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Research Paper

'It's not necessarily a social space' – Institutions, power and nature's wellbeing benefits in the context of diverse inner-city neighbourhoods

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HIGHLIGHTS

- Wellbeing benefits from urban nature are not realised equitably to all residents in diverse urban contexts.
- The ontology of co-production provides insights into what mediates everyday experiences of urban nature.
- Feelings of ownership, fear of conflict and norms for appropriate uses of space influence human-nature interactions.
- Planning tools for optimal allocation of space may reinforce divisions between demographic and socio-economic groups.

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ABSTRACT

Urban nature is widely known to provide wellbeing benefits to people and communities, but evidence particularly from diverse and disadvantaged contexts suggests that these benefits are not experienced equally by all. This paper unpacks this complexity by focussing on how urban nature is interacted with to produce relational wellbeing on two diverse inner-city housing estates undergoing regeneration in London, UK. We focus on the role of both formal institutions and the perceptions that people form of spatial features and their meanings and functions, and the manner in which these intermediaries shape human-nature interactions and the co-production of nature's wellbeing impact. Our findings from quantitative and qualitative data demonstrate that urban nature contributes to all aspects of a five-dimensional notion of wellbeing. But social housing residents' and young peoples' ability to experience these benefits is limited. Informal mechanisms of social control such as perceptions of ownership of space and its appropriate uses, and fear of conflict and crime limit the extent to which residents access greenspaces and the activities within them. Together with formal institutions such as tenancy types, housing targets and criteria for optimisation of site allocation, they produce hierarchies of use of public greenspaces and reinforce existing divisions between people of different demographic and socio-economic status. The findings underline the need to facilitate the establishment of shared and inclusive norms concerning access and appropriate uses of natural spaces in housing and greenspace delivery.

1. Introduction

The impact of urban nature on the wellbeing of communities and individuals has gained attention in literature and in planning and public health policy, particularly in the wake of the Covid-19 pandemic (Ribeiro et al. 2021; WHO 2016; Kabisch et al. 2021; Syrbe et al. 2021). The aspiration for 'greener' cities, referring to an increase in the presence of nature, such as parks, trees and water, is now a global phenomenon (UN 2015). But inequalities in access to urban nature are also well evidenced (UN-HABITAT 2021). Though the residents of poor neighbourhoods stand to benefit significantly from new accessible greenspace (Vert et al. 2019), poor communities generally report less benefits than wealthy ones (Jennings et al. 2016). Perceived distance, compromised quality and lack of safety, among other things, discourage access in disadvantaged neighbourhoods (Cole et al. 2019; Juntti et al. 2021; Diep et al., 2022). Moreover, some of the evidence regarding wellbeing impacts of nature suggests further complexity in the actual realisation of nature's benefits in the urban context. Hunter et al. (2019) found that an increase and improvements in urban greenspace did not automatically lead to an increase in physical activity levels, park access

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or general health in the US. Evidence from the Netherlands and China suggests no correlation between exposure to urban greenspace and self-reported mental health benefits among older people, and a negative correlation between mental health and an increase in greenspace in the urban periphery (Noordzij et al. 2020; Zhang et al. 2020). Objective markers of greenspace also failed to yield a correlation with the prevalence of somatic symptoms in a study including 3481 adults in the European context, and the authors suggest that subjective satisfaction with urban greenspace mediates its impacts on health (Watson et al. 2020).

Research is making some inroads into understanding this complexity. Liu et al (2023) identify a number of different pathways underpinning urban nature's health impacts, and stipulate the need to pay attention to the location, attributes and components of nature and the type of interactions that people have with it. Others highlight the need to explore how local infrastructure and formal institutions such as planning guidance and policies influence the realisation of the benefits of urban nature (Andersson et al. 2021; Kirsop-Taylor et al. 2021; Watson et al. 2020). Nature is perceived as having both material and signifying functions in the everyday urban context (Juntti et al. 2021), and these perceptions are subjective and context dependent and have been shown to inform how residents value and engage with nature (Juntti and Özsezer-Kurnuç, 2023). We argue that there is a need to better understand this complexity in order to support equitable realisation of the much-lauded wellbeing benefits of urban nature, particularly in highly politicised urban planning contexts like London, UK, on which this paper focuses.

To this end, we approach urban nature and its relationship to wellbeing in a diverse inner-city context through a relational ontology (e.g. Latour 2004), where any wellbeing impacts are seen as co-produced in everyday interactions between people and nature (O'Brien et al. 2014; Juntti and Özsezer-Kurnuç, 2023). The notion of relational agency recognises the multiplicity of nature – that it has plural potential functions with multiple potential benefits and harms that may be realised, and that may have trade-offs (Liu et al. 2023). We argue that intermediaries such as formal institutions like planning guidance, processes and tools (Andersson et al. 2021; Kirsop-Taylor et al. 2021) and perceptions that people form of spatial features and their meanings and functions are central to understanding the complexity evident in the actual realisation of nature's wellbeing impact in the urban context. This is because both formal institutions and the manner in which they represent nature, and peoples' everyday perceptions shape spatial practices (Lefebvre 1991) – here, the human-nature interactions that underpin the co-production of nature's wellbeing impact.

We employ a mixed methods approach that captures the perceived functions, and experienced interactions and wellbeing benefits associated with urban nature on two housing estates undergoing regeneration in north and west London, UK. Our focus on socio-economically mixed neighbourhoods is inspired by the observation that diverse urban contexts pose particular challenges for the realisation of nature's social impact (Juntti and Özsezer-Kurnuç, 2023). In reporting on findings from surveys and interviews with residents and stakeholders, such as local authorities, developers and housing associations involved in the ongoing regeneration projects, we explore both formal institutions and everyday experiences of urban nature (Sekulova et al 2021) and provide a high level of detail on how they inform residents' perceptions of and interactions with nature within these diverse urban communities. We address the following research questions:

- What representations and functions of urban nature are recognised and experienced among the formal stakeholders and residents in the case-study estates?
- How do these representations and functions support wellbeing?
- What are the formal and informal intermediaries that shape the human-nature interactions and what implications does this have for the realisation of nature's wellbeing benefits for residents in our case-study estates?

2. Wellbeing and the benefits of urban nature

2.1. Wellbeing as a relational concept

The relational approach to wellbeing recognises that personal, societal and environmental structures and processes collude to produce wellbeing (White and Jha, 2020). Therefore, there needs to be an appreciation of the individual in interaction with and as a part of a larger whole to understand how wellbeing is co-produced and shaped by situated social and material relations and culturally informed expectations and understandings. The Millennium Ecosystem Assessment (MEA) set out the notion that the four groups of supporting, regulating, provisioning and cultural ecosystems services contribute to human wellbeing by enhancing its five constituent parts of: security, basic materials for good life, health, and social relations which, when present in abundance, create freedom of choice central to wellbeing (MEA 2003). The 'ecosystem services cascade' theory (e.g. Spangenberg et al 2014) demonstrates that the attribution of value to nature's functions is an important step in how any services, benefits and goods come into being. We build on these theorisations, but argue that when addressing wellbeing in the urban context, nature's potential benefits to health and social relations come to the fore, and in a developed urban centre like London, the impact of urban ecosystems on livelihoods is limited. Particularly in urban regeneration where housing and infrastructure are demolished and rebuilt, potential benefits to community cohesiveness and relationships with neighbours, as well as place identity and inclusivity are important (Social Life 2020). We therefore structure our analysis of the wellbeing impact of urban nature along the five dimensions broadly reflecting the definition of social value provided by Social Life (2020), which was specifically developed for the context of London. The five dimensions of wellbeing that we use here are 1) directly experienced physical and mental wellbeing, 2) community cohesiveness and relationships with neighbours, 3) home neighbourhood identity, inclusivity and satisfaction 4) individually experienced agency and power and 5) perceptions and experiences of the local economy. We suggest that nature's wellbeing impact emerges from interactions between humans and nature in the everyday life of the city (O'Brien et al. 2014; Juntti and Ozsezer-Kurnuc 2023). Wellbeing benefits may be based on active or passive engagements with nature, such as growing edible plants in a back garden or the enjoyment of aesthetic features of a nearby greenspace and subsequent feelings of pride and belonging (Juntti et al. 2021).

2.2. Intermediaries and the co-production of nature's impact in the urban context

The relational ontology stipulates that agency emerges from a heterogenous network of a range of both human and non-human entities (actors) that act in concert and thereby, empower each other to produce specific outcomes (Callon 1986; Latour 2004; Allen 2010). The realised outcomes depend on the relative ability of the different actors to mobilise specific ends – for example wellbeing impacts from nature – by enlisting others to function with them to do so. While actor networks remain fluid and constantly in negotiation, intermediaries, such as scientific knowledge, technological solutions and institutionalised norms and practices may act to stabilise certain relations and outcomes (Latour 2004; Allen 2010). For example, the concept of ecosystems services (MEA 2003) foregrounds an anthropocentric perspective yielding societal benefits a central position in the manner in which it represents and 'speaks on behalf' of nature (Noergaard 2010; Latour 2004). It prioritises a focus on 'biophysical structures' that can be engaged to 'collaborate' to produce societal benefits such as flood risk management or biodiversity gain, potentially at the expense of what some term the intrinsic value of nature (Spangenberg et al. 2014; Kirsop-Taylor et al. 2021).

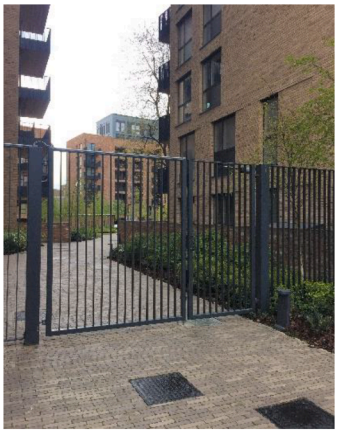
In this paper, we delimit the analytical focus to the heterogenous

actor network that is implicated when wellbeing is realised in interactions between humans and nature, with particular attention to the intermediaries modulating these interactions. Literature already points to certain network members here. The broader material context such as the type and form of nature and infrastructure within which it is located shapes human-nature interactions (Liu et al. 2023). For example, the presence of trees encourages active exercise whereas areas with less green features and more access infrastructure attract social activities (Kabisch et al. 2021). The social context such as demographic and socioeconomic factors, cultural and ethnic diversity, and levels of crime, have also been shown to be influential intermediaries in shaping human-nature interactions in the urban context (Hatala et al. 2020; Jing et al. 2021; Vert et al. 2019; Mottaghi et al., 2020). But there is less clarity in literature as to how this mediation happens. Findings suggest that the material form of urban nature takes on different meanings in different social contexts, and these perceptions in turn influence the manner in which people interact with the nature in question and how beneficial (or otherwise) it is experienced to be (Jennings et al. 2016; Watson et al. 2020; Juntti et al. 2021). We focus on this less well understood 'step' of meaning attribution in the ecosystem service cascade. Our analysis focusses on the role of both formal institutions (Andersson et al. 2021; Kirsop-Taylor et al. 2021) and the perceptions that people form of spatial features and their meanings and functions, and the manner in which they shape the human-nature interactions that underpin the co-production of nature's wellbeing impact. We refer to quantitative survey data regarding *what* perceived functions people assign to urban nature in our case-study areas and the perceived functions, experienced benefits and barriers to access that they report. We then engage qualitative data to understand *how* the interactions that people have with nature are shaped by the material and social context, subjective perceptions and formal planning institutions.

2.3. Research methods

This research is based on a mixed method design and focusses on two housing estates in London, UK. Our case study estates (Images 1–4) are both undergoing long-term regeneration processes delivering new social (council rental), shared ownership, and private housing in collaboration with private sector developers and housing associations. Woodberry Down is a large 64-acre estate bordering two unused reservoirs that are both open to recreation access. Acton Gardens, 52 acres, replaces the old South Acton estate.

Images 1 and 2: Woodberry Down – wetlands, adjacent new buildings and SUDS (photo credits: authors).



Images 3 and 4: Acton Gardens – new buildings and greenspaces (photo credits: authors).

Both projects were approximately 10 years into the regeneration process at the time of data collection. In Woodberry Down, regeneration involved temporarily rehousing existing residents with an offer to return to new homes on the same estate. According to the London Borough of Hackney Council "41 % of the 5,500 new homes being built over the 20-year period will be for council rent or shared ownership. Secure council tenants have the right to return to a new Notting Hill Genesis home at a council rent, while leaseholders are offered a range of options, including

the opportunity of a new shared equity property at Woodberry Down. Residents are also entitled to a package of financial compensation and support for the disruption of moving home" (LB Hackney 2023). In Acton Gardens, located in the London Borough of Ealing, all existing residents have been offered new homes on the estate prior to demolition. The developer, Countryside, states "Upon completion, Countryside and L&Q's project will deliver 3,463 high-quality homes, of which 48 % will be affordable, delivering a third more social housing than existed before the project began…" (Countryside 2019). Both construction projects increase the number of homes on the sites substantially and deliver a significant amount of re-designed greenspace with attention to biodiversity, water management and community benefits. For example, in Woodberry Down, a new wetlands centre has opened on an adjacent reservoir (Image 1).

We conducted a systematic review of international literature to collate evidence of the social impact of urban nature and the factors influencing it. We then undertook a survey of 270 residents and visitors, aged above 18 years old (Acton Gardens N = 160 and Woodberry Down N = 110), to evidence these impacts and factors on our case study estates. In line with the relational ontology, the survey focussed on the perceived functions and actual interactions that people associated with nature on the estates, its experienced benefits, and barriers to access. We used targeted convenience sampling to reach respondents that lived on or visited the estates in question. We advertised the survey through social media channels such as residents' online groups and approached people in person on the estates. In the resulting sample was broadly representative of the population, with the exception that people who identified as white were overrepresented with 92 % of the sample to 56.5 % of the population of South Acton (ONS 2021) and 90 % to 61 % in Woodberry Down (LB Hackney 2021). In both case study estates, largest group of respondents self-report as 19–29 years of age and second largest as 30–49. Approximately 40 % of respondents were either living in council housing or with parents or other family. While the 'young bias' broadly reflects the estates' demography, it is not possible to draw conclusion on the experience of elderly people on the basis of the survey responses. The gender distribution in both samples is equally representative of both male and female genders.

Following the survey, we conducted 20 purposively sampled semi-structured interviews with residents and formal stakeholders such as community organisations and housing developers. The purpose of the qualitative inquiry was to understand how exactly relational wellbeing is being co-produced through interactions between nature and people on the estates and the role of intermediaries in this co-production. In order to capture the impact of the on-going regeneration projects, we only interviewed residents who had been living on the estate for a minimum of two years and recruited both private and council housing residents. We ensured the inclusion of members of the key ethnic groups, such as the Turkish community in Woodberry Down and those of Somalian origin in Acton Gardens. Interviewees ranged from early 20 s to 60 s in age. The interviews explored the manner in which the residents perceived the greenspaces on the estates as functioning and whether and how this had changed over time; the benefits and harms associated with urban nature more broadly; how residents experienced the social context of the estate; and possible opportunities to contribute to the design of new greenspaces and ideas for improvement. By eliciting descriptions of the perceived functions and actual interactions with nature, we acquired evidence of activities that could feasibly support the realisation of the five dimensions of wellbeing. By prompting respondents to describe these interactions in the specific social and material context, we explored the role of contextual factors such as socio-economic diversity, material form and perceptions, institutions and other possible intermediaries. Eliciting ideas for improvement was used as a prompt for potential dis-benefits or harms associated with the nature and broader material and social context of the estates. The questions regarding opportunities to contribute to the planning process probed for the relevance of planning institutions and processes from the residents' perspective.

The formal stakeholders (5 out of 20 interview respondents) were similarly purposively sampled from people who were involved in blue and greenspace planning and delivery on the two estates and who possessed extensive knowledge about the estates and the regeneration projects. They represented the youth provision for the under 18 s, public and private sector estate management and housing provision organisations, and community stakeholders working on the estates. The formal stakeholder interviews with tailored questions based on each stakeholder's specialism, focused on views regarding both the formal, or intended, and the realised function of nature on the estates, and the role of institutions influencing the 'delivery' of water and greenspaces as a part of housing regeneration. These stakeholder interviews complemented the residents' descriptions of nature and its experienced impacts and explored the role of institutions in more detail.

3. Urban nature and wellbeing in diverse inner-city estates undergoing regeneration

3.1. Nature's perceived and realised functions

Regeneration on both of our case-study estates has involved expansion and improvements to the provision of greenspaces. At the time of data collection, in Woodberry down, there were new pocket greenspaces, SUDS, playgrounds and paths connecting to the adjacent reservoirs and a new wetland (Images 1 and 2) and in Acton Gardens (Images 3 and 4), new lawn areas, parks with fitness equipment, and courtyard gardens. The survey findings regarding the most frequently reported functions of and reasons for accessing nature evidence perceptions and interactions that have strong potential for the co-production of relational wellbeing.

The overall impact of the water and greenspaces on the estates was described overwhelmingly as positive (88 %) or neutral (8 %) across the two estates. The most frequently reported perceived functions of greenspaces and water were 'enabling a healthier lifestyle', 'improved aesthetics', 'opportunities for physical exercise and play', 'attracting visitors to the estate' and 'providing space to relax and recharge' (Fig. 1).

The two most frequently indicated purposes for accessing the greenspaces (their realised functions) on the estates were to 'enjoy nature' and to 'spend time with friends'. 'Exercise' (including to 'use the sports facilities') was the next most often indicated purpose, with to 'feel connected to the community' and to 'access playgrounds', with equal frequency in fourth place, followed by to 'spend time alone'. These perceived and realised functions align with pathways that underpin nature's health impacts in literature (Liu et al. 2023) and can be seen to support at least three of the five dimensions of wellbeing that we are focussing on in this paper: experienced physical and mental wellbeing; community cohesiveness and relationships with neighbours; and home neighbourhood identity, inclusivity and satisfaction.

However, the survey data reveals that only just over 20 % of 270 respondents experience 'no barriers' to accessing the greenspaces on the estate. This suggests latent demand, and that for some reason, a majority of respondents are not able to interact with nature in ways that that they would like to. The majority of the respondents reporting no barriers were women (63 %) but beyond that no significant correlation between barriers and demographic factors were found in the survey data. The most frequently cited barriers to access point to the role of infrastructure, extent of available greenspace and subjective preferences. While 'distance/lack of transport' may refer to greenspaces beyond the estates, on both estates 'park opening times', 'access limitations due to privatisation', 'insufficient facilities', 'lack of accessible paths and signposting', 'insufficient services' 'lack of activities' and 'lack of time' featured in the top 10 most cited barriers (see Figs. 2 and 3 for estate specific findings). In the next section, we explore the interview data for a better understanding of how exactly the perceived functions, actual interactions and

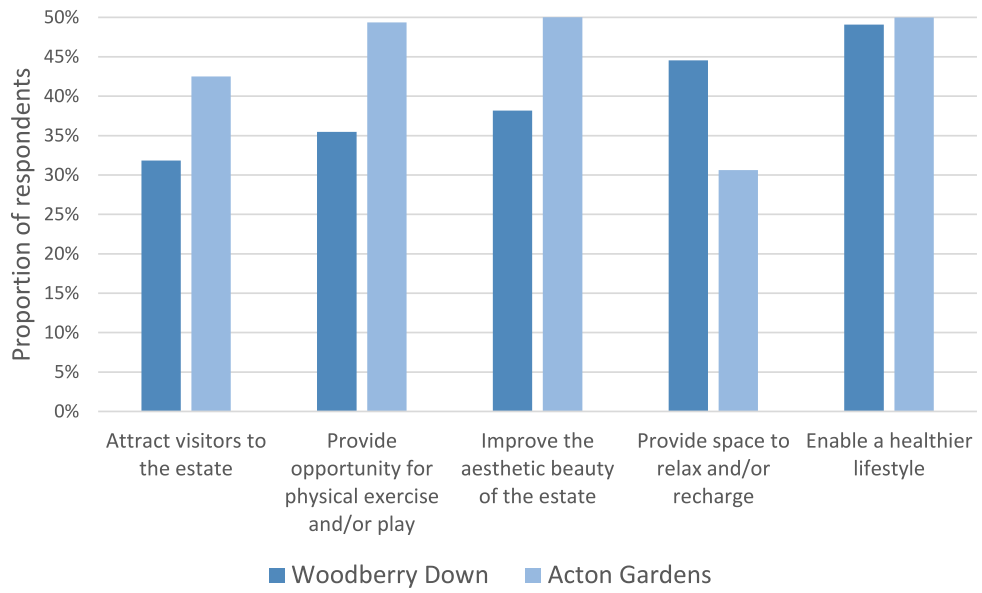


Fig. 1. The top five most frequently cited functions of urban nature on the estates, when respondents were prompted to select four most significant out of a total of 17 cited functions.

reported barriers influence residents' interactions with nature on the estates.

3.2. *Perceptions and institutions in mediating nature's wellbeing benefits*

3.2.1. *Nature as an 'active communal space' and as a 'commodity'*

The interviewed residents describe multiple perceived functions and interactions that they have with nature that clearly underpin different dimensions of wellbeing (Social Life 2020). These align with what can be termed a representation of nature as an active communal space. For example, in Woodberry Down (images 1 and 2), several respondents suggest that having access to nature on the estate has encouraged them to exercise more. Similarly, while the surveys indicated that nature functions as a valued social space for meeting friends and neighbours, in Acton Gardens, a resident expands on this:

> *The positivity around my place, and then the kind of environment, is very good. I think just some of the things that have made it very easy …to connect me with the people around here. (I5AG)*

In Acton Gardens, regeneration has seen the establishment of a

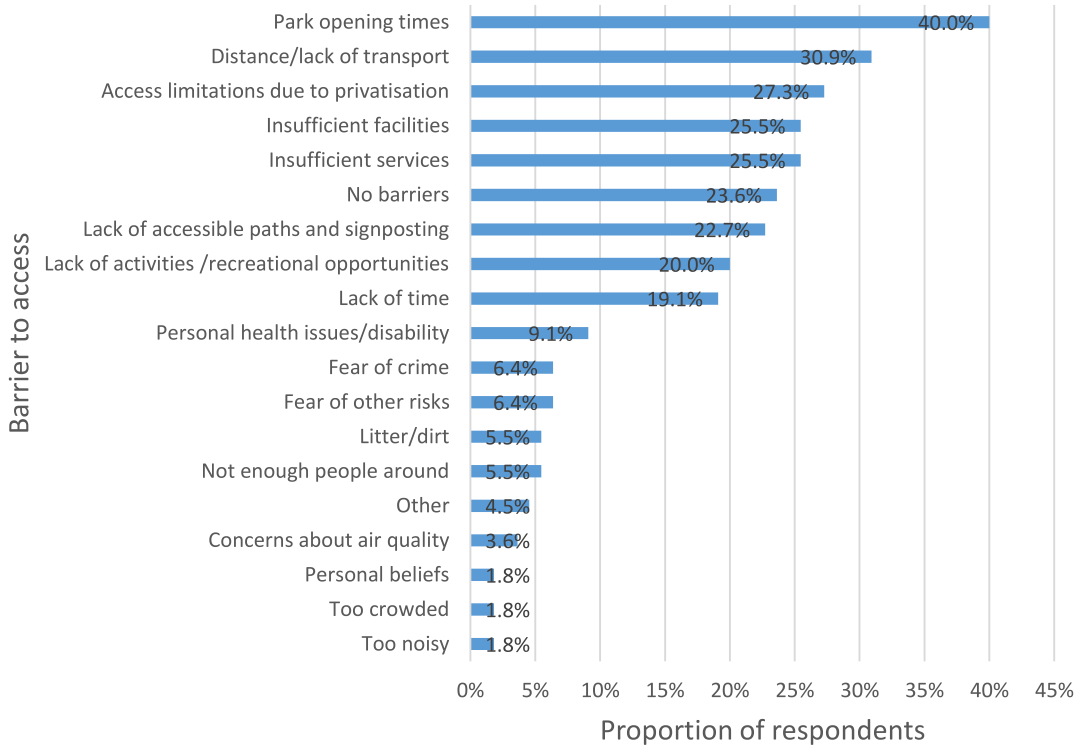


Fig. 2. The proportion of respondents that cited each barrier of access, when asked what limits access to the greenspaces and water features in Woodberry Down (N=110). Respondents were prompted to select as many barriers as applicable.

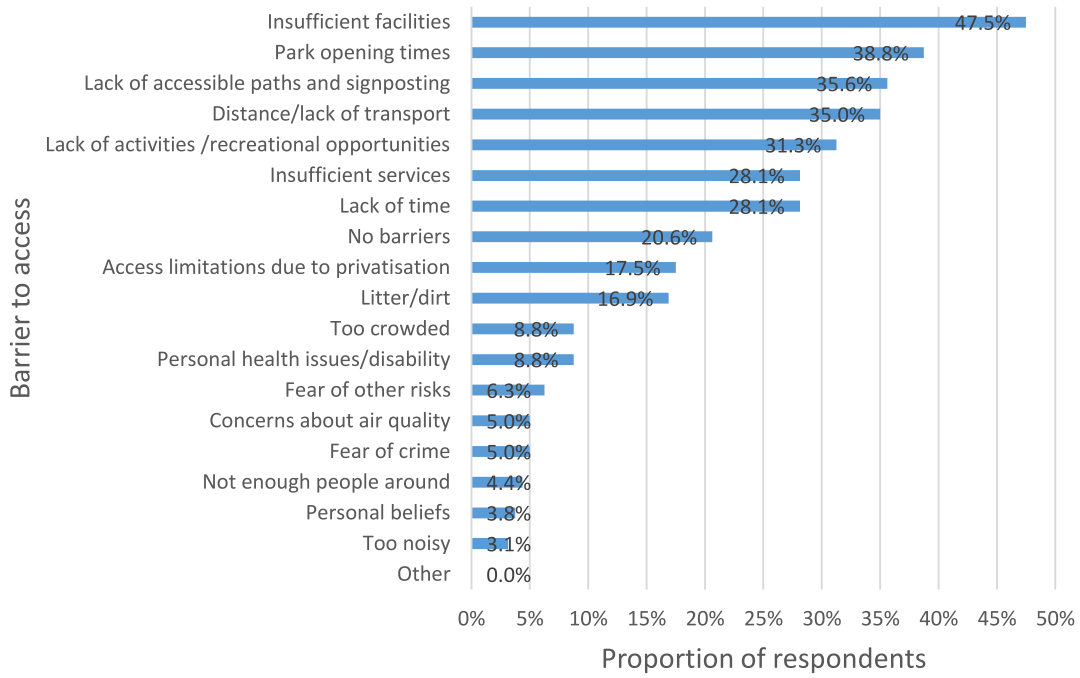


Fig. 3. The proportion of respondents that cited each barrier of access, when asked what limits access to the greenspaces and water features in Acton Gardens (N = 160). Respondents were prompted to select as many barriers as applicable.

number of parks with different uses, including sports facilities, children's play areas and greens that some respondents suggest may be intended for dog walking. Another resident describes how these spaces afford opportunities for communal out-door exercise that has also created space for a local fitness entrepreneur, potentially contributing to the local economy:

> *We do boot camp class four days a week, which is in the local park here. So, we have a local chief that comes …and runs it in South Acton Park. (I2AG)*

Beyond increasing residents' agency to lead more active lifestyles, living in a neighbourhood with accessible and diverse greenspaces is also valued for the opportunity to reconnect with nature and to learn to appreciate and care for it. Below, one of the residents of Acton Gardens (R) explains to the interviewer (I) how this may support a crucial first step in the necessary societal transformation to counter the climate crises:

> *R: We all have to change how we think we're connected with nature because that's something that has been lost for way too long now. Tackling climate change is not just planting some trees, it's rebuilding a concept and a connection that's been lost. And, if we don't do this from the local community, but you want to impose this from above – it's not gona work. I: So, you think this is a start of …reintroducing greenspace and the function of greenspace and benefits to people's consciousness and their everyday lives? R: I hope so. (I3AG)*

Therefore, the nature present on the estates is perceived by some residents as not just beneficial for people, but as functioning as a response to the planetary environmental crisis. Respondents on both estates suggest that how we treat nature in our everyday lives makes a difference.

> *When you increase the greenspace, there will be an offering – water sources will be protected. Do you see? Animals will not die anyhow, and such …. (I4AG)*
> *People should take care of the green spaces and treat like it's their own property. Yeah, that's what I can recommend. But yeah, [if] we all do this, everything would be OK. (I7WD)*

This suggest that living in a green neighbourhood may also increase residents' feelings of agency in relation to environmental crisis by providing reassuring evidence of healthy nature and opportunities to connect with and actively care for it. This requires further research as it contrasts with literature that reports a positive correlation between nature connectedness and climate anxiety (Whitmarsh and Mitev 2022). However, it suggests that there may be a more complex relationship between awareness and knowledge about nature, opportunity to interact with it in everyday life, and levels of anxiety.

The interviewed stakeholders also recognise the nature on the estates as an active communal space affording relational wellbeing. But they also articulate a different representation of nature, as a unique selling point imbued with commodity value (see also Juntti and Lundy 2017):

> *"So yes, one, it [greenspace] helps us sell homes – absolutely it does, but it creates the backbone to good place making" (WDS1)*

It is well established in literature, that good quality greenspace augments real estate value (Anguelovski, et al. 2019; Bockarjova, et al. 2020). This formal representation of nature as a commodity with quantifiable and often also monetizable value (Martin Ortega et al. 2024) is operationalised in both real estate marketing and business reporting and plays an important role in area branding. For example, the quantity of greenspace is engaged to demonstrate social value and a sustainable business approach in the housing development sector (Berkeley Group 2023). The recognition of nature's brand value is evident in the renaming of South Acton as Acton Gardens in an attempt to highlight the amount of greenspace. The next section examines the actors and intermediaries that empower these two different representations and make them present in the everyday life of the estates. It becomes evident that balancing these two representations – nature as an active communal space and nature as a commodity – is decisive for equitable realisation of relational wellbeing.

3.2.2. *Perceptions as mechanisms of social control*

While the nature on our case study estates yields multiple wellbeing benefits, the interviews provide evidence of differential experiences by different groups of residents that may explain the high number of reported barriers to greenspace access in the survey. Young people stand

out as a group whose potential to spend time in nature is not well supported on the estates, as suggested by this Acton Gardens resident:

> *You can see a bunch of school kids just finished the school. They've got nowhere to go and hang out. And even things like …seating areas where they can sit and chat. There isn't anywhere (for) them to do it. (I2AG)*

A resident of Woodberry Down reveals why young people's activities in the public greenspaces may be restricted:

> *… if they [young people] are hanging around the new houses, the more high-quality ones with the glass, I don't think anyone would want them to kind of stay there or like play any ball games, or you know disrupt the local residents who live in the new housing. So the more, when I say housing, I mean the more like posh people who can afford to live in those houses, they don't want to have any disruption, or like loud noise. (I9WD)*

This begins to articulate divisions within the community and in perceived ownership of space, and an apparent hierarchy of desired uses of the greenspaces on the estate. Although only 2 % and 9 % of the survey respondents in Woodberry Down and Acton Gardens respectively ticked 'too crowded' as a barrier to access, the below quotation from a council housing resident (R) in Woodberry Down demonstrates that lack of space is not just about physical access but feeling comfortable in the space is important (see also Wolch et al. 2014):

> *R: I don't feel comfortable because it's all buildings – all houses. There's no green. I don't feel like fresh air in this area. That's why. Yeah. I: Okay. Although there's the reservoirs and there's the walk around the … R: People already there. I don't have a space for me to stay there. … Too many people for too narrow, small area. (I1WD)*

This respondent describes how, as a social housing resident, she has been made feel unwelcome by some living in the new private blocks built on the estate as a part of the regeneration project. She is not alone in referring to a breakdown of community associated with regeneration, and to a loss of trust among residents. The new mix of council and private rental and ownership residents and the division into 'old' and 'new' inhabitants has, according to another Woodberry Down resident, weakened the perception of public space as communal and shared:

> *Feel like, with the new people, they don't know what's going on, they're not really familiar with the older residents who live in Woodberry down … then I don't think a lot of the people want to be, you know, in the same space, I guess. They just want to mind their own business and then get on with their day-to-day lives without really interacting with the rest of the community… (I9WD)*

Despite the developer's aspiration to provide a 'tenure blind' environment where private and social housing do not differ in appearance, tenure type informs residents' perceptions of ownership and the primary function of nature on the estates.

> *… It's not that I have a view of the reservoirs, but lots of people in …the private rental sector do. So, it's potentially that it's aimed at people who are buying, or I don't know, renting, so… I: That's your impression? R: Well, yeah, I mean, because these buildings are nearer the nicer bits of greenspace. (I2WD)*

Feelings of ownership of space appear to mediate access to the available greenspaces on Woodberry Down in particular. This may explain why 'access limitations due to privatisation' is a frequently cited barrier to access in the surveys on both estates, despite the formal stakeholders' efforts to provide an inclusive estate where the majority of greenspace is public and intended for the whole community. In the fragmented social context, misunderstandings arise, where material features are being assigned meanings that further inhibit aspects of relational wellbeing, such as feelings of inclusion and belonging. The below quote refers to a garden with decorative gates and a café in Woodberry Down:

> *… it [decorative gate] kind of makes you feel like it's only exclusive to those blocks or those new apartments. That's why a lot of people might think it's kind of closed off, and the general public can't really go in. (I9WD)*

Although the vast majority of greenspaces on the estates are publicly accessible, new housing blocks have double-gated entry systems, where a greenspace adjacent to an apartment block is gated and reserved for the residents of the block for the safety of access (Image 4). In Acton Gardens, blocks also have internal courtyard gardens, with access limited to residents. But on both estates, these block specific spaces appear under-used. Respondents report not using the courtyard gardens because they are unsure what constitutes their acceptable use, whether dogs are allowed and because there is no shared agreement on what to do with the space. It therefore appears that norms regarding appropriate uses of public greenspaces constitute another significant intermediary in the co-production of wellbeing from urban nature. Brownlow (2006) suggests that informal mechanisms of social control, such as perceptions of ownership of space and risk of conflict and danger have profound implications for how public greenspaces are used. On these newly stratified housing estates undergoing regeneration, it appears that the shared norms and understandings of appropriate uses of space that empower the representation of nature as an active communal space have been weakened. Instead, more restrictive mechanisms, such as fear of crime, that underpins the double gated entry systems, perceptions of limited ownership and fear of conflict over appropriate uses have gained agency. This sheds light on why the introduction of new and improved greenspaces does not necessarily increase greenspace access in the complex context of the city (Hunter et al. 2019). It demonstrates the power of perceptions and the manner in which they act as mechanisms of social control curbing the multiplicity of nature, the broad range of interactions and subsequent benefits that it has potential to afford (Latour 2004). In restricting the range of acceptable uses to only those that do not disrupt the *'posh people who can afford to live in those houses'* the prevalent perceptions and norms align with the representation of urban nature as a commodity, serving the production of real estate value. This narrow representation creates opportunity costs, where the diverse needs and perceptions vis a vis nature are rendered into conflict (Mottaghi et al., 2020). For example, in the studied inner-city estates, the double gated safe zones for building access come at the cost of sufficient space for young people, and are perceived as a wasted opportunity by his young Woodberry Down resident:

> *… you can see the green space, but we don't have access to it. Which, for one, I personally don't think that's very …that's fair. (I8WD)*

The high proportion of respondents reporting 'lack of activities and recreational opportunities' as a barrier to greenspace access in the survey (about 20 % and 30 % in Woodberry down and Acton Gardens respectively) may be symptomatic of the need for more opportunities to establish trust and shared understandings of appropriate uses of the greenspaces on the estates so that all residents feel comfortable accessing them. A Woodberry Down resident suggests organised activities and events, such as *'some markets or stores happening in the area'* as a potential solution that could heal community fragmentation and foreground the establishment of more inclusive functions of public space.

3.2.3. Formal institutions and enacted representations of urban nature

The stakeholder interviews show that residents' perceptions mirror the institutions that shape the representation of nature in the planning and delivery of housing and public space in the regeneration process. The below quote from a stakeholder in Woodberry Down demonstrates how the multiple demands on urban space make allocation and design of greenspace that co-produce relational wellbeing a balancing act.

> *"All landscape has to work very hard and just because of the amount of people. It needs to do lots … of different things. So, it needs to look pretty, it needs to be biodiverse, but it needs to be a play space, it needs to be a*

quiet contemplation space, and you need to find pockets of these things all along way. … The other thing is because we have to hand it over to the Council, it has to include materials that they can maintain for years to come. So, that's another sort of learning curve along the way of what the Council can take on, with a maintenance regime." (WDS1)

The formal stakeholders are keenly aware of nature's multiple wellbeing potential and the fact that incompatibility of uses requires careful planning and site allocation. Measured site allocation is seen as crucial for alleviating trade-offs between different uses of space. But our data suggests that the representation of nature as a commodity imbued with real estate value that informs residents' perceptions of ownership of space and its appropriate uses, is also powerful in the planning sphere where developers and local authority planners make decisions regarding the allocation of space in regeneration. The real estate value of nature is likely further emphasised in contexts such as our inner-London case study estates, where the aspiration to concentrate development in areas that are well connected to jobs and services further inflates high housing targets (Raco et al. 2022). The frequent references to high-quality nature in estate branding and marketing materials suggests that nature's role in adding value to private equity is significant for local authorities and developers, who need to subsidise the statutory social housing provision from the income from private real estate on mixed tenancy estates. In such densely populated high-pressure areas, the London Plan (GLA, 2021) stipulates a design-led approach to 'optimising site-capacity'. While there is a strong commitment to the provision of conveniently located greenspaces that meet community needs in the stakeholder interviews, efficiency of use is an important goal and a range of more or less formal, often quantifiable quality criteria are employed as decision-making tools:

"for example, Bollo Bridge Park, while it was only a green field it was opposite the school. So, it was used, it was an area that Ealing owned. And, so, as part of the master plan, that was retained (…), looking at existing sites, where you have green space that isn't well utilised, … you try and move that and provide adequate space for a number of residents, because there are a lot of competing priorities. (AGS1)

The aspiration for 'high use value' of urban nature is not just about frequency of use but stipulates a hierarchy of uses of space, where dog walking and behaviour classed as 'antisocial' seem to form the bottom rung:

"… how you can maybe revitalise the space you already have, and creating a space that the community will want to use rather than creating a space that; (A) …mostly the dog walkers just use, or, (B) a place that creates or provides an opportunity for things like antisocial behaviour." (AGS1)

The notion of antisocial behaviour remains ambiguous in the interviews, but the residents' responses suggest that it may refer to behaviours that are incompatible with the real estate value of nature. Literature has found that the price impact of greenspace varies according to type, and spaces affording play may have a negative impact on real estate value (Bockarjova et al. 2020). As discussed above, activities such as ball games and the congregation of young people that may be experienced as disruptive and that do not align with the formal notions of liveability associated with urban nature are perceived as unwelcome (see also Draus et al. 2020). The key intermediaries stabilising this perception encompass informal mechanisms of social control such as perceived ownership of space and assumed hierarchies of use, but also more formal and tangible factors such as private security. In Woodberry Down, many describe the estate as being patrolled by private security who discourage certain, undesirable uses of space. A young male resident (R) of Woodberry Down notes:

R: [that green area there] … It's not (…) necessarily a social space. And, I think it could be (…) if there wasn't such issues with it. For example, like when it gets to like 8 pm (…) the security kind of move us on if we're spending time around there. …Sometimes we might be talking a bit loudly, but again – we're outside and it's like 8 pm. (I8WD)

Therefore, the representation of urban nature as a selling point, a commodity involved in the generation of real estate value is made present in the everyday life of the estates in multiple ways (Allen 2010). Both the formal planning institutions and the prevalent perceptions of ownership and acceptable uses discourage plurality in the range of interactions that produce wellbeing from nature. A further 'reductive' tool at stakeholders' disposal is the monetary compensation mechanism that allows developers to 'off-set' the impacts of densification where the multiple demands on urban space are irreconcilable. A Woodberry Down stakeholder refers to the minimum requirement for open space per inhabitant specified in the Hackney Local Plan 2033:

"You might end up having to pay a financial contribution to enhance other spaces in the area or see what we can do. But I think it's a stretch target, and I think the council are mindful that it is a big number. But you know, they have to balance it. Often there are conflicting policies that a planning application has to sort of resolve on one of their other ones would be to deliver housing…. But we'll try and make it work" (WDS1)

This aligns particularly strongly with the commodified representation of nature, where it is seen as an interchangeable object of use (Martin-Ortega et al. 2024). It is not evident from the interview data whether this planning tool has been used on our case study estates, but it is certainly easy to see how it might facilitate the loss of greenspace that has not managed to attract high value uses, further limiting the extent of greenspace available to fulfil the needs and preferences of groups such as young people.

Our findings reflect the suggestion that an over-simplification of social landscapes in government guidance prevent outcomes that meet a plural and diverse set of stakeholder needs (Raco, 2018). Raco (2018: 7) report a detectable shift in priorities within the planning system, away from community needs, to meet the 'legal requirement, wherever possible, to prioritise growth and the expansion of new homes and development projects.' Our interviews point to the well-known legacy of neglect of council estates as contributing to the normalisation of urban nature as a commodity rather than a common good.

… During the 80s, what I call the factory years, it was just run down … Being a Council tenant was really looked down upon and nothing happened. So, the only way to build it all back up was to regenerate……I do sometimes look at it and feel now it's too dense, but then it is dense everywhere. I mean, there's only got to be a small piece of land come free around here and someone fixes a block of flats on it. … The maintaining of them [greenspaces on the estate] and the equipment in them is far better. So, you know, I mean, if you're going to get a quality greenspace, then I guess a little bit of a shortfall on it isn't quite so bad because…there was masses of greenspace, but it was so badly maintained. (I5AG)

4. Conclusions on the wellbeing impact of urban nature in diverse inner-city neighbourhoods

The analytical focus of this paper was on the heterogenous actor networks that are implicated when wellbeing is realised in interactions between humans and nature, and in particular, the factors mediating these interactions in the urban context. The aim was to understand what underpins the conflicting evidence regarding nature's wellbeing benefits in cities. The relational understanding of urban nature highlights its multiplicity: how urban water and greenspaces can be several things at once, to several different urban actors. However, in the studied diverse inner-city estates undergoing regeneration, this multiplicity was thwarted by a prevalent representation of nature as a commodity imbued with real estate value. While qualitative and quantitative data demonstrated a good range of wellbeing benefits derived from the greenspaces on the estates, they also revealed a range of barriers that

limit the realisation of benefits for some groups.

The analysis demonstrates how the breakdown of community associated with housing regeneration has led to a loss of the notion of urban nature as a shared active space among residents. Instead, restrictive mechanisms of social control, such as fear of crime and conflict, and feelings of lack of ownership inform the manner in which greenspaces are accessed and used on the newly stratified mixed tenancy estates. Formal institutions informing spatial allocation and the delivery of greenspace reflect and, in some cases, further amplify the impact of the norms and perceptions prevalent among residents. Tenancy types, planning targets and decision-making tools such as criteria intended to support optimised site allocation and to ensure the efficiency of use reinforce a commodified representation of nature that affords a narrow range of appropriate uses. While there is little doubt that the focus on high use value in site allocation is intended for the maximisation of public benefit, it appears that in the context of the diverse estates, it contributes to the production of minorities whose needs are marginalised. Although both of our case study estates are designed to be tenure blind, it appears to be social housing residents whose feelings of ownership of space are compromised and young people, whose preferred activities do not fall in line with the representation of urban nature as a real estate asset, suffer from a lack of spaces that would serve their needs. These findings reflect the politicisation of public space in the context of housing delivery (Swyngedouw 2007), and resonate with the suggestion by Sekulova et al. (2021) that the manner in which urban nature is represented is central to who it benefits.

Where literature has highlighted cases where an entire community is less able to engage with urban nature in the context of disadvantage (Wolch et al. 2014; Jennings et al. 2016; Diep et al., 2022), here, the marginalisation of certain members of a stratified community is emphasised. Our findings therefore call into question the predominant framing of urban nature-based solutions as guaranteed win–win solutions delivering equitably to community needs while augmenting real-estate value in urban planning (Diep et al., 2022). Instead, it appears that what in name is public greenspace, can easily become formally and informally regulated to secure one groups benefits over others' (Draus et al. 2021). This highlights the need for an ethics of governance – planning and delivery – of urban nature that recognises and resits the reductive and subversive impact of planning targets and tools, and ensures that the delivery of urban nature doesn't further reinforce already existing divisions between people of different demographic and socio-economic status. In diverse urban contexts in flux, greenspace delivery needs to be accompanied by mechanisms that facilitate the establishment of trust among community members and the development of inclusive norms that respect and enable plural values and functions of urban nature, in order to enable the realisation of nature's wellbeing benefits for all. This is particularly important in contexts like inner London, where the targets for affordable housing delivery are high and there is a need to fund social housing from development gains, and where there is therefore high pressure to treat urban nature as a commodity, prioritising its function in real estate value production.

CRediT authorship contribution statement

Meri Juntti: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Sevda Ozsezer-Kurnuc:** Methodology, Investigation, Funding acquisition, Formal analysis, Data curation. **Nicholas Dash:** Writing – review & editing, Visualization, Data curation.

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References

Allen, J. (2010). Three spaces of power: Territory, networks, plus a topological twist in the tale of domination and authority. *Journal of Power, 2*(2), 197–212. https://doi.org/10.1080/17540290903064267

Andersson, E., Borgström, S., Haase, D., Langemeyer, J., Wolff, M., & McPhearson, T. (2021). Urban resilience thinking in practice: Ensuring flows of benefit from green and blue infrastructure. *Ecology and Society, 26*(4), 39. https://doi.org/10.5751/ES-12691-260439

Anguelovski, I., Connolly, J. J., Garcia-Lamarca, M., Cole, H., & Pearsall, H. (2019). New scholarly pathways on green gentrification: What does the urban 'green turn' mean and where is it going? *Progress in Human Geography, 43*(6), 1064–1086. https://doi.org/10.1177/0309132518803799

Berkeley Group (2023) Annual report. Extract available online: https://www.berkeleygroup.co.uk/our-vision.

Bockarjova, M., Botzen, W., van Schie, M., & Koetse, M. (2020). Property price effects of green interventions in cities: A meta-analysis and implications for gentrification. *Environmental Science and Policy, 112*, 293–304.

Brownlow, A. (2006). An archaeology of fear and environmental change in Philadelphia. *Geoforum, 37*(2), 227–245. https://doi.org/10.1016/j.geoforum.2005.02.009

Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and fishermen in St Brieuc Bay. *The Sociological Review, 32*, 196–223. https://doi.org/10.1111/j.1467-954X.1984.tb00113.x

Cole, H. V. S., Triguero-Mas, M., Connolly, J. J. T., & Anguelovski, I. (2019). Determining the health benefits of green space: Does gentrification matter? *Health and Place, 57*, 1–11.

Countryside (2019) Acton Gardens wins Best Urban Regeneration Project at the First-Time Buyer Readers' Awards. Countryside News. Available online at: https://www.countrysidepartnerships.com/news-and-media/acton-gardens-wins-best-urban-regeneration-project-first-time-buyer-readers-awards.

Diep, L., Parikh, P., dos Santos, P., Duarte, B., Figueiredo Bourget, A., Dodman, D., & Scarati Martins, J. R. (2022). "It won't work here": Lessons for just nature-based stream restoration in the context of urban informality. Pp: 542–554 *Environmental Science & Policy, 136*. https://doi.org/10.1016/j.envsci.2022.06.020.

Draus, P., Haase, D., Napieralski, J., Qureshi, S., & Roddy, J. (2021). Lurking in the bushes: Informality, illicit activity and transitional green space in Berlin and Detroit. *Cultural Geographies, 28*(2), 319–339. https://doi.org/10.1177/1474474020948876

Hatala, A. R., Njeze, C., Morton, D., Pearl, T., & Bird-Naytowhow, K. (2020). Land and nature as sources of health and resilience among Indigenous youth in an urban Canadian context: A photovoice exploration. *BMC Public Health, 20*, 1–14.

Hunter, R. F., Cleland, C., Cleary, A., Droomers, M., Wheeler, B. W., Sinnett, D., & Braubach, M. (2019). Environmental, health, wellbeing, social and equity effects of urban green space interventions: A meta-narrative evidence synthesis. *Environment International, 130*, Article 104923.

Jennings, V., Larson, L., & Yun, J. (2016). Advancing sustainability through urban green space: Cultural ecosystem services, equity, and social determinants of health. *International Journal of Environmental Research and Public Health, 13*(2), 196-. 15. https://doi.org/10.3390/ijerph13020196

Jing, F., Liu, L., Zhou, S., Song, J., Wang, L., Zhou, H., & Ma, R. (2021). Assessing the impact of street-view greenery on fear of neighbourhood crime in Guangzhou, China. *International Journal of Environmental Research and Public Health, 18*(1), 311.

Juntti, M., & Lundy, L. (2017). A mixed methods approach to urban ecosystem services: Experienced environmental quality and its role in ecosystem assessment within an inner-city estate. *Landscape and Urban Planning, 161*, 10–21.

Juntti, M., Costa, H., & Nascimento, N. (2021). Urban environmental quality and wellbeing in the context of incomplete urbanisation in Brazil: Integrating directly experienced ecosystem services into planning. *Progress in Planning, 143*, Article 100433.

Juntti, M., & Özsezer-Kurnuç, S. (2023). Factors influencing the realisation of the social impact of urban nature in inner-city environments: A systematic review of complex evidence. *Ecological Economics, 211*. https://doi.org/10.1016/j.ecolecon.2023.107872

Kabisch, N., Kraemer, R., Masztalerz, O., Hemmerling, J., Püffel, C., & Haase, D. (2021). Impact of summer heat on urban park visitation, perceived health and ecosystem service appreciation. *Urban Forestry & Urban Greening, 60*, Article 127058.

Kirsop-Taylor, N., Russel, D., & Jensen, A. (2021). Urban governance and policy mixes for nature-based solutions and integrated water policy. *Journal of Environmental Policy & Planning*. https://doi.org/10.1080/1523908X.2021.1956309

Latour, B., 2004. Politics of Nature: How to Bring the Sciences into Democracy. Harvard University Press: Cambridge MA. https://doi.org/10.4159/9780674039964.

LB Hackney (2023) Woodberry Down. Web page available online at: https://hackney.gov.uk/woodberry-down.

LB Hackney (2021) Hackney Ward Profiles – Woodberry Down. Available online at: https://hackney.gov.uk/hackney-ward-profiles.

Lefebvre, H. (1991). *The production of space*. Oxford: Blackwell.

Liu, Y., Kwan, M. P., Wong, M. S., & Yu, C. (2023). Current methods for evaluating people's exposure to green space: A scoping review. *Soc Sci Med., 338*, Article 116303. https://doi.org/10.1016/j.socscimed.2023.116303

Martin-Ortega J., Novo, P., Gomez-Baggethun E., Muradian R., Harte C., and Mesa-Jurado M.A., (2024) Ecosystem services and the commodification of nature. Elodie

Bertrand and Vida Panitch (eds) The Routledge Handbook of Commodification. Abingdon: Routledge.
MEA (2003). Ecosystems and Human Wellbeing: A Framework for Assessment. World Resources Institute, Washington, DC. Island press. Available online at: http://millenniumassessment.org/en/Framework.html.
Mottaghi, M., Kärrholm, M., & Sternudd, C. (2020). Blue-green solutions and everyday ethicalities: Affordances and matters of concern in Augustenborg, Malmö. *Urban Planning, 5*(4), 132–142.
Noergaard, R. B. (2010). Ecosystem services: From eye-opening metaphor to complexity blinder. *Ecological Economics, 69*, 1219–1227.
Noordzij, J. M., Beenackers, M. A., Groeniger, J. O., & Van Lenthe, F. J. (2020). Effect of changes in green spaces on mental health in older adults: A fixed effects analysis. *J Epidemiol Community Health, 74*(1), 48–56.
O'Brien, et al. (2014). Engaging with Peri-Urban Woodlands in England: The contribution to people's health and well-being and implications for future management. *Int. J. Environ. Res. Public Health, 11*, 6171–6192.
ONS (2021) Population Report for Ealing. Available on line at: https://data.ealing.gov.uk/population/report/view/960b749ecf914c72b5023cde19ec986a/E05000188/#/view-report/63aeddf1d7fc44b8b4dffcd868e84eac/__iaFirstFeature/G3.
Raco, M., 2018. Private Consultants, Planning Reform and the Marketisation of Local Government Finance. In Ferm J. and Tomaney J. (eds.) Planning Practice: Critical Perspectives from the UK. Routledge: London. Pp: 123-137.
Raco, M., Ward, C., Brill, F., Sanderson, D., Freire-Trigo, S., Ferm, J., Hamiduddin, I., & Livingstone, N. (2022). Towards a virtual statecraft: Housing targets and the governance of urban housing markets. ISSN 0305–9006 *Progress in Planning, 166. 100655*. https://doi.org/10.1016/j.progress.2022.100655.
Ribeiro, A., Triguero-Mas, M., Jardim Santos, C., Gómez-Nieto, A., Cole, H., Anguelovski, I., et al. (2021). Exposure to nature and mental health outcomes during COVID-19 lockdown. A comparison between Portugal and Spain. *Environment International, 154*, Article 106664.
Sekulova, F., Anguelovski, I., Kiss, B., Kotsila, P., Baró, F., Voytenko Palgan, Y., Connolly, J. (2021) The governance of nature-based solutions in the city at the intersection of justice and equity. Cities 112, 103136, ISSN 0264-2751, https://doi.org/10.1016/j.cities.2021.103136.
Social Life (2020) Understanding Woodberry Down. Available online at: https://www.social-life.co/publication/understanding_woodberry_down/.
Spangenberg, J., von Haaren, J., & Settele, J. (2014). The ecosystem service cascade: Further developing the metaphor. Integrating societal processes to accommodate social processes and planning, and the case of bioenergy. *Ecological Economics, 104*, 22–32.
Swyngedouw, E., 2007. Impossible "Sustainability" and the Post-Political Condition. In: David Gibbs and Rob Krueger (Eds.) The Sustainable Development Paradox: Urban Political Economy in the United States and Europe. Guilford Press: New York. Pp: 13-40.
Syrbe, R.-U., Neumann, I., Grunewald, K., Brzoska, P., Louda, J., Kochan, B., Machác, J., Dubová, L., Meyer, P., Brabec, J., et al. (2021). The value of urban nature in terms of providing ecosystem services related to health and well-being: an empirical comparative pilot study of cities in Germany and the Czech Republic. *Land, 10*, 341. https://doi.org/10.3390/land10040341
UN (2015) Transforming Our World: The 2030 Agenda for Sustainable Development. A/RES/70/1. Available online at: https://sdgs.un.org/2030agenda.
UN-HABITAT (2021) Cities and Pandemics: Towards a More Just, Green and Healthy Future. HS/058/20E. ISBN Number: 978-92-1-132877-6. Available online at: https://unhabitat.org/cities-and-pandemics-towards-a-more-just-green-and-healthy-future-0.
Vert, C., Carrasco-Turigas, G., Zijlema, W., Espinosa, A., Cano-Riu, L., Elliott, L. R., & Gascon, M. (2019). Impact of a riverside accessibility intervention on use, physical activity, and wellbeing: A mixed methods pre-post evaluation. *Landscape and Urban Planning, 190*, Article 103611.
Watson, C., Nieuwenhuijsen, M. J., Triguero-Mas, M., Cirach, M., Maas, J., Gidlow, C., & Zijlema, W. L. (2020). The association between natural outdoor environments and common somatic symptoms. *Health and Place, 64*, Article 102381.
White S. and Jha S. (2020) Therapeutic Culture and Relational Wellbeing. Nehring D., Madsen OJ., Kerrigan D., Cabanas Día E., and Mills C. (eds). The Routledge International Handbook of Global Therapeutic Cultures. Routledge. Pp: 203-214.
Whitmarsh, L., Mitev, K. (2022). Public perception of climate change and their variation across audience. In A. Hansen & R. Cox (eds.), The Routledge handbook of environment and communication (pp. 379-394). Routledge.
WHO (2016). Urban green spaces and health. Copenhagen: WHO Regional Office for Europe.
Wolch, J. P., Byrne, J., & Newell, J. P. (2014). Urban greenspace, public health, andenvironmental justice: The challenge of making cities 'just green enough'. *Landscape and Urban Planning, 125*, 234–244.
Zhang, X., Zhou, S., Lin, R., & Su, L. (2020). Relationship between long-term residential green exposure and individuals' mental health: moderated by income differences and residential location in urban China. *International Journal of Environmental Research and Public Health, 17*(23), 8955.
GLA (2021) The London Plan. The Spatial Development Strategy for Greater London. The Greater London Authority. ISBN 978-1-84781-739-6. Available online at: https://www.london.gov.uk/programmes-strategies/planning/london-plan/new-london-plan/london-plan-2021.