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Urban Green Space as a Matter of Environmental Justice

The Case of Lisbon's Urban Greening Strategies

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Urban Green Space as a Matter of Environmental Justice:
The Case of Lisbon's Urban Greening Strategies

Urbana grönområden som en miljörättvisefråga:
En fallstudie om Lissabons strategier för urban grönska.

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ABSTRACT

In the summer of 2018 the European Commission awarded Lisbon as European Green Capital 2020 – in part due to investments made by Lisbon municipality in Green Infrastructure (GI) and new green spaces. As the city is becoming greener, this study aims to analyze Lisbon's urban greening strategies from an environmental justice perspective. It does so based on data collected through desk-research of relevant planning documents and other studies; semi-structured interviews held with individuals working in different positions at Lisbon municipality; and field observations made in Lisbon's green spaces. The data was analyzed while attending to the different dimensions of environmental justice (EJ), namely procedural and substantive aspects.

This research finds that Lisbon's urban greening strategies reflect environmental justice concerns by seeking to expand GI across the city and increase green space availability. However the strategies are based on a quantitative analysis of the spatial distribution of green spaces, failing to address other barriers that may prevent people from accessing and using green space. This is problematic as EJ is considered to go beyond just distribution.

Furthermore forms of public participation and consultation are rather limited and are an exception to the rule; the decision-making process is based on the expert knowledge of civil servants – mainly landscape architects. As participation is seen as a central element of EJ, this research identifies a risk for Lisbon's urban greening strategies to bypass the different needs and vulnerabilities of different social groups. Therefore, this study recommends policy-makers to include qualitative data regarding the use of Lisbon's green spaces when analyzing access to green space, and to actively involve and recognize local residents when designing and implementing Lisbon's GI.

SAMMANFATTNING

Sommaren 2018 utsågs Lissabon av Europeiska kommissionen till Europas miljöhuvudstad 2020 – delvis på grund av investeringar som Lissabons kommun gjort i grön infrastruktur och nya grönområden. Eftersom staden håller på att bli grönare har denna studie som syfte att analysera Lissabons strategier för urban grönska från ett miljörättviseperspektiv. Denna analys baseras på data insamlad genom skrivbordsforskning i relevanta planeringsdokument och andra studier, semi-strukturerade intervjuer med anställda på Lissabons kommun, samt fältobservationer i Lissabons grönområden. Datan analyserades med hänsyn till de olika dimensionerna av miljörättvisa, nämligen procedurella och substantiva aspekter.

Studiens resultat visar att Lissabons strategier för urban grönska tar hänsyn till miljörättviseperspektiv genom målet att utveckla grön infrstruktur runt om i staden och öka tillgången till grönområden. Däremot är strategierna baserade på en kvantitativ analys av den geografiska fördelningen av grönytor, och bortser därför från andra begränsningar som kan förhindra vissa gruppers tillgång till och användning av grönområden. Detta är problematiskt då miljörättvisa anses gå bortom endast geografisk fördelning.

Dessutom finns det endast begränsat utrymme för allmännhetens deltagande och samråd; beslutsprocessen är snarare baserad på expertkunskaper från kommunens tjänstepersoner – främst landskapsarkitekter. Eftersom deltagande anses vara en central del i miljörättvisan finns här en risk att Lissabons strategier för urban grönska förbiser de mångfaldiga behov och svagheter av olika samhällsgrupper. Därför rekommenderar studien att beslutsfattare tar hänsyn till kvalitativ data om hur Lissabons grönområden används när de analyserar tillgång till grönområden, samt att de aktivt involverar invånare under design- och implementeringsprocessen av Lissabons gröna infrastruktur.

RESUMO

No verão de 2018, Lisboa foi eleita Capital Verde Europeia 2020 pela Comissão Europeia – em parte, devido aos investimentos feitos pela Câmara Municipal de Lisboa (CML) na Infraestrutura Verde da cidade e na criação de novos espaços verdes. Enquanto a cidade vai ficando mais verde, esta investigação visa analisar as estratégias de estrutura verde da CML a partir de uma perspetiva de justiça ambiental. A análise baseia-se em dados obtidos através do estudo de documentos estratégicos e de planeamento; de entrevistas semi-estruturadas com indivíduos em diferentes posições na CML; e, por último, de observações de campo feitas nos espaços verdes de Lisboa. A análise de dados atendeu às diferentes dimensões de justiça ambiental, nomeadamente aspetos processuais e substantivos.

Baseado nessa análise, considera-se que as estratégias de estrutura verde da CML refletem questões de justiça ambiental no sentido de visar a expansão da Infraestrutura Verde pela cidade e o aumento da quantidade de espaços verdes. Contudo, as estratégias baseiam-se numa análise quantitativa da distribuição espacial de espaços verdes, sem ter em consideração possíveis outras barreiras que possam impedir as pessoas de aceder e usufruir de tais espaços. Isto é considerado problemático, uma vez que justiça ambiental requer ir além da distribuição justa.

Ademais, as formas de participação ou consulta públicas são limitadas e uma exceção; o processo de tomada de decisão é fundamentado no conhecimento especializado de funcionários públicos, nomeadamente arquitetos paisagistas. Como a participação é vista como um elemento central de justiça ambiental, esta investigação identifica o risco de as estratégias de estrutura verde passarem ao lado das necessidades e vulnerabilidades específicas de diferentes grupos sociais. Assim, recomenda-se que as estratégias incluam uma análise qualitativa sobre a utilização de e acesso a espaços verdes; e que se vise o envolvimento e reconhecimento ativos dos residentes no processo de definição e implementação de novos espaços verdes.

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Jessica Verheij
Lisbon, May 2019

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LIST OF ABBREVIATIONS

Acronyms of terms in Portuguese are followed by an English translation

AML – *Área Metropolitana de Lisboa* – Lisbon Metropolitan Area
CML – *Câmara Municipal de Lisboa* – Lisbon city council
DGT – *Direção-Geral do Território* – General Directory for Spatial Planning
EC – European Commission
ECGA – European Green Capital Award
EEA – European Environmental Agency
EEM – *Estrutura Ecológica Municipal* – Municipal ecological network
EJ – Environmental Justice
ES – Ecosystem Services
GI – Green Infrastructure
NBS – Nature-Based Solutions
PDM – *Plano Diretor Municipal* – Municipal master plan
REOT – *Relatório do Estado do Ordenamento do Território* – Report on the state of territorial planning
UHI – Urban Heat-Island
UPE – Urban Political Ecology

Explanation of terms

When referring to 'Lisbon' I particularly mean Lisbon municipality – meaning the territory of the city of Lisbon. Lisbon municipality is just one of the 18 municipalities that together form the Lisbon Metropolitan Area.

When referring to the Lisbon city council, I mean *Câmara Municipal de Lisboa* – the authority responsible for governing Lisbon municipality.

I have chosen to refer to the Tagus river as *Tejo* – its Portuguese name.

1. INTRODUCTION

"Lisbon has a unique set of tones: blue reflected from the sky and river; white from the light. And increasingly green, from the city itself"
(Lisbon's Application to the ECGA 2020; CML 2017a, 1)

1.1 Lisbon as European Green Capital

In the summer of 2018, the European Commission elected Lisbon as the "European Green Capital 2020". This award is handed out by the EC every year to a European city considered to be a "champion of sustainability" (European Commission 2018), which can serve as an example for other cities in regard to sustainability transitions, and is considered to lead the way towards environmentally-friendly urban environments. The award, therefore, is not about recognizing 'the greenest' city in Europe, but instead the progress and change that was accomplished in relation to a set of environmental indicators. Lisbon's Mayor Fernando Medina proudly received the award (see figure 1.1.), stressing the fact that Lisbon is the first southern-European city to be elected as European Green Capital and re-confirming his commitment towards sustainability.

Besides its performance on issues like sustainable urban mobility, innovation and waste management, the jury highlighted Lisbon's efforts in expanding its Green Infrastructure (GI) – in fact, this element was one of the elements to receive the highest evaluation. Lisbon was distinguished for increasing the availability of green space in the city by establishing a connected network of green spaces – *corredores verdes* (green corridors). Through these corridors, Lisbon incorporated ideas related to Green Infrastructure (GI) into its spatial planning and expanded its green space by 200ha since 2008. According to the EC, 76% of Lisbon's residents already live within 300m of a green area (European Commission 2018). The city council has promised to continue developing new and existing green spaces: according to the Mayor, an additional 400ha of green spaces will be created until 2021 (CML 2018b). The EC recognized and awarded these efforts, for which Lisbon is now portrayed as one of the European leaders in terms of expanding GI in dense and consolidated cities. As the European Commissioner responsible for the award highlighted, Lisbon and its predecessors "showed how to turn environmental challenges into opportunities, and make their cities healthy and enjoyable places to stay, live and work in" (Vella in European Commission 2018).

Figure 1.1. Lisbon's Mayor Fernando Medina receives the European Green Capital Award 2020. Source: CML (2018b).

1.2 Green Infrastructure: A matter of Environmental Justice

As cities all over the world have taken up the quest for sustainability, urban greening and urban nature have gained prominent roles in policy-making (Pauleit et al. 2017). Urban green spaces have since long been seen as a way to transform dense and crowded cities into more pleasant environments; however, in the last years a city's natural amenities started to be understood also as a 'natural' infrastructure providing environmental benefits (Samson 2017). The concept of 'Green Infrastructure' (GI) addresses this: GI is considered to be an interconnected network of green spaces that actively support biodiversity, natural ecological processes and water resources, while contributing to a healthy living environment (Kabisch et al. 2017). The idea that urban nature can be managed to optimize its contribution to the urban environment started to make its way into urban ecology, landscape architecture and spatial planning, emphasizing terms such as ecosystem services (ES) and nature-based solutions (NBS) (Kabisch et al. 2017). Likewise, within this discourse green space became essentially an asset, providing the city with a number of benefits that need to be managed as efficiently as possible.

Following this, the European Union has been promoting the 'greening' of European cities and the expansion of GI, among others through the creation of the European Green Capital Award[1] (ECGA). The European Commission developed a number of policy documents specifically seeking to support the development of green spaces in urban environments, calling for 're-naturing cities' (European Commission 2015). Green spaces are nowadays seen as a crucial element in the urban fabric, not only for the sake of recreation but equally for the sake of public health and environmental quality. Living in close proximity to or frequently visiting these spaces has proven to provide many benefits which directly or indirectly impact human health and well-being, including: improved air quality, opportunity for physical activity, stress reduction through engagement with nature and greater social cohesion (see Korn 2017, 189). Furthermore, green spaces mitigate the urban heat-island (UHI) effect by providing shade and infiltrating rain water (Oliveira et al. 2014). Trees are known for absorbing both air and noise pollution, and can create spaces of calmness and tranquility amidst the urban buzz of traffic, noise and emissions.

These benefits are often referred to as 'ecosystem services', which can be defined as "processes that directly or indirectly contribute to human wellbeing; that is, the benefits that people derive from functioning ecosystems" (Costanza et al. 2017, 3). This term has been criticized by some for focusing on the value of nature based on the services it provides to humans, instead of acknowledging the intrinsic value of nature itself (Graça et al. 2018). Nowadays the term 'nature-based solutions' (NBS) is increasingly used by policy-makers and researchers within the discourse on climate change adaptation and resilience, including actions related to green space, regulation of water flows and architectural solutions (Depietri & McPhearson 2015). The potential of green space to reduce the UHI effect is particularly relevant within the Lisbon context, as the city will increasingly experience heat-waves and dry summers due to global warming (Alcoforado et al. 2009). A study by Burkart et al. (2016) analyzed the role of urban green in shaping thermal environments in Lisbon and its role in heat-related mortality in Lisbon's elderly population. It concluded that the relation

[1] Stockholm was the first city to be awarded as European Green Capital in 2010.

between mortality and increased temperatures was most significant in those areas with the least availability of green space and the longest distance to the *Tejo* river. A study by Oliveira et al. (2014) provides evidence of a significant difference in experienced thermal comfort between Lisbon's green spaces and its surrounding built areas, reaching up to 7ºC difference at certain times, especially during heat waves. The authors provide several policy recommendations, including the preservation of existing green spaces and the creation of new ones where possible.

Hence it has been widely acknowledged that natural elements in cities play a vital role in terms of environmental quality and public health. Urban green spaces are not just 'something nice to have' but an important factor influencing the health and well-being of the urban population. Likewise, green spaces are increasingly seen as a right instead of a luxury. However, the benefits these provide are not equally accessible to everyone. Studies have shown how some social groups disproportionately suffer from limited access to green spaces, whereas other more privileged groups disproportionately enjoy its benefits (Kabisch and Bosch 2017; Nesbitt et al. 2019; Wolch, et al. 2014). Often improved access to green space is linked to social, economic or cultural privileges. For this reason, access to green space and the related health benefits has increasingly become recognized as a matter of environmental justice (O'Brien et al. 2017).

1.3 Environmental justice in relation to urban greening strategies

The term 'environmental justice' (EJ) can refer to a social movement, a field of studies or simply an 'idea(l)'. It is related to the fact that some groups in society generally suffer more from environmental hazards than others – mainly already vulnerable groups such as ethnic minorities, low-income groups and politically unrepresented communities (Schlosberg 2007). At the same time, environmental benefits are disproportionately available to more privileged groups in society (Byrne 2017). EJ was first and foremost an activist movement, originating from the anti-toxic movement happening in the USA during the 1970s and 1980s. A growing number of grassroots movements, scholars and communities became aware of how the distribution of environmental hazards, such as waste dumps and polluting facilities, was particularly affecting low-income communities and minority groups (Armiero 2017). The term 'environmental justice' was coined to address the general idea that environmental hazards disproportionately impacts some social groups, whereas others have the ability to protect themselves from these impacts (Schlosberg 2007). As the EJ movement gained momentum, an increasing number of researchers started to be concerned with understanding *who* exactly is impacted most by environmental hazards and *why*, resulting in a discipline on its own: environmental justice studies (Holifield et al.2017).

For long justice-related issues have been mostly absent from the general debate on sustainability (Bradley et al. 2008). Many strategies related to urban sustainability have for long failed to address concerns related to equity and social justice and, most importantly, the social impact of the strategies themselves (Agyeman and Evans 2003). Furthermore, Haase et al. (2017) have argued that the justice implications of urban greening strategies are often not addressed by policy-makers. The authors state that a more nuanced understanding is needed to understand the social impacts of urban greening, due to sometimes paradoxical outcomes; in some cases, greening strategies have

led to increased inequality among social groups, for benefitting some city areas more than others. In other cases, greening strategies are integrated in profit-oriented urban renewal projects, which cater for higher income residents. Through urban greening, developers ensure higher property values by attracting wealthier residents (Byrne 2017). Anguelovski et al.(2018) have studied the implementation of a greenbelt in Medellín, Colombia, and concluded that this project poses several risks for the people living in the self-built settlements in and around the destined location for the new greenbelt, through forced relocation, top-down implementation of radical changes in people's living environment, and physical displacement. As such, not all urban greening strategies necessarily benefit all people in society, and in some cases may even proliferate social and spatial segregation, exclusion and displacement (Haase et al. 2017). To address these matters, this research seeks to analyze urban greening strategies from an environmental justice perspective.

1.4 Research aim and questions

A growing number of scholars is concerned with critically analyzing urban greening projects, paying attention to the impact these projects have on more vulnerable groups in society and to the way the projects are shaped by existing power relations. Based on the previous sections, I understand environmental justice as a useful framework to analyze these issues, as it allows for questioning policies - often presented as win-win solutions - based on how these impact different people differently. 'Sustainability' (including urban greening) is often taken for granted in urban planning, however it focuses mainly on the "techno-managerial complex that might deliver a 'sustainable' urbanity", whereas it only occasionally pays attentions to questions of socio-environmental inequality and injustice (Swyngedouw and Kaika 2016, 49). This research aims to contribute to filling this gap.

In light of the above Lisbon makes a good case study to explore how Lisbon's urban greening strategies are reflecting concerns related to environmental justice. Based on the results of previous research focusing on urban greening strategies in relation to EJ, I understand that even though Lisbon has been awarded by the EC for its efforts in expanding GI, these efforts may not benefit all of its population in the same way. Hence it becomes particularly relevant to explore how these strategies address the distribution of green spaces in Lisbon and eventually contribute to providing even access to the many benefits provided by urban green spaces. Therefore this research aims to apply an EJ perspective towards Lisbon's urban greening strategies, while building on the work done by other scholars in regard to critically questioning the social implications and justice-related outcomes of urban greening strategies.

The research questions that guide this project are:

(1) How do Lisbon's urban greening strategies contribute to ensuring that everyone can access the benefits provided by urban green spaces?
(2) To what extent do these strategies reflect concerns related to environmental justice?

With the first question I aim to analyze the strategies designed and defined by the city council in terms of expanding GI and implementing the system of green corridors, while particularly looking

at how the issue of distribution of and access to green space is addressed. The second question reflects the need for urban greening strategies to pay attention to the social impact and justice implications of these strategies. Hence I seek to understand to what extent these concerns are considered by Lisbon's city council, while also aiming to raise awareness about the possible justice implications of developing and implementing GI in cities.

The geographical scope of this research project is Lisbon municipality which is governed by the Lisbon city council (*Câmara Municipal de Lisboa* - CML). This is based on the fact that the CML received the European Green Capital Award 2020 and that the EC particularly praised the CML's efforts in expanding GI. In terms of temporal scope I will analyze the strategies that have led to the ECGA 2020, namely the system of green corridors as put forward by Lisbon's 2012 master plan and subsequent strategies.

2. THEORY FRAMEWORK

2.1 Overview

This chapter constitutes the theoretical framework that guides and shapes this research project. Since its very beginning I have been inspired by ideas developed by political ecologists and urban political ecologists, regarding the relation between power, nature and society. The field of (urban) political ecology provides the theoretical starting point through which the urban and the natural environments are understood, whilst seeing urban planning as one of the many power-induced processes that produce these environments. Section 2.2. provides an overview of the main theoretical ideas taken from political ecology and urban political ecology, followed by a brief description of what I understand the role of urban planning to be in producing urban environments (section 2.3). Building on this, the research indeed revolves around the concept of environmental justice (EJ). This concept is, however, far from straightforward – section 2.4 provides an overview of its different dimensions and how it relates to urban green spaces.

2.2 (Urban) Political Ecology: the production of environments

In their work on explaining land degradation as a social problem, Blaikie and Brookfield (1987), two geographers based in the UK and Australia respectively, understand political ecology as being built from combining "the concerns of ecology and a broadly defined political economy" (Blaikie and Brookfield 1987, 17). In their case, this means recognizing, on the one hand, the human activity leading to land degradation, and on the other hand, how land degradation impacts human activity. Thus political ecology is an approach "critically branching out to understand relationships between society and the natural world" (Keil 2003, 728), in order to unravel the processes that shape both worlds.

According to political ecology, these processes shaping nature and society are embedded in politics and power relations. For this reason, it seeks to particularly address environmental problems like forest degradation, climate change and the loss of wildlife forces (Robbins 2011), in order to frame these as being *also* political: in the words of Marco Armiero, an Italian environmental historian and political ecologist, "environmental problems are never only environmental" (2017, 166).

Being rooted in a Marxist perspective (Robbins 2011, chap. 3), political ecology stresses the idea that global capitalism has become a major driving force transforming nature and society. Likewise, local environments are transformed through global forces, the origins of which may be located on the other side of the world (Faber 2017). Political ecologist particularly address the current climate crisis by linking this crisis to a number of questions related to justice (Allegretti et al. 2013). Be it on local or global scale, it has become clear to many that those powerful and affluent enough will be able to more easily adapt to the impact of climate change, whereas others will suffer significantly (Peet et al.2011). To apply a political ecology approach means, therefore, to not be neutral in the face of environmental issues, but instead to try to understand who is benefitting from these issues and who is suffering the consequences.

The ideas developed by political ecology helped me to understand that the processes leading to the current ecological crisis are embedded in a political structure, and therefore these processes can never be understood only from a technical or technological perspective (e.g. 'how to minimize greenhouse gas emissions?') but require also a political perspective (e.g. 'who is causing the emissions? For what purpose? Who is suffering the consequences?'). From the perspective of political ecologists, to address environmental issues without addressing its politics is inadequate – as Maria Kaika, a Greek scholar educated in architecture and at the forefront of the field of (urban) political ecology, states: "in an ideal world the 'political' should be redundant from this term [political ecology], because ecology can only be political" (Kaika 2014). By applying a political ecology approach to urban greening strategies, I aim to emphasize the political nature of environmental strategies. This means I do not analyze or assess the ecological performance of the strategies, i.e. whether these strategies are sufficient in terms of climate change adaptation and mitigation. Instead I address the politics behind the strategies: who has the power to make the decisions and who does not? Who is benefitting (most) from urban greening strategies and who does not? Considering that environmental problems and benefits do not impact everyone in the same way, I understand that a political ecology approach towards urban greening strategies allows for addressing the relevance of these questions.

i. Urban political ecology: the city as a produced environment

Whereas political ecology originally focuses on environmental issues located *outside* the city (such as the construction of hydro-power dams, soil erosion and waste dumps), urban political ecology has sought to "bring the methodology of political ecology into urban settings to which it had hitherto not been applied" (Angelo and Wachsmuth 2015, 18). For this reason, and considering that this research focuses on the urban, I understand UPE to provide a useful theoretical understanding, based on political ecology but at the same time sensitive towards the particularities of the urban setting.

Nonetheless, UPE goes beyond merely applying the ideas of political ecology to the urban. A group of scholars, led by Erik Swyngedouw (1996), a critical geographer from the University of Manchester, started to question the ontological distinction between nature and the city. Being theoretically based on the ideas developed by David Harvey (1996) and Neill Smith (1984), both Marxist geographers, UPE attempts to move beyond the human-nature divide by understanding nature as being shaped by the same socio-political processes that shape cities: 'nature' is not intrinsically different from 'the city' as both exist *because* of each other (Swyngedouw and Kaika 2016). Therefore, UPE seeks to break down the binary vision of city against nature: as David Harvey famously said, "there is nothing unnatural about New York City" (1996, cited in Swyngedouw and Heynen 2003). As such, the urban and the natural are not two distinct realities, but highly interconnected, interdependent and even inseparable (Keil 2003; Swyngedouw 1996).

Likewise I understand that what matters to UPE is to understand *what* the socio-political processes are that shape environments (whether 'natural' or 'urban') and *who* is producing and transforming these environments. As UPE scholars have shown, these processes of production and transformation inevitably occur within a structure of power, benefitting some at the expense of

others (Swyngedouw and Heynen 2003). UPE recognizes the socio-economic inequalities that result from this, aiming to understand these processes - which may be invisible or even located far away. Likewise, UPE seeks to push forward a strong normative agenda: it not only aims to 'untangle' the hidden processes that produce and shape uneven environments, but also seeks to contribute to a more democratic handling of the production of cities (Zimmer 2010). It is therefore a field of research, as well as a political project, attempting to democratize the "highly uneven and deeply unjust urban landscapes" (Swyngedouw and Heynen 2003, 898).

I understand urban greening strategies to be one of the processes through which (urban) environments are produced: these strategies develop urban nature in a certain way, based on a number of plans and objectives and a set of ideas about what urban nature is and how it should be developed. Likewise an urban park is as much a produced environment as a street or a square – although it may be cognitively understood as something 'natural' (Heynen 2003). By applying an UPE approach to urban nature, I aim to be aware of how urban nature is produced and through what socio-political processes. At the same time I seek to explore by whom urban nature is developed, and for whom, in order to address the underlying power relations that shape this process of transformation. The same way that political ecology allows for taking notice of the political nature of environmental problems and benefits, UPE allows for taking notice of the socio-political processes that produce urban nature. As figure 2.1. illustrates, I understand urban greening strategies to be part of the processes that produce urban nature which, for being embedded in a structure of power, can result in socio-economic inequalities. For this reason, urban greening strategies have implications in terms of environmental justice.

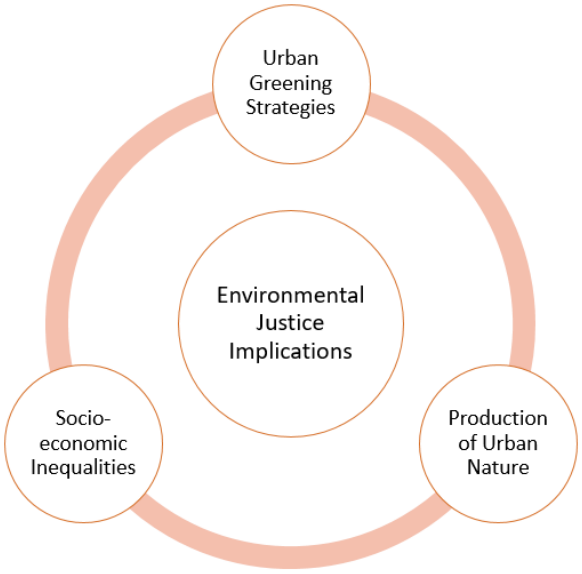

Figure 2.1. Graphic visualization of how I understand the relation between urban greening strategies and environmental justice. Own illustration.

2.3 The role of urban planning

Urban and spatial planning, being "an activity that attempts to manage spatial change" (Tewdwr-Jones 2012, 1), is one of the socio-political processes that shape the production and transformation of environments. For this reason, I understand urban planning as a key process for analyzing urban green spaces in relation to environmental justice; after all, it is mostly through urban planning that urban green spaces are created or, possibly, destroyed (i.e. replaced by other forms of development). In his book *Spatial Planning and Governance,* UK-based planning theorist Tewdwr-Jones (2012) defines spatial planning by immediately bringing up the conflicts of interest that arise when deciding on how to plan space. After all, space is a finite resource for which political choices need to be made regarding whose interests will be considered and whose will not: according to Tewdwr-Jones, "for every winner there is a loser" (Tewdwr-Jones 2012, 3).

Although it is not always clear who is winning and who is losing, urban planning is never a neutral or merely technical exercise. Whereas the 'modernist' way of planning of the twentieth century understood planning as a top-down technically driven process, this understanding changed (among other things) with Jane Jacob's 'civic revolt' against planning. As her book *The death and life of great American cities* (1961) was published, Jacobs questioned the legitimacy of the expertise knowledge on which planning decisions were made. She argued that there is a difference between how cities are planned and how cities function in real life. Her critiques resonate until today, as planning is now considered to be a dynamic social process in which a plurality of actors attempt to deliberate and debate the use of space (Tulumello 2017). Planning thus became a more inclusive exercise, recognizing the need to involve citizens in the decision-making process.

Also, from the 1970s planning became concerned with the idea of achieving social justice, by not only aiming to enhance the quality of life, but by also addressing the causes of social problems, such as poverty, homelessness and social exclusion (Steele et al. 2012). Notwithstanding urban planning practices have been highly criticized by many scholars and social movements alike – among others David Harvey (2009). His critique focuses, for example, on planning practices that prioritize economic growth and market-oriented approaches (such as urban marketing, privatization and liberalization, see Tulumello (2017)) over social welfare and environmental protection. During the last decades, urban planning started to focus on its role in mitigating and adapting to climate change, while incorporating the global discourse on 'sustainability' (Hurlimann and March 2012). However, and despite the fact that sustainability policies are often presented as win-win solutions, urban planning continues to be a political exercise implying a number of political decisions to be made: what is to be sustained, by whom and for whom? In what area? And over how long? (Briassoulis 1999). According to Campbell (1996) the three goals representing sustainability (the three E's: economy, equity and environment) are not always complementary, requiring planners to reconcile conflicting interests or to prioritize one over the other. And while doing so, planners are always subjected to a structure of political and economic forces, limiting what can be done (Campbell 1996).

While cities became prominent actors in the policy arena of sustainability and climate change, environmental justice activists have found that spatial and urban planning is often involved in land

use policies negatively impacting already marginalized and vulnerable social groups (Steele et al. 2012). At the same time, studies have suggested that in some cases so-called sustainability policies are employed by cities to increase their attractiveness in comparison to other cities, as part of inter-city competition affecting land value (Kabisch and Haase 2014). Likewise the relation between policies addressing climate change and sustainability, and the enhancement of justice is far from straightforward. Although most planners do recognize the need for planning to contribute to a 'just city', it is often unclear *what* is meant by 'just', *how* this justice can be achieved and *whose* justice we are referring to (Steele et al. 2012; see also section 2.4). Likewise I understand urban planning to be not merely a technical expertise but also a political activity. Planners inevitably work to achieve some form of political agenda, usually resulting from a democratically elected political body. At the same time urban planning requires political decisions to be made regarding the use of space, prioritizing some political goals over others. My research builds on this by analyzing Lisbon's urban greening strategies, not as neutral policies benefitting everyone equally, but as political decisions through which some interests and perspectives are favored over others.

2.4 Environmental Justice: From Movement to Theory

Environmental justice, being mainly concerned with the quality of the environments 'where we work, live and play', gained an intrinsically practical and urban dimension: EJ became a way of 'everyday environmentalism' (Pulido 2015). For this reason, I understand it to be a practical tool to analyze environmental issues within cities. Mainly, applying the concept of environmental justice affects the way how I analyze urban greening strategies: I particularly pay attention to how urban greening strategies aim to distribute benefits among the population and within the city – and how these decisions are made. Although EJ has a practical nature – concerned with environmental conflicts and benefits - it is based on a theoretical framework revolving around the nature and meaning of the term 'justice'. The following section briefly explains this framework, while then linking it to urban green spaces as an environmental justice concern.

i. The 'justice' in environmental justice

To provide an overview of the different theoretical approaches towards the term 'justice' is beyond the scope of this research project. Nonetheless, I deem it necessary to briefly reflect on what it means to enjoy environmental justice or to suffer environmental injustice, in order to clarify the use of this term throughout my research. In his book *Defining Environmental Justice*, David Schlosberg (2007), a key scholar in the field of EJ, reflects upon the different conceptualizations of environmental justice. According to the author, EJ, both as movement and as theory, has mainly focused on the distributive conceptualization of justice, based on John Rawls (1999). Rawls theorized justice as being, in essence, about a fair distribution of goods within society: justice is achieved as long as goods are distributed according to principles deemed as 'just'.

However, Schlosberg and many others with him, have argued that only a distributive conceptualization is insufficient: in order to achieve justice, the structural processes that create injustice need to be addressed too – processes like oppression, discrimination and marginalization. The political theorist Iris Marion Young (1990), for example, has argued that the unfair distribution

of goods has a number of precedents. Hence, the reality of domination and oppression should be taking into account when theorizing the conceptualization of justice. In the same way, Nancy Fraser (2003), a researcher in philosophy and politics based in New York, calls for including recognition as a key element of justice, understanding that a fair distribution of goods can never be achieved without cultural, political and social recognition (Schlosberg 2007, chap. 2). Building on these ideas, Schlosberg understands environmental justice to go beyond distribution, including recognition, participation and functioning.

Agyeman et al.(2002) have equally highlighted the different dimensions of environmental justice. They understand EJas having both procedural and substantive aspects. *Substantive* aspects are related to the right to live in a clean and healthy environment, and can thus be linked to the distribution of environmental benefits and hazards. However, according to the authors, EJ also implies *procedural* aspects, which are related to the involvement of people in defining and developing environmental policies, linked to participation and recognition. Through this understanding, environmental justice is based on both the right to a healthy living environment and the right to have a say about the future of this environment.

These different conceptualizations of justice are relevant for me when studying EJ in relation to urban green spaces, to understand that fair distribution only does not lead to justice unless the structural processes that cause injustice are addressed simultaneously. 'Eco-gentrification' (Wolch et al. 2014) or 'green gentrification' provides a clear example of this: this type of gentrification can occur when disadvantaged or marginalized urban areas are 'upgraded' by improving the environmental quality and creating public green spaces. Although this may initially lead to more availability of green spaces in these areas, neoliberal market logics dictate that property values rise as neighborhoods become more attractive and thus more wanted. As such, the 'greening' of marginalized areas causes the risk for the original residents to be evicted and replaced by wealthier people (Anguelovski et al. 2017; Byrne 2017; Dooling 2009; Haase et al. 2017). As long as the processes creating injustices (in this case a neoliberal profit-oriented housing market) are not addressed, improving distribution does not necessarily lead to environmental justice.

i. Green space as an environmental justice concern

As EJ studies developed, it started to not only focus on the uneven distribution of environmental *hazards*, but to also analyze the unequal access to environmental *benefits* – including green spaces (Byrne 2017). Although green spaces provide many benefits in the form of ecosystem services, often the materialization of these benefits depends on being able to access the green space (Davoudi and Brooks 2016).Due to the uneven distribution of green spaces, some parts of the urban population naturally enjoy better access to these spaces than others. However, many studies have emphasized the fact that often more privileged social groups disproportionately enjoy better access, and can therefore better enjoy the direct benefits of using green spaces. . On the other hand, those with limited access to green spaces, may eventually suffer from poorer health conditions, lower levels of mental well-being and less environmental amenities (Costanza et al. 2017; Maas et al. 2006). For this reason, access to green space has increasingly become seen as an issue of environmental justice (O'Brien et al. 2017).

Ecosystem services, i.e. the benefits people derive from functioning ecosystems, vary greatly in terms of scale and context (see Andersson et al. 2015). The ecosystem services provided by green spaces and Green Infrastructure function on multiple scale, from the very local scale (e.g. the shading effect from trees) to a global scale (e.g. the trees' absorption of carbon dioxide). As a result, not all ES provided by green spaces require people to use and to visit the space: one can enjoy the benefits of cleaner air resulting from trees in a park, without setting foot in the park itself. Nonetheless, studies have shown how people living in close proximity to a green space typically derive more benefits, at the same time that frequent use can result in important mental and physical health benefits (Davoudi and Brooks 2016). Without neglecting the importance of the benefits of urban green spaces on a larger scale, the focus of this research is on benefits enjoyed directly when using and visiting urban green spaces – depending on whether people are able or not to access green space.

Studies on this topic have highlighted how the uneven distribution and availability of green spaces in cities impact to what extent different social groups are able to access green space. A study conducted in the USA (Wolch et al. 2014) highlighted the uneven distribution of green space in cities, which disproportionately benefits predominantly White and more affluent communities. Kabisch & van den Bosch (2017) have analyzed the unequal distribution of green space in Berlin, arguing that the benefits of GI are disproportionately available to a part of the urban population, and that particular social groups, such as immigrant communities, suffer limited access. A recent study done by a research group from Lisbon University has provided evidence of unequal access to Lisbon's green spaces (Luz et al. 2019). The study is based on spatial analysis of green space density in Lisbon municipality and a survey distributed among Lisbon residents. The results indicate that, although Lisbon's average green space coverage is 21%[2], in most zip code areas (12 out of 19) green space coverage is less than 10% (see figure 2.2). Furthermore, the surveys indicated that residents tend to frequently visit the green spaces within their own residential area – in zip areas with a low levels of green space coverage, people would travel to adjacent areas to visit green spaces. Hence the study shows the importance of ensuring the availability of green space close to where people live. The authors conclude that Lisbon's residents do not enjoy equitable accessibility to green spaces, due to the uneven distribution of green spaces across the city. They recommend policy-makers to prioritize areas with low green space coverage, while raising concerns related to environmental justice.

[2] Percentage based on TNDVI – Transformed Normalized Difference Vegetation Index. The TNDVI was calculated based on spatial images from the European Space Agency.

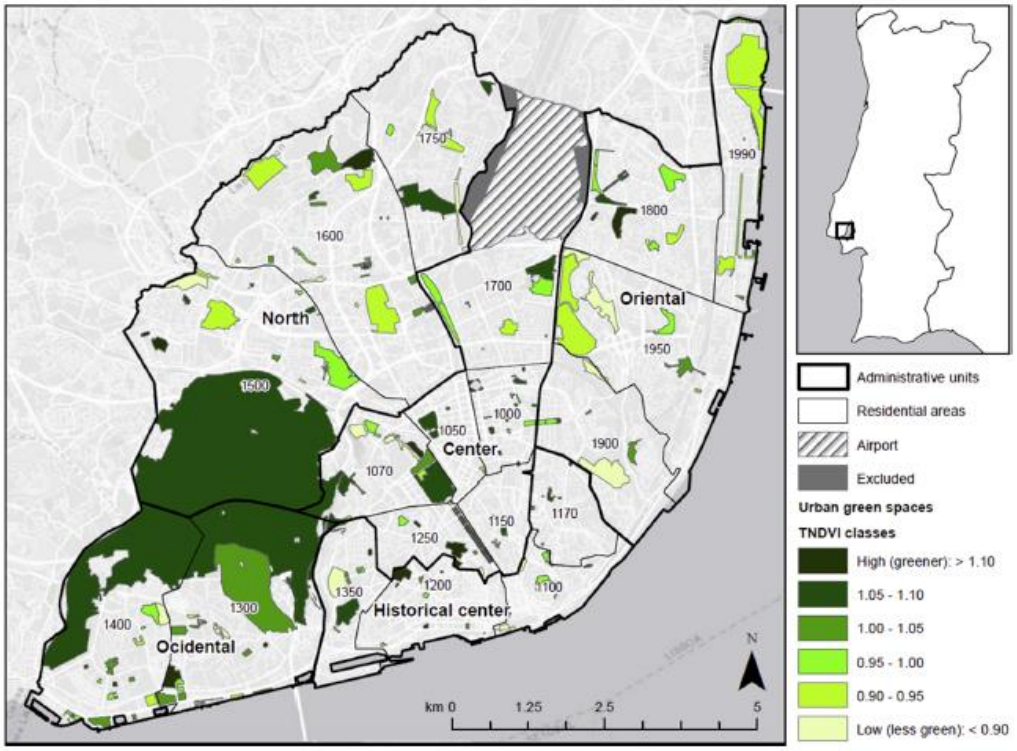

Figure 2.2. Map showing the level of green coverage in Lisbon municipality, per zip code area. The results indicate high levels of green space coverage in the western area, and low levels in the historical center and eastern parts of the city. Source: Luz et al. (2019).

Besides distribution, qualities of the green space are also considered an important factor influencing access to green space. For example, Brien et al. (2017) highlight how access to green space varies depending on the existence of different types of barriers, which include but are not limited to geographical distance to green space. The study therefore recommends a wider understanding of 'access', going beyond only the distribution of GI: "by including not only access, but also the preferred and actual use of GI, the focus on the equitable distribution of GI is broadened"(O'Brien et al. 2017, 156) – in line with the argument raised by Schlosberg and others. In this sense the authors differentiate between social, personal and economic barriers which may prevent access to green space. These barriers include distance to and distribution of GI, physical barriers such as road infrastructure, lack of adequate recreational infrastructure and quality of the green space, lack of information and knowledge, cultural norms and safety and confidence issues. In their study on urban green spaces in Newcastle Upon Tyne, Davoudi and Brooks (2016) state that access to green space is dependent on a number of factors: availability, accessibility and quality. Access, therefore, goes beyond spatial distribution in order to incorporate how the qualities of the green space can function as 'barriers or promoters' to the use of green space: from equipment such as seats, toilets and access ramps, to (perceived and actual) levels of safety and the quality of the vegetation.

However, these barriers do not impact all people in society equally, as some experience these barriers more significantly than others. Therefore an important aspect of access to green space is the fact that it is affected by "people's different identities and vulnerabilities" (Davoudi and Brooks

2016, 33). This means that level of access to green space differs according to people's diverse social and cultural identities; for example, a study has shown that "older, disabled, ethnic minority and female residents are less likely to use parks than other groups because of the parks' poor quality, poor access, a lack of toilet and other facilities, and safety" (Williams and Green, cited in Davoudi and Brooks 2016). In line with Nancy Fraser's call for including recognition, I understand that environmental justice requires the recognition of different people having different needs and limitations regarding using and visiting green spaces, which should translate into strategies addressing the wide variety of users seeking to access green space.

Furthermore, several studies have addressed the (more or less) unexpected implications of urban greening strategies. According to Wolch et al. (2014), implementing urban greening strategies in neighborhoods lacking an adequate supply of green spaces may lead to paradoxical outcomes, causing increased housing costs and property values. Likewise, the study calls for implementing urban greening strategies that are 'just green enough', meaning the strategies are explicitly "shaped by community concerns, needs, and desires rather than either conventional urban design formulae or ecological restoration approaches" (Wolch et al., 2014, 241). Haase et al. (2017) draw attention towards the social implications of urban greening strategies, which, according to the authors, are often neglected by policy-makers. The study argues that although urban greening strategies are often presented as ways for "urban renewal, upgrading and revitalization projects, [these] are in reality first and foremost market-driven endeavors primarily catering for higher income residents". Both studies call for greater awareness of the social impacts of urban greening strategies, while paying attention to specific local contexts.

Although not all urban greening strategies necessarily lead to increased levels of displacement and gentrification, and without undermining the importance of GI in cities, it becomes evident from these studies that urban greening strategies can have significant justice implications. This goes beyond merely exploring the uneven distribution of green spaces – also because green space can never be distributed completely evenly. To study urban green spaces in relation to environmental justice is not necessarily about how green space is distributed, but about asking "which factors and processes determine disparities (…) and why are these outcomes inequitable and/or unjust" (Byrne 2017, 437). The above-mentioned studies suggest that justice implications are not always taken into account by policy-makers.

3. METHODOLOGY

3.1 Overview

This chapter describes the methodology applied in this research. It starts by explaining how I approach my research topic, and what the purpose of this research is. Section 3.3. explains the use of qualitative data. Following is a description of the research case: the city of Lisbon. I explain my decision to use Lisbon as research case, and how this relates to a broader context. In section 3.5. I provide a detailed description of the three research methods used: desk-research, semi-structured interviews and field observations. Section 3.6. describes the analytical framework, in order to describe how I analyzed the collected data to answer the research questions. Finally, the last section of this chapter addresses my personal bias in relation to the research topic.

3.2 Research approach & purpose

This research started with a natural curiosity regarding Lisbon's urban greening strategies - how these are transforming the urban environment and how this is impacting people's lives. As explained in the previous chapter, I use the concept of environmental justice in order to critically analyze to what extent social impact and justice implications are reflected in the strategies, while building upon the theoretical ideas about the relation between nature and society developed by (urban) political ecology. As far as I know, Lisbon's urban greening strategies have not yet been studied from this perspective and therefore my research is based on an exploratory approach – meaning it focuses on a relatively unknown social phenomenon to generate a basis of knowledge leading to new questions and possible hypotheses (Toit 2014). Likewise I intend to shed new light on this topic, while attempting to contribute to the literature by providing insights on the case of Lisbon.

By explicitly including the term 'environmental justice' in its topic, this research acknowledges a clear normative agenda – as is common in the field of (urban) political ecology (Zimmer 2010). Hence I argue that EJ is desirable and that urban planning has a role to play in achieving this. Likewise, the purpose of this research aligns with what has been described as 'emancipatory research', seeking to highlight social injustices, to raise people's awareness and to improve social conditions (Toit 2014). At the same time, I have based my research on the belief that research can be a tool for positive social change, described as 'critical social science' (Toit 2014). Therefore, I not only seek to produce valid knowledge claims, but also to place this knowledge within the broader socio-political context of Lisbon's urban planning.

3.3 Qualitative methods to study EJ issues

In order to analyze Lisbon's urban greening strategies from an EJ perspective I apply a qualitative research strategy. This relates to the fact that qualitative data allows for understanding 'the social world' not as a straightforward reality but instead based on different interpretations of that world by its participants (Bryman 2012). To analyze the strategies from an EJ perspective only based on quantitative data would lead to limited research results as it would not provide any insights about

the aspects that cannot be quantified. Many studies about urban green spaces tend to apply a quantitative approach, by spatially analyzing the number of square meters of green space per inhabitant or by calculating spatial distribution (Barrera et al. 2016). However, as Barrera et al. (2016, 255) write, "the need for research on the use of green spaces that includes qualitative dimensions responds to the fact that the mere existence of green spaces does not warrant their use by the public."

Considering that a significant amount of quantitative data regarding spatial distribution and availability of green spaces in Lisbon already exists (see Luz et al. (2019) and the studies produced by CML), this research seeks to go further by understanding the practices through which green spaces are developed (or not) and how this relates to the way the spaces are used (or not used). By doing so I aim to provide a comprehensive yet critical analysis of my object of study: Lisbon's urban greening strategies. Hence I pay attention to how the strategies were defined, based on what ideas and, consequentially, how these strategies impact the people living in the city. Qualitative data allows for addressing these non-quantifiable aspects of urban greening strategies.

3.4 Case study: Lisbon

Lisbon is Portugal's capital, located on the south-western edge of Europe and on the north bank of the *Estuário do Tejo* – the location where the Tagus river, coming from Spain, meets the Atlantic Ocean (see figure 3.1). Due to its geographical location connecting Europe with the Atlantic Ocean, the African continent and the Americas, the city of Lisbon has historically played an important role in international trade and commerce and developed mainly as a port city.

Figure 3.1. Geographical location of Lisbon. Source maps: Google Maps (left) and Geografia de Portugal (right).

Topography is an important characteristic of the city of Lisbon, as altitude varies from sea-level by the *Tejo* waterfront to up to 200m in the Monsanto forest (figure 3.2). For this reason the urban landscape is characterized by valleys, more or less steep slopes and hills, affecting building patterns and the existence of open spaces. Due to its geographical location, Lisbon experiences mild winters

and hot summers. Most rainfall happens between October and April, whereas July and August are generally very dry months. Nonetheless, its close proximity to the ocean results in Atlantic winds frequently hampering down the high temperatures.

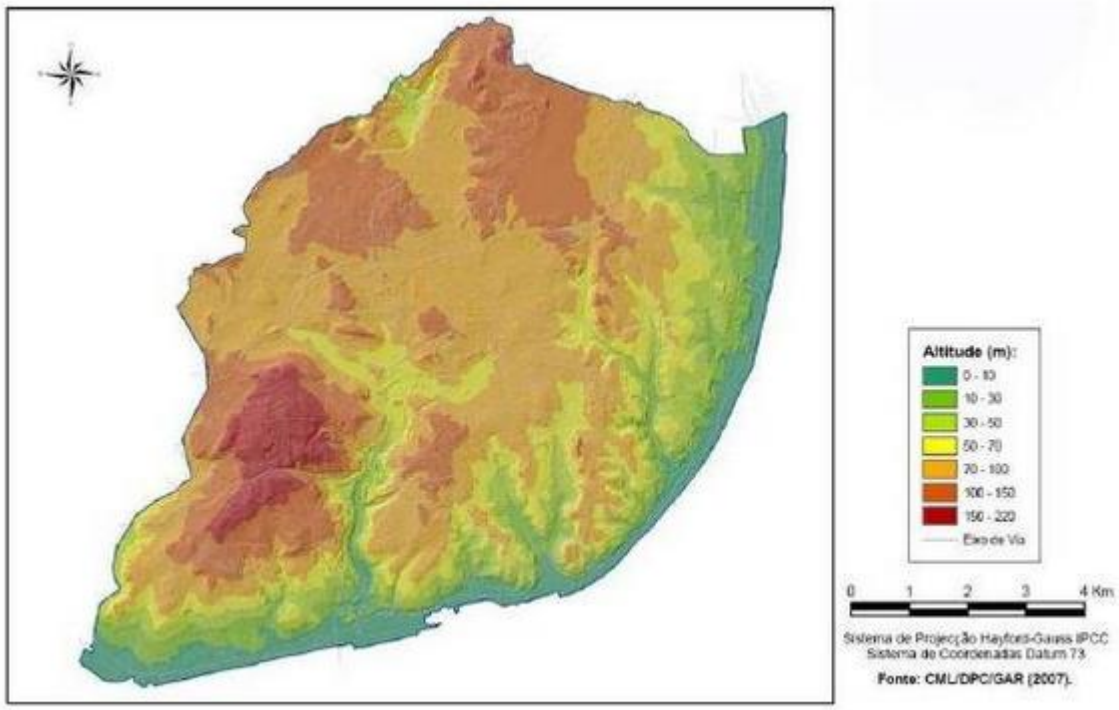

Figure 3.2. Differences in altitude in Lisbon municipality. The different colors represent different levels of altitude in meters. Source: CML (2012b).

Lisbon refers to the Municipality of Lisbon[3], which is one of the 18 municipalities of the Metropolitan Region of Lisbon (*Área Metropolitana de Lisboa* – AML) (figure 3.3). The region is home to almost 3 million inhabitants, accounting for almost 30% of Portugal's total population while playing a central role in the national economy – most enterprises functioning in Portugal are located in the AML (European Commission 2019). Lisbon municipality has a population of just over 500.000 inhabitants: despite its central function, the bulk of the AML's population does not live in Lisbon municipality. In fact, its population has been decreasing since 1981, whereas the overall population of the AML has grown drastically (V. Oliveira and Pinho 2010) – a consequence of the tendency for people to exchange the dense city center for suburban areas. Nonetheless, Lisbon plays a vital role in the AML as most of the AML's working population commutes to Lisbon municipality (CML 2017a). The municipality is governed by the *Câmara Municipal de Lisboa* (henceforth, CML) – Lisbon's city council – and subdivided into 24 civil parishes responsible for government on local scale.

[3] In Portuguese: *Concelho de Lisboa*

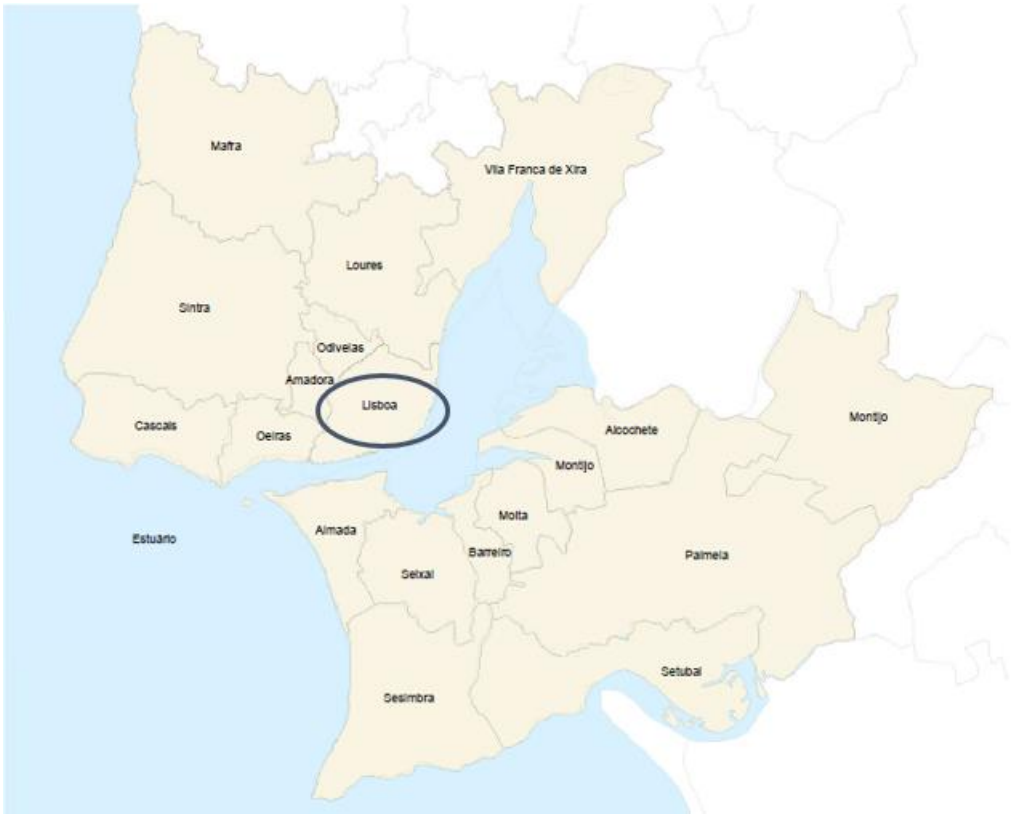

Figure 3.3. Location of Lisbon municipality within the Lisbon Metropolitan Area. Source: CML (2016).

i. Lisbon's urban planning framework

Most of the processes and regulations governing Lisbon's current urban planning framework were developed in the aftermath of 1974 – the year in which Portugal ended its dictatorial regime and transitioned into a multi-party democratic system. During this period, most public laws and institutional organizations suffered reforms, including frameworks for spatial planning. On a municipal level, these years meant the introduction of the *Plano Diretor Municipal* (henceforth, PDM) [Municipal master plan]. In 1991 it became mandatory for all Portuguese municipalities to develop and implement a PDM for their territory – prior to this, a large part of Portugal's territory was not covered by any form of master planning (Pereira and Nunes 2008). Lisbon approved its first PDM in 1994, followed by the second in 2012 – which is in force until today, and is expected to be revised and replaced with a new plan by 2022.

The PDM is supplemented by plans functioning on a smaller scale, such as the *Plano de Urbanização* [urbanization plan], defining land use and the location of the main infrastructure in an area to be developed; and the *Plano de Pormenor* [detailed plan], implementing land use policies in detail and defining, among other things, rules for urban design. For parts of the city not covered by *Planos de Urbanização* or *Planos de Pormenor*, *Unidades de Execução* [execution units] constitute an in-between instrument, ensuring an integrated vision without the need to develop detailed plans. Furthermore, several sectorial programs and strategies are developed alongside formal plans, for

example in relation to climate change, housing, tourism and economic growth (see figure 3.4). The city council is responsible for developing and implementing all municipal planning instruments.

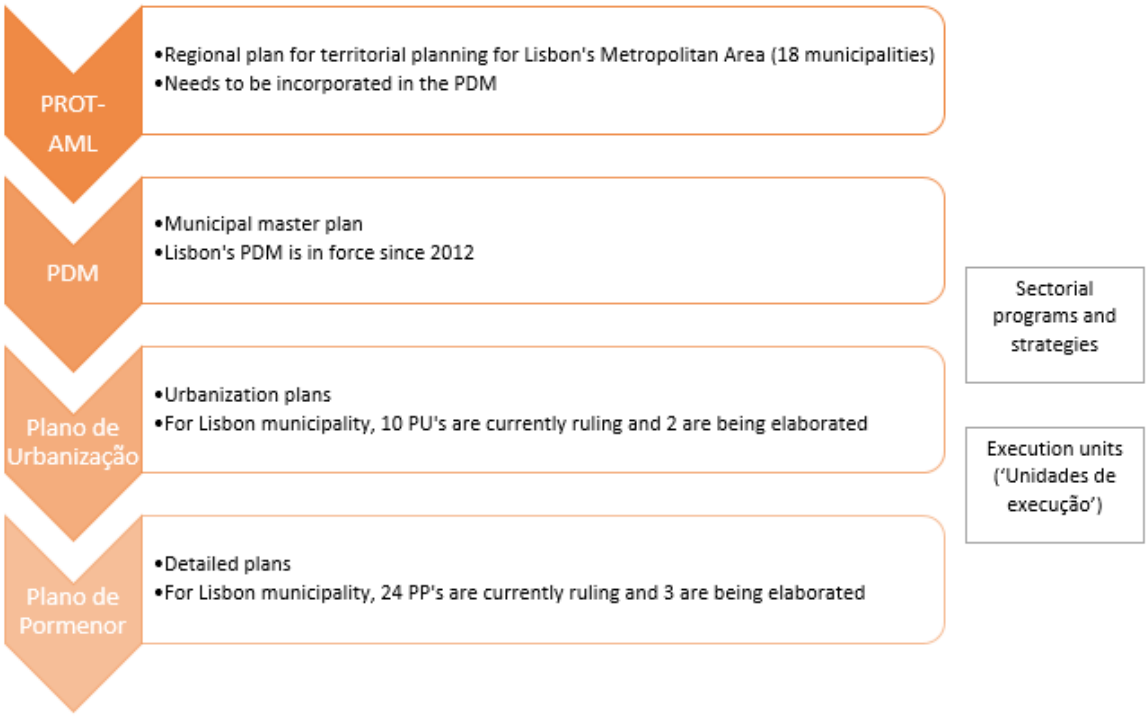

Figure 3.4. Graphic scheme of Lisbon's urban planning framework, from metropolitan level to detailed planning. Source: own visualization.

ii. Lisbon as European Green Capital 2020

Lisbon's green structure is dominated by the *Monsanto* urban forest located in the south-west (see figure 3.5), existing as a green space open to the public since the 1930s and often referred to as the 'green lung'[4]of the city (CML 2019a). The inner city contains a number of historic green spaces and gardens, such as the *Jardim da Estrela*, the *Jardim do Príncipe Real* and the area around the historic castle. In the beginning of the 20th century the *Parque Eduardo VII* was projected, being one of the largest public green spaces in the central part of the municipality. The outer parts of the municipality also contain a number of public parks, either projected as such during development projects or created later on open or abandoned lands. However, within the European context Lisbon shows below-average levels of green space availability, being classified as city with "high degree of soil sealing and low proportion of green urban areas" (EEA 2017). According to Kabisch et al. (2016), low levels of green space availability in south-European cities can be explained due to the often compact and dense character of these cities, together with high maintenance costs of green spaces due to the Mediterranean climate.

[4] In Portuguese: *pulmão verde*.

Nonetheless, as referred to in chapter 1, Lisbon has been investing significantly in creating new green spaces in the city since 2008. These investments are part of a major rehabilitation program developed by the city council during the last decade, through which Green Infrastructure became a main element of urban strategies (Luz et al. 2019). In 2012 the system of green corridors was introduced through the PDM. Besides this system, other actions included the creation of allotment gardens, ecological restoration, creation of biodiversity hotspots and wildscapes and the re-naturalisation of water streams (Luz et al. 2019).

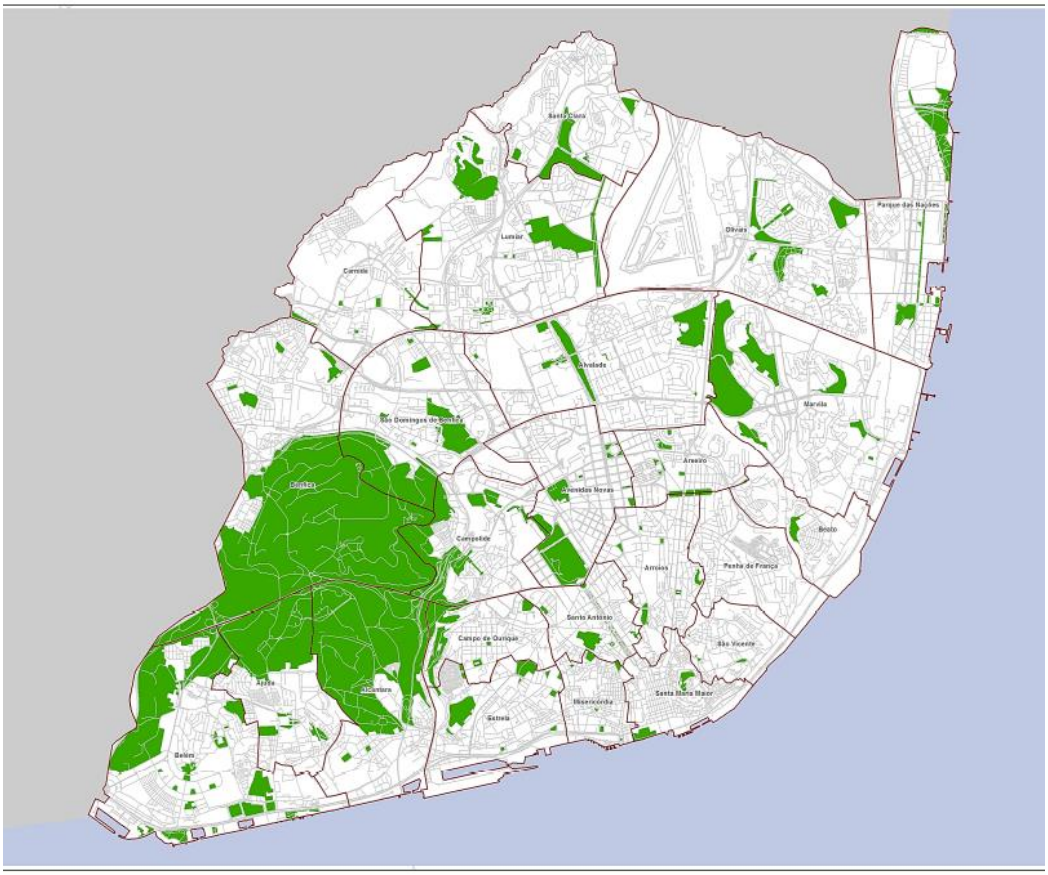

Figure 3.5. Public green spaces in Lisbon municipality. Red lines represent borders of civil parishes. Data from 2016. Map facing north. Scale approximately 1: 1 500. Source: CML (2019c).

I chose the city of Lisbon as case for my research project, following Lisbon being awarded European Green Capital 2020. This event triggered my curiosity, as I wanted to explore what type of strategies led to this award and how social implications are taken into account. As Bryman (2012) explains, research based on a single case is mainly concerned with understanding the complexity and particular nature of this case; therefore, case-studies can often not represent a category or sample of cases. Bryman thus argues that it is difficult to generalize any findings from the case-study. Nonetheless, case-studies are considered to be useful for providing insight knowledge about the particular case they focus on, and for providing a basis of knowledge that can help to understand other cases (Bryman 2012).

Nonetheless, I consider that the case of Lisbon can be significantly relevant in a broader context. As Lisbon was awarded with the ECGA, the European Commission considered the city as an 'example to follow' in terms of sustainability, and in particular in terms of urban greening strategies. As other European cities may now be looking to Lisbon to understand how to develop GI in their own cities, it becomes particularly relevant to explore how these strategies are related to environmental justice and what their possible justice-implications are. Besides, and although Lisbon's urban greening strategies may not be representative, it does provide a good case to understand how urban greening strategies are being developed and implemented in European cities. As Flyvbjerg (2006) argues, despite a single case not being representative, it can still allow for some level of generalization by exploring how the case relates to the theory and by providing very detailed and insightful data about complex realities – which may tell us something about other cases too. Hence by analyzing Lisbon's urban greening strategies in relation to EJ, I seek to contribute to the general theory with insights from this specific case.

3.5 Data collection

Data has been collected through three different methods: desk research of planning documents and relevant literature; semi-structured interviews with key informants; and field observations. The following sections describe each method in detail, as well as their purpose for this research.

i. Desk research

With the first research method, I aim to provide an overview of the current situation of Lisbon's urban green spaces and the existing urban greening strategies. The *Câmara Municipal de Lisboa* (CML) [Lisbon city council] is the main actor, as it is responsible for implementing green infrastructure and creating green spaces. Therefore, I study the strategies created and implemented by the city council. Other actors, such as civil parishes[5], local organizations and private actors, can play a role in terms of maintenance and use of green spaces; however, as these are not responsible for developing strategies nor for planning, designing or constructing green spaces, their work is not considered in my study.

In this first stage, data is collected from both primary and secondary sources: the primary sources consist of planning and policy documents produced by CML in relation to urban greening strategies, as well as monitoring studies of these strategies. These are primary sources because they were produced for other purposes than conducting research (Bryman 2012). Secondary sources of data consist of previous studies conducted by researchers regarding Lisbon's urban green spaces. Both primary and secondary sources have been selected based on their relevance for the research topic. An overview of the sources of data are provided in table 3.1.Besides these documents, primary sources also include information provided by the municipal office for the environment, green structure, climate and energy[6]. After visting the office, I was given access to a number of projects

[5] In Portugal, each municipality is sub-divided into smaller civil parishes, which have responsibilities in terms of implementing policies and maintaining infrastructure on a smaller scale.
[6] In Portuguese: Divisão Municipal do Ambiente, Estrutura Verde, Clima e Energia

and presentations relating to specific green spaces that have been developed in the last years: *Parque da Ameixoeira, Parque Periférico de Carnide, Quinta da Granja, Parque da Quinta da Montanha, Jardim da Cerca da Graça, Parque do Casal Vistoso* and *Corredor Verde do Vale de Alcântara*. Due to the inability of discussing all projects in detail, only some of these projects are described in chapter 4. The projects that were selected are those that appeared to be most relevant for the research topic, due to addressing aspects related to environmental justice.

Primary sources (all documents are elaborated by 'Câmara Municipal de Lisboa')				
Original title	Translation into English	Type of document	Date of publication	Period of implementation
Plano Diretor Municipal	Municipal Master Plan	Legally binding master plan, including a large variety of topics.	2012	2012 - 2022
Plano de Ação Local para a Biodiversidade 2020	Plan for Local Action for Biodiversity 2020	Thematic strategic program addressing in particular the aim to increase levels of biodiversity by 20% until 2020.	2015	2015 - 2020
Estratégia Municipal de Adaptação às Alterações Climáticas	Municipal strategy for climate change adaptation	Thematic strategic program putting forward a number of measures to be taken within the context of climate change adaptation	2017	No specific timeframe
Relatório de Estado de Ordenamento do Território	State report on spatial planning	Mandatory report for monitoring and analyzing to what extend the PDM is implemented effectively.	2016	Not applicable
Relatório de Monotorização do Plano de Ação Local da Biodiversidade de Lisboa	Monitoring report on the Plan for Local Action for Biodiversity 2020	Report for monitoring and analyzing to what extend the Plan for Local Action for Biodiversity 2020 is implemented effectively.	2018	Not applicable

Secondary sources				
Title	Author	Date of publication	Type of study	Topic
Interactive map – Green Infrastructure indicators	European Environmental Agency	2017	Statistical study conducted by the EEA – an agency of the European Commission	The study collects data from European cities regarding GI indicators and compares their performance to each other.
Urban Green Space Availability in European Cities	Nadja Kabisch et al.	2016	Study published in peer-reviewed journal, analyzing spatial data on green space availability in 299 cities	The study compares levels of green space availability among European cities in order to highlight specific patterns.
Should I Stay or Should I Go? Modelling the Fluxes of Urban Residents to Visit Green Spaces	Ana Luz et al.	2019	Study published in peer-reviewed journal, based on spatial data of green spaces in Lisbon and data collected through surveys on use of green space	The study analyzes the distribution of green space across Lisbon, based on spatial data, and combines this with the results from a survey distributed among Lisbon residents regarding their preferences and uses in relation to green space.

Table 3.1. Overview of the data sources used for doing desk research, divided in primary and secondary sources as defined by Bryman (2012).

ii. Semi-structured interviews

Interviewing as a research method is well-documented and represents an essential tool for collecting qualitative data. Generally, to conduct interviews with key stakeholders allows for gaining "detailed and focused insights into how individuals perceive a topic of interest to researchers" (Silverman 2014, 149). I used semi-structured interviews with individuals working at the city council to gain insights about 'the ideas behind the plans'. Whereas the desk research seeks to understand how plans 'are', interviews seek to understand how these have been elaborated this way and what kind of knowledge, assumptions and priorities were considered. Likewise, the interviews aim to complement the data collected through the desk-research.

For this reason, the interviewees were selected for being involved in different stages of the process of either defining or implementing Lisbon's urban greening strategies. Each of the four interviewees has a different responsibility and role in this process. Interviewee A is actively involved in the decision-making process through which strategies and priorities are defined – based on the political mandate of the city council. Interviewee B is responsible for the department that produces and implements Lisbon's master plan, including the development of the urban greening strategies. Interviewee C and D are both responsible for implementing the strategies by designing urban nature; though, whereas interviewee C works on a city-wide level and focuses on Lisbon's GI as an integrated network, interviewee D works on specific projects targeting specific areas or green spaces (see table 3.2).This way, the four interviewees 'cover' the different roles that are involved in the decision-making process within the Lisbon city council.

Besides these interviews, I have had informal conversations with several people regarding the topic of my research and used these opportunities to "collect data through informal conversations" (Silverman 2014, 149). These people were: 2 researchers, 2 architects and 1 person working at a coffee place located in a recently-developed green space. All people were informed on forehand about my research project. During the conversations I took notes which I later used when developing interview guides or conducting field work. Whereas the interviewees working at the city council were responsible for developing the strategies, these 'spontaneous' informants were 'outsiders' (to the city council) yet knowledgeable about the social impact of the city council's strategies. The interviews at the city council gave me a rather 'positive' image of the work done by the city council (as the interviewees are responsible for this work); on the other hand, the other informants were more critical (and in some cases even skeptical) about this work. This often led me to notice things I had not noticed before; I felt that combining the two sources allowed me to combine different interpretations and perceptions of the same social reality, leading to more comprehensive research results.

All interviews were conducted in Portuguese. The excerpts of the interviews used in chapter 4 were translated to English by me. All interviewees have approved the use of these excerpts and the way these were translated. For interview A, B and C an interview guide was created with the aim of structuring the interview, while allowing sufficient space and time for unexpected topics and issues to arise (see appendix I). For my meeting with interview D I did not prepare an interview guide, as

the aim was, in the first place, to collect projects and plans of Lisbon's recently developed green spaces. During the process of collecting projects and plans I had requested, the interviewee (and some of her colleagues) responded to the questions I had about the work process and the way decisions are made. During this time the interviewee and her colleagues provided me with a vast amount of information including specific details about specific projects. All interviewees have voluntarily agreed to participate in this research and have given informed consent to record the audio of the interviews. In order to safeguard the interviewees' integrity I have refrained from using their names.

Overview of interviews					
Interviewee	Role	Responsibility	Date of interview	Location of interview	Observations
A	Advisor to the city councilor for green structure, environment and energy; landscape architect	Responsible for combining the technical planning with the political mandate of the city council; responsible for elaborating a large part of Lisbon's GI planning	13 March 2019	Office of the interviewee	Not applicable
B	Director of Lisbon's urban planning department; architect and urban planner	Responsible for leading the process of creating and implementing the PDM	18 March 2019	Office of the interviewee	The interview with interviewees A and B was a combined interview
C	Landscape architect at Lisbon's urban planning department	Responsible for designing and developing the strategies in regard to Lisbon's GI	18 March 2019	Office of the interviewee	The interview with interviewees A and B was a combined interview
D	Landscape architect at the municipal office for green structure	Responsible for designing projects for green spaces that are created or rehabilitated by the city council	2 April 2019	Office of the interviewee	This interview took place at the interviewee's office where her colleagues also provided additional information

Table 3.2. Overview of the interviews conducted for this research.[7]

iii. Field observations

The third research method aims to understand how the urban greening strategies play out in the city, by visiting the green spaces that result from these strategies. With this method, I aim to move beyond the plans and understand how these have folded out in reality and what this means for the people using the green spaces. As plans can be different from reality, I believed it to be important to observe the actual outcomes of Lisbon's urban greening strategies. This research method 'follows up' on the results from the other two research methods, i.e. I have observed the use and characteristics of the green spaces based on the data collected through the desk-research and the interviews. For example, I visited the spaces in the historical center because the interviewees

[7] Due to their professional role, interviewee A and B are identifiable if one is familiar with the Lisbon city council. Both interviewees have given informed consent to include this information nonetheless.

brought up that these spaces had been redeveloped with the purpose of increasing the level of green vegetation in this area. Through my observations I aimed to understand how this redevelopment folded out in reality.

My visits to Lisbon's green spaces occurred in different times between February and May 2019, with varying weather types: February is a generally sunny but cold time; March presents the first signs of spring for which people tend to be out more often; April is mainly cloudy and rainy (with few people visiting green spaces except for people running and walking their dogs) and May presents the start of summer with increasingly high temperatures. I have attempted to collect data at diverse moments, i.e. morning versus afternoon, weekday versus weekend, etc. However, most observations were done in the afternoon of sunny days, as these are naturally the moments that visits to green spaces are most frequent.

Observations were conducted for 30 to 60 minutes, during which I took notes regarding: time and date, physical setting of the green space, available equipment and infrastructure, people visiting or using the green space, type of activities. Furthermore I wrote down any particular occurrences or special situations; for example, during one of my visits to *Jardim da Cerca da Graça*, I noticed a brief conflict between a visitor and a police man regarding the visitor's dog being off-leash. Table 3.3 lists the green spaces that were visited and figure 3.6 shows a map indicating the location of these spaces. I have also visited the *Corredor Vale da Alcântara*, however, as this corridor is still in construction, I could not collect any data on the use of this space.

The field observations allowed me to collect useful data, in particular regarding possible barriers preventing people from accessing green space besides spatial distribution. It was through my observations that I noticed how certain green spaces were used in some ways and not others; for example in the case of *Alameda,* as described in more detail in chapter 4.

Green spaces where field observations were conducted			
'Corredor Oriental'	'Corredor Monsanto'	Historical center	'Corredor Periférico'
A. Alameda B. Parque do Casal Vistoso C. Parque da Quinta da Montanha D. Parque da Bela Vista E. Parque do Vale Fundão F. Parque Ribeirinho do Oriente	G. Parque Eduardo VII H. Jardim Amália Rodrigues I. Jardim Amnistia Internacional	J. Jardim da Cerca da Graça K. Campo das Cebolas L. Ribeira das Naus	M. Quinta da Granja N. Quinta das Conchas

Table 3.3. List of green spaces visited to conduct field observations.

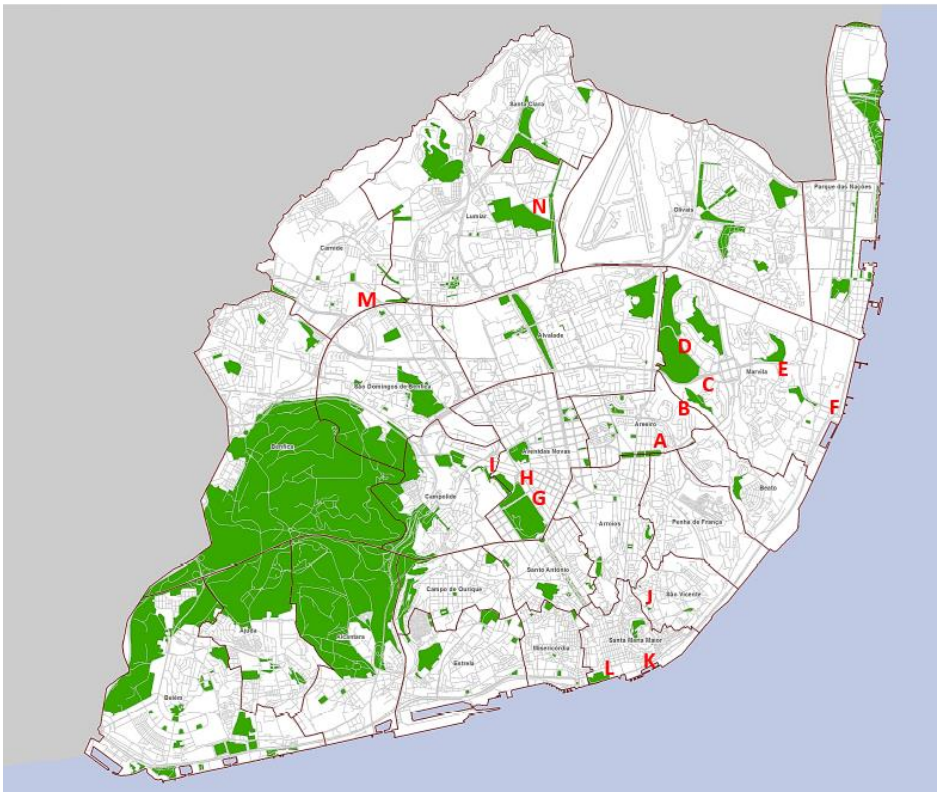

Figure 3.6. Location of the spaces where field observations were conducted. Map facing north. Scale approximately 1: 1 500. Source base-map: CML (2019c).

3.6 Analytical framework: How to analyze Lisbon's urban greening strategies from an environmental justice perspective

As shown in section 2.4, to provide a straightforward and general definition of environmental justice is challenging. Some critics have even argued that EJ, for being too much, ends up being nothing at all (as explained by Schlosberg (2007)). Hence to understand how Lisbon's urban greening strategies relate to such a concept is challenging. Nonetheless, based on the literature review described in section 2.4, I put forward the following definition of environmental justice in relation to urban greening strategies:

The idea that urban greening strategies should contribute as much as possible to: i) providing even access to the benefits of green space through a just distribution and by reducing other barriers; and ii) seeking the active involvement and recognition of those affected in the decision-making process.

This definition is based on the distinction between substantive and procedural aspects (Agyeman et al. 2002; see section 2.4.i) which is used in order to address the different dimensions of environmental justice. As such, this research is concerned with the strategies in itself, as well as the outcomes these produce, or foresee to produce: the procedure as well as the substance. The substance is related to providing even access to the green space and the benefits that can be

enjoyed directly when using or visiting the green space. Access depends both on green space availability, related to the distribution of green space in the city, and on other barriers preventing access (see section 2.4.ii). Therefore I distinguish between 'distributional' aspects and 'qualitative' aspects of access – the former is related to the physical distribution of green space, whereas the latter relates to the qualities of the green space which can either prevent or promote the use of the space. The procedure regards the way that those affected by the urban greening strategies are involved or not in the decision-making process and the way their needs are recognized by the decision-makers (see figure 3.7).

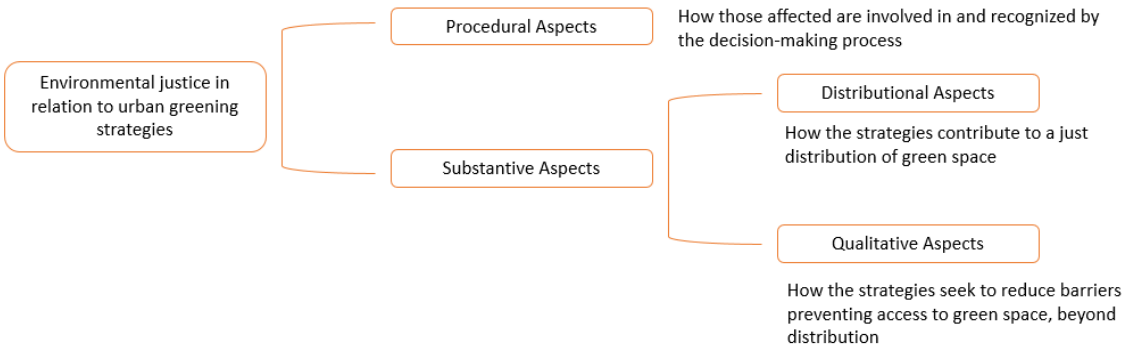

Figure 3.7. Graphic visualization of the conceptualization of environmental justice in relation to urban greening strategies, used for the purpose of this research. Own illustration partly based on Agyeman et al. (2002).

The data I collected was analyzed based on this conceptualization of environmental justice. The different aspects were used in order to code the collected data. In the first step of the data analysis, I applied 'open coding' (Silverman 2014) by highlighting and categorizing any aspect of the data that relates to my research topic. Then I applied 'focused coding', as I categorized these parts of the data based on three aspects shown in figure 3.7: procedural, distributional and qualitative. Examples of codes used are shown in table 3.4 – the list is not exhaustive, but rather shows the main and most prominent codes that I used. I applied the same analytical process to the data collected through desk-research, interviews and field observations. Nonetheless, due to the different nature of the data the process unfolded differently. The data found in the documents was often rather straightforward: for example, the project for the green corridor of *Vale de Alcântara* contains distributional aspects, as it foresees to improve physical access to Green Infrastructure in neighborhoods which are currently somehow isolated. It also contains qualitative aspects, as the project addresses the implementation of equipment destined for specific age groups, e.g. a skate park for youngsters. In case of the interviews, one piece of data would often relate to different aspects simultaneously, which allowed me to understand the relations between the different aspects. Field notes taken during the observations were also coded and categorized, however the observations provided data mainly regarding the qualitative aspects of green space, being this the main objective of this research method.

Open Coding	Focused Coding
New green spaces	Distributional aspects
Rehabilitation	
Lack of green space	
Distance to green space	
Access paths	
Ecological function	Qualitative aspects
Social function	
Ecosystem services	
Equipment	
Play / sports	
Reduced mobility	
Participatory budgeting	Procedural aspects
Democratic	
Residents	
Top-down	
Bottom-up	

Table 3.4. Examples of 'open codes' in relation to 'focused codes'.

Some excerpts from the interviews were used in chapter 4 in order to emphasize or highlight specific findings. These excerpts were chosen based on the fact that these most clearly indicate how the Lisbon city council works with the three aspects of EJ. Hence these excerpts are not the only relevant excerpts from the interviews, but instead those that best support the findings that were induced from the interviews.

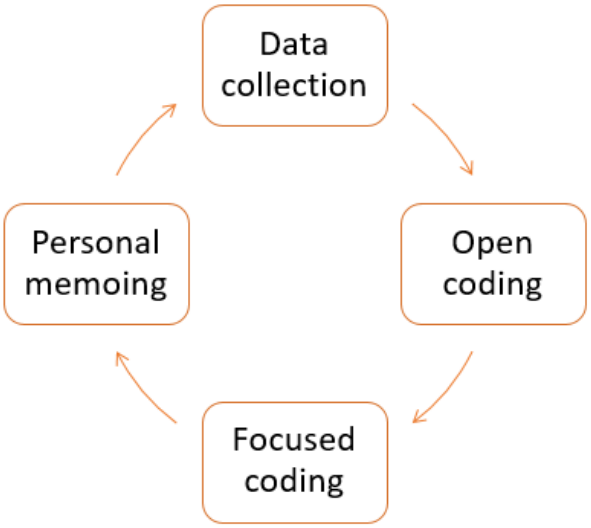

Figure 3. 8. Graphic visualization of the ongoing analytical process. Own illustration.

Analysis of qualitative data is an ongoing process requiring continuous examination and re-examination (Silverman 2014). The process of analysis was done as I collected data, meaning I analyzed the data from the desk-research, which I then used to produce the interview guides. The data from the interviews was analyzed and used to, first, return to the desk-research and, second, to conduct the field observations. Throughout the process I created personal memo's in order to keep track of the analysis and to highlight possible relevant outcomes (see figure 3.8). Through this process I identified how the different urban greening strategies developed by Lisbon city council relate to procedural, distributional and qualitative aspects, allowing me to gain understanding of how these strategies contribute to ensuring that everyone can access the benefits provided by urban green spaces (research question 1) and to what extent these strategies reflect concerns related to environmental justice (research question 2). The following chapter provides a description and analysis of the results of this process.

3.7 Subjectivity and other ethical considerations.

Important to recognize is the fact that collecting data through field observations necessarily entails a 'filtering process' (Silverman 2014) – the researcher decides what information is relevant enough to be included in the analysis and what information can be left out. In fact I understand that any research method necessarily implies some type of filtering and personal bias. Likewise, it becomes particularly important to address my own bias and subjectivity in this process. Here I reflect on my personal position in order to clarify how this may have influenced the research results.

After having lived many years abroad, I moved back to Lisbon when starting this research project, to become, again, a "Lisboeta" (a resident of Lisbon). Living my daily life in this city, I have, of course, not remained neutral towards the challenges that this rapidly transforming city is facing. Major changes have happened during the last years, and I see many of them to be positive: investment in public transport after years of austerity, the creation of new green spaces, the rehabilitation of many abandoned buildings and squares and the rehabilitation of the *Tejo* waterfront, just to name a few.

However, I also see the many issues that are persisting, and the failure of the city council's plans and policies in addressing these issues. In particular, the city council has been highly criticized from a social justice perspective, due to its controversial policies regarding housing and rehabilitation of the historic center. The incentives given by the city council to private investors willing to recuperate old and abandoned buildings, together with an exploding tourism industry and a housing market subjected to a system of global finance, have led to major gentrification-related issues (Mendes 2017). The city council has received critiques from researchers and different organizations, for not doing enough to ensure affordable housing for its residents (Mendes 2016). In my view, the city council is a political actor that seeks to combine, on the one hand, the desire to improve the quality of life of its citizens; but *also*, on the other hand, the aim to create a city that attracts investors, tourists, economic growth and large businesses. From my perspective, a city council should not consider its city a resource that can be used to promote economic growth: the city is, first and foremost, a place where people live their daily lives. The role of any urban government should, therefore, be to support its residents by designing, planning and managing the city in *their* interest: through an efficient public transport system, affordable housing and healthy living environments.

Having made my personal views clear, I also feel the need to address an issue raised by scholars in environmental justice: "A final problem is that researchers have tended to treat environmental justice communities as passive victims, robbing them of agency in engaging with these complex issues and working through solutions" (Byrne 2017, 444). As my research does not include any participatory methods, the research results present limitations in the sense that the voice of those that matter (i.e. more vulnerable social groups that may be disproportionately impacted by limited access to green space) are not included in my research. Hence, there is a risk of me, as a researcher, treating these social groups as 'passive victims', while bypassing what really matters to them.

4. RESULTS & ANALYSIS

4.1 Overview

This chapter contains a description of the relevant data collected during my research, as well as its analysis from an environmental justice (EJ) perspective. The next section provides an overview of the different urban greening strategies designed and implemented by Lisbon's city council This section aims to present the main results collected through the desk-research, complemented with relevant details provided by the interviewees. In section 4.3 I proceed to analyze this data from an environmental justice perspective, based on the analytical framework set out in section 3.6. Here I link the results to my own field observations, in order to make sense of how the urban greening strategies unfold in the city and how these impact life in the city. This section contains the bulk of the analysis, as well as its interpretation based on my own insights. Finally, section 4.5 provides a summary of the main findings of my research.

4.2 What are Lisbon's urban greening strategies?

i. The PDM and the system of green corridors

As the PDM is Lisbon's main planning instrument, this is where most of its urban greening strategies are outlined. According to the PDM, the two main objectives of the city council to develop Green Infrastructure are: 1) to improve access to urban green spaces, by increasing the availability of green space and by improving access points to the existing spaces; and 2) to adapt the existing green structure to climate change, including concerns related to heat waves, heavy rainfall and increased droughts (CML 2012a). Green Infrastructure is mainly developed based on the system of green corridors, being part of the *Estrutura Ecológica Municipal* (henceforth, EEM) [the municipal ecological network] (figure 4.1). The corridors cross the city in order to create ecological connections between different landscapes (see figure 4.2). This system is based on the work of landscape architect Gonçalo Ribeiro Telles, whom, in 1977, started working on the *Corredor Verde do Monsanto* (the green corridor of *Monsanto* – corridor A in figure 4.2) seeking to connect the 'grey' city with the 'green' forest. Currently the system comprises 9 corridors, connecting the *Monsanto* forest to the *Tejo* waterfront and different parts of the city. The corridors are intended to be fully implemented by 2022. At the moment, the corridor of *Vale de Alcântara* is being constructed (corridor G in figure 4.2), being this the city council's main green space project for 2019.

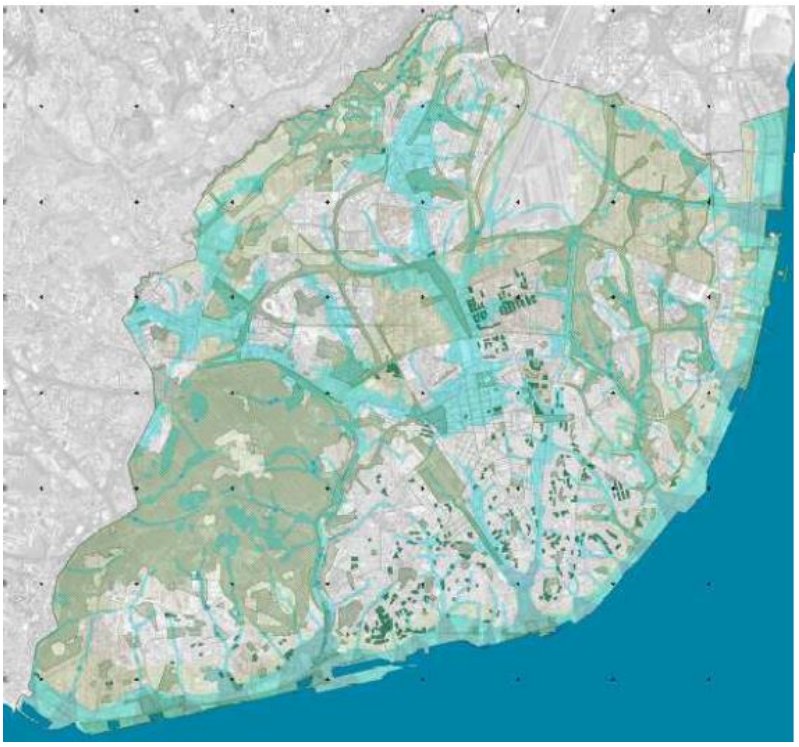

Figure 4.1. Lisbon's ecological network showing the green corridors together with the city's subterranean water flows. Map facing north. Scale approximately 1: 2 000. Source: CML (2012a).

The green corridors integrate the concept of GI and address the challenges posed by climate change. Interviewee B stated that while creating the corridors, the city council aims to adapt the green spaces to climate change, taking into account the specific ecological elements of each corridor, such as valleys or the *Tejo* waterfront. Interviewee A argued that 'everyone can make green spaces', but the challenge is to create spaces taking into account long-term challenges in terms of maintenance and management, bringing up the example of irrigation.

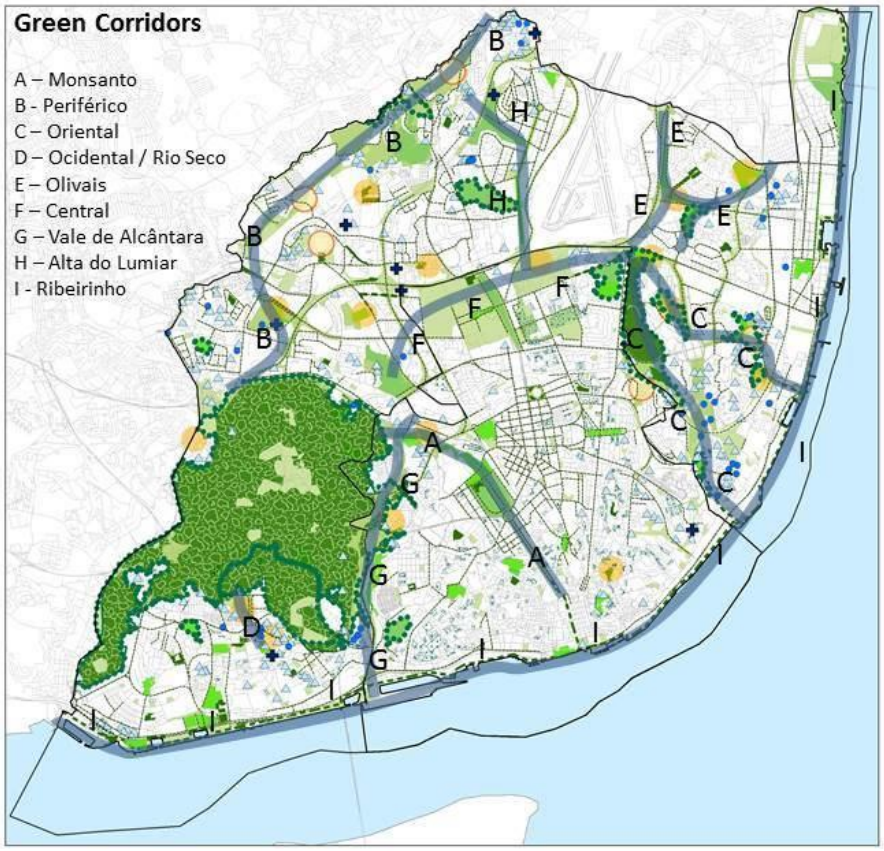

Figure 4.2. Lisbon's 9 green corridors as proposed by the 2012 master plan. Work is underway to complete the corridors until 2022. Map facing north. Scale approximately 1: 2 000. Source: CML (2017a).

Lisbon's urban green space is dominated by the *Monsanto* urban forest (figure 4.3), located in the south-west of its territory. It has a size of around 1000ha., due to which it plays an important role in the functioning of Lisbon's ecosystem. It is managed and protected separately from Lisbon's remaining GI, however the strategies actively seek to connect green spaces to the urban forest (CML 2012a). For instance, the first green corridor to be completed in Lisbon was the *Corredor verde do Monsanto*, going from central Lisbon to the entrance of the *Monsanto* forest. The spaces are connected through cycle and pedestrian paths, which run through a number of green spaces (see figure 4.4).

Figure 4.3. Entrance to the urban forest of *Monsanto*. Source: own photo.

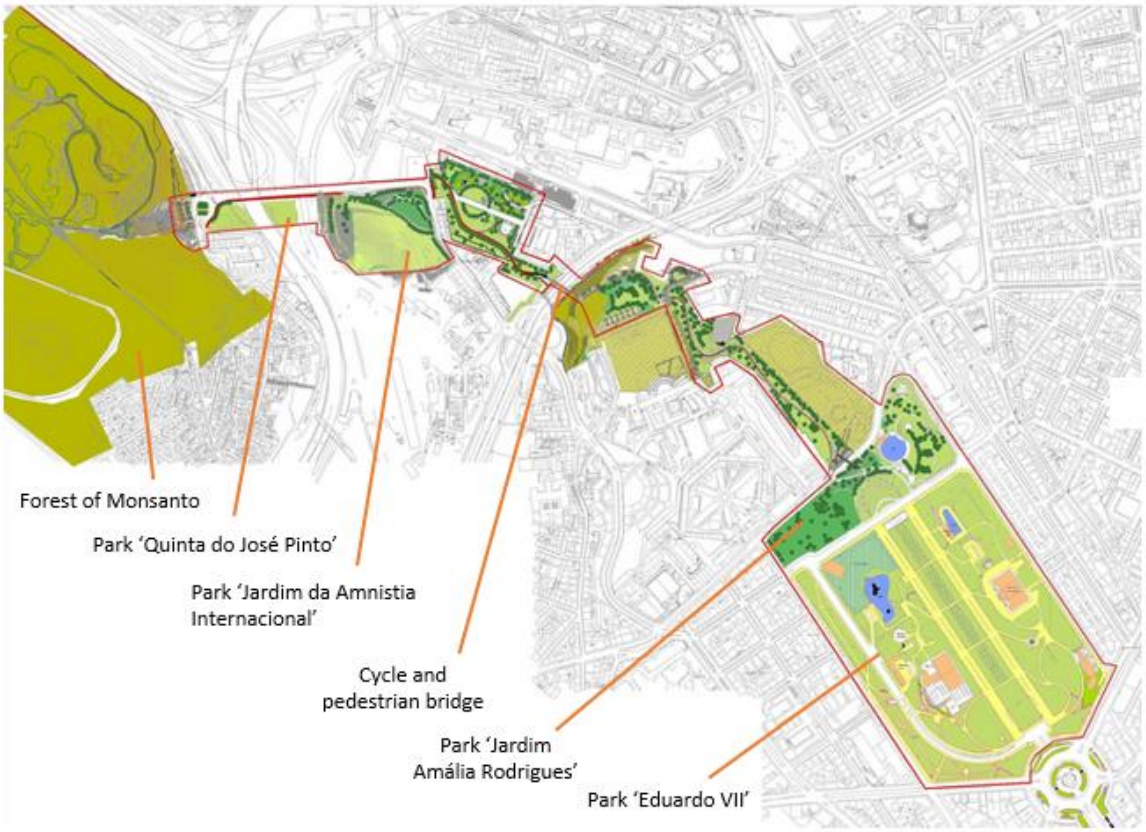

Figure 4.4. The green corridor of *Monsanto*, the first corridor to be fully implemented. Map facing north. Scale approximately 1: 200. Source: CML (2019) and own additions.

Figure 4.5. The *Monsanto* corridor linking downtown Lisbon to the *Monsanto* forest. From left to right: *Park Eduardo VII*; a cycle and pedestrian bridge made to ensure continuity of the corridor; a cycle and pedestrian path follows the corridor. Under: the corridor leads to the *Monsanto* forest, in the background. Source: own photos.

As said, a main objective of building the corridors is to integrate climate change adaptation measures, both through adapting the green spaces to climate change (e.g. in the selection of the type of vegetation) and by using the green spaces to develop nature-based solutions, such as rainwater detention, promotion of biodiversity and reduction of the urban heat-island effect (CML 2012a). Based on the interviews, I understood the interviewees to be fairly positive about the system of green corridors and how this is improving environmental quality in the city. Interviewee A and C (both landscape architects) demonstrated an expertise understanding of GI. Interviewee A described the ecological elements as being part of the urban environment and stressed the need to integrate these elements into spatial planning and urban development (see quote 1 and 2).

Interviewee A: "Today it is well-known, the idea that cities have to live in articulation with their natural system. We could argue that it's only a matter of indicators, and we would have, for example, a very compact city and then a gigantic urban park outside, and we would tell people that, if you would calculate the average, the issue would be solved. But we have abandoned these ideas, because what matters is having nature at your front door."

Quote 1.

Interviewee A: "Because we have already understood that having a compact, artificial city and having the country side around it, doesn't work. Because the river enters the city, the valley exists. (…) If the valley is badly built, it will flood."

Quote 2.

Interviewee A also stressed that Lisbon's ecological network (the EEM) represents the ecologically most sensitive areas of its territory, due to the many ecological functions that these areas support. I understood the interviewee to be very positive about the fact that the city council integrated this network as such in its land-use policies (through the 2012 PDM), as this shows it is prioritizing Lisbon's ecological system. Furthermore, interviewee C noted that not all elements of the EEM are necessarily 'green', as other elements can also contribute to the ecological network. For example, some parts are constituted by railways, road infrastructure or built areas. According to the interviewee, this is due to the city council having a "comprehensive understanding of what we call ecological structure". I understood that for the city council, the ecological structure is not necessarily about green spaces, but about safeguarding the ecological functions and connections that exist within these areas.

The PDM as well as the interviewees highlighted the importance of the green corridors in promoting active forms of travel or 'soft mobility' (i.e. by foot or by bike). Through the corridors, the city council aims to create a connected system of pathways and cycle paths. As such, I understood that the system of green corridors is highly connected with the city council's plans for mobility, and that this system can serve other purposes besides creating green spaces. Likewise, public green spaces are just one element of the system of green corridors.

ii. Other relevant planning documents

In order to complement the PDM, the city council elaborates strategic documents to further develop specific themes or strategies. Two of these are relevant for the purpose of this research: the first one is the '*Plano de Ação Local para a Biodiversidade 2020*' [Plan for Local Action for Biodiversity 2020]. This plan was elaborated in 2015 together with several research institutes, and, although it does not have executive force like the PDM, it does roll out plans and policies regarding GI and the provision of ecosystem services (CML 2015a). Furthermore, in 2017 the '*Estratégia Municipal de Adaptação às Alterações Climáticas*' (EMAAC) [Municipal strategy for climate change adaptation] was published (see figure 4.6), providing an implementation plan for the projected climate change adaptation strategies. GI and urban greening strategies are present throughout different sections of the strategy (CML 2017b).

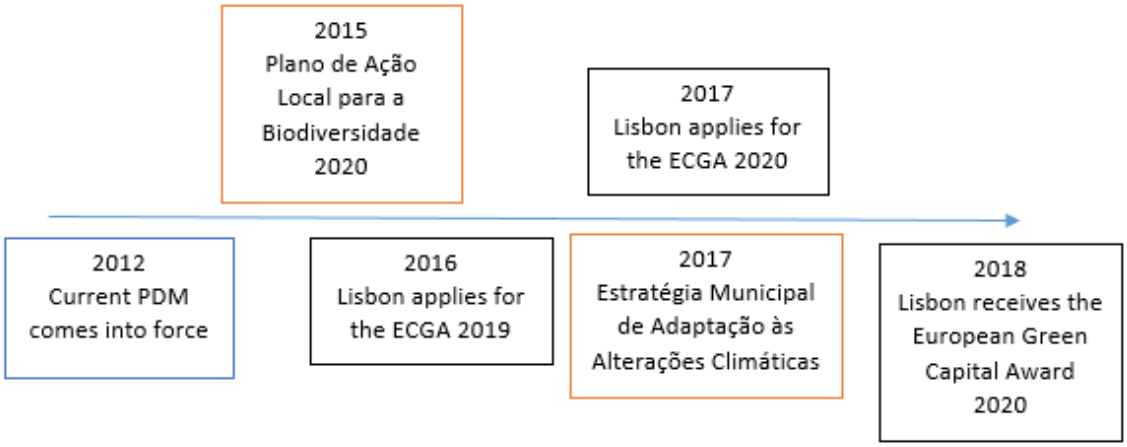

Figure 4.6. Timeline showing the sequence of the different planning documents in relation to the ECGA. Source: own visualization.

The plan for Biodiversity 2020 states as overall objective to increase Lisbon's level of biodiversity by 20% up to 2020, and includes three lines of action that seek to address the importance of biodiversity for the city's ecological functioning: 1) increase awareness; 2) create knowledge and 3) improve GI. The latter includes several goals, such as increasing the level of GI in the city, ensuring the continuity and connectivity between green spaces, improving the quality and quantity of ecosystem services and ensuring the creation and management of green spaces as to promote biodiversity (for example, through maintaining an integrated ecological system and by increasing levels of permeability) (CML 2015a).

After studying this document, I understood it is mainly concerned with the ecological function of GI, as this is directly related to improving levels of biodiversity. Hence it pays less attention to its social function. As the strategies address ways to improve the ecological functioning and quality of Lisbon's GI, it only occasionally mentions how people can make use of the green structure. Nonetheless, the use of public green spaces for leisure and recreation is acknowledged as an ecosystem service (CML 2015a, 9), and the measurement of this ES is based on a system of areas of influence (see section 4.4.ii). I understand that, implicitly, high quality GI serves Lisbon's population

in many ways, by mitigating the effect of climate change, decreasing risks of flooding and contributing to a healthier living environment. Explicitly, this strategy does not address the public use of green space beyond a number of general definitions.

The municipal strategy for climate change adaptation addresses green spaces by recognizing the need to adapt the green structure to climatic changes, including measures related to storm water management, resilience towards high temperatures and drought, reduction of the heat-island effect and a more efficient use of water (CML 2017b). From studying this document, I identified the important role given to GI, by constituting a main adaptation measure - both in terms of designing the urban landscape and in terms of adapting the management and maintenance of green spaces.

Besides, the document addresses the fact that some groups in society are more vulnerable towards climate change, in particular elderly and people with less economic resources, for not being able to protect themselves from, for example, heat waves or other extreme weather events (CML 2017b, 68). This aspect of the strategy is important from an environmental justice perspective, as it acknowledges that some social groups will be better equipped for climate change, whereas others require additional support. However, this acknowledgement does not translate into any specific measure, as none targets vulnerable groups in particular. The strategy provides a general plan for the whole municipality, therefore not addressing specific areas or social groups.

4.3 Analyzing Lisbon's urban greening strategies from an environmental justice perspective

Recalling the definition given in section 3.6, for the purpose of this research environmental justice is: 'the idea that urban greening strategies should contribute as much as possible to: i) providing even access to the benefits of green space through a just distribution and by reducing other barriers; and ii) seeking the active involvement and recognition of those affected in the decision-making process'. From analyzing the strategies, as well as from the data collected through the interviews, I noticed that the term 'justice' is never explicitly mentioned or referred to in relation to urban greening strategies. However, the strategies do recognize the relation between access to green space and environmental quality. Also, I identified that the strategies seek to ensure that everyone can access green space and the related benefits. This issue was also raised several times by interviewees. The following sections develop this by describing in particular the procedural, distributional and qualitative aspects of Lisbon's urban greening strategies.

i. Procedural aspects

Within the Lisbon city council, a large number of departments and divisions cooperate to develop and implement urban greening strategies, from city scale to the design of specific projects. Once the decision for a new green space or GI has been taken (based on the PDM), a project is created in order to define the design and quality of the landscape, the infrastructure and its equipment. Most projects are elaborated by landscape architects working at the municipal department for green structure (like interviewee D), although some are createdby external parties or other municipal departments (e.g. in relation to public space or sustainable mobility). In general these projects are

developed and implemented by a large number of different civil servants, although deriving from a central political program (see quote 3) guided by the councilor responsible for green structure and, in some cases, the Mayor.

Interviewee C: "When a project for a space, for a garden, is elaborated, is it based on a program which is already defined. It's defined technically, and it is approved democratically, by the Municipal Assembly, and the project needs to obey the program. This is also a democratic and just way of working. Because the people can be heard by the Assembly."

Quote 3[8].

The interviewees confirmed that no formal processes of public participation or consultation exist within this framework. The decisions about what an urban green space should be and how it should look like are mainly taken by landscape architects, in cooperation with city architects and engineers. Nonetheless, the interviewees did state that an ongoing conversation exists between the city council and different local actors, for example civil parishes[9] (see quote 4) or the public housing organization, whom may bring up issues related to safety or the lack of certain types of equipment – these can then be considered in projecting a new or rehabilitated green space.

Interviewee C: "It can even derive from a request by a civil parish, saying that what we really need is a playground"

Quote 4

Nevertheless, I understood that the process of planning, designing and implementing Lisbon's GI is a process owned by civil servants, based on their expertise knowledge. This knowledge is mainly related to the vital role of GI within the context of climate change adaptation, which is addressed many times, both within the strategies as by the interviewees.

An exception to this is the process of participatory budgeting[10] promoted by the city council as well as by a number of Lisbon's civil parishes. Through this process, any citizen can submit an idea or a project, which, once approved by the local authorities, can be voted for by Lisbon's residents. The project with the most votes wins, and is implemented. Through this process, several projects for green spaces have been submitted and approved, such as the project for a garden in Penha de França (*Jardim do Caracol da Penha*, see figure 4.7) – a dense neighborhood in the historic part of the city, which lacks adequate public green spaces. The project received the most votes ever in the history of Lisbon's participatory budget, and is intended to be concluded by the summer of 2020.

[8] Each Portuguese municipality has its own assembly (*Assembleia Municipal*) which approves and controls the work by the city council (*Câmara Municipal*).
[9] Portuguese municipalities are sub-divided into civil parishes, which function on a smaller scale. Both the municipality and the parish are governed by a democratically-elected body.
[10] In Portuguese: 'orçamento participativo'.

Figure 4.7. Preliminary project for the *Jardim do Caracol da Penha*. Source: Movimento pelo Jardim do Caracol da Penha (2016).

Last year, a participatory budget project was submitted for an urban park in the parish of Marvila, located in the eastern part of the city and known for its large number of public housing. Although its territory includes a lot of vacant land covered with green vegetation, the parish has one of the lowest level of equipped public green space in the municipality. The project sought to rehabilitate a part of this vacant land (see figure 4.8) in order to construct a public green space with adequate infrastructure. As the project gained participatory budgeting, a conflict of interest arose between the local population and the city council, as the latter had already planned the construction of new housing on this land. As I spoke to one of the architects involved in the project on behalf of the local community, I understood that, despite this conflict of interest, the city council had been very positive and supportive towards the project. In fact, the Mayor as well as some councilors publicly announced that the request by the residents will be attended and that the park will be created – although at the time of speaking to the architect, it was not yet entirely clear to what extent this would impact the plans for new housing. The architect understood her role to be mainly about ensuring a continuous public participation in the process. Therefore, she stressed the importance of a meeting to be held between the city council and the local community, in order to discuss what type of park the local community needs, what their preferences are and how this park should look like.

Figure 4.8. Intended location of Marvila's future urban park, as requested by the local population. Currently the area consists mainly of abandoned open space. Source: own photos.

These projects based on participatory budgeting are, however, rather an exception than the norm, while their impact on Lisbon's GI is fairly limited. In general, projects for new green spaces are not participated, leaving it up to 'the expert' to plan and implement Lisbon's GI. I have not identified any formal ways of ensuring that different social groups are involved in the design and implementation of urban greening strategies. The strategies derive from a top-down vision, resulting from an (assumed) expertise understanding of GI, instead of public debates or public consultation. Through the interviews, it became clear that all interviewees understood themselves as having a role in safeguarding and improving Lisbon's living environment. Lisbon's urban greening strategies are believed to play an important role in this, as it is assumed that the new green spaces that are created are serving the interests of Lisbon's residents (see quote 5).

Interviewee A: "So I think, yes, I think we are making spaces that people are interested in, yes."

Quote 5

ii. Distributional aspects

Based on the research results, I understood that the strategies explicitly aim to contribute to a more even distribution of green space across the city. This is mainly done by expanding GI and creating new green spaces. Based on the desk-research as well as the interviews, I clearly recognized that the strategies address the uneven distribution of green space among Lisbon's residents and seek to enhance this situation (see quote 6 and 7).

Interviewee A: "What has prevented people from using green spaces is what we have identified, that there are several areas in Lisbon, and I am highlighting, for example, some areas of Benfica and Lumiar, where access to green structure is still very limited. Meaning, we don't have any main green structure, the urban parks are far away and smaller parks don't exist. And so, that is the main problem. A person has to use some type of transport, whatever it is, to reach a space. When we make the connection and create the green corridors…. I think it will be a first step."

Quote 6

Interviewee B: "And indeed, we understand that based on the area of influence, on the one hand there is a great contrast between the eastern area and the western area [of the city], and on the other hand there is a lack [of green space] in the more central and historical areas."

Quote 7

In 2015 a report[11] was produced by the city council, seeking to monitor the implementation of the 2012 PDM. Among other things, it includes an analysis of the implementation of the urban greening strategies as proposed by the PDM (CML 2016). The report analyzes the distribution of the area of influence[12] of Lisbon's green spaces – a green space has an X area of influence (in meters) based on its size. This is done in order to calculate what share of Lisbon's residents is 'served' by green spaces of different sizes: people living within a green space's area of influence are 'served' by the green

[11] *Relatório do Estado do Ordenamento do Território* (REOT).

[12] In Portuguese: 'raio de influência'.

space (see quote 8). Hence, this analysis regarding 'who is served' by green spaces only includes the size of the different parks, and the distance at which people live from these parks (see figure 4.9).

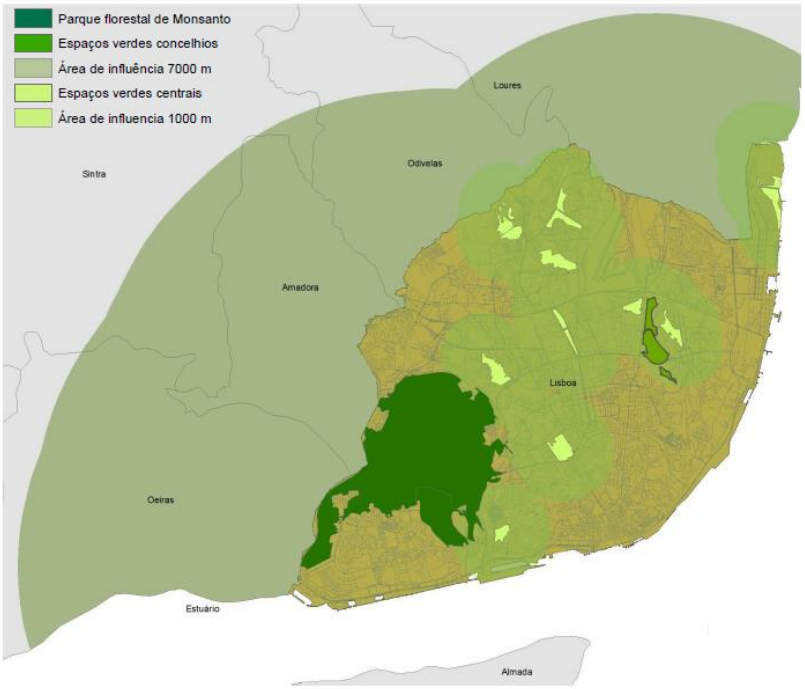

Figure 4.9. Areas of influence of Lisbon's green spaces. Smaller parks are indicated by light green, which are surrounded by an area of influence distancing 1000m. The *Monsanto* forest and the Park of *Bela Vista* (in the east) have a larger area of influence (light grey) that trespasses the municipality's borders. Map facing north. Scale approximately 1: 3 000. Source: CML (2016).

Interviewee C: "In this case, we understand green space as a service. There are previous studies on which this is based, which allow to create a relation between the size, the number of people that visit the space and the distance they are prepared to travel. So this creates an offset, meaning that the people that visit Monsanto…. There are more people visiting Monsanto that the '*Quinta da Nossa Senhora da Paz*', for example."

Quote 8

Based on this spatial analysis, the report states that virtually Lisbon's entire population (94-96%) is served by large urban parks (including the *Monsanto* forest), but less than 50% (47 – 49%) of the population is served by smaller green spaces (see figure 4.10). The study acknowledges this as a shortfall, and argues that this is mainly due to the impossibility of creating new green spaces in the dense inner city. As a solution, the report states that public space in these areas should contain a high level of vegetation to compensate for the lack of green space per se (CML 2016, 43). It also affirms that the development of the green corridors has the potential to improve these figures.

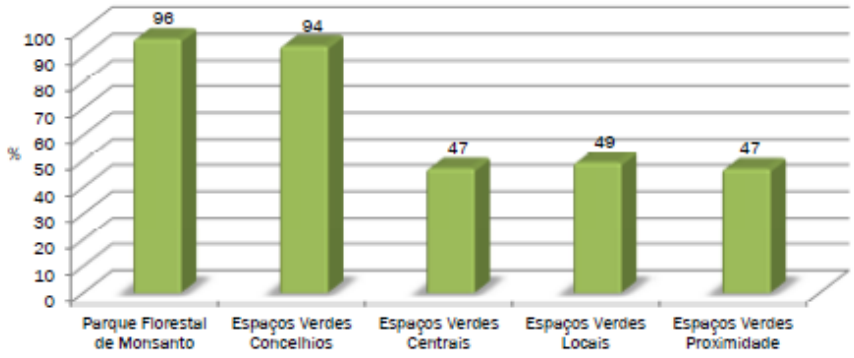

Figure 4.10. Graph indicating the percentage of the population served by green spaces categorized by size. Between 47% and 49% of the population is served by 'central green spaces', 'local green spaces' and 'neighborhood parks'. Source: CML (2016).

The report furthermore includes a calculation of the percentage of Lisbon residents living within a range of 300m of a green space[13]. It states that in 2015, 75% of the Lisbon population lived within this range, but, once all green spaces proposed by the 2012 PDM are implemented, this figure will have risen to 89% (CML 2016, 46) (see figure 4.11). This percentage was emphasized by the European Commission when awarding Lisbon as European Green Capital 2020 (European Commission 2018) and was brought up during the interviews (see quote 9).

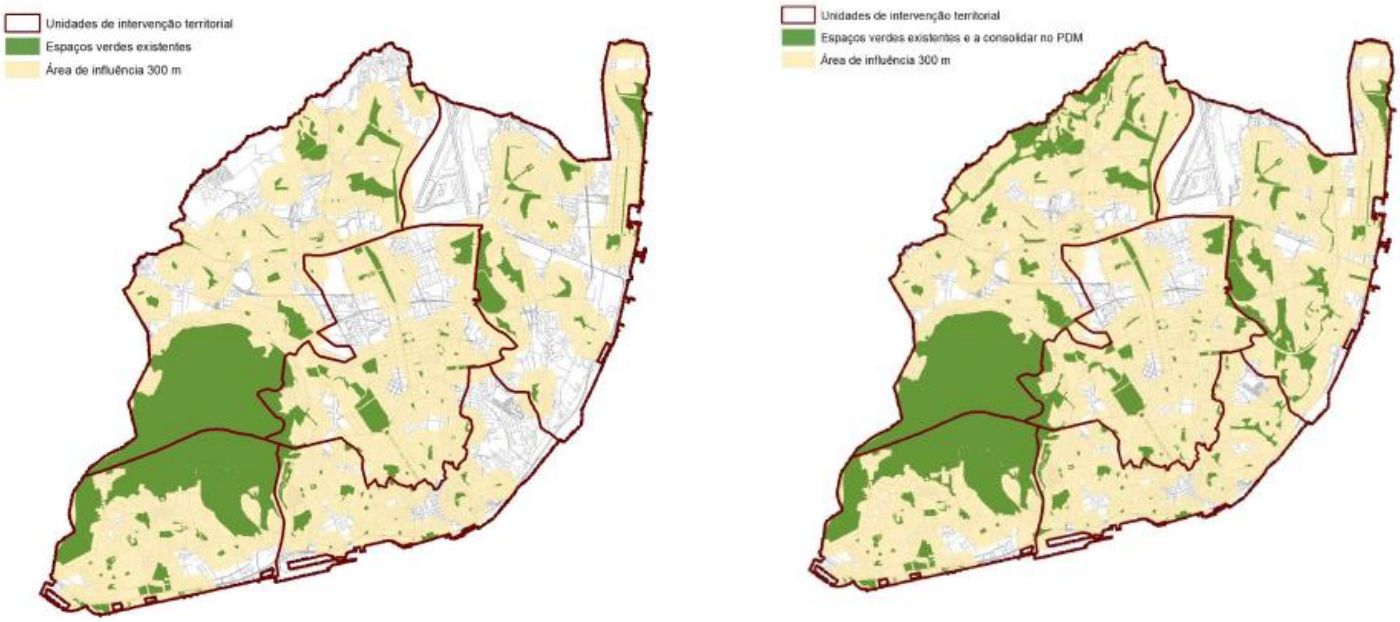

Figure 4.11. Areas of Lisbon within a 300m distance from a green space. The red borders represent the city's areas (north, center, east, west and historic center). The green patches are the green spaces. The orange color represents the area of Lisbon within a range of 300m of a green space. The map on the left is based on data from 2014; the map on the right shows the same situation once all green spaces proposed by the PDM are implemented. Maps facing north. Scale approximately 1: 3 000. Source: CML (2016).

[13] The '300m' threshold is used as a planning guideline by many cities (see Kabisch et al. (2016)) and endorsed by the European Commission (European Commission 2018).

Interviewee A: “In the end the idea is to create a buffer of 300m, which allows at least 90% of the people living in Lisbon to be at this distance of the GI. There will always be a minor part of the population that cannot be at this distance."

Quote 9

Interviewees A, B and C stressed the role of the system of green corridors in creating green spaces in close proximity to where people live, while also highlighting that with the pathways and cycle paths that run through the corridors, one can easily move around the city and enjoy the environmental quality of the corridors (see 10 and 11). Even if one does not live near a green space itself, most people will live at a 300m distance from this infrastructure, through which green spaces will be easily accessible.

Interviewee A: “When a small neighborhood park (…) becomes connected to another and another and another, and one can go, without interruption, running, by bike or whatever, and suddenly you are in Monsanto, which is something that is already happening at Avenidas Novas and Duque d’Ávila (…) And that is a thrill, not only psychologically but also physically”.

Quote 10

Interviewee B: “Cycle paths, pedestrian spaces, and so, this would allow to create a GI, actually we have already tested two possibilities, an occidental corridor and an oriental corridor, which would then come together in the northern part, which would allow, basically, for all Lisbon residents, or at least the very large majority, to live less than 300m away, so a distance that can be crossed by foot, from this infrastructure. In the end, this would create a continuous connection, with the green spaces, and with the waterfront, through the city. This is another ambition we have, it’s a work in progress, to be developed.”

Quote 11

This analysis, however, raises several questions as it only takes into account spatial distribution and physical distances. If 90% of the population will live in close proximity to a green space, 10% will not. From an EJ perspective, it becomes relevant to understand who these 10% are, where they live and what their demographics are. The maps in figure 4.11 do not provide clear indications, however the interviewees have brought up that mainly the historic center will continue to represent a lack of access to green space. At the same time, to state that everyone living at an X distance of a green space is ‘served’ by this space, is problematic for not acknowledging the diversity of Lisbon’s population: what works for some, does not necessarily work for all.

The analysis disregards whether or not the green spaces are what people need or desire, and whether there are other barriers preventing people from using this green space. A green space like *Alameda* (see figure 4.12) is composed mainly by a large field of grass in a very crowded and well-connected area of the inner city. The space fulfills several functions, as people often gather here for picnics and play activities. The space is also well-used by students from the nearby university. However, the green space does not meet the needs of people searching for tranquility, high levels of shade, diverse flora or a place to go running. Therefore, to say that people living within a 300m distance from *Alameda* have adequate access to green space is insufficient, as this space may not be what people need.

Figure 4.12. *Alameda* is a centrally-located open space composed by a stretch of grass aligned by trees. Source: own photos.

The interviewees stressed the importance of the different green spaces being connected to each other; as such, the *Alameda* is connected by a cycle path eventually leading to the corridor of *Monsanto* (see figure 4.13). Interviewee B explained that the aim is to also connect *Alameda* to the eastern corridor. This way, the two largest parks of the city (*Monsanto* and *Bela Vista*) will be connected. Hence, the perspective of the city council seems to be that, even though green spaces in the city center may not fulfill all functions, people can access other green spaces using the paths crossing through the green corridors. However, the strategies fail to address whether or not those 90% of the population will actually be able to do so.

Figure 4.13. The cycle path connecting *Alameda* to the corridor of *Monsanto*. Source: own photos.

Besides my own observations, many studies have stressed that physical distance to green space is not the only barrier preventing people from accessing green spaces: Kabisch & Haase (2014) emphasize the need to match the quality of the park with the needs of potential users, in terms of age and culture; O'Brien et al. (2017) have listed possible barriers preventing access to green space in Europe, ranging from legal barriers to safety issues and cultural norms; and Byrne (2017) describes how social practices can shape access to the benefits of green space. For example, as Lisbon's population is aging (CML 2016, 25), it is hard to imagine how elderly can use the cycle paths connecting different green spaces. In fact, cycling is not part of Portuguese culture the way it is in some other countries; for many people cycling is not an obvious way to move around in the city. Despite the many positive effects of promoting cycling in the city, this only works for a part of the population.

Both the REOT report as the interviewees argue that the system of green corridors is improving access to green space in Lisbon, as it will result in 90% of the residents living within a 300m distance of this GI (see also quote 12). Likewise, the understanding is that the large majority will have the possibility of enjoying the benefits of urban green space. However, and without neglecting the positive effects of creating an integrated GI, I argue that taking improved access for granted is problematic, as the analysis of the REOT report does not include data about any other aspect besides physical distance. It does not address the qualities and characteristics of the green space, and how these may serve some people better than others. Some social groups may experience additional barriers, due to their age, culture, physical ability or gender. Issues related to safety, maintenance or accessibility may prevent people from visiting green spaces, even when living within a 300m distance – I will elaborate on this in the next section.

Interviewee B: "studies like the '*Relatório de Estado do Ordenamento do Território*' (REOT) show us that there are significant asymmetries in terms of green coverage in the city. And what is also important to understand through the REOT, is whether these asymmetries are softened or not, when the plans we made are materialized. And, well, we clearly understand that indeed this is softened."

Quote 12

iii. Qualitative aspects

Previous studies have concluded that physical distance is not the only factor determining access to green space: the qualities of a green space are equally important for people to frequently enjoy its benefits. Based on my desk-research, I understood that the strategies and green space projects particularly address the type of ecosystem services that can be provided by the GI. For instance, the project for *Parque da Ameixoeira* includes an analysis of how the park can be used to retain rainwater in order to reduce the risk of flooding in the adjacent area, while the project for *Quinta da Montanha* addresses how the type of trees selected will help to create increased shade and reduce noise pollution. Another important aspect is the role of green spaces in reducing the UHI effect (see quote 13). As such, there is awareness of how the design of the landscape can support the quantity and quality of ecosystem services.

Interviewee A: "This issue of temperature in Lisbon is crucial, as we are doing some studies and we realized there is a direct relation between heat areas and mortality. And that moreover there is a tendency of this affecting disadvantaged groups, elderly people, people with chronicle diseases, people that live alone. People face an incredible level of vulnerability when it comes to heat waves."

Quote 13

However, I was unable to identify how the projects ensure that different social groups are able to access the green space, taking into account their specific needs and possible limitations. Almost none of the projects specifically addresses *who* will be using the green space and *what* these users are looking for. The interviewees did address this by distinguishing between 'ecological function' and 'social function' – according to interviewee A, different parks have different functions and this is taken into account in the planning process. Interviewee B confirmed this by stating that the type of human activity that is expected to take place in the area is taken into account (see also quote 14). Interviewee B and C both brought up how age and gender influence the use of green spaces: youngsters actively use parks to have lunch and 'hang'; old men often spend hours in gardens and parks playing cards. Interviewee C highlighted that often older women do not have the habit of going out alone and spend time in green spaces: "this is a cultural thing".

Interviewee B: "And many times it is the existing spaces that are transformed and we create new types of equipment. For example, with an ageing population the idea came up to create outdoor gyms – also democratizing the access to physical activity in the parks."

Quote 14

Currently the green corridor of Vale de Alcântara is being constructed in the western part of the city. The corridor plays an important role in the municipal ecological network by connecting the corridor of *Monsanto* to the *Tejo* waterfront. One of the objectives of the city council is to reduce the physical isolation of some of the neighborhoods located in the valley by improving connections by foot and by bike (CML 2015b) (see quote 15). The project for the corridor foresees the creation of pedestrian and cycle paths and a segregated bus corridor, and will include several public parks and gardens with facilities such as playgrounds, sport equipment, benches and public toilets.

Interviewee A: “If we think of the case of *Vale de Alcântara*, we are making a structure which connects neighborhoods that, today, are stuck. You can’t get out of there. And we, by creating green on that side [of the city] people will be able to pass through it and (…) people will go running, and come back, and they are no longer stuck. Before, people would get to the railway and would have to go back….”

Quote 15

From an environmental justice perspective it is relevant to understand who are the people living in the adjacent neighborhoods, and what *their* preferences and needs are – not only in terms of green space, but also in terms of mobility (again considering that not everyone may be well-served by pedestrian and cycle paths). Although the interviewees seemed to believe that the corridor will have a positive impact on these areas, I did not find any evidence of this project actively seeking to involve the local residents. This is problematic, as Wolch et al. (2014) have argued that the challenge in relation to urban greening is to make cities ‘just green enough’, while being shaped by community concerns instead of conventional knowledge on urban design and ecological restoration. Based on this, the corridor of *Alcântara* risks being classified as a large emblematic project that supports the image of Lisbon as a ‘green’ city, without explicitly addressing the needs of the local population in terms of access to green space– possibly resulting in paradoxical outcomes.

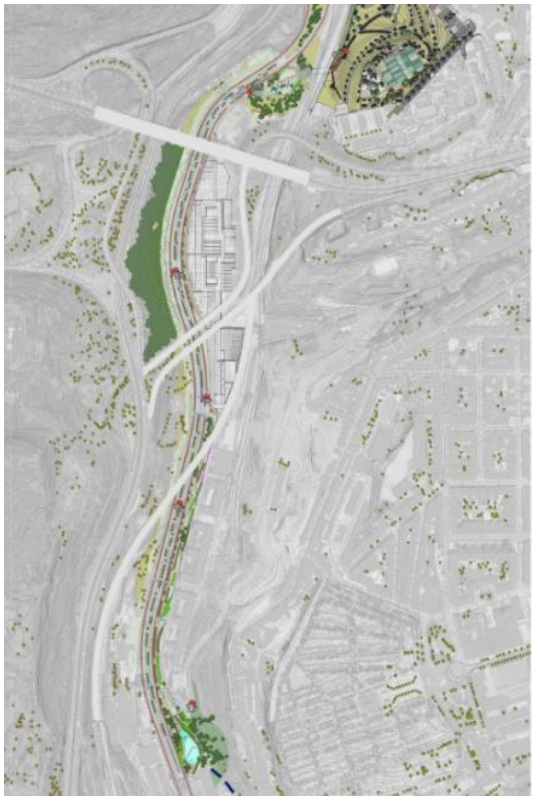

Figure 4.14. Project for the green corridor of *Vale de Alcântara*. Source: CML (2015b).

Figure 4.15. The corridor of *Vale de Alcântara*, still under construction. The corridor runs through a valley crossed by an historic aqueduct and aims to connect some isolated neighborhoods in this valley, by constructing cycle and pedestrian paths. Source: own photos.

One project for a recently developed green space *did* take into account a specific social group: the *Jardim da Cerca da Graça* addresses the potential use of the park by the ageing population living in the area. The park was specifically created to improve the availability of public green space in the historic center and serve the people living in this area (see quote 16). The park opened to the public in the summer of 2015, being developed on an abandoned lot belonging to the Convent of *Graça*. The project included a number of features and equipment. A viewpoint was projected particularly in order to serve the elderly population in the surrounding area, as, according to the responsible landscape architect, elderly often enjoy contemplation and observation in public space (Duarte 2011, 11). Furthermore, attention was given to the garden's exposure to sunlight and heat, mainly in the summer season. As such, tree shades and several water elements were included for their cooling effect. In this sense, the project provides a very inclusive understanding of the different uses and functions of the new green space (see figure 4.16).

Figure 4.16. General plan of the park of *Cerca da Graça*. Source: Duarte (2011).

Interviewee A: "And then we have critical zones in terms of access to green spaces, which is the historic center. What green spaces do we have in the historic center? Few. We made the *Cerca da Graça*, but the space has a massive load of users. People come from very far, but they go there because it is the only one [green space]."

Quote 16

Based on my field observations, I understood that the park is indeed well used by people from different age groups and different backgrounds. During weekdays the space is mainly used by people walking their dog or visiting the coffee place in the park. Many families as well as young adults use the space during weekends and on sunny afternoons (see figure 4.17). Activities include

picnics, sun bathing, reading, and play activities. I also noticed families with migrant backgrounds using the park for picnics and games. As the weather became warmer during my research period, the park also started to be used by young people in the evening time.

Figure 4.17. Families and young adults actively use the park of *Cerca da Graça*, especially during sunny weekends. Source: own photos.

However, considering the fact that the project acknowledges the elderly population as potential users, I was surprised to notice the absence of elderly people in the park during my frequent visits, at different days and different times of the day. Possibly this is related to the fact that access to the

park is somehow difficult, due to its location on a steep slope; although an access ramp exists at one of the entrances, the topography of the area may be a constraint for people with limited mobility (see figure 4.18). An additional access ramp is projected in the plan, however this has not yet been materialized. According to the interviewees, a second phase of the project is meant to be implemented soon, which should improve the conditions of physical access.

Figure 4.18. Access to the park of *Cerca da Graça* is mainly done by stairs, except for one access ramp. Sources: own photos.

Based on my field observations I understood that this park clearly fulfills the need of having a public green space in close proximity to people's home, considering the variety of users and type of uses. Studies have shown that the closer people live to a park, the more likely they are to frequently visit and use this space (see, for example, Santana et al. (2007) about use of green space in Lisbon's neighboring municipality Amadora). As *Cerca da Graça* is located in a dense area of the inner city with limited access to green space, this park enables the residents to more frequently enjoy the benefits provided by green spaces. However, the lack of elderly people using this space does raise questions: who is served by this park and who is not? Why are elderly people not frequently visiting this space? Are their specific needs effectively considered in the design and management of the park? The findings of this research stress how these concerns need to be reflected in urban greening strategies to ensure everyone can adequately access the benefits of green spaces.

4.4 Summary of main findings

During the last decade the Lisbon city council has been seeking to expand the city's GI, by creating new green spaces and intending to improve access to these spaces. Based on my research, I identified that the strategies explicitly address the uneven distribution of green space and the need to enhance its availability in some areas of the city. This objective was also emphasized by the interviewees, by referring several times to the uneven access to green space among Lisbon's population and by recognizing the need for this situation to be improved. In areas where creating new green spaces is not feasible due to the already consolidated urban fabric, cycle paths and pedestrian ways are supposed to lead people from one green space to another, while also improving physical access to the *Monsanto* forest and the *Tejo* waterfront.

Nonetheless, the strategies focus mainly on the distributional aspect of access, aiming to reduce the distance to green spaces. In this regard the analysis done by the city council (CML 2016) only includes quantitative data, i.e. physical distance and spatial distribution of green spaces. Hence does not address whether or not any other barriers are preventing people from accessing and using green spaces. I was unable to identify how the strategies seek to reduce other barriers preventing people from using green spaces, besides geographical distance. Also, I did not identify any concrete measures in order to recognize the specific needs and desires of different social groups or particular areas. Hence I understand this analysis to be insufficient from an environmental justice perspective.

The green corridors that are currently being developed focus on the benefits these can bring to Lisbon's population and the environment, however do not address possible limitations or pitfalls. Emphasis is put on the role of these corridors in terms of climate change adaptation and mitigation, neglecting to equally emphasize its public use. Hence the ecological function of the corridors is prioritized over its social function. New green spaces are designed based on the vision of landscape architects and other civil servants, resulting in emblematic projects with high-quality ecological functions. Likewise these projects do not engage with possible alternative visions about what green space is, what type of functions it should provide and what specific social groups should be considered in its design and implementation.

Due to the lack of public engagement, the risk exists that these strategies are bypassing the needs of more vulnerable or voiceless social groups. Strategies are focused on distributional aspects, lacking a more nuanced understanding of the different types and functions of green space and who its users are. As such, these spaces may not work adequately for everyone, therefore reducing their potential in contributing to environmental justice.

5. DISCUSSION

As described in chapter 1 and 2, urban greening strategies have often not addressed its justice implications, failing to recognize the socio-political processes that shape these strategies. This research aimed to describe and analyze Lisbon's urban greening strategies while particularly looking at how these relate to environmental justice. This chapter discusses its main findings in relation to its theory framework and to the wider context of urban planning in Lisbon. I relate my research results to literature on urban green spaces in relation to environmental justice, as I intend to contribute to this literature with insights from the case of Lisbon. I also describe the limitations of this research, in terms of its scope and its methodology, in order to provide some recommendations for future research.

As Schlosberg (2007) defined (see section 2.4.i), to achieve environmental justice goes beyond distributing environmental goods in a just way. People should have the possibility to access these goods, while recognizing that some people experience additional barriers and vulnerabilities. When addressing the issue of access to green space in the city, Lisbon's urban greening strategies are mainly concerned with the uneven distribution of green space. As Luz et al (2019) argue, this is important due to evident lack of green space availability in some parts of the city. However, from an EJ perspective the focus on distribution is insufficient, as uneven distribution may not be the only barrier preventing people from accessing green space.

The benefits that people derive from directly visiting and using urban green spaces can positively contribute to physical health and mental well-being. However, to what extent people have the ability to access green space is dependent on diverse social and cultural identities (Davoudi and Brooks 2016). Distribution and geographical distance is just one barrier preventing access (O'Brien et al. 2017; see section 2.4.ii). Hence green spaces should be designed to ensure access not only for healthy adults, but equally by elderly people, people with physical disabilities, ethnic minorities and families. Therefore, to include other aspects regarding access to green space is important – what I have called qualitative aspects. The difficulty with planning for qualitative aspects is that different people need and prefer different things: there is no 'one-size fits all' (Madureira et al. 2018). For example, Kabisch and Haase (2014) show how preferences differ among age groups in Berlin: whereas elderly enjoy tranquility, nature and benches for seating, younger groups prefer grass areas for sunbathing and play activities. The case of *Jardim da Cerca da Graça* provides an example of how the type of use of the space by elderly people can be explicitly included in a project; although it also shows how this can turn out differently in practice. In general, however, Lisbon's urban greening strategies mainly address the spatial dimension of access, whereas its social dimension is relatively neglected.

Participation is considered a key element of environmental justice, as it allows people to have a say about the way their living environment is planned and developed (Agyeman et al. 2002). In particular more vulnerable social groups need to be actively included in the decision-making process, to ensure that these can make their voices heard. The decision-making process leading to Lisbon's urban greening strategies is democratically controlled, however other forms of active

involvement of citizens are not pursued by the city council. While the implementation of the green corridors is significantly transforming Lisbon's urban environment, I notice a lack of public debate regarding what these corridors should be and what type of interests these should serve. Although 'more' participation does not necessarily lead to better quality of green spaces (see for example Fors et al. 2015), EJ scholars understand participation to be crucial for policy-makers to take into account the social impact of environmental strategies. The case of Marvila shows how local residents can actively participate in the production of a green space in their neighborhood, although this being an exception to the regular decision-making process.

As explained in section 2.2., political ecology studies have highlighted the political dimension of the way (urban) environments are produced. The research results show how urban greening strategies - and therefore the production of Lisbon's urban nature - are based on the expertise knowledge of the city council's civil servants, namely landscape architects. Despite this being partially a technical exercise, political decisions are made about where to develop green spaces, whose needs and desires are taken into account and what type of functions these spaces are to provide. In the case of Lisbon, ideas related to climate change adaptation dominate the strategies, which seek to maximize the effectiveness of green spaces in terms of ecosystem services and nature-based solutions. This way, urban nature is considered an asset. However, little attention is given to the social implications of these strategies.

Some studies have raised concerns regarding the (sometimes unexpected) implications of urban greening strategies in relation to gentrification and increased social segregation (Wolch et al. 2014; Haase et al. 2017). As urban greening strategies directly improve the quality of the living environment, it is crucial for these strategies to be designed by community concerns, instead of by conventional approaches towards urban design and ecological restoration. This way the local context is taken into account, reducing the risk of these strategies to bypass the needs of the local residents and to only cater for high-income residents. I have not identified any evidence of these implications being taken into account by Lisbon's city council.

However, scholars in the field of urban political ecology have shown that it is crucial to understand what social-political processes are shaping urban environments (section 2.2.i). As Heynen (2003) argues, urban nature is as much a produced environment as a square or a street. Therefore, Lisbon's urban greening strategies inevitably pursue some political interests over others. For example, Emilsson and Sang (2017, 22) state that "from a planning perspective, it is interesting to pose the question on where and which NBS [Nature-Based Solutions] to implement when prioritizing resources". They argue that in order to take into account environmental justice, NBS ought to be implemented considering who is impacted most by negative environmental impacts (e.g. the urban-heat island effect); where do the most vulnerable social groups live; and where is a lack of green and blue infrastructure. At the moment Lisbon's urban greening strategies only take into account the last aspect (where is a lack of green structure) – although not necessarily prioritizing interventions in these areas over other interventions. The first and second aspect (who is most impacted and who is most vulnerable) are not explicitly acknowledged when defining and developing urban greening strategies. Hence the extent to which Lisbon's urban greening strategies effectively contribute to the different dimensions of environmental justice is limited.

5.1 Limitations and recommendations for future research

The decision to focus on the city council was based on the fact that it is the main actor in implementing urban greening strategies. Nonetheless, for this reason I was unable to make any interferences regarding how people use Lisbon's green spaces or why they do not. To fully understand how Lisbon's urban greening strategies contribute or not to environmental justice, it is crucial to understand the perspective of its target group: Lisbon's residents. Likewise I recommend that any future research on this topic considers to apply participatory methods, by surveying Lisbon residents and by mapping the different uses of green space. In this sense it would be particularly relevant to also include citizens that do *not* frequently visit green spaces, in order to better understand what is preventing them from doing so.

A topic that I have not been able to address in this research is related to so-called 'eco-gentrification' – the phenomenon where the creation of new green spaces drives up property values in the adjacent areas, eventually leading to displacement and evictions (Dooling 2009). Considering that Lisbon is currently experiencing what some people call a "housing crisis" (e.g. Drago in Minder (2018)), I understand it to be extremely important to better understand to what extent Lisbon's urban greening strategies are contributing or not to this crisis. Likewise I recommend research focusing on the possible relation between new green spaces and increased housing costs, in order to explore whether or not such a relation exists and what the implications of this are.

The answers provided in this research are neither complete nor final; instead I aimed to raise awareness and instigate further research. As the system of green corridors is being implemented and expected to be completed in the upcoming years, Lisbon's GI is transforming drastically. This necessarily impacts people's lives, whether positively or negatively. For this reason I understand it to be greatly important to seek a more nuanced understanding of the social impact of these changes. Public participatory GIS (see Brown and Kyttä 2014) in combination with surveying how people use (and not use) Lisbon's green spaces is a fruitful way to ensure that 'no one is left behind' in this process of transformation.

6. CONCLUSION

This chapter intends to provide an answer to the research questions that guided this project, culminating in a number of recommendations for policy-makers. The research questions are:

(1) How do Lisbon's urban greening strategies contribute to ensuring that everyone can access the benefits provided by urban green spaces?
(2) To what extent do these strategies reflect concerns related to environmental justice?

I identified access to green space to be an important objective of Lisbon's urban greening strategies, however access is understood as being dependent only on physical access and geographical distance – aspects that are easily quantifiable. The analysis regarding whether or not access is improved through implementing Lisbon's master plan (the REOT report) is based on a spatial analysis of the location and size of green spaces and at what distance people live from the system of green corridors. Qualitative aspects that *also* determine access are not included in this analysis. Plans for specific green spaces focus on the ecological function, with less priority given to who the users of the space will be and what their preferences and needs are. Different social groups and how they seek to use green space in different ways are mostly not recognized in these plans. Hence the urban greening strategies do not actively seek to reduce any other barriers (besides distribution) preventing people from accessing green spaces.

Environmental justice concerns are reflected in the sense that the city council explicitly and implicitly understands that the benefits provided by GI and green spaces should be accessible to everyone. I understand that the analysis regarding the uneven distribution of green spaces is evidence of this concern. Nonetheless, the decision-making process lacks forms of public participation and consultation, while mainly building on the expertise knowledge of the city council regarding the way urban nature should be developed and transformed. Those affected by this decision-making process, i.e. Lisbon's residents, are not actively involved in this process. This is problematic due to the risk of the strategies not incorporating the wide diversity of uses and preferences of the public in terms of green space, and instead focusing only on the dominant vision of what green space is and how it should be used.

6.1 Policy recommendations and contribution of this research

Based on the above, I suggest the following policy recommendations:

(1) To include qualitative data on the use of Lisbon's green spaces by different social groups, in order to better understand to what extent the urban greening strategies are contributing to improved access and a just distribution of ecosystem services;
(2) To actively involve local residents in the design of new green spaces in order to integrate their needs, preferences and visions;
(3) To actively acknowledge that some social groups experience additional vulnerabilities in the face of climate change and to translate this into concrete measures, e.g. surveying Lisbon residents to understand what (besides geographical distance) prevents people from accessing green spaces.

In general this means to integrate different visions of what GI is and how it can be integrated in the urban fabric, instead of implementing strategies based only on the vision put forward by the city council. Likewise each green space should be built on a tailor-made vision based on local assessments of preferences and needs - in line with what has been called greening strategies that are 'just green enough' (Wolch et al. 2014).

This research contributes to the literature by describing how Lisbon's urban greening strategies are based on a distributional understanding of environmental justice. I have been able to identify that the city council is indeed concerned with improving access to green space for its residents, however this is mainly focused on expanding GI and improving physical access. Other types of barriers are not considered in a meaningful way. Therefore the different dimensions of environmental justice as put forward by the literature are insufficiently addressed. For this reason, the extent to which these strategies contribute to environmental justice is limited, as EJ studies have shown that just distribution is not enough to achieve justice. Lastly, I understand EJ to be a useful framework to analyze Lisbon's urban greening strategies, as it allows for attending to the multidimensional social implications of urban green spaces.

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APPENDIX I

INTERVIEWS

INTERVIEW WITH INTERVIEWEE A

Date: 13 March 2019
Duration: 60 min.

Interview guide

Introduction

- Interviewee's position and responsibilities; how does your daily work look like?
- How were you involved with application to the ECGA 2020?
- What is, in your perspective, the most important GI project being developed by CML?

Factors that influence how GI is developed

- What is the EEM and the system of green corridors?
- What do you know about how the system of green corridors was conceptualized?
- Why is CML investing in GI?
- What criteria are considered when developing GI and green spaces?

Accessibility to and quality of green spaces

- What criteria define where new green spaces are located?
- What is, in your perspective, the most significant factor influencing access to green space?
- How do you describe access to green space in Lisbon?

INTERVIEW WITH INTERVIEWEE B AND C

Date: 18 March 2019
Duration 60 min.

Interview guide

Introduction

- Interviewee's position and responsibilities; how does your daily work look like?
- How were you involved with application to the ECGA 2020?
- What is, in your perspective, the most important GI project being developed by CML?

Spatial distribution of green space

- What criteria define the location of new green spaces?
- What is preventing access to green space?

- Could you explain the areas of influence of green spaces and what their implications are?

Accessibility

- What are criteria defining a minimum level of accessibility?
- How do you define what type of infrastructure and equipment are built in a green space?
- How do you ensure access by different social groups, e.g. by age, gender or background?
- What are difficulties in relation to creating access to green spaces?

Quality

- How are decisions about the quality of a green space made?
- In your perspective, what is preventing people from using green spaces in Lisbon?