Literature review

This section reviews the academic literature on urban blue spaces (UBS), and incorporates literature from wider fields like urban ecology. It also introduces concepts that are central in understanding equity with regards to urban blue space, namely environmental justice and accessibility. These two concepts will be central to the research.

The benefits of urban blue spaces

In an urban context, UBS have undeniable positive effects which Gascon et al. (2017) summarise as "stress reduction, increased physical activity, promotion of positive social contacts, increased place attachment and the reduction of extreme temperatures". These benefits fall under three broad categories: health and well-being, community, and climate adaptation. First, being exposed to water makes people feel better, happier, and be more active. There is an extensive repertoire of quantitative studies demonstrating these effects on people's health and well-being (Gascon et al. 2017, Britton et al. 2020). Qualitative studies also show that exposure to UBS improves mental health, regardless of how people interact with it (Garrett et al. 2019, van den Bogerd et al. 2021). Second, UBS give people the opportunity to connect with each other and with nature. UBS revitalisation projects can be an opportunity to create community bonds by engaging residents in the design and implementation process. For example, the small-scale waterfront intervention in a deprived area of Plymouth, UK, revealed that residents who participated in the project reported a greater sense of well-being and life satisfaction due to feelings of community belonging and safety (van den Bogerd et al. 2021). Lastly, in the context of climate change, UBS can naturally alleviate pollution, heat stress, flooding or drought, and increase the climate resiliency of cities (Lin et al. 2020, O'Donnell et al. 2021).

Given the potential of UBS, and that public space is a highly valued commodity in the city, revitalising UBS into attractive, high-quality environments is a way to make the most of all urban areas.

The social and environmental consequences of blue urban renewal

Despite the undeniable benefits of water in the city, transforming UBS into high-quality public space can have harmful consequences on people and the environment. Two mecha-

nisms of action are exclusionary planning, and neoliberal urban renewal. These reinforce socio-spatial inequalities by discriminating against people on the basis of socio-economic and cultural differences, or by way of racist and sexist practices.

First, in stark contrast to the social bonds that can be fostered when residents are involved in revitalisation projects, when the local community's perceptions are not understood by planners, changes can disrupt human-to-human or human-to-water connections (Toomey et al. 2021). This is particularly susceptible to happen when a community's social practices do not fit with the social norms (Wessells 2014). Moreover, marginalised or stigmatised communities may find it hard or impossible to communicate their experience to the mainstream because they lack the words to articulate their reality. And vice-versa: wealthy, white, males may not be capable of understanding the experience of 'others' (Anguelovski, Brand, et al. 2020). To this end, Toomey et al. (2021) propose using language like "place-disruption" and "place-protection" to promote mutual understanding and avoid privileging the values of mainstream groups over those of marginalised communities.

Second, cities are prioritising economic growth over well-being and community. Local governments are exploiting nature-based solutions to brand their cities as green and liveable , and to promote greening as a win-win strategy where "no one is left behind by the trickle-down of benefits from green infrastructure" (Anguelovski and Connolly 2021). Anguelovski et al. (2021) explain that with "glitzy green" renewal projects, cities try to attract a new creative class rather than addressing public UBS as a common good and prioritising the concerns of existing residents (Wessells 2014, Anguelovski, Brand, et al. 2020). These strategies perpetuate inequalities by privileging the values of white, environmentally privileged upper classes who can afford to live near nature, thereby pricing out residents who will be displaced to neighbourhoods with less attractive blue-green space.

The environmental justice principle

To articulate the phenomenon whereby natural spaces provide social and environmental benefits but at the same time discriminate against vulnerable populations, scholars have used the concept of environmental justice. Environmental justice has evolved into the principle that everyone should have equal opportunities to access clean, healthy, unpolluted spaces, and in turn, share environmental burdens. As Agyeman et al. explain (2016), it started as a social movement in the US in the 1980s at a time when it became obvious that

ethnic minority and low-income populations were disproportionately exposed to polluted and degraded land.

Since then, environmental justice has concretised into an academic discourse and is typically broken down into three categories: distributional justice, procedural justice, and recognition justice. Applied to public blue-green space, distributional justice refers to where these are situated in the city. Procedural justice deals with questions of discrimination in public participation and decision making. Recognition justice addresses individual and community perceptions and preferences which may influence how people interact, or not, with the space.

It follows that environmental (in)justices take place in public space. Although there is no direct economic barrier to public space (there is no entrance fee), rarely is it fairly accessible to everyone. There exists both physical and non-physical barriers which can prevent individuals, or whole communities, from benefiting from urban nature.

Geographical vs. perceived accessibility

To date, studies that evaluate the degree to which people can make use of urban blue-green space have focused on measuring geographical accessibility, such as spatial distribution and proximity to people's homes. However, this ignores the fact that accessibility is a multidimensional concept which cannot be reduced to purely a physical dimension (Wang, Brown, and Liu 2015). Perceived access is also important to consider when studying social benefits of blue-green space. Are people happier and healthier because they live near nature, or because they can afford to? As Anguelovski et al. (2020) put forward, environmental justice must go further in understanding "how [...] people's experiences of place shape their perception of access".

To this end, Wang et al. (2015) suggest focusing on perceived accessibility, ie. "the quality, diversity, and size of the green spaces or socio-personal characteristics including age, income, safety, and cultural concerns". Comparing this approach to geographical accessibility, researchers studying two neighbourhoods with differing socio-economic status in Brisbane, Australia, concluded that perceived accessibility was better suited to explain park-use than their proximity to home (Wang, Brown, Liu, and Mateo-Babiano 2015). This shows that in the context of environmental justice, recognition can be more influential than distributional justice in detecting unequal access to nature.

Research intention

Although evidence shows that perceived accessibility is significant in determining use of parks, there are limited studies that translate this idea to UBS. However, UBS are particularly interesting because natural water bodies like rivers or lakes are relatively immobile and cannot be planned in the same way as public parks. Thus, when it comes to providing equal opportunities to access UBS, perceived accessibility becomes more relevant than geographical distribution. This makes it worthwhile to explore the subjective experiences of UBS users, in order to understand the barriers to achieving environmental justice.

Problem Statement

The principle of environmental justice entails equitable access to clean, unpolluted environments, such as high-quality public UBS. This is important because exposure to water improves people's health and well-being, and being in UBS builds relationships within a neighbourhood or community. In reality, a multitude of barriers exist which may prevent individuals or communities from visiting UBS even if they live nearby. The barriers include physical characteristics like preferences for the quality, size, or infrastructure of the site; and non-physical characteristics like socio-economic and personal factors including income, age, gender, ethnicity or cultural concerns. Understanding this phenomenon is important because public UBS are places of community, identity, attachment, and well-being. Ignoring subjective experiences that differ from the mainstream increases social inequalities, discrimination, and causes displacement.

Given the above, my research aims to answer the following question: **to what extent do subjective experiences shape how (un)fairly accessible high quality, public UBS are, and what does this mean for the environmentally just city?**

References

Agyeman, J., Schlosberg, D., Craven, L., & Matthews, C. (2016). Trends and directions in environmental justice: From inequity to everyday life, community, and just sustainabilities. *Annual Review of Environment and Resources*, *41*, 321–340.

Anguelovski, I., Brand, A. L., Connolly, J. J., Corbera, E., Kotsila, P., Steil, J., Garcia-Lamarca, M., Triguero-Mas, M., Cole, H., Baró, F. et al. (2020). Expanding the boundaries of justice in urban greening scholarship: Toward an emancipatory, antisubordination, intersectional, and relational approach. *Annals of the American Association of Geographers*, *110*(6), 1743–1769.

Anguelovski, I., & Connolly, J. J. (2021). *The green city and social injustice: 21 tales from north america and europe*. Routledge.

Britton, E., Kindermann, G., Domegan, C., & Carlin, C. (2020). Blue care: A systematic review of blue space interventions for health and wellbeing. *Health Promotion International*, *35*(1), 50–69.

Garrett, J. K., White, M. P., Huang, J., Ng, S., Hui, Z., Leung, C., Tse, L. A., Fung, F., Elliott, L. R., Depledge, M. H. et al. (2019). Urban blue space and health and wellbeing in hong kong: Results from a survey of older adults. *Health & place*, *55*, 100–110.

Gascon, M., Zijlema, W., Vert, C., White, M. P., & Nieuwenhuijsen, M. J. (2017). Outdoor blue spaces, human health and well-being: A systematic review of quantitative studies. *International journal of hygiene and environmental health*, *220*(8), 1207–1221.

Lin, Y., Wang, Z., Jim, C. Y., Li, J., Deng, J., & Liu, J. (2020). Water as an urban heat sink: Blue infrastructure alleviates urban heat island effect in mega-city agglomeration. *Journal of Cleaner Production*, *262*, 121411.

O'Donnell, E. C., Netusil, N. R., Chan, F. K., Dolman, N. J., & Gosling, S. N. (2021). International perceptions of urban blue-green infrastructure: A comparison across four cities. *Water*, *13*(4), 544.

Toomey, A., Campbell, L., Johnson, M., Strehlau-Howay, L., Manzolillo, B., Thomas, C., Graham, T., & Palta, M. (2021). Place-making, place-disruption, and place protection of urban blue spaces: Perceptions of waterfront planning of a polluted urban waterbody. *Local Environment*, *26*(8), 1008–1025.

van den Bogerd, N., Elliott, L. R., White, M. P., Mishra, H. S., Bell, S., Porter, M., Sydenham, Z., Garrett, J. K., & Fleming, L. E. (2021). Urban blue space renovation and local resident and visitor well-being: A case study from plymouth, uk. *Landscape and Urban Planning*, *215*, 104232.

Wang, D., Brown, G., & Liu, Y. (2015). The physical and non-physical factors that influence perceived access to urban parks. *Landscape and urban planning*, *133*, 53–66.

Wang, D., Brown, G., Liu, Y., & Mateo-Babiano, I. (2015). A comparison of perceived and geographic access to predict urban park use. *Cities*, *42*, 85–96.

Wessells, A. T. (2014). Urban blue space and "the project of the century": Doing justice on the seattle waterfront and for local residents. *Buildings*, *4*(4), 764–784.