Environmental justice considerations in urban greenspace planning: Insights from the Netherlands

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Summary

Various scholars suggest urban greening initiatives could exacerbate environmental injustices. Projects aimed at enhancing or creating greenspaces within urban areas may inadvertently displace or exclude the very residents they were intended to benefit. The development of urban greenspaces might perpetuate or worsen existing inequalities. This study seeks to contribute to the ongoing scientific debate by examining how urban planners pursue environmental justice in urban greenspace planning processes, which precede outcomes of greenspaces, shedding light on how urban planners currently try to prevent unjust outcomes of urban greenspace planning. The following research question is leading:

How is environmental justice pursued in urban greenspace planning processes in Dutch cities?

Focusing on two Dutch cities – Utrecht and Rotterdam – the research aims to map out how urban planners conceptualize, prioritize and apply environmental justice in the planning process for greening interventions. By conducting a comparative embedded multiple case study, including interviews and analysis of policy documents on greenspace planning, this research provides insights into how urban planners engage with environmental justice thinking. The study employs an analytical framework centred on environmental justice, utilizing indicators from literature on Nature-Based Solutions (NBS) to operationalize recognitional, distributional, and procedural justice. The research also adopts an exploratory approach by examining additional justice dimensions such as corrective, intersectional, transitional, and multi-scalar justice, exploring their conceptualization and application in planning practice. This includes a focus on how ecological, temporal, and spatial justice are integrated into planning processes. Moreover, the study explores the trade-offs between these justice dimensions, shedding light on how interconnections between justice dimensions occur in practice.

An important finding of this study is that environmental justice considerations in urban greenspace planning are limited, and often implicit rather than explicitly defined. Urban planning approaches tend to incorporate principles of justice without formal acknowledgment, focusing predominantly on distributional aspects of justice. Procedural justice is usually evident at the operational level of specific neighbourhood greening projects. While ecological justice is recognized as important in urban greenspace planning, aspects of recognitional justice are mostly missing from planners' approaches. Additionally, concepts such as corrective, transitional, and intersectional justice were mostly observed in Utrecht, with temporal and spatial perspectives on justice being limited in both cities. This research uncovers new perspectives on how justice is applied in urban greenspace planning. Delving deeper into these findings can provide a better understanding of their implications and potential for shaping more equitable urban environments.

Key concepts: Environmental justice dimensions, environmental justice framework, environmental justice trade-offs, urban greenspace planning.

Acknowledgements

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1. Introduction

1.1 Background and context

For the past decades, cities have increasingly been putting effort into addressing climate change, both in terms of adaptation and mitigation (Bulkeley, et al., 2013). In line with this, efforts for the provision of urban greenspaces (UG) have become prioritized in urban planning policies (Liotta et al., 2020). Urban greening has shown to provide different social, economic and ecological benefits (Sax et al., 2022; Anguelovski et al., 2020). Ecological benefits are also understood as ecosystem services, which are important for climate adaptation and mitigation. These services have positive effects on biodiversity and help tackle issues such as the heat island effect and flood risks. For example, vegetation provides shade and absorbs rainfall (Sturiale & Scuderi, 2019). In terms of social benefits, green spaces are associated with various physical and mental health outcomes, as greenspaces can function as a place for physical activity and psychological wellbeing that for example help prevent cardiovascular diseases and mental disorders (Anguelovski et al., 2020: Jennings, Browning & Rigolon., 2019). The economic benefits of urban greening are linked to business growth and generating real estate value, thereby enhancing neighbourhoods, creating economic opportunities (Anguelovski et al., 2020).

Yet, scholars from several fields have shown that greening interventions do not always lead to favourable outcomes in terms of environmental justice (EJ). A wide array of studies shows how greenspace planning can lead to unjust effects, where the unequal distribution of benefits and burdens of greenspaces enhances societal inequity and inequality, creating and reinforcing existing vulnerabilities (Zuniga-Teran & Gerlak, 2019; Pearsall & Anguelovski, 2016; Wolch, Byrne & Newell., 2014).

Urban planning by municipal actors plays a significant role in shaping greening interventions and affects the outcomes of urban greening in terms of justice (Anguelovski et al., 2020). This is particularly the case in the Netherlands, where the introduction of the new Environment and Planning Act shapes a new playing field where municipal governments are increasingly taking on a more significant role in the development of public spaces (Dutch Central Government, 2023). Therefore, questions arise regarding the role of local urban planners in influencing the environmental justice outcomes of urban greenspace planning. Urban planners play a crucial part in shaping these outcomes through their decisions and interventions (Swanson, 2021).

This research is situated in Dutch cities, offering a context marked by urbanization challenges such as densification, climate change, and inequality, all of which also interact within the built environment (de Haas, Hassink & Stuiver, 2021). The Netherlands serves as an exemplary context, as it is very much confronted with the complexities that accompany high levels of urban growth (Centraal Bureau voor de Statistiek: (Statistics Netherlands) [CBS], 2022). Additionally, the presence of social inequalities is evident, reflected by unequal wealth and income distribution, especially in larger cities (CBS, 2019). In the Dutch context, further escalating housing prices in cities pose risks for social exclusion and segregation. The consequence of this trend is population homogenization, leading to unjust socio-spatial outcomes such as displacement and growth of inequalities, as also highlighted by Hochstenbach (2017). Furthermore, Dutch cities are poorly represented in research on environmental justice in urban greening planning.

1.2 Research gap

Research on displacement and exclusion embedded in sustainability planning is considered extensive and theoretically sophisticated (Anguelovski et al., 2019). A rich body of literature has provided insights into justice in terms of distributional, recognitional and procedural processes and outcomes of urban greening. These analyses align with the traditional tripartite framework of justice as described by, among others, Schlosberg (2007), Dooling (2009), and Pearsall & Pierce (2010). Research has shown that many greening projects do not incorporate social vulnerabilities (Pearsall & Pierce, 2010) and cause issues related to an increase in housing costs due to greening interventions (Pearsall & Pierce, 2010; Checker,

2011, as cited in Anguelovski et al., 2019). Other research shows that alliances of urban planners and elected officials and developers, with the goal to enforce the economic situation of a city, can create competitive value for cities, that however come at cost of minorities and low-income groups (Anguelovski et al., 2019).

Various scholars stress the need for new research to further understand socio-spatial dynamics of green gentrification (Anguelovski et al., 2019: Garcia-Lamarca et al., 2021) and suggest that there is a lack of insight in the dynamics within urban planning in relation to justice of greening interventions. A specific expression of environmental injustices in relation to greenspace planning is green gentrification (Anguelovski et al., 2019). In their research agenda on green gentrification, Anguelovski et al. (2019) identify several unresolved questions about effective and long-lasting strategies for addressing green gentrification. The authors stress the role of municipal decision-makers and agencies in addressing or preventing inequities and ask how municipalities attempt to address environmental justice claims in greening (Anguelovski et al., 2019). Swanson (2021) provides a literature review on climate adaptation planning and equity, aiming to provide a foundation for research that examines climate change planning from an equity perspective. Equity is part of the climate justice discourse, which positions within the environmental justice literature (Schlosberg, 2013; Swanson, 2021). Swanson specifically focusses on vulnerability and argues that equity considerations are a necessary component of adaptation planning, The author suggests future research should investigate how climate change adaptation planning considers needs and priorities of disadvantaged groups in society, both in terms of processes and outcomes. Swanson (2021) shows that the degree to which equity concerns are addressed into planning remains under-researched, in line with the suggestion of Rutt & Gulsrud (2016), who point to the importance of understanding how urban planners include and integrate EJ concerns in their daily and strategic decision-making. Garcia-Lamarca et al. (2021) also emphasize that science knows little about how "planning, policy and overall municipal approaches related to greening efforts mitigate or exacerbate social inequalities" (p. 92) . Furthermore, literature mostly focuses on the outcomes of urban greening efforts which does not aim to analyse the practice of providing greenspace - or formulated differently - the supply side of greenspaces. This can be seen as a gap in literature (Boulton et al., 2020).

Trying to address the research gap explained above, this research uses an environmental justice lens to analyse the planning of urban greening interventions. Such an analysis is important because it provides better understanding of the role of urban planners in creating just outcomes for urban greenspace planning. Urban planners are mostly municipal-level governmental officials that collaborate with private actors such as consultancies and NGOs to realize greening interventions, sometimes in combination with real estate development projects.

Moreover, there seems to be a scarcity of research on environmental justice in greenspace planning, particularly in the European context, and, more specific, in the Dutch context. De Vries, Buijs & Snep (2020) explored how the presence and quality of greenspace varies in the Netherlands, based on the socioeconomic status of neighbourhoods. Their study lacks, however, an analysis of the preceding planning process that lead to distributionally unjust outcomes. Furthermore, Kruize et al. (2007) examined the distribution of greenspaces in the Netherlands, revealing that environmental quality tends to be somewhat lower for lower-income groups compared to higher-income groups, based on factors such as proximity and availability.

1.3 Research problem

This study focuses on the problem of environmentally unjust outcomes that urban greenspace planning interventions by local governments might cause, such as green gentrification or an unequal distribution of environmental burdens such as exposure to heat stress. Urban greening interventions can be seen as policy measures that contribute to climate change adaptation and mitigation. Such interventions and, in a broader sense, the outcomes of climate policies, have to be perceived as socially just, as a lack of attention for justice issues might lead to a decrease of support and acceptance for climate policies leading to decreased climate policy effectiveness (Hulscher et al., 2023; Swanson, 2021). Unequal outcomes

can jeopardize the social, economic, and environmental sustainability of urban development. (Harris, 2003; cited in Rutt & Gulsrud, 2016). A deeper understanding of the problem from a planning perspective is therefore needed to find solutions for preventing or mitigating unjust outcomes resulting from greening interventions.

Moreover, creating just green spaces is also important from a democratic perspective. Urban planning scholars stress the importance of fair access to and development of these areas, especially since they are typically funded by public institutions, and thus paid for by everyone. Therefore, it is crucial that everyone can enjoy the benefits and drawbacks of these spaces. It is a common assumption that the positive effects of urban greenspaces benefit the entire urban population equally (Calderón- Argelich et al. 2021), while this is not always true.

The research problem thus is the undesirability of urban greenspace planning posing a risk of creating or reinforcing existing environmental injustices. Enhancing our understanding of the role urban planners play in navigating systemic inequalities and the uneven politics of urban development in adaptation planning, is crucial for mitigating this risk.

1.4 Research aim and research questions

By analysing and comparing how urban planners address environmental justice in greenspace planning, this study aims to understand the pursuit of environmental justice within urban greenspace planning processes. This study will map which considerations planners make and how they pursue environmental justice outcomes. The research focuses on a specific context, examining both on the level of specific local greening projects in practice, and on a broader strategic level perspective, the latter meaning a comprehensive strategic level perspective that encompasses overarching urban planning and policy decisions. Based on these insights, the study also aims to make a societal contribution: to provide insight into how urban planners can enhance justice in urban greenspace planning to ensure environmentally just outcomes.

The research contributes to knowledge of the use of justice principles in urban greenspace planning projects as it tries to identify patterns in how justice is addressed in neoliberal urban development (Sax et al., 2022). Moreover, the research contributes to informing and evaluating the progress made on the agenda of just urban transitions, as listed as important by Diezmartínez & Gianotti (2022). The study also aims to make a theoretical contribution: first by integrating various dimensions of environmental justice into the environmental justice conceptual framework, as it aims to create a systematic overview of how environmental justice is conceptualized in literature, specifically in the context of urban greenspace planning. Secondly, it aims to enrich urban greening research from a theoretical angle by expanding the tripartite framework of distributional, recognitional and procedural justice, which is also suggested by Schlosberg (2013).

To achieve these research objectives, the following research question is used:

How is environmental justice pursued in urban greenspace planning processes in Dutch cities?

The following three sub questions help to answer the main research question.

- *How can environmental justice be conceptualized and operationalized in the context of urban greenspace planning?*
- *How do urban greenspace planners conceptualize, apply and prioritize justice principles in urban greenspace planning processes?*
- *What trade-offs do urban planners experience when addressing justice in urban greenspace planning and how are they dealt with in practice?*

1.5 Scientific relevance

Little is known about the role of planners in addressing environmental justice in urban greenspace planning. Most research that connects justice to urban greening aims to assess the outcomes in terms of justice. This lack of focus on the role of urban planners in relation to justice might be due to the fact that most research on just urban greenspace planning focuses on the US and UK contexts. In these countries, or states in the case of the US, spatial planning processes are more centralized (per state In case of US), and urban planners have a different position in decision-making compared to planning contexts where spatial planning processes are more decentralized. Local planners have more discretionary freedom in such contexts.

Hence, the findings of this research are scientifically relevant, particularly for contexts with similar decentralized planning systems, such as Scandinavian countries or Germany, where related studies are currently scarce. Moreover, this research contributes to broadening the scope of literature on the topic. Also, focusing on the Dutch context, a country known for its decentralized approach to spatial planning, this research aims to assess the developmental processes leading to these outcomes, in doing so exploring the structural causes of potential injustices. This approach is also currently underrepresented in literature.

The research expands empirical insights beyond the US and UK, by analysing Dutch case studies. The research also enhances interdisciplinary contributions to literature by integrating insights from justice scholarship into the specific research domain of urban greenspace planning. This study also aims to make a theoretical contribution by creating an integrated holistic conceptual framework of environmental justice considerations in urban planning, as a broad shared understanding of justice is absent, as reflected by the vast variety and interchangeability of terms scientists in the field of justice use. Examples of this are equity, social justice, environmental justice, equality, climate justice (Ikeme, 2003). This makes communication between and among researchers and practitioners challenging and can result in wrong interpretations and findings (Zimm et al., 2024). Especially within the context of urban greenspace planning, creating a conceptual framework enables the shared understanding of justice in research and brings conceptual clarity. Another theoretical contribution this study aims to make, is to operationalize environmental justice dimensions based on empirical findings, by analysing the application of environmental justice principles in urban greenspace planning. This integrated operationalization of environmental justice is currently missing in literature.

1.6 Societal relevance

The research contributes to society by providing an understanding of how urban planners address social justice in their work. Creating such an overview offers relevant insights for developing solutions to justice-related problems in urban greenspace planning. These insights may support a more integrated approach for a just climate adaptation in cities. In doing so, this research also aims to contribute to Sustainable Development Goals (SDG) 11: sustainable cities and communities. SDG 11 aims to make cities and human settlements inclusive, safe, resilient, and sustainable. Understanding and revealing how justice perspectives currently are (or aren't) pursued can contribute to identifying opportunities or best practices for the provision of just urban greenspaces. Also, by comparing different cases, opportunities for learning can be created by articulating the differences between cities in addressing justice. Sharing these insights can be helpful for addressing the problems of environmental injustice in the future.

1.7 Research framework
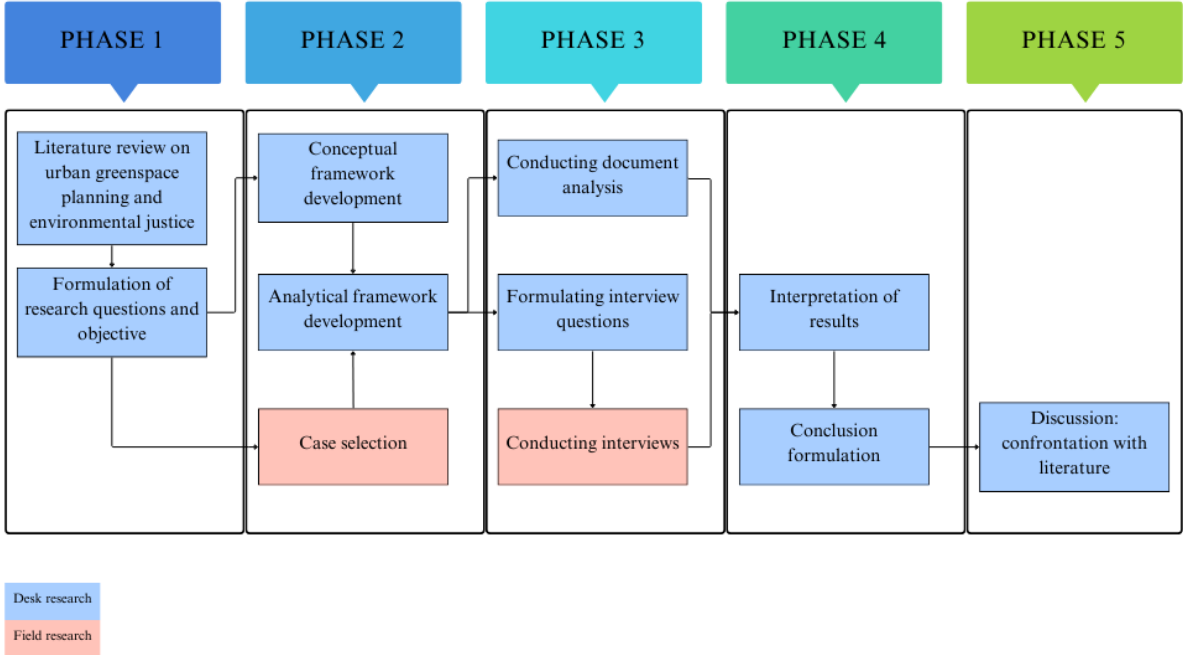
Figure 1: Research framework

The roadmap of this study shown in figure 1 is as follows. First, a literature review has been conducted on the concepts of urban greenspace planning, environmental justice, and what is known already about the relationship between those concepts. This shapes the conceptual framework, which underpins the analytical framework. Based on the analytical framework, themes for semi-structured interviews and the document analysis have been identified. In the meantime, case study selection took place. The analysis involved using the analytical framework to interpret the data. Subsequently, conclusions are formulated, and the research questions will be answered. Finally, the results will be confronted with literature.

2. Theoretical and analytical framework

This section offers an overview of the steps involved in preparing for and conducting the research. It starts by defining greenspace and the planning process. Next, it offers an answer to sub-question 1, addressing how environmental justice can be both conceptualized and operationalized within the realm of local-level urban greenspace planning. Furthermore, we discuss literature on the nexus between environmental justice and urban greenspace planning. Finally, the conceptual and analytical framework, utilized to address the remaining empirical research questions, are outlined.

2.1 Urban greenspace planning

This research investigates the process of urban greenspace planning. The first element of this concept is urban greenspace, the second element is the planning process. Below, the two elements are discussed and defined.

2.1.1 Urban greenspaces

In literature about greenspaces, the term urban Nature-Based Solutions (NBS) is often used. The term nature-based solutions can be defined as a variety of systemic approaches inspired by nature, utilizing nature, and benefiting from nature's support. They are designed to address environmental challenges while delivering multiple benefits (Pineda-Pinto, Frantzeskaki, & Nygaard, 2021). This term is related to urban greenspace, as urban greenspaces can be seen as a specific form of nature-based solutions. Another example of nature-based solutions is blue infrastructure, which refers to water elements such as rivers and canals. In this research however, only urban greenspace is focused on.

In literature, two general interpretations of the term 'greenspace' are known (Taylor & Hochuli, 2017). This is greenspace as *nature* on the one hand, as antonym for urbanization. On the other hand, greenspace can be defined as *urban vegetation*, such as parks, gardens, urban forests, etc. It refers here often to an open space which is vegetated. The two elements of (1) the urban environment, and (2) the subset of an open space, together make up the second interpretation of greenspaces. The focus in this interpretation lays on the value for human use (Taylor & Hochuli, 2017). Urban greenspaces can be thought of as "parks and reserves, sporting fields, riparian areas like stream and riverbanks, greenways and trails, community gardens, street trees, and nature conservation areas, as well as less conventional spaces such as green walls, green alleyways, and cemeteries" (Wolch et al., 2014, p. 234).

In this research, greenspace is understood as publicly accessible vegetated areas, which provide both social as well as ecological value. This definition aligns with the second interpretation of greenspace within scientific literature (Taylor & Hochuli, 2017). However, the central term used is *urban* greenspace, where urban refers to an area with a high population density, using the social scientist interpretation of the term urban (McIntyre, Knowles-Yánez & Hope, 2008). To conclude, in this research urban greenspace is understood as publicly accessible vegetated areas providing ecological and social value, located within an area of high population density.

2.1.2 Urban planning, urban planners, and the planning process

The second element of urban greenspace planning is the planning process. Urban planning primarily involves shaping the physical layout of cities (Northridge & Freeman, 2011). By making decisions about how land is utilized, urban planners at public organizations such as municipalities and national governments decide where important entities such as shops, roads, and green spaces are located, as well as how densely built-up areas are. The planning process of urban spaces shapes how greenspaces come to look like and what processes precede the development of those spaces. Greenspace provision has emerged as one of the most important challenges facing cities (Boulton et al., 2020), and has become a priority in urban planning policies (Liotta et al., 2020). Creating greenspaces means working on Sustainable Development Goal (SDG) 11 of Sustainable Cities and Communities, but also responding to health and other socio-environmental challenges. The planning process can take different shapes and could consist of participatory planning or other forms of governance modes, such as hierarchical governance, interactive governance, or self-governance (van der Jagt et al., 2023).

Most urban planners are individuals employed by local governments, of which most are civil servants (Levy, 2016). Within governments, some are political appointees. Only a small share of planners is employed by the private sector, working in planning consultancies that can serve both public and private clients (Levy, 2016). In this study, urban planners are defined as municipal civil servants responsible for shaping the physical landscape of cities, particularly in terms of incorporating greenspaces. While these officials may collaborate with private sector actors like consulting firms and NGOs to implement green initiatives, they remain the leading force in urban planning. Therefore, their perspectives are prioritized as the main point of analysis.

Furthermore, the introduction of the Dutch Environment and Planning Act in 2024 shapes a new playing field in the context of urban planning. Municipal governments are increasingly taking on a more significant and freer role in the development of public spaces, with more room for local considerations, and more responsibilities and authorities for local municipalities (Dutch Central Government, 2023). Previously, national governments held greater power, while municipalities primarily executed national policies. This presents yet another reason for examining the pursuit of justice by local urban planners.

The analysis conducted in this research is ex-ante, focusing on examining the pre-implementation planning and development processes, which precedes the implementation of urban greenspaces. The ex-ante conditions of the planning process are critical in overcoming justice-related challenges (Kato-Huerta & Geneletti, 2022). The policy cycle model by Hoogerwerf & Herweijer is useful in illustrating this approach (2014). The model describes the different steps municipal policy development goes through, and how these steps follow up on each other (Hoogerwerf & Herweijer, 2014). This research investigates the first three steps of the policy cycle: (1) policy agenda-setting, (2) policy preparation and design and (3) policy formulation and decision-making: analysing the steps that precede the policy implementation. Therein, the analysis does not look at the outcomes of urban greenspaces, but how outcomes are shaped within both the strategic and daily decision-making (Rutt & Gulsrud, 2016). The second and third refer to more specific project-based planning processes which precedes the implementation of more specific greenspace plans (van der Jagt et al., 2023). Strategic refers to long term goals or visions, which address overarching themes and disciplinary boundaries: these are often complemented with incremental processes with short term and intermediate steps: reflected in how specific greening projects are conducted (van der Jagt et al., 2023).

2.2 Defining Justice

2.2.1 Environmental justice and climate justice

The concepts of environmental justice and climate justice are closely related: environmental justice is a broader concept, which examines the power relations, social movements, and politics behind the unfair distribution of risks and resources (Zuniga-Teran & Gerlak, 2019). Originally, the environmental justice movement arose from unjust distribution of human-caused environmental risks. Many scholars and activists attribute the inception of the environmental justice movement to the demonstrations in 1982 against the disposal of soil contaminated with PCBs at a recently established landfill in North Carolina (Schlosberg & Collins, 2014). Climate justice can be seen as a subset of environmental justice, as the environmental justice discourse started to focus on justice questions arising environmental conditions caused by climate change (Schlosberg & Collins, 2014). Environmental risks now are more often related to the occurrence of extreme heatwaves or rain floods that happen more frequently due to climate change. However, environmental risks related to greenspace are not only related to climate change. They are also related to direct human impacts such as noise and air pollution by cars or planes. Climate justice can also be seen as overlapping with, and expanding, the more traditional environmental justice concerns (Schlosberg, 2013). This research operates at the intersection of both concepts, as justice issues related to greenspace are related to both environmental injustices as climate injustices: greenspaces are seen as a measure to adapt to climate change, and the distribution of them can therefore also be seen as a climate justice issue.

Related to environmental justice is the concept of inequality, which highlights the uneven spatial distribution of environmentally related risks or resources across populations. Also (in)equity is often mentioned. This concept considers the social fairness of the spatial distribution of resources and risks (Zuniga-Teran & Gerlak, 2019). These concepts can be seen as subset of environmental justice, as they provide different rationales to decide what is considered just or fair.

2.2.2 Greenspace justice

This research positions itself by studying the environmental justice implications in greenspace planning, where greenspace planning can be seen as a means of climate change adaptation and resilience in urban areas (Zuniga-Teran & Gerlak, 2019). In this research, justice in urban greenspace planning is the subject of investigation. In the small body of literature on urban greenspace and justice, the concept of *greenspace justice* is relevant. The concept of greenspace justice applies environmental and climate justice principles to greenspace planning (Zuniga-Teran & Gerlak, 2019), and is therefore also relevant for this study. Greenspace justice can also be seen as a subset of environmental justice, where environmental justice is more often related to climate effects, which can be mitigated by greenspace provision in urban areas.

An important concept in the context of greenspace justice is green gentrification, which serves as a significant example of the injustices resulting from urban greenspace planning. Green gentrification refers to the displacement, exclusion, or marginalization of residents in urban areas near sustainable or green developments that attract wealthier **new residents** (Gould and Lewis, 2017, as cited in Quinton et al., 2022).

2.2.3 Environmental justice as the key concept

The concept of environmental justice aligns well with the focus of this study, which investigates how justice is considered in the process of urban greenspace planning. The various conceptualizations of justice discussed above do not exclude each other, and climate justice and greenspace justice can be seen as an extension or subset of the concept of environmental justice. Hence, the study adopts environmental justice as the central concept to its conceptual framework to comprehensively understand how planners conceptualize and implement justice principles, considering its broad scope and inclusive nature.

2.3 Environmental justice in urban greenspace planning – insights from literature

Having defined the two main concepts, this section provides a preliminary discussion on what is known about the relationship between them, drawing insights from the field of studies on the nexus between justice and greenspace planning.

Historically, environmental justice research has been concentrated on distributional dimensions of justice: distribution of environmental risks. More recently, distributional environmental justice has extended to include environmental benefits, such as access to greenspaces (Kato-Huerta & Geneletti, 2023). The emergence of justice discourses in urban responses to climate change has been investigated by Bulkeley et al. (2013). Their analysis involved examining one hundred global cities through qualitative and quantitative methods. The study revealed a limited explicit concern with justice at the urban level. Moreover, the study indicated that when justice was addressed, it was primarily framed in terms of distribution rather than procedural justice. The research found that in both adaptation discourses, there was a notable emphasis on distributing 'rights' to protection. In mitigation responses, the importance of the right to benefit from actions addressing climate change was highlighted.

More recent studies show a similar pattern. Fitzgibbons & Mitchell (2019) examined thirty-one resilient city strategies, to analyse the extent to which participating cities focus on social equity in their narratives and whether justice is operationalized in strategies' embedded actions. The analysis was based on the traditional justice framework using the trilogy of recognitional, distributional and procedural justice. The researchers found that actions focusing on equality and justice were 'piece-meal' across the strategies, indicating that the inclusion of justice perspectives in cities strategies was limited in the cities analysed.

Meerow, Pajouhesh & Miller (2019) conducted a cross-sectional analysis of how issues of equity are incorporated into urban resilience planning, using the traditional tripartite justice framework as well. Greenspaces can be seen as interventions part of resilience planning, as greenspaces contributes to adaptive capacity of cities. The study reveals considerable variation in how much cities focus on justice. Dominant conceptions of equity generally are related to the distributional dimension of justice. In general, however, most cities lacked engagement with systemic inequalities and uneven outcomes of urban sustainable development (Meerow et al., 2019).

Chu & Cannon (2021) conducted a narrative review of key planning documents of ten largest cities in the US, investigating equity, inclusion, and justice as criteria for decision-making. Their analysis finds that considerations of recognitional justice are relatively nascent compared to distributional justice in urban plans. Diezmartínez & Gianotti (2022) conducted similar research and analysed how US cities integrate justice into climate planning and create policy tools for climate justice. The authors state that previous research (Bulkeley et al., 2013; Fitzgibbons & Mitchell, 2019; Meerow et al., 2019; Schrock et al., 2015) indicates few cities have meaningfully incorporated equity or justice goals in their climate strategies. Important to note is that the research Diezmartínez & Gianotti (2022) refer to were all conducted in the context of the US. The analysis by Diezmartínez & Gianotti showed that large cities in the US are attending justice in their climate action plans and that the recognition of structural and historical injustices is becoming more common.

Similar findings were provided by Hess & Mckane (2021), in their analysis of the fifty largest US cities and their plans focusing on sustainability and social equity they find attention for justice is growing. Reckien et al. (2023) also show that adaptation plans often neglect equity and justice issues where they do not address vulnerabilities and distributional outcomes of the plan. Furthermore, Araos et al. (2021) conducted a systematic global review assessing equity in adaptation responses, analysing how marginalized groups are considered. The urban adaptation responses showed the least coverage in terms of articles addressing equity and the inclusion of marginalized groups.

More recent research by Calderón-Argelich et al. (2023) evaluating the incorporation of social justice and gender equity in urban greening plans and strategies shows that justice is addressed in a superficial and unstructured manner within greenspace planning. However, the case study showed that incorporation of justice concerns is increasing.

Summarizing, literature shows various patterns: urban greenspace planning efforts having relatively limited attention to justice concerns in local urban sustainability interventions seems to be the norm (Castán-Broto & Westman, 2017). However, it appears an increase of attention for environmental justice concerns is happening. Also, where justice is addressed in urban context, distributional justice remains dominant, and attention for recognitional justice considerations seems to be growing (Bulkeley, 2013; Meerow et al., 2019).

2.4 Conceptual framework: an environmental justice framework for urban greenspace planning.

The objective of this study is to explore how justice considerations are (or not) incorporated into urban greenspace planning processes. Within EJ literature, various dimensions or frames of EJ are identified. This study seeks to develop a comprehensive and multifaceted understanding of justice considerations among urban planners. Therefore, the framework should encompass a wide spectrum of environmental justice dimensions, aligning with the exploratory nature of the research. By mapping the different variations of justice dimensions and considerations regarding these dimensions, this study also contributes theoretically by creating an integrative holistic framework of existing environmental justice perspectives from literature. The result of this effort is shown below in Figure 2, which depicts the holistic environmental justice conceptual framework in this study.

Like, Zimm et al. (2024), I aim to systematically identify which justice considerations are explicitly and implicitly invoked. With my analysis I do not aim to normatively evaluate what is just or unjust, but to map out the justice considerations made by those involved in greenspace planning, investigating which environmental justice principles are deemed most relevant and why, and how actors make trade-offs between the different justice considerations, taking an exploratory descriptive approach. Applying the justice framework of Zimm et al. (2024), the area, or policy context, of justice in this study is the climate change adaptation and mitigation, as greenspaces function mainly as means to continue human wellbeing under changing conditions due to climate change, such as heatwaves or floodings.

The dimensions of justice must not be seen as separate, but rather as interacting and influencing each other. For example, who is included in procedures for distribution of greenspace planning can depend on what groups are recognized as important. This example illustrates that procedural, recognitional and distributional justice are highly intertwined (Pineda-Pinto et al., 2021). This also applies to all the other dimensions of justice, which are discussed below.

2.4.1 The classical threefold justice framework: distribution, procedure and recognition

The widely acknowledged trivalent conception of justice by Schlosberg shapes the foundation for the conceptual framework in this study (Bulkeley, et al., 2014; in Meerow et al., 2019). The threefold framework has proven to be useful, as it is widely applied by scholars researching justice (Anguelovski et al., 2020). Schlosberg's framework delineates three justice dimensions: recognitional, distributional, and procedural justice dimensions. The three dimensions function as the starting point from which the framework is advanced. Zuniga-Teran & Gerlak (2019) provides a summary of the framework by Bulkeley et al., (2013) which is based on the framework by Schlosberg from 2004 but adds the dimension of rights and responsibilities. Distribution is about who gets what; procedures is about why things are the way they are; rights is about who loses; responsibilities is about who or what is responsible for the injustices; recognition is about the cultural and oppressive practices that allow injustice to happen. Below the three dimensions are further explained.

Distributional justice is defined here in line with the justice framework of Schlosberg (2004) described by Meerow et al. (2019) as: "equitable access to goods and infrastructure, environmental amenities, services, and economic opportunities urban greenspaces provide, and just the distribution of disamenities or pollutants across the urban environment" (p. 797). Thus, distributional justice in greenspace planning is about the just distribution of amenities and disamenities of urban greenspaces (Jennings et al., 2019).

Procedural justice refers to meaningful participation of relevant groups in the political processes related to environmental policies, as a prerequisite for justice (Schlosberg, 2004), or to the institutional contexts that allow distributional injustices to occur (Zuniga-Teran & Gerlak, 2019). It involves the fair and inclusive decision-making process to locate environmental goods and bads, or amenities and disamenities as described above (Jennings et al., 2019).

Recognitional justice refers to the equal acknowledgement and respect of different identities and associated social status (Schlosberg, 2004). A lack of recognition does not only constrain certain societal groups, but it can also be seen as the foundation of distributional and procedural justice (Schlosberg, 2004). The conceptualization of recognitional justice by Bulkeley, Edwards & Fuller (2014) is adopted in this study. It defines recognitional justice as "recognition as to view socio-economic injustices as fundamentally linked to cultural or symbolic injustices, which fail to give adequate recognition to certain groups" (p. 31). According to Bulkeley et al. (2014, p. 33) taking account of recognition in cities means "moving beyond simplistic assumptions concerning for example the 'needs' of particular parts of cities to be afforded protection from the impacts of climate change". It means examining how both the practice and politics of climate change action justice, taking a more structural approach. Bulkeley et al. (2014) also suggest that recognition entails acknowledging the elements of responsibilities and rights of groups and understanding how the implementation and political aspects of certain actions impact justice. The elements of recognition and rights are therefore also included in the framework, depicted in figure 2.

Again, it remains important to note that the three different dimensions of justice described above function interactively: distributional injustices are generated and perpetuated by procedural and recognitional justices and vice versa (Pineda-Pinto et al., 2021). The three 'classical' dimensions of justice are depicted in figure 2, as the three dimensions on top.

2.4.2 Additional relevant dimensions of environmental justice

Capabilities approach

The capabilities framework is often proposed as an extension of the classical tripartite framing of justice (Rutt & Gulsrud, 2016: Robeyns, 2021). Capabilities can be understood as the abilities of people to live their lives in the way they want, having all means and freedom to do so (Robeyns, 2021). This freedom of and capacity for choice of an individual how to live and fully function, for example depends on basic literacy and numeracy, physical security, employment, information, and recognition as a citizen (Rutt & Gulsrud, 2016). In the context of urban greenspace, the capacity for choice is critical in relation to, for example, the decision-making process, or whether to make use of greenspaces, through for example accessibility. In this research, the capabilities dimension of justice is gathered under the dimension of corrective justice, as to move towards justice those less capable may need disproportionate attention and care for equality in participation and enjoyment of greenspaces (Zimm et al, 2024).

Corrective justice

Corrective justice is here understood as the actions that aim to address or ameliorate historical wrongdoing, such as restoration or compensation. Within corrective justice, restorative justice is about setting a situation back to the status quo. Compensatory justice means providing alternative means for achieving ends or addressing the losses involved in adopting new ends (Zimm et al., 2024, p. 23). Restorative justice, also known as reparative justice, highlights the need to acknowledge past experiences of violence, oppression and exclusion and the extent to which green interventions can address historical trauma and promote the inclusion of specific neighbourhoods and communities and

taking recovery measures to address these experiences (Calderón-Argelich et al., 2021). Therein it is highly related to recognitional justice as well.

Transitional justice

In their conceptual framework grounded in philosophical theory to describe justice considerations in climate research, Zimm et al. (2024) also include transitional justice. This dimension of justice draws from a strand of justice studies that explores the sequencing of policies or actions, such as how (seemingly) unjust policies on short term could potentially lead to fair end results: meaning that at unfair policy can be justified as it yields equitable outcomes. Zimm et al. (2024) use the term to "indicate dynamic questions about approaching ideally just (end of state) goals" (p. 24). This is also a possibility of how justice could be conceptualized by urban planners, to for example compensate those that have not had the luck of enjoying greenspaces historically and should therefore be compensated. This justice dimension is about whether the transition towards a new situation is just, and whether it is alright to compromise the fairness of the transition for a fair outcome. Therefore, this dimension is also included in the conceptual framework. The dimensions of corrective justice and transitional justice are included in Figure 2 on page 21.

2.4.3 Contributions from critical environmental justice literature

Besides the contributions by Zimm et al. (2024) which can be seen as an integrative effort to bring together the mainstream school of environmental justice thinking, I also include EJ principles from a more critical school of thought: the Critical Environmental Justice (CEJ) framework (Pellow, 2018; in Menton et al., 2020). Adding this helps addressing the critique that EJ literature tends to focus on state/institutional reforms or policy concessions that do not change the underlying power structures that produce environmental injustices. The four justice pillars Menton et al. (2020) propose to address this problem are: intersectional justice, CEJ-embeddedness justice, multi-scalar approaches in justice and indispensability of humans and non-human beings and things, which I adopt as ecological justice. They are discussed below.

Intersectional justice

Intersectional justice perspectives help to understand how multiple identities (such as gender, class, race/ethnicity, sexuality, or disability, among others) interact and are or are not recognized in the green infrastructure planning processes (Anguelovski et al., 2020; Jerneck, 2018: in Calderón-Argelich et al. 2021). Intersectional justice addresses the problem of sectoral approaches in sustainability actions in cities, which lack recognitional justice (Westman & Castán-Broto, 2021: as cited in Amorim-Maia et al., 2022). Thus, intersectionality involves recognizing that the interplay of various facets of an individual's or group's identity can lead to unique types of discrimination and injustices. Building on this, Westman & Castán-Broto (2021) pose another important notion on justice in urban planning: that recognitional justice is frequently disregarded, failing to confront the question of how to challenge the structural limitations that perpetuate injustices within cities. CEJ-embeddedness justice states that social inequalities are deeply embedded in society and reinforced by state power (Menton et al. 2020). Intersectional justice is depicted in figure 2 below.

2.4.4 Multi-scalar justice

Temporal and spatial justice

Literature on environmental justice mentioned above discusses various dimensions, reflecting diverse perspectives within the field. Another essential aspect of understanding environmental justice is considering its scale— to who and what does justice apply to? (Langemeyer & Connolly, 2020; Adger et al., 2003). In this research I refer to dimensions of justice that address this as "scale dimensions of justice." In the conceptual framework employed in this research, the first scale variable is the 'multi-scalar justice' approach, encompassing temporal and spatial dimensions (Menton et al. 2020). For example, the historical suffering of certain groups, by for example not having access to greenspace, could justify corrective justice efforts. An example of spatial dimension of justice could be the specific allocation of new greenspaces across neighbourhoods in a city.

In his discussion on spatial and temporal justice in urban greening, Bauer (2023) notes that these concepts are not often mentioned. However, the author emphasizes their importance. Spatial justice adds a geographical component to distributional justice, ensuring that resources are distributed fairly across different areas (Soja, 2009, as cited in Bauer, 2023). It addresses both small-scale issues like local segregation and broader connections between cities and their surrounding regions (Langemeyer and Connolly, 2020, as cited in Bauer, 2023). Though rarely mentioned in urban greening literature, according to Bauer (2023) spatial justice is vital for nature-based solutions as they aim to address broad societal challenges while also having local impacts.

Temporal justice focuses on how historical legacies affect urban greening and stresses the need to consider future implications. For instance, Bauer refers to insights by Anguelovski et al. (2020, as cited in Bauer, 2023) who advocate for preventive justice to ensure that urban greening does not cause future harm. These concepts have only recently begun to receive attention in urban planning and greening initiatives (Bauer, 2023).

Ecological justice
The second scale variable adopted is ecological justice, which extends justice considerations beyond humans to include nature in urban greenspace planning. These two elements are also included in the conceptual framework in Figure 2 below. It is important to keep in mind that the scale dimensions of justice should always be considered in combination with any other dimension of justice. The example provided above combines the distributional dimension with the spatial scale.

Menton et al. (2020) also propose the idea of indispensability, related to the idea of ecological justice (Pineda-Pinto et al. 2021), is the principle that excluded, marginalized and othered populations, both human and non-human beings and things, are indispensable (Menton et al., 2020). This dimension of indispensability justice in this research is gathered under the dimension of ecological justice, much like the concept of ecological justice itself. It endows nature with agency, recognizes the interconnectedness between social and ecological systems, and advocates for the inclusion and participation of nature's interests in decision-making processes (Pineda-Pinto et al., 2021).

2.4.5 Interrelations between justice dimensions
For analytical purposes, the three classical dimensions of justice, distribution, procedure and recognition, are often separated. In practice however, dimensions of environmental justice are closely interrelated and intertwined (Bulkeley et al., 2014; Milchram, 2020). Recognitional justice is often a prerequisite for procedural and distributional justice (Brinkley & Wagner, 2024) Perceptions of procedural justice are instrumentally linked to perceptions of distributional justice. For example, determining the distribution of profits of energy systems, whether to individuals or to the group, was considered fair depending on whether the profits were attained through individual efforts or through collective processes (Milchram, 2020).

The interrelations between justice dimensions are also of importance to the analysis in this study, as understanding the interrelationship between them gives insight into the trade-offs and tensions between justice considerations. Hence, the justice dimensions are also conceptualized as interrelated to one another, similarly to the conceptualization of climate justice by Bulkeley et al. (2014). Rather than simply adding one dimension of justice to another dimension of justice, justice dimensions should be seen connected to all the other dimensions of justice. Taking a viewpoint from one dimension, say distributional justice, is always refracted through other dimensions of justice - procedural justice - even when this is not obvious in the first place.

This conceptualization emphasizes the multivalence of justice (Schlosberg, 2007: in Bulkeley et al., 2014). The interrelationships between justice dimensions have, however, not received much attention in literature yet (Broers et al., 2022). By taking a multidimensional, pluralistic approach which acknowledges the interwovenness of justice dimensions, this study aims to address this leap. The aim is to explore how the dimensions of justice are interconnected and mutually reinforcing, expanding upon

the work of Broers et al. (2022) in examining the interrelationships among justice dimensions. This study will also include additional justice dimensions for analysis and conduct the analysis within the context of urban greenspace planning. The interrelationships are shown in figure 2 by the arrows between the justice dimensions.

2.4.6 Conceptual framework

Bringing together the variety of justice dimensions in the holistic conceptual framework yields a comprehensive conceptualization of environmental justice, aligning with the study's focus on assessing how urban planners conceptualize and pursue environmental justice principles. This conceptual framework is visualized in figure 2 below. The conceptual framework constitutes the first step to understanding the considerations and trade-offs urban planners encounter in planning urban greenspaces. Having a broad conceptualization of the concept is crucial for analysing how urban planners prioritize and pursue justice principles, enabling a comprehensive interpretation of considerations and justice principles. This conceptual framework forms the basis for the operationalization of environmental justice. Below, the first start of this analytical framework is discussed. Again, it is important to emphasize that there are many interrelationships and overlaps between the justice dimensions. This framework therefore aims to be as comprehensive as possible, particularly for analysing overlaps and trade-offs in the practice of urban greenspace planning.
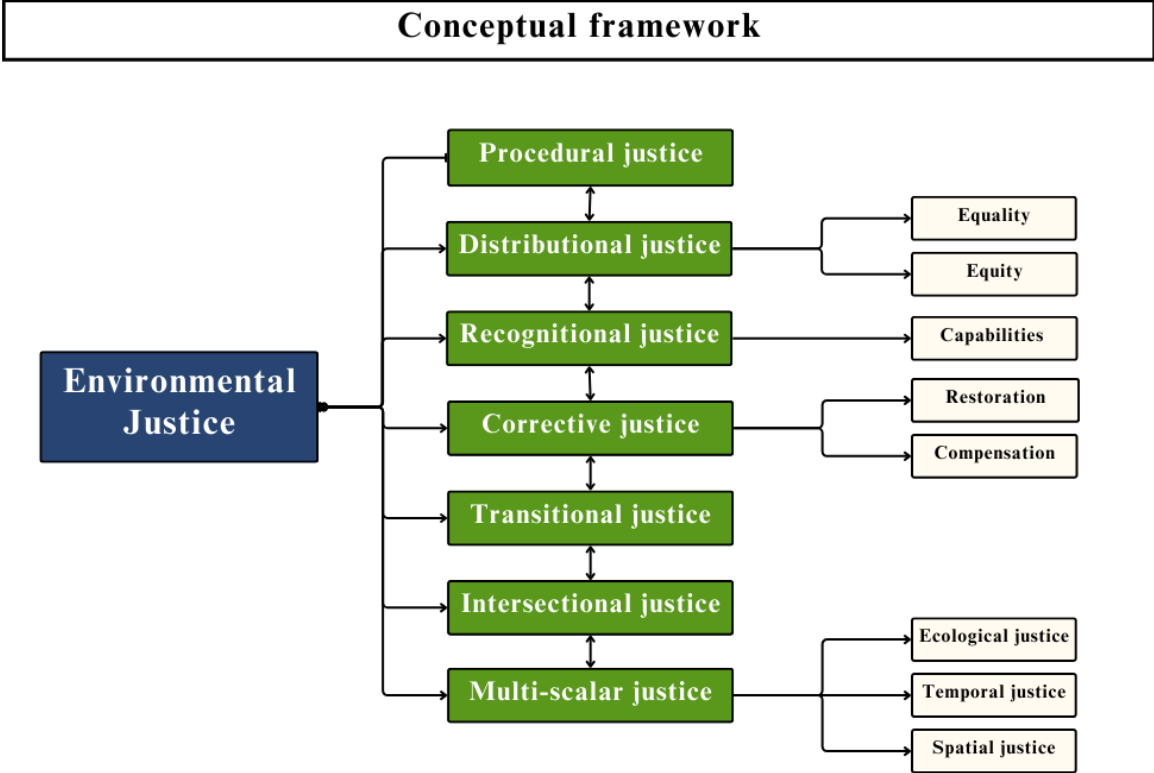

Figure 2: Environmental Justice- conceptual framework in urban planning (inspired by Schlosberg, 2004; Langemeyer & Connolly, 2020; Zimm et al., 2024; Menton et al., 2020; Meerow et al., 2019).

2.5 Analytical framework

The analytical framework below constitutes the operationalization of the conceptual framework as described in the previous section. The operationalization of the justice framework is used for the analysis of the interviews and for the document analysis. The framework is also used for both structuring and analysing the answers of the semi-structured interviews.

Included in the operationalization are the principles of distributional, recognitional, and procedural justice. Kato-Huerta & Geneletti (2022) conducted a systemic literature review on approaches, indicators and outcomes of environmental justice of urban nature-based solutions. The study identified indicators used for the threefold justice framework of distributional, procedural and recognitional justice. This indicator framework will be adopted in the analytical framework used in this study as it enables the empirical observation of the three classical justice argumentations or considerations in the practice of urban greenspace planning.

Operationalizing the classical three justice dimensions

Principles of recognitional justice distinguished by Kato-Huerta & Geneletti (2022) are: governance perspectives, diversity of preferences and needs, social needs and local knowledge. Governance perspectives is related to place attachment: perceived community ownership or feeling of displacement of NBS and greenspaces, or a sense of communal belonging, or frequency of visitation of the greenspace. Acknowledging social needs and local knowledges is about how communities could use their knowledge and experiences to make sense of diverse solutions and improve their living conditions. The principle of diversity of preferences and values explains what people perceive is desirable or acceptable in, for example, parks.

Principles of procedural justice from the indicator framework by Kato-Huerta & Geneletti (2022) are: conflict solving, representation and inclusion, enfranchisement and information exchange. Conflict solving is about setting conflicts in efficient ways, providing satisfaction with the process of all involved stakeholders. This is about trust in institutions, perceived effectiveness of interventions or satisfaction with the results of the process. Representation is about allowing a leading role for all communities involved or related to the development of urban greening. Inclusion and enfranchisement mean giving voice to all involved parties. Information exchange is about providing relevant information related to the project to all interested individuals. Adopting these principles allows for observation of procedural justice considerations in urban planning.

Principles of distributional justice as distilled from the systemic review by Kato-Huerta et al. (2022) are functionality, quality of NBS and preconditions for the use of green. Functionality is about the biophysical characteristics, such as area, size, vegetation density, tree height, soil characters and per capita greenspace. These characteristics have an impact on how, for example, health impacts will be such as reducing air pollution or heat mitigation. The distributional justice principle of quality includes indicators such as the presence of non-natural and natural amenities and facilities, maintenance, such as the presence of civic incivilities. Natural amenities is for example the presence of shading plant species. The principle of preconditions for use is about that it is necessary to test geographical and perceived accessibility: this can is disproportionately distributed between different urban communities: Higher distances, perceptions of insecurity within green spaces can undermine the provision and access of NBS for specific communities.

For the other dimensions of justice - intersectionality, corrective justice, transitional justice and scale dimensions of ecological and multi-scale justice - the operationalizations are developed in an iterative process based on empirical observations, taking an inductive approach. The first steps of the operationalization are discussed below.

Operationalizing intersectional, corrective, transitional, ecological and multi-scalar justice

For intersectionality the analytical indicators outlined by Anguelovski et al. (2020) are adopted. This operationalization of intersectional justice involves recognizing that greenspaces are experienced, understood, sensed and lived through various intersecting identities in locations affected by multiple environmental injustices and insecurities, shaped by diverse histories, and perceived through the lens of marginalized voices and practices.

Corrective justice has not yet been fully operationalized in literature. The operationalization of corrective justice will therefore also be based on empirics, but is first based on the conceptualization of Zimm et al. (2024): seeking for arguments or considerations of justice that reflect corrective justice principles, such as restoring or correcting historical or moral wrongdoings. Similarly, transitional justice is operationalized based on the iterative process of analysing the application of environmental justice principles in urban greenspace planning. An integrated operationalization of transitional justice is currently missing in literature, so I will start from the conceptualization of justice by Zimm et al. (2024, p. 24): they use the term to indicate dynamic questions about approaching ideally just (or 'end-state') goals. The two scale dimensions of justice, ecological and multi-scalar justice, are operationalized as who makes claims to justice: such as nature and non-human species, and how justice is applied in spatial and temporal terms. Table 1 below provides an overview of the indicators used for observation of justice principles in the empirical analysis.

Principle of Environmental justice	Description	Indicator	Key sources
Distributional justice	Equitable access to goods and infrastructure, environmental amenities, services, and economic opportunities urban greenspace provide, and just the distribution of disamenities or pollutants across the urban environment	Arguments or considerations in greenspace planning that incorporate or reflect distributional justice principles, referring to for example distribution of goods and bads of greenspace, referring to functionality, quality, preconditions for use of greenspaces.	Schlosberg, (2004); Meerow et al., (2019), Kato-Huerta & Geneletti (2022)
Recognitional justice	To 'recognize' existing forms of inequality and the ways in which climate change interventions might serve to either exacerbate or redress these underlying structural issues.	Arguments or considerations in greenspace planning that incorporate or reflect recognitional justice principles: for example, referring to which groups are considered important as subjects greenspace planning, such as acknowledging the diversity of preferences and valued, social needs, local knowledges and governance perspectives.	Meerow et al. (2019), Bulkeley et al. (2014), Kato-Huerta & Geneletti (2022)
Procedural justice	Fair and inclusive decision-making processes to locate environmental goods and bads, or amenities and disamenities	Arguments or considerations of justice that incorporate or reflect procedural justice principles: referring to for example referring to conflict solving, representation, inclusion and information exchange.	Meerow et al. (2019) Kato-Huerta & Geneletti (2022)
Intersectional justice	The view that a combination of various aspects of an individual's or group's identity can	Arguments or considerations of justice that incorporate or reflect intersectional justice principles: recognizing that greenspaces are experienced,	Menton et al. (2020)

	create distinct forms of discrimination and injustices.	understood, sense and lived through various intersecting identities in locations affected by multiple environmental injustices and insecurities, shaped by diverse histories, and perceived through the lens of marginalized voices and practices.	
Corrective justice	Responds to historical moral wrongdoings, correcting them: can range from symbolic to compensation.	Arguments or considerations of justice that incorporate or reflect corrective justice principles: responses to historical wrongdoings and correcting them.	Zimm et al. (2024)
Transitional justice	How policies or actions can be sequenced: to discuss the dynamics of pathways or sequencing of policies and how they lead to a fair outcome.	Arguments or considerations of justice that incorporate or reflect transitional justice principles, for example argumentations on how policies can be sequenced: unjust policies for just outcomes, for example justifying the unfair process with a just end goal.	Zimm et al. (2024)
Multi-scalar justice: temporal and spatial justice (scale)	The complex spatial and temporal causes, consequences, and resolutions linked to EJ.	Arguments or considerations of justice that incorporate or reflect to whom justice principles apply in terms of time and space: to who does justice apply and when?	Menton et al. (2020)
Multi-scalar justice: ecological justice (scale)	A situation wherein non-human species and/or can make a claim to justice – not only humans.	Arguments or considerations of justice that incorporate or reflect ecological justice principles: who can make a claim to justice in terms of human and non-human species and nature.	Menton et al. (2020), Baxter (2004), Bauer (2023)

Table 1: operationalization of environmental justice dimensions

The analytical frameworks posed earlier by Meerow et al. (2019) and Kato-Huerta & Geneletti (2022) constitutes as the inspiratory papers for the operationalization of the three dimensions of distributional, recognitional and procedural justice, shown above, as it is used for constructing questions for the interviews, and analysing the transcripts of interviews on greening interventions and how they entail justice, as the authors provide an analytical framework for analysing documents. The authors used this scheme to assess the interpretations of equity and resilience. Here it is used similarly to assess planning documents on greenspace plannings.

The indicators shown in table 1 aim to measure the considerations and pursuit of environmental justice of greenspace planners, as reflected during interviews or as stated in documents. The analytical framework and indicators will be developed further during the execution of the research, based on the empirical data on justice applications in urban greenspace planning, taking an inductive approach.

3. Technical research design

3.1 Research strategy

This study employs the research strategy of case study analysis (CSA). This strategy can be defined as "an intensive study of a single unit for the purpose of understanding a larger class of (similar) units" (Gerring, 2004, p. 342). Conducting a case study is about studying a contemporary phenomenon in its real-life context, where often the boundaries between the phenomenon and context are not clear (Yin, 2009).

This strategy fits well with the aim of the research, to understand how environmental justice is pursued within the process of urban greenspace planning. Case study analysis allows for a deep understanding of the complexity of environmental justice in greenspace planning and allows to understand the nuances of how environmental justice is addressed. Case studies provide the opportunity to examine these dynamics in detail in real-life examples, offering insights that are important for both theory and practice.

More specifically, the embedded comparative case study design is selected as the appropriate research strategy (Yin, 2009). In this design, multiple cases are investigated, with multiple units of analysis within each case. The units of analysis in these cases are specific greening projects within the cities, encompassing both specific projects - such as parks - and more strategically oriented projects – such as parks meant for the whole city. Because single case studies are context-dependent, a comparative multiple case study across two cities and their greening projects is chosen, as this makes the insights more applicable to the entirety of the Netherlands. This contributes to literature, as the Dutch context is under researched on the topic subject of this study. Also, having an embedded design allows for a more detailed level of inquiry as deep exploration of units is possible. It allows for investigating several units within the same case, which allows for a focus on various aspects of the case, such as more strategic level greening projects, and more specific location-based projects. This way, the research can assess the pursuit of environmental justice both on a more strategic, as well as on a more operational level. Another argument for choosing the embedded case study strategy, is because it allows for the analysis different phases of the planning process in the pre-implementation phase, including agenda setting, preparation and design, and the policy formulation and decision-making. The embedded case study approach allows analysing the different parts of the planning process.

According to Yin (2009), three variables are considered important when selecting a CSA as a research strategy. These are the conditions regarding the form of the research question, the degree of control over behavioural events, and the focus on contemporary events within a real-life context. When looking at these variables, using the case study approach seems appropriate, as the main research question is a 'how' type of question. Furthermore, the degree of control over the behavioural events is limited, as the researcher does not have influence on the projects analysed. Third, the research focusses on contemporary events. Thus, the situation of this research aligns well with the research strategy of the case study (Yin, 2009).

Subsequently, the pursuit of justice considerations is not a phenomenon that is directly observable, such as for example the number of trees present in a park. The inclusion and consideration of justice can be seen as a complex social phenomenon, which requires *understanding* and an interpretivist scientific approach to capture subjective views. This study aims to understand how environmental justice is pursued within the process of urban greenspace planning. Also, it aims to contribute to the formulation of a general theory of environmental justice suitable for analysis of urban planning processes. The case study approach provides the opportunity for such a theory, as one can dive deep into a limited number of cases creating thorough understanding (Yin, 2009). Also, for this understanding, insights into the characteristics of the context of the phenomenon are needed. When conducting research on justice issues related to urban greenspaces, it can be difficult to distinguish between the phenomenon itself and its context. Doing a multiple case study creates the opportunity to analyse a phenomenon within its real-life context, and thereby makes this in-depth analysis possible (Yin, 2009).

3.2 Case selection

The selection of cases is based on the most similar case study design. As outlined by Seawright & Gerring (2008), this design in its purest form involves selecting a pair of cases that are similar in terms of contextual variables but differ in terms of the independent variable of interest. This approach has also been adopted in this research.

The most similar case study approach chosen in this research is based on the need to capture potential variations in the independent variable, while not selecting for variation in the dependent variable. The variation in the independent variable—how EJ is pursued by urban planners across different projects — is intentionally varied through the selection of cities with diverse political compositions while it is assumed that cities with more socially oriented coalitions may prioritize justice differently than those with more neoliberal right-wing compositions. Next to that, efforts are made to maintain similarity in contextual factors, by selecting cities of similar sizes in a similar geographical context of one single country and similar greening projects employed because most similar cases provide a stronger basis for generalization (Seawright & Gerring, 2008).

Another criterion for selection involves the existence of ongoing urban greenspace planning initiatives within the case. The case must demonstrate sufficient activity in urban greenspace planning projects to warrant research on the subject. Furthermore, the selection of cases relies on population density, as environmental justice risks seem predominantly present in urban areas, especially in urban cores and low-income inner ring suburbs (Wolch et al., 2014). Issues surrounding the equitable distribution of benefits and burdens are particularly noticeable in urban settings, where resources may be limited and must be shared among a large population. For example, urban neighbourhoods often concentrate vulnerable populations alongside hazardous environments (Corburn, 2017). Also practical considerations play a role in the selection of cases: access to the network of urban planners and speaking the same language as interviewees, makes it possible to conduct meaningful research. These considerations also contribute to the research's quality, in that it makes it possible to create thorough understanding through interviews and document analysis.

3.3 Case study description

3.3.1 Cases: Utrecht and Rotterdam

The selection criteria have led to the selection of the cases of Utrecht and Rotterdam: two Dutch cities, located in the contexts of the municipality of Utrecht and the municipality of Rotterdam. The cities are the cases within those contexts. The specific units of analysis are the urban greenspace projects within the cases. The specific units of analysis selected for Utrecht are, Nature area Zuilen, greening North-west and Greening Rivierenwijk, all in Utrecht. The projects of Nelson Mandela park and Hofbogen park were selected in Rotterdam. The unit selection was be based on a expected variation in justice outcomes. Below, an overview of the units of analysis is provided. Figure 3 below illustrates this multiple embedded case study design employed in this study.
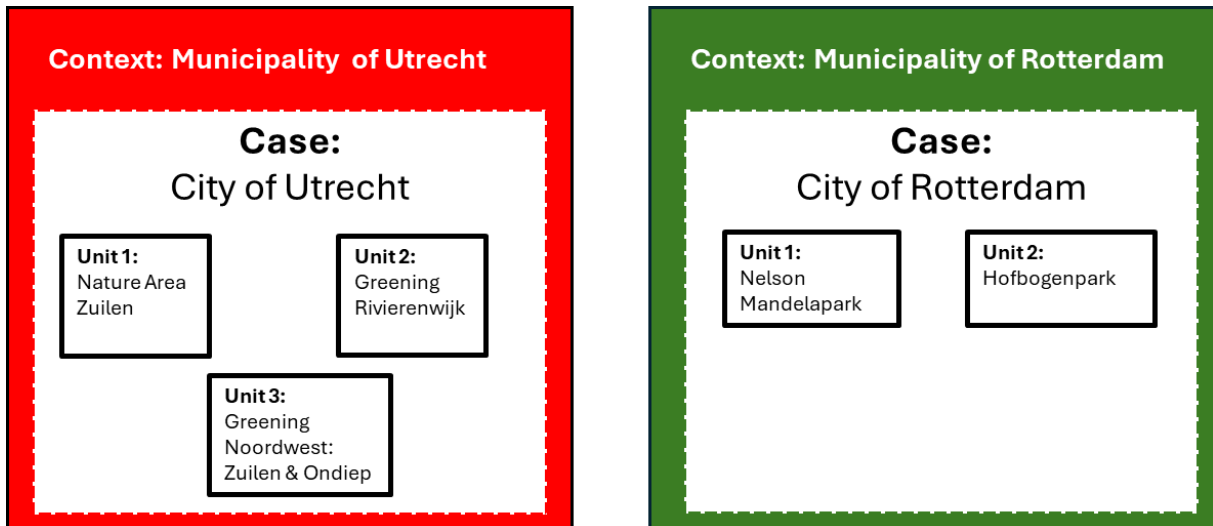
Figure 3: visual representation of the *embedded multiple case study* is shown, as inspired by Yin (2009).

3.3.2 The city of Utrecht

The first case selected is Utrecht, which ranks as the fourth-largest city in the Netherlands by population. Within the city, various greenspace projects are taking place. Utrecht was crowned as the greenest city in the Netherlands in 2023, an award given based on the project of re-greening the station area of the city. The most famous example of greenspace planning in Utrecht is the one shown in the picture below in figure 4, where a highway right next to the city centre was replaced by a greenspace in form of a park with a canal, which completed the full circle of the canal around the city centre again.

Figure 4: Greenspace changing the city of Utrecht (Fietsprofessor, 2024)

Utrecht wants to realize 4.4 km2 of green within its city boundaries: 75 square meters of green per household. Utrecht can be seen as an ambitious city in terms of greenspace planning. Utrecht's political city council Coalition with the Green-left, Labor party, Democrats, Student & Starter party, and Christian Union, I assume to be prioritizing environmental justice considerations in greening the city.

3.3.3 Units of analysis Utrecht

The units of analysis chosen within the city of Utrecht are: Nature area Zuilen (1), Greening Rivierenwijk (2), and Greening Noordwest: Neighbourhoods of Ondiep and Zuilen (3). Nature area Zuilen is about the redevelopment of an existing greenspace at the Northern edge of Utrecht. The other two units of analysis are about greening existing neighbourhoods, located in the Northern and Southern part of the city. The three project are briefly introduced below.

Unit 1 Nature area Zuilen

Nature Area Zuilen, located in the Northern part of Utrecht, is a key greening project aimed at expanding nature and public green spaces to maintain the city as a pleasant and healthy environment for its growing population. Within the wider greening strategy, Nature Area Zuilen is at scale level 3: creating new park-areas, as the municipality describes it (Municipality of Utrecht, 2023). This nature area is characterized by its diverse ecosystems, including grasslands, herbaceous areas, shrublands, and woodland patches, but is also used as farmland. A significant portion of the area is dedicated to nature-inclusive agriculture. The project also mostly involves the restoration of heritage sites and aims to better connect Nature Area Zuilen with surrounding neighbourhoods and industrial areas, enhancing opportunities for relaxation and recreation while preserving the tranquillity of the area. The enhancements are particularly intended for the residents of Zuilen and Overvecht, offering more walking paths, improved accessibility, and upgraded entrances with information boards and bicycle parking (Municipality of Utrecht, n.d.a) From birds eye perspective, the area looks as follows:

Figure 5: nature area Zuilen (Municipality of Utrecht, n.d. a)

Unit 2 Rivierenwijk

Rivierenwijk, a older neighbourhood in Utrecht, is undergoing significant green transformations to enhance the quality of life for its residents, especially in terms of climate adaptation due to high levels of heat stress in the neighbourhood. The initiative focuses on increasing the amount of green space, improving existing parks and introducing green short walks close to everyone's homes, and creating new opportunities for urban gardening and biodiversity. The project includes planting more trees, creating green roofs, and developing community gardens where residents can grow their own vegetables and flowers. Additionally, efforts are being made to make the green areas more accessible and enjoyable, such as by installing new seating areas, play equipment for children, and ensuring paths are well-maintained and navigable for all. Within the wider greening strategy, Nature Area Zuilen is at scale level 1: integral design of public spaces, as the municipality Council describes it the letter Strategy for Green (Municipality of Utrecht, 2023). Figure 6 below shows some examples of greening interventions planned in the neighbourhood.

Figure 6: Map of Rivierenwijk Neighborhood in Utrecht. (Urbanos, 2020)

Unit 3: Utrecht Noordwest: Ondiep & Zuilen

Close to Nature Area Zuilen described above, lies Noordwest, a part of the city assigned to enhance its green spaces through the initiative "Noordwest: Samen Groener Maken" (Noordwest: Making Greener Together). This collaborative effort initiated by the municipality aims to transform the neighbourhood into a greener area for climate adaptation and health reasons. Noordwest consists of neighbourhoods Ondiep and Zuilen, which can both be considered highly petrified, vulnerable to heat stress and water extremes due to the low amount of green infrastructure in the neighbourhoods. Both Ondiep and Zuilen can be seen as neighbourhoods with higher numbers of vulnerable inhabitants compared to other parts of the city. Through active community engagement, including workshops and collaborative planning sessions, residents play an important role in shaping green spaces to answer to diverse needs, with features such as community gardens, recreational areas, and biodiversity spots. By promoting environmental stewardship and fostering a sense of ownership among residents, 'Noordwest: Samen Groener Maken' strives to create a healthier, more resilient community that prioritizes the well-being of both its inhabitants and the natural environment. Below in figure 7, an areal photo of Noordwest area.

Figure 7: Areal photo of Utrecht Noordwest (Municipality of Utrecht, n.d.b)

3.3.4 The city of Rotterdam.

The second case selected is Rotterdam, the second largest city in the Netherlands, located on the west coast of the Netherlands. Rotterdam is a city located in the Delta of the Rhine River, and therefore is always challenged with water issues. Rotterdam can be seen as a city with a considerably more conservative-right wing in city council, with parties as Leefbaar Rotterdam, VVD, D66 and Denk in the coalition. The city can be considered ambitious in greenspace planning, being part of 100 Resilient Cities Network and has been considered frontrunner in terms of sustainable urban development (Spaans & Waterhout, 2017). The city deploys various greening projects, and recently invested 233 million euros in large urban greening projects.

3.3.5 Units of analysis Rotterdam

Unit 1: Nelson Mandela park

The Nelson Mandela park in Rotterdam is a urban greening project situated in Maashaven, an area in Rotterdam-Zuid. The city of Rotterdam is developing this park to enhance urban green spaces and provide recreational opportunities for local residents. Initially, the park was called Maashaven Park. The area was initially created as new nature area. When completed, the Nelson Mandela park will feature various amenities including sports facilities, leisure areas, and a connection to Maashaven waterfront, integrating natural and recreational spaces. This park is expected to improve local biodiversity, enhance the quality of life for residents, and serve as a catalyst for further neighbourhood improvements. The neighbourhood around the park can be considered vulnerable. See figure 8 below for an impression of the Nelson Mandela park.

Figure 8: impression of the Nelson Mandela park (Welch, 2021)

Unit 2: Hofbogen park

Hofbogen park in Rotterdam is an urban green space planned atop the historic Hofbogen railway viaduct. Stretching over two kilometres, it is set to be the longest roof park in the Netherlands. The park will transform the old railway line into a vibrant green corridor, offering a unique elevated escape from urban life. Residents and visitors can engage in various activities, from walking amidst treetops to sitting and socializing in a serene, nature-filled setting. The park's design includes features that promote biodiversity and sustainable water management, enhancing its role as a green urban oasis.

Figure 9: Impression of the Hofbogen park (de Urbanisten, 2019)

3.4 Operationalization of variables

The analytical framework provided in table 2 is used as a guideline for exploring environmental justice considerations within Rotterdam and Utrecht. The analytical framework provides indicators to operationalize the classical three justice dimensions of distributional, recognitional and procedural justice. Indicators and dimensions of justice form the foundation of the code-tree used to interpret interviews and documents. Based on this, predetermined questions were formulated to operationalize the indicators. These are based on literature, mainly the framework provided by Kato-Huerta & Geneletti (2022).

The operationalization of the other justice dimensions: corrective justice, transitional justice, intersectional justice and multi-scalar justice are based on the iterative process based on empirical observations, taking an inductive approach. Hence, the operationalization of these variables is based on the observations during data collection of the research. The codes were constructed during the process of inductive interpretation of data. It is important to recognize that this interpretation is based on common beliefs, norms, and principles, and thus contains a subjective element (Verschuren, Doorewaard & Mellion, 2010). By operationalizing these justice dimensions based on empirics, the research also addresses the lack of common understanding of how to identify aspects of justice in practice, especially in the context of climate adaptation research (Juhola et al., 2022: Chu & Cannon, 2021).

3.5 Data collection

In this research, data collection consisted of three main methods: review of academic literature, document analysis, and semi-structured interviews. The first method used was a review of academic literature, to start with an overview of contemporary scientific insights on the topic of environmental justice and greenspace planning. The conceptual framework and analytical framework are based on the literature review, answering sub-question 1. Databases used to search for academic literature were Google Scholar and Scopus. The second form of data collection was desk research in the form of document analysis of grey literature. Policy documents, strategy documents, vision documents and project plans that have provided insight into the planning of greenspaces for both Rotterdam and Utrecht that provided insights into how justice perspectives are addressed or used. Analysis of the documents is done by applying the analytical framework, which is presented at the end of the theoretical chapter 2. The third method is qualitative semi-structured interviews. These created the opportunity for interpretative analysis and provide room for respondents to explain their perspective on how they or their organization include environmental justice perspectives. This creates an opportunity for a deeper understanding of the extent to which justice issues are pursued in the planning processes, how they arrived at the different evaluation and assessment and what importance is assigned to each kind of justice dimension and how they made different trade-offs between justice dimensions within those considerations. Among respondents are urban planners at municipalities, which are most often the initiators and leading force within the urban planning processes (Levy, 2016).

For the case of Utrecht, ten urban planners are interviewed, of which four are working on specific projects of greening of the units of analysis, and of which six are working on a more strategic level of urban greenspace planning. For each case, several people who are working on greenspace planning from both a strategic level and a daily project-based level, have been interviewed. Examples of job descriptions of respondents are landscape architect, social architect, project manager, program manager, advisor, strategist, coordinator and urban planner In Rotterdam, nine respondents have been interviewed. The total number of interviews is nineteen. For the semi-structured interviews, a more inductive approach is used. Interview questions were formulated based on the same analytical framework described earlier. This framework conceptualized environmental justice in the context of urban greenspace planning. Based on the analytical framework, the semi-structured interviews guide is guided by an interview guide. See Appendix III for the interview guide. .

Additionally, data triangulation has been applied: this involves employing various data sources and methods in qualitative research to develop a thorough understanding of the researched phenomenon, thereby enhancing the validity of the results (Patton, 1999; Carter et al., 2014). Data source triangulation has been done by obtaining data from both interviews, document analysis and literature review. The use of these three methods also leads to method triangulation, enhancing internal validity.

Research materials

The research materials used for the desk research are planning documents, plans, policy documents or other relevant documents that provide insight into the formal planning process of the greenspace intervention. This data was gathered from municipal government websites, but also asked for via respondents of the interviews. The respondents for the field work/interviews have been selected after the researcher has reached out to the municipal organizations that are or were involved in planning the project. Using the concept of snowball sampling within the network of already familiar respondents, other relevant respondents are identified (Boeije & Bleijenbergh, 2019). The respondents relevant for interviews were urban planners employed by municipal governments as they are in lead of the projects. For an overview of documents analysed, see appendix I.

3.6 Data analysis

The data of both the interviews and document analysis have been analysed using NVivo 12 coding software, which allows deductive coding based on operationalization of the environmental justice framework (Boeije & Bleijenbergh, 2019). Based on the analytical framework codes and subcodes were constructed and applied to the texts of the documents and the transcripts of the interviews. Axial and selective coding will be used to work towards the results. Research question 1 will be addressed through a concise literature review, which is already done in chapter 2. Research questions 2 and 3 will be answered based on the combination of insights from the interviews and document analysis. Research question 4 will be answered solely based on insights from the interviews. The final research question, research question 5, will be based on a combination of insights from the interviews and those found within the literature of the brief literature review. Once the four research questions are answered, there will be enough insights to formulate an answer to the main research question.

3.7 Ethical considerations

Furthermore, as a researcher, it is important to be aware of ethical considerations or dilemmas inherent to conducting research. This includes appropriately processing research data. Therefore, in this study, the six ethical principles outlined by Rosenberg (2015) have been utilized. Rosenberg's (2015) principles encompass informed consent, making beneficial advancements, avoiding harm, and upholding honesty, equality, and justice. Below the application of the principles in this research are discussed.

Regarding informed consent, participants are provided with an informed consent form, which informs them that the research is anonymous, that data will be anonymized, and are made aware of what it means to participate in the study, see appendix VI. Participants can withdraw from the study at any time without giving a reason and know they are free to ask questions at any point. For the principle of "making positive improvements", this research contributes creating insight into how environmental justice is applied by urban planners. This can be valuable information for other governments, potentially leading to an improvement of justice in greenspace planning. Regarding the principle of doing no harm, there are minimal risks in this research. The research will not be published, anonymized, and not shared with third parties, so there is no need for concern in that regard. Anonymization of respondents is especially important as justice can be a subject bringing tensions due to different views colliding. Therefore, respondents are completely anonymized, and quotes are rewritten if they refer to individuals or information which make individuals traceable. Concerning the principle of honesty, equality, and justice, there are no reasons to withhold information or be less transparent about the research towards participants.

Furthermore, data will be processed safely: all data collected will only be used for the purposes of this research. Any personal information is treated confidentially. Data is deleted after finishing the research. For the interviews, an informed consent form will be provided to respondents, and will be asked for consent. Data will be managed in line with GDPR regulations, where data will be anonymized, and stored using the safe OneDrive environment provided by Utrecht University.

3.8 Quality criteria: reliability and validity

Two crucial quality criteria in scientific research are reliability and validity. Reliability concerns the precision of data collection methods. A method of data collection is considered reliable if it yields consistent outcomes when the observation is repeated, as long as what is being measured remains the same (Boeije & Bleijenbergh, 2019). Reliability can be understood as both internal and external reliability. Internal reliability in qualitative research pertains to "the consistency of observations among different observers" (Bryman, 2016, p. 384). However, in this research, there is only one observer, making it challenging to ensure internal reliability. Nonetheless, with the involvement of fellow students and the research supervisor in discussions and readings, support was provided. Therefore, the research was not solely conducted, contributing to internal reliability. External reliability refers to the extent to which a study can be replicated. Efforts were made to ensure external reliability, allowing the research to be replicated as closely as possible, by describing and disclosing the research context and methodology in as much detail as possible. This makes it possible that the study can be repeated in the same manner.

Validity refers to the extent to which what is measured is the same as what is intended to be measured. It entails accurately identifying what is observed and ensuring that it is based on solid evidence that the concept can be established or measured in that manner. Validity means that systematic errors have minimal influence on the observation (Boeije & Bleijenbergh, 2019). Similarly, validity can be categorized into internal and external validity. External validity concerns the degree to which findings can be generalized across various social contexts (Bryman, 2016). In this research, the external validity is maximized by selecting cases which can together be seen as representative of the variation present in the Dutch context, by choosing two cities with different political compositions and functions. Hereby variation coverage is aimed for. Internal validity is about the extent of conformity between the researcher's observations and the theoretical ideas the researcher develops. It answers the question of whether the conclusions drawn by the researcher can actually be inferred from the observations made. In this study, the observations are grounded in the operationalization of concepts from the literature, which enhances internal validity.

4. Results Utrecht

Chapter 4 and 5 aim to analyse how environmental justice is pursued within the two cases: Utrecht and Rotterdam. These chapters address sub-questions 2 and 3. For an overview of the interviews conducted and the documents consulted, see appendixes IV, V and VI at the bottom of this document.

The findings are structured in line with the research questions. Each question is addressed from various perspectives: a city-wide perspective and from the perspective of the units of analysis. For Utrecht, the units are the urban greening projects Nature Area Zuilen, Rivierenwijk, and Noordwest. The Rotterdam units are the Nelson Mandela park and Hofbogen park. The interviews and documents analysed are all in Dutch, the citations from these sources were translated into English based on the interpretation of the researcher. The findings on conceptualization, prioritization, application of environmental justice, and trade-offs between justice dimensions have been organized based on the distinction between city-wide and unit-level structures for clarity. However, it is important to note that justice considerations manifestations are not dichotomous between these two levels of analysis.

The results of this study show that ecological justice, the subdimension of multi-scalar justice, occurred more as a justice dimension on its own, as a goal in itself. Therefore, the dimension of ecological justice is discussed as a separate justice dimension in the results section. Further reflections on the theoretical implications of this finding are provided in section 7.3.

For overview purposes, at the start of each results-(sub)chapter I provide an overview of how environmental justice considerations are applied on each level. For this overview I employ a five point scale, which is briefly explained below in table 2. Each level represents a different depth of commitment and integration of justice principles in the planning process. The darkness of the colours in table 3, 5 and 7 indicates strength of the application, based on the rough indication.

Level	Explanation
Minimal	This justice consideration is rarely addressed and not systematically integrated into planning for urban greenspaces.
Limited	Some elements of the environmental justice principle are present but not fully developed.
Moderate	A fair level of implementation of this justice principle, though not comprehensive into the planning process for urban greenspaces.
Substantial	Most elements of the consideration are in place and the principle seems applied often.
Extensive	Environmental justice principle is fully integrated and comprehensively applied in the planning practice.

Table 2: Five level scales for overview on how environmental justice are applied.

	Utrecht overall	Utrecht strategic level	Utrecht operational level
Distributional justice	Extensive	Extensive	Extensive
Procedural justice	Moderate	Minimal	Extensive
Recognitional justice	Moderate	Moderate	Moderate
Corrective justice	Substantial	Substantial	Substantial
Transitional justice	Limited, but growing	Limited	Limited
Intersectional justice	Moderate	Moderate	Moderate
Ecological justice	Substantial	Substantial	Moderate
Multi-scalar justice	Limited	Limited	Limited

Table 3: Overview of how justice dimensions are applied in Utrecht. The darkness of the colour indicates the strength of the application. For example, dark blue refers to extensive application of the justice principle, where light blue means minimal application.

4.1 Conceptualizing, applying and prioritizing justice in Utrecht

4.1.1 Strategic level findings Utrecht

In this section I discuss how environmental justice is conceptualized, applied and prioritized in Utrecht, from a broader strategic level perspective, which encompasses overarching urban planning and policy decisions taken in Utrecht, as earlier described in the introduction. Distributional notions of environmental justice are dominant in Utrecht, both explicitly and implicitly. Distributional justice perspectives are often combined with corrective and intersectional notions of justice in which the principle of sufficientarism seems to be underlying, as everyone should have enough greenspace (Buitelaar, 2020). Procedural justice is also considered important, although implicitly and playing out differently at strategic level compared to specific urban greening at operational level. Ecological justice is also gaining ground, together with transitional justice perspectives. Recognitional conceptualizations of justice remain largely absent. Most justice considerations are made implicitly, as reflected in the interviews and documents analysed.

Below, the results for application, prioritization and conceptualization for each justice principle in Utrecht are discussed. The order of the discussion of justice principles is based on domination of the discussed justice principle in the findings about how urban planners conceptualize and apply principles.

Distributional justice

To start, the conceptualization and application of justice considerations in Utrecht mainly reflect distributional notions of environmental justice, as evidenced by the interviews and documents analysed. The main challenge of the city is to keep the amount of greenery in balance with the city's growth: the city calls this approach 'healthy growth', in its spatial strategy for 2040 (Municipality of Utrecht, 2021).

More specifically, the city aims to maintain both the current amount and the quality of green space per capita equal despite its growth. However, this is challenging due to growth through densification, not expansion. With Utrecht projected to grow by 25% to 460,000 inhabitants by 2040, mostly within the existing boundaries, the use of public space use will intensify. This increase of pressure on the existing public space enforces and emphasizes the distributional notion of environmental justice considerations in both policy documents and interviews.

Within the policy document of the Spatial Strategy Utrecht 2040, the leading policy document for spatial development, the city adopts the policy tool of the Utrecht Barcode (see figure 10). This tool is a visualization of the use of public space, showing the various uses of space in the city. This allows to combine various functions, leading to a more effective, but more intensified and densified use of space. The specification on distribution for whom is framed using the Barcode. This enables the municipality to ensure each area has enough greenspace available from an egalitarian perspective (Buitelaar, 2020). Additionally, it allows for corrections where needed from a corrective justice perspective. Urban planners prioritize, meaning that the worst off are prioritized, as visible in the decision for projects of Rivierenwijk and Noordwest as those neighbourhoods lack greenspace.
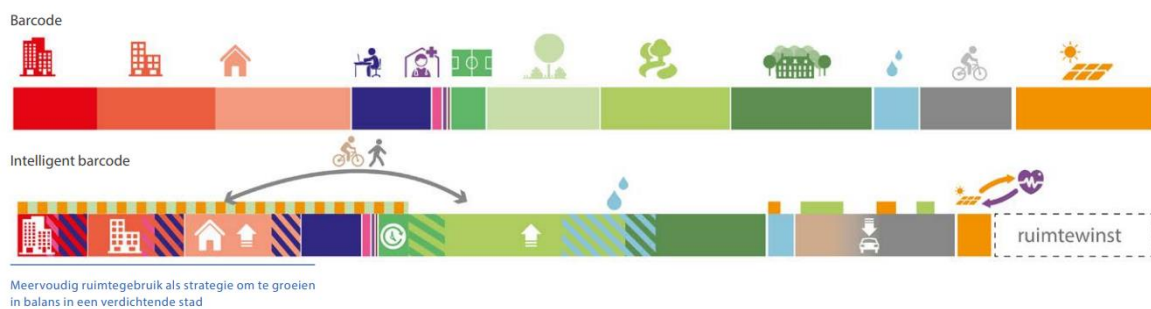
Figure 10: The Utrechtse Barcode (Municipality of Utrecht, 2021) This figure shows the barcode used in spatial planning: the barcode shows the distribution of space, helping the municipality to make sure that growth stays in balance. For example, the orange part shows quite a part of the space is used for housing. If housing could be combined with office space, as indicated by the dark blue bar, space could be used more efficiently. This is visible in the bottom bar.

Furthermore, intense battles for space due to densification highly emphasize the distributional justice perspective. The use of space for sports is in direct conflict for the use for greenery and the use of space for sustainable energy infrastructure. R7 explains:

> **R7**: "The struggle for space is huge, especially in relation to green spaces, energy, and sports. … Physical activity is healthy, especially for certain areas in the city where people have fewer opportunities to play sports and can't afford a gym. But that directly conflicts with our green space objectives. Because we also want to green that space, and it conflicts with our energy objectives as a city. So, the fight for unbuilt space is the biggest between these three things."

Another example of the distributional approach applied to specifically greening is the approach called: 'green scale-up', adopted in the multi-year green program for 2020-2023, see figure 11 below (Municipality of Utrecht, 2020). This approach creates a focus on adding 440 hectares of green space while 60,000 homes are constructed within the city, as well as incorporating greenery at various spatial scales. The scales are visible in the figure below. This example emphasizes the distributional notion of enough (quantity) and accessible (quality) green in the city, at various scales: from small to large scale: Garden and street (1), plantations and neighbourhood garden (2), City Park (3), Green wedges (4) and Greening around the city (5).

Figure 11: the 'Green scale-up', from the Multi-year Green Programme (Municipality of Utrecht, 2020).

In the Spatial strategy Utrecht 2040 (RSU2040): the goal of 75m2 square meters of green per household reflects the quantitative approach to greening for Growth in balance. Accessibility is also an important factor in the distribution of greenspaces: all greening should be accessible within ten minutes: the municipality calls this the proximity principle. The municipality applies three distributional principle throughout their greening development strategy: the proximity (10 minute) principle (1), growth in balance (2) and unequal investing for equal opportunities (3). The latter principle is from the Coalition agreement (Municipality of Utrecht, 2022b) and is applied throughout various policy areas in the municipal organization. The principle means that the resources the municipality has available are going to the people who need it most, from a corrective rationale. This is reflected in the municipality choosing North-West and Rivierenwijk-area neighbourhoods as place to invest in greenspace planning projects. The following quote by R8 illustrates this distributional corrective and intersectional interpretation of justice in greenspace planning.

> **R8**: "We started in Noordwest and Rivierenwijk because those are the least green neighbourhoods in Utrecht. So there is the most need, and also in the context, the coalition agreement strongly emphasizes reducing inequality: unequal investing for equal opportunities, which you have already heard. So in Noordwest, especially Ondiep, well, there are quite a few residents with a lower socio-economic status."

Corrective justice

In Utrecht, the distributional notion of justice is often conceptualized in combination with corrective and intersectional notions of justice. This corrective conceptualization of justice is of course reflected in the principle of unequal investment for equal opportunities, R1 explains this further:

> **R1**: "One is that we ensure sufficient, good quality green spaces grow along with the city. So, it starts with making sure that everyone in the city benefits or at least does not experience a decline. The second is that when we invest in green spaces, we really look at where those green spaces are poor or insufficient. And addressing that by looking not only at the quality and quantity of the green spaces but also at the socioeconomic status of those neighbourhoods."

Corrective justice is also conceptualized by R7, as restoring previous mistakes of planning, where for example the city-ring road under Hoog-Catharijne Mall has removed and the canals and the park surrounding the canal were recovered, as also shown in figure 4. Another example mentioned is the Leidsche Rijn canal, which was seen as a mistake to close because boats cannot reach the city centre from the Amsterdam-Rhine Canal. Corrective justice is thus conceptualized as restoring past mistakes by the municipality.

Intersectional justice

The intersectional conceptualization combined with the distributional notion of justice is explained well by R7. They combines several aspects that could affect the vulnerability of an individual: employment,

life expectancy, income and education level. These factors all together form a reason for investing in greening in those areas, reflecting an intersectional perspective. R7 explains:

> **R7:** "We assigned several scores to these neighbourhoods based on employment participation, life expectancy, and other social aspects. We categorized them into two categories: category two and category three, with three being the worst. In category three, where opportunities are low, we have areas like Overvecht. We also overlaid these areas on the ten-minute city maps. I created a map to highlight where the most paved areas are in the city. For example, Ondiep, Noordwest has more than 70 percent paving in its neighbourhood. If you consider climate change, you could address that. And if you also monitor the social divides, you have two reasons to take action there. This really pertains to justice. This is serious—one would need to have strong arguments to say it doesn't matter."

Furthermore, distributional justice can be seen as the starting point for of justice: other forms build upon this one and are to be included later on, when an acceptable amount and quality of greening has been realized. R5 illustrates this point, when asked on whether distributional justice can be seen as the starting point for environmental justice in greenspace planning:

> **Interviewer**: "Yes, yes, so it's actually always, yes, that, that's the starting point, so to speak, to get things rolling, to set it in motion."
> **R5:** "Yes, we now have a task exactly, and the rest is also needed to ensure that, well, that everyone can benefit from the green spaces and the city's climate resilience. Yes, and those are things we are increasingly developing. So we're looking, it was established in 2021, so we are still at the beginning, let's say, this transition, and you can see that we are increasingly focusing on other forms of justice as well."

Procedural justice

Also procedural conceptualizations and applications of justice have shown to be prioritized, increasingly when greenspace planning takes place in a operational level. To put the dimension of procedural justice into context, it is important to know that in December 2022, the municipality of Utrecht was confronted by the City's Court of Audit that participation processes were not functioning well (RTV Utrecht, 2022). As a response to this, the municipality is currently working hard to get to a new participation strategy, no Utrecht without U (you). The reprimand by the court of audit had a sharpening effect that participation, and procedural justice therefore, has increasingly been prioritized. Still, inclusive participation remains a challenge for the municipality. This is also mentioned by R1 who describes how the strategy on strategic level came about in an untransparent way, reflecting a lack of procedural justice considerations, the process being a black box:

> **R1**: "No, we really set up an extensive process to do the Long term Spatial Plan (MPR) properly, but also the preliminary work for it. To ensure that how it used to go, those task leaders and spatial coordinators would get together in a room and write down what they needed. And then they would have written down together that they needed more than was available. And then, in my view, it was a kind of black box or arm-wrestling, and something would come out of it."

The procedural conceptualization and application of justice do not occur much at the strategic level perspective on greenspace planning. R1 explains the municipality was wrong not involving citizens, but 'the city' (residents) are since just now increasingly involved in decision-making at the strategic level:

> **R1**: "In this RSU (Spatial Development Strategy), we did not involve the residents, or did not involve them well. That was simply a mistake. But this past spring and summer, we worked on an urban development vision, and with that, the municipality was fully engaged with the city."

Several respondents, R2, R7 and R9, express doubt about the current emphasis on procedural justice, particularly regarding participation efforts. For example, R7 also emphasized that residents are becoming tired of participating in greenspace projects. However, R7 shared it is about finding a balance

between participation, and only informing people and making decisions without consulting inhabitants, including perspectives of transitional justice. This remains a challenging exercise however:

> **R7:** "You also notice that people eventually get participation fatigue. There's so much happening in a city, you can participate in everything. Yes, and the question is: what do you still participate in and what not? … That's a very difficult question because it costs a lot of time, a lot of money. So, I sometimes wonder what the exact added value of participation is"

Finally, procedural justice is not only conceptualized as an externally oriented process to be conducted in participation with residents, but also as an internal process, within the municipal organization of Utrecht. R2 shared his views on the tension within different policy departments fighting for space, illustrating the compartmentalized approach within the organization. This leads to an unprofessional situation where the municipality is internally battling on how space should be distributed, leading to arbitrariness for the outcomes of the project. R2 explains:

> **R2**: "Well, actually, how it's going now, I find it far from ideal. When I think about the challenge, the topic of greenery, where I work, what I really think we need to address, is the way we weigh the choices we make. When it comes to greenery. And therefore, because there is still too little system and process in place for it, in practice it often happens in a very unprofessional manner, which makes it difficult, from a standpoint of justice, to explain why we choose one thing and not another."

This procedural challenge as well pose difficulties from a democratic standpoint, as it reduces transparency and democratic accountability.

Transitional justice

Transitional justice notions on policy sequencing, or choosing short term injustices over long term justices, appear to be growing among the urban planners, also at the interplay of the strategic level and the operational level. Several respondents indicate that having procedural justice at operational level means having to give up distributional justice at a strategic level, indicating transitional questions of justice where the short term justice leads to a long term injustice because the municipality cannot provide the 440 hectares of greenspace, as decided in the RSU2040.

Ecological justice

Ecological justice considerations are considered increasingly within the greenspace planning of the municipality of Utrecht., In the theoretical conceptualization of ecological justice from literature, as provided in chapter 2, it was discussed that it is important to consider the scale to which the ecological dimension extends. Therefore, ecological justice is conceptualized as a scale variable. The data showed that ecological justice is not exclusively viewed as a scale variable. In practice, it serves more as a goal in itself, as separate from other justice considerations.

Furthermore, ecological justice is considered in combination with the distributional justice: connections between green areas for ecological connections are considered important, for biodiversity, creating so called ecological infrastructure and the green web, where the city is viewed as an ecosystem in the Green structure plan from 2017 (Municipality of Utrecht, 2017). The green structure plan of Utrecht also includes ecological perspectives in the selection of trees, which contribute to the living habitat of birds, bats and insects. At a strategic level, the ecological importance of the green framework just discussed is however primarily seen as subordinate to the value of the framework for human use. R1, strategic urban planner, explains:

> **Interviewer**: "Yes, yes, and about that green framework, how is it viewed? Is it also seen as helping nature, or is it solely for the benefit of humans, for example?"
>
> **R1**: "Primarily the latter, but it also benefits nature to some extent."

Another observation is that the conceptualization of ecological justice is specie-selective: some species are put to the foreground, for instance to ease participation processes for greenspace planning, as a form of selective ecological justice to ease procedural justice. Making residents aware on the importance positively affects nature, is the reasoning R8 explains:

> **R8**: "Yes, it's actually two-fold. You make it accessible, whether for the hedgehog, the butterfly, or the bee. So, you also make it more attractive for those animals. But essentially, you still design it primarily for humans, so that they have a certain experience there, and through that indirectly, it also benefits the ecological value, because it raises people's awareness."

Finally, the extent to which ecological justice is applied is growing, but ecological justice efforts remain difficult to attain, partly due to nature not being able to participate. R2 explains:

> **R2**: "The awareness is growing that we must design the city for more than just humans, and you notice that while this recognition of ecological justice is growing, nature often still gets the short end of the stick, partly because nature doesn't participate."

Recognitional justice

At the strategic level, recognitional conceptualizations of justice which refer to the equal acknowledgement and respect of different identities and associated social status, and making sure to include their interests, remained largely absent in both the interviews as in the documents analysed. The findings on recognitional justice conceptualization are well summarized by R8, who explains that recognitional justice efforts are growing, but remain passive mostly. Actively engaging and acting upon this recognition is still not happening.

> **R8:** "Yes, and I think we are currently in a phase of passive recognition. Instead of actively engaging with it, we observe, right, that there are all kinds of different people we are not reaching, so all kinds of different influences, cultures, and various needs, we acknowledge that and we try, right. So, we think we are trying, but I believe there is still progress to be made in this area."

The importance of recognitional justice is however acknowledged, but specific methods, strategies and tools to pursue recognitional justice in the greenspace planning remain a search, also due to the compartmentalized approach within the municipal organization causing social and spatial questions to be approached divided, while they are highly intertwined in practice. The consequence being to make decisions without consulting those affected. R3 explains;

> **R3**: "I actually think that at the moment, no, there is still a real division between the social domain and the spatial domain in the sense that, when there is a lot of complex issues involved, we often discuss people who, for example, live in poverty: as a result, they experience a lot of stress because they can't afford their rent and need to focus heavily on that. Issues like language barriers, unhealthy lifestyles, lack of exercise, or poor diet are prevalent, and there's much more focus on how to directly solve these problems rather than looking at, for instance, whether these people could benefit from being able to take a healthy walk outside every day in a good, green environment, which could also help. I think that connection isn't really being made yet."

Justice from a recognitional perspective also means including various meanings of greening. From a recognitional perspective, the interest of the car should also be included for people who have a practical job: this is an important question as replacing parking spots with greenery is often a dilemma. Now, still everyone in Utrecht has access to a parking license, from an egalitarian rationale. R7 explains how the different identities are increasingly recognized in greenspace planning, but that it remains a challenge how to differentiate between them:

R7: "Practical jobs often require a car. Theoretical jobs, well, they often get a company car, but that's becoming less common. They can easily use public transport or an alternative. The practical jobs, they need their service van or a car because they have a taxi company. Well, that's how it is, they have different needs, and how do you differentiate between them?"

Multi-scalar justice

Specific references to explicit multi-scalar justice considerations are generally absent within the justice consideration employed by the urban planners in Utrecht. However, the spatial dimension of justice has been conceptualized in some sort. The ' Utrecht ten minute city' approach from the 2040 Spatial Strategy reflects temporal conceptions of distributional justice, from street scale to strategic level. Its goal is to create enough greenspace on all scales for accessibility of green for everyone in the city within ten minutes, from an egalitarian rationale.

Furthermore, at the strategic level urban planning process, long term temporal justice is conceptualized as ten years, so processes of for example gentrification (Anguelovski et al., 2019) are not considered as an important justice consideration within greenspace planning. This might have to do with the political system, wherein elections are held every four years, so politicians and their administrations consider long term justice considerations less important than short term interests.

Also, multi-scalar justice considerations, in the temporal dimension, is conceptualized from historical perspectives of planning. R3 shared that historically, parks have were not developed in participation with residents, which leads to a misalignment of park functionalities with the needs and wants of residents, which can be seen as unfair from a distributional and procedural justice view, as explained above in the discussion on corrective justice on the strategic level. R3 explains:

R3: "I think that many park layouts in the past were not created in participation with residents, so we also don't know what the desired use is. We don't know which target groups visit them and for which target group you therefore want to design."

4.1.2 Operational-level findings Utrecht
Patterns of justice conceptualization, application and prioritization

On the operational level of greenspace projects in Utrecht, justice is conceptualized, applied and prioritized predominantly in frames of distributional and procedural justice. Corrective justice notions also played a role, combined with distributional justice notions. Transitional justice and ecological justice notions gain attention. Notions of recognitional justice remain limited. Challenges concerning procedural and distributional justice are exacerbated by the spatial constraints of a densely built city, necessitating trade-offs for green space allocation, also on the operational level.

Distributional justice

The distributional justice perspective is often connected to corrective justice notions, aiming to create an equal distribution of dis-amenities of climate change and a lack of greenspace. First, the areas of Noordwest and Rivierenwijk are selected as places for greening by the municipality, based on the idea that residents living in Noordwest and Rivierenwijk are most vulnerable for disamenities of greening and that they are vulnerable in various ways, also heeding the idea of intersectional justice as well to help people that are vulnerable not only in terms of lack of greening, but also in social and economic ways. The following quote by R8 explains this perspective:

> **R8:** "We started in Noordwest and Rivierenwijk because those are the least green neighbourhoods in Utrecht. So there is the most need, and also in the context, the coalition agreement strongly emphasizes reducing inequality: unequal investing for equal opportunities, which you have already heard. So in Noordwest, especially Ondiep, well, there are quite a few residents with a lower socio-economic status."

This also applies to Nature Area Zuilen. This project predominantly employs procedural justice considerations, focusing on fair decision-making processes based on participation, while also addressing distributional justice on a strategic level scale to rectify greenspace deficiencies in neighbourhoods of Overvecht and Zuilen, which are neighbourhoods that experience a lack of (qualitative) greenspace.

Procedural justice

On the operational level, environmental justice is also often conceptualized and applied as procedural justice, with the municipality engaging with community members in designing neighbourhood greenspaces. Greenspace planning is not only a goal on itself, but also viewed as a tool to reinforce social cohesion in the neighbourhoods. Participation is seen as the main tool to enhance this cohesion. The starting point is to do the greenspace planning together with the residents, as also in the unit of Noordwest. However, in terms of procedural justice, representation and making decisions based on differing interests and opinions is a large challenge, showing limited inclusion in procedural justice efforts. R8 explains:

> **R8:** "Yes, and we really struggle with that procedural justice. How do you make a decision, say, in a street, and then there's always the question: how many people need to be in favour of the compensation and how many need to be against it. Well, the policy of 'making the city together' has stated: we are not going to make statements about that, because if someone is very disadvantaged by it, even if it's just one person, then you don't do it. So that is but we find it very difficult because then you have an initiator who wants greenery and has 60 people with him on the street. And then there is one person who says: it's not going to happen, and then do you change your plans for that one person?"

Recognitional justice

Recognitional notions of justice appear difficult on the operational level of Utrecht. R8 shared that recognition is just recognition by now, and not active acting on this perspectives. This should have and is getting more attention within the municipality. The following quote by R8 reflects well how recognitional justice is conceptualized and applied on the operational level of greenspace planning.

R8*: "Yes, and I think we are still at that stage of passive recognition. Instead of actively addressing it, we observe that there are various people we are not reaching, with different influences, cultures, and needs that we acknowledge, period, and we try. So, we think we are trying, but I believe we can still make progress in that area."

Another example from the unit of Nature Area Zuilen is provided by R2: the main challenge concerning the procedural justice in the Nature Area Zuilen project is that recognitional justice did not happen early enough in the participation process. By insufficiently recognizing the variety of interests and concerns in the first vision document 'Vision Nature Area Zuilen September 2022', the municipality created a difficult situation for itself. R2 illustrated:

R2 "We actually started this participation process at the Zuilen nature reserve because a vision had previously been drawn up and a lot of criticism came from the inhabitants, on the basis of which you could say: well, then we might not have enough listened, so we may have not acknowledged the concerns enough. "

Hence, the observation here is that the recognitional justice dimension can be seen as a condition for procedural justice. The lack of recognitional justice at the start impacts the procedural justice perceptions of citizens: this is the municipality's responsibility to shape the framework of participation, to manage expectations. Regarding the importance of procedural justice, the municipality took a step back to create a working group for residents, to address recognitional justice more. This is explained in the starting document of Nature Area Zuilen (Municipality of Utrecht, 2024a):

"Based on the number and content of the responses, it was decided to take a step back. The draft vision (for Nature Area Zuilen) lacked sufficient consideration for the existing values of the area and had not been sufficiently developed in collaboration with the community, which was evident in the feedback received. Therefore, we chose to form a working group consisting of residents, stakeholders, and officials to collectively develop a new vision for the area"

Transitional justice

The slow and complex participation process, intensifies interest in transitional justice considerations among greenspace planners. According to R10, climate change and the biodiversity crisis have shifted urban greening from optional to essential, particularly due to significant heat stress risks in the neighbourhood. This shift may compromise procedural and recognitional justice considerations, to fulfil distributional justice—the right of residents to have greening for health reasons, as responsibility of the municipality to take care of citizens. R10 explains:

R10: "I don't understand why our "polder model" always compromises and never takes decisive actions. That's just how it is. And that is part of the Netherlands, part of being Dutch—it's ingrained in us. If you look far enough at a water management system, they can discuss everything with everyone. And we have extremely good water systems, that we are very good at, because of the poldering. What we shouldn't do is apply this to every square centimetre in front of people's doors, because the functions and challenges ahead of us are too significant for that."

Ecological justice

At the operational level, ecological justice is gaining importance but has not yet become the predominant focus. It is increasingly recognized, yet its implementation faces challenges due to nature's lack of formal representation. The dedication of ecologists working on projects and the strong influence of local residents' opinions have led to a de-prioritization of recreational values. This shift is largely due to the participation process where local stakeholders wield significant influence, often advocating for conservation over recreation. The Nature Area Zuilen project, as described by R2, highlights this shift:

R2: "Nature development has primarily taken the lead here, and when we look at recreation, it has more or less adapted to the other goals we have with this development. So, we could have

chosen, for example, to make that area into light meadows and set up picnic benches, or even create a festival site. That could have been possible. And again, there are many people from Utrecht who like to go to festivals, so you are also catering to a specific audience with that. But because the community we collaborated with was very critical of this, we have now chosen to give more space to nature development. "

Moreover, ecological justice is regarded not merely as an aspect of distributional justice but as a standalone goal. An interesting development in advocating for ecological justice emerged when R8 considered introducing a persona for wildlife in a future vision map for the neighbourhood. This idea to represent animals such as hedgehogs or butterflies in planning discussions, although not realized due to time constraints, signifies a shift towards integrating ecological perspectives more thoroughly into urban planning. R8 explains:

> **R8:** "So we worked with personas, and then we asked ourselves: should we create a persona for the animals, like a hedgehog or a butterfly, to make that one of our personas? Because normally, should that maybe not be one of our personas? And we didn't end up doing it because we were a bit, well, I think just practical, so we ran out of time."

Multi-scalar justice

Finally, from a multi-scalar and corrective justice perspective, environmental justice is conceptualized as conserving and restoring the historical- cultural value of the heritage of Nature Area Zuilen. The starting document 2024 for the nature area Zuilen states that the history of the area should be at the forefront, illustrating this observation (Municipality of Utrecht, 2024a):

> "By restoring lost cultural and historical elements, we bring the history of the area to the forefront. It tells the story of the region. When visiting the area, the rich past becomes one of the highlights" (Start document Nature Area Zuilen, 2024)"

R8 also shared that the approach by the municipality can be characterized as reactive and small scale oriented, when discussing the ecological justice perspective. R8 stated he or she is missing an integral vision on a neighbourhood level. A conceptualization of multi-scalar justice in temporal terms is thus missing:

> **R8**: "Yes, that was the ecological justice, right? Yes, that's an interesting one because, in addition to those neighbourhood initiatives, we are also going to create a map. Currently, we are being reactive; a resident comes with a question, and we respond to it. But we actually still lack a plan of what the green neighbourhood will look like in 30 years."

In relation to multi-scalar justice, which is about application of justice principles in time and space, I observed that in the case of Nature Area Zuilen, procedural justice considerations play an important role on a project based level, and on a strategic level scale, procedural justice is less important and justice is mainly conceptualized as distributional justice. Also, R2 felt there is a lack of integrated assessment or considerations framework in which a transparent and clear consideration can be made by the municipality. In the current practice, justice considerations are dependent on the projects characteristics and conditions, and on the personal efforts or character of managers working on the project. This finding also emphasizes the departmentalized approach within the municipality. R2 explained:

> **R2**: "Well, in this case, for this specific project (Nature Area Zuilen), I do know who got their way the most. But if you talk about who generally gets their way and how that is determined, I think, we often have little to go on, we don't really have a kind of benchmark for that, so to speak. So, it is often an internal struggle that I sometimes find difficult to explain (to residents). So, it's not really about having a specific idea of justice behind it, but more a result of, how do you say, pushing and pulling."

4.2 Trade-offs between justice principles in Utrecht

Table 4 below provides an overview of what trade-offs urban planners face at the strategic level and at the operational level in urban greenspace planning practice in Utrecht. More extensive discussion of these trade-offs takes place in 4.2.1.

	Dimension	Dimension	Brief explanation
Strategic level			
1	Distributional justice	Procedural justice	City scale distributional considerations are at odds withs local scale procedural considerations
2	Procedural justice	Transitional justice	Procedural justice efforts are at odds with transitional justice considerations
3	Ecological justice	Distributional justice	Due to densification of the city, the ecological interests are at direct odd with human interest for greening.
4	Ecological justice	Procedural justice	Representation of human interests affects representation of ecological interests in participation of greenspace planning
5	Distributional justice	Distributional justice	Quality of greenspaces versus quantity of greening across the city
Operational level			
1	Distributional justice	Procedural justice	Procedural justice efforts (intensive participation) are very costly, leading to distributional injustices in the bigger picture due to these costs
2	Recognitional justice	Procedural justice	Recognizing values and interest of groups with non-dominant groups sometimes requires prioritizing those interest over others: this leads to resistance
3	Procedural justice	Multi-scalar justice	It shows difficult to include ecological and future generations interest in participation processes: current participation processes are not set up to solve this

Table 4: Overview of trade-offs in Utrecht, both on strategic and operational level of urban greenspace planning.

4.2.1 Strategic level trade-offs Utrecht

On the strategic level in Utrecht, various dimensions of justice were found to be in tension with each other. The trade-offs are not occurring separated, as the justice dimensions are interwoven, as also explained in chapter 2.

Trade-off 1: Distributional and procedural justice

The first and most prevalent trade-off concerns the trade-off between procedural justice considerations at street and neighbourhood levels, and distributional justice at the strategic level. This trade-off is observed in various ways (R2, R8, R9). The 'poldering' approach of cooperating with all stakeholders and making compromises as procedural justice is explained to be at odds with distributional conceptions of reaching city wide greening goals as formulated in the spatial strategy for 2040. R2 explains:

> **R2**: "And then just the old-fashioned poldering, so to speak, if you do that in every street and you think there is no problem at all and that is a huge task and you will polder in every street until you are left with something that you actually say : yes, are we making an impact with that? Aren't you going to pay the price for that in the long run? And that, that is also the issue with the municipality,

especially about greenery and the street, fresh parking, really a question that we cannot yet resolve together. Shouldn't we just be more decisive about this as a public administration?"

Next to the tension between operational level procedural justice and strategic level distributional justice, the quote above also reflects other justice dimensions. The first being temporal and spatial notions of multi-scalar justice. R2 explains that short term local procedural justice is at tension with long term strategic level distributional justice. R2, being both involved in street level greenspace planning as on a more strategic level, starts asking the questions about whether the public administration should not be more decisive: meaning to hand in street level short term procedural justice efforts for long term strategic level distributional justice efforts. This line of thought aligns with transitional perspectives of environmental justice as it asks questions about policy sequencing and that a seemingly unjust policy might lead to a more just outcome in the end. The quote above thus reflects not only the trade-off between procedural and distributional justice considerations, but also of temporal and spatial multi-scalar justice dimensions and transitional justice perspectives.

The strategic level distributional justice goal of creating sufficient greenspace (75m2 per household) with the barcode can also be at odds with street-or neighbourhood level distributional justice efforts: as explained by, among others R1 and R7 (Senior urban planners at Utrecht Municipality):

> **R7**: "Parking on the street versus greenery on the street: 72 percent prefer greenery on the street. But when it comes to their own street, if you try to involve them in the decision-making process, you face resistance. Despite what is said, this is a conflict between the general interest of climate adaptation (on strategic level and the distribution of parking spaces (on operational level)."

R5 explained that the procedural justice consideration is prioritized over strategic level distributional justice of the city-wide goals of creating a liveable climate-adaptive city:

> **Interviewer**: "And that last thing you said, about how the goals for the city as a whole are prioritized. Do you find that weighs more heavily than?"
>
> **R5**: "At the moment, the residents' interests actually weigh more heavily, and that's tricky because then the question arises whether we will achieve the goals set by the council regarding a liveable city.."

According to R2, the conflict between procedural and distributional justice stems from the lack of a comprehensive assessment framework for making integral and explicit decisions on what is considered just. This absence prevents the municipality from making well-rounded decisions that also enhance procedural justice through transparent decision-making. Additionally, the undefined functionality of greening initiatives results in outcomes that are disproportionately influenced by the participation of local residents alone, excluding interest of other groups in the city, such as students who live elsewhere but might have interest in a festival option for greenspaces. R2 explains:

> **R2**: "It is a weakness, I think, that as municipality of Utrecht we have said: we want a lot of greening, we want to add greenery to the city. Well, of course, that sounds wonderful and grand. But yes, what is that functionality exactly? What kind of greenery, what functions does it have? And if you don't break that down further and define what you mean by it, then it often comes down to a bit of randomness/arbitrariness in what you do in such a project (on a local scale). Because what if we had had the courage to say: we are going to create a festival ground here, how could we have justified that (from a strategic level perspective)?"

This dominant trade-off between distributional and procedural justice is illustrated by figure 12 below.
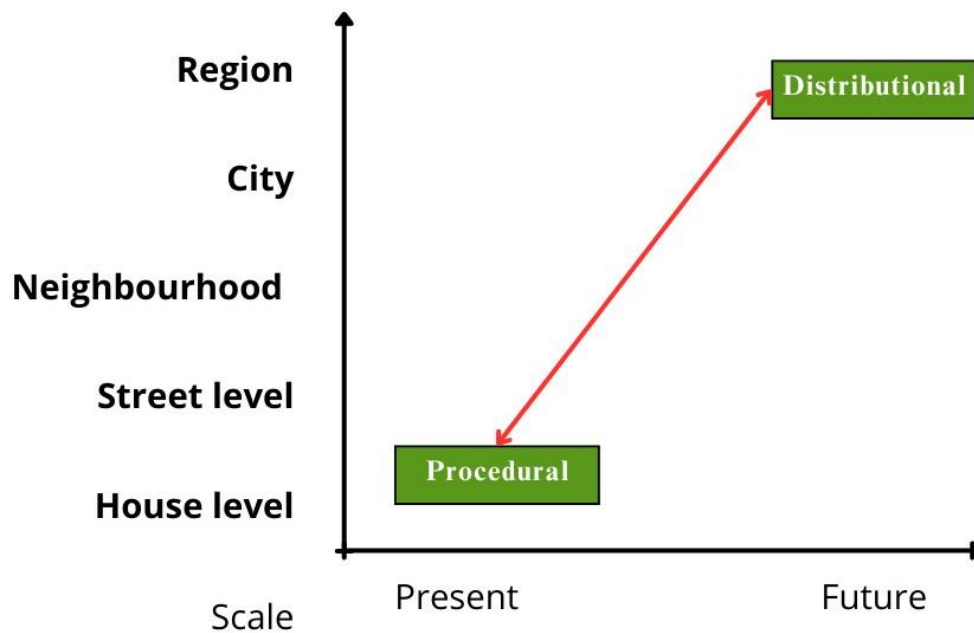
Figure 12: Trade-offs between procedural justice at the microlevel (current concerns of the street/neighbourhood) is at tension with distributional justice considerations at the macrolevel (future concerns for the city on climate change mitigation).

Trade-off 2: Procedural and transitional justice

The second trade-off is between street level procedural justice and recognitional justice perspectives of inclusive representation participation on one hand and transitional justice in the governments duty of taking care on the other.

This trade-off is linked to the first trade-off, but definitely different. Urban planners are challenged with developing urban greening in vulnerable neighbourhoods as Ondiep and Rivierenwijk. At a local level, procedural justice considerations are seen as important: the municipality wants to create an inclusive participation process, hearing the differing perspectives and opinions that are present in the neighbourhoods. However, this participation process is not always running smoothly, because some resident don't want any greening in their streets. This leads to the dilemma urban planners face that from a transitional justice perspective, they say that at some point the government should take its duty of taking care of its citizens, and create greening against the will of some residents, simply because summers are getting too hot, posing risks such as the heat island effect or flooding. According to Article 22 of the Dutch Constitution, the government has the obligation to protect the health of its citizens. This trade-off shows the tension between procedural justice efforts and distributional and transitional justice considerations. R9 illustrates this trade-off between procedural and transitional justice:

> **R9**: "So there is a significant tension, in the sense that on one hand, as a government, you want to recognize, which pertains to recognitive justice, that there are different meanings attributed to green spaces. Some people think green spaces are very beneficial, while others prefer as little as possible because of concerns about birds and maintenance. This influences the situation as well. Essentially, it means that at a certain point, the government must fulfil its duty of care and decide to take definitive action."

Trade-off 3: Ecological and distributional justice

The third trade-off observed on the strategic level planning is between ecological and procedural justice considerations. According to R3, distributional justice considerations are intensified by the challenge of densification, leading to the trade-off between ecological functionality and distributional functionality justice considerations.

R3: "So, we see that quite a bit of friction arises there between wanting green spaces to prevent heat stress and support biodiversity, but also wanting green spaces that can simply be used, where people can barbecue, play football, and do things. And I notice that there is quite a lot of tension within the municipality about how to distribute that properly."

Trade-off 4: Ecological and procedural justice

The fourth trade-off observed is between ecological and procedural justice. Working on procedural justice processes, which are mainly designed for human participation, means less attention for the ecological interests. R2 explained that inclusion of nature in participation processes is very difficult, and leads to the situation wherein procedural justice only is meant for human needs, leading to human interest being traded off with ecological interest. R2 explains:

> **R2**: "Ecological justice extends the concept of justice to animals. Well, that's exactly what you were saying, we are increasingly recognizing that, the awareness is growing that we must design the city for more than just humans, and you notice that while this recognition of ecological justice is growing, nature often still gets the short end of the stick, partly because nature doesn't participate."

Trade-off 5: Distributional justice and distributional justice: between subdimensions

Within the distributional conception of justice, quality oriented and quantity oriented perspectives are battling internally. Within the municipality, some people are more in favour of focusing on increasing quality and realizing multiple functionalities of greenspaces, whereas others are arguing in favour creating as much greenspace as possible. This reflects a tension between subdimensions of environmental justice within the practice of urban greenspace planning in Utrecht. R10 illustrates:

> **R10**: "Because more greenery is not the holy grail in the sense that it solves problems; it can certainly contribute to solving some, but quality also plays a big role. There's a sort of debate within the municipal organization, where a faction leans towards the quantitative aspect, focusing on calculations, but I believe more in the qualitative aspect, because it's not just about square meters or distances or percentages of greenery. It's also very much about what that greenery is and what value it contributes. I always say: green is also just a colour... Of course, that's true, because in itself it has no value in that sense—nature does, but greenery in that sense does not—but it always contributes to something, you also use it to solve things."

4.2.2 Operational level trade-offs Utrecht

In this section, findings for the operational level are discussed: providing insights from the units of Rivierenwijk, Noordwest and Nature Area Zuilen.

Trade-off 1: Distributional justice and procedural justice

All three empirical units show the trade-off between procedural and distributional justice notions (R2,8,9). This trade-off is at the intersection of multi-scalar, transitional and intersectional justice notions too. This trade-off involves effective use of public resources, and is complicated by intersectional problems complicating participation processes for greening. Hence, participation processes demands so much public costs, time and efforts, it creates a tension with distributional justice considerations on a strategic level of reaching adaptation goals. This is also about multi-scalar justice, where justice considerations vary in space. The following quote from R9 explains:

> **R9**: "I don't understand why our "polder model" always compromises and never takes decisive actions. That's just how it is. And that is part of the Netherlands, part of being Dutch—it's ingrained in us. … What we shouldn't do is apply this to every square centimetre in front of people's doors, because the functions and tasks are too significant for that."

> **R2**: "So you really try to keep the conversation going, but at a certain point, the costs of constantly having that conversation—those are hours, and each time having the conversation—make a tree simply unaffordable. The dilemmas for us are really in the participation aspect of greening. So how do you involve everyone, how do you then make a decision?"

This trade-off also relates to growing notions of justice perspectives on policy sequencing (Zimm et al., 2024) which entails that short term unjust policies or practices might lead to a more just outcome on the long term: transitional justice. From an intersectional perspective, residents cannot see why it would benefit them or don't have the time to participate. For the municipality, this creates a trade-off between procedural and transitional justice, making it seem like the municipality is imposing green on its residents. Currently, the same approach emphasizing procedural justice is still being taken, but transitional justice ideas seem to be growing. That is also reflected by the following passage from the Letter to the Mayor and Aldermen to the City Council from 2022 (Municipality of Utrecht, 2022a):

> "We are not choosing to respond individually to each point of view at this time. Instead, we are grouping the points of view by themes and using those themes as a basis for discussions with the community. The submitted points of view will, of course, remain the foundation. We will move forward quickly with this approach, in collaboration with the stakeholders. By actively engaging with residents in this step, we better honour the involvement from the community."

Trade-off 2: Recognitional justice and procedural justice

The second trade-off observed across units Nature Area Zuilen and Rivierenwijk is between recognitional and procedural justice (R2 and R9), also indirectly affecting distributional justice considerations. Starting from recognizing the different identities and corresponding meanings of greening for an inclusive participation, this leads to a situation where the participatory process (from the idea of procedural justice) becomes complicated and gets stuck. By creating an inclusive participation process based on recognitional justice considerations, the municipality inadvertently mobilized resistance that wouldn't have emerged without the participation initiative. A minority of citizens prefer to not have green in their living space at all, emphasized by both R2 and R9. The recognitional justice efforts in the participation process create a tension with a representative participation process, and thus procedural justice. Groups opposed to greening became overrepresented, both in Nature Area Zuilen as Rivierenwijk, which frustrates the participation processes. Small minority against greening receive most

attention and gains the most influence in the planning process. As a result, the participation process becomes non-inclusive in terms of representation, with one minority disrupting the process. The latter part of the quote above by R9 also illustrates how this tension leads to increased attention for transitional justice perspectives.

> **R9:**"So that (against greening) group is always the same, and it frustrates these processes enormously. Because those saying yes, I know they say they have the right to a street, the right to a healthy life, a good environment for their children. And the no-sayers say I have the right to influence what my environment looks like, I don't want that, and where does that leave you as a government? This shows itself every time and then you get to what I said earlier. When is it still a choice, or should it become an obligation that we no longer ask. "

See picture X showing an example of petrification of the street called Reggestraat in Rivierenwijk showing this absolute absence of greenery.

Figure 13: Petrification of the Reggestraat, Utrecht Rivierenwijk (Google Maps, 2024)

Multi-scalar justice considerations are also evident in the trade-off between procedural and recognitional justice: currently, procedural justice primarily benefits those living near the nature area, with residents from other parts of the city being underrepresented. This reflects a spatial dimension of multi-scalar justice, focusing on which interests are recognized and deemed important at different spatial scales.

> **R2**: "Yes, you see it very often and that is also quite logical, because in participation processes you often see that stakeholders are overrepresented and target groups underrepresented, okay, and that bias, that is also a search for us, how we as a municipality ensure that in such a process the target groups get more of a voice. "

This trade-off between recognitional and procedural justice indirectly above also complicates the municipality's duty of protecting its citizens from extreme heat and provide a healthy living environment. Even, when the heat island effect is very strong during summer. R9 illustrates this tension between recognitional justice and indirectly distributional justice through procedural justice:

> **R9**: "So there is an important tension, you could say, on the one hand, that as a government you want to acknowledge—that is about the recognition justice—that there are different meanings of that green space. So, some people think green space is very good, and other people prefer as little of it as possible, because birds thrive in it, and that has its own consequences (noise and feces). ... It essentially comes down to the fact that at some point, you have to take up your duty of care as a government and say, "Well, we are just going to do this."

Trade-off 3: Procedural justice and multi-scalar justice. Ecology and future generations

The third trade-off observed is between multi-scalar justice and procedural justice considerations: where multi-scalar justice consists specifically of ecological and intergenerational temporal notions with procedural justice. Because nature has no voice now, currently participatory efforts cause ecological justice perspectives to shift to the background, according to R2:

> **R2**: "The awareness that we must design the city not only for humans is increasingly growing, and you notice that although the understanding of ecological justice is growing, it still often comes up short, also because nature does not(literally) participate."

Also, the Aldermen Greening in Utrecht explained in the Starting document Nature Area Zuilen (Municipality of Utrecht, 2024a), also goes into the tension between ecological perspectives and procedural justice considerations. The Aldermen for Greening elaborated on this in the following:

> "After the publication of the draft plan in the fall of 2022, there was a flood of responses from residents who felt they were not adequately included in the plans and wanted their voices to be heard. What was the municipality planning to do with 'their' green space? Why focus on nature and biodiversity—wasn't it already green enough? Would this tranquil area turn into a busy hotspot? In the draft vision, the municipality had tried to give a voice to those who cannot speak for themselves: nature. And to the future residents of Utrecht, for whom the preservation of nature and biodiversity is important to live in a green and liveable city. However, the municipality's draft vision and the concerns from the neighbourhood did not sufficiently align. After some internal deliberation, we decided on a 'hard reset': a pause to make more room for the voices of local residents."

In the current situation, ecological justice perspectives therefore had to give up space to procedural justice for human interests. Another way this trade-off expressed is in Noordwest. This concerned multi-scalar justice concerned intergenerational and intragenerational justice notions. R8 explained that most people live somewhere relatively short, but still have a large say in what a greening project will look like. This raises questions about fair representation in participation, also for future inhabitants. R9 explained:

> **R9**: "We had also planned trees in another street, and there was one person who was against a tree in front of their house, because their disabled parking spot would shift a bit, but it wasn't by much. But okay, I understand that, if you have mobility issues. So, we ultimately removed that tree from the design. But a few weeks later, that person passed away, and that's of course very intense, but it was very emblematic of the fact that people are often temporary, even if you live somewhere, you might live there for ten years, sometimes twenty years, but a tree lasts much longer than that. So that, that makes it complicated because you give people who live there now a lot of say over the future. So, when you talk about procedural justice, everyone who lives now and who currently lives on that street gets to have a say, but future residents do not have a voice in the process."

Including future generations currently also implies a trade-off with procedural and recognitional justice because recognizing present day residents interests might be at expense of future generations whose interest are currently not recognized and represented. This is emphasized by R2:

> **R2**: "But it's a bit like, you know, with the ecologist who speaks for nature, which has no voice of its own. Sometimes, we try to represent the voices of people from other neighbourhoods who also need to come to such a park, or the voice of the future inhabitants of Utrecht. This is always a challenge in conversations with residents."

4.3 Synthesis Utrecht

The synthesis of the findings for Utrecht on this page provides a brief overview of main findings and an answer to the sub questions.

To address sub questions 2 and 3 in the case of Utrecht, I will focus on both a city-wide strategic level and the specific units of Rivierenwijk, Nature Area Zuilen, and Noordwest. The sub-questions are:

SQ2: *How do urban greenspace planners conceptualize, apply and prioritize justice principles in urban greenspace planning processes?*

SQ3: *What trade-offs do urban planners experience when addressing justice in urban greenspace planning and how are they dealt with in practice?*

4.3.1 Answering SQ2: conceptualizations, prioritization and application of environmental justice considerations in Utrecht

In Utrecht, urban greenspace planning embodies a complex interaction of the various justice principles, predominantly viewed through the lens of distributional justice, closely interwoven with corrective and intersectional justice. This is particularly evident in the strategic level urban policies aimed at balancing the needs of a growing population while maintaining quality green spaces within city limits, such as the RSU2040 and the Green structure plan (Municipality of Utrecht, 2017, 2021). The city's strategy, encapsulated in the spatial strategy for 2040, emphasizes a "healthy growth" approach, where maintaining green space per capita is prioritized despite urban densification challenges. Innovative tools like the 'Utrechtse Barcode' exemplify this, as they help to visualize and manage space use to preserve green areas effectively.

Procedural justice is also a significant consideration, though its application is more implicit and varies between strategic level planning and more localized street-level efforts. Ecological and transitional justice are emerging in their importance, with ecological considerations increasingly seen as goals in their own right rather than merely instrumental benefits. Temporal and spatial notions of justice remain limited, similar to recognitional justice interpretations. Concluding, justice considerations most often remain implicit and limited, but are becoming increasingly explicit as the municipality's team of social architects works on the 'Social Vision Utrecht 2040'. This upcoming vision aims to connect various justice considerations in a framework that explicitly addresses the social dimensions of urban planning.

4.3.2 Answering SQ3: Trade-offs between justice dimensions in Utrecht

The implementation of environmental justice principles does not come without challenges. Urban planners frequently need to navigate trade-offs between procedural and distributional justice, particularly when local interest at the neighbourhood level may conflict with broader strategic level strategic goals of creating enough greenspaces for everyone. These trade-offs manifest in the tension between maintaining an inclusive, participatory approach that respects local residents' inputs and that achieves equitable access to green spaces across the city. For example, the drive for neighbourhood-level engagement can sometimes impede or delay the implementation of strategies designed to benefit the city as a whole, especially when local preferences do not align with wider environmental or equity objectives.

Further complicating these dynamics are the trade-offs between other forms of justice. Ecological justice, for instance, is increasingly prioritized but must be carefully balanced with procedural and distributional aspects. Efforts to include ecological considerations can clash with immediate community desires or participation fatigue, where engagement intensity does not necessarily lead to equitable outcomes. Additionally, recognitional justice remains a challenging dimension to fully integrate, as it requires acknowledging and incorporating diverse community needs and values into the planning processes, a task that is still underdeveloped in practice.

Hence, the city's planners are tasked with integrating these various justice principles in a manner that addresses both the immediate and long term needs of Utrecht's residents. This integration necessitates finding a balance, seeking not only to mitigate the effects of urban densification on green space availability but also to ensure that these spaces are distributed in a manner that promotes overall urban sustainability and equity. The ongoing efforts to refine participatory processes and enhance the inclusivity of urban planning initiatives reflect a how planners try to evolve to these justice considerations, in line with the city's changes.

Urban planners try to manage these trade offs by making participatory processes as inclusive as possible, addressing their conceptualization of recognitional justice. However, ecological justice considerations often lose to distributional and procedural justice applications for human interests. Also, procedural justice are in the form of participatory approaches is still prioritized over transitional and distributional perspectives on justice on a local level. On a strategic level, distributional conceptualizations of justice are prioritized. Ideas on alternative approaches to justice are growing, however thus has not yet come to a tipping point of becoming normalized. .

In conclusion, Utrecht's approach to urban greenspace planning illustrates a dynamic approach but including justice remains challenging: conceptualization, application, and prioritization of justice appears difficult, especially concerning explicitness. Another challenge is find balance in the justice trade-offs faced.

5. Results Rotterdam

5.1 Conceptualizing, applying and prioritizing justice in Rotterdam

As explained in chapter 4, for overview purposes I provide an overview of how environmental justice considerations are conceptualized, prioritized and applied on each level at the start of each chapter with results.

	Rotterdam Overall	Rotterdam strategic level	Rotterdam operational level
Distributional justice	Extensive	Extensive	Extensive
Procedural justice	Moderate	Minimal	Substantial
Recognitional justice	Limited	Limited	Limited
Corrective justice	Limited	Limited	Limited
Transitional	Minimal	Minimal	Minimal
Intersectional	Limited	Limited	Limited
Ecological justice	Substantial	Substantial	Substantial
Multi-scalar justice	Minimal	Minimal	Minimal

Table 5: Overview of justice considerations as applied in the urban greenspace planning of Rotterdam.

Below, the results for application, prioritization and conceptualization for each justice principle in Rotterdam are extensively discussed. The order of the discussion of justice principles is based on the dominance of the justice principle in the findings for conceptualization and application by urban planners.

5.1.1 Strategic level findings Rotterdam
Introduction

First, justice considerations are most of the time not explicitly included in the narrative that is employed by urban planners in Rotterdam. This means justice considerations are often implicitly addressed in urban greenspace planning processes. In the implicit conceptualization and application, justice is primarily viewed through the lens of distributional justice. An egalitarian approach prioritizes equal distribution of green spaces in terms of quantity and quality across the city, emphasizing the role of greenspaces for climate adaptation to manage heat stress and water. Ecological justice is increasingly recognized, focusing on biodiversity and specific species, hinting at a selective approach to ecological justice. However, corrective and transitional justice perspectives seem notably absent. The multi-scalar justice dimension primarily highlights short-term direct outcomes. Procedural justice primarily influences local park development to ensure that greenspace functionality meets local demands. There is little recognitional justice emphasis, while signs of intersectional justice are emerging within the municipality.

At the strategic level in Rotterdam, trade-offs between and within justice dimensions are not always well visible. Some trade-offs exist within the justice dimension of distributional justice, and between procedural and distributional justice as well as corrective and procedural justice. The limited number of trade-offs could be attributed to the implicit and underdeveloped nature of justice considerations in the

municipality's urban planning narrative. Below, the justice conceptualizations, application and prioritization are discussed in more detail.

Distributional justice

At the strategic level Rotterdam, justice is predominantly conceptualized, applied and prioritized from a distributional justice rationale. Distributional justice considerations are mainly conceptualized as creating enough qualitative greenspace everywhere for everyone in the city, applying the distributional justice principles of egalitarianism as described by Buitelaar (2020).

This distributional conceptualization is reflected in the vast majority of interviews and documents analysed. For example, the municipality is aware that some parts of the city are more vulnerable to heat island effect and have a lower amount of greenspace, as shown in the pictures X below. The municipality invest in the red parts of the city map from an egalitarian perspective. The maps below come from the document Vision Public Spaces of Rotterdam (Municipality of Rotterdam, 2019). They illustrate the consideration that the city wants to create a equal level of greening and heat island effects across all parts of the city. The left figure shows places with the least amount of public greenspace available, which happen to be places with the highest population density. The map on the right shows the distribution of the heat island effect within the city.


Figure 14: Greenspace availability Map and heat island effect Map of Rotterdam in Vision public Space Rotterdam (Municipality of Rotterdam, 2019)

The municipality aims to reduce the heat island effect where it is the strongest (Municipality of Rotterdam, 2019). This principle does not stem from a corrective rationale, but from an rationale of equal distribution of benefits and burdens across the city. Hence, justice is not conceptualized in corrective notions of justice in Rotterdam, as is more the case in Utrecht. The following passage by R15 illustrates the distributional line of thought employed in Rotterdam:

> **R15**: "Greenery, you know, it's about beautiful homes, beautiful greenery, but it's also important to add more usability. What is important for people is functional greenery, where you can do something, like have a picnic, play football, you name it. So that's the challenge we face. I see it as equitable distribution, not only to create an average amount of greenery per square kilometre across the entire city."

R15 also emphasized inclusivity for parks that serve the city as a whole is very important, so every group in society can make use of the parks, as a form of universal accessibility: justice is inclusivity of the users of the park as it is meant for everybody. R15 illustrates

R15: "But if you look at the city scale and the large parks and large squares, they must be fair. Yes, then the word inclusivity, which of course has a lot to do with it, comes in much more because it is for everyone and that is the hallmark of the city."

Implicit justice considerations

Another finding for the case of Rotterdam is that justice considerations are often implicit, so not made consciously. This is also visible in the distributional framing of creating enough green for everyone explained by R17.

Interviewer: "What dimensions are present in this narrative, or which ones are dominant in this thinking? What is considered the norm within the municipality, and what do you observe there?"

R17: "To be very honest, I don't think people (in the municipality) consider this (justice) at all. Perhaps they apply some principles unconsciously (if they do)."

However, justice is increasingly becoming explicit and becoming part of the narrative within the spatial and greenspace planning departments within the municipality. Justice as an explicit subject is in a starting phase, and is gaining ground. R18 illustrates this by explaining the city just started a EU-funded research project on just greening in the city, exploring what justice entails in urban greenspace development means, learning also from other cities

R18: "It's a European project involving various cities, and we want to explore how to implement equitable green policies. It's really in the early stages—it will last four years, so we're not exactly sure what we'll be doing yet, but I think it's going to be very interesting."

Ecological justice

In the context of urban greenspace planning in Rotterdam, ecological justice revealed also to be one of the dominant conceptualizations of justice. The ecological dimension of justice is often combined with the distributional notions of justice. An example of ecological dimension of justice being central is illustrated by R15.

R15: "Ecological justice is increasingly becoming a topic. We also have a project, Hofbogen, which is a long park. No, that can't be in many places, but it is very much centred less on people and more on the whole ecological, how do you say it? The sociology, I would say, is central. There, on the hedgehog, the animal, but it can also be something else."

Ecological justice is often conceptualized as taking a specific species central, such as the hedgehog or bee as shown in the quote above. One of the reasons for this is to ease procedural justice and make ecological justice considerations more tangible for residents, to create more acceptance for nature. This species-selective ecological justice conceptualization is also illustrated by R17, who also shared it feels uncomfortable that some species are placed above others.

R17: "Yes, let's see, ecological justice—I notice that the focus is mainly on bee landscapes and such, and that there are many animals in the city which people consider pests or unwanted. Think of rats, for example, while they can actually be very useful. So, I feel there is too much focus on one species."

Furthermore, ecology is operationalized in urban planning as an instrument for humans, for example in the form of climate adaptation and mitigation effects. This is reflected in various policy documents, where adding nature to the city can be seen as crucial for adaptation and mitigation: the heat island effect and water problems are extraordinary high for Rotterdam. On the other hand the instrumental value of greening is health of the people of Rotterdam.

In the third conceptualization of justice by urban planners, nature is not framed as instrumental.

In this approach, ecological justice is conceptualized as a goal in itself, rather than as a scale variable or subdimension of multi-scalar justice where it merely denotes the subject to which justice principles are applied. The following quote from the Green Agenda 2023-2026 (Municipality of Rotterdam, 2022, p. 2) summarizes the three conceptualizations of ecological justice mentioned above: green should be for everyone, green is seen as healthy for residents and green is important for biodiversity.

> "Extra green spaces in the city also boost the happiness and health of Rotterdammers. It is well-known and researched that trees and plants have a positive impact on people's well-being. Therefore, this action plan serves a dual purpose: contributing to our climate adaptation goals and creating a more beautiful and pleasant living and working environment. The action plan also strongly promotes biodiversity. We aim to create 40 hectares of bee-friendly landscapes, partly by managing existing green strips differently."

Procedural justice

First, on a strategic level, procedural justice is primarily seen as giving room to bottom-up citizen initiatives. This approach, often termed "going where the energy is" by R18, emphasizes giving citizens the space to initiate greening efforts themselves by providing subsidies or supporting foundations. These conceptualizations of procedural justice, focusing on citizen-led initiatives, is a consistent observation among various respondents (R11, 16, 17, 18, 12,). For example, R12 illustrates:

> **R12**: "Yes, what you see is that we've been very focused on increasing green spaces and encouraging residents to get involved with extra green initiatives. So, if people want to, they can adopt a piece of greenery in their street or submit plans to create additional green spaces."

Furthermore, at the city level procedural justice is also conceptualized as inclusive representation, but this remains one of the main struggles of the municipality (R11, R12, R19). The municipality is aware of the lack of inclusivity in participation, though this has just landed at the municipality. So equal representation remains a challenge:

> **R12**: "Not everyone is eager to work on greening initiatives like facade gardens in their neighbourhood. You could say, "Well, we have measures in place that are sort of standard, so every resident of Rotterdam has an equal opportunity to get involved in this way." But what you actually see is that not everyone is served by these measures, because not everyone enthusiastically engages with them, and we're noticing this more and more. So, regarding participation, we've been searching for alternative approaches for quite some time."

Finally, procedural justice principles play a larger role at the operational level, and less at city-wide level. Procedural justice is however gaining attention in the designing of greenspaces on a higher level, which is a good thing according to R12 illustrates:

> **R12**: "So, I have the idea that the whole blueprint design approach (without participation), you know, where you envision something as a municipality and six years later it's there, fortunately, that's becoming more abandoned. It's more about leaving the vision open and seeing what people think about it. So, I don't know if it will work, but I think there's much more attention to it now, so that's a good thing."

Multi-scalar justice

The temporal applications of multi-scalar justice by urban greenspace planners in Rotterdam do not concern indirect effects of greening, such as risks of green gentrification: residents being displaced due to new greenspace planning (Rigolon & Nemeth, 2020). According to R17 & 18, the municipality aims to 'improve' parts of the city by creating greenspaces, intentionally changing the population composition to a more richer and higher-educated one. R19 illustrated this perspective by justifying gentrification effects of greening with the argument that gentrification cannot be stopped anyways and that it benefits

home owners in those areas. This perspective however neglects effects on the long run and for example residents who rent their homes.

> **R19**: "Just with the idea of, well, it's being renovated, you can be very much against it, because with that, you're displacing people. But at the same time, for people who perhaps moved from social housing to their first purchased home years ago, it also means a step forward. So the whole city, that city, is of course changing and you really can't stop gentrification."

In a similar line of thought, the Rotterdam Green agenda 2023-2026 states that green is good because it increases the value of real estate (Municipality of Rotterdam, 2022a). Based on these findings, we can observe justice is framed from a short term perspective in spatial development: long term perspectives seem to not play an important role in the consideration of effects of greening. This might have to do with political representatives wanting to see results within four years, not being punished by voters for long run, indirect effects such as green gentrification. The following perspective from R17 illustrates this perspective:

> **R17**: "But yes, one of the best examples, I think, is the Hofbogen park. It's quite intense. But look, it is one of our seven urban projects, and I believe it can bring a lot of good to the neighbourhood. What I hear a lot around me is people saying it's great that property prices are going up around there. I asked the project leader about gentrification, about the effects it could have, and literally, they told me, 'Yes, I think it's great that we're investing in the city and bringing different kinds of people to live there. I think, okay, that is one perspective, but what about the people who already live there and see their neighbourhood changing? Maybe they will experience stress, because property values are rising. Will they have to pay more in the future? There could be all sorts of consequences. I'm not saying it will happen, but anything could happen. And the fact that it's not even really up for discussion, or that they say gentrification is actually good."

Furthermore, in the application of temporal multi-scalar justice, including future generations in urban greenspace means to urban planners educating children so they are aware of the importance of greening in the future. This conceptualization of intergenerational justice is illustrated by the quote from R15, who answers the following when being asked how interests of future generations are involved in urban greenspace planning:

> **R15:** "Yes indeed, another form of justice, you could say, is that we are really focusing on creating green schoolyards. So, environments for children, because of the motto that they are the future, investing in them now to benefit from it later. It's about instilling in them the importance of interacting with nature and learning these things early on, which they may not get at home."

Explicit conceptualizations of spatial multi-scalar justice are not clearly observed for Rotterdam on a strategic level, apart from the notion that there green should be enough green for everyone around the city, taking an egalitarian approach (Buitelaar, 2020).

Recognitional justice

Conceptualizations of recognitional justice, which address the recognition of structural mechanisms of exclusion (Bulkeley et al., 2013), appeared almost entirely absent in the justice considerations observed in Rotterdam. At the strategic level, recognitional justice is conceptualized as part of inclusive participation within the dimension of procedural justice. Strategic level urban planners acknowledge the challenge of incorporating a diverse range of perspectives, noting that some groups are not adequately considered or visible within municipal planning processes. R15 illustrates this by pointing out the important role of neighbourhood networkers and district managers in integrating local insights into planning, providing insight into the ongoing challenge of engaging underrepresented groups:

> **R15**: "Yes, yes, exactly, if you engage in a whole debate about it, you notice that despite all the efforts being made—I'm not making excuses, but it's done with the best intentions—you realize that reaching target groups, especially those who do not yet use public spaces, is particularly difficult, leaving them, yes, essentially unheard."

R15 also shared that the neighbourhood workers and district managers, people who are connected to a neighbourhood, are mainly concerned with the recognitional aspects of justice in greenspace planning. This reflects that if recognitional justice considerations are into play, they mainly manifest on the operational level, and not on strategic level. In line with this, R11 mentioned that the lack of coherence between operational and strategical considerations is due to compartmentalization, which can pose a risk to balancing justice considerations at strategic and operational level. There are too many project to oversee, that no one is making sure recognitional justice efforts equally takes place everywhere and the bigger picture is being missed. The following quote by R11 illustrates this:

> **R11**: "I think the complexity lies in how the municipality is organized and how they manage projects. Each project has a project manager, who can sometimes be the same person, but often they are different, especially for larger projects, and each has its own team. And sometimes, for instance, I am involved in several projects, but not everyone is. It's also a bit of synergy that is missing between different teams within the municipality, which may result in a lack of strategic oversight across all projects."

Recognitional justice notions at a strategic level perspective in Rotterdam appear to be underdeveloped, possibly leading to disparities in how greenspace is distributed. A lack of focus on recognitional justice could result in inequitable outcomes which fail to address the diverse needs and challenges of various groups of residents. According to R17, the dominance of equal treatment distributional justice poses contradictory effects. Considerations related to intersectional and recognitional justice are absent in Rotterdam's greenspace planning, resulting in unjust distributions. In the following example, R17 explains that privileges of wealth and education, which can also operate through intersectional effects, reinforces the absence of recognitional justice perspectives and exacerbates the effects of intersectional privilege.

> **R17**: "What I see happening is that they (the Municipality) take equal treatment very literally. So, they treat everyone the same. But that doesn't mean it's accessible to everyone because they are essentially designing Rotterdam for an average person. For instance, the energy often goes to those who shout the loudest or those who know the right channels, which are usually people who are already wealthy or have a good network. This gives them more privilege and better opportunities in life. So, it often benefits people who may not need it as much as others in Rotterdam. Take subsidies, for example. The whole concept of subsidies is almost like an investment model for people with money. Money makes money; you can invest, apply for subsidies, get part of your money back, and then you're the first to make your home sustainable. You benefit from that, and later the rest have to follow, but by then there are no subsidies left. And before, they didn't have access to subsidies anyway. So, in that sense, I feel that the focus is primarily on equal treatment, but this leads to unequal outcomes."

According to R17, this lack of recognitional justice, as including a variety of perspectives in urban planning, is also one of the reasons for founding ICAR:

> **R17**: "ICAR actually came about because one of the members started noticing things within the municipality. Her or she saw that there were subsidies, but some people couldn't advance the money to claim them. So he or she wondered, how does that work? It's not accessible at all. We observe that there's a heavy emphasis and focus on technology, and decisions are often made from a technical perspective, while the residents themselves are frequently not considered. This combination is rarely, if ever, made."

Transitional justice

Transitional conceptualizations of justice are almost entirely absent in Rotterdam. However, transitional notions of justice are being explored recently. This concerns the responsibility of the municipality to take care of all of its residents for the effects of climate change, the municipality is currently exploring the judicial options for positive discrimination to make sure being able to provide care for and protect every residents in the city: R18 explains this argumentation:

> **R18**: "We are also starting a project where we will work with a lawyer to examine what responsibilities municipalities have regarding climate justice and their duty towards citizens. We will look into what is legally possible if you want to provide positive support to neighbourhoods that need it more than others. This is essentially about positive discrimination. … However, if we treat everyone the same, we inadvertently also discriminate by not addressing specific needs."

Intersectional justice

Intersectional conceptualizations of justice that acknowledge that the combination of various elements of an individual's or group's identity can create distinct forms of discrimination and injustices (Amorim-Maia et al., 2022) are mostly absent in the case of Rotterdam strategic level urban greenspace planning. However, the introduction of ICAR (Inclusive Climate Action Rotterdam) since two years, can be seen as a first step to include intersectional justice thinking into the organization. Also, ICAR developed a tool to facilitate discussion and thinking on intersectional justice perspectives, and ICAR is working on spreading this kind of explicit justice thinking across the organization. R18 and R17 illustrate:

> **R18**: "I think that intersectional justice is something ICAR is very focused on, and intersectionality is actually one of the... Well, these are the official core values that they always incorporate into our thinking and try to promote each time, not just viewing things in separate boxes, but seeing everything in connection with each other. It's about understanding how different forms of marginalization intersect and overlap, which brings very different perspectives compared to just focusing on poverty, homelessness, or discrimination individually. "

> **R17**: "Yes, and ICAR also conveys this to various departments and projects where it has advisory discussions or ongoing collaborations. For example, they also provided input for the neighbourhood approaches. So, actually the ICAR climate wheel is used effectively."

Corrective justice

At the strategic level, corrective justice does not seem to be a justice principle which has played an important role in the justice considerations of urban planners in Rotterdam. However, R14 conceptualized corrective justice as restoring mistakes made by previous planning activities, connecting it to distributional notions of justice:

> **R14**: "Let's see, corrective restorative justice, well, that's really not applicable, you could say. Well, it's a bit far-fetched. Katendrecht is currently the densest part of the city after the, after the centre, and in the past, a lot has been built with the Kop van Zuid, the Wilhelmina Pier, Katendrecht, and almost no green space has been added. And with this, you try to make up for that a bit. The standard, but it's a bit in this distributional, so this is a bit far-fetched. But yes, we have densified that area enormously, and green spaces simply belong there, and we've kind of forgotten that in recent years."

5.1.2 Operational level findings Rotterdam

Distributional justice

At the operational level of greenspace planning in Rotterdam, environmental justice is conceptualized, applied and prioritized in various ways.

Environmental justice is dominantly conceptualized in a distributional form: the municipality wants to create greenspace where it is needed, both for greenspace availability and quality. This perspective is reflected in the sense that most conceptualizations of justice recurring in the documentations and interviews are about the quality and quantity of the greening are arguments involved in the development of the place. Quality, for example, is often defined as accessibility and reachability, for everyone. The following example from the reaction document of the Nelson Mandela park at the Maashaven (Municipality of Rotterdam 2022b) illustrates the two perspectives of quality and quantity within distributional justice conception well:

> "In the neighbourhoods around the Maashaven, there is a lack of public green spaces and areas for physical activity. Due to the growth of Rotterdam-Zuid, the need for these spaces is increasing. A park has a positive impact on the health of residents. Additionally, it contributes to relaxation, residential satisfaction, and social contacts. Furthermore, a park reduces heat stress, absorbs rainwater, and improves air quality. Therefore, the growth of the city must go hand in hand with the creation of more public green spaces. With this vision, the municipality is realizing various city projects. The Nelson Mandela park is one of them."

The same counted for the unit of the Hofbogen: the letter from Aldermen of Urban development to the council from 2023 illustrates the idea of creating enough greenspace for everyone, for functionality and quality improvement, reflecting a distributional rationale of justice (Municipality of Rotterdam, 2023b, p. 2).

> "The Hofbogen park is used to green the heavily urbanized neighbourhoods of Rotterdam North, providing residents with more public green spaces. The Hofbogen park will play an important role in making the city attractive for both people and animals and in preparing the city for climate change; it aims to make the city resilient against flooding, drought, heat stress, and to increase biodiversity. The development of the Hofbogen park acts as a catalyst for a significant quality improvement in the neighbourhoods of Rotterdam North."

This expression also seems to resonate with corrective justice considerations, however, the underlying rationale is to create an equal amount of greening everywhere from an egalitarian perspective, so starting on spots that have the least greenspace is seen as logical. With the distributional conceptualization, creating greenspace is considered just when everyone has access to green. Following from this, the dominating rationale is that the municipality should invest where a lack of green occurs. This should not be seen as corrective justice, but more as fulfilling the need and right of everyone to have access to greenspace, from an egalitarian perspective. The Hofbogen area, which is an old, mostly paved area in the old city of Rotterdam, is chosen to be greened due to a lack of greenspace present, due to the dense development in the area. R14 explains how this is also the case for Nelson Mandela park:

> **R14**: "Well, the first one, the, so that distributional justice, yes, I explicitly talked about that, so that's exactly what we do. Everyone has a right to green spaces and where there is little green, we invest, and that is the case here."

The third conceptualization of distributional justice by urban planners on the operational level combines it with an ecological justice rationale, but reasons from the position that everyone in the city has a right to climate adaptive living space. Ecology is seen as a mean to realize climate adaptation for humans. The Hofbogen also contribute to climate change adaptation, by improving the water retention capacity most importantly, as water retention is a challenge for Rotterdam. The fourth conceptualization of distributional justice is the consideration that the benefits of the greenspace planning are distributed

locally: thus combining the local scales of spatial justice. R19 refers to the example of Piet Oudolf, the person who designed the High Line in new York, similar to the Hofbogen. This example of urban greenspace planning is known for its gentrifying effects it had on the area in Manhattan and where the High Line is used by tourists primarily. The municipality wants to prevent that. However, specifics on how to prevent this are lacking. R19 explains:

> **R19**: "You see, the owners of Dudoc wanted to create that plan with Piet Oudolf, while we were actually saying: yes, that's all well and good, but it is hardly for the local people anymore; it's a complete tourist attraction (referring to greenspace development example in New York). Great, but we find it very important that, first and foremost, our Hofbogen should be for the direct residents in the area because they already have little green space. Second, it should be attractive for all Rotterdammers, just like the city parks that are used by all Rotterdammers."

Ecological justice

Ecological justice considerations revealed to play an important role in the planning process too. Initially, the idea was to create a tidal park, just for the sake of nature, not for the use of humans in the area. This changed however, as the use for humans as climate adaptation increasingly became important at the Nelson Mandela park. The following passage by R14 reflects this insight:

> **R14:** "Well, look, ecological justice, what you see is, that we came from a model where an island was designed purely for nature development. Yes, nature and ecology are incredibly important to apply here, so we are also creating an eco-friendly shoreline area. We are going to plant native species, so ecology is really crucial here. And perhaps another good point is that nowadays, with climate change, neighbourhoods experience significant heat stress. Even though this park is situated on the water, it will play a role in cooling down the surrounding area. So, we find that important, and you could also call it a form of justice."

According to R19, the Hofbogen currently can be seen as an ecological desert. Also, in the design of the project, the municipality explicitly made room for the hedgehog as a key species, based on a quantitative value of ecology and biodiversity. Hence, ecological justice can be seen as an important justice consideration for this project.

> **R19:** "Well, the second thing is that, of course, because there is little greenery, it is also an ecological desert, especially such a, yes, such a station area which is completely empty! Right, it was just a bitumen roof so nothing was happening there, and it stretches two kilometres through the city, from the city centre, also in combination with Hofplein, so there are enormous ecological opportunities there."

Procedural justice

Following up on the above, participation, from a procedural justice perspective, is seen as an important condition for the realization of benefits to be local. What further actions are taken to ensure that benefits remain local are missing, except for listening to inhabitants during participation. A big challenge for the city projects is the inclusiveness of the representation. COVID improved the inclusiveness by online meetings, reaching 9000 inhabitants, but this number fell back again after Covid when participation processes became physical again. The conceptualization of justice as a procedural issue on operational level are well reflected in the following passage, in which R14 explains the importance of participation very early in the development process at Nelson Mandela park, mainly for deciding what the park should look like.

> **R14**: "Yes, from the very beginning, when I got involved, that was five years ago, we had two very large participation rounds. The first participation round was actually about the question: "The municipality of Rotterdam plans to create a park here. What should it look like? What would you want to do in such a green area?" We have taken most of the arguments and ideas mentioned at that time into account in the design."

Multi-scalar justice

Finally, considering justice across multiple scales such as time and space, temporal justice is operationalized as involving children in the park design process. Unlike the literature's focus on intergenerational justice concerning future generations yet to be born, this highlights how temporal aspects are applied in this concept of multi-scalar justice.

> **Interviewer:** "Yes, and in that decision-making process, how are future generations considered?"

> **R14:** "Yes, during the preparation and participation phases, we specifically asked schools in the area what the children think and what they would like. They might no longer be at that school when it's completed, but we still asked the youth, young people, and children about their needs."

For the spatial dimension of multi-scalar justice, the benefits of the park are meant for everyone in the Southern part of Rotterdam: justice is conceptualized here using egalitarian distributional principles of justice (Buitelaar, 2020). This is, among the interview with R14, reflected by the following part of the Masterplan for the park (Municipality of Rotterdam, 2023a):

> "Park Maashaven is a park for everyone in Zuid. Meeting and engaging with your neighbourhood and community members are central here. The park is an ideal public space for all ages and all lifestyles. Its design invites residents from near and far to come to Park Maashaven."

Reflections on remaining justice considerations

Conceptualizations of transitional, intersectional, multi-scalar, or recognitional justice are observed to be limited in the analysed documents and interviews and are mostly implicit. However, one of the observed conceptualizations of recognitional justice is as follows: in their efforts the municipality of Rotterdam made for including all kinds of societal groups, knowing that some groups are harder to reach due to intersectional challenges such as poverty or other social problems. Recognitional justice is thus conceptualized as inclusive participation, especially of more vulnerable residents. R14 explains:

> **R14**: "And yes, in communication and participation, you also see that those poorer neighbourhoods are harder to engage with or reach. We understand and know this, and that's why we have made extra efforts to reach those people. So, we went into the neighbourhoods, conducted interviews, asked students to walk around, talk to everyone, and just have those conversations. To speak to those people, it remains challenging to really engage them. Because, you know, when it comes to participation, you also see that these people have other concerns, like how to put food on the table for today and tomorrow, and the fact that you want to build a park worth so many millions doesn't interest them as much. So, that does play a role. But we made extra efforts to reach those people."

Furthermore, explicit application of other justice principles mostly remains unclear from the interviews and documents; further applications of for example procedural justice dimensions are not observed. For example, the document 'Definitive Design Hofbogen park' (Municipality of Rotterdam, 2023b) discusses participation in the design of the project: it mentions the BewonersAdviesGroep (BAG), translated as Residents Advisory Group, which is an active group of people living close to the park, giving advice to the municipality developing the project in collaboration with Dudok Real Estate, the owner of the building. The participation does not mention anything on inclusiveness or representation in the participatory process. Seven neighbourhood sessions have been organized to involve inhabitants to think along about the preconditions of the park and the design of the park, as well as ecology and maintenance. Neighbourhood councils are also involved in this process. The document does not directly address conflict solving, inclusion and representation, and information exchange as procedural justice indicators. This does not mean it did not happen, but the final design document doesn't mention it.

The document 'College Letter on final design Hofbogen park - Park on the Roof' (Municipality of Rotterdam, 2023b) mentions several aspects that apply as environmental justice considerations. The letter discusses various aspects of justice in its content. Firstly, it covers distributional aspects related to the recreational quality and climate adaptation of the building, highlighting its historical value and advocating for multi-scalar justice. It emphasizes the need for more green spaces in areas with the least greening, a concept tied to distributional and corrective justice. The letter also mentions the importance of making the space attractive for animals, reflecting ecological concerns. Additionally, it stresses the necessity of transforming the area into a meeting place, which pertains to quality and distributional justice. The letter asserts that this space should be accessible to everyone, promoting egalitarian distribution. Furthermore, it addresses the accessibility of the space, which is essential for its use and relates to distributional justice. Lastly, it calls for inclusivity of users regardless of age. The conceptualization of considerations on justice in the Hofbogen park is summarized well in a letter from the council of Mayor and Aldermen (Municipality of Rotterdam, 2023b):

> "The Hofbogen as a versatile entity that can do everything: it is both a water and ecological reservoir, a safe living environment for people and animals, a place to walk, stay, relax, play, meet, and stroll."

In terms of prioritization, R19 explained it is not really the case that one dimension of justice is prioritized explicitly. However, the distributional justice considerations appeared dominant when explaining how justice considerations play a role in the project. Due the densification of the city and the pressure on public space, all kind of challenges come together in these kinds of projects, leading to an strong emphasis on distributional justice considerations. R19 explained that the quantitative approach in creating greenspace stems from the historical context: pre-war built neighbourhoods have very little greenspace. Within the distributional justice thinking, the egalitarian approach is seen as justified: when we create enough greening, everyone can have minimal amount and quality of greenspace. Accessibility is also mentioned as very important, especially for disabled residents. Accessibility for people with a disability is also considered important. The municipality must strike a balance between various interests concerning people who cause nuisances, such as the homeless. Additionally, while providing benches with handles to assist the elderly, measures should be taken to ensure these are not used as sleeping places by outfitting them with features that prevent extended lying down. This is about the question of distributional justice. Now the interest of the elderly is considered most importantly, reflected by the idea of space for the ages in the 0 to 100- perspective currently applied by urban planners.

5.2 Trade-offs between justice principles in Rotterdam

Table 6 below provides an overview of what trade-offs urban planners face at the strategic level and at the operational level in urban greenspace planning practice in Rotterdam. More extensive discussion of these trade-offs takes place in 5.2.1.

Nr.	Dimension	Dimension	Brief explanation
	Strategic level		
1.	Procedural justice	Recognitional justice	Trade-off between enhancing initiatives from society, knowing that these are not coming from those that need greenspaces the most
2.	Procedural justice	Distributional justice	Participation is done by a homogenous group: leading to unjust distributional effects
3.	Short term distributional justice	Long term distributional justice	Long term negative effects as green gentrification may be at odds with short term positive effects of greenspace planning
4.	Corrective justice	Procedural justice	Corrective approaches lead to unequal treatment of citizens
	Operational level		
1.	Procedural justice	Ecological justice	Human interests in participatory green planning processes are expressed stronger then at the expense of the voice of ecology and nature
2.	Distributional justice	Ecological justice	Human functionality at the expense of ecological quality
3.	Distributional justice	Distributional justice	Quality versus quantity of green
4.	Distributional justice	Distributional justice	Short term versus long term effects of greening

Table 6: Overview of trade-offs between environmental justice considerations in Rotterdam: on both strategic and operational level.

5.2.1 Strategic level trade-offs in Rotterdam

Trade-off 1: Procedural and recognitional justice

The first trade-off observed on the strategic level greenspace planning is between recognitional and procedural justice considerations. R11 explains the municipality wants to be open to initiatives from residents, but views a trade-off between the interests of those more and less vulnerable in the city and giving funds for these citizen-lead projects. Providing attention and arranging citizen lead initiatives might lead to abstaining listening to those that really need the greenspaces, which concerns recognitional justice. This is also emphasized by R17 and R18.

R11: "So I think, yes, that also makes it fair, but it's also honest to say that the people who are really struggling, for whom you might be doing this, are not really engaged with such themes. They are hard to reach because they are just trying to survive. So, those people, the eighty volunteers from Feyenoord, they are not the poorest residents. They are people who have the time and energy."

Trade-off 2: Procedural and distributional justice

From a multi-scalar justice perspective, one can observe the trade-off between procedural justice on the operational level and distributional justice on the city-wide level. The quote from R15 below highlights this trade-off. This trade-off shows when comparing the bottom-up greening efforts in neighbourhoods that differ in wealth and education levels. R15's statement shows that in his neighbourhood with many highly-educated residents, local residents utilize their resources and networks to enhance their immediate environment through greening initiatives. This local mobilization is an example of procedural justice, where the process of decision-making is accessible and influenced by those who will be directly affected by the outcomes. However, this form of procedural justice of giving residents freedom to themselves shape their streets might lead to injustices, as those not capable of organizing themselves might not be able to attain greenspace that way. R15 explains:

> **R15: "**Well, what I notice myself, coming from such a typical rich district, highly educated with all nice renovated old houses, and we've personally ensured through our networks that our street is being greened. And I think people in Rotterdam South *(synonym for more vulnerable part of the city)* want that too. Only then, if you say: we treat everyone equally, then justice is a bit lost."

However, when extending this localized, participatory approach to greening across the city, a trade-off emerges. R15 notes that in less affluent areas, like in South or other similar efforts, residents also desire greening but may lack the resources or networks to advocate for or implement it. If the policy is to treat every area equally without considering these differences, then the areas that already have advantages—like R15's neighbourhood—continue to benefit, reinforcing existing inequalities. This represents a failure in distributional justice, which seeks to ensure that city resources, such as green spaces, are allocated fairly and equitably, meeting the needs of all residents across the city, particularly those in less advantaged neighbourhoods.

This illustrates the trade-off where local-level procedural justice, through community-led initiatives, does not necessarily translate into equitable distributional justice across the city. While local engagement and decision-making processes are crucial, they must be supported by city-wide policies that ensure equitable outcomes, especially for vulnerable or less affluent communities. Without such mechanisms, procedural justice at the local level might inadvertently deepen the disparities in access to green spaces, hence challenging the broader goals of multi-scalar justice that aim to balance immediate local needs with long term, city wide justice.

Trade-off 3: Multi-scalar justice: trade-off between short term distributional and long term distributional justice

The following quote from R11 brings to light the trade-off between short-term and long term distributional justice in urban planning within Rotterdam, particularly concerning the development of green spaces. This dilemma centres on enhancing public spaces in the short term, which often leads to increased property values and potentially displaces lower-income residents, thus conflicting with long term equity goals such as displacement.

> **R11: "**So, everything we do is for all residents of Rotterdam, and the projects I have been most involved in are all in the south, often under the National Program South. It's known that public

space is one of the key topics of this program, aiming to enhance it so that people have sufficient green spaces nearby and quality outdoor spaces, even if they live in a densely populated urban neighbourhood. So, everything we do is aimed at creating that sense of justice (to increase quality and quantity). Of course, as always in our field, the challenge is to make everything better. But as we improve the quality of an area (by greening), the rental and housing prices tend to rise. This often has a negative impact on certain groups of people, and that's the ongoing conflict we face. "

Interviewer: "And how do you deal with that? What's the approach?"

R11: "From our department, I think our job is to create quality spaces. But I believe the municipality is working on different levels to ensure affordable housing. You might need to interview other colleagues who handle this directly to understand their approach. Essentially, different departments handle this, and we have a department specifically focused on housing issues. They often work with us on planning, discussing aspects like the size of the apartments and engaging with housing corporations to determine fair rents."

R11 discusses their involvement in projects, particularly in southern Rotterdam under the National Program South, aimed at enhancing public spaces to provide residents with better access to green areas. This initiative supports immediate distributional justice objectives by improving current residents' quality of life. However, these improvements may result in higher rental and housing costs, potentially displacing original residents due to affordability issues. This dilemma illustrates the conflict between short-term neighbourhood enhancement and ensuring long term affordability for all residents.

While R11's department focuses on creating high-quality public spaces, he acknowledges the need for other departments to address the consequences, such as affordable housing, to mitigate negative impacts on vulnerable populations. This highlights the compartmentalized approach in Rotterdam, where sector-specific actions are insufficient to tackle the complex dynamics between short-term benefits and long term equitable access to improved spaces. This finding also emphasizes that overcoming compartmentalization is crucial for ensuring coherence across all greening initiatives and their just outcomes.

Trade-off 4: Corrective and procedural justice
R15 highlights a trade-off between corrective and procedural justice in resource allocation for urban projects. The respondent explains that neighbourhoods facing more urgent challenges in terms of greening and heat receive more funding per square meter than those with less urgency. This approach aims to address disparities but may seem procedurally unfair to those in greener, better-off areas, who might feel sidelined because they receive less immediate support for their initiatives. This discrepancy can lead to perceptions of injustice, as equitable resource distribution doesn't always align with uniform procedural fairness. Corrective justice thus might feel procedurally unjust for residents.

R15: "This happens in the allocation of where we initially want to spend the money, and when we also say that in the neighbourhoods facing the most difficulties, based on all those conditions and criteria, I receive a bit more funding per square meter for projects than areas where it's less urgent. Yes, we don't want to say to someone living in a green area, "You as a citizen initiative figure it out yourself," because that's not really fair either."

5.2.2 Operational level trade-offs Rotterdam

At the operational level of Rotterdam, various trade-offs between justice principles have been revealed among the specific units of analysis of this study: the Nelson Mandela park and the Hofbogen park.

Trade-off 1: Procedural and ecological justice

The first trade-off identified at the operational level in Rotterdam is between procedural justice and ecological justice considerations. In the case of Nelson Mandela park, the focus on procedural justice, which emphasizes strong representation of human interests, has diminished the park's ecological functions. This situation exemplifies the trade-off between the effects of procedural justice efforts and the pursuit of ecological justice considerations. R14 illustrates this trade-off, explaining how the multifunctional purpose of the park creates tension between nature and human use of public greenspaces in Rotterdam. Currently, greenery, from an ecological perspective, has not been a leading factor in the design process.

> **R14**: "So actually, the park has a multifunctional purpose, with a square including an area where you can relax, exercise, there are hills, so it has really become a very densely programmed park. And greenery is not leading, and we do want trees, large, mature trees, native trees, grass fields, but the function of the park is what has been leading. And what do people want and how? How can we incorporate that into a design?"

Trade-off 2: Distributional and ecological justice

Resulting from the first trade-off between procedural and ecological justice considerations, I also uncovered a trade-off between ecological justice considerations and distributional justice considerations. Space for nature and space for human functionality, such as football pitches, festivals, or grass fields, is at odds with space for ecological functionalities. The following quote from the letter from the Council of Mayor and Aldermen to the City Council (Municipality of Rotterdam, 2023b) illustrates the trade-off between ecological functionality and recreational functionality:

> "The elevated park must connect to this partially existing and partially future city. The greenery has a high ecological value due to its variety and layering of species. A good balance must be found between the recreational and ecological aspects of the park."

Currently, in dense areas such as the city centre, human user-value is prioritized over ecological value. This prioritization of distributional justice for humans clearly reflects a trade-off between distributional justice and ecological justice, or ecological justice as a scale dimension within distributional justice considerations. R19 explains that although the municipality has focused on ecological norms over the past 10 years, user-oriented norms must now be prioritized even more.

> **R19**: "Yes, that's what the discussion is about now, whether we should indeed designate areas as inaccessible to people, but open to flora and fauna. That's what the discussions are currently about. But it's interesting that we're only now starting to establish those standards. Over the past decade, we've had a lot of standards for ecology and climate, but hardly any for users. And now we're actually bringing those into consideration as well."

Trade-off 3: Trade-off between distributional justice considerations

The third trade-off at the operational level is observed between qualitative and quantitative perspectives in the development of Hofbogen park, relating to distributional justice considerations (Kato-Huerta et al., 2022). A specific aspect of this trade-off within the distributional dimension of justice is the choice between creating a very quiet, peaceful park or opting for recreational activities such as sports, which would introduce more commotion. R19 explains this perspective:

> **R19:** "If you consider that 250,000 homes are going to be built, which means certainly 400,000 more residents in the entire Randstad, you can see that there's actually too little space. Everything is full now. All the recreational green spaces, for example, are still being used, while the main reason people want to go to green spaces is for peace and quiet. So there's a huge conflict there. "

Trade-off 4: Multi-scalar justice, short term versus long run effects

The final trade-off concerning distributional justice dimensions is between short-term distributional justice and long term distributional justice. This interpretation of justice relates to the multi-scalar dimension of justice. Currently, short-term distributional justice, ensuring access to greenspace for everyone, is prioritized over the risks of green gentrification, which are seen as inevitable. Furthermore, according to R19, green gentrification can be justified because it creates opportunities for home-owners by increasing the value of their properties. This is seen as just because it stimulates movement and growth in the housing market.

> **R19**: "Just with the idea of, well, it's being renovated, you can be very much against it, because with that, you're displacing people. But at the same time, for people who perhaps moved from social housing to their first purchased home years ago, it also means a step forward. So the whole city, that city, is of course changing and you really can't stop gentrification."

From a multi-scalar perspective of justice, the indirect, long term, and city-wide effects of greening in the Hofbogen area, such as green gentrification, are considered uncontrollable. Consequently, the interest in creating quality greenspace for every neighbourhoods is prioritized. R19 explains this idea:

> **R19**: "It can't be that you don't have (qualitative) public spaces. We have always said: we create public spaces for everyone in Rotterdam. That is really the best quality, in my opinion, of the Rotterdam Style, that we have created a basic quality for the entire city, not making some neighbourhoods more better, except maybe for the city centre. But beyond that, no. And yes, with that, you will always have developments in such an area, and you have to take all of that into account. …. Gentrification in the public spaces (not private), right, what we do in those public spaces is bring a basic quality for the entire city, and then there are some places, and we identify those places because they are used by many different people. So those are the city parks and city squares, which can have a higher quality."

Gentrification of public space is viewed as the responsibility of urban greenspace planners, whereas gentrification in the private sector (housing) is not seen as the municipality's responsibility. The egalitarian starting point justifies the development of greenspace in Rotterdam. In this context, gentrification is seen as inevitable and unpreventable. The argumentation is that not creating greenspace would lead to a greater injustice compared to not enhancing greenspaces, despite the gentrification that may follow.

5.3 Synthesis Rotterdam

The synthesis of the findings for Rotterdam in this section provides a brief overview of main findings and an answer to the sub questions. To address sub questions 2 and 3 in the case of Rotterdam, I will focus on both a city-wide strategic level and the specific units of Nelson Mandela park and the Hofbogen park. The sub-questions are:

SQ2: *How do urban greenspace planners conceptualize, apply and prioritize justice principles in urban greenspace planning processes?*

SQ3: *What trade-offs do urban planners experience when addressing justice in urban greenspace planning and how are they dealt with in practice?*

5.3.1 Answering SQ2: Conceptualization, application and prioritizing of justice in urban greenspace planning in Rotterdam

In Rotterdam, conceptualizations of justice within urban greenspace planning primarily revolve around distributional justice, emphasizing an egalitarian approach that seeks to provide equitable access to green spaces across the city. Planners prioritize this by aiming to balance the quantity, quality and accessibility of green spaces, particularly focusing on their role in climate adaptation—managing heat stress and enhancing water management. While ecological justice gains ground, prioritizing biodiversity and species-specific interventions, corrective and transitional justice remain notably absent. Procedural justice primarily influences the development at a local scale, ensuring that greenspace functionality aligns with community needs and preferences. However, recognitional justice is less emphasized, with efforts to integrate diverse perspectives only gradually emerging. Overall, the implicit nature of all of these justice considerations often means they are not explicitly discussed within planning.

5.3.2 Answering SQ3: Trade-offs between environment justice dimensions in Rotterdam

Urban planners in Rotterdam face various trade-offs when addressing justice in greenspace planning. One significant challenge is balancing between enhancing local green initiatives from a procedural rationale, with city-wide distributional justice-oriented efforts, particularly concerning resource allocation. This is particularly challenging as initiatives that benefit specific localities, like affluent neighbourhoods using their resources to enhance nearby green spaces or their streets, can inadvertently exacerbate inequalities, impacting the equitable distribution of environmental benefits. Planners try to manage this trade-off through fostering community engagement everywhere and striving for inclusive participation, which, while challenging, aims to ensure that all groups benefit fairly from urban greenspace planning. Another significant trade-off involves multi-scalar justice: balancing short-term sustainability improvements with long term outcomes. Initiatives that immediately enhance a neighbourhood's aesthetic and functional value can lead to increased property values and gentrification, potentially displacing lower-income residents. How urban planners in Rotterdam strive to manage these trade-offs remains unclear. Additionally, the city's approach to integrating ecological considerations seeks to address both immediate community needs and longer-term resilience against climate change impacts, though this too can lead to trade-offs between ecological justice and functionality for humans, from a distributional lens.

Overall, Rotterdam's approach to urban greenspace planning reflects a complex interplay of distributional, procedural, and ecological justice, with ongoing efforts to enhance the inclusivity and effectiveness of these initiatives. While most aspects of justice seem less developed, the city's strategic focus on egalitarian distribution and local engagement highlights the ambition to improve justice outcomes. However, most considerations of justice in urban greenspace planning of Rotterdam remain implicit or undefined.

6. Comparative analysis of Utrecht and Rotterdam

6.1 Overview

The findings from both cities are presented in the table 7 below. The table 7 provides an overview of how justice is conceptualized, applied and prioritized as observed in the two cases, distinguishing between strategic, operational and overall scales. This table provides a brief overview of how justice principles are being applied, but does not give right to the nuances of how justice plays out in the planning processes in both cases.

Justice Dimension	Utrecht (overall)	Utrecht strategic level	Utrecht operational level	Rotterdam (Overall)	Rotterdam strategic level	Rotterdam operational level
Distributional justice	Extensive	Extensive	Extensive	Extensive	Extensive	Extensive
Procedural justice	Moderate	Minimal	Extensive	Moderate	Minimal	Substantial
Recognitional justice	Moderate	Moderate	Moderate	Limited	Limited	Limited
Corrective justice	Substantial	Substantial	Substantial	Limited	Limited	Limited
Transitional justice	Limited, but growing	Limited	Limited	Minimal	Minimal	Minimal
Intersectional justice	Moderate	Moderate	Moderate	Limited	Limited	Limited
Ecological justice	Substantial	Substantial	Moderate	Substantial	Substantial	Substantial
Multi-scalar justice	Limited	Limited	Limited	Minimal	Minimal	Minimal

Table 7: Overview of how justice dimensions are applied in Rotterdam and Utrecht. The darkness of the colour indicates the dominance of the application. For example, dark blue refers to extensive application of the justice principle, where light blue means minimal application.

6.2 Reflections on differences and similarities

In both cases of Utrecht and Rotterdam reveal mainly *implicit* applications of environmental justice principles in urban greenspace planning. However, Utrecht is starting to become more explicit in its justice considerations, as for example reflected by the principle of unequal investment for equal opportunities, from the coalition agreement (Municipality of Utrecht, 2022b), and the 'Social Vision' for 2040 (Municipality of Utrecht, 2024b) which is currently being developed by the social architects: which both connect social questions like justice thinking to spatial developments like greenspace planning.

Furthermore, concerning how justice is applied implicitly, in Utrecht, environmental justice considerations appear to be more important for the greenspace planning process compared to Rotterdam. This is also visible in table 7 above, which shows for Utrecht, environmental justice principles are applied more principles are applied and more prominently. Justice thinking thus appears to have landed more in the city of Utrecht. For Rotterdam, the (almost) absence of justice thinking in greenspace planning is remarkable, especially with the presence of the ICAR movement within the municipal organization, which aims to make justice thinking more mainstream in its organization. These differences in the cities' approaches to environmental justice could be attributed to their distinct political contexts. Utrecht, with its socially oriented left-wing politics, contrasts with Rotterdam, which has a historically and currently more liberal-right wing coalition, as explained in section 3.3.

Comparison: Utrecht versus Rotterdam

Concerning distributional justice, Utrecht and Rotterdam are quite similar. In both cities, distributional justice is the prevailing interpretation of environmental justice. Interviews and policy documents in both Utrecht and Rotterdam frequently reference to indicators such as the quality, quantity, accessibility, functionality, and preconditions for the use of greenspace.

Procedural justice is in both cities mainly visible at operational level, where functionalities of greenspaces such as parks must align with needs and wants of target residents of a park. Participation processes are used to pursue this interpretation of procedural justice In Rotterdam, procedural justice is also about giving room to bottom-up initiatives. In Utrecht, participation is more about fitting top-down initiatives with residents' preferences.

Both cities show an absence of recognitional justice conceptualizations. When they do, urban planners conceptualize it in a different way compared to literature. In this study, the following definition of recognitional justice from literature is employed, referring to recognitional justice as to recognize that socio-economic injustices are linked to cultural and symbolic injustices: "recognition as to view socio-economic injustices as fundamentally linked to cultural or symbolic injustices, which fail to give adequate recognition to certain groups" (Bulkeley et al., 2014, p. 31). Planners, on the other hand, aim to recognize the diversity of perspectives and ensure inclusivity in participation processes to capture these varied interpretations and views on greenspace planning. This differs.

Urban planners in Utrecht often combine corrective justice with intersectional and distributional justice perspectives. Various urban planners in Utrecht start from the point that the lack of access to greenspace should not be seen as separate from other forms of vulnerability or inequalities. In Rotterdam, corrective justice appears to be applied primarily to ensure adequate greenspace from an egalitarian standpoint. However, this egalitarian approach does not align with the rationale of corrective justice, which aims to address and remedy historical wrongdoings. Intersectional justice perspectives are employed by the ICAR, but the insights from the ICAR apparently haven't landed yet in the rest of the organization. Intersectional conceptions of justice seem to be absent in the practice of greenspace planning in Rotterdam.

With regard to intersectional justice, both cases showed sectoral approaches. Respondents 5,7 and 11, among others, share that a departmentalized approach to spatial- and greenspace development leads to sectoral approaches to urban greenspace planning. As a response to this challenge of departmentalization, Utrecht set up a social architecture department, which aims to connect spatial development to questions of social challenges, including justice perspectives. This social architecture department answers the demand for a more integral assessment framework for social questions in greenspace planning. Rotterdam might be able to learn from the experiences with social architecture in Utrecht.

The multi-scalar justice dimension of ecological justice is applied in a somewhat similar way in both Utrecht and Rotterdam. Biodiversity is seen as an important policy goal, but in Rotterdam it is framed as instrumental to human value. Also, ecological justice goals are viewed as instrumental for climate adaptation measures, especially in Rotterdam where water challenges are quite serious and many parts of the city are highly petrified. Regarding the temporal and spatial subdimensions of justice, both cities lack consideration for future generations. They define the long term as ten years, but the indirect long term effects of greenspace planning, such as green gentrification (Anguelovski et al. 2019), often extend beyond this timeframe. These effects are largely overlooked in both cities' conceptualizations of justice in urban greenspace planning. A long term temporal application of multi-scalar justice is thus missing in both cities.

Transitional justice interpretations are absent in Rotterdam's urban greenspace planning in the empirical observations of this study. However, in Utrecht, several respondents indicated that ideas of transitional justice are emerging due to participatory challenges related to resistance, costs, and time. From a transitional perspective, the obligation to provide greenspace as an adaptive measure, to protect health

impact of heatwaves for example, eventually becomes prioritized over procedural justice interests. However, this is not yet the case.

6.3 Operational-strategic level comparisons

The primary similarities between operational and strategic justice applications in Utrecht and Rotterdam are the following. In general, procedural justice principles usually are applied at the operational level, where participation serves as a way to align the interests of the municipality with those of its residents. Moreover, distributional considerations impact all levels, often creating tensions; for example, measures that are just at the project level may contradict broader strategic objectives, such as city-wide greening initiatives that might not be achieved due to localized decisions. Furthermore, considerations of corrective and transitional justice, which are particularly significant in Utrecht, are highly specific to the context and thus tend to be conceptualized and implemented more frequently at the street or neighbourhood level. In Both cases, justice operationalizations across multiple scales in both cities are integrated with ecological views on the development of green spaces. The idea is that green spaces should be accessible on various scales, from local to city-wide. Green areas should be conveniently available near homes, throughout neighbourhoods, and extensively around the city. These patches of green are intended to be interconnected, both to ensure accessibility from a distributional justice perspective, and to serve ecological purposes, acting as ecological corridors, from an ecological justice perspective.

6.4 Comparisons of trade-offs

Both Utrecht and Rotterdam experience various, sometimes similar trade-offs between justice considerations. The first shared trade-off is the trade-off between procedural justice at operational level and distributional justice at strategic level: where the first potentially stands in the way of the latter. Secondly, a pattern recognizable is that ecological justice considerations are at odds with distributional and procedural aspects of justice. Furthermore, trade-offs are observed within the distributional dimensions of justice, regarding quality and quantity of greenspaces. Both cities also shared the trade-off between multi-scalar justice considerations.

What stands out for Utrecht is the trade-off between transitional justice and procedural justice. This also reflects the difference between the cities: in Utrecht, transitional justice perspectives are becoming increasingly important. Another trade observed in Utrecht and not in Rotterdam is between procedural and multi-scalar justice considerations: as long term temporal justice. The absence of this trade-off is perhaps also due to the future generations being applied less in the justice considerations within urban greenspace planning practice of Rotterdam. A trade-off observed in Rotterdam and not in Utrecht is the one between corrective and procedural justice notions: in Rotterdam, corrective justice efforts are viewed as potentially procedurally unjust. This finding also reflects the egalitarian approach taken by urban planners Rotterdam, taking the principle of equal treatment as most important to the planning process for urban greenspaces.

7. Discussion

This section provides a discussion of the findings in light of societal, scientific and theoretical and practical relevance. Furthermore, it discusses the limitations of the study and the suggestions for further research. It places the findings in the light of the broader societal and scientific debate, reflecting on implications of environmental justice theory in the contexts of urban greenspace planning. Furthermore, practical implications are discussed, providing recommendations on how to enhance justice in greenspace planning.

7.1 Societal implications

The implications of this study's results for the societal debate are presented in this section. The societal implications are threefold: the study has an agenda-setting function among urban planners, it offers an opportunity for a novel approach to including environmental justice in urban greenspace planning and it emphasizes the importance of an integral approach for environmental justice in urban greenspace planning.

The study provided insight into the current applications of environmental justice principles in processes of urban greenspace planning. This snapshot of the current narrative of urban planners shows that justice considerations often remain implicit and focus dominantly on distributional justice notions. Therefore, the first societal implication of this study is the introduction and explication of environmental justice thinking into the debate within the practice of urban greenspace planning. This study functioned as agenda-setting, introducing eight dimensions of environmental justice thinking among to those working on greenspace planning in Dutch cities, introducing the narrative to urban planners. Moreover, the study attributed to discussions on explicit environmental justice considerations among those in urban greenspace planning. Specifically, it brought explicit justice considerations under attention to greenspace planning departments of Rotterdam and Utrecht, creating an explicit conversation on environmental justice in greenspace planning, fostering the discussion and deliberation between urban planners and policymakers on what is considered just. This deliberation and dialogue between urban planners is important for dealing with the uncertainties and social complexities of climate adaptation, as also shown by Mees et al. (2014).

Many interviewees from both cities are unfamiliar with the term 'environmental justice', often associating it solely with legal aspects. By embedding a justice narrative within urban greenspace discussions, this research fosters a more informed and equitable approach among urban planners and policymakers. This contributes to a more comprehensive and fairer urban greenspace planning practice in the Dutch context. This ultimately makes it possible to make conscious decisions instead of unconscious decisions, which currently often seems to be the case. This can ultimately enhance agency for urban planners to create more liveable and environmentally just cities with greenspace planning.

Secondly, this study sheds light on how urban planners conceptualize, apply, and prioritize environmental justice and the trade-offs they encounter in greenspace planning. It highlights the potential environmental justice risks that can arise despite planners' good intentions to achieve equitable outcomes, often due to a predominant focus on distributional justice. The societal implication of this study is that its findings offer an opportunity and starting point for Dutch urban planners and society as a whole, to address these environmental (in)justice-related risks and prevent undesirable outcomes. The study provides insight into the details of how justice is conceptualized and applied, guiding future approaches to address environmental justice outcomes of greenspace planning. For example, the study highlights that recognitional justice receives little attention in urban greenspace planning in both cities. Consequently, this research emphasizes the need to integrate recognitional justice into urban greenspace planning to ensure more inclusive and equitable outcomes for society.

The third societal implication of this research pertains to the fragmented approaches observed in urban greenspace planning. Interviews with various urban planners highlighted the necessity for a more integrated assessment framework or approach to justice. Departmentalization within municipal

organizations leads to fragmented approaches to greening. This occurs when various departments pursue different objectives, such as ecological goals that may conflict with the recreational purposes of green spaces. The societal implication is that a lacking integrated justice approach currently endangers the governments duty to protect its residents from adverse and unjust effects of greenspace planning. Consider multi scalar aspects of longer-term temporal and spatial justice outcomes such as green gentrification and suburban displacement, alongside marginalization and segregation may be helpful, as discussed by Hochstenbach (2017) and Anguelovski et al. (2019). These indirect effects are often overlooked because each department pursues its specific objectives, such as recreational, ecological, or quantitative greening, without a comprehensive vision for just outcomes, leading to arbitrary justice results. The societal implication is that planning for justice necessitates an integrated approach, as current sectoral approaches to greenspace planning lead to partial considerations that fail to address the complexity of environmental justice outcomes in urban greenspace planning and the interconnectedness of justice dimensions.

7.2 Scientific implications

The insights from the literature review in section 2.3 provided insight into how environmental justice considerations are included in the context of urban greenspace planning. The review revealed the trend that most greenspace planning does not explicitly include justice concerns. The lack of explicit inclusion of environmental justice considerations in the greenspace planning did not apply fully to Utrecht: this city actively invests unequally for equal opportunities, and justice considerations are increasingly becoming part of the planning narrative. For Rotterdam, the image of justice considerations being absent applied more: justice conceptualizations remained mostly implicit or weaker for this city. Hence, these insights differ from what is observed in literature.

When environmental justice perspectives are applied, they predominantly concerned distributional perspectives, and recognitional notions of justice appeared to get more attention (Meerow et al., 2019). This study also shows the dominance of distributional justice in conceptualizing justice within greenspace planning, which is in line with what is observed in literature (Bulkeley et al., 2013; Kato-Huerta & Geneletti, 2022; Diezmartínez & Gianotti, 2022). Furthermore, the introduction highlighted Chu & Cannon's (2021) observation that recognitional justice is relatively nascent in planning documents compared to distributional justice. This study confirms that urban planners in Utrecht acknowledge the importance of recognitional justice but still struggle with practical implementation strategies. Rotterdam, however, shows little to no engagement with recognitional justice concepts. The findings of this research thereby confirm what previous research has indicated: there has been a historical lack of justice considerations within urban (green) planning (Castán-Broto & Westman, 2017: Bulkeley, 2013; Meerow et al., 2019).

Furthermore, the literature review also suggested that attention to justice in urban planning is on the rise, signalling a growing awareness and integration of justice considerations in urban greenspace planning. Conversely, this study offers new insights in this rising attention: it reveals a new shift towards the incorporation of dominantly ecological and transitional and corrective justice into the planning frameworks of greenspace planning. This is demonstrated in Utrecht. For instance, transitional and corrective conceptualizations of justice were strong in this city. This shift is an interesting topic for further research, as it is not completely in line what earlier research suggests.

Another reflection on the scientific implications of this research concerns its contribution to the scientific debate on environmental justice. To the best of my knowledge, this study represents the first effort in the field of environmental justice and urban greenspace planning research to empirically apply justice principles in urban planning practice, in doing so providing a practical framework to the abstract concept of environmental justice. Consequently, this study provides a foundation for further practical operationalization of environmental justice in greenspace planning in future research.

Finally, this study also revealed challenges urban planners face in operationalizing environmental justice. While the various subdimensions of the framework facilitated the application of environmental

justice, the actual practice in urban planning showed significant deviations from theoretical expectations. The operational subdimensions such as recognitional, multi-scalar, ecological, and corrective justice as observed in practice differ compared to their conceptual descriptions in the literature. In particular the conceptualization of recognitional justice was remarkable, as it varied widely. Most interpretations by urban planners did not align with the definition used in this study, which understands recognitional justice as "viewing socio-economic injustices as fundamentally linked to cultural or symbolic injustices that fail to adequately recognize certain groups", as described by Bulkeley et al. (2014, p. 31). Instead, urban planners primarily perceived recognitional justice as the acknowledgment of diverse opinions on how greening should be implemented and recognizing these varying perspectives. Hence this research provided novel insights into the environmental justice dimensions of transitional and corrective justice and their practical applications in urban greenspace planning, enriching the scientific debate on environmental justice.

7.3 Reflections on the EJ framework and its implications

This section discusses the applicability of the environmental justice framework constructed in this study. I reflect on the analytical framework for examining distributional, procedural, and recognitional justice considerations in urban greenspace planning, which for these three dimensions was mainly based on the 'environmental justice analytical framework' by Kato-Huerta & Geneletti (2022). Additionally, I also reflect on the conceptualization and operationalization of the five non-classical justice dimensions in the two case studies, expanding beyond the previously mentioned three dimensions. Again, the alternative dimensions are corrective justice, transitional justice, intersectional justice, ecological justice, and multi-scalar justice. The operationalization of these dimensions is based on an iterative process informed by empirical observations, utilizing an inductive approach.

7.3.1 Reflections on the applicability of classical three EJ justice dimensions

The three justice dimensions of recognitional, procedural, and distributional justice have been adopted and operationalized in the environmental justice framework using indicators by Kato-Huerta & Geneletti (2022). This operationalization proved useful for assessing distributional, recognitional and procedural justice within greenspace planning. The results of this study illustrated that considerations of environmental justice remain implicit most of the time. This causes environmental justice decisions typically being made unconsciously in greenspace, leaving discussions about what exactly is deemed just unexplored and undiscussed. The environmental justice analytical framework constructed for the three main dimensions of justice has been of use in identifying which justice dimensions have been applied and how. The indicators and sub-indicators applied, refer to elements considered in justice dimensions. For procedural justice, the sub-indicator includes the enfranchisement of residents in the greenspace planning process. Another sub-indicator for procedural justice involves the inclusion of a variety of groups from different backgrounds in decision-making.

However, this part of the framework used in this study struggled to capture the underlying rationale behind what urban planners and their organizations consider to be an environmentally just outcome of greenspaces. The framework only provided *indirect* insights into the specific justice principles or subprinciples applied, and misses to capture what is deemed environmentally just, missing the ability to grasp the argumentation behind choosing these justice principles and approaches.

In Utrecht, for example, the principle of unequal investment for equal opportunities was identified as a guiding principle for municipal officials, as articulated in the Coalition Agreement (Municipality of Utrecht, 2022b). This principle reflects the justice ethos of prioritizing the most vulnerable, inspired by Rawls' theory of justice and the difference principle. Hence, the analytical framework based on the operationalization of Kato-Huerta & Geneletti (2022) was not able to facilitate capturing this underlying distributional rationale. Adding the other five dimensions of justice to the framework, however, proved helpful in uncovering the nuances of the underlying justice rationales. In the example mentioned above, the notions of corrective justice are visible: where those most vulnerable lack access to greenspace, they are corrected for this by putting extra effort into making sure those groups gain more greenspace than

others. Including the five other justice dimensions thus proved helpful in understanding what justice considerations are made by urban planners. Still, these also did not fully uncover the ethical argumentations substantiating what is considered fair.

Therefore, including operationalization of justice dimensions whereof the indicators reveal the rationale behind justice considerations, would significantly enrich the analysis in this study and enhance the EJ framework developed in this study. Adding these would provide a deeper understanding of the principles guiding environmental justice decisions. To provide an example of how this could be done for the dimension of distributional justice, Buitelaar (2020) identified several distributional justice principles derived from ethics: maximizing utility for the largest group possible (utilitarianism), ensuring equality (egalitarianism), guaranteeing sufficiency (sufficientarianism), or adopting no specific principle (liberalism). Similarly, de Vries et al. (2024) also distinguish ten principles of distributional justice, which stem from political philosophy. These principles are classified into four categories: greatest utility, individual rights and freedoms, capacity and solidarity and lastly the category of contribution and benefit. Including operationalization of these underlying principles of justice would enrich the analysis of this study significantly.

To conclude, the EJ framework constructed in this study could be enhanced by including operationalization of justice that unveils the underlying ethical argumentations in urban greenspace planning. This does not apply exclusively to distributional dimensions of justice, but also to the other seven in the analytical framework for environmental justice proposed in this study. These kinds of operationalizations could help distinguish the underlying ethical rationales of what is considered just by urban planners. This could improve the analysis and understanding of how urban planners apply environmental justice principles in urban greenspace planning, also contributing to the aim of this study.

7.3.2 Reflections on the empirical operationalizations of the other five justice dimensions

In this section, I discuss how urban planners operationalize ecological, corrective, intersectional, multi-scalar, and transitional justice in the practice of Dutch cities, and I explore the scientific implications of these findings. This analysis serves as an empirical foundation for the operationalization of these justice principles: providing insights for constructing and adjusting the environmental justice framework established in this study.

Ecological justice

In both cases, ecological justice is conceptualized and operationalized primarily as a distinct variable rather than a scale variable. As discussed in the conceptualization of ecological justice in the theoretical framework in chapter 2, ecological justice endows nature with agency, recognizes the interconnectedness between social and ecological systems, and advocates for the inclusion and participation of nature's interests in decision-making processes (Pineda-Pinto et al., 2021). The idea of indispensability was discussed (Menton et al., 2020), which is related to the idea of ecological justice (Pineda-Pinto et al. 2021). It entails the principle that excluded, marginalized and othered populations, both human and non-human beings and things, are indispensable (Menton et al., 2020).

This, nonetheless, is not how ecological justice is conceptualized and operationalized in practice of urban greenspace planning. In both cases, when conceptualizing ecological justice, urban planners view nature and ecology as separate from the human world. Ecological justice is seen and applied as a goal in itself. This distinction also makes inclusion and participation of nature's interest difficult in practice. The precise operationalization of ecological justice differs slightly between the two cases of Rotterdam and Utrecht. For example, in Rotterdam urban planners view ecology and nature more as a means to reach human goals, such as climate adaptation goals for cities. In Utrecht, biodiversity is seen as important in itself, but in Rotterdam it is also seen as a means for human interest. The reasoning in Rotterdam urban planning is as follows: if we don't have biodiversity, we have boring nature, and lose the economic benefits from nature. In Utrecht this is different: ecology is seen as a goal in itself, although most urban planners do prioritize human interest over the interest of the natural environment.

For the theoretical framework this implies that ecological justice should not only be understood as a scale variable of multi-scalar justice. It should also be understood as a justice goal worth pursuing in itself. In the other conceptions of ecological justice revealed, nature is framed as an instrument for human interests. Future research could further inquire about these conceptualizations and applications of justice to get a full understanding of these conceptualizations of justice.

Corrective justice

Corrective justice in practice of the two Dutch cities was understood as correcting historical wrongdoings, but not wrongdoings to humans but to the city and to nature, including a perspective of ecological justice. In the conceptualizations of Utrecht and Rotterdam, historical wrongdoings are related to restoring mistakes from spatial developments conducted before. For example, the area of Katendrecht forgetting the green in this area, and example of Utrecht putting a highway right into a canal below Hoog Catharijne or filling the Leidsche Rijn canal being a mistake.

Also, in Utrecht, corrective justice is conceptualized strongly from an intersectional rationale: where multiple forms of vulnerability come together, the municipality should invest unequally for equal opportunities. This is explained further in the section below.

Intersectional justice

In the empirical data gathered for this study, primarily through interviews, urban planners predominantly conceptualized and operationalized the concept of intersectional justice as being closely linked with corrective justice. For urban planners in Utrecht, intersectional perspectives provide the rationale for implementing corrective measures. This finding further underscores the interrelations among different conceptions of justice (Bulkeley et al., 2014; Milchram, 2020).

Furthermore, the empirical data from this study reveals a nuanced relationship between intersectional justice and recognitional justice dimensions, presenting a significant conceptual and operational challenge. This close linkage often complicates the distinct identification and discussion of each within conversations and interviews with urban planners. Intersectional justice, with its focus on the interplay of various social identities and the related systems of oppression, domination, or discrimination, naturally incorporates elements of recognitional justice. On the other hand, recognitional justice, prioritizes the acknowledgment and respect for diverse identities and experiences. This analysis suggests that in the context of urban planning, intersectional justice might effectively be conceptualized and operationalized as a subdimension of recognitional justice.

This can be explained as follows. Intersectional justice perspectives are essential for the application of recognitional justice. For instance, understanding the structural mechanisms of marginalization—analysed through the recognitional justice lens of environmental justice—requires acknowledging the intersectional effects of factors such as class and income on exposure to environmental injustices. These intersecting vulnerabilities compound and reinforce the marginalization experienced by affected groups, are in line with intersectionality theory by Crenshaw (2013). A comprehensive approach to recognitional justice must include an intersectional perspective to effectively address the compounded vulnerabilities faced by marginalized groups. Therefore, intersectional justice could be viewed and operationalized as a subdimension of recognitional justice.

Transitional justice

Empirical data collected in this study indicates that within the environmental justice framework, the transitional dimension is conceptualized and operationalized as the duty of taking care. This understanding is connected to the trade-offs encountered between distributional outcomes. This study has shown that efforts in procedural justice and recognitional justice sometimes lead to distributional injustices. Hence, transitional justice is framed as the responsibility to ensure safety and health of vulnerable citizens.

The municipality consciously chose to implement greening initiatives as a necessary measure to protect citizens from the impacts of climate change, such as heat stress in the elderly and water stress in residents

with low-quality homes. These initiatives are justified by the need to mitigate increasingly severe and frequent rainfall. In this approach, the municipality prioritizes the justness of the distributional outcomes over the fairness of the procedural and recognitional aspects. This highlights the trade-offs and dilemmas involved in operationalizing transitional justice on the ground. It implies that, within the theoretical framework, achieving equitable distributional outcomes can sometimes necessitate compromises in procedural and recognitional justice. Consequently, transitional justice is operationalized as a mean to navigate and resolve trade-offs between these different forms of justice. This dilemma is particularly evident at the operational level, such as in greening a single street or square within neighbourhoods.

Furthermore, transitional justice is conceptualized by urban planners as mean to increase effectiveness, driven by a distributional rationale. The pursuit of procedural justice showed to be time-consuming and resource intensive: the costs associated with the participatory processes required by procedural justice sometimes heavily outweigh the social benefits derived from greening projects. As this becomes more common, urban planners are increasingly considering that making decisions on behalf of the community (at the expense of procedural justice) might be more cost-effective. This perspective on cost efficiency shapes the current understanding of transitional justice: this provides another conceptualization and application in the practice of urban greenspace planning, and can be adopted for theorizing transitional justice in the environmental justice framework.

Multi-scalar justice
Empirics in this study show that urban planners in greenspace planning conceptualize and operationalize multi-scalar justice predominantly as spatial justice. The dominant justice argumentation is that everyone should be living close to an accessible green space. The temporal subdimension of multi-scalar justice conceptualizations was scarce among both cases, especially long term notions of justice concerning future generations are notably absent. Long term justice was defined as 10 years. This approach contrasts with the more extended time frames generally used in intergenerational justice, which aim to address impacts on future generations over several decades or even centuries.

According to Meijers (2023), various scholars have observed that democratic governments often face challenges in addressing long term issues. Due to the short duration of election cycles, typically 4–5 years, there is a tendency toward short-term thinking in politics, sometimes described as the 'tyranny of the present' (Gardiner, 2014; in Meijers, 2023). Politicians aiming for re-election within a few years might lack the motivation to implement expensive policies that have benefits extending far into the future. This might explain the absence of intergenerational or long term justice conceptions by urban greenspace planners in Dutch cities.

Concluding, the reflections above provided various insights, reflecting on the applicability of the three classical environmental classical environmental justice principles and the inductive operationalization of the five alternative principles. These reflections on the empirical testing of the justice dimensions, I use as the foundation for constructing and adjusting the environmental justice framework established in this study. Summarizing, for all environmental justice dimensions, an addition that would enable the analytical framework to uncover the underlying justice argumentations would enhance the framework significantly. This would enable the framework to uncover underlying ethical considerations, improving the ability of the framework for thorough understanding what is considered just in the practice of urban planning. Secondly, ecological justice is operationalized as a goal in itself, or as instrumental means to human interest. Corrective justice was conceptualized as correcting wrongdoing from recent past, not historical wrongdoing, as corrective justice is conceptualized in literature. Intersectional justice should be seen as a subdimension of recognitional justice, as understanding intersectionality can be seen as a prerequisite for understanding recognitional justice. Transitional justice should be operationalized as means to enhance effectiveness and to be able to fulfil the duty of care governments have, protecting those most vulnerable. Multi-scalar justice was operationalized primarily in terms of spatial distribution. An operationalization of long run temporal scales within the multi-scalar justice dimension would also benefit the environmental justice framework constructed in this study.

7.4 Limitations

This section touches upon the limitations of this research, discussing limitations on internal and external validity of the methods and discussing methodological contributions.

The first limitation of this study concerns the reliability of the findings, also called internal validity. The primary means of data collection in this study have been interviews, together with document analysis. This method is subject to risks which decrease the internal validity of the findings, such as misunderstandings of respondents, (mis)interpretations of answers, time constraints and personal experiences that shape how interviews go. Also, the selection of documents is subject to selection bias, other documents might be available that lead to different insights. To increase internal validity, cross-triangulation has been applied, and a wide variety of perspectives in both cases have been included, for example from both project managers, social architects, and more technical urban planners. A further expansion of the sort and number of respondents and documents could also address this limitation.

The second limitation of this study concerns external validity. The first concern in this is the contextuality of the findings: the study analysed two cities in the context of the Dutch planning system, which differs largely from urban planning systems in other parts of the world. Decentralized planning systems as the Dutch are not common around the world. At the same time this provides an opportunity for the exploratory nature of the research. Hence, the findings are mostly applicable for similar contexts in countries wherein the urban planning is also highly decentralized, as is the case for example the countries as Germany or Denmark. Also, the limited number of cases (two) reduces the external validity of the findings for the rest of the Netherlands.

Finally, during the research, twenty interviews have been conducted across the case studies in Rotterdam and Utrecht. Initially, discussing environmental justice with urban planners was challenging. This also showed to be a key finding: urban planners often consider justice implicitly rather than explicitly. Many planners lacked the specific language and narrative skills needed to articulate how environmental justice considerations are integrated into urban greenspace planning, which initially limited the quality of study. To still facilitate productive interviews, a concept list was introduced to respondents, see appendix VII. This list provided concise and neutral explanations of the environmental justice framework and its various dimensions as identified in the research. This methodological contribution of the study proved effective, as it made it easier for participants to explicitly discuss the justice considerations underlying greenspace planning. This approach could be beneficial in future qualitative studies where discussions on the relatively abstract concept of environmental justice are involved.

7.5 Suggestions for future research

To enhance the understanding and application of environmental justice considerations in contexts of urban greenspace planning, several suggestions for future research are proposed in this section.

First, a detailed analysis of the interwovenness of justice dimensions would provide deeper insights into how these considerations are implicitly included in decision-making processes. Understanding the underlying argumentations for specific justice-related decisions could reveal the complexities of integrating various justice dimensions in urban planning. Literature on the interwovenness of environmental justice challenges remains scarce, so explorative research on this topic would well contribute to literature.

Secondly, an ethical-philosophical analysis of underlying justice considerations could enrich the discussion by bridging empirical observations with theoretical principles. This approach would delve into the moral and ethical grounds guiding decisions in urban greenspace planning, offering a richer and more nuanced perspective on justice in urban contexts, uncovering the underlying and yet often implicit justice argumentations for considerations in greenspace planning decisions. As discussed, the analytical framework of Kato-Huerta & Geneletti (2021) does not capture the underlying environmental justice considerations, also due to the implicitness of the considerations. An analysis of the underlying argumentation for justice related decisions would uncover the currently implicit consideration of justice in the process of urban greenspace planning

Third, including perspectives from citizen initiatives and the informal sector, particularly in cities like Rotterdam, where such activities are prominent, would broaden the scope of research. This exploration would shed light on how environmental justice is perceived and enacted outside formal planning processes in municipal administrations, enhancing the understanding of community engagement and its impact on urban greenspaces in relation to environmental justice in greenspace planning. The analysis in this study provides limited insight from the perspective from citizens or citizen groups. Especially with regards to procedural justice efforts which often happen in engagement with citizens, future research could be enriched by providing a bottom-up perspective on justice considerations in greenspace planning

Finally, this research took place in the context of the highly decentralized planning system of the Netherlands. Therefore, the findings are relevant for only a limited number of countries with similar decentralized urban greenspace planning contexts. Future research conducted in non-similar greenspace planning contexts would enrich literature, also in relation to how environmental justice is understood and operationalized in practice. Related to this, broadening the geographical scope to include examples from the global south could diversify research findings. This expansion is crucial for uncovering unique challenges and strategies across different socio-economic and urban planning contexts, making insights more globally relevant and applicable, as also emphasized by de Souza & Torres (2021).

8. Conclusions

In this section, the answer to the central research question is formulated. The research question at the core of this thesis is:

How is environmental justice pursued in urban greenspace planning processes in Dutch cities?

This question has been explored through detailed analyses in two main ways. First, it examines environmental justice-related approaches in the greenspace planning processes of Utrecht. Second, it looks at similar strategies in Rotterdam. Both cities are analyzed at strategic and operational levels.

To answer the central research question, this study inquired how environmental justice can be conceptualized and operationalized in the context of urban greenspace planning, answering SQ1. This study first explored how urban greenspace planners conceptualize, apply, and prioritize environmental justice principles in their processes. It then investigated the trade-offs they experience when addressing justice in urban greenspace planning. Finally, the study examined how planners dealt with these trade-offs in practice, providing answers to sub questions 2 and 3.

8.1 Conceptualization, application and prioritization of justice principles

Both the cases Utrecht and Rotterdam show that distributional justice as dominant in urban greenspace planning, although with differing emphases and methodologies. However, both cities share that most of their justice considerations are made implicitly, although Utrecht is developing a vision to integrate environmental justice thinking more explicitly into its spatial development, reflecting a change.

In Utrecht, the conception of distributional justice is dominant. This is reflected by strategic urban policies like the Spatial Strategy 2040 and the Green Structure Plan, which aim to balance population growth with the preservation of green spaces (Municipality of Utrecht, 2017, 2021). The distributional justice is also tightly interwoven with corrective and intersectional justice and ecological justice, focusing on maintaining green space per capita, space for nature, and addressing inequality from an intersectional perspective, despite challenges of increasing densification. Tools like the 'Utrechtse Barcode' are employed to manage spatial use effectively, ensuring an equitable distribution of green spaces amidst urban growth and vulnerability. Multi-scalar justice conceptualizations are limited. Procedural justice and recognitional notions of justice are important on the operational level of specific projects, but transitional perspectives on justice are gaining ground due to challenges of these justice dimensions on operational level. This is not the case for strategic level: transitional and recognitional justice conceptions are (almost) absent here in Utrecht.

Rotterdam employs an egalitarian approach on access to green spaces across all neighbourhoods, with a specific focus on enhancing climate resilience through heat stress management and water retention. Ecological justice is also gaining prominence, highlighting biodiversity and the specific needs of various species. Procedural justice considerations appear important at the local level, ensuring that greenspace functionality aligns with community needs and preferences. However, multi-scalar, corrective and transitional justice, as well as intersectional justice, remain notably absent in the Rotterdam's greenspace planning conceptualizations.

Differences between the strategic and operational levels of urban planning were clear in the application of environmental justice. What stood out was that procedural justice was dominant at the operational level, whereas it played a minimal role at the strategic level. Additionally, transitional justice concepts are emerging from the bottom-up, with strategic level goals often hindered by operational level barriers related to procedural factors. Distributional justice is evident across all levels but is particularly strong at the strategic level. At the city level, ecological goals are significant but face obstacles from operational-level interests, such as the recreational functionality of greenspaces for humans. Corrective and intersectional justice considerations appear to be more noticeable at the strategic level.

8.2 Trade-offs in pursuing environmental justice

Trade-offs are a significant aspect of urban greenspace planning, as highlighted in both cities.

In Utrecht, planners are navigating on the complexities between procedural justice at the neighbourhood level and distributional notions at the strategic level. This often involves balancing inclusive, participatory approaches for procedural justice, with broad, strategic goals that benefit the entire city, from a distributional justice perspective. Additionally, ecological justice must be balanced with procedural and distributional justice, as efforts to include ecological considerations can sometimes conflict with community preferences. Procedural justice efforts increasingly lead to participation fatigue, a reason for increased attention for to transitional justice perspectives.

Rotterdam faces similar challenges, particularly in managing the tension between enhancing specific local environments and maintaining equitable access to green spaces across the city. Concerning multi-scalar justice, this can lead to indirect effects of increased property values and potential gentrification, which in turn affects the equitable distribution of environmental benefits: reflecting the trade-off between direct and indirect distributional justice outcomes. Rotterdam strives to manage these trade-offs through extensive community engagement and inclusive participation, ensuring that all groups benefit fairly from urban greenspace planning. Other trade-offs concern recognitional and procedural justice, where currently procedural considerations seem to outweigh recognitional notions of justice in shaping actions of the municipality.

To answer the main research question: in the practice of urban greenspace planning in Dutch cities, environmental justice considerations often remain implicit. Distributional justice considerations tend to dominate when environmental justice considerations are applied. Procedural justice is primarily implemented at the operational level, while notions of corrective, intersectional, transitional, and ecological justice are showing increasing application. Recognitional and temporal justice applications seem to be limited. To conclude, integrating environmental justice considerations into urban greenspace planning remains a complex challenge in Dutch cities, where such considerations are often implicit and involve significant trade-offs. However, it is encouraging to see an increasing number of urban planners apply and prioritize environmental justice considerations in their work. This shift in awareness suggests that cities are progressing towards more equitable and just outcomes in the development of urban greenspaces.

8.3 Recommendations to society and policymakers

In this section, I address the societal aim of this research: insights into how urban planners could enhance justice in urban greenspace planning to ensure environmentally just outcomes. Below, three recommendations are formulated, which can be of use for urban planners, in Dutch cities and similar planning contexts.

Recommendation 1: Make justice considerations explicit

A key finding from the research is that justice considerations remain implicit. Consequently, one of the primary recommendations from this study is finding a way to make justice considerations explicit. Several respondents (R2, R7, R11) expressed a structured decision-making approach for justice in green spaces, implying the need for a comprehensive assessment framework that would facilitate the explicit consideration of justice thinking in decision-making processes. This recommendation is also emphasized by Calderón-Argelich et al. (2021) and de Vries et al. (2024), who both emphasize that principles of justice are often implicit to policy measures, while explicit discussions of justice are usually lacking. Specifically, de Vries et al. (2024) emphasize discussions on the fair distribution of decisions should be explicitly discussed during policymaking, *before* policies are implemented.

The need for integral consideration of various interests is particularly applicable to the Dutch context, where the development of green spaces must balance diverse interests and needs such as ecology, health, climate adaptation, sports, and recreation due the high densification in cities and the lack of space in the country. Making justice considerations explicit ensures they are not merely broad concerns, but are

concretely integrated into the decision-making process for greening. Currently, both in Utrecht and Rotterdam, departmentalization of the municipal organization and the lack of an integral assessment framework, makes a integral, transparent and well-considered choice on environmental justice issues difficult.

This implies that choices regarding environmental justice outcomes often arise from pragmatic considerations rather than a well-considered strategy based on an underlying theory of justice, which can be perceived as undemocratic. These observations underscore the need for a more systematic and transparent process in greenspace planning, such as the implementation of an integral assessment framework. This is in line with other insights from literature: providing explicit considerations of environmental justice with clear operational definitions helps to reveal biases, implicit assumptions and motivations (Calderón-Argelich et al., 2021: Friedman et al., 2018).

This assessment framework could draw on insights from Pearson and Pierce (2010), who advocate for incorporating environmental justice perspectives into urban planning. They recommend using justice-oriented indicators that specify the scales at which justice measures are applied to effectively assess the impacts of environmental justice. The authors emphasize the importance of explicitly addressing justice concerns. Without such measures, urban policies risk creating new inequalities or reinforcing existing inequalities, a concern evident in both Utrecht and Rotterdam.

Enhancing urban greenspace planning with explicit environmental justice assessments - such as indicators of justice at various scales as temporal and spatial - could refine how planners integrate these considerations into their frameworks. This includes setting clear environmental justice objectives and developing actionable strategies within sustainability plans. Justice should be viewed not as an isolated issue but as an integral part of all urban planning aspects. Integrating it into policy frameworks is important. Furthermore, establishing mechanisms to monitor environmental justice is vital, enabling continuous improvement and adaptation of planning strategies to better serve all community members (Pearson & Pierce, 2010, Calderón-Argelich et al., 2021).

Recommendation 2: Address recognitional justice perspectives

Various respondents from both Utrecht and Rotterdam indicated difficulties in addressing recognitional justice or did not conceptualize justice in this form. Also, the documents analysed reflect limited recognitional justice thinking. This suggestion aims to address this shortage. Urban greenspace planners should prioritize inclusivity and empowerment, particularly of marginalized groups, battling underlying marginalization and exclusion mechanisms. This involves recognizing and incorporating local, often non-expert knowledge into the planning processes and ensuring genuine participation from all community sectors.

Anguelovski et al. (2020) suggest that Nature-Based Solutions (NBS) should be inclusive and empowering by acknowledging and valuing the often overlooked, non-expert knowledge of residents and users, especially those from historically marginalized communities. These groups should be genuinely involved in the design and management of NBS projects. Without such inclusion, there is a risk that their needs, vulnerabilities, and identities will be overlooked, allowing the preferences of higher-income or more politically powerful groups to prevail (Anguelovski et al., 2020).

Urban greenspace planners should specify how to organize this inclusive and empowering approach. While perspectives from non-experts and users are being considered, currently there is insufficient recognition of historical marginalization and the risk of exacerbating inequalities through greenspace planning. Specific plans, techniques, and monitoring are needed to ensure that the preferences of higher-income and more politically influential groups do not dominate. For example, local governments could map out what the variety of backgrounds of the groups they want to include and how these backgrounds views greenspace planning, and documenting how these perspectives are including in the outcomes of greenspace planning. Specifics on this are beyond the scope of this study, and could be included in future research.

Recommendation 3: Address multi-scalar justice

Urban greenspace planners should include indirect and long term justice considerations in their planning processes. Empirical observations revealed that long term perspectives and indirect effects of greenspace planning are not extensively considered by urban planners in Dutch cities, especially in Rotterdam. To address this gap, planners could incorporate promising 'futuring' approaches, for example as advocated by Krznaric (2019), who emphasizes the need to reinvent democracy to account for long term impacts and ensure decisions benefit future generations. In both cities studied, temporal justice is largely defined in terms of current-day benefits such as climate adaptation effects or health improvements, possibly neglecting the longer-term future consequences of greening such as green gentrification (Anguelovski et al., 2019).

Transformations of communities due to gentrification are often slow processes. Therefore, planners must consider the long term effects of greening projects, not only from a climate adaptation perspective but also from a social perspective. This was also emphasized by respondents within the climate action initiative within the municipal organization of Rotterdam, ICAR. Including social perspectives involves evaluating the potential for green gentrification, where green space developments can lead to the displacement of existing communities due to rising property values and living costs (Anguelovski et al., 2019). By adopting a long term and multi-scalar approach, planners can ensure that the benefits of urban greenspaces are equitably distributed over time and that vulnerable populations are protected from unintended negative and often longer-term consequences.

This recommendation emphasizes the inclusion of indirect and long term justice considerations in the planning process, balancing short and long term interests. Empirical observations indicate that long term perspectives and the indirect effects of greenspace planning are often overlooked by urban planners in Dutch cities: this is also illustrated by the multi-scalar and procedural justice, where in participation processes future residents are not represented. This is particularly relevant for Rotterdam, where greening is positively framed as a contributor to increasing real estate value (as noted in the 'Rotterdam Goes for Green' plan of 2023, Municipality of Rotterdam (2023c) and gentrification is viewed as inevitable, according to R19. This recommendation addresses these concerns directly.

The foundations for such an integrated approach seem to be present: municipalities need to further develop these. For example, the presence of ICAR suggests an element for integrating greenspace policies with environmental justice perspectives are in place. Similarly, in Utrecht, the policy 'Social Vision Utrecht 2040' could serve as a promising framework for an integrated approach to achieving just outcomes in greenspace planning.

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Appendix

Appendix I: Data source for the grey literature for strategic level and overall analysis

Year	Name	Translation
	Utrecht	
2017	Groenstructuurplan actualisatie 2017-2030 Utrecht	Green structure plan: actualization 2017-2030
2020	Meerjaren Groenprogramma: Ruimte voor Groen 2020-2023	Multi-Year Green Program: Space for Green 2020-2023
2022	Raadsbrief strategie voor groen	Council Letter on Strategy for Green
2023	Meerjaren perspectief ruimte	Multi-Year Perspective on Space
2022	Coalitieakkoord 22-26: Investeren in Utrecht: kiezen voor gelijke kansen, betaalbaar wonen en klimaat	Coalition Agreement 22-26: Investing in Utrecht: Choosing Equal Opportunities, Affordable Housing, and Climate
2020	Koersdocument leefbare stad en maatsch. voorzieningen	Policy Document on a Livable City and Social Services
2019	Nota gezondheid voor iedereen	Health Policy for Everyone
2021	RSU 2040: tienminutenstad: onderdeel omgevingsvisie	RSU 2040: Ten-Minute City: Part of the Environmental Vision
2022	Visie klimaatadaptatie Utrecht	Climate Adaptation Vision Utrecht
2023	Handboek openbare ruimte	Handbook Public Space
2023	Scheidslijnen rapport	Demarcation Lines Report
2024	Conceptversie rechtvaardige stad	Draft Version of a Just City: social Vision 2040
	Rotterdam	
2023	Rotterdam gaat voor Groen: groenagenda 2326	Rotterdam Goes for Green: Greenagenda
2021	Raadsinformatiebrief 7 stadsprojecten	Council information Letter: 7 City projects
2021	Stadsakkoord Rotterdam: 7 stadsprojecten	City agreement Rotterdam: 7 City projects
2021	Groenblauwe groeidiamant	Green blue Growth Diamond
2020	'Actieplan Rotterdam gaat voor groen', 20 ha erbij.	Action Plan Rotterdam is going for Green
2019	Visie openbare ruimte 2019-2029	Vision public space 2019-2029
2022	Coalitieakkoord 22-26	Coalition agreement Rotterdam 22-26
2021	Omgevingsvisie Rotterdam: de veranderstad	Spatial Vision Rotterdam: The changing city
2020.	Uitvoeringsagenda biodiversiteit	Biodiversity implementation agenda
2023	Rotterdams weerwoord Uitvoeringsagenda 23-26	Rotterdam's Response Implementation agenda 23-26
2023	Programmakader Rotterdams weerwoord 2030	Rotterdam's Response Programme
2020	Rotterdams weerwoord urgentiedocument	Rotterdam's Response urgency document
2021	Rotterdams OmgevingsEffectRapport (ROER)	Rotterdam Spatial Report

Appendix II: Overview of documents used for unit analysis of Rotterdam and Utrecht

Year		Document name	Translation
	Utrecht		
2023	Unit 1: Rivierenwijk	Raadsbrief Groene Ommetjes Overvecht	Council Letter: green circles Overvecht
2022		Strategie voor Groen brief	Strategy for Green letter
2022	Unit 2: Zuilen	Visie Nature Area Zuilen	Vision Nature area Zuilen
2024		Startdocument Nature Area Zuilen	Starting document nature area Zuilen
2024		Participatierapportage Nature Area Zuilen	Participation report Nature area Zuilen
2023	Unit 3: Noordwest	Raadsbrief Groene Ommetjes Overvecht	Council Letter: green circles Overvecht
2022		Strategie voor Groen brief	Strategy for Green letter
	Rotterdam		
2023	Unit 1: Hofbogen park	definitief ontwerp Hofbogen park - Park op het dak	Definitive design Hofbogen park: Park on the Roof
2023		Collegebrief over definitief Ontwerp Hofbogen park - Park op het dak	Council letter on definitive design Hofbogen park: park on the roof
2019		019-Visie-Hofbogen_Dudok-Group_Samenvatting_mail-bestan	Vision Hofbogen Dudok
2022	Unit 2: Nelson Mandela park	Masterplan park maashaven	Masterplan Park Maashaven
2023		ontwerpbestemmingsplan 'Nelson Mandela park'	Draft destination plan Nelson Mandela park
2022		Reactiedocument Nelson Mandela park	Reaction Document Nelson Mandela park

Appendix III: Interview guide (translated)

Subject	Questions
Introduction	Introduction of myself and the research
	Explanation of the research: goal of the interview
	Introduction of interviewee: what kind of position, background, role in the project (unit of analysis)
Unit of analysis: what greening project are we talking about?	What are you working on? Can you tell me about the project? What does the project entail?
Perception of environmental justice	How would you conceptualize justice/fairness in the context of your work?
Application of those justice considerations.	What role does environmental justice play in the greenspace planning process?
SQ1/2	What justice considerations do you make? What justice principles are included into the planning process and how?
	When is the outcome of your project environmentally just?
	How are these justice considerations incorporated into the planning process for urban greenspace? And why? Could you provide an example?
	What values, principles and considerations are used?
	(Perhaps introduce the dimensions of justice to the respondent, if respondent has any trouble thinking about environmental justice or is not familiar with the concept)
Prioritization of justice principles SQ2	Are certain justice principles prioritized over other ones in the planning process of greening?
	How are different justice considerations prioritized?
	Why are they prioritized like that?
Trade-offs and tensions between dimensions of justice	Are there trade-offs and tensions between those dimensions of justice?
Dealing with trade-offs and tensions in practice	What tensions between the justice principles do you encounter?
SQ3	How is dealt with this tensions in practice?
Best practices/ points of improvement SQ4	What are, in your experience, best practices of environmentally just outcomes: how should justice be pursuit from your perspective?
Concluding remarks	Anything important that has been missed?
	Summarizing question.
	Relevant documents that can be shared?

Appendix IV: Interview Guide (in Dutch)

Subject	Questions
Introductie	Introductie van mezelf en het onderzoek
	Uitleg van het onderzoek: doel van het interview
	Introductie van de geïnterviewde: wat voor soort positie, achtergrond, rol in het project (eenheid van analyse)
	Privacy:
Eenheid van de analyse: welke groenprojecten hebben we het over? Strategisch?	Kun je me iets vertellen over projecten waar je aan hebt gewerkt als strateeg stedelijke ontwikkeling?
	Wat hebben deze met groen te maken?
	Waar heb je aan gewerkt qua groen?
Conceptualisatie van rechtvaardige uitkomsten **Toepassing van deze rechtvaardigheidsafwegingen in werkpraktijk**	Hoe zou uw eerlijkheid/ rechtvaardigheid of milieurechtvaardigheid conceptualiseren in de context van je werk?
	Welke rechtvaardigheidsafwegingen maak in het proces van groenplanning? En Hoe doe je dat? En waarom?
	Maak je afwegingen tussen rechtvaardigheidsperspectieven?
	Wanneer is een uitkomst van de stedelijke (groen)ontwikkeling rechtvaardig?
	Hoe worden deze rechtvaardigheidsafwegingen opgenomen aan de voorkant van het stedelijke ontwikkelingsproces, i.c.m. vergroening? En waarom zo? Zou je een voorbeeld kunnen geven?
	(Misschien de dimensies van milieurechtvaardigheid introduceren, als de respondent moeite heeft om na te denken over rechtvaardigheid?
Prioritisering van rechtvaardigheidsprincipes	Zijn er bepaalde rechtvaardigheidsprincipes die belangrijker zijn of meer geprioriteerd worden over anderen in het proces van de stedelijke groenplanning?
	En hoe worden ze geprioriteerd? En waarom op die manier?
Omgaan met Trade-offs en spanningen tussen dimensies van rechtvaardigheid in de praktijk	Zijn er afwegingen of spanningen tussen deze rechtvaardigheidsprincipes?
	Wat voor spanningen loop jij tegenaan of neem je waar?
	Hoe wordt hier in de praktijk mee omgegaan?

Beste praktijken/ punten van verbetering	Wat zijn in jouw ervaring de beste praktijken van milieurechtvaardige uitkomsten: hoe zou rechtvaardigheid moeten worden nagejaagd vanuit jouw perspectief?
Conclusie	Hebben we iets belangrijks gemist? Als je je boodschap zou willen samenvatten van de antwoorden die je hebt gegeven: hoe zou je dat dan doen? Wat is de kern van je verhaal? Zijn er nog relevante beleidsdocumenten die je zou willen delen? Zijn er mensen te binnen geschoten die ik zeker nog zou moeten spreken.

Appendix V: Overview of interviewees

Respondent number	Respondent Details	Interview Date
1	Strategic level Urban planner at Utrecht Municipality	4/4/2024
2	Operational level urban planner at Utrecht Municipality	22/04/2024
3	Social architectural urban planner at Utrecht municipality	23/04/2024
4	Urban planner at Utrecht Municipality	26/04/2024
5	Policy advisor green at Utrecht Municipality	2/5/2024
6	Social urban planner at Utrecht municipality	2/5/2024
7	Operational level urban planner at Utrecht Municipality	13/05/2024
8	Project level urban planner at Utrecht Municipality	13/05/2024 (online)
9	Senior urban planner operational level at Utrecht municipality	14/05/2024 (online)
10	Urban planner at Utrecht Municipality (technical)	21/05/2024
11	Strategic level urban planner at Municipality of Rotterdam	15/04/2024
12	Urban planner at Municipality of Rotterdam	15/04/2024 (online)
13	Urban planner at Municipality of Rotterdam	17/04/2024
14	Urban planner at Municipality of Rotterdam	17/04/2024
15	Strategic level urban planner at municipality of Rotterdam	1/5/2024
16	Urban greenspace planner at Municipality of Rotterdam	06/05/2024 (online)
17	Urban planner at Municipality of Rotterdam	07/05/2024 (online)
18	Urban planner at Municipality of Rotterdam	07/05/2024 (online)
19	Senior Strategic level Urban planner Municipality of Rotterdam	27/05/2024 (online)

Appendix VI: Informed consent form

Introduction

You are invited to participate in this research on equitable urban greening. The aim of the research is to learn more about considerations of justice in urban greening. The research is being conducted by Karst Popkema, a student in the MSc program Sustainable Development: Earth System Governance at the Department of Sustainable Development at Utrecht University. The research is supervised by Dr. Heleen Mees.

Participation

Your participation in this interview is entirely voluntary. You can stop at any time without giving any reason and without any penalty. Your contribution to the research is highly valuable to us, and we greatly appreciate the time you take to complete this interview. I estimate that it will take about 60-90 minutes to complete the interview. The questions will be read to you by the interviewer. Some questions will take little time to answer, while others may require more careful consideration. Feel free to skip any questions you are not comfortable answering. You can also ask the interviewer to clarify or explain questions before you answer. Your answers will be noted by the interviewer in an answer template. The data you provide will be used for writing a master's thesis report and may be used for other scientific purposes, such as publication in a scientific journal or presentation at academic conferences. Only patterns in the data will be reported through these channels. Your individual responses will not be presented or published.

Data Protection

The interview will also be recorded for transcription purposes. The audio files will be available to the master's student and academic supervisors. We will process your data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and the Dutch Data Protection Act). Audio files will be deleted once data collection is completed and all interviews have been transcribed. Audio files will only be stored on a secure and encrypted server of Utrecht University.

Informed Consent Form

In this research, I aim to learn more about considerations of justice in the process of urban green development. Participation in this interview is voluntary, and you can stop the interview at any time without giving a reason and without consequences. Your answers to the questions will be shared with supervisor. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and the Dutch Data Protection Act). Please answer the questions honestly and feel free to say or write whatever you want.

I confirm that:

- I am satisfied with the information received about the research;
- I currently have no further questions about the research;
- I have had the opportunity to carefully consider participation in the study;
- I will answer the questions honestly.

I understand that:

- I have the right to view the research report afterward.

Do you agree to participate? o Yes o No

Appendix VII: Concept list used during interviews

Distributional justice: This concept concerns the fair distribution of the benefits and burdens of urban green spaces. It means that everyone should have equal access to and amount of greenery, such as parks and green areas, and should fairly share any burdens, such as traffic noise or air pollution.

Procedural justice: This principle emphasizes that the way decisions are made should be fair. This means that everyone affected by a decision should have the opportunity to truly participate, and that decision-making processes regarding the distribution of the benefits and burdens of greenery should be transparent and inclusive.

Recognition justice: This principle means that in planning and developing urban green spaces, the needs, values, and cultures of all community members, especially marginalized and often overlooked groups, should be taken into account. Recognition justice goes beyond passive acknowledgment; it means actively meeting specific needs to combat inequality and stigmatization (Schlosberg, 2007).

Corrective/restorative justice: This concept involves taking measures to remedy or correct (historical) injustices or deficiencies. This could mean, for example, providing compensation for past harm or the lack of access to sufficient green spaces in the past.

Transitional justice: This principle focuses on the process of transitioning from injustice to justice. It implies that a measure that initially appears unjust can ultimately lead to a just outcome.

Intersectional justice: This concept recognizes that discrimination and inequality are often based on multiple, overlapping, and mutually reinforcing factors, such as ethnicity, class, gender, sex, and education. Intersectional justice aims to address these complex interactions to achieve a deeper understanding and improvement of justice.

Ecological justice: This principle extends the idea of justice to non-human beings, such as animals, plants, and nature in general. It implies that these entities also have rights and should be considered in policy and development decisions.

Multi-scalar justice: This concept involves applying justice at different levels, such as local, national, and global, and across different time periods, ensuring that both current and future generations are treated fairly.

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