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Review

Reframing Urban Nature-Based Solutions Through Perspectives of Environmental Justice and Privilege

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Abstract

Since its introduction, the concept of "nature-based solutions" has gained much attention, drawing public funds and private investments. Nature-based solutions conceptualise the use of nature in planning as a cost-efficient and sustainable means to address societal, economic, and ecological challenges. However, this "triple win" premise tends to conceal potentially resulting injustices, such as displacement through green gentrification. While these injustices have attracted the attention of environmental justice scholars, as exemplified by the "just green enough" approach, links to the "nature-based solutions" concept are mostly implicit. Further, the concept of environmental privilege, questioning who benefits from created natural amenities, has rarely been taken up. This article, therefore, argues that environmental justice should be linked closely to nature-based solutions. Supported by a theoretical perspective, the article aims at exploring who benefits from, and who loses out on, urban nature-based solutions processes. It builds on a qualitative literature review of the scholarly landscape on environmental justice and urban greening while linking to nature-based solutions, adding perspectives of environmental privilege. In this, it attempts to offer three important contributions to the current academic discussion. First, the article provides an overview of the debate on urban greening, (in)justice, and environmental privilege. Second, it relates the concept of nature-based solutions to the debate on environmental justice, opening nature-based solutions up for critique and conceptual refinements. Third, it outlines a way forward for reframing nature-based solutions through the lens of environmental justice and privilege. Thus, this article provides a starting point for further discussions on the implementation of just nature-based solutions in cities.

Keywords

environmental justice; environmental privilege; Global North; green gentrification; just cities; nature-based solutions

Issue

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1. Introduction

Since its introduction in 2015, the concept of nature-based solutions (NbS) has rapidly grown in popularity. Defined by the European Commission (Directorate-General for Research and Innovation, 2015) and IUCN (Cohen-Shacham et al., 2016) as cost-efficient and multifunctional tools to address societal, ecological, and economic challenges through nature, NbS seem to be ideal strategies for municipalities adapting to climate and environmental change. The NbS umbrella concept includes previous greening terminologies, such as green infrastructure and ecosystem-based adaptation, and attempts to integrate natural elements within urban planning. Some examples of NbS include floodplain restoration projects, street greenery, and parks aiming to improve well-being and offer space for recreation. NbS are holistic in their approach and frame nature as a tool to address broader challenges of scope and scale (Mell & Clement, 2019). Despite overlaps, NbS expand upon other greening terminologies in several ways. As formulated by a Nature Editorial (2017, pp. 133–134), NbS "dump" further greening terminologies into a "policy-relevant pot, where sustainable practices that harness the natural world…can be devised, analysed and then be pulled out for use by politicians, scholars and researchers." In their broad formulation and holistic approach, NbS have the potential to overcome sectoral planning silos (Sekulova & Anguelovski, 2017, p. 18). Their placement as an umbrella concept also boasts the potential to simplify navigating existing greening terminologies by offering a "common language" (Dorst et al., 2019, p. 5). In addition, NbS have attracted public sector interest, thus unlocking new modes of funding. This is not overly surprising, given the appeal of a supposedly sustainable solution offering various benefits simultaneously and cost-efficiently. Connolly (2019) describes this acclaim and often apolitical notion of unquestioned benefits as the "green planning orthodoxy."

However, the benefits created are neither universal nor without trade-offs. Possible trade-offs entail ecosystem disservices, ranging from natural hazards such as allergic reactions to social hazards such as increased criminality (Shackleton et al., 2016). These trade-offs may vary over time and may not affect all stakeholders equally (IUCN, 2020, p. 16). Further, Bush and Doyon (2019) categorise five types of trade-offs especially relevant for NbS: temporal, spatial, functional, species, and social equity. Hence, NbS may even trigger or aggravate inequalities (Haase, 2017; Sekulova et al., 2021). Therefore, scholars of environmental justice (EJ) have criticised urban green interventions due to their effect on housing prices, their often-unequal distribution, and their tendency to primarily serve the already well-off (Anguelovski, 2016; Anguelovski & Connolly, 2022). This critique relates to NbS and helps in questioning NbS' implications for justice issues. This is especially relevant due to the overarching scope, growing prominence and solution orientation of NbS. In a sense, NbS can bear the risk of restoring the uncontested assumption of urban green being an "unqualified good" that critical scholars have battled for over a decade (Bentsen et al., 2010). The usage of the terminology by private actors adds another challenge, as NbS are being employed as profit-oriented marketing and retail strategies; by maximising profitability, questions of social justice are commonly externalised or ignored. Hence, NbS might become private solutions, causing wider social challenges. This issue is related to the broad formulation of NbS, also offering opportunities for the appropriation of the concept. Hence, Kotsila et al. (2020) questioned NbS as the latest tool in nature's neoliberalisation processes, while the Third World Network (2020) alluded to possible "nature-based seductions," linking NbS to greenwashing and companies like Shell or BP trying to avoid cutting emissions by simply offsetting them. Against this background, it is essential to question who decides upon the alleged "solution," whose problems are addressed, and who becomes excluded (Brink et al., 2016). O'Sullivan et al. (2020, p. 11) underline that "concepts such as NBS are not politically inane concepts that are brought into existence solely for their practical merit; they are 'signifiers' that embody, privilege, and elevate a certain type of knowledge and 'expertise' over others." However, despite significant interest in the intersection of greening and justice, there are only few articles explicitly connecting NbS to justice or privilege. Further, critique of NbS is mainly oriented towards gentrification and uneven distribution while rarely questioning other ways green injustice is produced.

To address these questions in the context of cities in the Global North, I first present a brief overview of the contemporary EJ debate related to urban greening as a theoretical grounding. Second, I give a detailed overview of the connections between urban applications of NbS and EJ in the scientific literature to show dominant themes and missing links. Lastly, I advance the concept of environmental privilege (EP) as a tool to further examine the interdependence of injustice and greening efforts. Through this approach, the article connects the existing EJ literature to the trending concept of NbS, while problematising its intertwinement with green capitalism and power imbalances. Further, it offers starting points for theoretical advancements to promote socially *just* NbS.

2. Environmental Justice: From "Brown" to "Green" Injustice

Claims for EJ entered the scientific debate in the early 1980s amidst the protest from mostly African American activists against the uneven distribution of environmental harm. Pioneer studies showed, for example, that landfills are often located near African American communities, exposing residents to the ill effects of toxic waste (Bullard, 1993; Chavis & Lee, 1987). Anguelovski (2013, p. 1) refers to this as "brown cases of injustice." Hence, early claims for EJ called for equal protection and thus distributional justice. Since then, this focus has broadened in both scope and scale towards the "global nature of environmental justice" (Schlosberg, 2013, p. 37). Concurrently, the conception of justice has expanded too. Alongside distributional justice, recognition justice—accounting for diverse needs and subjectivity—as well as procedural justice—calling for inclusive processes—are now commonly mentioned (Agyeman et al., 2016; Mohai et al., 2009). Further, more recent studies started to investigate the influence of, for example, gender, sexuality, race, and intersectionality on struggles for EJ (Pellow, 2016). As part of this expansion, "green" cases of environmental injustice, manifested in unequal access to coveted natural amenities, gained attention (Anguelovski, 2013, p. 1). These forms of injustice are increasingly relevant in the current paradigm of green urban transformations in the Global North, illustrated by NbS. Focusing on green injustice raises the question of who is addressed by or benefits from greening efforts (García-Lamarca et al., 2021; Immergluck & Balan, 2018). It also points to the relationship of greening and social justice signified by environmental or green gentrification (Checker, 2011; Gould & Lewis, 2016), wherein greening leads to rising rents and thus "exclusionary displacement" (Marcuse, 1985), limiting access to the created benefits to wealthy and often white populations. The relation between greening and social exclusion led to substantial critique from EJ scholars, as shown by concepts such as "just green enough" (Curran & Hamilton, 2017; Wolch et al., 2014) and "just sustainabilities" (Agyeman, 2013; Agyeman et al., 2003). These approaches illustrate a complicated situation for EJ advocates. As pointed out by Maantay and Maroko (2018, p. 13), planning and scholarship "must acknowledge and never lose sight of the fact that these greening actions tend to pit the goals of environmental justice against the effects of environmental gentrification." Broadly speaking, EJ scholars highlight the intertwinement of greening efforts and "green capitalism" or "racial capitalism" (Brand, 2012; Pulido, 2017) as possibly resulting in aggravated injustices. Problematising this linkage is even more essential for NbS, since their appeal transcends the public sector and crosses into the private sector, turning them both into marketable strategies for profit-oriented businesses. Additionally, sticking to the broad definition of the European Commission allows us to frame almost every nature-including form of investment or planning as an NbS. Hence, Maes and Jacobs (2015, p. 3) "define nature-based solutions as any transition to a use of ecosystem services with decreased input of non-renewable natural capital and increased investment in renewable natural processes." This conception, while depicting any form of increased investment in renewable natural processes as problem-solving, does not specify nature, nor does it explicitly mention any addressed problem. This opens room for the exploitation of the concept and the undermining of its ambitions through individual or private interests. Therefore, "just nature-based solutions [must] examine how the planning, design, and management of urban ecologies intersect with the raced and classed politics of urban natures to influence who is enabled, repressed, or dispossessed through green development" (Cousins, 2021, p. 6).

Using EJ as a reference illustrates two central aspects of NbS planning and implementation. First, it problematises greening efforts and questions the uneven distribution and accessibility of offered benefits and trade-offs. Second, it points out the effects of NbS on market values and thus a linkage to gentrification, exclusion, and displacement. While much research recently focussed on this interconnection, there is still a need for more insights into causal linkages and gentrifier preferences and their interrelation with the production of injustice (Quinton et al., 2022, p. 18). Thus, this article forwards the concept of EP for further examination, since environmental injustice cannot exist without privilege (Park & Pellow, 2011, p. 4). Therefore, Section 4 first details the connections between EJ and NbS in the literature before I advance the concept of EP in the subsequent section. But first, the underlying methodological approach is presented.

3. Methods

The articles considered for this integrative review were selected in a four-step process (see Figure 1). The keyword search run on 11 January 2022 on Web of Science and Scopus included three criteria, namely an urban focus, an explicit consideration of justice, equity, or equality, and a reference to NbS or urban greening more generally. Besides NbS, urban forests were considered due to long-standing linkages to justice-related research from the urban political ecology that is often cited (e.g., Heynen, 2003). Ecosystem services and green infrastructure are terms, now partly falling under the NbS umbrella, which were selected as prominently featured in the debate. Urban greening as a general term was included to avoid missing publications discussing questions of greening and justice detached from the above-mentioned terms. After removing duplicates and screening the abstracts for relevance, 104 full-text articles and chapters were qualitatively assessed for their discussion of the linkage between justice and urban greening efforts. After removing 28 articles that not explicitly discuss issues related to justice, and the late addition of 12 overlooked or newly published articles of relevance to the author, 88 articles were reviewed.

Analysis of the selected articles revolved around two main interests. First, the general conception of justice related to greening efforts was analysed to allow for an overview of the debate. Second, explicit and implicit linkages to NbS were reviewed. Starting from the assumption that justice is still rarely explicitly considered when focussing on NbS, this step aimed to map out related or missing EJ considerations. The following section presents the results of the review process along referred dimensions of justice. Through this, it presents the possible pitfalls of NbS through perspectives of EJ. Subsequently, I put forward the concept of EP as a complementary concept to question the reproduction of environmental injustice.

4. The Dimensions of Nature-Based Solutions and Environmental Justice

The subsequent analysis is focused on social justice and is thereby inherently human-centric, despite calls for multispecies justice (Haraway, 2016) and socio-ecological justice (Low & Gleeson, 1998), with the latter recently being linked to NbS by Pineda-Pinto et al. (2022). However, there is still a need for an overview of the relationship between urban NbS and social justice. Here, I address this gap following the dimensions of justice named in the literature, which identifies the aforementioned distributional, recognitional, and procedural justice as well as spatial and temporal justice. Although discussed separately for structuring purposes, these dimensions are not fully exclusive and are closely interlinked (Langemeyer & Connolly, 2020). Further, it must be noted that only comparatively few articles explicitly

Search Terms:
"Nature-based Solution*" OR "Green Infrastructure*" OR "Ecosystem Service*" OR "Urban Green*" OR "Urban Forest*"
AND "Urban*" OR "City*" OR "Cities*"
AND "Justice*" OR "Equity*" OR "Equality*"

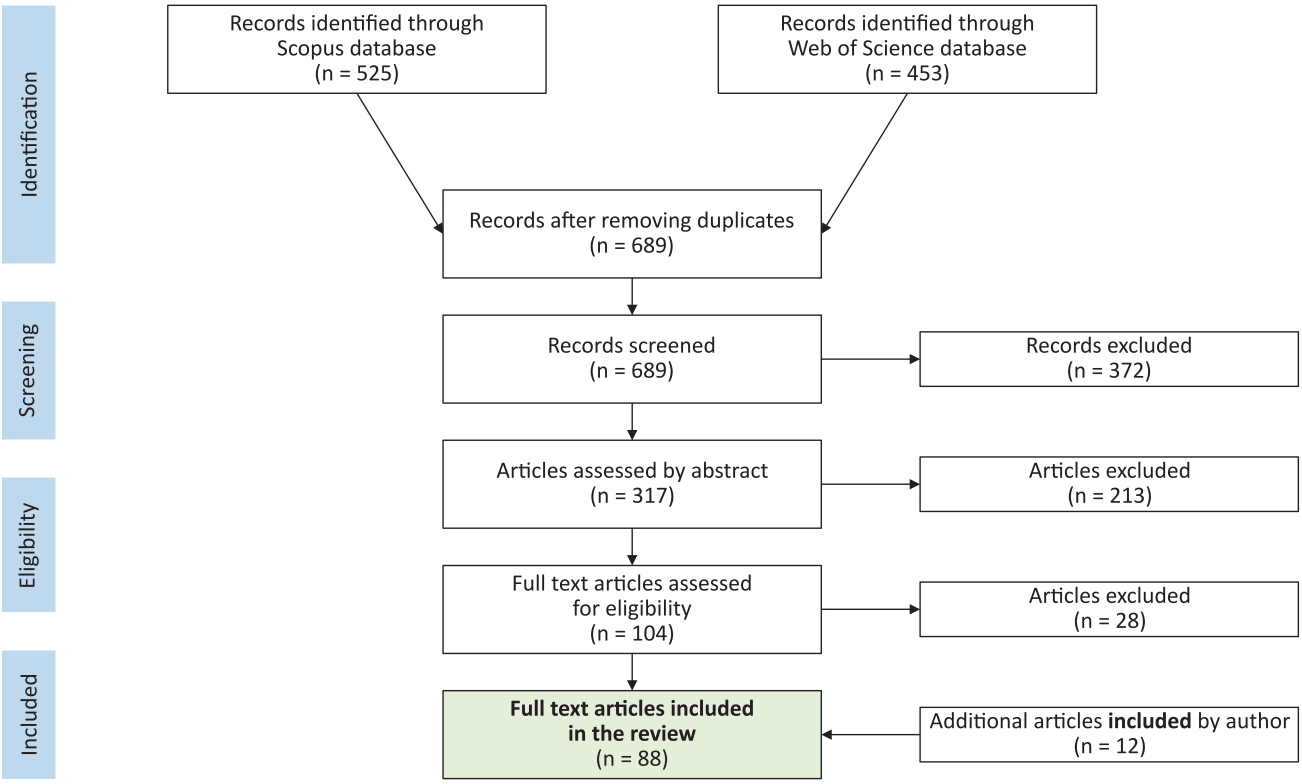
Identification
Screening
Eligibility
Included
Records identified through Scopus database (n = 525)
Records identified through Web of Science database (n = 453)
Records after removing duplicates (n = 689)
Records screened (n = 689)
Records excluded (n = 372)
Articles assessed by abstract (n = 317)
Articles excluded (n = 213)
Full text articles assessed for eligibility (n = 104)
Articles excluded (n = 28)
Full text articles included in the review (n = 88)
Additional articles included by author (n = 12)

Figure 1. Four-step selection process of articles to be reviewed.

link EJ to NbS (Anguelovski & Corbera, 2022; Cousins, 2021; Mabon et al., 2022; Pineda-Pinto et al., 2022; Sekulova et al., 2021). However, relevant research has been done on greening terminologies such as ecosystem services and green infrastructure (Calderón-Argelich et al., 2021; Langemeyer & Connolly, 2020) that are subsumed under NbS. The following sections therefore outline both explicit linkages to NbS as well as links to other greening concepts to offer a substantial overview of the debate on EJ and urban greening.

4.1. Distributional Justice

Distributional justice is the most prominent justice dimension in urban greening research. John Rawls' (1971) *A Theory of Justice* is the central reference point, approaching justice through equal distribution of and access to resources. Distributional injustice thus occurs when uneven access hinders or harms a societal group (Langemeyer & Connolly, 2020, p. 7). For distributional justice regarding green amenities, availability and attractiveness must be considered alongside accessibility (Biernacka & Kronenberg, 2018).

Availability is the most-researched named aspect, with predominantly quantitative studies depicting the location, size, and other metrics of urban greening and NbS (Calderón-Argelich et al., 2021; Zuniga-Teran et al., 2021). The availability of, for example, parks or green retention areas determines the availability of offered ecosystem services, such as health support or floodwater regulation (Jennings et al., 2019). However, especially for "active use" greenspaces such as parks, accessibility and the closely related aspect of attractiveness are as important. Accessibility is also determined in part by "thick injustices," the social preconditions influencing whether groups feel welcomed (Rigolon & Németh, 2021), as well as public/private boundaries (Armstrong et al., 2022). Whether NbS are attractive to specific groups depends on many variables. Enssle and Kabisch (2020), for example, demonstrate different perceptions and needs regarding greenspaces according to different age groups and argue to include various perspectives in planning to ensure diverse usage. However, achieving distributional justice through NbS is highly challenging. As Sekulova et al. (2021, p. 3) argue:

> The mass and large-scale development of genuine, inclusive, diverse and evenly distributed forms or representations of nature would generate more economic "losses" than direct economic benefits. Stated differently, financial markets are unable to provide a return on large-scale investment in urban greening

> without tying it to a form of real estate development or commercial retail industry.

The quote underlines the interrelation between financial feasibility and the design and distribution of NbS, conceding that luxury greening often offers the best financial returns. Yet such greening, similar to patterns of green gentrification, deepens existing green injustices and contradicts efforts towards distributional justice (Anguelovski & Connolly, 2022). Anguelovski and Corbera (2022, p. 5) thus advocate for decoupling NbS from "speculative and profit-oriented dynamics." Beyond financial feasibility, promoting distributional justice is also a challenging task for planning processes, requiring considerations of procedural and recognition justice.

4.2. Procedural and Recognition Justice

Recognition justice refers to the equal recognition and treatment of diverse values, preferences, abilities, and identities, as well as of specific histories (Fraser, 1995). Procedural justice requests fair and equitable institutional processes from state and local authorities, as well as spaces for engagement. They are jointly discussed here because they are often indivisible, since participation can strengthen recognition, while recognition can be prerequisite for inclusion and thus procedural justice (Schlosberg, 2007, p. 26).

Only a small handful of studies explicitly mention procedural or recognition justice and NbS (Carmichael et al., 2019; Pineda-Pinto et al., 2022; Toxopeus et al., 2020). Even when broadening the scope, a "procedural justice deficit" is obvious (Olsson et al., 2020, p. 3). This is caused by the lack of consideration of procedural justice in the first place, and by overly simplistic understandings of it, often equating procedural justice with participation. Yet participation is neither inherently equal nor just. For example, Tozer et al. (2020) problematise stewardship governance of NbS in Sofia as a time-consuming task, limiting who can participate. More generally, Verheij and Corrêa Nunes (2021) criticise tokenistic participation in their analysis of Lisbon's greening strategy, observing that participation is mostly limited to the initial planning phase. By contrast, Rigolon and Németh (2018) observe justice issues related to the participatory inclusion of NGOs, showing how, on the greenway project Chicago 606, shared responsibilities facilitated green gentrification since the responsible organisation was solely involved in greenspace planning and "not in the business of housing," thus lacking both expertise in and a mandate to enact gentrification-preventing measures.

Missing or tokenistic participation in NbS planning is a key example of procedural injustice, also delimiting the recognition of diverse perspectives and thus producing recognition injustice. This relation is illustrated by Kotsila et al. (2020) in their analysis of the greening of the Passeig de Sant Joan in Barcelona. The authors show via interviews how the project was both for greening and urban renovation, with a secondary aim being to tacitly "upgrade" mostly Chinese-owned retail stores which, in the eyes of a local official, were a symptom of neighbourhood degradation (Kotsila et al., 2020, p. 11). This conception was reflected in the planning process, which was dominated by non-Chinese shop owners, ultimately leading to the decision for a gastronomy-oriented boulevard design despite reservations from the neighbourhood association and potentially fewer offered ecosystem services. The redesign fuelled changes to both the surrounding demography and usage of the Passeig de Sant Joan. Within a few years, over 50 Chinese-owned stores had to close, giving way to high-profile gastronomy. This restructuring process was accompanied by an openly racialised rebranding strategy that saw real estate agencies marketing the district as "free of 'textile Chinatown' " (Kotsila et al., 2020, p. 12). This example illustrates the entanglement of procedural and recognition justice, as well as the ways powerful groups employ NbS to pursue individual or collective interests.

4.3. Spatial and Temporal Justice

Spatial and temporal justice are neither explicitly linked to NbS nor common in the general literature on urban greening. However, Langemeyer and Connolly (2020), in their account on justice and ecosystem services, frame them as layers influencing the interplay of other dimensions of justice. Spatial justice adds a geographical component to distributional justice, conceptualising the fair and equitable distribution of valued resources in space (Soja, 2009, p. 2). Spatial justice addresses small- and large-scale linkages or, in the words of Langemeyer and Connolly (2020), down- and interscale. Downscale refers to small-scale segregation or local differences in, for instance, exposure to risks felt at the local level, while interscalar relations are, for example, linkages between city and hinterland. While spatial justice is only rarely mentioned in urban greening literature (Jian et al., 2020; Sharifi et al., 2021), its consideration seems important for NbS, as both concepts attempt to address broad societal challenges while also having deliberate local effects. Temporal justice, on the other hand, points out the influence of historical legacies on greening, while sensitising for future justice implications. Similarly, Anguelovski et al. (2020, 2022) advocate for preventive justice to ensure urban greening causes no future harm. These dimensions have only recently been taken up. Kabisch et al. (2022), for example, position long-term inclusivity as a guiding principle for urban NbS. This includes lifecycle assessments, as both benefits and trade-offs might vary over time. Exemplifying this is a community garden in the Lene-Voigt Park, Leipzig (Kabisch, 2019): While designed in a participatory process and initially well used, most plots have been abandoned in recent years. Now, the poorly maintained area is vacated due to its lack of appeal and increasing safety concerns, undermining the intended benefits. It must thus be questioned whether this change left certain groups who initially benefitted from the garden under-serviced or worse off. In their principles for the design of *just* NbS, Anguelovski and Corbera (2022) state that NbS must tackle long-term green inequalities to fulfil their potential of addressing social and economic challenges. Long-term green inequalities hence refer to historically uneven opportunities and capacities to benefit from NbS. However, concepts on how to operationalise temporal justice are mostly absent. Looking at EP might aid in understanding historical inequalities and their influence on contemporary developments. Similarly, all previously mentioned dimensions of EJ link to EP, underlining the importance of considering privileges in urban greening scholarship. The next section addresses this topic by outlining the EP concept before reviewing its linkages to NbS and identifying theoretical gaps.

5. Environmental Privilege and Questioning the Naturalisation of Injustice

EP was framed by Park and Pellow (2011), building on Pulido's (2000, 2017) concept of "white privilege" as an obscured and naturalised form of power possessed by certain, mostly "white," groups in racially stratified societies. Safeguarding these privileges, even without racist intent, can thus reproduce inequality (Pulido, 2000, p. 15). Relating this conception to the environment, Park and Pellow (2011, p. 4) argue that:

> Environmental privilege results from the exercise of economic, political, and cultural power that some groups enjoy, which enables them exclusive access to coveted environmental amenities such as forests, parks, mountains, rivers, coastal property, open lands, and elite neighborhoods. Environmental privilege is embodied in the fact that some groups can access spaces and resources, which are protected from the kinds of ecological harm that other groups are forced to contend with.

EP is as much about protection from harm as it is about exclusionary access to benefits. It works through power asymmetries that enable certain groups to enjoy positive environmental conditions whilst being free from adverse ones. In this sense, EP is a manifestation of inequality through environmental conditions and within the oftentimes uncontested "green planning orthodoxy." As Argüelles (2021, p. 6) points out, "those with EP are setting the terms in which environmental problems and solutions are constructed, deployed, and interrogated." This is especially relevant given that the solution-oriented design of NbS tends to assume problems are agreed upon (Nesshöver et al., 2017, p. 1220). However, NbS implementation in cities is always embedded in complex and conflicting landscapes of interests and needs, alongside mediating factors and constraints, such as infrastructures, institutions, and perceptions of value (Andersson et al., 2021; Kronenberg et al., 2021). Thus, implementing NbS is always about "finding the right trade-off" (Ernstson, 2013, p. 12). This decision-making, however, is often dominated by privileged groups or knowledge systems. For instance, "green city branding" (García-Lamarca et al., 2021) through NbS might benefit ruling parties or real estate owners but exacerbate green gentrification. Likewise, eco-efficiency or green growth are commonly championed over other understandings of sustainability like "the environmentalism of the poor" (Martínez-Alier, 2002). Transferring this to NbS, Mabon et al. (2022) ask "whose knowledge counts in NbS." The authors argue that it is "precisely because NbS draw on such a breadth of knowledge systems that it is vital we remain attuned to the potential for epistemic injustice and the implications of excluding some ways of knowing" (Mabon et al., 2022, p. 662). Focussing on EP can complement this approach through actor-analysis focussed on power imbalances and situated instead of normative justice-claims.

Despite these important considerations, EP has yet to enter the discourse around NbS. However, some studies mention EP in relation to urban greening efforts more generally (Anguelovski et al., 2022; Argüelles, 2021), while others refer to privilege implicitly (Anguelovski et al., 2016; Gould & Lewis, 2021; Shokry et al., 2020). One prominent concept is the differentiation between sites or acts of commission and omission (Anguelovski et al., 2016). Acts of commission are intentional and benefit-oriented whilst acts of omission reproduce injustice through leaving out stakeholders or interests by design or mistake. As Anguelovski et al. (2016, p. 334), in an analysis of climate adaptation strategies, phrased it, "acts of omission refer to plans that protect valuable areas over low-income or minority neighbourhoods, frame adaptation as a private responsibility rather than a public good, or fail to involve affected communities in the process." Drawing on that notion, Shokry et al. (2020) analysed green storm water adaptation strategies in Philadelphia, determining that economically valued and wealthy areas were disproportionally more greened, consequently diverting investment and funds from more vulnerable areas and communities. This led to protected enclaves, on one side, and to further insecurities for the omitted, on the other (Shokry et al., 2020, p. 17). These processes of inclusion and exclusion, protection and vulnerability were magnified by concurring processes of green gentrification, displacing disadvantaged groups from greened and thus more flood-protected areas. Importantly, this study assessed both the strategies employed by privileged groups and the related ill effects affecting already-disadvantaged groups. This tacit aggravation of environmental injustice derives from often-overlooked imbalances, for example, the power to strategically influence decision-making processes. The result, however, is an appropriation and protection of EP and an extension of green injustices.

Gould and Lewis (2021) identify similar processes in their analysis of post-disaster recovery in Brooklyn after Hurricane Sandy in 2012, and on Barbuda after Hurricane Irma in 2017. On both occasions, reconstruction focused on improving the resilience of luxury buildings, attracting wealthy renters, and rising construction costs were covered through increased prices. This resilient reconstruction thus aimed at a new demographic, thereby mostly excluding the actual disaster victims. While termed "resilience gentrification" by the authors, the process also evidently depicts EP, the protection from risk. Hence, similar to the Philadelphia case, the displacement of former inhabitants due to exclusive reconstruction represents an act of commission, while leaving the affected previous residents to adapt on their own is as an act of omission. These empirical accounts underline the necessity to critically assess who benefits from and set the implementation terms for NbS. They also uncover the influence of power asymmetries on resilient planning and disaster recovery forces. However, empirical accounts examining the rationales and motives of the planners and residents are missing; these viewpoints are essential to understanding whether resulting injustices are considered and tolerated as consequences of economic disparities or simply overseen. They would enrich the debate around planning a just NbS since, on the one hand, economic realities cannot simply be ignored, while, on the other hand, the non-recognition of green injustices tasks planners to raise their own awareness or to proactively plan around social justice. Actor analysis focussed on EP should incorporate stakeholders and groups often barely considered in research on green injustice: the well-off. Understanding voiced claims and strategies employed by privileged groups is essential to take into account or to counteract in cases where they undermine EJ.

6. Solutions for Whom? Challenging Nature-Based Solutions Through Perspectives of Environmental Justice and Environmental Privilege

This review underlines the necessity to question NbS in terms of EJ. Although literature examining greening and EJ is increasing, links to NbS are still rare. However, I argue it is imperative to explicitly connect NbS and justice issues to avoid adverse effects or greening measures that only serve the well-off. The analysis of several dimensions of justice shows how complex this endeavour is, especially in dense urban environments with numerous stakeholders. I, therefore, agree with Anguelovski et al. (2020) that the planning of just NbS must reach beyond the aforementioned dimensions and include further frequently hidden drivers of injustice. Extending concepts of EJ through EP can be a helpful entry point to do so. It is essential that NbS are supported by all stakeholders in order to be sustainable. Thus, questioning who truly benefits from NbS can foster more inclusive approaches, even though further research is necessary. As this article shows, justice issues related to NbS are multidimensional and require balancing trade-offs. The recent "Global Standard for Nature-Based Solutions" published by IUCN (2020, p. 16) acknowledges this, stating that possible trade-offs must be addressed in fair and transparent negotiations as a baseline for "successful" NbS in the long term. The report further illustrates the potentially unequal affectedness by trade-offs, underlining the importance to safeguard that "trade-offs do not negatively impact the most disadvantaged elements of society." However, the report does not clarify how to approach fair and transparent negotiations. The apparent question is, how can we ensure that NbS reconcile diverse problems and prioritise the least well-off to close the apparent equity gap? Centring EJ and EP in green urban planning is a first step. For decades, EJ scholars offered empirical evidence of the uneven distribution of green benefits and environmental burdens, while recently also pointing to underlying deficits of procedural and recognition justice. EP can thus broaden our view of the diverse ways injustice is reproduced through the appropriation or defence of green privileges. It can shed light on which and whose expertise is considered in the implementation of NbS. For instance, Anguelovski and Connolly (2022) challenged "the social cost of glitzy-green urbanism," as prestigious projects are often linked to green gentrification. Understanding the underlying motives of similar forms of NbS, as well as the perceptions of which problems are addressed and which trade-offs are considered, can help provide a more comprehensive view on the (re)production of green injustice. It can also inform theoretical understandings of the "political ecologies of gentrification" (Quastel, 2009) and relational understandings of green (in)justice.

Findings from this review call for further research in several areas. First, there is a need for practical strategies on how to implement *just* NbS. The recent call by Anguelovski et al. (2020) for "emancipatory, antisubordination, intersectional and relational" greening might thus be a starting point. Additionally, critical mediation as suggested by Geiselhart (2021) could be a useful strategy to account for the procedural justice deficit and recognise diverse needs by offering a platform enabling the perspectives of absent groups to be considered in negotiation processes. However, this approach must still be tested, especially when broadening EJ beyond the human perspective (Maller, 2021). Also, this article argued on a conceptual level without differentiating between different forms of NbS. NbS, however, vary in scale, aim, and use, and can thus offer ecosystem services and disservices alike. Testing varying justice implications of differently scaled NbS may provide crucial insights. Drawing on the existing literature on ecosystem services and justice appears to be helpful in doing so (Baró et al., 2021; Langemeyer & Connolly, 2020). Lastly, further work must extend beyond the Global North. This will require localised conceptualisations and further empirical evidence. However, examining EJ and EP can also be helpful in different geographical contexts. For example, the persistence of unequal green legacies in South Africa, termed by Venter et al. (2020) as "green apartheid," can be framed through EP. Likewise, Unnikrishnan and Nagendra's (2015) account of the privatisation of green commons in Bangalore might be understood as an appropriation of privileges. Critically examining EP in similar cases might help to uncover underlying motives and relations, and thus ways of the production of green injustice.

7. Conclusion

NbS and their premise of multifunctional benefits have recently attracted much attention from academics, politicians, and the private sector. This article does not evaluate whether NbS can be useful in general. Indeed, green spaces can serve diverse needs and assist climate change goals, as well as support adaptation and mitigation (Intergovernmental Panel on Climate Change, 2022). However, an insensitively designed NbS can also create new or aggravate existing social injustices. I argue that focusing on EJ and EP can help mitigate adverse social effects. These perspectives help to consider the power-laden nature of NbS whilst drawing attention to the diversity of needs and perceptions regarding urban greening. Further, questioning privileges can be helpful to better understand the persistence of green injustice, as it is partly reproduced through the unintentional defence of one's own position. Also, examining EJ and EP sheds light on uneven power structures and their influence on the design, location, and aims of NbS. This is ever more necessary for NbS due to their rising prominence in both the public and private sectors and because their ostensibly solution-oriented, holistic design carries the risk of concealed trade-offs and caused injustices. While accounting for EJ and EP cannot *guarantee* just NbS, doing so may offer ways to challenge their exclusivity and thus also become a solution for often disadvantaged groups.

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Conflict of Interests

The author declares no conflict of interests.

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