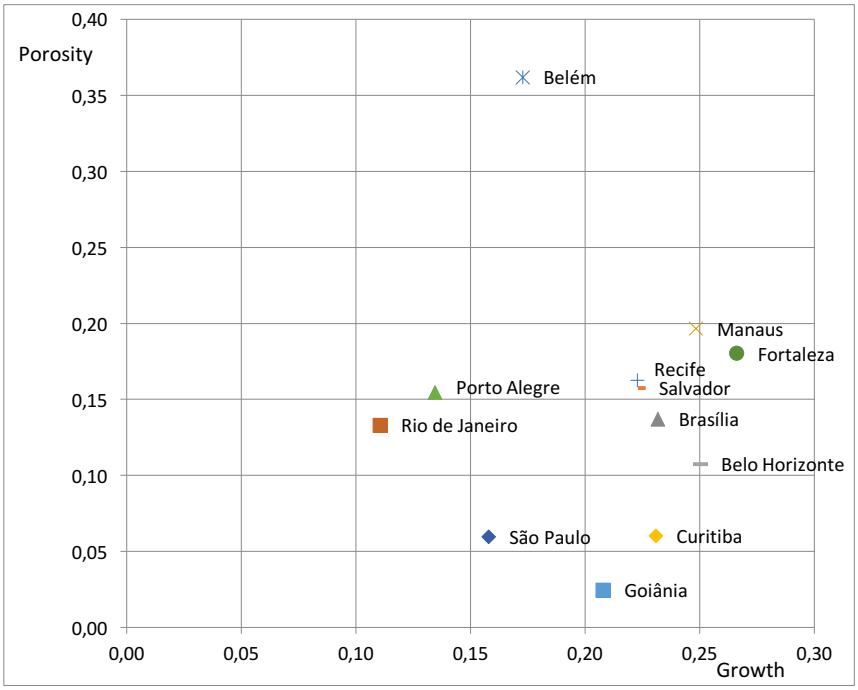

FIGURE 2.2 Porosity index of 12 Brazilian cities

The output porosity value indicates how much these three variables influence the porosity of each metropolis, enabling comparison and critical analysis. The outcomes (Table 2.2 and Figure 2.2) show the distinct position of Belém, scoring highly on porosity because of the occurrence of slums, with over half the city's dwellings considered as part of that category, a number considerably higher than the national average. Furthermore, there is no obvious relationship between growth in the previous ten years and porosity. Although Manaus and Fortaleza had high growth rates, Belo Horizonte, Curitiba, and Goiânia also enjoyed strong growth and rank among the lowest four porosity outputs in the country. This is remarkable because Goiânia, Curitiba, and Belo Horizonte are well-known for their urban planning. Belo Horizonte and Goiânia are planned cities and Curitiba is often cited as one of the most successful examples of urban planning in Brazil. As mentioned, further investigation is indeed required; however, we might speculate that those metropolises perhaps have more proximity with the porosity challenges faced by cities with a well-established planning tradition and do not follow the same patterns of output porosity measured in the index (slums, gated communities, lack of identification). Furthermore, this could also be the case for São Paulo, which used to be the national industrial heartland and, despite several

differences, saw its industries move elsewhere in a process similar to that described by Secchi in European cities.

The porosity index is not directly linked to resilience but keeping in mind the analytical questions that relate to the challenges and opportunities of porosity, the following section will discuss the relationship between resilience and porosity.

§ 2.6 Conclusion and discussion: do spatial discontinuities create opportunities for resilience?

Metaphorically, porosity can be seen as holes in the urban system that may make a system more brittle and more prone to fragmentation, but may equally be seen as enabling and accommodating new flows and uses in the urban system. Are there opportunities for ensuring that urban porosity can be used for the good? This article has sought to understand the influence of porosity on the adaptation of urban society as a whole to various disturbances, even when it is affected by spatial discontinuities. Based on the above analysis, we can conclude that there are several steps to be taken when answering this question.

Firstly, our analysis has shown that each system provides unique porosity conditions in which positive or negative outcomes may occur in terms of resilience, depending on the context. Thus, we can conclude that the local context is crucial in determining how porosity will contribute to the resilience of an urban system. Can we, on the basis of the above analysis, argue that relatively smaller cities such as Porto Alegre and Recife are as resilient as Salvador because they have a similar rate of porosity? Or can we say that Curitiba and Goiânia, both with a lower porosity index, have less opportunity to transform the negative side of porosity into positive aspects and increase their resilience? It is clear that further investigation using local data is required to answer these questions. As mentioned previously, this article is part of a wider research project that will further investigate the phenomenon of urban porosity, especially spatial fragmentation. This deeper analysis will be fundamental in validating the proposed model and identifying the specifics of each metropolis.

Secondly, despite its natural limitation and space for further improvement, the porosity index can serve as an analytical tool with which to assess porosity in a range of contexts to highlight some of the differences between various types of porosity in a distinct metropolitan context. We established this index as an initial case in order to

test whether we could make a sound analysis for understanding Brazilian metropolises. This index, the variables, and the analysis can be developed further by using more data, adding weight to the index, looking for further social aspects, and so on, but our initial result indicates that the porosity index will add to our understanding of the local context of porosity.

Thirdly, we can also assert that the link between porosity and resilience can be established through certain policy instruments. In other words, this link does not exist naturally, but it can be established by viewing it from a territorial governance perspective. An urban system can also be seen from a territorial perspective focusing on physical space and the actions that take place on different plots of land, or from a relational perspective that studies the relationships between diverse agents. We believe that integrating the relational and territorial approaches can provide opportunities to make use of porosity in urban areas. A specific class of relational/territorial mechanisms are land-based self-organising instruments. These instruments provide the potential for resilience since they can both integrate fragmented spaces and communities, while also allowing them the space for self-organisation, flexibility, cohesion, and the potential for change. Examples of these instruments include community land trusts (CLTs), community benefits agreements, joint development projects, land readjustment, interim use, business improvement districts, industrial improvement districts, urban agriculture regulations, and the *cittaslow* strategy. Zones of porosity may provide the space for such instruments, both in terms of the territorial and policy understanding of the term.

We can conclude that porosity provides some treats and some threats at the same time. In order to enhance the positive aspects of porosity and minimise its negative aspects, it is imperative to identify the main challenges posed by porosity in a specific place. Brasília, for example, has an output porosity of 0.14, very close to Rio de Janeiro at 0.13. Nevertheless, they face very different challenges. Brasília's porosity is not due to the large number of slums and gated communities, which create social and spatial disconnection; however, in Rio this is indeed the main challenge of porosity.

Moreover, porosity has a direct impact on resilience, since fragmented urban environments tend also to be more socially disconnected and to respond less efficiently to economic, social and environmental changes. Porosity can increase or undermine the capacity of a metropolis for resilience, depending on whether it constitutes a treat or a threat. In this sense, when used strategically, porosity represents an exceptional opportunity for improving resilience in the built environment.

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MERCADINHO BILL

3 My House, my Fragmented City. The Brazilian Social Housing Programme "Minha Casa, Minha Vida" in the cases of Manaus and Belém

This chapter was submitted as an academic article and is currently under peer-review for a specialised journal. The chapter addresses the influence of the social housing programme Minha Casa, Minha Vida (MCMV) on spatial fragmentation, using the cases of Manaus and Belém (Figure 3.1). The programme is an example of how the urban policies of the federal government can have an impact on spatial fragmentation at the municipal level.

Abstract

This study investigates the relationship between housing policy and spatial fragmentation, specifically in the case of the social housing programme in Brazil called "Minha casa, minha vida"(MCMV - Portuguese for "my house, my life"). As the title of the programme suggests, it aims to improve life quality by increasing housing quality and home ownership, but this article demonstrates that the programme can have a substantial negative impact at the wider urban scale promoting spatial fragmentation. Two case studies are analysed: the cities of Manaus and Belém. The research involved the development of maps using GIS technology crossing data related to spatial fragmentation and the MCMV programme. By creating maps that incorporate these data, it is possible to observe that the MCMV programme is reinforcing existing spatial fragmentation in Manaus and Belém. The article concludes that even though the MCMV social housing programme has had a positive impact on increasing home ownership in the low-income segment, it has also had an adverse impact by reinforcing spatial fragmentation at the city level.

Keywords: Brazilian housing policies; minha casa minha vida; social housing; fragmentation; MCMV; Manaus; Belém

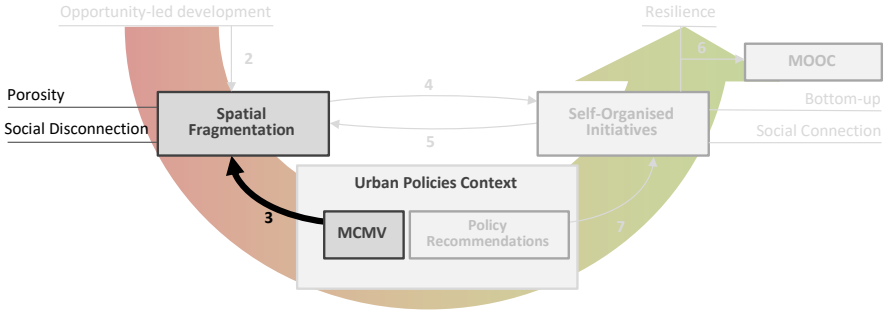

FIGURE 3.1 Conceptual relation of Chapter 3

§ 3.1 Introduction

In 2009, the Federal Government of Brazil started a massive housing programme focusing on the empowerment of those living on lower incomes. The objective of this initiative is to create a comprehensive housing programme with opportunities for the low-income segment to become homeowners paying a low interest rate and living in subsidised housing. To illustrate the scale of the "Minha casa, minha vida" programme (MCMV), €66.6 billion was invested between 2009 and 2015 to construct 3.96 million dwellings in 5,336 different municipalities (Government, 2015).

The research investigates the extent to which the MCMV programme is reinforcing existing spatial fragmentation in Manaus and Belém. With the aim of better understanding the municipal-level implications of comprehensive housing policies applied at the federal level, such as the MCMV programme, the article reveals how the Brazilian MCMV housing programme is intertwined with market dynamics and how this is contributing to spatial fragmentation.

GIS maps were used to display the relationship between spatial fragmentation and the developmental pattern of MCMV dwellings. Even though the MCMV programme is not a traditional urban planning measure initiated by municipal governments, this massive federal-level housing policy is having a significant impact on urban dynamics at the municipal level, and this can be seen on the maps generated.

The phenomenon of fragmentation, when analysed in housing studies, has mainly been viewed through a socio-economic lens as synonymous with inequality and as symptomatic of social fragmentation (Van Kempen, Schutjens, & Van Weesep, 2000). Accordingly, the effects of housing policy on social fragmentation have been researched extensively (Bentham, 1986; Hamnett, 1984; Murie & Priemus, 1994; Robinson, O'Sullivan, & Le Grand, 1985), but its interaction with spatial fragmentation has been largely overlooked. In this sense, because of its massive scale, the MCMV programme offers an opportunity to discover how a single housing policy can interact with spatial fragmentation at the municipal level.

With this in mind, by creating maps that combine data from the Brazilian Institute of Geography and Statistics (IBGE), from the Observatory of the Metropolises (OM), and from the Brazilian Ministry of Cities, this article analyses the effects of federal housing policy in built environments that are already spatially fragmented. Besides the two case studies presented here, the same methodology could be applied to other Brazilian cities where data is available.

The two cities were selected based on the porosity index of chapter 2, which was developed as an analytical tool to compare how porosity is related to growth in different urban centres (ibid). Porosity can serve as a metaphor to describe these threshold areas in a discontinuous metropolitan context, and is particularly common in Brazilian cities. When applied to Brazil's urban context, the porosity index takes into account the number of gated communities and slums areas. In this sense, as used in this article, a high porosity index is also understood as an indication of spatial fragmentation. Since Belém and Manaus had the highest porosity index of the 12 metropolises analysed, these two cities were chosen for further study regarding the MCMV program.

Since spatial fragmentation is an extremely common phenomenon in Brazilian cities, it is vital to understand how housing policies may impact on it. In this regard, maps can help to illustrate how fragmentation and the MCMV programme interact in spatial terms in a single urban area. The GIS maps produced for this article provide a tool with which to analyse the distribution pattern of the MCMV dwellings. This paper is divided into five sections. After the introduction, the theoretical framework will be presented, in which the main concepts are defined and discussed. The third section presents the methodology and discusses how the data were used. The fourth section analyses the maps of Manaus and Belém generated with these data. And lastly, the conclusion discusses the insights gained from these maps and introduces some possible subjects for further research.

§ 3.2 Spatial fragmentation in Brazilian cities

Brazilian cities face issues of inequality and segregation in relation to housing policies (Fahlberg & Vicino, 2016; Marques & Saraiva, 2017; Perlman, 2010; Rolnik, Iacovini, & Klintowitz, 2014; Vilaça, 2011). These matters of inequality and segregation also relates to issues of connectivity between different areas of the built environment, which is commonly referred as fragmentation in Latin American cities (Bocarejo, Portilla, & Meléndez, 2016; Calquin, Farris, & Patuelli, 2017). Next to connectivity, Bayón and Saraví (2013) develops on the cultural urban fragmentation in Mexico City. The work of Carrière and De la Mora (2014) studies not only what Brazilian spatial fragmentation is, but also the relation between public policies and spatial fragmentation focused in the city of Recife and on the concept of a "socio-spatial fragmentation".

Despite the different perspective on spatial fragmentation on Latin American cities, fragmentation suggests an unequal spatial identity in the built environment. For example, the built environment may develop in different forms, accumulating different patterns and infrastructure in the same physical area. In other words, development does not occur in an equal way in all areas (Santos & Dias, 1982). Within the same urban context, thus, it is possible to observe people living in modern skyscrapers while others live in dwellings that are more reminiscent of the infrastructure of the sixteenth century. Here spatial configuration and fragmentation are linked. Santos has analysed the spatial organisation of São Paulo as a collection of different fragments (1990). This approach served as a basis for further research by Balbo and Navez-Bouchanine in their case-study on Rabat-Salé in Morocco. These authors define fragmentation as a characteristic of most cities in developing countries, which contrasts with the orderly space of the developed north. In the words of the Balbo and Navez-Bouchanine:

[...] the city of the developing countries shows a distinct spatial pattern characterized by the variety of the physical environment or the fragmentation of urban space. From an aerial view, most Third World cities appear as a complex mosaic where the various pieces are assembled according to a logic entirely different from the one that of the rational and efficient industrial city model. (Balbo & Navez-Bouchanine, 1995, p.573)

Fragmentation is thus viewed as the sum of autonomous elements, as opposed to segmentation, where distinct elements make up a homogenous whole (Balbo & Navez-Bouchanine, 1995). Identifying the difference between fragmentation and segmentation depends on the autonomous capacity of the various areas of a city. In this sense, it is more logical to identify metropolitan areas with a high number of slums and gated communities as fragmented systems, rather than segmented systems. In this article, the term fragmentation includes not only the difference in the spatial

characteristics of distinct areas of a city, but also the lack of connection between those areas: the lack of interdependency. Fragmentation therefore involves more than just diversity within an urban system. The diverse urban patchwork of Brazilian cities is based not only on the spatial disconnection between autonomous areas, but also on the systematic inequality that is found in Brazil. Marques and Saraiva (2017) have shown that not only the population living in informal settlements have grown in Brazilian metropolises, but they have also become more unequal.

This article uses the notion of spatial inequality to refer to the difference in the spatial configuration of distinct areas and how this impacts on the wellbeing of the city's population. Thus, spatial inequality is not the antonym of spatial similitude, is not about a lack of homogeneity; rather, it is related to how different parts of the built environment influence access to opportunities and services. This perspective is in line with that of Keeling (2015), Bocarejo and Oviedo (2012), and Câmara and Banister (1993), who use the concept of space as a variable that can generate different levels of access to services.

The notion of variations in access to services brings us back to the fundamental concept of a fragmented space, as described by Balbo & Navez-Bouchanine (1995) – namely that spaces are not only different but also autonomous. The presence of extreme variations in access to basics services, such as garbage collection, electricity or sewage, can mean that in some cases these services must be provided autonomously. In this sense, in Brazilian metropolises, spatial inequality can be a driving force towards fragmentation.

The reasons why spatial fragmentation has emerged are not the main focus of this article; however, it is important to explain the underlying forces behind this phenomenon. According to Steel et al. (2017) talk about a speculative urbanism in the Global South, where real state, speculation and gentrification generates this complex urban patchwork. In line with this, Taşan-Kok (2004), in an opportunity-led environment, the realisation of projects is strongly dependent on the quality of institutional relationships and market conditions. The mosaic of parts described by Balbo and Navez-Bouchanine is also the result of the interaction between Brazilian public institutions and market forces. While some parts of the metropolitan mosaic have developed and benefited from public and private investment, others parts have received limited financial resources or have been ignored by private and public actors completely. This opportunity-led logic, or speculative urbanism, seem to be one of the driving forces behind the fragmentation mentioned by Santos. This interaction between Brazilian public institutions and market forces not only shapes the land development in Brazil, but also the MCMV social housing programme, as will be explained.

It is important to clarify at this point that the MCMV programme is understood here as the concretisation of what we refer to as "housing policy". This corresponds to Alex Schwartz's "broad view on housing policy, focusing not only on specific housing subsidy program, such as public housing, but also on the federal income tax code and regulations affecting mortgage lending, land use decisions, real estate transactions, and other activities integral to the housing market." (Schwartz, 2015, p. 1). In this sense, even though the Brazilian federal government does not fund or construct the dwellings itself, the MCMV subsidised lending scheme, which involves a public bank and private companies, is currently the most comprehensive housing policy in the country.

§ 3.3 The Minha Casa, Minha Vida programme

According to the report from Fundação Pinheiro (Pinheiro, 2013), in 2010 there was a deficit of 6,490,000 dwellings in Brazil, corresponding to 12.1% of the total number of dwellings in the country. The MCMV is a social housing programme launched by the Brazilian Federal administration in 2009 with the aim of reducing this housing shortage. The government is not itself responsible for constructing the dwellings, but it provides financial resources through lending arrangements provided by a public bank (Caixa Econômica Federal). Those living on low incomes can access subsidised loans to buy their own home built by private developers. These loans are subsidised and instalments are limited to 5% of the borrower's income, enabling the beneficiaries to become homeowners.[1] This structure is used by the government to target those living on low incomes with a comprehensive housing policy (Brazilian Federal Government, 2015), without having to construct the dwellings itself or interfere with the agenda of individual municipalities. It is a social housing financing scheme that does not fit the standard ones seen in Europe or in the United States (Klink & Denaldi, 2014).

By 2015, the programme had reached 5,336 municipalities out of a total of 5,570, which means that 95.79% of the Brazilian municipalities have benefited from the MCMV fund. Nevertheless, the downside of such a comprehensive programme is that government loses its control in the sense that it cannot define strategically where and

1 The study is based on the "faixa 1" part of the MCMV programme, which focuses on the low-income population, families earning up to R$1,600.00 (around €400), and which is financed by the Federal Government Fund (Orçamento Geral da União).

which social housing is to be developed, and is reliant on the private sector and market dynamics to provide these new homes. The research from Campos and Guilhoto (2017) also shows that the socioeconomic impact also depends on the typology of the chosen dwelling. This market approach is not necessary problematic, but in a fragmented urban context it can reinforce the opportunity-led development that is already taking place.

The Institute for Applied Economic Research (IPEA), a research institute of the Brazilian Federal Government, has studied the effectiveness of the MCMV programme in reducing the country's housing shortage (Neto, Krause, & Furtado, 2015). Even though it recognises that the MCMV has reduced the mismatch between supply and demand for affordable housing in the low-income sector, the IPEA suggests that much still needs to be done regarding the location of the dwellings provided by the programme:

"MCMV's operation has shown difficulty in finding well located and affordable land plots, so we suggest a further discussion of location within the program and the inclusion of criteria for the use of additional resources, in order to get better housing solutions in the metropolitan scale." (Neto et al., 2015, p.6)

The location of MCMV dwellings is a problem pointed out not only by the IPEA, but also by the Brazilian Ministry of Cities itself, which as early as 2010 published a seventy-page guideline document entitled "How to produce well-located housing using resources from the MCMV programme"? (Rolnik, 2010).

Adauto Lúcio Cardoso and Luciana Corrêa do Lago in "O Programa Minha Casa Minha Vida e seus Efeitos Territoriais" (2013) completed various case studies concerning the territorial effects of the MCMV programme, including in the metropolitan region of Belém. Nevertheless, the two chapters in the book about Belém, by Mercês (2013) and Lima et al. (2013), focus more on metropolitan dynamics rather than on the municipality of Belém itself. It is important to highlight that at the time these chapters were published, not a single MCMV development in Belém had occurred for the low-income segment. In this sense, now that 9,634 dwellings in the municipality of Belém and 12,779 in Manaus have been constructed, it is important to reflect on the as yet unclear relationship between current housing policy and spatial fragmentation.

§ 3.4 Assessing fragmentation and the MCMV programme using maps - Methodology

In contrast with Mercês (2013), Lima et al. (2013) and most of the articles in the book edited by Cardozo (2013), this study is based on the creation and analysis of maps. Even though tables and charts constitute an important database for scientific analysis, the maps provide a distinct perspective, enabling us to focus on the spatial distribution and interaction of the MCMV programme with fragmentation. The maps provide a visual representation of the spatial distribution of the variables that we address in this article.

Nevertheless, mapping the spatial implications of broad public policies has its limitations and challenges. The work of Evers and Tennekes (2016) on mapping the spatial impact of broader policies demonstrates the problems that are faced here. Mapping is, by nature, a reductionist representation of a given reality and in this sense will always be a limited, distorted and superficial view of that reality. In this respect, the methodology could be criticised for not including all the underlying forces that promote spatial fragmentation; however, the attempt to visualise the interaction of this comprehensive housing policy with spatial fragmentation remains valuable. It is important at this point to clarify that unlike the work of Even and Tennekes, this research focuses on only one policy – the Minha Casa, Minha Vida programme – so the problems arising from overlaying multiple policies simultaneously do not apply. Nevertheless, this does not mean that the map could not be improved with additional data. Since some MCMV developments cover a significant area, it would be interesting, for example, to include data on the positioning of each dwelling within the developments and not only the positioning the development itself, as has been done here.

In order to grasp the structure of fragmentation, as mentioned previously this research uses IBGE data on informal settlements.[2] The IBGE uses the term aglomerado subnormal (subnormal agglomeration) to define those areas that are popularly known as favelas (slums), and introduced the following objective definition of an informal settlement for the 2010 census: a "group made up of 51 dwellings or more that have no property titles and have at least one of the following characteristics: irregularity of access routes, the shape or on the size of the plots, and a lack of essential public services - for example, garbage collection, sewage network, water network, electricity and street lighting" (IBGE, 2010).[3]

2 The work of Kovacic and Giampietro (2016) addresses how the term "informal settlement" is used and quantified in different contexts, including IBGE's definition.

3 This article uses IBGE's *aglomerado subnormal* as the definition of informal settlement.

The term 'informal settlement', as used in this article, is based on this definition of subnormal agglomerations used by the IBGE. On the one hand, the IBGE's definition focuses on spatial and physical aspects, which are insufficient to understanding the dynamics of social inequality, power struggles or other societal challenges (Kovacic & Giampietro, 2016). Nevertheless, it is important to explore this definition in detail in order to understand how informal settlements relate to fragmentation. The IBGE definition of informal settlement mentions groups of 51 dwellings or more without property title, which characterises a collective structure outside the legal framework provided by the state. The group aspect is emphasised, since the definition focuses on collective capacity and ignores the possibility of individual dwellings without property titles. This is not only a collective deviation from the formal urban structure, but also a strong signal of a parallel legal framework. Returning to Balbo and Navez-Bouchanine's fragmentation concept, which recalls not only the urban system as the sum of distinct elements but also the capacity for autonomy between them, the link between informal settlements and fragmentation starts to become sharper, since informal settlements have this autonomous characteristic. Moreover, according to the IBGE, as well as being outside the legal ownership umbrella, informal settlements are not covered by the network of essential public services either. This can also be understood as another autonomous capacity. Informal settlements are still able to receive these essential services, but they are required to provide them autonomously, creating an additional network of services in parallel to the public networks. In this sense, based not only on the variety of the urban mosaic, but also on the autonomous characteristic of each element, we assume that areas denominated as informal settlements according to the IBGE definition are extremely illustrative of the spatial fragmentation in Brazilian metropolises. It is not the aim of this research to dive into how autonomous these informal settlements are; however, it is evident that since they lie in a parallel legal structure and need to provide basic service to themselves, they are intrinsically more autonomous than dwellings on legal parcels.

The research accessed the shape files of informal settlements in the metropolitan areas of Manaus and Belém. Shape files are extremely useful in GIS software, because they give the precise geographical position and shape of each informal settlement. The shape files provided by the IBGE were analysed using GIS software to isolate data in different layers.

Additionally, this article uses data from the Observatory of the Metropolises regarding urban wellbeing to establish differences in access to urban services. The Observatory of the Metropolises has developed an index called the Índice de Bem-estar Urbano (Urban Wellbeing Index) or IBEU (Ribeiro & Ribeiro, 2013), which includes detailed data from Brazil's 15 major urban areas. The IBEU includes information on five dimensions: urban mobility, urban environmental condition, urban habitation condition, urban

infrastructure, and the collective urban services provided. It is a valuable resource when seeking to understand spatial inequalities at the neighbourhood level, because it is a comprehensive survey that combines into a single index not only spatial differences, but also the capacity to access services. The index ranges from 0 to 1, with 0 indicating the lowest level of wellbeing and 1 the highest. Moreover, the presence of informal settlements was one of the variables taken into account to produce the IBEU index. Nevertheless, since the IBEU index is the result of the sum of numerous variables in the five distinct dimensions, it is interesting to observe how informal settlements, as a fragmentation factor, relate to the final outcome of the index.

Spatial inequality is a relative notion rather than an absolute one. Accordingly, the concept used by the IBEU evaluates the built environment in terms of a relative index based on a comparative spatial analysis of the 15 areas studied. Like the informal settlement data from the IBGE, the IBEU data was also publicly available in a shape file format. The strategy described previously was also applied here and the IBEU data were placed in a different layer of the same ArcGIS file. The research uses the overlap of the data, IBGE's informal settlements and OM's IBEU, in order to produce maps that illustrate spatial fragmentation visually.

The data regarding the programme "Minha Casa, Minha Vida" was provided by the Ministry of Cities of Brazil (Cidades, 2016) and includes the location and number of dwellings financed through the programme. This information was entered into the GIS software together with the previously mentioned data on fragmentation. The MCMV programme is a new factor in relation to fragmentation. They started building MCMV homes in Manaus in 2012 and Belém in 2013. Since maps can measure the spatial implications of public policies within a given timeframe (Dmowska & Stepinski, 2016), this article focuses on the period between the IBEU data on fragmentation in 2010, when there were no MCMV developments, and the 2015 data from the Ministry of Cities on the location of the MCMV developments. In this sense, the MCMV is a new factor regarding spatial fragmentation in both metropolises.

Despite natural particularities, Manaus and Belém have a similar historical background and have gone through similar processes of urban development. The Portuguese founded both cities in the seventeenth century, and they both have a historical centre. They are both located on the Amazon and served as strategic points for trade and defence during the colonial era. They were both affected by the boom and decline in rubber production in the first half of the twentieth century, which had strong implications for the city's built environments. They have also seen robust population growth over the last 50 years, and now have a similar population of around 2 million residents. Moreover, they have similar climatic conditions and similar connections to other Brazilian urban centres (IBGE, 2008). Nevertheless, the spatial configuration

of both metropolises is quite different today, with very distinct fragmentation structure (figures 3.2 and 3.3). Primarily, Belém has a greater challenge with informal settlements than Manaus (Pessoa et al., 2016). This challenge involves the number of informal settlements, and their more complex distribution within the municipality.

Regarding the MCMV programme, this originated as an anti-crisis response (Adauto Lúcio Cardoso & Aragão, 2013). Ironically, the 2008 crisis, which was triggered by the US real estate market, was tackled in Brazil with massive public investment in the real estate market. Both municipalities have benefited from the programme, but they differ its implementation. In Manaus, the municipality took a leading role in attracting investment quickly began what would become the biggest MCMV development in the country. In Belém, due to the city's metropolitan dynamics, neighbouring municipalities started developing MCMV dwellings before Belém, mainly due to the lower price of land on the periphery of the metropolitan region. While the MCMV dwellings are concentrated largely in massive developments in northern areas of Manaus, in Belém they have taken the form of smaller developments. Both cases will be further analysed in the next section.

§ 3.5 Results in Manaus

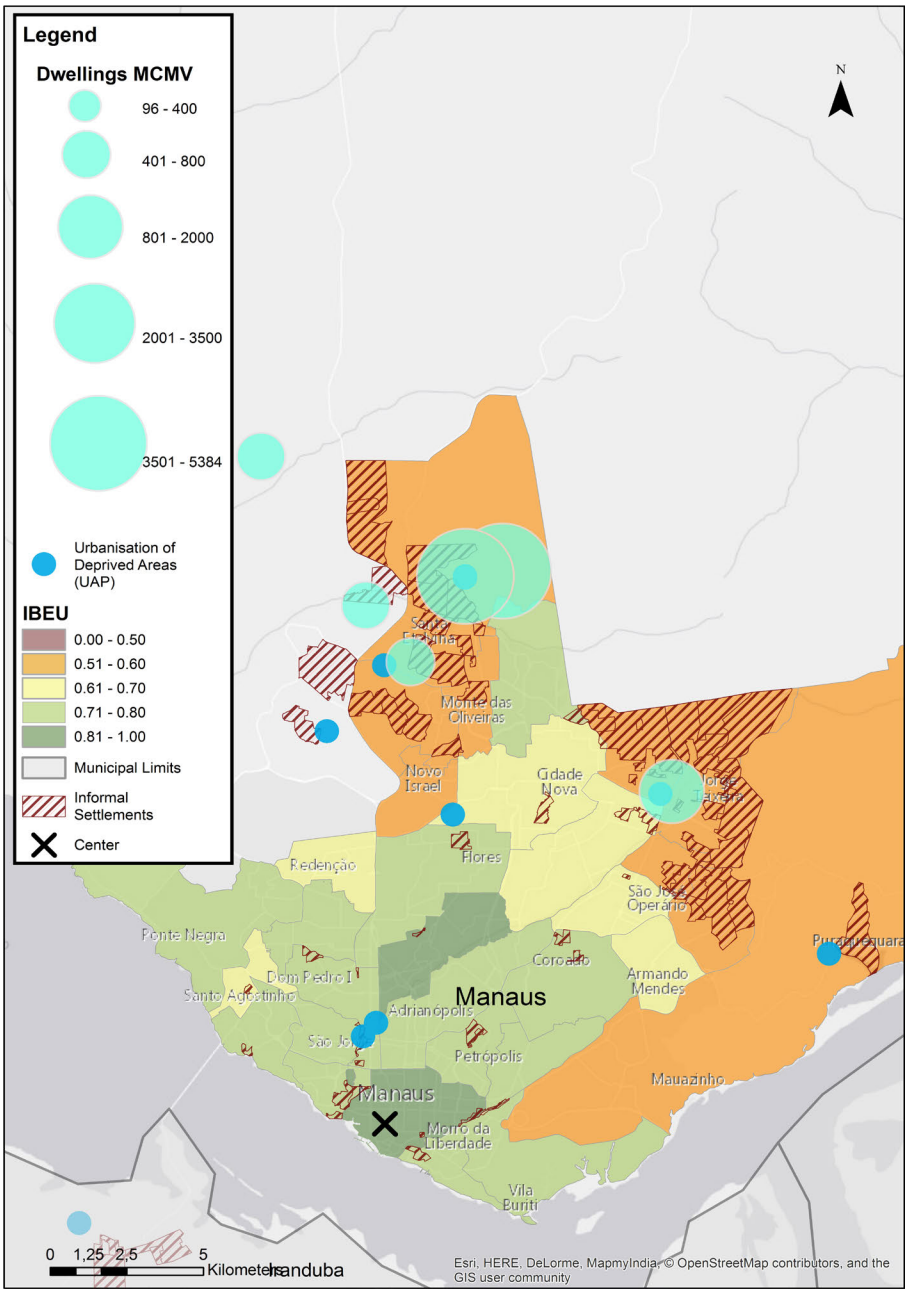

FIGURE 3.2 Map of fragmentation in Manaus and the MCMV programme

The data on informal settlements and urban wellbeing (IBEU) for Manaus reveals that spatial fragmentation follows a clear polar structure with the historical centre as the central pole. The historical city centre as a highly valued urban environment is not a common phenomenon in contemporary Brazilian metropolises, where many historical city centres tend to be affected by urban decay as new developments focus on suburban areas, creating a more complex and multipolar system. By contrast, Manaus consists of an extreme central/periphery system.

The peripheral zones include large areas of informal settlements, especially in the northern and eastern neighbourhoods, while the informal settlements in more central areas are relatively small and dispersed. There is an unequal relationship between the size of informal settlements in the periphery and in the central area. In this regard, it can be argued that the informal settlements in the peripheral areas are more autonomous, since they occupy a larger area and are concentrated mainly in two regions to the north and east of the city, while the central settlements are more connected to the services and municipal infrastructure. Meanwhile, the smaller informal settlements in the central area are more disconnected from each other and in that sense less autonomous. At the same time, the smaller informal settlements in the central area suffer less from lower spatial inequality compared to those in the north and in the east, since they are located in areas that score high on well-being (IBEU). Even though the central neighbourhoods differ on the IBEU index, almost all informal settlements in the city centre are located in areas with an IBEU of above 0.7.

The peripheral areas are also the areas with the lowest IBEU scores. In Manaus, besides the city centre, there is only one neighbourhood with an IBEU value above 0.8. Again, this reinforces the polar structure of the city, which is reflected in the spatial inequality data (Nery, 2014).

Overlapping the two data sets provides the opportunity to graphically observe the relation between spatial inequality and fragmentation. It becomes visually clear that neighbourhoods with intense fragmentation usually have high spatial inequality. Fragmentation and spatial inequality generally coincide in Manaus. Nonetheless, it would be premature at this point to state how they may influence one another. What can be inferred from the map is that fragmentation in Manaus coincides remarkably closely with spatial inequality.

§ 3.6 The effect of the MCMV programme on fragmentation in Manaus

Regarding how the MCMV relates to this fragmented and unequal context, the map reveals the following. Firstly, it shows that the social housing programme in Manaus is basically limited to areas with a low IBEU. This is a reflection of economic dynamics, since those areas with lower urban wellbeing tend to have cheaper land. Cheaper land offers greater profit margins for developers, since the amount paid by the government is fixed per each house built. Assuming that the development of a new housing complex has a positive impact on the wellbeing of its neighbourhood, the MCMV programme might reduce inequalities since it is introducing development into areas with a low IBEU. However, the map in figure 3.2 reveals that the MCMV social housing programme is strictly related to land market dynamics and it merely reinforces the previous market structure rather than changing it. To confirm this, map 1 shows that the MCMV developments have not incorporated informal settlements but have been developed in proximity to them. This perpetuates the isolation, autonomy and lack of access to services and opportunities. Additionally, analysing the geographic position of each MCMV development, it is possible to observe how disconnected these areas are. In table 3.1 we can see that even the closest MCMV dwelling is a 90-minute commute from the city centre.[4] This shows how disconnected these communities are from the services and opportunities that are available in the city centre. Alternatively, this time is reduced to 36 minutes if the same journey is made by car, which is a great incentive to MCMV house owners to opt for this mean of transportation. However, since the programme focuses on the low-income segment, car ownership may not be an option for most residents.

TABLE 3.1 MCMV Dwellings in Manaus

Total number of MCMV dwellings in Manaus: 12,779	Minimum	Maximum	Mean
Journey time to the city centre by public transport (minutes)	90.0	189.0	110.209
Journey time to the city centre by car (minutes)	36.0	50.0	40.596
Distance to the city centre (kilometres)	18.3	26.4	22.368

4 The time travelled was based on the estimation provided by google maps on at off-peak hours (12:00) by car and by public transport.

Additionally, no MCMV developments have taken place in those areas with informal settlements closer to the city centre. The development of social housing programmes in those deprived areas closed to the city centre would have a greater impact on reducing fragmentation, since they would not add to urban sprawl, would have less impact on the transportation system and would increase the interdependence between these areas. In this sense, the map in figure 3.2 demonstrates the limits of the MCMV social housing programme in Manaus. The existing fragmentation created by opportunity-led development is clearly being reinforced, since the MCMV programme operates within the same market structure and does not incorporate informal settlements that have a lower market value. It is therefore extending the same existing logic to suburban areas of Manaus.

Furthermore, even though it could be argued that since the MCMV developments are located in areas with a lower IBEU, the programme could be reducing spatial inequality; however, it is still not clear how the MCMV could effectively improve urban wellbeing, since it tackles only one dimension of the IBEU index: housing quality. The impact of the MCMV programme on other aspects such as transportation, security, sewage and garbage collection, among others, is still unclear. Many locations where the program is developed have poor public services. Thus, even the possible positive outcome of the MCMV programme of reducing fragmentation through the improvement of the local wellbeing depends on more comprehensive policies and this has yet to be confirmed.

Fragmentation in Manaus is caused by informal settlements and the spatial inequality reflected in the IBEU data; however, it can be observed that the MCMV programme does not tackle the informal settlements issue effectively, since the social housing programme is limited to areas with a lower IBEU; and informal settlements in areas where the urban wellbeing is higher are completely left out of the MCMV logic and spatial fragmentation closer to the city centre is not addressed by the MCMV programme.

The map also reveals that the private companies involved in the MCMV programme in Manaus aim for economies of scale and focus on larger projects rather than smaller ones. Once again, this is a market-driven phenomenon that reinforces existing opportunity-led development in Manaus and thus perpetuates the same logic that produced existing spatial fragmentation in Manaus: opportunity-led development.

One possibility for improving the dwelling conditions of areas not covered by the market logic of the MCMV programme would be to apply to the federal fund for the Renewal/Urbanization of Deprived Areas (UAP – Portuguese acronym for "urbanização

de áreas precárias").[5] This data was added to the map as a reference to highlight the differences between the location of the MCMV programme and the areas subject to this comprehensive urban policy that is unrelated to market forces. The application of the UAP fund is conducted by the municipality, which applies for this funding from the federal government. If granted, the municipality earns the freedom to use it directly in areas of its own choosing. The UAP was used here as a base for comparison, since it is also federal-level funding to be used for urban infrastructure improvements; however, it does not rely on market dynamics. The location of the blue dots on map 1 reveals that unlike the MCMV programme, the UAP improvements are not limited to those areas with a low IBEU or peripheral informal settlements. It is natural that UAP funds are targeted on areas of low urban wellbeing, where the majority of the informal settlements are; however, these resources can be used more strategically and also incorporate smaller isolated pockets with a high IBEU. In this sense, the UAP could provide an important counterbalance for the market dynamics that drive the MCMV programme.

5 The data is public and can be accessed on the webpage of the Ministry of Cities: http://cidades.gov.br/habitacao-cidades/progrmas-e-acoes-snh/67-snh-secretaria-nacional/programas-e-acoes/122-programa-urbanizacao-regularizacao-e-integracao-de-assentamentos-precarios - last access on 23/04/2019
And on the webpage of Brazilian Geo-space data: http://www.visualizador.inde.gov.br/ - last access on 23/04/2019

§ 3.7 Results in Belém

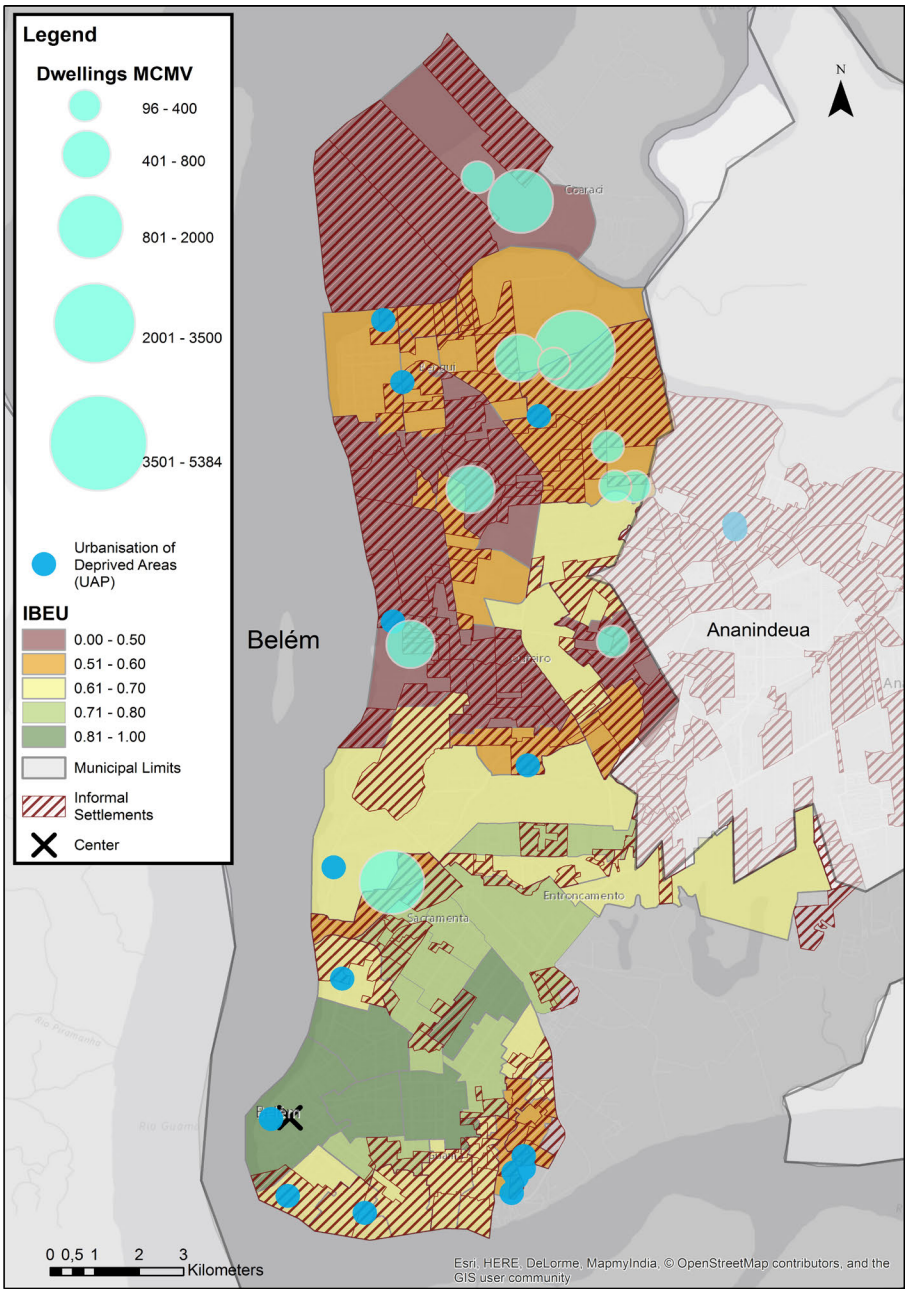

FIGURE 3.3 Map of fragmentation in Belém and the MCMV programme

The map of Belém that was generated demonstrates a more complex urban configuration compared to Manaus. Firstly, there is considerably more fragmentation in Belém, which can be seen by the large number of informal settlements. More than 50% of dwellings in Belém are situated in informal settlement areas, which has a significant impact on its urban system. Secondly, spatial inequality is also higher in Belém. There are vast areas with an IBEU of less than 0.5, while there is not a single such neighbourhood in this category in Manaus. Thirdly, the influence of the historical city centre is not as straightforward as in Manaus. There are large areas of informal settlements around the city centre, and also neighbourhoods with a low IBEU. Fourthly is the greater influence of adjacent municipalities. While the Manaus urban zone is more detached from neighbouring cities, Belém has a contiguous urban connection with Ananindeua and Marituba towards the East.

Regarding informal settlements, Belém has the highest ratio of dwellings in informal settlements of all twelve of the Brazilian metropolises. The fragmentation is so extreme that it is possible to argue that this informal parallel structure overweights the formal official structure. This is an inversion of the logic we would expect from the terms formal and informal, as if living in an informal settlement (subnormal agglomeration) was more "normal" than actually living in a formal settlement. This informal structure is evident in large areas of the city, from north to south.

When spatial inequality is analysed separately, the severity of the situation is clear. As mentioned previously, Belém has large neighbourhoods with an extremely low IBEU. These are concentrated in the northern and middle sections of the city. The concentration of low IBEU areas in the north indicates isolation and a wider problematic zone. However, it is not the aim of this article to analyse the IBEU data alone. The Observatory of the Metropolises' report on Belém's IBEU (Ponte, Lima, Cardoso, & Rodrigues, 2014) can be accessed for further information on this issue.

§ 3.8 The effect of the MCMV programme on fragmentation in Belém

The overlap between the fragmentation information and the MCMV data (figure 3.3) shows that the location of the MCMV dwellings in Belém also follows market dynamics and therefore reinforces spatial fragmentation. Even though the social housing programme here has not followed economies of scale and is more dispersed, there is not a single MCMV development in an area with a medium (0.6-0.7) or higher IBEU. Fragmentation in Belém is complex and diffuse, but the MCMV initiatives are

concentrated in the northern areas with a low IBEU, which shows the limits of the programme. The only MCMV initiative closer to the city centre[6] is located in a low IBEU area and was developed by accident. The area was occupied by squatters, which resulted in an MCMV project after a long negotiation between the municipality and the owners of the land. The squatters were removed, but the area was handed over to developers to implement an MCMV dwelling complex.

Although there are more MCMV developments closer to the city centre than in Manaus, the average of journey time from a MCMV dwelling is still high (table 3.2). Relying on the public transport system, a MCMV resident takes an average of 67 minutes to reach the city centre.[7] Even with a lower average journey time than Manaus, the access to services and opportunities for these communities is compromised, which reveals once again an exacerbation of the fragmentation of the urban environment.

TABLE 3.2 MCMV Dwellings in Belém

Total number of MCMV dwellings in Belém: 9634	Minimum	Maximum	Mean
Journey time to the city centre by public transport (minutes)	32.0	97.0	67.127
Journey time to the city centre by car (minutes)	20.0	87.0	49.205
Distance to the city centre (kilometres)	7.0	66.7	24.591

In the case of Belém, there is a sizeable area of informal settlement close to the historical city centre, which has a high IBEU, but these areas were not considered for MCMV development. As in Manaus, the fragmented spaces near the city centre of Belém fell outside the market logic that dominates the MCMV programme, and as in Manaus, the locational limitations of the MCMV programme are clear. In addition to failing to connect fragmented spaces in the central area, the MCMV is also pushing the logic of fragmentation into the periphery of the city, increasing urban sprawl according to the same opportunity-led logic that has traditionally led to spatial fragmentation.

When we compare the UAP initiatives, it becomes clear that there are also dwellings close to the city centre that are in a precarious condition and could benefit from social housing initiatives. In figure 3.3, it is clear that there are more UAP initiatives in the

6 This refers to the development called "Res Viver Val de Cans".

7 The time travelled was based on the estimation provided by google maps on at off-peak hours (12:00) by car and by public transport.

city centre than in the northern periphery. As seen in the case of Manaus, the UAP fund could be used as a strategic tool to counterbalance the opportunity-led development present in the MCMV, which reinforces the spatial fragmentation of Belém.

§ 3.9 Conclusions and comparative analysis

Unlike the traditional procedure used to analyse fragmentation on the basis of socio-economic characteristics (Van Kempen et al., 2000) or on the lack of connectivity between different areas of the city (Bocarejo et al., 2016), this article has taken an approach that delves into the complex relationship between social and spatial fragmentation at the city level by focusing on the territorial impact of housing programmes such as the MCMV. As a massive social housing programme, the MCMV programme was an opportunity to address the issue of fragmentation on a more comprehensive scale. The two maps generated using different dimensions of fragmentation and data from the MCMV programme in Manaus and Belém have shed some light on this topic. The MCMV programme is clearly reinforcing existing spatial fragmentation in Manaus and Belém by accelerating urban sprawl based on its strongly market-driven implementation. It has been possible to display the locational consequences of a social housing programme based on market dynamics. Such programmes are notorious for exacerbating spatial fragmentation in Brazilian urban areas.

The result of the territorial displacement of a social housing programme that follows a strict market logic can be observed in Table 3.3, which shows that the average journey time of an MCMV resident in Manaus and Belém to reach the city centre off-peak hours is 91 minutes. The capacity of such a programme to generate access to the opportunities and services in the city centre is very limited, reinforcing the isolation and the autonomous capacity of these communities, as well as the spatial fragmentation of the cities as a whole.

TABLE 3.3 MCMV Dwellings in Manaus and Belém

Total number of MCMV dwellings in Manaus and Belém: 22,413	Minimum	Maximum	Mean
Journey time to the city centre by public transport (minutes)	32.0	189.0	91.96
Journey time to the city centre by car (minutes)	20.0	87.0	44.30
Distance to the city centre (kilometres)	7.0	66.7	23.32

The approach to social housing taken by the federal government is also fragmented in itself. The maps show that the MCMV programme limits its development to areas with low urban wellbeing, which is not necessarily a bad approach provided the local scale is observed. Assuming that the MCMV programme improves housing conditions in areas where it is implemented, this could benefit areas of low wellbeing and ease spatial inequality (one aspect of spatial fragmentation in Brazilian metropolises). Nevertheless, at the municipality level we can observe the negative influence of the MCMV programme on spatial fragmentation in the city as a whole. These maps show that the implementation of the MCMV programme at the city level is problematic, since it is limited to areas of low urban wellbeing at the periphery, creating a renewed move towards fragmentation. Additionally, since the MCMV follows market dynamics, it reinforces the speculative urbanism, pointed out by Steel et al. (2017), in areas where the programme is implemented. In this sense, even though the MCMV programme may ease spatial inequality, its implementation is more problematic than a preliminary analysis would suggest. Since the MCMV programme is relatively new, more time will be needed for further data to be produced and research to be conducted on this matter. Nevertheless, the limitations of the MCMV programme in addressing spatial fragmentation in the central areas of Manaus and Belém are clear. This aspect of the programme raises concerns not only because it constitutes a missed opportunity to reduce fragmentation through a comprehensive housing programme, but also because, as mentioned previously, it reinforces the opportunity-led development logic, extending it into the periphery of urban areas.

Moreover, data from the Renewal/Urbanization of Deprived Areas programme (UAP) reveal the locational contrasts of a comprehensive policy whereby municipalities can apply the funds without necessarily following market dynamics. The UAP developments are not restricted to areas with low urban wellbeing and they also include informal settlements closer to the city centres, where market condition are less attractive. In this sense, not only could the UAP programme be a more effective urban policy through which to address spatial fragmentation, but it could also be a strategic tool to counterbalance the spatial fragmentation caused by the MCMV programme. However, the scale of the MCMV programme is significantly greater than that of the UAP programme: while the former is present in 5,336 municipalities, the latter covered only 90 municipalities in 2009.

Even though the MCMV programme is relatively new, the maps presented in this article show clearly the spatial distribution of the dwellings in Manaus and Belém. It is fundamental to create incentives to improve the implementation of the MCMV programme and ensure that it reaches central areas of cities. Using a spatial fragmentation lens, the combination of a more balanced social housing approach using

market dynamics and public initiatives could be the starting point for generating more positive outcomes.

It is important to acknowledge at this point that since the research conducted is limited to two Brazilian metropolises, other case studies would be extremely helpful to create a more comprehensive understanding of the spatial fragmentation dynamics of the MCMV programme. The same methodology used in this article could be replicated in other Brazilian cities where data are available. Additionally, the MCMV programme is still being implemented and could still be changed. In this sense, at present, it is impossible to predict how future stages of the programme will be implemented. Furthermore, it would be interesting to understand the social forces underlying these fragmented spaces. How do local communities cope with the push towards fragmentation? To what extent does spatial fragmentation affect social connections? A clearer overview of these local dynamics would strengthen the macro understanding of the impacts of massive social housing programmes such as the MCMV programme.

This study shows that a large-scale programme to provide social housing, such as the MCMV programme, may focus only in the provision of housing and overlook other spatial consequences for the wider built environment such as spatial fragmentation. Due to the mechanisms of the land market, social housing provision may end up in peripheral locations, which may be detrimental to social cohesion, and may add to existing fragmentation of urban systems. Using the same market logic, other social housing programmes outside Brazil may also face the same challenges and end up exacerbating undesirable spatial fragmentation at the city level. We have shown clearly that when designing social housing programmes, spatial fragmentation should be taken into account and counterbalanced with specific planning policies.

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TOC

4 Spatial fragmentation and self-organisation: a negative relation in Brazilian metropolises

This chapter was accepted for publication as an academic article in the journal, Urbe: Revista Brasileira de Gestão Urbana, in January 2019. As highlighted in Figure 4.1, it focuses on the influence that spatial fragmentation has on the work of self-organised initiatives. The chapter analyses this relationship by studying six self-organised initiatives in the city of São Paulo.

Abstract

While Brazilian metropolises are spatially fragmented, at the same time they have abundant bottom-up, spontaneous, self-organised initiatives that usually emerge as a response to a weak or neglected public authorities. Both phenomena are influencing Brazilian metropolises, but we do not know how they influence each other. This paper aims to answer the question: To what extent does spatial fragmentation influence self-organised initiatives? The article is based on an analysis of data collected in São Paulo. It first develops a theoretical reflection on both concepts, fragmentation and self-organisation, followed by an outline of the methods and analysis. The results show that the spatial fragmentation pattern observed in São Paulo is defined by a strongly polarised urban structure that heavily influences the operation of self-organised initiatives. This imposes a limitation on the work area of self-organised initiatives. The study indicates that the relationship between spatial fragmentation and self-organised initiatives, however, is not straightforward and that spatial fragmentation hinders the expansion of the work self-organised initiatives.

Keywords: Spatial Fragmentation, self-organisation, self-organised initiatives, self-governance.

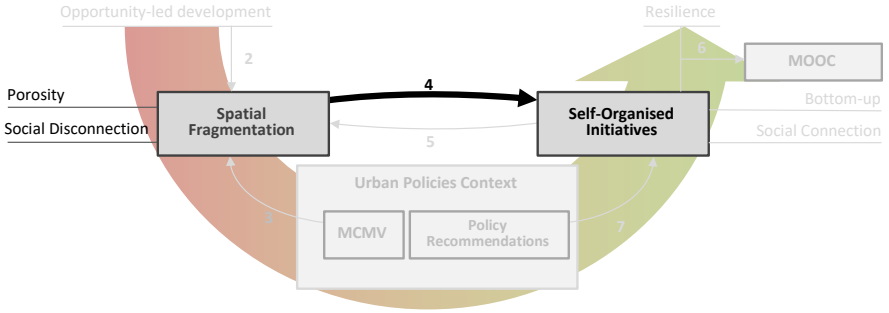

FIGURE 4.1 Conceptual relation of Chapter 4

§ 4.1 Introduction

Since the 1960s, urbanisation in Brazil has been changing the country from a predominantly rural society, with less than half the population living in cities in 1960, to a highly urbanised society, with an 84.5% urbanisation rate in 2010 (IBGE, 2015b). This phenomenon was accompanied by a population increase of 270% (IBGE, 2015a), resulting in the massive growth of urban population. This process has also been accompanied by intensive opportunity-led development, where conventional urban planning tools were unable to cope, and cities being built according to a strong market logic. The result in contemporary Brazilian metropolises is a fragmented and unequal urban environment.

Public urban policies have not been able to respond effectively to this challenge. Conventional urban planning tools, such as zoning strategies and top-down master plans, have successively failed to provide services, and even affordable housing in the formal sector, as needed by the population. Nevertheless, while these conventional urban planning tools were not successful, Brazilian metropolises have become fertile ground for bottom-up, self-organised initiatives. These initiatives commonly emerge in contexts where the public authorities would traditionally be the leading actor, such as in improving public spaces, providing social services or even renewing urban infrastructure. As can be observed in some of the cases analysed below, the initiatives emerged from a popular need that was not being effectively addressed by state institutions.

Self-organised initiatives rely on a social connection between members to function effectively; moreover, in Brazil, they need to operate in a very fragmented urban environment. This paper delves deeper into the relationship between spatial fragmentation and these self-organised initiatives. In this regard, it is important to understand the challenges and difficulties that spatial fragmentation generates for self-organised initiatives.

According to Caldeira (2000), the city of São Paulo is an extreme example of spatial fragmentation, which creates an inefficient urban system characterised by rigidity and violence. While a high degree of physical fragmentation is created by walls, spatial fragmentation is not only based on physical barriers but also on socioeconomic differences. In theory, creating physical connections between urban spaces would be an example of a 'good' planning strategy to promote social connectivity and therefore better conditions to generate self-organised initiatives. Nevertheless, physical connection does not necessarily promote social connection between diverse groups or individuals. There may be other factors influencing this phenomenon apart from the simple connection of spaces. As Sabatini and Salcedo (2007) suggest, in some specific contexts, the development of gated communities and the physical barriers surrounding them can, to some extent, create a social connection between residents and non-residents of such communities. The relationship between physical connection and social connection is thus not that straightforward.

Acknowledging that self-organisation is highly influenced by local conditions, this paper addresses the relationship between spatial fragmentation and some self-organised initiatives in the city of São Paulo in detail. More specifically, it asks the question: To what extent does spatial fragmentation influence self-organised initiatives? This question will be addressed using an urban policy lens, which means that the concepts of spatial fragmentation and self-organisation are to be understood in a broader urban context that goes beyond mere urban planning. The aim of this article is to develop the theoretical debate around the two concepts and elaborate on how spatial fragmentation could have a negative influence on self-organised initiatives. Additionally, the article contributes to the self-organisation literature by relating it to that on spatial fragmentation.

§ 4.2 What does spatial fragmentation mean?

The notion of spatial fragmentation used in urban studies refers mainly to two other fields of knowledge. The first one is *landscape ecology* where spatial fragmentation is seen more related to morphology. It is given a greater focus on the physical rupture of space. This view is present in the work of Dramstad et al. (1996), where the authors develop on principles related to fragmentation such as patches, edges and corridors; Lister et al. (2015) focus more on the environmental impact of these physical interruptions; while Shlomo et al. (2012) develop their research on satellite images specially connected to urban sprawl. The second view of spatial fragmentation is based on *critical geography* and takes into account the social limitations created by this physical division of the space. In this study, the concept of spatial fragmentation is aligned with this second view of spatial fragmentation, especially related to the work developed by Milton Santos about the city of São Paulo.

Santos' notion of spatial fragmentation refers to an extremely unequal spatial pattern in the built environment. For example, the physical built environment may develop in different forms, in what Santos calls as un 'uneven accumulation of times'. This notion of the accumulation of times refers to the development of very distinct spatial structures within the same built environment (Santos & Dias, 1982). In other words, development does not occur in an equal way in all areas. Within the same urban context, for example, it is possible to observe people living in modern skyscrapers, while others live in dwellings that are reminiscent of sixteenth-century infrastructure. Santos analyses the spatial organisation of São Paulo as a collection of different fragments (2009). This approach already served as a basis for other researches, like for example the study from Balbo and Navez-Bouchanine about Rabat-Salé in Morocco. Based on Santo's perspective the authors define fragmentation as a characteristic of most cities in developing countries, which contrasts with the orderly space of the developed Global North. In the words of Balbo and Navez-Bouchanine:

[...] the city of the developing countries shows a distinct spatial pattern characterised by the variety of the physical environment or the fragmentation of urban space. From an aerial view, most Third World cities appear as a complex mosaic where the various pieces are assembled according to a logic entirely different from that of the rational and efficient industrial city model. ... In this paper we consider fragmentation to be the sum of autonomous elements (Balbo & Navez-Bouchanine, 1995, p.573)

Based on Balbo and Navez-Bouchanine, identifying fragmentation depends on the autonomous capacity of various areas of a city. In this sense, areas with a high number of slums and gated communities can be classified as fragmented systems.

In this article, the term 'fragmentation' refers not only to the difference in the spatial characteristics of distinct areas of a city, but also to the low degree of integration between the residents of these areas. The framework of Sabatini and Salcedo is used as a reference to analyse the level of integration. Spatial fragmentation, therefore, involves more than just diversity within an urban system.

In a general view, the city of São Paulo is described by Milton Santos as a 'fragmented corporative metropolis' (translation by the author from Portuguese 'metrópole corporativa fragmentada') (2009). In addition to being led by the market, which is the corporative aspect, fragmentation in São Paulo is constrained by the polarised structure of the city, where jobs and services are concentrated in the city centre. The population living in the suburbs on the periphery have less access to these jobs and services due to an inefficient public transport network and a lack of financial means. According to the author, this centre/periphery dichotomy is the main underlying force of fragmentation in São Paulo (Santos, 2009), a strong reason for social disconnection. Since Santos began his study in 1990, it is highly appropriate to verify whether this polarised structure is still valid today.

§ 4.3 Distinct fragmentation patterns

The fragmentation dynamics of São Paulo are linked to strong polarisation, which can be demonstrated by looking at different indicators. The concept of porosity, for example, is helpful to illustrate this. 'Porosity' is a metaphor for urban areas with spatial discontinuities, such as brownfield areas, empty spaces and disconnected neighbourhoods. A porosity index (Pessoa et al., 2016) is used to measure and understand the different types of porosity in the Brazilian context. In the case of São Paulo, porosity is mainly created by strong economic growth and the presence of informal settlements.

TABLE 4.1 Porosity index of São Paulo

Metropolis	Population growth (2000-2010)	Real GDP growth per head (2000-2010)	Dwellings growth (2000-2010)	Growth as input for porosity	Houses in gated communities	Houses in slums	Dwellings without street/ number identification	Output porosity
	a	b	c	[a+b+c]/3	c	d	e	[c+d+e]/3
São Paulo	0.08	0.28	0.20	0.16	0.01	0.10	0.06	0.06

Source: Pessoa et al. (2016)

A large share of informal settlements in the provision of housing is a strong indicator of fragmentation in São Paulo. The Brazilian Institute of Geography and Statistics (IBGE) uses the term 'subnormal agglomeration' ('aglomerado subnormal') to define those areas that are popularly known as *favelas* (slums), and introduced the following definition in the 2010 census:

[...] a group made up of 51 dwellings or more that have no property titles and have at least one of the following characteristics: irregularity of access routes, the shape or the size of the plots, and a lack of essential public services – for example, no garbage collection, sewage network, water network, electricity or street lighting. (IBGE, 2010)

The term 'informal settlement' does not mean that there are no social structures or any kind of order in these areas. The areas identified by IBGE as informal just follow a different legal and spatial logic than the one recognised by the state. Despite the limitations of the terminology, the term informal settlement used in this article is based on the definition given by IBGE. While IBGE's definition focuses on spatial and physical aspects, which are insufficient to understand the dynamics of social inequality, power struggles or other societal challenges (Kovacic & Giampietro, 2016), it is important to explore this definition in detail in order to understand how informal settlements relate to fragmentation. IBGE's definition mentions groups of 51 dwellings or more, without property titles. This characterises a collective structure outside the government legal framework. The group aspect is emphasised, as the definition focuses on collective capacity and ignores the possibility of individual dwellings without property titles.

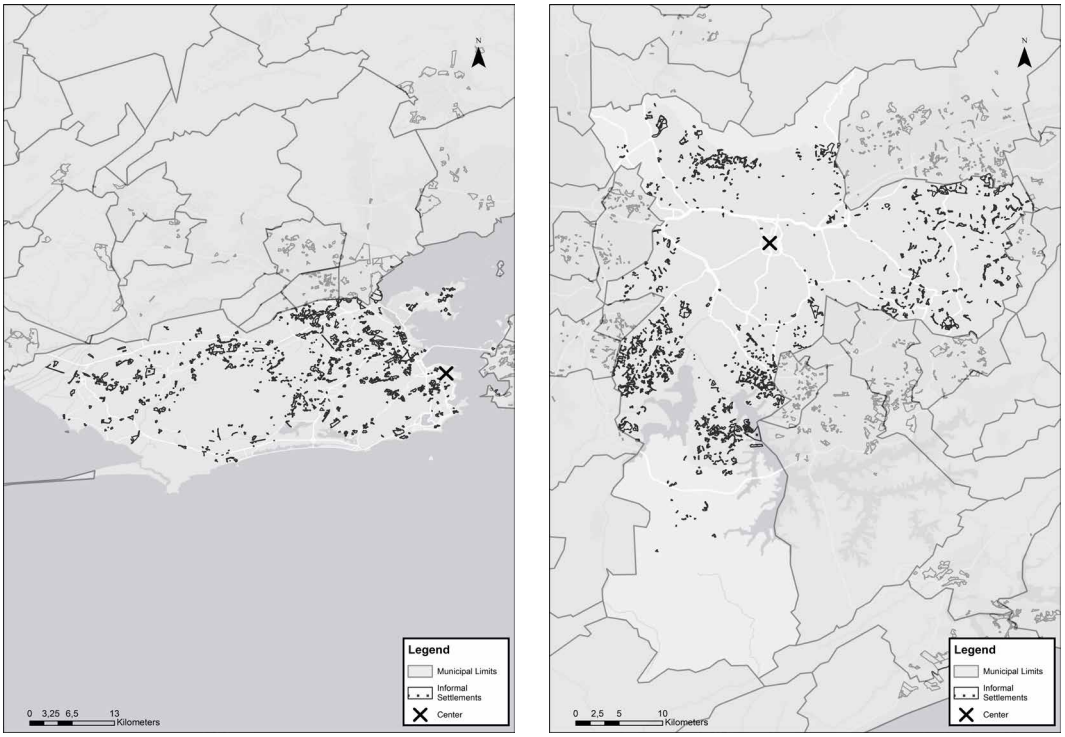

FIGURE 4.2 Informal Settlements in São Paulo (left) and in Rio de Janeiro (right)

This is not only a collective deviation from the formal urban structure, but also a strong sign of a parallel legal framework. The maps depict the location of informal settlements in São Paulo and Rio de Janeiro (Figure 4.2). The map of São Paulo shows a strong polarised structure, with informal settlements located on the periphery, while the city centre has almost no informal settlements. Comparing São Paulo with Rio de Janeiro, Figure 4.2 shows different structures related to spatial fragmentation. While São Paulo has a clearly polarised structure, with the city centre being one main pole, Rio de Janeiro has a more homogenous structure, with informal settlements distributed in a rather random pattern throughout the entire municipality.

The polarisation structure is not restricted to informal settlements in São Paulo, as gated communities are another indicator of fragmentation, because they also have the autonomous capacity mentioned by Balbo and Navez-Bouchanine (1995). This can be seen in research by D'Ottaviano (2008), which confirmed the polar structure of the development of gated communities in São Paulo. Additionally, the IBEU data shows this polarised structure, with more affluent areas concentrated in the city centre and less affluent areas on the periphery (Ribeiro & Ribeiro, 2013). Historically, the city invested in

individual modes of transportation, with the inhabitants of the suburbs largely dependent on cars or on a very inefficient public transport system. Santos shows that due to factors such as limited financial capacity or a poor transportation system, a fragmented structure was created, where the population outside the city centre was ultimately restricted to the vicinity. Urban fragmentation in São Paulo is manifest in this extreme polarisation.

§ 4.4 What kind of self-organisation?

A second key concept concerns self-organisation. There are two main interpretations of 'self-organisation' in urban studies. The first relates to *complexity science* (Ashby, 1947; Eigen, 1971; Foerster & Zoepf, 1962; Haken, 1983), while the second is used in governance studies (Dam, Eshuis, & Aarts, 2009; Kotus & Hławka, 2010; Nunbogu, Korah, Cobbinah, & Poku-Boansi, 2017; Wunsch, 2013). Although both fields use the term 'self-organisation' and the definitions have some similarities, they are fundamentally different. Ward Rauws (2016) developed a framework to distinguish the two, in an attempt to avoid possible confusion. While self-organisation as seen through a complexity science lens focuses on the emergence of spontaneous urban patterns from individual local interactions (Heylighen, 2008; Portugali, 1999), in governance studies the focus is on processes of self-governance, where citizens take the lead from the government and act in a kind of bottom-up, grassroots, 'do-it-yourself' urbanism (Kee & Miazzo, 2014; Newman et al., 2008). The later interpretation, aligned with governance studies, is used in this article.

According to Rauws, self-organisation considered through a governance studies perspective has four main characteristics that clearly distinguish it from the complexity science perspective: there is internal coordination, where members develop a participation and decision-making process; actions are undertaken with a collective intent, where a common goal, for example the renewal of a public space, is the aim; a change in the urban environment is the result of this deliberate action designed to achieve this common goal; and the transformation of the urban system is to some extent predictable (Rauws, 2016). In summary, the initiatives rely on an internal process of coordination, have a common goal, bring people together to act to achieve this goal and the result of this change is relatively predictable. Additionally, these self-organised initiatives work independently from the government (Dam et al., 2009; Schmidt-Thome, Wallin, Laatikainen, Kangasoja, & Kyttä, 2014; Swyngedouw & Moulaert, 2010) and usually work around the established networks of governance and institutions (Lydon & Garcia, 2015).

The self-organised initiatives studied here share the above-mentioned criteria. Firstly, they are all managed by a civil society group, which means that they are not externally controlled by any government body or private enterprise. This does not mean that public institutions have not influenced the initiatives, but rather that the initiatives are independent and act with a bottom-up logic. The relationship of the initiatives with the private sector may vary, with some of them receiving support from private companies. This occurs more often with initiatives that started as an informal collective but then developed into a formal association or NGO, which allows companies to financially contribute to them. Secondly, they do not aim for financial gain for a specific group or person, but are focused on solving collective problems. Thus, they concentrate on the collective aspect mentioned by Wunsch (2013). There is always a factor of common concern in the initiatives that goes beyond individual financial interest. Furthermore, they focus their work on an urban challenge which traditionally would be tackled by public authorities (Tonkens, 2008). In this regard, the initiatives analysed here addressed issues that are traditionally dealt with by public agencies, focusing on urban challenges – for example, the renewal of public spaces.

§ 4.5 Methods

The research started with a literature review on spatial fragmentation and self-organisation aforementioned. This initial section also considered the development of the concepts, the current debate and the application of both concepts in the Brazilian context. Additionally, the research used different sources of data. We accessed data from IBGE about the location of informal settlements. The data were used in ArcGIS to develop maps and visualise the fragmented structure of the city. These maps (Figure 4.2) confirmed the fragmentation dynamics of São Paulo as claimed by Milton Santos, with informal settlements found to be located on the periphery, while the city centre of São Paulo had almost none.

In this regard, a qualitative strategy was developed to understand how this fragmented and polarised structure is currently affecting self-organised initiatives in the city of São Paulo. A preliminary online scan of social media and related websites was undertaken to look for initiatives, which indicated that they were concentrated in the city centre. The researcher's personal network was also used to find potential participants in these initiatives and start a snowball process. The snowball strategy worked well, but also demonstrated a relative limitation, as it did not extend to initiatives based in peripheral neighbourhoods. The initiatives contacted were limited to a network that only extended

to the city centre region. Nevertheless, this did not hinder the research and it was still possible to investigate how this polarised structure influenced these initiatives in the city centre; in other words, the kind of relationship that self-organised initiatives in the city centre have with the peripheral neighbourhoods and their residents.

Ten semi-structured in-depth interviews were conducted in São Paulo with members of these organisations, as well as academics and public servants working at the municipality dealing with these initiatives. The interviews were conducted in July 2016 and took place at the office or meeting place of the initiatives, in public spaces or in cafés. The search for initiatives that would fit the criteria mentioned above was relatively easy; however, it turned out to be challenging to find a representative willing to give an interview. As will be further explained in the analysis, there was a common concern of the interviewees not to be regarded as the leader of the initiative. In São Paulo, contact was made with six initiatives:

TABLE 4.2 Initiatives interviewed in São Paulo

Initiative	Contact	Actions	Area of work
Terreyro Coreográfico	In-depth interview	Renewal of public spaces under viaducts through the organisation of dance-related events.	Expanded city centre
Bela Rua	In-depth interview	Renewal of public spaces.	Expanded city centre
Cidade Ativa	In-depth interview	Develop urban interventions to promote mobility on foot.	Expanded city centre and occasional work in the periphery
Organismo Parque Augusta	In-depth interview and social media observation	Reclaim and manage the Parque Augusta, a public park that is located on private land and has been targeted by real estate developers.	City Centre
Colaboratório - Lab Bijari	In-depth interview	Different urban interventions to raise awareness of how urban space is being used; for example, highlighting where empty buildings are located.	Expanded city centre and occasional work in the periphery
A Batata Precisa de Você	Social media and field observation	Renewal of the Largo da Batata, a public square located in the Pinheiros neighbourhood.	Expanded city centre

The interviews were audio-recorded and analysed later with Atlas.ti software, where themes like connection with the neighbourhood, location of the initiatives, work in the periphery, communication between members, ties with the space of the intervention, and social connection with local residents were addressed. Additionally, field observations during physical meetings and participation in online groups of these initiatives also provided insights during the analysis.

§ 4.6 Spatial fragmentation and self-organised initiatives in são paulo

Self-organised initiatives rely on the capacity to communicate and integrate the wishes of their members. Nevertheless, it is challenging to deal with public space in an urban environment that exhibits striking inequalities. As mentioned by a member of Organismo Parque Augusta, when dealing with public spaces, you also have to deal with the problems of the city as a whole.

Because it is very different from squatting a house or an occupation aiming for housing. In a public park occupation, there is the idea of a place without ownership ... another relationship. It is a collective relationship between the people there in a common space. It was very interesting. [...] the area was kept open 24 hours a day for 47 days, and we faced the complex challenges of the city itself. [...] It was a rich experience, because you could see there the relationship between people from different social classes came out. (Member of Organismo Parque Augusta)

In this sense, the striking spatial fragmentation of the Brazilian urban environment creates a greater challenge to the integration of inhabitants into the space in which they live. There are not only physical barriers but also financial inequalities, which make it more difficult to connect residents and the built environment. To better understand the level of social integration between the participants in self-organised initiatives, the research used the framework developed by Sabatini and Salcedo (2007) as a reference, which defines three levels of integration: functional, symbolic and community. Functional integration is based on power and economic relations, and can be measured, for example, by the level of participation of the poor in the market, in the democratic process and in their access to services and urban facilities. Symbolic integration is related to the sense of belonging to the place where one lives. While community integration refers to:

[...] the formation of social ties that go beyond simple functional exchange. It is expressed in friendship, solidarity networks, and even familial relations. Community integration requires people to recognize and be recognized by the 'other' as an equal with whom it is possible to surmount the borders of privacy. Community means intimacy and complicity. (Sabatini & Salcedo, 2007 p.589)

Without disregarding the complexity of social relationships in the metropolitan areas of Brazil, based on the three levels of social integration presented, it becomes clear that the metropolises with a high degree of inequality and spatial fragmentation actually exhibit more functional integration. Residents from informal settlements and residents from gated communities reveal functional integration, for example, when gated communities rely on the workforce of residents from informal settlements to do low-skill tasks. Villaça (2011) has already pointed out the negative impact of inequality on the metropolitan dynamic of São Paulo.

As argued above, due to the lack of capacity of the government to adequately respond to or manage the complex metropolitan environment (Maricato, 2011), Brazilian metropolises have become fertile ground for bottom-up initiatives, where civil society has taken on a major role, not only putting forward its demands but also implementing them. From the renewal of public spaces to the construction of urban infrastructure, self-organised initiatives have had an important role in the urban development of Brazilian cities. This is no different in São Paulo. Moreover, due to the massive scale of the city, many self-organised initiatives have emerged as a solution to different urban challenges. The initiatives analysed here were all, to some extent, working with the renewal of public spaces. Some of them undertook more ephemeral activities, such as social events in marginalised or abandoned spaces, while others focused on more long-term spatial interventions. While using different strategies, they all aimed for the improvement of public space and the wellbeing of the local inhabitants. As the aim here is to see how these active initiatives operated in a fragmented city and not how they emerged, all of the initiatives included in the research were already established and relatively successful, insofar as they have already produced concrete outcomes.

A common characteristic of these initiatives is the lack of clear leadership, which, as we suggested above, results in individual members being concerned that they will be seen as the voice of their respective initiative. During the interviews, it was common for interviewees to make a disclaimer that they should not be interpreted as speaking on behalf of the initiative. Although this matter was not explicitly addressed in the interview, some interviewees stated several times that their account should only be understood as their personal perspective and not as an opinion shared by the whole group (it should be noted, however, that interviewees coming from the public sector did not express this particular concern). This issue was raised by the 3 out of 6

interviewees. It was mentioned, for example, by an interviewee referring to how it was problematic not only to develop the initiative's common discourse, but also how to communicate it to the public authorities.

[...] I think that initiatives don't want to have a spokesperson [...] I think we have more of a lexical challenge ... how do you say something that the regional mayor, a life-time bureaucrat, will listen to, will understand you ... but I had to do this work ... try to understand what were the problematic questions in the initiative and try to translate them in a way that a public servant would understand ... (Member of the Terreyro Coreográfico)

One initiative that became well known for redeveloping a famous square in São Paulo, for example, was clearly initiated and led by one individual; however, due to what seems to be the result of this fear of being labelled the head of the initiative, it was not possible to interview this person. Instead, I was invited to participate in an open meeting with them, in which I could make some field observations.

In order for these groups to operate without a clear hierarchy, it is imperative to have an effective communication process. Evidently, these interactions do not occur in a vacuum; even without an institutionalised hierarchy, social aspects such as gender, race, wealth and education definitely play a role in the internal dynamics of initiatives, as they do in Brazilian society generally.

Nevertheless, the effective communication capacity of the initiatives was confirmed in the field observations and mentioned in all interviews. Most initiatives use Facebook groups to start a discussion, schedule meetings, define an agenda, create common documents and promote events. As one of the interviewees stated, the new social media technology made it possible to bring together people who had the desire to start an initiative:

[...] technology allowed this fit, they wouldn't be able to communicate and access each other so quickly if not for social media ... now it seems that they know each other even better. (Public servant from the Municipality of São Paulo)

It is worth noting that sometimes even if someone already had a strong connection with the local context and knew about the initiative, it was only after contact on social media that they became involved in the initiative. The capacity of social media to attract an online user to become part of a physical movement proved to be an important aspect for recruiting members and it was mentioned in 3 interviews.

I saw the problem of the 'Parque Augusta', which was an area that I had known about since 2002 ... I knew that there was a local movement to protect that area ... I had even spoken to people to understand what the situation was ... but I made contact after a call for help on Facebook from this local group, because companies were advancing in their attempt to get a development project approved ... at the same time, a lot of meetings started to take place in the park ... . (Member of Organismo Parque Augusta)

All of the initiatives intensively used social media as a communication tool. However, even initiatives that relied heavily on digital interfaces also had physical meetings on a regular basis. Thus, when the initiative focused on projects that took place in public spaces, social media interaction on its own did not appear to be enough. The initiatives had a strong relationship with the physical space that they were working with. The interest in improving a common public space created ties that brought the group together. This was the case for the Organismo Parque Augusta, which strongly relied on social media but also on physical access to the park's terrain. In this specific case, the initiative used to meet in the park, but when they were deprived access to it this had a strong impact on the initiative. This shows how much the physical space plays a fundamental role in these initiatives.

[...] we have met weekly since 2013 ... and we are still resisting. The park was illegally closed at the end of 2013. ... and since it has been closed there has been less enthusiasm, because the area itself provides encouragement for our meetings, the peoples' articulation ... it is the terrain itself that stimulates this. The meetings were always there, until 2013, but after this there was a weakening and some neglect, but we managed to reactivate start the meetings at the Roosevelt Square next to it. We had to organise ourselves in a nomadic way. (Member of Organismo Parque Augusta)

This strong tie to the territory was repeatedly mentioned in all interviews. Additionally, it seems fundamental to have a social connection with residents in the area where the initiatives are located. One initiative that had been formed by artists who were attempting to tackle different urban problems using art as a solution explained how they chose an area to work.

I think that is ... we never go to a place like 'ah, let's take a look at the map and think: wow that place has a conflict and we need to work on it'. No, there is a network of affective attachments ... that is, we go to a place because there are people we know there. (Member of Bijari)

Nevertheless, the fragmented urban structure of São Paulo undermines the social connection between different groups, which have difficulties in overcoming the polarisation between the centre and the periphery. The social connections between

initiatives in the city centre and the inhabitants of the periphery are at the level of functionality based on Sabatini's scale (2007). This issue was mentioned several times in 5 interviews. A member of a group based in the city centre working on the renewal of public stairways mentioned that despite their effort it was very difficult to start a project on the periphery, where they had only worked once:

It is easier to work where you already know the people, the collectives ... Everything seems easier and simpler ... so to get to a territory that you don't know, that has informal settlements, that has drug trafficking, that has many other forces at play that you don't know of ... it is hard, it is very hard to work. Everyone from our organisation lives in the extended city centre ... a bubble, right? No one is from the periphery. (Member of Cidade Ativa)

Since social connections are one of the pillars of self-organised initiatives, the fragmentation pattern of São Paulo undermines the social connections between the centre and the periphery and in turn the social network of self-organised initiatives. In this sense, the expansion of the area of action or attempts to undertake projects outside the extended city centre are much more difficult. In addition to the lack of social connection with residents on the periphery, as mentioned above by the Cidade Ativa member, mobility and safety were commonly mentioned as the main obstacles to undertaking work outside the city centre. Both problems were mentioned in all interviews. It is clear that the fragmentation in São Paulo, as described by Santos, is still directly influencing the range of areas in which these initiatives can work.

We have the wish to work on the periphery [...] we did some minor work there ... we had maybe two projects there [...] but to be honest, we work a lot in the city centre and in the west zone ... it is where many of these urban and cultural interventions happen [...] Sometimes we try, we say 'Let's change our focus and go there', but the tendency ... when we think about a project, we sit down and say 'Well, this project ... where will we install it?' we always think about more central neighbourhoods. ... we go to Pinheiros, to the Largo da Batata ... I don't know, maybe we go the Ibirapuera Park, but it is still quite central. It is where we have more visibility, it is easier to access, it is also safer ... there is that issue too. In the periphery you need to be better prepared. The periphery is a place we don't know well. We are from the middle class, there is a whole structure there ... we are in our little world ... you go to one of these neighbourhoods and you have to ... well, we want and like it, it is also part of our work, but to be honest, it is more complicated. (Member of Bela Rua)

Although this locational limitation of self-organised initiatives was repeatedly mentioned, a common positive point cited by all of the initiative members interviewed was the capacity of these initiatives to bring together a very diverse group of people.

This is especially relevant in a country with striking inequality, and where there are many redevelopment projects underway to generate consumption and economic gain (Cortes, 2008). In this sense, the city of São Paulo has been more successful in generating places of consumption than places of diversity.

Some interventions by the municipal government have generated empty public spaces offering only functional integration between local inhabitants. This was the case for the Largo da Batata, a traditional square in São Paulo that was part of a major redevelopment project called 'Operação Faria Lima', occurring over the last 20 years. After the renovation of the square was completed, it was possible to observe that the project had focused much more on the transport aspect (a new tunnel, a metro stop and quicker access by car) than on the human scale. Although the redevelopment of the square was completed, it was left as a simple open paved space. There was limited interaction between the people 'using' the space, since the square was mainly seen as a commuter hub.

It was only after a self-organised initiative called 'A batata precisa de você' (The Batata Square needs you) started to redevelop the square that it became a diverse and lively space. The case of 'a batata precisa de você' is emblematic, not only because it was triggered by the relative failure of the public administration to create a vibrant urban environment for the local residents, but also because it was very successful in promoting social connections between groups that rarely interact. Even though the initiative had its operational limitations, it revealed how a self-organised initiative could bring together people with different socioeconomic profiles. Despite their social differences, they shared the common interest of having a pleasant urban space at their disposal. This perspective was also shared by all initiatives. The cases of Terreyro Coreográfico, which organises dance classes under viaducts to redevelop the area, and Organismo Parque Augusta's role in the management of the park were extremely symbolic in this respect.

For example, last year we had a 'festa junina' (a Brazilian folk festival). And there were people from the neighbourhood, workers and middle-class people ... there were real homeless people ... also a transgender person who lives under this viaduct ... there were some artists. It was crazy, everybody was dancing together ... I thought it was beautiful to have this integration between people from such different groups. (Member of Terreyro Coreográfico)

So ... a lot of homeless people came and spent all these moments with us ... many heavy drugs users were there. So, you could see old ladies (referring to the high-income local residents) giving detox herbal tea to the crack addicts to help them. There were some very thought-provoking relationships of affection... very powerful for a city like São Paulo. (Member of Organismo Parque Augusta)

In this respect, based on Sabatini and Salcedo's integration framework, it was possible to observe the capacity of these self-organised initiatives to transform functional integration into symbolic and sometimes even community integration. Field observation of the 'Largo da Batata' confirmed the information collected from the interviews, which demonstrated that self-organised initiatives have the capacity to generate social connections even between extremely diverse groups.

§ 4.7 Discussion and conclusions

Based on the case of São Paulo, the influence of spatial fragmentation on the operations of self-organised initiatives revealed the following. Firstly, although initiatives rely on the virtual domain for communication, their activities are highly dependent on the physical context. The virtual environment, such as social media, proved to be an effective tool to spread the word about the initiatives' work and to get more participants involved. Nevertheless, the initiatives were highly dependent on the availability of physical space. When access to the location of the initiative or the place they met were denied, the initiatives faced greater challenges in organising themselves. However, it was also interesting to observe that in the case of the Organismo Parque Augusta initiative, the connection with the physical space alone was not sufficient to attract new members. Moreover, some participants who already knew about the initiative because they had seen activities in their local context only became regular members after interaction with the group on social media. In this respect, the physical and virtual realms are connected and both are important to the initiatives' work.

Secondly, we found that Santos' fragmentation perspective on the city of São Paulo (1990), which includes a socioeconomic perspective on the entire city, is still relevant. The polarisation of the city centre and the periphery is still apparent in the urban dynamics today. Furthermore, the interviews revealed that this polarised system has a strong negative influence on how initiatives operate. Although the initiatives repeatedly affirmed that they would like to expand their work to the periphery, the interviewees exposed the difficulty of taking their initiatives beyond their own local context in the city centre.

The peripheral neighbourhoods of São Paulo have a lower urban well-being and could benefit more from the work of these initiatives than the city centre. Nevertheless, those working in the city centre rarely managed to take their actions to the periphery. The interviews conducted in São Paulo showed that the lack of social connection with

residents from the periphery added to logistical challenges, such as difficult access and the threat of violence, which were the main factors cited as obstacles to taking the initiatives beyond the extended city centre. Based on the framework of Sabatini and Salcedo, the lack of integration between inhabitants of the expanded city centre and the periphery confirms that they are mainly on the level of functional integration (2007). This lack of social connection with residents of peripheral neighbourhoods also had an effect on the snowball strategy used in this research, as all the initiatives contacted were based in the extended city centre of São Paulo. The research could be further broadened to understand the dynamics and limitations of initiatives in peripheral neighbourhoods and their connection with the city centre. Nevertheless, the negative effect of this polarised fragmentation is evident in the case of the self-organised initiatives studied here.

While constrained by the polarisation of the city of São Paulo, the self-organised initiatives demonstrated a great potential to promote encounters between people from diverse groups. The capacity to generate social connection between very distinct groups could be extremely helpful in overcoming spatial fragmentation in an unequal society. Based on the framework of Sabatini and Salcedo, it was observed that the initiatives developed social ties that could be understood on the level of symbolic and community integration, while without them the only form of integration was merely at the functional level. The study showed that the intensification of the level of integration between the people participating in the initiatives can have a strong impact on the local social dynamics and particularly in the space where these initiatives occur. The impact of a stronger social relationship between members of these initiatives on the space in which they work should thus be further studied. Rather than examining how fragmentation influenced these initiatives, it would be interesting to consider how these initiatives influence fragmentation itself by creating stronger social ties. For example, to what extent do these strongly socially connected self-organised groups break down this fragmentation logic, at least at the local level?

Thirdly, the São Paulo case can serve as an example to other spatially fragmented cities of the Global South. Self-organised initiatives can have a positive impact; however, as the results have shown, it is important to understand the fragmentation pattern of the city where such initiatives take place. Fragmentation can have a negative impact on how self-organisation initiatives work and this can vary depending on the fragmentation pattern of each city. In the case of Rio de Janeiro, for example, fragmentation does not have the same polarised dynamic of São Paulo. The scattered pattern of informal settlements in Rio de Janeiro suggests that fragmentation might be related to the topography of the city. In the case of Rio, it is not a horizontal division between centre and periphery but perhaps a vertical fragmentation between the low lying and the high lying neighbourhoods. Two contexts popularly known in Rio de

Janeiro as 'asfalto', the affluent formal neighbourhoods, and 'morro', the slums and informal areas on the hills of the city.

Finally, in the case of São Paulo, public policies could be created to promote successful self-organised initiatives that go beyond their local context and break down this polarisation. The municipality, for example, could offer incentives or better conditions for institutions to operate in the suburbs where they are needed more. This could be done, for example, by connecting initiatives with the sub-municipalities of peripheral neighbourhoods, or organising workshops or capacity training programmes. Despite the challenges, the positive impact of self-organised initiatives in the city centre could be strategically used in peripheral areas. In the case of São Paulo, this shift in the role of urban planners towards the facilitation of social-spatial initiatives (Nunbogu et al., 2017) could be fruitful, with planners mediating the process of extending self-organised initiatives from the city centre to the periphery and breaking down the polarised fragmentation dynamic.

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5 Self-organised initiatives: a planners' subversive tool for fragmented urban spaces

This chapter has been submitted for publication as an academic article and is currently under peer-review. It elaborates on the possibility of using self-organised initiatives as tools to foster social connections in fragmented urban contexts.

Abstract

Self-organised initiatives are abundant in Brazil. Nevertheless, it is not clear how these informal, bottom-up and self-organised initiatives, supported by urban planners, are shaping the built environment. This chapter investigates whether these self-organised initiatives are able to undermine the underlying dynamics of spatial fragmentation in Brazilian metropolises by promoting social connections between groups that are extremely diverse. Since self-organised initiatives not only promote spatial connections but also social connections between different groups, the primary premise of this study is that they will have a positive impact on reducing the spatial fragmentation present in Brazilian metropolises. Therefore, the central question here is: *To what extent can self-organised initiatives promote social connection in the public spaces of highly fragmented and unequal urban contexts?* The analysis was based on data collected from 22 in-depth interviews with members of self-organised initiatives, experts as well as field observations during some actions of the initiatives. The interviews were conducted in Brasília, Rio de Janeiro and São Paulo during two months of fieldwork

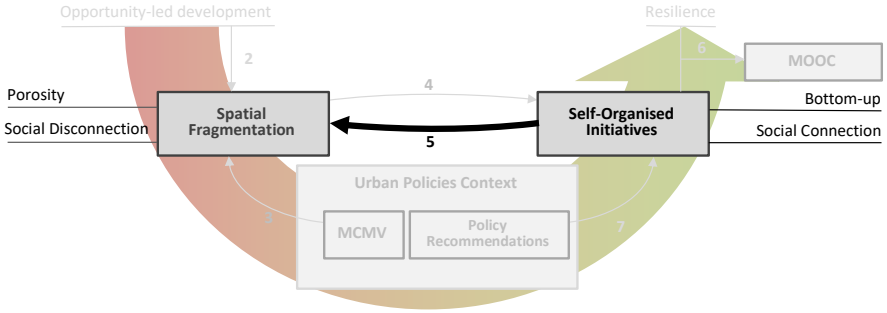

FIGURE 5.1 Conceptual relation of Chapter 5

§ 5.1 Introduction

Brazilian metropolises are highly fragmented. Opportunity-led development has created a disconnected urban patchwork where walls and inequality reign. However, the barriers in fragmented cities go beyond the physical ones. Breaking down invisible walls and connecting spatially disconnected areas does not necessarily erode the social inequality behind them or promote social connections. The walls in Brazilian metropolises are also social (Cortes, 2008). The result is that traditional urban policies often fail to confront the spatial fragmentation in Brazil. At the same time, it is also common to observe bottom-up, informal and self-organised initiatives in such fragmented contexts. These initiatives are abundant and range from housing construction to upgrading public spaces.

Self-organising initiatives are not only often recognised as important in shaping the city, but they are frequently led or supported by planners. It is interesting to observe that planners are taking part in these movements and pushing their agendas forward. Understanding the participation of planners in self-organised initiatives was not the initial aim of this research; however, it became clear during the fieldwork that planners were playing a significant role. The reasons for planners joining these initiatives were not investigated in this thesis, as there is already research explaining why young planners are trying non-traditional paths of practice. According to Taşan-Kok and Oranje (2017), young planners feel that it is necessary to explore new paths in order to express their ideological position and move beyond a purely technocratic function. This is mainly the result of a mismatch between the expectations of the profession created during their education and their professional practice after graduation. It

seems that traditional top-down planning is failing to fulfil the aspirations of young planners in Brazil.

In this context, it is not clear how these informal, bottom-up and self-organised initiatives, supported by urban planners, are shaping the built environment. Aspects such as spatial fragmentation are being influenced by these initiatives, through building new social connections and increasing the level of integration. This chapter investigates whether these self-organised initiatives are able to undermine the underlying dynamics of spatial fragmentation in Brazilian metropolises by promoting social connections between groups that are extremely diverse. Since self-organised initiatives not only promote spatial connections but also social connections between different groups, the primary premise of this study is that they will have a positive impact on reducing the spatial fragmentation present in Brazilian metropolises. Therefore, the central question here is: *To what extent can self-organised initiatives promote social connection in the public spaces of highly fragmented and unequal urban contexts?*

To answer this question, the research used qualitative methods to understand the social dynamics in these self-organised initiatives. The analysis was based on data collected from 12 in-depth interviews with members of self-organised initiatives as well as field observations during some actions of the initiatives. Additionally, 10 in-depth interviews with public servants and experts were conducted to provide a complimentary perspective on these initiatives. The interviews were conducted in Brasília, Rio de Janeiro and São Paulo during two months of fieldwork. These three cities were chosen because they are the three main metropolises of Brazil (according to the Brazilian Institute of Geography and Statistics) and have an abundant mix of self-organised initiatives. The results show that self-organised initiatives can create new social ties even in public spaces with patent social inequalities.

§ 5.2 Theoretical explorations of spatial fragmentation and social connection

Spatial fragmentation is common in cities of the Global South, with many researchers focusing on understanding the phenomenon. While Balbo (1993) and Çakir et al. (2008) focused more on the physical and land use aspects of spatial fragmentation, Bayón and Saraví (2013) addressed the cultural dimensions of fragmentation. In addition, Janoschka (2002) and Klaufus (2017) shed some light on the inequality, segregation and market aspects related to fragmentation. Moreover, Bénit-Gbaffou

(2008) and Santos (1990) analysed spatial fragmentation in terms of the differences in services and opportunities depending on locational aspects. Brazilian metropolises are no exception and are also known for their spatial fragmentation, with walls separating different urban fragments, and many in-between, left-over spaces, as well as cultural differences and inequality of access to services and opportunities.

While researchers have pointed out these characteristics of Brazilian metropolises (Klink & Denaldi 2012; Santos, 1990), it seems that spatial fragmentation in the Global South will not be resolved by merely connecting different fragments. Other social forces, such as violence, inequality and stigmatisation, for example, play an important role in maintaining urban fragmentation and keeping residents separated. Different theoretical frameworks, for example, the Just City (Fainstein, 2010), or Planning and Diversity in the City (Fincher & Iveson, 2008), suggest the creation of spaces of encounter to promote social ties between diverse groups. Nevertheless, social challenges, such as the striking inequality within Brazilian cities, are not considered in these approaches. It is hard to believe that residents of slums will come together with well-off residents of gated communities if merely provided with a well-designed public space. Fragmentation in Brazil is not only spatial but also social. This does not mean that public spaces in Brazil do not need good design, but that urban planning needs to go beyond design and address the social issues that make these encounters more difficult when they occur in spaces of extreme inequality.

Attempts to create spaces of encounter in the metropolises of the Global South have faced difficulties (Friedmann, 2010; Maricato, Lobo, & Leitão, 2009). Authors have highlighted the importance of planning, due to the social challenges and inequality present in Brazilian metropolises (Vilaça, 2011). Design-based and top-down approaches to the renewal of public spaces, for example, rarely manage to tackle the complex social challenges of Brazilian metropolises. As a result, planners have used different strategies to promote changes in the built environment. It has become more common to observe planners taking part in self-organised initiatives, for example. This not only points to a possible change in the role of planners (Taşan-Kok & Oranje, 2017), but also demonstrates that these initiatives can be seen as important agents in shaping cities. Regarding the capacity to work with an extremely diverse group, self-organised initiatives seem to be able to succeed better compared to top-down planning, since they are based on an already existing local social network and have a more inclusive approach. The capacity of these initiatives to create social ties between extremely diverse and unequal groups is fundamental to an understanding of how these initiatives can counteract the spatial fragmentation logic of Brazilian metropolises.

Spatial fragmentation, understood as the sum of autonomous parts in the same city (Balbo & Navez-Bouchanine, 1995), is constructed in an extremely unequal manner. From a broader perspective, this can be seen as a difference in levels of autonomy. Nevertheless, spatial fragmentation in Brazilian metropolises also has a social inequality aspect, with Santos pointing out that it is connected to unequal access to services and opportunities (Santos, 1990). For example, gated communities and informal settlements can be seen as autonomous parts of a city, and it is clear that both possess a high level of autonomy. However, they operate in very distinct ways and have different access to services and opportunities. In this sense, unlike other kinds of fragmentation, the social inequality present in Brazilian metropolises makes it harder to connect such unequal urban fragments. Gated communities and informal settlements greatly rely on the social networks within their own communities, but the level of social connection between the two realms in South American cities is traditionally quite superficial or merely professional (Sabatini & Salcedo, 2007). To develop public spaces in such a fragmented context is challenging, especially spaces that foster social connections between people from extremely diverse socioeconomic backgrounds.

Even acknowledging that the pattern of social connections has changed due to the influence of social media, the effect that the built environment has on the promotion of these connections remains paramount. Using the concept of the Network Society, Manuel Castells, for example, points out how social connections are being created differently today (Castells, 2004). Nevertheless, this does not undermine the importance of the spatial variable in relation to this issue, despite increasing the complexity of the way in which social connections are created nowadays.

Distinct planning theories have addressed the importance of developing strong social connections within the built environment. As mentioned above, Susan Fainstein's 'Just City' (Fainstein, 2010) is one of these. The framework presents social connection as one of the fundamental requirements for attaining what, according to the author, are the three most important elements of a just city: diversity, equity and democracy. Although the Just City framework is extremely helpful for establishing criteria which orient planning policy towards fairer built environments, the cases of New York, London and Amsterdam, addressed in the book, do not accommodate the complex and extreme scenario of inequality occurring in metropolises of the Global South. Several scholars have pointed out the difficulties of creating just cities in the Global South (Maricato et al., 2009; Musset, 2015; Winkler, 2009). One reason commonly mentioned to explain this failure is the quality of government in cities of the Global South, which is said to generate unequal services. The worldwide governance index (WGI) of the World Bank demonstrates how the Brazilian government is facing challenges to improve its effectiveness. According to the WGI, the country has lower government effectiveness even compared to other Latin American countries.

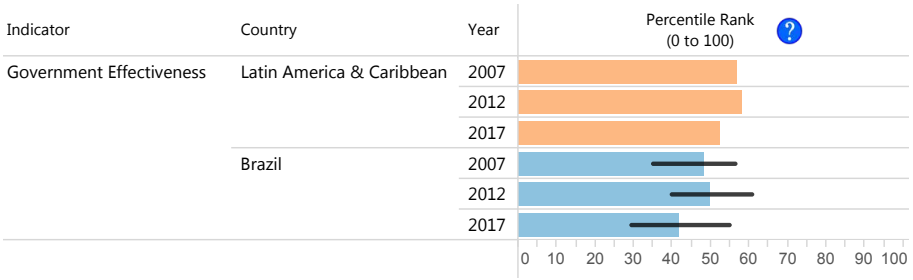

FIGURE 5.2 Government Effectiveness from World Bank (Kaufmann & Kraay, 2018)

Fincher and Iveson (2008) also explored social connection as a tool to 'plan for diversity', in an attempt to incorporate the challenges of planning in diverse cities. They developed a normative strategy to improve what they referred to as the 'three social logics of urban planning': redistribution, encounter and recognition. Ahmadi has shown that other factors, such as poverty, play a bigger role than diversity in influencing the interactions of inhabitants, even in North American cities (Ahmadi, 2017). In Brazilian metropolises, diversity is also present, but planning for diversity seems not to be sufficient when inequality is even higher than in North America. In the case of Brazil, it is evident that inequality plays a fundamental role not only in spatial fragmentation but also with regard to how people interact. In aiming to promote stronger social connections within Brazilian metropolises, adopting the framework of 'planning within inequality' would be a better fit than planning for diversity.

In this context, self-organised initiatives seem to have a greater potential to plan within inequality. They are capable of fostering social connections between their participants because the success of their work depends on these social ties. It is common for informal settlements and gated communities, for example, to have some self-organised initiatives. Nevertheless, these initiatives mainly operate inside their own communities. Thus, it is interesting to shed light on self-organised initiatives that aim to improve public spaces outside informal settlements and gated communities, which inevitably have to work with a more diverse group of people. These self-organised initiatives are often led, influenced or supported by architects and planners.

At this point, it is important to clarify what type of self-organisation is being referred to here. There are two main interpretations of 'self-organisation' in urban studies. The first relates to complexity science (Ashby, 1947; Eigen, 1971; Foerster & Zoepf, 1962; Haken, 1983), while the second is used in governance studies (Dam et al., 2009; Kotus & Hławka, 2010; Nunbogu et al., 2017; Wunsch, 2013). Although both fields use the term 'self-organisation' and the definitions have some similarities, they are fundamentally different. Rauws (2016) developed a framework to distinguish

the two in an attempt to avoid possible confusion. While self-organisation, as seen through a complexity science lens, focuses on the emergence of spontaneous urban patterns from individual local interactions (Heylighen, 2008; Portugali, 1999), in governance studies, the focus is on processes of self-governance, where citizens take the lead rather than the government and produce a kind of bottom-up, grassroots, 'do-it-yourself' urbanism (Kee & Miazzo, 2014; Newman et al., 2008). The latter interpretation, aligned with governance studies, is used in this study.

According to Rauws, self-organisation considered from a governance studies perspective has four main characteristics that clearly distinguish it from the complexity science perspective: first, there is internal coordination, where members develop a participation and decision-making process; second, actions are undertaken with a collective intent, where there is a common goal, for example the renewal of a public space; third, a change in the urban environment is the result of this deliberate action designed to achieve this common goal; and fourth, the transformation of the urban system is to some extent predictable (Rauws, 2016). In summary, the initiatives rely on an internal process of coordination, have a common goal, bring people together to act to achieve this goal and the result of this change is relatively predictable. Additionally, these self-organised initiatives work independently from the government (Dam et al., 2009; Schmidt-Thome et al., 2014; Swyngedouw & Moulaert, 2010) and usually operate around the established networks of governance and institutions (Lydon & Garcia, 2015). Moreover, the self-organised initiatives investigated in this research relied on the participation of planners.

§ 5.3 Methods

The first stage of the research required understanding the literature on spatial fragmentation and self-organisation. These preliminary theoretical sections of the research, together with the literature review focusing on fragmentation, were presented at the 2017 Nordic Geographers meeting, while self-organisation was discussed at the 2017 Research Committee 21 Conference. Both events were used to obtain critical feedback, broaden the literature base and generate insights for this chapter.

The research mainly used qualitative methods to understand how self-organised initiatives operate in fragmented contexts. A set of semi-structured interviews was developed to shed light on different issues related to how the initiatives function. The questions, for example, were focused on the following topics (although they were not limited to these topics): their organisation methods, communication, finance, the agenda and area of action, the interaction between members from the initiative and the local inhabitants, and expected and achieved results. The plan was to have semi-structured interviews and give the respondents the opportunity to highlight other relevant factors related to their operation. Thirty interviews were conducted in two months of fieldwork in Brasília, Rio de Janeiro and São Paulo. The strategy behind selecting different cities was to avoid being limited by the fragmentation dynamics of one city and to be able to look for common patterns in the way initiatives work.

The interviews took place in July and August 2016, in public places, cafés, in the interviewee's home or in the work place of the initiative. In total, 12 self-organised initiatives were studied and an additional set of interviews with public servants and local experts were conducted to gather external views. Most of the interviewees were planners and architects, with a total of 20 interviewees having this professional background. It is important to clarify that, in Brazil, architecture and urban planning are always taught together. The interviews were audio-recorded and analysed later with Atlas.ti software. Additionally, field observations during physical meetings and participation in the online groups associated with these initiatives also provided insights for the analysis.

TABLE 5.1 Initiatives interviewed

	Initiative	Methods used	Actions	City
1	Terreyro Coreográfico	In-depth interview	Renewal of public spaces under viaducts through the organisation of dance-related events.	São Paulo
2	Bela Rua	In-depth interview	Renewal of public spaces.	São Paulo
3	Cidade Ativa	In-depth interview	Develop urban interventions to promote mobility on foot.	São Paulo
4	Organismo Parque Augusta	In-depth interview and social media observation	Reclaim and manage the Parque Augusta, a public park that is located on private land and has been targeted by real estate developers.	São Paulo
5	Colaboratório - Lab Bijari	In-depth interview	Different urban interventions to raise awareness of how urban space is being used; for example, highlighting where empty buildings are located.	São Paulo
6	A Batata Precisa de Você	Social media and field observation	Renewal of the Largo da Batata, a public square located in the Pinheiros neighbourhood.	São Paulo
7	Caminha Rio	In-depth interview	Renewal of sidewalks and promotion of pedestrian mobility.	Rio de Janeiro
8	AMAI	In-depth interview	Neighbourhood association that promotes cooperation between residents for local improvements.	Rio de Janeiro
9	Saracura	In-depth interview and field observation	Art related installations in the port zone.	Rio de Janeiro
10	Brasília Para Pessoas	In-depth interview	Proposals for healthy urban mobility.	Brasília
11	Jane's walk Brasília	In-depth interview	Renewal of sidewalks and promotion of pedestrian mobility.	Brasília
12	Litro de luz	2 In-depth interviews and field observation	Installation of public light poles.	Brasília

The preparation for the fieldwork was done from abroad, so the first attempt to contact the initiatives was made using email and social media. Although the physical distance was an initial challenge, the strategy of contacting the initiatives using the internet proved to be relatively successful. This online scanning of possible initiatives generated a schedule of 10 interviews before the fieldwork itself started. The personal network of the researcher, who is a planner himself, was also used to contact possible interviewees.

Subsequently, a snowballing technique was utilised to find new contacts, which produced the remaining interviews. It is important to acknowledge the limitations of the snowballing technique. Since the initiatives suggested contacts in their own network, this meant that they led us to others who were working on related topics or in the same areas of the city. Notwithstanding this limitation, the aim of the research was not undermined, as the first group of initiatives contacted through the online scan was quite diverse and, moreover, the research focused more on how these initiatives operated in the city rather than on how they were related to each other. In this sense, the snowballing technique was extremely efficient, since there was an active network of different initiatives and they were less concerned about providing an interview when recommended by a colleague from another initiative.

§ 5.4 Self-organised Initiatives as a planner's tool

Firstly, it is important to clarify that the concept of planning used in this chapter is not limited to the design of the built environment or the creation of norms to regulate the physical development of cities. It also refers to the processes that create these spaces and norms. In this respect, planning can vary considerably between different places. In many cities of the Global South, for example, planning occurs with and without the formal support of public institutions (Watson, 2014), including through the work of self-organised initiatives. Not surprisingly, these initiatives also rely on the participation of planners. The interviewees often explained that their participation in the initiatives was motivated by a desire to further an agenda that they believed in as a planner. This was the case for one planner who explained how his group decided to act after they noticed that the traditional way of working in conjunction with public authorities was not leading to any action:

A lot of autonomous actions started, things that we would like the municipality or the state to do, for example … but the people got there and thought 'well, if they [the municipal authority] don't do it, let's do it ourselves' and this was very interesting. (Member of Organismo Parque Augusta)

In this short quote, it is possible to identify a sense of disappointment with the work of the public authorities. This frustration was mentioned in all of the interviews of members of self-organised initiatives. The data collected showed that the frustration with the government's inertia was an intrinsic aspect of these self-organised initiatives. The complaints varied from simple annoyance with governmental red tape to a general discontent concerning governmental urban policies at the macro level. The interviews showed that these planners acted in self-organised initiatives as a direct response to governmental inefficiency. Planners from these initiatives demonstrated confidence about the possibility of furthering their agendas or implementing specific actions more efficiently through these initiatives, rather than using official government channels.

In the specific case of *Parque Augusta* mentioned above, which involved the occupation and renewal of a public park located on private land, the interviewee expressed surprise at the positive result of the action. Although the initiative did not achieve by then its long-term goal of permanently opening the park to the general public, it was possible to partially implement their wishes without waiting for the public authorities to intervene. This led to the realisation among the planners of the potential of self-organised initiatives. Although the planners interviewed were enthusiastic about their impact as members of these initiatives, this does not mean that they did not face difficulties and drawbacks. Nonetheless, they were convinced that these actions were effective and, from their perspective, had generated positive results.

It is like putting together urban planning with society … but with what society really needs. Sometimes urban planning comes too much from above. It's not something authoritarian, but mainly vertical. And there is not a dialogue … but if you only get this dialogue, you don't know much what to do. You need to have this meeting between the two. (Member of Bela Rua)

It is interesting to note that this confidence in the work of self-organised initiatives and the disappointment with public authorities did not keep members away from the local government. Three interviewees from self-organised initiatives were also working in different departments of the local government. The data from the interviews showed that they did not see a contradiction between these two functions but understood them to be complementary. They referred to their work as a public servant as something more 'bureaucratic' and their participation in self-organised initiatives as more connected to their 'ideologies', or what they believed was better for the city.

Nevertheless, this division is not that clear cut. It is misleading to believe that their ideology does not influence their technical work and that their technical knowledge does not influence the way they participate in these initiatives. Additionally, this perception of participating in self-organised initiatives based on an 'ideology' does not seem connected to the profile of activist planning presented by Sager (2016). The planners interviewed did not justify their actions in self-organised initiatives based on a response to neoliberal planning, but rather as a way to be more closely connected to civil society, as mentioned in the quote.

Planners have different perspectives from the regular citizens who also take part in these initiatives. It was interesting to note that all of the planners interviewed had prior knowledge of the urban challenges and policies of the city as a whole. As a consequence, planners taking part in self-organised initiatives saw their actions as being integrated into a broader context. Although the actions of these initiatives focused on a restricted local context, such as a square or an alley, for example, all of the interviewees contextualised their actions in terms of a comprehensive solution to challenges faced by the city, such as improving mobility, increasing the amount of green space, developing better infrastructure, or increasing community participation. As shown in the quote from the *Bela Rua* member above, urban planners who are engaged in self-organised initiatives are both conscious of the general challenges in the city and also expect that these self-organised initiatives will contribute to and confront these challenges. This perspective goes well beyond that of ordinary citizens, who do not have technical knowledge gained from professional planning education but become involved because they are interested in solving a specific challenge in their neighbourhood. The data from the interviews showed that planners actively take part in these initiatives because they believe in their capacity to tackle the macro challenges facing the city, even if their activities related to the initiatives are limited, for example, to the scale of a public square. Additionally, this perception that planners have a pluralist and managerial role is increasingly being acknowledged among planners (Fox-Rogers & Murphy, 2016). The self-organised initiatives researched are definitely seen by the planners interviewed as a possible tool to reshape the city.

§ 5.5 Planning in cities with high socioeconomic inequality

Planning for just cities or planning for diversity must also recognise that inequality is extremely high in Brazilian metropolises. According to the World Bank, based on the GINI index, Brazil ranks as the eleventh most unequal country in a list of 144 nations

(Bank, 2016). As previously discussed in the theoretical section, it is difficult to develop public spaces in such an unequal context (Maricato, 2011; Vilaça, 2011). Even excellent quality public design can fail to foster redistribution, recognition and encounter, as suggested by Fincher and Iveson (2008). This is definitely more striking in central metropolitan areas, where income inequality is greater than in the peripheral zones. The renewal of the Largo da Batata, a public square in São Paulo, is emblematic because it was a successful project in terms of design and functionality led by the municipality. However, it did not manage to integrate the higher and lower income residents in the use of the public space. This integration only occurred after a self-organised initiative called '*a batata precisa de você*' – 'The batata square needs you' – which developed the social connections in this unequal context (Da Silva & Rojas-Pierola, 2018). In order to understand how these self-organised initiatives work in extremely unequal environments, the interviews addressed topics related to the diversity of the public involved in their activities and affected by their work.

All twelve initiatives mentioned that the public affected by their work was extremely diverse, which is an inherent characteristic of central areas of Brazilian metropolises. The interviewees referred not only to the financial inequality between users, but also to the social contrasts and conflicts concerning how the public space was being used. Initiatives would try, for example, to renew public spaces by giving different uses to marginalised areas; however, it was common that these areas were used by vulnerable groups, such as homeless people. As a consequence, it was a challenge to reconcile the new uses of the public space – bringing more activities to these areas but still serving the needs of the vulnerable groups already established in these marginalised areas. This was the task of another case study, *Terreyro Coreográfico*, which attempted to use dance activities to develop new functions in marginalised public spaces such as those under viaducts. These conflicts concerning the use of public space are well expressed in the following quote:

There is this thing of the people living there. So, there is the smell of shit, of pee, of cooked beans. You are in a way in contact with these peoples' intimacy, which is an experience that a lot of people can't stand ... to be so close to this. To be there doing a class [dance classes] and having a person waking up next to you. (Member of Terreyro Coreográfico)

The quote provides an example of extreme contrasts in the use of public space. Despite the natural conflicts created by these different uses, the initiative attempted to bring together these two diverse groups, which would rarely interact otherwise. The data from the interviews indicates that these encounters were not previously planned nor were they part of the initial strategy of the self-organised initiatives. However, the initiatives were aware that this was an inevitable challenge when working on public spaces in

Brazilian metropolises. In the specific case of *Terreyro Coreográfico*, the initiative maintained a dialogue with the homeless people living in the area and included them in their activities. As a result, the self-organised initiative not only brought a new function to a marginalised space but developed new social ties between the users.

For example, last year we made a 'festa junina' [a party based on Brazilian country folklore]. And there were like people from the neighbourhood, workers and middle-class people … there were the real homeless people … also a transgender person who lives under this viaduct … there were some artists. It was crazy, everybody was dancing together […] I thought it was beautiful to have this integration between people from such different groups. (Member of Terreyro Coreográfico)

The quote not only reveals the positive result of the interaction promoted by the initiative within this diverse group, but also the surprise of the interviewee to witness this success. As mentioned above, this interaction was not the aim of any of the initiatives. Nevertheless, the strategy used to provide a new function to this marginalised space generated an opportunity to create social connections within this diverse group. The necessity of accommodating extremely diverse people was referred to in all of the interviews. Although the initiatives did not follow traditional strategies of urban renewal, such as focusing mainly on design, the data indicated that they were able to promote interaction between users of the public spaces on which they were working. The interviewees revealed that this process of do-it-yourself urbanism (Finn, 2014) created strong social connections between users. Despite not following the normative strategy suggested by Fincher and Iverson (2008), and not using traditional planning strategies, the self-organised initiatives were able to foster redistribution, recognition and encounter when renewing public spaces. Their success indicates that public authorities could definitely learn something from the modus operandi of these initiatives.

Notwithstanding the above, the diversity found among the group of people affected by the work of the initiatives was definitely not the same as that within the group working on the initiatives. Although the interviewees mentioned that they were diverse to some extent, this diversity did not compare with that of the people affected by their work. This divergence of social differences between the users of the public spaces in Brazilian metropolises and the members of the initiatives was confirmed by the field observations. The self-organised initiatives that participated in the interviews and in which urban planners were involved, were mainly composed of highly educated middle-income earners. As such, the initiatives were more homogenous than the public affected by their work and this could be one of the reasons why they had more difficulties acting in neighbourhoods with a predominantly low-income population, with whom the initiative's members did not have strong social ties previously. Only

one initiative interviewed focused mainly on areas with a predominantly low-income population, and they mentioned the difficulties that they faced acting in these areas. The data from the interviews reflected this, indicating that the self-organised initiatives interviewed had difficulties establishing dialogue with the residents of less affluent neighbourhoods.

Despite the relative socioeconomic uniformity of the members of the initiatives, their work was still successful in creating social ties in areas known to have a predominantly less affluent population. Although planning in extremely unequal contexts has proven to be challenging (De la Espriella, 2007), the self-organised initiatives were able to operate successfully. The interviews and field observations confirmed that inequality was present in all of the public spaces in which the initiatives were working; however, this difficulty did not compromise their capacity to create social connections and implement their actions.

§ 5.6 Discussion and conclusions

Aligned with the frustration of young planners nowadays (Taşan-Kok & Oranje, 2017), this active attitude towards the built environment perhaps indicates a change in the manner that planners perceive these initiatives. In the past, traditional top-down planning might have considered these initiatives to disrupt the planned order, but today, planners have joined these initiatives and are using them to shape the built environment. The interviews suggest that planners are taking part in these initiatives because they believe that such activities can be effective in tackling urban challenges within their cities on local and macro scales. Although it is still unclear what the greater impacts of these initiatives will be in the city as a whole, the positive perception of planners and their interest in these initiatives already indicates that they might play a greater role than previously expected. As pointed out by Watson and Siame, there is still a lot to be learned from these co-creation processes, especially those coming from the Global South (Watson & Siame, 2018).

Additionally, it is interesting to note that planners are assuming different roles in these initiatives compared to traditional planning practice. As pointed out in different interviews, they perceive their work in self-organised initiatives to be closer to what is wanted by civil society. In this sense, planners are positioning themselves as mediators between the technical realm and the local community. Also, in all of the initiatives that participated in the interviews, the planners seem to reject the status of leadership.

Instead, they are trying to promote more horizontal relationships with local citizens and to avoid being labelled as the drivers of the actions, even when their leadership position was clear. Additionally, they portray their work in the initiatives as being more ideological and less technocratic than that of traditional planning practice. Nevertheless, the interviews showed that is difficult to separate the two dimensions. The planners involved in self-organised initiatives still used very technical terminology to describe their actions, aims and results from working in such initiatives. Thus, it is hard to believe that planners working in the municipality, developing very technical functions, are not influenced by their own ideology.

The research revealed that these initiatives were indeed able to work closely with civil society and function even in contexts of extreme inequality. Perhaps this is one of the factors that led urban planners to work more closely with them. Based on Sabatini and Salcedo's framework (2007), there is definitely a change from functional integration to symbolic integration between these extremely diverse groups. In this sense, these initiatives were able to create social connections while renewing public space. This contrasts with projects led by public authorities, where the main focus is on delivering a good design, but which often fail to promote social connection within unequal environments. This capacity to create social connections in contexts of extreme inequality is interesting because it undermines the logic of spatial fragmentation in Brazilian metropolises, which is not only based on the disconnection of spaces but also on extreme social division. Although the interviews revealed that this was not their initial aim, the self-organised initiatives studied here managed to go beyond the renewal of a public space in also fostering social connections between diverse groups.

It is important to note that the research could only understand the local impacts of these initiatives, and the macro effects in the three cities are still unclear. While the study generates insights into the modus operandi of self-organised initiatives and how planners are engaging with them, the research could still be broadened in scale, using quantitative methods, and also in scope. It would be particularly interesting to understand how those implementing public policies could work with these initiatives to achieve better results. While self-organised initiatives have a strong capacity to create social ties, municipalities have the experience and power necessary to implement spatial changes. It could be mutually beneficial to promote more cooperation between the public authorities and self-organised initiatives. The possibility of cooperation opens new questions and avenues for research. For example, how might public authorities support these initiatives? In an environment with an array of initiatives, how can central planning work with them to promote cohesion and not fragmentation?

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6 Planning education with self-organised initiatives: a case study of societal impact using online education

A PhD thesis develops by aiming to answer specific research questions. However, despite the quality of the research, the translation of scientific knowledge into societal impact can be challenging. This thesis not only aims to contribute to the academic debate concerning urban planning but also to have a societal impact beyond the realms of academia and recommendations for public policy. In achieving this aim, the work developed here was mainly limited in two aspects. Firstly, doctoral research has a natural difficulty in generating societal impact due to its dependence on third parties outside academia. In planning research, the dependence is mainly on public authorities. Some doctoral theses result in the development of a set of policy recommendations covering a large urban area, which is also the case with the present research, but which might never be followed up by public authorities. The implementation of these recommendations depends on the access that the researcher has to public planning institutions and the openness of public authorities to implement the ideas. Secondly, the doctoral research was developed in the Netherlands, while the study areas are located in Brazil. Although the research definitely benefited in many aspects from the knowledge and resources located at TU Delft, the distance added a challenge to the work successfully connecting with the Brazilian context. Academic research in urban planning can have a societal impact not only by producing policy recommendations but also by making a stronger contribution to education. Despite the distance being a challenge, online tools can help to bridge this gap by connecting the researcher with local stakeholders, in this case in Brazil. Through these connections, this doctoral research aimed to become a useful tool for public authorities, while also contributing to planning education through its application in online courses. With this in mind, a Massive Open Online Course (MOOC) was developed during the third year of the doctoral research, with a second edition following in the fourth year of the research. The course worked as a case study of how doctoral research can generate societal impact through planning education. In this case, the course created a channel by which to maintain a close connection with international practitioners, in particular local stakeholders in Brazil, while giving back to Brazilian society part of what was being developed at TU Delft. The experience of the course is discussed in further detail here in Chapter 6, while the main results are presented in Chapter 7.

The case study of the Rethink the City MOOC, as presented in Chapter 6, has been accepted for publication in the journal, Transactions of the Association of European Schools of Planning (AESOP).

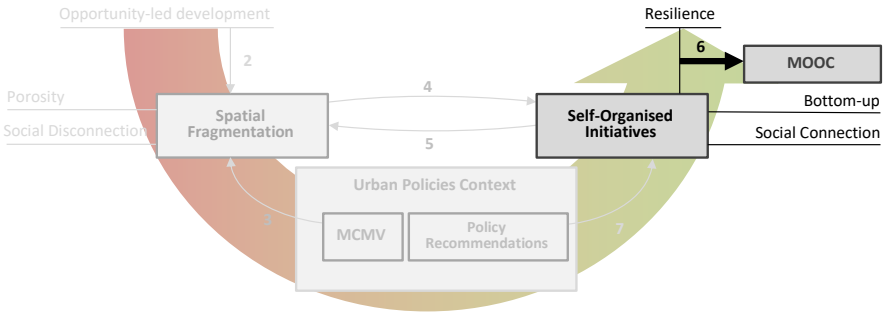

FIGURE 6.1 Conceptual relation of Chapter 6

Rethinking planning education using massive open online courses: the case of Rethink the City

Abstract

Massive Open Online Courses (MOOC) are becoming a popular educational tool on different disciplines. Urban planning education is no exception and new MOOCs are being release every year. Nevertheless, it is still not clear how this new learning experience is being developed, delivered and impacting planning education. This article sheds some light on this issue using the case of the Rethink the City MOOC organised by the Faculty of Architecture and the Built Environment of TU Delft. The course received the AESOP Excellence on Teaching award in 2017 and can serve as an example of how planning education is facing these changes. The article briefly introduces the course and develops on the challenges and results of it. Based on the course team experience on preparing and delivering the course, the article aims to contribute to the debate about online education and to support fellow academics involved on the creation of new MOOCs.

Keywords: MOOC, urban planning education, Global South

§ 6.1 Introduction: Learning About the Global South

The world has become predominantly urban in the last decade (UN, 2015). However, this fascinating change is not being led by traditional urban centres in Europe and Northern America, but by the extremely accelerated urbanisation process in emerging economies of the Global South. Several researches have pointed out the implications of this change on planning theory and practice (Miraftab, 2016; Roy, 2011, 2016; Watson, 2016). Nevertheless, not only planning practice and research will have to adapt to this new reality, but also planning education. In this sense, it is imperative to debate how planning education is dealing with this change. The same way that traditional planning tools may not be suitable to address the urban challenges of the emerging world, educational strategies will also have to change in order to better address and reach the Global South. Even though the urban challenges of the Global South have a clear global aspect, the aim is to impact locally. In this regard, a traditional classroom approach is not suitable to connect lecturers and researchers based in Europe with local students and practitioners based in the Global South. Therefore, this paper explores the opportunities and challenges of online education by presenting and making some reflections on the process of developing and delivering an online urban planning course focusing on the Global South.

The concept behind the course was to explore educational strategies that would connect the researchers from TU Delft with practitioners and urban enthusiasts from the Global South. Already from the beginning it was clear that to be able to reach a great number of participants from the Global South, the course had to be online and affordable. The option to go for a Massive Open Online Course (MOOC) seemed the best fit. The result was the creation of the Rethink the City MOOC, which attracted more than 10.000 participants.

The idea to develop this course emerged as a bottom-up initiative. PhDs candidates focusing on research about the Global South within TU Delft wanted to expose and discuss their work with students and professionals working abroad in the field. The aim was to generate a platform to connect the frontline of on-going research within TU Delft with people working in Africa, Asia and Latin America. This first idea developed into an open online course proposal, which fitted best to make this connection between researchers in TU Delft and (prospective) planners in the Global South possible. This bottom-up structure with young PhDs presenting their research made it possible to have a stronger connection between participants and lecturers. In this sense, it was easier for the participants to debate about the urban challenges of China when the lecture and discussion was leaded by a young Chinese researcher working in TU Delft. This model was repeated in the other cases discussing urban challenges, such as, in

Ghana, Chile or Malaysia. A bottom-up initiative lead by the PhD candidates suited very well to trigger this level of interaction and debate.

The paper is structured as follows. The first section discusses the benefits and challenges of online education in urban planning in comparison with traditional education. The second section describes the course Rethink the City in terms of learning objectives, pedagogical approaches and assessment tools. The paper finalizes with the discussion of the results regarding critical thinking, theory and practice integration, student's engagement and challenges to overcome.

§ 6.2 Online Education in Urban Planning: Benefits and Challenges

What is the Rethink the City MOOC?

A MOOC, as the name points out, aims to reach a large audience and provide open education. It was based on these two principles, great impact and affordability, that the course team started to design the course. The idea was to connect to a large audience in the Global South, trigger a critical discussion and receive feedback from the participants. Additionally, as will be later discussed, the course was also able to activate some local initiatives, which generated a local impact greater than previously expected.

The Rethink the City course was developed during a year and it was delivered on 7 weeks of intensive work. The content was divided into 3 modules based on the thematic expertise of the team in Delft. The majority of the course team is made of PhD candidates developing research on the Global South. The course was an interesting opportunity to enhance the link between the researchers in Delft and the habitants of where they conduct research. Therefore, the course focused on three urban themes relevant to the Global South: Spatial Justice, Urban Resilience and Housing Provision and Management.

As aforementioned, academic expertise from TU Delft was used to trigger debate around these thematic modules and was presented in a range of challenging case studies from Ghana, Brazil, Malaysia, Chile, and China, among others. In order to have a comprehensive understanding of the challenges in the Global South, the course provided a combination of theoretical lessons, presentation of case studies and testimonies from practitioners. On the other hand, students were requested to deliver

practical assignments in which they connect theory with their own local challenges. The aim of the course is that students develop a critical perspective about their urban environment and how to translate this knowledge into analytical tools and innovative urban solutions.

Even though the course had a high percentage of experienced practitioners, which shows the interest on the topic between more advanced professionals, the course was originally targeting undergraduate, master planning students and young planners. We considered that the open and online format would allow the participants and the staff members to be part of an inclusive educational experience in which students from the Global South could really implement in their own local realities what they learned in the course.

View of TU Delft Online Education

Rethink the City is part of a greater TU Delft strategy to improve the quality of education around the world throughout online learning. In 2014 the university presented their innovation program, which included open and online courses. Since 2014, more than 750,000 students have enrolled in TU Delft online courses (Nelson et al., 2016). The development of TU Delft courses is supported by the pedagogical model called Online Learning Experience (OLE), which strives for increasing quality. The OLE is an important guideline that serves all TU Delft online courses and generates the opportunity for knowledge and experience sharing between course teams. The OLE model has 8 course design principles that guide the development of TU Delft online courses: to be flexible, diverse, inclusive, supportive, interactive, active, contextual and innovative.

The Rethink the City team followed these principles in every step of the construction of the course. The principle of flexibility involved that students received all the 3 modules of the course at once and could choose in which order and pace to take. The course had not only a diverse team, but the activities and assessments were developed in a creative way to keep the participants motivated. Besides being free, the course also invested on the inclusion of non-english speaking communities, since it was also subtitled to Spanish and Chinese. Naturally this is a great opportunity for TU Delft to increase its internationalization and enhance its voice on the Global South debate and education. The high amount of participant from the Global South and especially from Latin America showed that there is a great potential to further develop TU Delft presence there.

With 11 PhD candidates on the staff team, the supportive aspect of the course was higher than a traditional MOOC, especially with a daily participation of the staff team on the course platform, on Sketchdrive (a platform for the assignments), on the course Facebook page and Instagram. Regarding the interactivity, the course had a

vivid discussion forum and more than 10.000 images and comments uploaded on the assignment platform (Sketchdrive). Every module had 2 practical assignments plus a final assignment, which made the learner experience quite active while learning by doing. The contextual aspect was achieved by the PhDs presenting their case studies and being complemented by 3 lectures from practitioners working on the ground, which made a balance between theory and practice. The course was so rather innovative. It was created and coordinated by PhDs candidates, which is not commonly seen on MOOCs. Additionally, it focused on alternative approaches for the urban challenges of the Global South, while using innovative tools to do so, like the Sketchdrive platform.

Benefits for Urban Planning Education

A general issue in planning education is to make links between the "transnational flow of planning ideas and practices" (Healey, 2013, 1511) and the local embeddedness of planning in its context. This tension already originates from the movement of modernist planning as a science based approach to urban and rural development and traditional local practices of planning (Healey, 2012), making that "...the worlds within which an idea arrives and has effects may be far removed from the world which generated the momentum in which an idea was given initial shape and meaning." (Healey, 2013, 1517) This even resulted in a physical separation of modern planned cities for the colonial elite and traditional practices for everybody else (Home, 2014; Siame, 2016; Watson, 2016). As Ratnayake and Butt (2017), indicate.

The internationalization of planning practice and planning education is problematic as it inevitably raises question of the utility of comparison and the embedded nature of local knowledge. Yet these experiences potentially serve three important purposes; by requiring reflection on values, developing cultural literacy and developing a sense of participation in a 'globalized' profession. (Ratnayake and Butt, 2018, 53)

One way to address this challenge is by having local planning schools in which teachers form the linking pin between embeddedness in their local context and being active in academic debate. In a recent review of planning programmes in Europe Frank et al. indicate that almost "...all planning education programmes in Europe are residential programmes" (Frank et al., 2014, 46). Although most of European planning programme have a focus on planning in a national or European context, "a range of institutions still offer international development planning degrees at postgraduate or master level, mostly taught in English."(Frank et al., 2014, 47) Such a distance between academic institution and local practices, has the advantage that it helps to teach ideas that provide new insights to localised practices, i.e., the "reflection on

values", the "cultural literacy" and the sense of being part of "'globalized' profession" (Ratnayake and Butt, 2017, 3). Many teachers in these programmes have a true commitment to international development issues, ensuring that the courses stay relevant for these localised embedded practices. In some cases, links between international ideas and practices and local embeddedness may be improved as other reasons than professional development play also a role in choosing to study abroad (Kunzmann and Yuan, 2014). An important issue is however, that international programmes may only address a small elite of planners and planning students of the global South. Following a full academic programme is expensive, not only because tuition fees, but also based on costs of living in more expensive environments and the opportunity costs of not being able to make a living locally. These issues can be addressed by a Massive Open Online Course, which can be followed, for free from the home environment with a relatively small investment in time and efforts, but still providing opportunities to develop a reflection on values, develop planning thought and by promoting a sense of being part of a wider, global, community. These courses can be followed by novices to the field, but also by professionals that may consider such a programme, if well designed, as a method of "work-integrated learning" "in which students learn and develop knowledge and skills through a wide range of interactions with people in the workplace, and through the completion of tasks, which may or may not be prescribed by academic supervisors" (Rosier et al., 2016, 489)

Challenges and Differences from Traditional Education

On-line education presents us with several challenges. It is difficult to replace face-to-face interaction between teachers and students: there is a reason why people get together to learn. The main problem seems to be the direction of learning: in a classroom environment, the richness of interactions and the diversity of backgrounds guarantees that students learn as much from each other as from teachers, and that teachers learn also from students themselves. In the MOOC Rethink the City, we tried to cater for shortcomings by creating online environments where students could interact and learn from each other. This also allowed teachers to learn from students' accounts and experiences. By interacting with students through short assignments based on narratives about urban problems, it was possible to create an atmosphere of mutual learning. This is a fundamental aspect of modern education that needs to be contemplated by online courses.

The diversity of backgrounds was emphasized, rather than overlooked. This is relevant because it contributed to the promotion of alternative visions on urban challenges at the local level, privileging local voices. It was essential, therefore, to find ways to let local voices speak in the course. This was done by creating a platform where students

uploaded pictures and films about urban challenges, which have been commented and discussed by others students.

This makes a fit with contemporary thought about flipping the classroom (Graham et al., 2017), which involves that teachers are facilitators, rather than dispensers of knowledge. The emphasis must be on learning not on teaching. In this perspective, students are not recipients of knowledge, but co-creators. But it also caters to the need to 'de-colonise' planning education. We are aware this is a very contentious subject. However, we believe that planning systems and planning education in Latin America, Africa and Asia follow excessively European-centred models of knowledge and education and local knowledge is generally overlooked in favour of an Anglo-American based literature (compare Paasi, 2005). We were not able to deviate from this literature in its entirety, and we cannot claim to have 'de-colonised' our planning views, but the inclusion of students' and practitioners' voices in the course gave us the possibility to expand the discussion.

Although the topic of transcultural understanding was not explicitly addressed during the course, we were surprised by the lack of friction in open forums. These forums were moderated, but we did not feel the need to intervene in the conversations that students from very different backgrounds were having in the open platforms. In short, interaction and diversity formed the basis of this course and this translated in a rather cooperative stance from participants.

The great advantage of online education is its reach, and when it comes to education about and for the Global South this is very relevant. We heard several accounts of students in Africa and Latin America who follow MOOCs regularly and hence have access to education that would be difficult to obtain in their home countries. In this sense, MOOCs have the potential to foster transnational understanding and collaborations, if they allow for participation and mutual learning. It is important to highlight that the local practitioners invited to give interviews in the course also work as academics in local institutions. Moreover, the majority of the PhD candidates presenting built their educational career in the Global South and are financed by an institution from the Global South. This makes the connection with local academics stronger than in a regular on-campus course.

§ 6.3 Course Description and Pedagogical Approach

Learning Objectives

The focus of the course on today's urban challenges of the Global South was channelled through three themes, that is, spatial justice, housing provision and management and urban resilience. The aim of the course was to contribute to current urban debate which stresses the importance to go beyond traditional strategies and policies. We discussed questions such as: Is the just city framework applicable in cities with extreme socio-economic inequality? Can community-led housing initiatives provide effective solutions for households in need? How can resilience support development instead of perpetuating a disadvantaged condition?

The purpose of the course was to progressively build-up a critical perspective about local urban challenges in the Global South. Through a combination of short theoretical lessons, presentation of case studies, testimonies from practitioners and practical assignments the participants learned how to develop a critical approach to understand their own urban environment and how to translate this knowledge into analytical tools and innovative urban solutions. Therefore, the course had mainly four learning objectives: (i) identify alternative theories in spatial justice, housing provision and management, and urban resilience, (ii) identify urban challenges in local contexts, (iii) develop a critical perspective about their own urban environment, (iv) translate knowledge into analytical tools and innovative solutions to contemporary urban challenges. By the end of the course, it was expected that the course participants were able to learn new perspectives to identify, understand and analyse one urban challenge of the Global South. The learning objectives do not focus on developing a comprehensive understanding of all urban challenges of the Global South, but rather that the participant can identify, criticize and produce solutions for one of their local challenges.

Pedagogical Approaches

TU Delft has been involved on urban planning education for decades. The Faculty of Architecture and the Built Environment is not only an international reference on the matter, but it has a tradition to be in the frontline of innovation in education. In this aspect, it seemed natural to transfer that experience on urban planning education to the virtual world.

Based on the aforementioned OLE educational model in section 2.2, the course has aimed to deliver the same quality of the on-campus courses, but taking advantage of the flexibility of the internet. The course was developed in a manner that it would be possible to debate the urban challenges of the Global South including the people that are on the ground living these challenges. The lectures from TU Delft had direct contact with participants worldwide. Taking advantage of this communication technology, the course connected TU Delft researchers to students and practitioners in 160 countries. Even though we have already been working with online education for a few years, the pedagogical experience created at the Rethink the City course was quite special, since we could extend the scale and impact of the discussions.

The course used two online platforms that were constantly fed during the course and promoted an intensive knowledge exchange experience. The first platform was based on edX and aimed for text discussion and communication between staff members and participants. This platform hosted discussions from varying topics, from fostering development but protecting the heritage to how to plan resilient cities but with low financial resources. In order to have a more vivid debate and because of the technical constrains of edX, another platform was used just to upload images, named Sketchdrive.

The two platforms were the core space for knowledge exchange. The Rethink the City staff[8] strategically relied on this pedagogical tool as one of the main aspects of the course. In such a large scale it is impossible for the teaching staff to reply all the questions in the forum. Therefore, the team designed and moderated the two platform in order potentiate this knowledge exchange aspect. Since we had an extremely diverse group participating from different parts of the world, the discussions were very rich and based on the participants' local knowledge.

In this sense it is important to realize some changes on the role of the lecturer on regard to such a large scale course. Besides triggering the discussions with the video lectures, the lecturers had to steer and moderate the discussions promoting this knowledge exchange between students. This differs from the traditional role of the lecturer in on-campus education, where every question or students' observation is addressed by the lecturer. On a MOOC, knowledge is not generated by the lecturer alone, but it is collective construction made by the lecturers and the participants.

8 The course was supervised by Prof. Willem Korthals Altes and coordinated by PhD candidates Igor Moreno Pessoa and Luz Maria Vergara. In total 11 PhD candidates and 3 guest practitioners from outside TU Delft gave lectures.

Course Structure

As previously mentioned, the course was structured in three thematic modules (see figure 6.2). This structure offered a flexible setup in which the three modules were simultaneously available from the beginning of the course. This meant that participants had freedom to follow the course according to their own pace but also follow it according to their own thematic preference. Nevertheless, workload estimations and fixed deadlines for assignments were incorporated in order to ensure appropriate allocation of time per module and define main stages in the course.

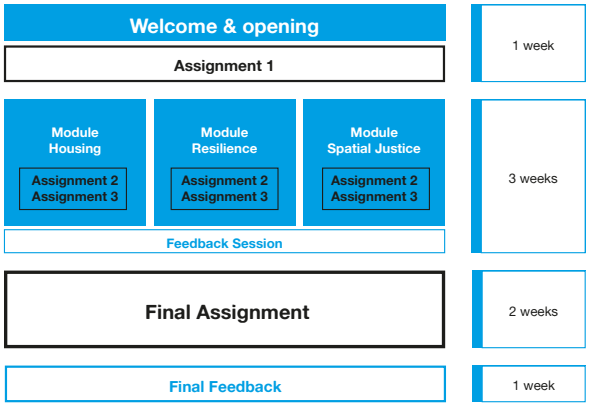

FIGURE 6.2 Course structure

FIGURE 6.3 Module structure

Therefore, during the 7 weeks the course was chronologically ordered in four stages, starting with an introduction and opening section (week 1), the three modules (weeks 2 to 4), the final assignment (week 5) and the closure of the course with the final feedback (week 7). Apart from the general structure, each module of the course followed the same structure: first a more comprehensive theoretical presentation was given by a professor from the faculty; following that a series of three lectures presenting cases studies were given by PhD candidates; the third part of each module would be the lecture of a local practitioner exploring the challenges faced when implementing the theory and research presented. Additionally, during the modules, the students had to do practical exercises, where they would have to engage in their local context exploring an urban challenge mentioned on the lectures (see figure 6.3).

The thematic selection of the modules was based, firstly, on the inclusion of topics that address the most contingent urban planning challenges for the Global South, and secondly, on the academic expertise of TU Delft lecturers. This led to the creation of three modules addressing spatial justice, housing and resilience. The module of spatial justice analysed concrete cases of spatial justice and injustice in the Global South and discussed how contemporary theories apply. It aimed to address issues of spatial justice in the booming metropolises of the South, where spatial fragmentation and inequality are extreme (Pessoa et al, 2016), which emphasis is different from the issues of spatial justice in the Global North.

The module of housing discussed the role of the State, the society, the market and third sector in housing policies, exploring opportunities for ownership and rental models in different contexts. Some topics of interest were social innovation in housing, collaborative housing approaches and the role of third sector organisations. In the module two different angles of the topic were discussed. On the one hand the relevance of alternative models that have flourished in the last decades to solve the increase demand of new houses for specific groups in the society, and on the other hand, the new challenges in the management of the increasing housing stock in order to avoid quick neighbourhood deterioration and devaluation (Vergara et al, 2015).

Finally, the module of urban resilience introduced students to the concept and shed some light on case studies of resilience and risk management that apply alternative approaches to the topic. The module aimed to go beyond the simplistic notion of resilience as a struggle for survival, which is based on the idea that communities in the emerging world are more resilient since they have more complex social, economic and environmental challenges than the Global North. In contrast, this module explored the possibilities of the Global South as a fertile ground to conduct research on how to use these complex threats as an opportunity to build better urban environments. Table 6.1 provides an overview of the lectures per section.

TABLE 6.1 Lectures outline

Section	Lecture title	Content description
Introduction	Rethink the City: an introduction to the content	- Introduction presenting the main goals of the course and the approach towards the Global South.
	Rethink the City, but with care	- Discussion of methodological and ethical problems of exporting ideas about planning, especially in countries of the Global South
Spatial Justice	Spatial Justice. What is it and why should we discuss it?	- Introduction to the concept and its theoretical underpinning. - Presentation of spatial justice as a framework for decision-making and action
	The relevance of human rights for planners	- Definition of human rights and their relevance for the practice of urban planning. - Discussion of the differences between negative and positive rights and how this impacts on the built environment
	Diversity in the city. Promises and pitfalls	- Definition and analysis of the concept of diversity through a critical lens. - Relevance of diversity in urban policy, identifying promises and pitfalls.
	Public space and Spatial Justice	- Interrelation between digital media and physical spaces in contemporary societies, focusing on social media as tool for demonstration. - Presentation and analysis of the Bersih movement in Malaysia.
	A practitioner's view: Quito, Ecuador	- Interview with a housing planning and advisor for the Municipality of Quito, Ecuador. - Discussion of main challenges to achieve a more sustainable and just city such as participation, inequality, housing provision, informality and gender unbalance.
Housing Provision and Management	Housing in the Global South. An introduction	- Background elements to understand the main issues that countries in the Global South are facing with regards to the provision and management of social and affordable housing today. - Presentation of main challenges and description of the elements needed for a comprehensive housing policy.
	Affordable housing in China: the role of public and private sectors	- Evaluation of the trends of housing development in China between 1949 and 2015, introducing the dynamic roles of the state, the local municipalities and the real estate developers - Presentation of three current initiatives: Governmental developers, Urban villages and Housing rental companies.
	Challenges of public housing management. The case of local authorities in Ghana	- Description of the State role in the production and management of affordable housing in Ghana and presentation of major weaknesses in Ghana's public housing management. - Discussion and analysis of opportunities for reform of the sector in order to achieve improved quality.
	Social Housing in Chile. Lessons from a homeownership perspective	- Description of housing policies based on ownership, presenting the new challenges regarding the quality, maintenance and management of this housing stock. - Discussion of opportunities for bottom-up approaches and the inclusion of new actors in housing policies.
	A practitioner's view: Co-housing project in Delft, The Netherlands	- Case of community-led initiative of housing provision presented by the architect of the project. - Visit to the building complex and conversations with residents.

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TABLE 6.1 Lectures outline

Section	Lecture title	Content description
Urban Resilience	Introduction to Urban Resilience	- Urban Resilience definition, origin and theoretical approaches - Discussion of the implications for urban planning and management
	Resilience thinking when planning in the South	- Theoretical perspective on resilience thinking in planning for the Global South. - Discussion of common challenges related to planning for resilience in the Global South.
	Exploring resilience possibilities	- Use of mapping as a tool to understand complex spatial problems and to help populated regions to be more resilient - Analysis of the spatial development of the Pearl River Delta in China using mapping techniques.
	Resilience in transition. Changing water values in delta cities	- Discussion of resilience in the context of urbanizing delta cities and the integration and balance of diverse values of water. - Relevance of resilience thinking with the understanding of history and the local context by using a Chinese case study. - Discussion of elements for future planning strategies in changing contexts
	A practitioner's view: Santiago, Chile	- Interview with the Deputy Resilience Officer of Resilient Santiago, a project created to improve the resilience capacity of Santiago, Chile. The project is part of the programme 100 Resilient Cities from the Rockefeller Foundation. - Presentation of the challenges faced in the creation and implementation of such a comprehensive resilience project.
Closure	Reading the City	- Overview of the process of understanding and representing an urban environment. - Presentation of four-steps process of design thinking: description, interpretation, reduction and abstraction.
	The New Urban Agenda: a roadmap for fair and sustainable cities around the world	- Presentation of the New Urban Agenda 2016-2036 - Discussion of the role of planning professionals, academics and urban activists in implementing the new agenda.

Assessment

Assessment of student's work is one of the challenges that remains unsolved in MOOCs, especially with regards the value of using automated grading software, the validity and consistency of the peer assessment and how to avoid fraudulent practices (Hew & Cheung, 2014).

Acknowledging these limitations, we highlight two main challenges regarding assignments and assessment that were frequently discussed during the planning of this course. First, it is important to acknowledge the impossibility to offer individual assessment to students given the high number of participants. Second, the design of a fair grading system was needed, which stablishes a cutting line for those participants

who approved the course and wanted to pursuit a certificate. Furthermore, the grading formula should be clear enough to avoid misinterpretations. Therefore, assessment and assignments were carefully planned considering that the course page should incorporate these requirements beforehand.

The course had two main types of assignments: quizzes and practical assignments. The quizzes were placed right after the lectures and had the purpose to check the understanding of the videos. Quizzes were automated graded and the participants could immediately check if they answered correctly. The practical assignments had the goal to help students to understand the main topic discussed by presenting applied examples. Each module considered two theme-based practical assignments in which participants had to upload a combination of visual content and an explanatory text on Sketchdrive. These assignments were self-assessed by the participants using either a checklist or a rubric. Besides the theme-based assignments, the course considered an introductory (and optional) assignment and a final assignment. While the first one was designed to foster the participation at the beginning of the course, the latest one consisted on a visual essay which had to offer a critical perspective on the theories and challenges explored during the course. The assessment of the final assignment was through a peer-review process using a rubric. In order to successfully pass the course participants had to fulfil three requirements: approve two out three modules, do the final assignment and have a final grade equal or more than 60%.

Some measures were taken to deal with the challenges mentioned. First, automated grading was confined only to the quizzes, limiting their weight in the total grade of the course. Second, the rubric was consistently used first for the self-assessment and then for the peer-assessment, reducing mistakes when it was applied to evaluate the peers. Third, the use of a multi-criteria requisite to pass the course in order to reduce fraudulent practices. Finally, a higher weight of the final assignment in the total grade, which created a natural filter for those students who were auditing the course and the students that wanted to obtain a certificate.

§ 6.4 Results

Critical Thinking

The course encouraged learner's critical thinking through the lectures, assignments and instructor's feedback. Students were progressively guided from the theory to the real-life challenges and from a descriptive perspective to an analytical perspective, preparing them to analyse their own realities with critical lenses. One of the main goals was to tear down prejudices and general approaches which do not contribute to a comprehensive perspective about the urban challenges of the Global South. One example is the inclusion of the term Global South at the beginning of the course, as the umbrella to refer to regions and countries that face, to some extent, similar urban, social and political challenges. It was a deliberate decision of the course team to avoid terminology such as developing countries or third world, in order to provide a concept richer in terms of political and empowerment connotation as well as less hierarchical than its predecessors (GSSC, 2015).

Similarly, the course reflected on the relationship between global theories and local embeddedness as two different layers to understand the challenges and the solutions. The students were confronted with different case studies as examples of problems and opportunities of regions in the South. They were encouraged to learn and extract lessons from these cases, but also to be aware about local realities and contextual variables. The subsequently step was to make students get in touch with their own realities regarding spatial justice, housing and resilience. To do so, practical assignments encouraged them to systematically analyse their own city or neighbourhoods from different topics, understanding the complexity of their urban challenges, but at the same time, foreseeing solutions from the planning perspective. At the end of the course, students were more aware about the nature of the urban challenges selected but also about the solutions to tackle them. These solutions were conceived from the local perspective, transforming the available resources into opportunities and thinking 'out of the box'.

Other important elements on the development of critical thinking were the peer review process and the spontaneous interchange between students in the two platforms of the course. These discussions referred to more complex issues while the course was in progress confronting the theory with their own questions. The staff participated in the discussions, answering the questions and opening new debates, but the same students were able to provide valuable and relevant feedback for their peers. An interesting example was the discussion started from a male student from Egypt about the

meaning of gender discrimination in the use of the public space. The discussion which started as a question, evolved to a rich debate in which female and male students from different countries contributed with their own perspective, interchanging their own understanding and experiences about the topic. At the end of the course, the student that started the question did his final assignment on this topic, opening from him a new perspective to understand the right to the city and the use of the public space.

Theory and Practice Integration

The course combined the presentation of the most up-to-date theoretical debate and the academic research that were using these theories with testimonials from practitioners that were implementing on real cases this debate. The course tried to not only have a balance between theory and practice, but also to connect them in each thematic module. This combination provided an interesting learning path in which participants could understand main barriers and difficulties but also successful elements when frontline theories are used in practice.

Additionally, the practical assignments requested a real engagement of the participants to apply the theories in their local context using a critical lens. After the course, students were more aware about the complexity behind the urban challenges in the Global South. They as future and, as many working professionals followed the course, actual urban planners, urban designers or architects, have learned the risk of adopting foreign solutions without questioning the impacts at the local level or using general and standard approaches to solve local problems.

As aforementioned in the introduction, surprisingly we had a large group of working professionals taking the course (41% of the participants). One of the positive outcomes of this high number of working professionals was the knowledge exchange between them and the undergrad students. It was possible to observe constant discussions on the online platform between more experienced professionals and bachelor students. We believe that this connection with planning professionals was extremely fruitful to the students. Additionally, we also had lecturers given by practitioners on the field showing real case studies. As witnessed in some testimonials after the end of the course, the practitioners' lectures were very well received by the students.

Student's Engagement and the Creation of an Online Community

In the field of Online Education, scholars have pointed out the relevance of stablishing a collaborative learning community between students and instructors as one of the 'essential components for improving the quality of online courses and students outcomes, satisfaction, and learning' (Kurucay & Inan, 2017). The role of building a learning community is relevant in order to address elements of the traditional education such as face-to-face classroom engagements or fieldworks which are difficult to replicate online (Shapiro et al., 2017).

In this sense, the great impact of the course attracting more than 10.000 students represented a positive starting point for this purpose, but it also entailed new challenges to the course team with regards the management of this community. By the end of the course, it had between 15% and 20% active students, a high number for Massive Open Online Courses. This definitely required a closer support of the whole team to give feedback and moderate the online forum. In total, we had 11 staff members replying and solving daily issues on the platform. This not only required an extensive coordination, but also some personal dedication, since the forums were extremely active especially on the weekends.

The course forums and Sketchdrive provided the platforms to consolidate an online community. They represented the main space of knowledge exchange and interaction with the course team, but also between participants, which intensively used the course platforms to discuss their local urban challenges with peers in different parts of the world. While 1500 students participated in the forum, 10.000 visuals were posted and commented on Sketchdrive. This exchange was one of the strengths of the course, which was highly appreciated by the participants in the post-course survey. Students highlighted 'the connection between students and the feedback videos', the existence of different platforms 'to give our opinion to others work and to have so many people of the course concerned on the different assignment and our comments', and 'the exchange of opinions between people who lives around the globe in very different circumstances and conditions'.

Additionally, the course coordinators used social media to complement the promotion of the course, but also to create informal spaces of interaction beyond the edX environment. The Facebook page rapidly became a key tool to start building-up this community before the course opening. Now, with almost 2000 followers, it is the main communicational channel with the community considering that the course has finished and edX platform is closed. Therefore, one of the main challenges remained is to keep this community captive and engaged in new versions of the course or in future projects of the Faculty of Architecture and the Built Environment regarding urban planning in the Global South.

Challenges to overcome

The course demonstrated several positive aspects, but also some pitfalls. Starting with the more challenging side, already on the development of the course it was visible that the tools offered on the edX platform were not sufficient to promote the learning experience of disciplines that require more visual and spatial content. The use of a second online platform to upload and display the images sent by the participants was fundamental to go beyond the learning experience of watching videos and debating on text. Urban planning even on a virtual environment needs maps and images. Sketchdrive was a positive asset to overcome this technical limitation of edX; however, there is a natural loss to host a course on more than one platform. This limitation will definitely be overcome as edX and other MOOC online platforms develops to better support courses dependent on visual aspects, like for example architecture, urban planning, industrial design and others. Nevertheless, on the platform used, it is important to acknowledge that any urban planning online course will have to reflect on how to manage on the virtual environment the embedded visual aspect of a planning course.

Another point that the experience of the Rethink the City can contribute to understand this educational phenomenon is the lack of control of the participants' profile. Even though the designed strategy aimed for young students and urban enthusiasts, the course attracted many experienced professionals. This is part of being an open course. Nevertheless, the Rethink the City showed that it is important to have a course structure to accommodate this rather unpredictable factor. To stimulate the knowledge exchange aspect of the course was absolutely fundamental on this regard. More experienced professionals can be an important asset on the forum discussions.

§ 6.5 Conclusions

Massive open online education is a relatively new phenomenon. The two major platforms hosting MOOCs in English were founded only in 2012 (edX and Coursera). Therefore, we are still trying to grasp the impact of this new learning method and also trying to identify how to get the most out of it. In planning education this is even more recent. It is still not clear how this step from the physical world to the virtual one will happen in a discipline so connected to spatial references such as in urban planning. Notwithstanding, despite being a novelty and having many uncertainties, it is clear that there is no step back. Online education is here to stay.

Furthermore, on the Rethink the City experience, knowledge exchange was not only a strategic tool to manage a diverse and massive group of participants, but it became the core educational aspect of the course. This is quite unique on planning education, especially in Europe where planning course are still very "residential" (Frank et al., 2014). The capacity to break the boundaries of the local context and connect it to a global scale is absolutely unprecedented. In this way, the transfer of a planning course from the physical helm to the virtual one is already a step towards a less residential planning education. Nevertheless, it is vital to approach this global scale as an opportunity to promote knowledge exchange and not a unidirectional educational experience from the lecturers to the participants.

Moreover, the change of scale from local to global also brought insights on the possible impact of an urban planning MOOC. Having 10.000 participants from 160 countries gives a completely different dimension of the societal impact of a planning course. A MOOC is not forming new urban planners, but it has the capacity to influence a diverse and broad range of people. The course was designed to foster critical thinking, to provide grounded examples of theory and practice integration and, despite the challenges of the massive participation, to create an online learning community even beyond the edX environment. Throughout the delivery of the course, it was already possible to witness how participants were taking practical steps to implement in their local context the knowledge produced in the course. On this regard, as aforementioned in section 4, the final assignment was the materialization of this knowledge transfer from theory to practice.

As the aim aforementioned in the introduction was to create a local impact connecting the researchers form TU Delft to urban enthusiasts of the Global South, the experience of the Rethink the City MOOC seemed successful. Not only because it manages to extend and enrich the debate being done in TU Delft with a global audience, but also because it demonstrated that a different educational approach with higher exchange and knowledge co-creation is possible. This has a special meaning in the Global South context, since the access to low cost good quality higher education can be a challenge. Additionally, it also points out to a possible change on the role of higher education institutions, from being less of a centre of knowledge production to more of a moderator and virtual host of a collective knowledge exchange process. The broad and open discussions of topics like the right to the city, the access to a good public transport system, gender discrimination or spaces of protest, for example, can have a great local impact in places where these debates are not that disseminated.

Even though it is still hard to measure the societal impact of the Rethink the City, based on the participants' testimonies it seems safe to affirm that the course had the capacity to influence much more people and places than any other course that the staff team

was involved. The effects of such a massive and open planning education is still not clear; however, the Rethink the City MOOC had the opportunity to experience on first-hand the potential of a truly global urban planning course.

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7 Conclusion

The thesis aimed to develop strategies to increase resilience in Brazilian metropolises. Resilience is currently a trendy concept in urban planning, and is appealing due to its capacity to deal with uncertainty as well as complex systems comprised of people and nature (Eraydın & Taşan-Kok, 2013; Folke et al., 2004). Nevertheless, resilience is a broad concept that is at risk of becoming just another buzzword (Davoudi et al., 2012). To avoid this pitfall, the thesis attempted to contribute to one specific aspect of resilience, that of self-organisation, based on the resilience thinking in urban planning framework (Eraydın & Taşan-Kok, 2013). The capacity of a system to self-organise is indeed fundamental for resilience, but it becomes quite challenging to promote self-organisation in a spatially fragmented urban system. While the two phenomena seem incompatible, many fragmented cities in the Global South have witnessed the rise of self-organised initiatives, including Brazilian metropolises. The contradiction between self-organisation and spatial fragmentation triggered an interest in taking a closer look at the relationship between the two phenomena.

During the thesis research, it became clear that the spatial fragmentation of Brazilian metropolises goes beyond the disconnection of physical spaces. It also depends on the degree of social disconnection imbedded in the socioeconomic inequality of the country. Connecting spaces in Brazilian metropolises does not mean that new social connections will be created between disconnected groups. Creating good-quality public space between a gated community and an informal settlement is not sufficient to connect the people from each environment. Even great quality urban design is not sufficient on its own to break down the social walls between groups with strong socioeconomic inequalities. Walls in Brazilian metropolises are not only physical but also social.

The thesis reveals that self-organised initiatives can be very effective in fostering social connections and increasing the level of integration in such contexts of inequality. The premise of the thesis was that urban planning can play a role in promoting resilience in fragmented and unequal cities of the Global South by incorporating the work of self-organised initiatives. With this in mind, the recommendations presented here focus on the improvement of urban planning strategies to incorporate the positive elements of self-organised initiatives when working in fragmented and unequal urban contexts. The responses to the research questions move in the direction of providing tools to understand the two phenomena and their relationship with urban planning.

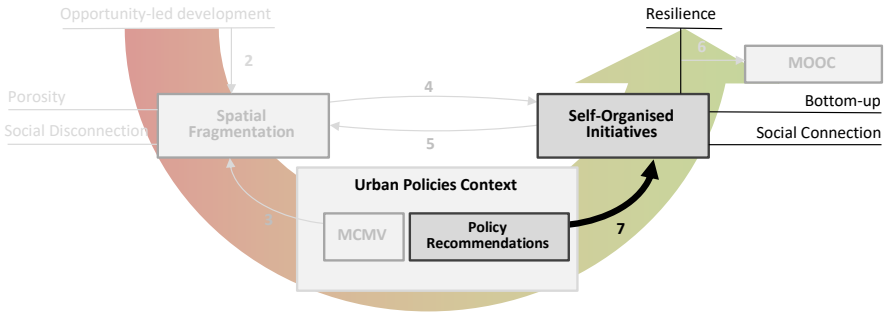

FIGURE 7.1 Conceptual relation of Chapter 7

As regards the aim of increasing the resilience capacity of Brazilian metropolises, the thesis only partially achieved its purpose. It is important to clarify that the set of policy recommendations presented here mainly promotes the development of social connections in the renewal of public spaces through the incorporation of the work of self-organised initiatives. This does not mean that the resilience of the urban system as a whole will be improved only by fostering the work of self-organised initiatives. What the thesis reveals is that incorporating self-organised initiatives into planning strategies is an effective way to counteract one of the main underlying forces of fragmentation specific to Brazilian metropolises – the disconnection between groups due to socioeconomic inequality – and on this basis will contribute to increased resilience. There are still many avenues for research to contribute to the development of a more comprehensive strategy on how to foster the resilience capacity of Brazilian metropolises. Self-organisation is only one dimension of resilience.

The case study examining how the doctoral research project can generate societal impact through online planning education produced interesting results. The research showed that the connection with practice can be achieved through the open publication of academic articles, but also through open education. The Rethink the City MOOC had a greater effect than expected, with more than 17,000 participants in the two editions of the course. The content of the research was made available to a broader and diverse audience, which received and replicated the knowledge presented. Although it is difficult to precisely measure the impact of this experiment, Chapter 6 nonetheless revealed that the MOOC generated a truly global impact.

§ 7.1 Fragmentation, Resilience, Self-organised Initiatives and Online Education

All of these findings comprise responses to the main research question and the research sub-questions that are presented individually in this section. The answers to the sub-questions are presented first. They are divided into three themes: fragmentation and resilience, which presents the results from Chapters 2 and 3; fragmentation and self-organisation, which presents the results from Chapters 4 and 5; and planning education and online tools, which focuses on Chapter 6. They are divided into these three topics because they represent the three main phases of the research, the exploration of fragmentation and resilience; the study of self-organisation initiatives in Brazil and their relationship with fragmentation; and the main strategy adopted to generate societal impact – the use of online education. This division does not mean that the analysis followed these three steps precisely, as there was some overlap during their development. This structure, however, makes it easier to see how the results of these three phases were built up to respond to the main research question.

§ 7.1.1 Fragmentation and Resilience

Fragmentation generates opportunity for resilience; however, urban policies, such as the MCMV, based on market structures that reinforce fragmentation, are not able to translate this opportunity into resilience.

The results from Chapter 2 revealed that the spatial discontinuities found in Brazilian metropolises are a double-edged sword, which can generate negative or positive impact with respect to resilience. In the specific case of the metropolises of Manaus and Belém, Chapter 3 showed that the MCMV social housing programme is not generating opportunities from local spatial fragmentation but is actually reinforcing it. The two chapters focused on this theme and answered the following research sub-questions.

Do spatial discontinuities create opportunities for resilience?

Yes, it is possible to generate opportunities for resilience from spatial discontinuities; however, the study shows that there are several aspects to be considered. Firstly, spatial discontinuities, referred to as porosity, depend on the specific context, which

can generate positive or negative effects on resilience. The local context is fundamental for determining how these discontinuities will contribute to the resilience of the urban system. A closer analysis of each specific case is necessary to an understanding of the particularities, opportunities and risks of each one of them. Secondly, despite the necessary consideration of the local context, the porosity index can serve as a first step in assessing spatial discontinuities in Brazilian metropolises. Although the index can be improved with additional data and further research, it provides an initial understanding of the local context in comparison with other Brazilian metropolises. Thirdly, the chapter demonstrated that the link between porosity and resilience can be established through certain policy instruments that promote territorial as well as relational approaches to the space; for example, community land trusts (CLTs), community benefits agreements, joint development projects, land readjustment, interim use, business improvement districts, industrial improvement districts, urban agriculture regulations and the *cittaslow* strategy. These instruments increase resilience because they integrate fragmented spaces and communities, while also allowing them the space for self-organisation, flexibility, cohesion and the potential for change.

Areas with higher porosity have more potential to develop such instruments to trigger resilience opportunities. Moreover, in order to transform porosity into resilience, it is imperative to identify the main challenges imposed by these spatial discontinuities in each context, since they can vary from city to city. While porosity in Rio de Janeiro is based on the high number of slums and gated communities, this is not the case in Brasília, although they have similar porosity indexes, 0.13 and 0.14 respectively. To conclude, as mentioned in Chapter 2, porosity has a direct impact on resilience, since fragmented urban environments also tend to be more socially disconnected and tend to respond less efficiently to economic, social and environmental changes. Porosity can increase or undermine the capacity of a metropolis for resilience, depending on whether it constitutes a treat or a threat. In this sense, when used strategically, porosity represents an exceptional opportunity for improving resilience in the built environment.

To what extent is the MCMV programme reinforcing existing spatial fragmentation in Manaus and Belém?

Belém and Manaus are the two metropolises with very high porosity indices and it is important to understand their local context. In both cities, fragmentation is being reinforced by the social housing programme of the federal government (the MCMV). The maps reveal the particularities of each pattern of spatial fragmentation. Manaus has fewer social housing projects, but they are on a larger scale and concentrated in the northern area of the city, while in Belém the projects are a little more scattered and on a smaller scale. Nevertheless, both cities show an imbalance in the location of the MCMV programme, with a concentration on the periphery and almost no development

closer to the central areas. This demonstrates that the programme implementation is following strong market dynamics, prioritising the development of houses in locations where land prices are low. This has generated a strong push towards urban sprawl and it is reinforcing the fragmentation pattern in both cities. The average travel time for a resident in an MCMV programme dwelling to the Belém or Manaus city centre is 91 minutes in off-peak hours using public transport, which makes access to services and opportunities more difficult. This strengthens isolation and the necessity of developing the autonomous capacity of these communities. Based on the findings of Chapter 2, it is possible to conclude that the MCMV programme is not using the spatial fragmentation of Manaus and Belém to trigger resilience opportunities. On the contrary, the programme is emphasising the spatial and social division that was already present in both cities.

§ 7.1.2 Fragmentation and Self-Organised Initiatives

Spatial fragmentation has a strong influence over where self-organised initiatives operate. At the same time, self-organised initiatives managed to undermine some of the underlying forces of spatial fragmentation, such as social disconnection in contexts of extreme inequality.

The results from Chapter 4, based on a case study of São Paulo, show that the city has historical spatial fragmentation marked by a strong polarisation between centre and periphery. This spatial fragmentation is also reflected in the way self-organised initiatives operate, mainly limiting their actions to areas where they have more social connections. Chapter 5 demonstrates that, despite being limited by spatial fragmentation, the initiatives studied are able to integrate people in extremely diverse socioeconomic contexts. This social disconnection in the context of inequality is one of the underlying forces of spatial fragmentation in Brazil. In this sense, this integration capacity of self-organised initiatives is an important resource to tackle fragmentation in Brazilian metropolises and has been attracting the interest of urban planners. The two chapters developed on this topic were responding to the following two research sub-questions:

To what extent does spatial fragmentation influence self-organised initiatives?

Although making intensive use of digital communication tools such as online social networks, self-organised initiatives are highly dependent on the physical context. While social media was used to spread the word about their work, to schedule meetings and

to encourage more participants to be involved, the self-organised initiatives studied in São Paulo demonstrated that the connection to a physical place where they could gather and conduct their activities is paramount. However, only using a physical space did not seem sufficient as the only channel of dialogue. The initiatives rely heavily on both realms, digital and physical, as important realms in which to conduct their activities. In the specific case of São Paulo, as already indicated by previous research, spatial fragmentation is based on an extreme polarisation pattern, with the city centre, or '*centro expandido*', as the main pole. This polarisation has a strong influence on how self-organised initiatives operate. Just as the city is divided between centre and periphery, so are the actions of self-organised initiatives. The interviews show that although many initiatives in the city centre wish to expand their actions towards the periphery, they face several difficulties in doing so. As a result, they end up concentrating their operations mainly in the local context of the '*centro expandido*'. The reasons for their inability to circumvent this polarised structure are the lack of social connections with residents of the periphery, difficult access and violence. Indeed, based on Sabatini and Salcedo's framework, the integration between residents of the periphery and the city centre is mainly functional.

To what extent can self-organised initiatives promote social connection in highly fragmented and unequal urban contexts?

It is of fundamental importance here to understand the modus operandi of self-organised initiatives and the impact they can have on connecting groups in highly fragmented and unequal urban environments. Firstly, it is remarkable that young urban planners are assuming active roles in these initiatives. It is difficult to establish why this phenomenon is occurring. However, as already pointed out by other researchers, this can be related to the current frustration of young planners with planning practice today (Taşan-Kok & Oranje, 2017). What is clear is that young planners believe in the capacity of these initiatives to change the urban environment. The planners not only justified their participation in self-organised initiatives based on a belief in their potential to tackle urban challenges on a neighbourhood scale, but also because they believe self-organised initiatives can play a role in solving macro urban problems on a city scale. Despite the lack of a precise measure of the impact of these initiatives at the city scale, the perception and interest of planners in these initiatives already indicates that they might play a greater role than on the local scale.

Moreover, planners working in self-organised initiatives are assuming different roles compared to traditional planning practices. Planners in self-organised initiatives are working as mediators with technical knowledge to implement the aspirations of the local community. The connection between planners and the local community was the first indication that self-organised initiatives are able to connect a diverse group. Self-

organised initiatives were able to work closely with civil society and function even in a context of extreme social and economic inequality. Based on Sabatini and Salcedo's integration framework, self-organised initiatives raised the level of integration from functional to symbolic and in some cases to community integration between extremely diverse groups. The increase in the level of integration between the people participating in the initiatives has a significant impact on the local social dynamics and particularly in the space where these initiatives occur. The initiatives managed to create unexpected social connections while renewing public space. This capacity to create social connections between extremely diverse groups is positive because it undermines the logic of spatial fragmentation in Brazilian metropolises, which, as discussed, is not only based on the disconnection of spaces but also on extreme social division.

§ 7.1.3 Planning Education and Online Tools

MOOCs are a powerful tool to disseminate research and have a strong societal impact.

The experience of the Rethink the City MOOC, addressed in Chapter 6, demonstrates that online planning education is an interesting outlet for research. The results show that the societal impact of the course was much greater than expected. In this sense, this platform should not be ignored as an efficient channel to trigger societal impact, especially when focusing on planning education. Chapter 6 delved into this topic by answering the following research sub-question:

How is this new learning experience being developed, delivered and impacting planning education?

The case of the Rethink the City MOOC reveals the benefits and challenges of using doctoral research for educational purposes in an online environment. Although MOOCs are a recent phenomenon, there is no doubt that online education will continue to increase its presence in planning education. The use of the internet made it possible to break the boundaries of the local context and connect on a global scale, which fostered a stronger diversity of perspectives and knowledge exchange. Additionally, the change of scale potentialises the impact of a planning education course. The fact that 10,959 students registered for the first edition of the Rethink the City MOOC and accessed the course platform from 160 different countries, already indicates that the societal impact of such a course is much greater than a regular on-campus planning classroom. The course aimed to develop critical thinking and to provide examples of theory and practice integration.

During the delivery of the course, it was soon possible to witness students attempting to reproduce lessons and examples from the course in their local context. The exposure of the work of one self-organised initiative, for example, made it possible for students worldwide to learn about these initiatives as a way of collectively transforming neighbourhoods. Connecting the work of researchers in Delft to a global community, the Rethink the City course successfully generated a strong impact in local regions throughout the world.

This has a special meaning in the Global South, where access to low-cost and good-quality higher education might be a challenge. This success also points to a possible change in the role of higher education institutions, from being less centres of knowledge production and more moderators and virtual hosts of a collective knowledge-exchange process. Despite it being difficult to accurately determine the societal impact of exposing planning research to an online planning education platform, the experience of the Rethink the City MOOC revealed that this doctoral research has the potential to generate high societal impact, not only through academic publications or policy recommendations but also by developing open access education content on online platforms.

§ 7.2 Answer to the Research Question

The thesis investigated the capacity of self-organised initiatives to counterbalance spatial fragmentation in Brazilian metropolises as a possible resilience mechanism. In order to address this, the concept of spatial fragmentation, especially in the Brazilian context, was studied.

To what extent can resilience towards spatial fragmentation be enhanced by self-organised initiatives?

As presented in Chapters 2, 3 and 4, spatial fragmentation in Brazil not only refers to the development of walls or the creation of left-over spaces due to uncoordinated urban growth, but also the social disconnection between different socioeconomic groups. In other words, spatial fragmentation in Brazilian metropolises goes beyond the disconnection of physical spaces, it also involves social aspects, due to barriers created by inequality within the country. Traditional planning tools can break down physical walls and connect spaces, but it has more difficulties disrupting social walls. It is in this regard that self-organised initiatives become vital. Although they have

limited legal and financial capacity to change the built environment, they are extremely efficient in breaking down these social walls and connecting diverse groups, as demonstrated in Chapters 4 and 5.

From a resilience perspective, social disconnection is a threat, as it undermines the capacity of an urban system to respond to an impact. The ability of a system to self-organise in the face of threats is one of the pillars of a resilient system. Applying resilience thinking in urban planning, the conceptual model (Figure 1.1) argues that self-organised initiatives have a positive impact on the resilience capacity of Brazilian metropolises. The research demonstrated that self-organised initiatives cannot completely counterbalance the spatial fragmentation of Brazilian metropolises, but that they do overcome some aspects of it, particularly the social disconnection present between different groups in an unequal society. The self-organised initiatives studied demonstrated the capacity to connect people even in contexts of extreme inequality, while implementing urban renewal projects on a local scale. Furthermore, the research described in Chapter 5 revealed that urban planners are taking active roles in self-organised initiatives as a recognition of a desire both to work closely with civil society and to tackle urban challenges on the neighbourhood and city scales.

§ 7.3 Limitations of Planning with Self-Organised Initiatives

Self-organised initiatives are useful in developing urban renewal projects, while also promoting social connections between diverse groups. Urban planning could definitely pay more attention to the dynamics of self-organised initiatives and include them as partners in urban renewal projects. Nevertheless, it is imperative to point out that self-organisation has its own limitations, and including such organisations in planning strategies will have its challenges.

Firstly, working with self-organised initiatives may be an attractive idea from the perspective of public administration, since it gives society the work that would traditionally be the responsibility of public authorities. It reduces the amount of labour and resources that municipalities would otherwise spend doing what self-organised initiatives achieve. Nevertheless, just as public authorities can fail, so can self-organised initiatives. As pointed out by Uitermark (2015), self-organisation can also fail to deliver the expected results. There is no guarantee that civil society will perform any better when dealing with urban renewal. There are many challenges for self-organised initiatives to overcome in order to be successful, such as a lack of financial,

legal or technical support. Planning strategies should be aware of these challenges when working with self-organised initiatives.

Additionally, one of the reasons self-organised initiatives are extremely efficient in connecting with the local population is because they are very spontaneous and do not have much of a bureaucratic structure. Public agencies working with self-organised initiatives should be aware of the importance of keeping these two characteristics as intact as possible in order not to jeopardise the positive effects to be gained from them. Although it is to some extent a paradox to have self-organised initiatives working as partners of public authorities while maintaining their spontaneity and non-bureaucratic approach, this is possible if municipalities do not impose too many constraints on the modus operandi of such self-organised initiatives. Limiting their capacity to make decisions about where to work and how to work, for example, will definitely impact on the connection that they have with the local residents. Furthermore, imposing overly bureaucratic procedures on self-organised initiatives conditioning how they perform will hinder their flexibility and efficiency. Nevertheless, these challenges can be overcome by developing a closer relationship with self-organised initiatives and establishing efficient channels of communication between them and public authorities.

Moreover, the fieldwork demonstrated that self-organised initiatives have difficulties in financing their activities and depend on the support of members, other donations or sponsorship from private companies. As a result, their activities can be quite limited due to financial constraints, meaning that the self-organised initiatives cannot invest in large infrastructural changes. While private and public developers can work on large-scale projects, self-organised initiatives work on small-scale projects. They mainly focus on the creation of activities in public space as a strategy to improve the space itself or in the development of small-scale changes, such as the introduction of new urban furniture or the renovation of existing fixtures. In this sense, it is important to be aware of the financial and scale limitations of self-organised initiatives. Municipalities might also help self-organised initiatives financially, as well as providing technical support through their planning departments.

§ 7.4 Recommendations

The thesis led to the formulation of some policy recommendations based on the challenges revealed by and findings of the research. The recommendations are divided into two categories: for policy development, focusing on public agents; and for

educational purposes. These recommendations do not aim to be a recipe or a one-size-fits-all solution. They are based on common challenges witnessed in different cases analysed in the research; however, they need to be adapted to the dynamics and particularities of each context. The recommendations aim to foster the work of self-organised initiatives in collaboration with public authorities, increase resilience in Brazilian cities and have a stronger societal impact throughout planning education. Nevertheless, it is important to note that the recommendations are just a starting point on the basis of which action strategies might be drawn up, and they should be further explored.

§ 7.4.1 Policy Development

These policy recommendations are aimed at public institutions responsible for the management and redevelopment of public space. In the cases studied here, these are the Secretaria Municipal de Desenvolvimento Urbano (SMDU) for São Paulo, the Secretaria Municipal de Urbanismo (SMU) for Rio de Janeiro, and the Secretaria de Estado das Cidades for Brasília. The implementation of these recommendations might involve other divisions within the municipal authorities. Despite the administrative differences between the three departments, the recommendations were developed based on general challenges faced in all cases, in an attempt to develop a productive relationship between public authorities and self-organised initiatives. As such, the recommendations can be used as a reference for other municipal bodies in other cities that do not have a productive relationship with self-organised initiatives..

Provide strategic support for self-organised initiatives that are already generating positive results:

None of the municipalities studied had a programme to specifically support self-organised initiatives that are already generating positive results. Municipal programmes tend to classify all initiatives without any distinction, without considering factors such as how long they have been operating, how many events or actions have they have already organised, and the results of these projects. To support initiatives without a strategic vision of their capabilities is inefficient. It is more productive to develop special working groups within municipal planning departments to create strategies to better evaluate self-organised initiatives and work closely with them. This could be done initially in partnership with a few selected self-organised initiatives and be expanded at a later stage. The Institute of Architects of Brazil from São Paulo, for example, gives an annual prize for initiatives that they have described as 'urban

activism'. The winners of the prize could be a starting point for partnerships between such initiatives and the municipality of São Paulo.

Develop a constructive relationship with self-organised initiatives and maintain their independence:

Municipalities have more to gain by working with self-organised initiatives as collaborators than as regulators. Self-organised initiatives will continue to exist independently of attempts by public agents to regulate or control them. In this sense, it is advisable to open channels of communication not only to understand their wishes, but also to follow their work and facilitate collaboration whenever possible. This can be done, for example, by rewarding initiatives that have generated positive outcomes for the city and thus set a positive example for other initiatives. Moreover, municipalities could offer technical support to self-organised initiatives that are generating positive change in the urban environment. During the fieldwork, it was observed that some public servants already work as volunteers in self-organised initiatives during their free time, but this commitment is not reflected in better interaction between self-organised initiatives and public institutions. Municipalities should take advantage of the fact that public servants are already involved in self-organised initiatives and invest in developing partnerships with them.

Create efficient channels of communication with self-organised initiatives:

It is important to develop efficient channels of communication with self-organised initiatives, since traditional channels such as contacting an ombudsman or calling hotlines are not sufficient. Self-organised initiatives intensively use social media tools as their main communication platform. In order to cultivate continuous and productive communication with self-organised initiatives, it is imperative that public agencies develop the capability to use the same language and access these forums. To have more efficient communication with self-organised initiatives, municipalities should invest in strengthening their capacity to operate in the social media environment in a more professional and structured manner. This is not only important for establishing more efficient communication channels, but also to enable genuine access to the debates and the work of self-organised initiatives in the digital world. Furthermore, beyond interaction in the digital realm, municipalities should support the development of information sessions for self-organised initiatives, where the latter could present and debate their projects.

Decentralise processes of collaboration:

Especially on the scale of a metropolis, it is difficult for public authorities to keep track of all self-organised initiatives taking place in the city. This might not even be attainable. Nevertheless, municipalities can have more productive relationships with self-organised initiatives if they give more autonomy to sub-municipalities and administrative regions to work with self-organised initiatives on their behalf. These smaller units already have closer contact with self-organised initiatives; however, they do not have the autonomy to directly support initiatives without clearance from the central administration. Investing in decentralising processes and collaborations can substantially increase the cooperation between self-organised initiatives and public authorities. It goes without saying that this should be done following general guidelines from the central office of the municipality.

Mediate between the private sector and self-organised initiatives:

Some self-organised initiatives already receive support from private companies to implement their activities. This support can have positive and negative results. This kind of partnership can generate win-win outcomes, with self-organised initiatives pushing forward their projects and companies improving their image by being connected to a social cause and developing social responsibility. However, this can also generate negatives outcomes, with the self-organised initiatives being overtaken by the interests of private enterprises. Public authorities should act as mediators to guarantee the public interest and to promote connections between sponsors and self-organised initiatives. This also depends, naturally, on the size of the private partner involved. Local business owners have more access to initiatives that influence their business activities and can take part in such initiatives; however, for medium and large-sized business, it is important that public authorities are present to guarantee that the public interest is preserved in such partnerships.

§ 7.4.2 Planning Education

These recommendations are aimed at urban planning universities and technical schools that wish to increase their societal impact through education. The experience of presenting this doctoral research in an online learning environment faced some challenges, but also demonstrated that doing so has great potential for societal impact. Although online education has been growing exponentially over the last decade, it has not been fully explored by urban planning schools. It is hard to believe that there

will be a retreat, with online education tending to have more presence each day in higher education. The recommendations presented below are part of an attempt to collaborate to ensure urban planning education is ready for this educational revolution. These recommendations consist of different steps which can be used to develop an educational programme that fosters education with societal impact based on research.

Adapt programmes for online planning education:

Online education has grown exponentially in the last decade and planning is not spared from this educational revolution. There is no sense of a retreat in this phenomenon, and planning education needs to be prepared for it. The Rethink the City MOOC experience, as part of a first batch of well-recognised planning courses, already suggests that there is a lot to learn and to improve. Contemporary planning curricula are not yet adapted to accommodate this change and this could cause difficulties in the future.

Include more cases of self-organised initiatives in planning education:

Self-organised initiatives may generate various insights and have greater societal impact. For example, one self-organised initiative from São Paulo participated in the Rethink the City MOOC and talked about their work on renewing public space. Although it is difficult to measure the impact of this kind of educational experience, the course opened the opportunity for knowledge dissemination and also triggered new local initiatives based on lessons learned from the case presented. One student in Brazil, for example, based on a collective action, presented his final assignment project to a local congressman, who expressed interest in supporting his idea. This is a small example of how the inclusion of self-organised initiatives in planning education can trigger other initiatives and generate greater societal impact.

Diversify the debate with more cases from the Global South:

The Global South is the frontline of the urban agenda. Urban planning education can benefit from a broad and open international debate. Although solutions always need to be local, problems are global and we can definitely learn from different approaches. Increasing the spectrum of different planning practices can substantially enrich the debate in planning education.

Invest in blended learning:

Despite the challenges of combining online education with traditional methods of on-campus education, the benefits are great, including online courses as tools in on-campus classrooms. The inclusion of on-campus students in MOOCs could, for

example, connect students in Delft directly to practitioners. As the results of the Rethink the City MOOC have shown (more than 40% of the participants in the MOOC were working professionals), this can generate a higher level of knowledge exchange and develop a broader professional network. According to Ratnayake and Butt (2017), the gap between theory and practice is one of the biggest challenges in planning education, and can partly be improved through blended learning. Moreover, blended learning manages to bring the incredible diversity of perspectives that are available to the on-campus classroom. This international contact enriches the debate and raises the standard of work produced in on-campus education.

§ 7.5 Societal Impact

The thesis serves to support the development of policies and programmes that aim to work with self-organised initiatives. Municipalities have a lot to gain from working in collaboration with self-organised initiatives. In addition to being an important channel to implement the wishes of local communities, self-organised initiatives are able to tackle urban challenges while connecting diverse groups, even in unequal environments. As a result, self-organised initiatives can have a positive impact, and this is especially the case with the spatial fragmentation of Brazilian metropolises, which is due to the social disconnection created by an extremely unequal urban environment. Nevertheless, it is not an easy process to have municipalities and self-organised initiatives working together. In developing the above-mentioned policy recommendations, this thesis responds to the insights gained concerning how public institutions can develop more constructive relationships with self-organised initiatives. Improving these relationships breaks down the social walls that urban planning cannot demolish with design-based solutions. Nevertheless, implementing these policies depends on the open-mindedness of public authorities in supporting such initiatives.

Moreover, exposure to the Brazilian context can provide a useful example for other cities that are experiencing the rise of new self-organised initiatives. The direct participation of citizens in the development of the urban environment is a global phenomenon and public institutions still lack experience in how to better deal with them. Even in the Global North, where planning departments are more active in responding to the general needs of the urban population, self-organised initiatives are emerging. The challenges and lessons presented in this study can be helpful, not only for understanding the motivations and modus operandi of self-organised initiatives,

but also to provide examples for other cities on how to develop a constructive relationship with these initiatives from the beginning.

Nonetheless, producing a doctoral thesis that is relevant to contemporary problems is not sufficient to generate societal impact or to avoid the research being relegated to a university repository. In addition to the production of the manuscript itself, the strategy of this research was to also invest in other channels to generate societal impact. This approach is not meant to undervalue the impact of the publication of the thesis, but to offer other possibilities beyond the release of the research into the academic realm. The first channel was to use an online platform to increase the exposure of the work developed during the research in a more systematic manner and in an accessible language. Working with other doctoral researchers from the Faculty of Architecture and the Built Environment of TU Delft, who also conduct research into the urban challenges of the Global South, a website was created to unite this academic production in one place and in a user-friendly way. The aim was not only to disseminate the content of our individual research, but also to increase our potential societal impact by combining different academic perspectives on one platform. It was in this context that the Global Urban Lab was created. The final findings of this research are available on the Global Urban Lab webpage.

As a product of this collaboration between doctoral researchers in the Global Urban Lab, the massive open online course (MOOC) Rethink the City was created. The experience of the Rethink the City MOOC made clear that planning education, especially if combined with online tools, can generate a stronger societal impact. The MOOC served the purpose of exposing the research to a larger audience so as not only to receive feedback from people located in the areas of the case studies, but also to offer analytical tools to a larger audience. The two editions of the course attracted 17,278 participants in total, of which 2,179 were from Brazil. The MOOCs presented the research of 14 PhD candidates. The presentation of theories, analytical frameworks and case studies of doctoral research in a massive open online course increased the societal impact of the work developed.

In the specific case of this research project, the introduction of the idea of planning with self-organised initiatives, as well as the participation of one initiative in the course, triggered several participants to attempt to reproduce the work of this initiative in their local context. The initiative that took part on the course was *Cidade Ativa*, which promotes collective actions to renew public space in São Paulo. They were linked to participants in the course via video, in which they described their work. This triggered debate and inspired participants. Additionally, the course was an opportunity to engage in a debate with local practitioners, with 42% of the active participants declaring themselves as such. The connection of the research with a large group of professionals

has the potential to generate impact beyond their education and have a direct effect on their daily professional practice. Although it is not easy to measure the societal impact of presenting the research in an online environment, it is irrefutable that the Global Urban Lab and the Rethink the City MOOC substantially increased the societal impact of the study.

§ 7.6 Avenues for New Research

Spatial fragmentation is an important challenge for many metropolises in the Global South because it has implications for different levels of human wellbeing. It affects such issues as housing, service provision, mobility, resilience and security. Understanding its causes, underlying forces and consequences is paramount to being able to tackle it with effective public policies. The relationship between fragmentation and self-organisation fits within this context, and can be further explored beyond this research. Comparative studies looking at other cases from the Global South would add information concerning the dynamics of different types of fragmentation and self-organisation. Issues could be explored in relation to questions such as: To what extent are other cases of self-organised initiatives generating strong social contact between diverse groups, or is this a particular aspect of the Brazilian self-organised initiatives studied here? The local dynamics of fragmentation and self-organisation are important and each context can generate valuable insights. Just as the lessons learned from the Brazilian cases have been shown to be useful elsewhere, the understanding of other contexts would also generate a more nuanced view of this relationship.

Furthermore, self-organised initiatives do not seem to be a phenomenon that is exclusive to the Global South. Cities in Western Europe are witnessing a rise in these types of initiatives (Healey, 2015). In the Netherlands, for example, initiatives such as Wijkwandeling, or neighbourhood walks, are spreading around different cities. Nevertheless, although these self-organised initiatives also seem to mainly occur in highly diverse neighbourhoods, the emergence of self-organised initiatives in the Global North does not seem to be connected to spatial fragmentation and the lack of service provision from public institutions. There are other motivations behind the emergence of self-organised initiatives, and it is interesting to note that these bottom-up movements occur in these different urban contexts, responding to different kinds of local social dynamics and focused on different local challenges. Despite these differences, developing a general understanding of how self-organised initiatives form and develop the capacity to address urban challenges in different urban settings may be

particularly interesting for planning practice. The comparison between self-organised initiatives in the Global South and the Global North could generate new insights into the development of this phenomenon and its connection with urban planning.

Additionally, planning with self-organised initiatives is a relatively new topic. Although self-organised initiatives have been active in Brazilian cities for decades, there is much more to be explored. The increasing participation of urban planners in these initiatives, for example, is something worth shedding light on. Young planners, especially, are becoming active in these initiatives and applying their technical knowledge. This indicates a change in the role of planners, which requires the development of a new set of skills and knowledge. In this regard, a whole new set of questions emerge. First, why are planners joining these initiatives? When even urban planners working in traditional planning departments are joining self-organised initiatives as volunteers, it is important to better understand what their motivations are. Second, what are the challenges of working in self-organised initiatives? Being part of such initiatives definitely creates different challenges for planners and this has not yet been further studied. Third, what role are planners taking inside these initiatives and how this is creating the necessity to learn new skills? This can also have implications for planning education, since traditional planning curricula might not include the tools required for this new practice. In this sense, planning education can benefit from a closer investigation of the contemporary practice of urban planners involved in self-organised initiatives.

The institutionalisation of self-organised initiatives is also a topic that deserves further investigation. Organisational diversity has already been pointed out as a necessary condition for community vitality (Barrett et al., 2011). However, the level of institutionalisation has varied a lot between the initiatives studied here. It would be interesting to analyse the reasons behind the decision of self-organised initiatives to further institutionalise or not. In Western Europe, there is a historical tendency for these initiatives to undergo an institutionalisation process whenever they start to collaborate with local governments. In Britain, for example, there has been a tendency for continuous cooperation with public planning institutions, even when there are conflicts between the government and local civic associations (Hewitt & Pendlebury, 2014). Nevertheless, it is hard to imagine such a scenario in Brazilian metropolises in the short-term, as there is still a lot of mistrust between public authorities and self-organised initiatives. In this regard, it would be important to understand what the consequences are for self-organised initiatives and for public authorities with regard to the institutionalisation of these initiatives.

§ 7.7 Final Remarks

Brazilian metropolises are extremely complex. They have many challenges to overcome in order to improve the urban environment and, consequently, the wellbeing of their inhabitants. Public authorities have been struggling in the last half century to manage rapid and uncontrolled urban growth that followed strong opportunity-led development. This process, added to the historical concentration of wealth in the country, led to the contemporary urban context, in which a high level of inequality occurs in all Brazilian metropolises. This poses a dramatic challenge to urban planning institutions: how to develop public spaces that will serve a public that has such extreme levels of inequality. It is in this area that this thesis hopes to have contributed. Traditional urban planning strategies do not seem to be sufficient to overcome these challenges, and this thesis demonstrated that some planners have already seen a possible ally in the work of self-organised initiatives. In this context of inequality, self-organised initiatives have demonstrated an outstanding capacity to build strong social connections based on their work redeveloping public space.

Nevertheless, it is important to clarify that self-organised initiatives should not be seen as infallible as a strategy to integrate extremely diverse groups. They are only part of the solution, and public authorities must continue to address the structural inequalities present in their country. Nonetheless, academia and public authorities should definitely pay more attention to self-organised initiatives as drivers of urban change in unequal environments. Although there is still a lot to be learned regarding the initiatives and their limitations, the results of this thesis already point to encouraging possibilities for cooperation between public entities and self-organised initiatives to break down the social barriers that are inherent in Brazilian public spaces. There is a long way to go, but it is hard to imagine a different strategy than improving collaboration between civil society and public authorities.

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Curriculum Vitae

Igor Tempels Moreno Pessoa was born in Niterói, Brazil. He became an Architect and Urban Planner by the Federal University of Rio de Janeiro in 2007, but he has always been interested in strategies beyond the traditional design-oriented approach. Before starting his doctoral research, he worked as an architect and urban planner. His research in the OTB Department at the Faculty of Architecture and the Built Environment started in 2014 and was financed by CAPES (part of the Brazilian Ministry of Education). In TU Delft he also helped to establish the Global Urban Lab, a communication and action platform that supports TU Delft in bringing visibility and articulation to staff and students doing work on urbanisation in the Global South. Igor was also one of the coordinators and creators of the Rethink the City MOOC.

Research Interest

Urban challenges of the Global South, Urban Planning and self-organization, planning with local initiatives, participatory policies, urban policies for unequal cities, resilience and sustainability.

Academic works published

Articles

- *Rethinking planning education using massive open online courses: the case of Rethink the City*
  Transactions of AESOP. ISSN 2566-2147 (approved for publication in May, 2018)

- *Spatial fragmentation and self-organisation: a negative relation in Brazilian metropolises*
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Book review

- *A Review of "Planning sustainable cities and regions: towards more equitable development", Edited by Karen Chapple*
  International Journal of Housing Policy. Volume 16, 2016 - Issue 3

Prizes

- 2017 Excellence in Teaching Award from AESOP (European Prize)
  Winner - for the Rethink the City MOOC
- 2018 Open Education Awards (Global Prize)
  Honourable mention - for the Rethink the City MOOC

Planning with self-organised initiatives: from fragmentation to resilience

The rapid urban growth of Brazilian cities in the second half of the twentieth century produced an extremely unequal urban fabric with spatial discontinuities and left-over spaces. Spatial fragmentation in Brazilian metropolises is not only related to spatial discontinuities, but also to socioeconomic inequalities. Walls in Brazil are physical and social. This fragmentation undermines the resilience of the urban system, which depends on the cooperation capacity between actors in the face of unexpected changes. Since the physical connection of disconnected spaces does not necessarily create social connections between segregated groups, it is difficult to develop cooperation and thus resilience in fragmented cities.

In this context, this thesis presents self-organised initiatives as potential actors to dismantle these invisible walls. Self-organised initiatives promote the creation of social connection between highly diverse groups in public spaces of cities with extreme socioeconomic inequalities, which has a positive impact on the resilience of the urban system.

Aiming to establish a solid societal impact, the thesis puts forward recommendations on two fronts: education and practice. The author demonstrates, based on the experience of the massive open online course Rethink the City, the way how doctoral research can be used in open online education. Grounded on the findings in the cases of Brasília, Rio de Janeiro and São Paulo, the thesis lays out a set of recommendations on how urban planning can work with self-organised initiatives in a collaborative manner in order to foster social connection in cities with patent socioeconomic inequalities.

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