

Green space assessment framework

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Report to advise Lund Trust on assessing urban greening projects

Executive Summary

This research presents a conceptual framework defining standards for a high-quality green space and a four-step approach for assessing urban greening projects. The framework highlights that a high-quality green space needs to be accessible and welcoming to all social groups, meets local needs, supports people's health and wellbeing, improves the local environment, and mitigates climate change impacts. The four-step approach lays out how Lund Trust should evaluate urban greening projects. The first step is to identify areas that need green space investment. The second step is to understand the local context. The third step is to decide the specific issues to tackle. And the final step is to quantify the project's ecosystem services.

The conceptual framework and four-step approach are based on literature research and experts' perspectives on how to evaluate and expand green space in the United Kingdom. This research also provides recommendations on improving greenspace availability and accessibility to different beneficiaries, particularly young people. The findings can help Lund Trust fund practical urban greening projects that can provide a wide range of essential ecosystem services to society and optimise human wellbeing. The conclusion identifies areas missing from this piece of work and outlines avenues for future studies.

This report contains five chapters. The outline of each chapter is summarised as follows:

Chapter one: Introduction

Read this if you want a general introduction to green space typologies and are interested in the design and method of this research.

Chapter one introduces the context of the research, addresses the importance of green space, and presents the research design. It discusses the typologies of green space and their associated ecosystem services, or the benefits nature provides people with. Overall, the research demonstrates that there are seven main types of green space:

- Recreational green spaces (e.g., public parks, provision for children and young people, zoological park/ garden);
- Infrastructure and street-level greenery (e.g., green walls, roadside greening);
- Greening of buildings (e.g., green rooftops, green walls, balcony);
- Natural, semi-natural, and wild green space (e.g., forest, natural reserves, woodland);
- Growing spaces (e.g., allotments, community gardens);
- Burial grounds (e.g., churchyards, cemeteries);
- Blue spaces (e.g., lakes, ponds).

Chapter one also briefly discusses barriers to using green space (e.g., distance, people's perceptions, lack of green space and amenities), and highlights the need to expand the

availability and quality of green space to ensure everyone has equal access to green space and its benefits.

Chapter two: Young people and their engagement with green space

Read this if you are interested in how young people engage with green space.

Chapter two investigates young people and their engagement with green space. It finds that young people have relatively low connection to and access to green space. It is important to increase their engagement, which improves their health and wellbeing, since they account for a large proportion of the urban population and drive the urban economy.

Chapter three: Analysis of green space policies and guidelines in the UK

Read this if you are interested in knowing key policies and guidelines related to green space in the UK.

Chapter three presents the current green space management situation in the United Kingdom. As local authorities are reducing their budgets for green space, the quality and quantity of green space has been declining. The chapter further discusses relevant policies and guidelines on green space management and planning in the United Kingdom. It explores 11 documents and finds that they usually mention aspects of quantity, distance, quality, and equity. Though most of the policies and guidelines argue that green space needs to meet the needs of all populations, they do not define who is lacking access or how to improve their engagement with green space.

Chapter four: Evaluation framework

Read this if you are interested in the conceptual framework and four-step approach for assessing the quality of urban greening projects.

Chapter four provides a conceptual framework of standards for high-quality green spaces. There are four overarching dimensions: people, local context, sustainable and healthy communities, and climate and environmental resilience. The “people” dimension means that the green space is inclusive and accessible by all social groups. The “local context” means that the green space is suitable for the local environment and improves and preserves local assets. The “sustainable and healthy communities” dimension requires the green space to have features that support people’s health and wellbeing. Lastly, the “climate and environmental resilience” dimension means the green space enhances the quality of the environment and helps mitigate climate change impacts.

In addition to providing a conceptual framework, this chapter presents a four-step approach for assessing an urban greening project. The steps are to identify areas that need green space investment, understand the local context, decide on specific issues to tackle, and quantify the projects’ ecosystem services.

Chapter five: Conclusion

Read this if you want a general summary of recommendations for Lund Trust regarding assessing urban greening projects.

Chapter five summarises recommendations for Lund Trust in evaluating urban greening projects and suggests potential directions for future research.

Green spaces play an important role in sustainable communities and healthy environments. However, not all populations have equal access to green spaces and not all green spaces can contribute the same benefits to communities. It is crucial that Lund Trust invests in urban greening projects that are multifunctional, relevant to the local context, and benefit as many people as possible, particularly those currently disengaged from green space.

Chapter one: Introduction

Human activity, in the form of industrialisation, urbanisation, deforestation, or agricultural expansion has significantly altered land use and imposed pressures on natural resources¹. As grey infrastructure, such as buildings, roads, and other impervious surfaces replace natural habitats, humans become alienated from nature and cannot access the benefits it provides². The disappearance of natural resources, including trees, forests, and woodlands might result in biodiversity loss and exacerbate climate change impacts, thus threatening the sustainability of society and livelihoods^{3,4}. To reconnect people with nature, mitigate the adverse consequences of human activity on the environment, and improve people's quality of life, the planning and development of urban landscapes often integrate green spaces⁵.

Green spaces are widely recognised in the literature to ameliorate the ecological quality of an area, bring economic benefits, and support people's health and well-being. Specifically, they can improve air quality, alleviate urban heat island effects, reduce noise pollution, and ease climate change impacts through carbon sequestration⁶. Green spaces are also associated with better mental and physical health. They encourage physical activity, strengthen social ties, and improve mental health. The importance of urban green space systems has been acutely realised during the COVID-19 pandemic, as they provide the needed solace to help people surmount feelings of confinement and fear of infection⁷. In the United Kingdom, green space is a critical infrastructure that contributes to improving people's wellbeing. It is reported that if all people living in England could access high-quality greenspace, health costs could be reduced by £2.1 billion each year. In England and Wales, the cost of houses and flats located within 100 metres of public green space is £2,500 higher than that of houses and flats that are located 500 metres away, indicating that people prefer to be near greenspace⁸. The UK's 25-Year

¹ Kanianska, R. (2016). Agriculture and Its Impact on Land-Use, Environment, and Ecosystem Services. *Landscape Ecology - The Influences of Land Use and Anthropogenic Impacts of Landscape Creation*. <https://doi.org/10.5772/63719>

² Schäffler, A., & Swilling, M. (2013). *Valuing Green Infrastructure in an Urban Environment Under Pressure*. *Ecological Economics*. doi:10.1016/j.ecolecon.2012.05.008

³ Long, T. (2014). *Climate change and its effects on natural resources*.

https://www.canr.msu.edu/news/climate_change_and_its_effects_on_natural_resources

⁴ Teixeira, I. (2021). *This proven strategy can reverse biodiversity loss and boost economies*.

<https://www.weforum.org/agenda/2021/05/natural-resource-management-reverse-biodiversity-loss/>

⁵ Haaland, C., & van den Bosch, C. K. (2015). Challenges and strategies for urban green-space planning in cities undergoing densification: A review. *Urban Forestry & Urban Greening*, 14(4), 760–771.

<https://doi.org/10.1016/J.UFUG.2015.07.009>

⁶ Nero, B. F., Callo-Concha, D., Anning, A., & Denich, M. (2017). Urban Green Spaces Enhance Climate Change Mitigation in Cities of the Global South: The Case of Kumasi, Ghana. *Procedia Engineering*, 198, 69–83.

<https://doi.org/https://doi.org/10.1016/j.proeng.2017.07.074>

⁷ Triguero-Mas, M., Anguelovski, I., & Cole, H. V. S. (2022). Healthy cities after COVID-19 pandemic: the just ecofeminist healthy cities approach. *Journal of Epidemiology and Community Health*, 76(4), 354–359.

<https://doi.org/10.1136/jech-2021-216725>

⁸ Public Health England. (2020). *Improving access to greenspace A new review for 2020*.

Environmental Plan recognises the role of green spaces in improving people's health. It emphasises the need to connect people with the natural environment through enhancing access to green spaces and developing programmes to encourage people's engagement with green spaces⁹.

Exposure to green spaces can patently lead to improved well-being, but the existing literature has shown evidence of inequities in access to green spaces with a tendency for worse access among the disabled, women, children, the elderly, people of low-socioeconomic groups, and those from minority ethnic groups^{10,11}. According to research conducted by Fields in Trust, 2.8 million people in Great Britain are living more than a 10-minute walk from the nearest public park, and priority levelling-up areas have approximately 10% less greenspace compared to the average across Great Britain¹². The Office for National Statistics found that 12% of people living in the United Kingdom do not have access to a private garden, and that Black people are four times less likely than White communities to have outdoor space such as private or shared garden, patio, or balcony at home¹³. Moreover, young people aged 16 to 34 years are reported to be less likely to have access to a garden compared to older people aged above 65¹⁴.

There is another question of whether access to green space equates to access to all its benefits. Having adequate physical access to green spaces does not guarantee that people get all the recreational opportunities, health benefits, or environmental exposure associated with greenspace provision. For example, parks are often built for the 'default male' and designed with facilities to support activities usually related to boys' interests like skate parks or football pitches, causing girls to feel unsafe and excluded from those spaces¹⁵. The People and Nature Survey conducted by Natural England found that during COVID-19 lockdown, 73% of children from low-income households with an annual income of less than £17,000 spent less time outdoors, in comparison with 57% from households with an annual income of over £17,000¹⁶.

⁹ HM Government. (2018). *A Green Future: Our 25 Year Plan to Improve the Environment*.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

¹⁰ Public Health England. (2020). *Improving access to greenspace A new review for 2020*.

www.facebook.com/PublicHealthEngland

¹¹ Hoffmann, E., Barros, H., & Ribeiro, A. I. (2017). Socioeconomic Inequalities in Green Space Quality and Accessibility—Evidence from a Southern European City. *International Journal of Environmental Research and Public Health*, 14(8). <https://doi.org/10.3390/IJERPH14080916>

¹² Fields in Trust. (2022). POLICY: Green Space Index reveals importance of local parks for achieving Levelling-Up. <https://www.fieldsintrust.org/News/green-space-index-reveals-importance-of-local-parks-for-achieving-levelling-up>

¹³ Office for National Statistics. (2020). *One in eight British households has no garden*.

<https://www.ons.gov.uk/economy/environmentalaccounts/articles/oneineightbritishhouseholdshasnogarden/2020-05-14>

¹⁴ Office for National Statistics. (2020). *Access to garden spaces: England*.

<https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/accesstogardenspacesengland>

¹⁵ Walker, S., & Clark, I. (2020). *Make Space for Girls Everything you need to know in one (relatively) easy document*. <https://makespaceforgirls.co.uk/wp-content/uploads/2021/02/Make-Space-for-Girls-Summary-of-Research-findings-December-2020-web.pdf>

¹⁶ Natural England. (2021). *The People and Nature Survey for England: Children's survey (Experimental Statistics)*. <https://www.gov.uk/government/statistics/the-people-and-nature-survey-for-england-child-data-wave-1-experimental-statistics/the-people-and-nature-survey-for-england-childrens-survey-experimental-statistics>

Great Britain has a plethora of green spaces, but many are not located in areas with high deprivation or are not designed with the needs of different social groups in mind, leading to the underutilisation of these spaces¹⁷. This situation can also perpetuate inequities in health and social status among different populations¹⁸.

Consequently, there is an urgent need to enhance and expand green space resources to tackle inequities in access and ensure green spaces have values for the environment and the local community. For urban greening to be effective and beneficial for local communities, it is important to appropriately address matters related to quantity, quality, and spatial distribution of green spaces. This research builds on relevant literature on the topic, existing green space tools and guidelines, and expert perspectives to develop a conceptual framework to assess the sustainability, quality, and accessibility of a green space. This framework can assist Lund Trust in evaluating the benefits and impacts an urban greening project can have on the local community and making suitable funding decisions.

RESEARCH PLAN

RESEARCH QUESTIONS, AIMS, AND OBJECTIVES

The main aim of this research is to devise a framework that Lund Trust can use to appraise the sustainability and quality of different green space types and identify opportunities to expand their availability. This study not only helps Lund Trust ensure its funding supports urban greening projects that offer social and environmental benefits, but also contributes to the emerging knowledge on sustainable green space management. To achieve the overarching goal, the following objectives are developed:

1. To identify the relevant standards and indicators used to measure green space accessibility and quality through reviewing the UK policies and guidelines;
2. To understand the diverse qualities and values that affect the use of green spaces using literature review and semi-structured interviews;
3. To develop a framework that can be used to evaluate the quality, value, and accessibility of green spaces; and
4. To provide Lund Trust with recommendations on how to expand the provision of green spaces in urban areas.

METHODOLOGY

This research combines a desk-based review of relevant literature, policies, and guidelines with a qualitative approach using semi-structured interviews with stakeholders including community

¹⁷ Public Health England. (2020). *Improving access to greenspace A new review for 2020*.

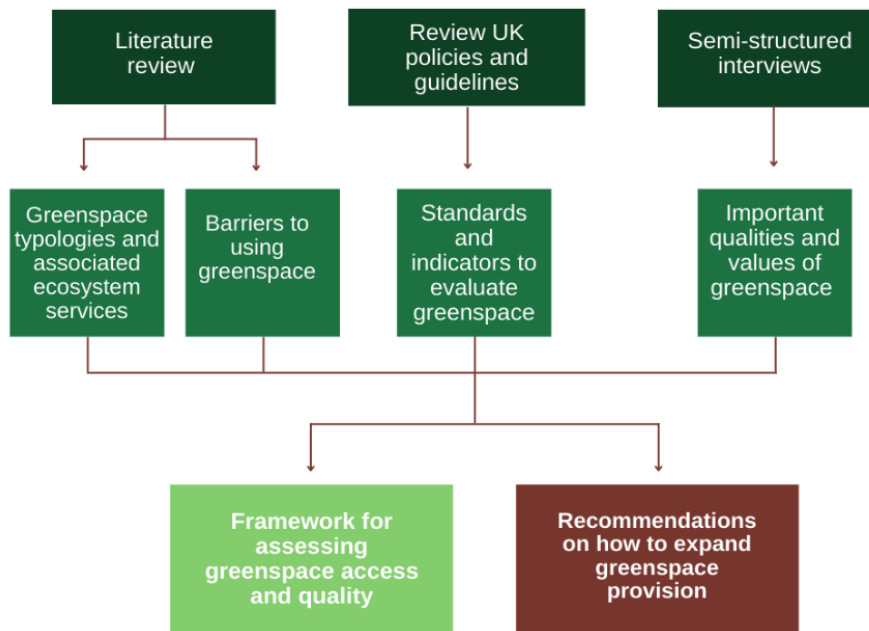
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904439/Improving_access_to_greenspace_2020_review.pdf

¹⁸ Public Health England 2020

groups and charities. The desk-based research provides an overview of the tools, methodologies, and standards available to assess the quality and accessibility of green spaces. Based on the findings, a conceptual framework with indicators relevant to the United Kingdom will be developed.

The semi-structured interviews with people directly involved in the management and implementation of urban greening projects help ensure the quality and accessibility indicators are applicable to different contexts and that the framework reflects insights from the literature, UK policies and guidelines, as well as experts. Moreover, they can provide insights that are practical and sensitive to local specifics but are not included in the body of literature. Figure 1 demonstrates the analytical framework that forms the premise of data collection and analysis.

Figure 1: Analytical framework



CONTEXT

TYPLOGIES OF GREEN SPACE

Green infrastructure has become an important concept in the fields of sustainable urban development and environmental planning. It is a planned, interlinked system of natural and semi-natural habitats together with other environmental assets that aim to deliver ecological,

social, and economic benefits to human society and other species¹⁹. Green infrastructure refers to both green and blue spaces such as parks, allotments, street trees, waterways, and river corridors, and is present in both rural and urban settings²⁰.

High-quality and well-designed green spaces are instrumental components of any green infrastructure project. Green spaces take many different forms, shapes, and structures and have different purposes. They can be public and available to all, or private and reserved for certain groups only. They can be recreational spaces such as parks, playgrounds, and sports areas, or spaces for growing foods like community gardens or allotments.

Currently, there are no consistent definitions of the term “green space,” and the classification of green spaces depends on factors such as their intended functions, purposes, size, vegetation coverage, or the context and culture where green spaces are present^{21,22}. Importantly, a consistent categorisation of green spaces allows urban planners and decision-makers to apprehend the specific ecosystem services and the benefits they could bring to society, effectively appraise, and manage existing urban green spaces, and initiate future development planning.

Many typologies of green spaces have been introduced. For example, green spaces can be differentiated into four main types, including amenity green space (e.g., private green space, incidental green space), functional green space (e.g., productive green space, burial grounds, institutional grounds), semi-natural habitats (e.g., wetland, woodland), and linear green space (e.g., river and canal banks, transport corridors)²³. The Planning and Policy Guidance Note 17, which details the UK Government’s policies and principles on open space, sport, and recreation, produces an inventory of eight types of green spaces, both publicly available and private²⁴. Other studies developed green space typologies based on users’ perspectives²⁵, ecosystem

¹⁹ European Commission. (2013). Green Infrastructure (GI) — [Enhancing Europe’s Natural Capital](#) - COM(2013) 149.

²⁰ Kabisch, N., Korn, H., Stadler, J., & Bonn, A. (n.d.). *Theory and Practice of Urban Sustainability Transitions Nature based Solutions to Climate Change Adaptation in Urban Areas*. Retrieved August 5, 2022, from <http://www.springer.com/series/13408>

²¹ Taylor, L., & Hochuli, D. F. (2017). Defining green space: Multiple uses across multiple disciplines. *Landscape and Urban Planning*, 158, 25–38. <https://doi.org/10.1016/J.LANDURBPLAN.2016.09.024>

²² Guedes Vidal, D., Cunha Dias, R., Patoilo Teixeira, C., Oliveira Fernandes, C., Leal Filho, W., Barros, N., Leandro Maia, R., & Alegre, C. (2022). *Clustering public urban green spaces through ecosystem services potential: A typology proposal for place-based interventions*. <https://doi.org/10.1016/j.envsci.2022.03.002>

²³ Swanwick, C., Dunnett, N., & Woolley, H. (1978). Nature, Role and Value of Green Space in Towns and Cities: An Overview. In *Environment* (Vol. 29, Issue 2). <https://about.jstor.org/terms>

²⁴ Communities and Local Government. (2002). *Assessing needs and opportunities: a companion guide to PPG17*.

²⁵ Hofmann, M. (2014). *A User-Generated Typology of Urban Green Spaces*. <http://tu-dresden.de/zit/>

services potential²⁶, or address informal green spaces such as street verges, lots, railways, waterside, and brownfields²⁷.

Even though a plethora of green space typologies exist, no single one can comprise all kinds of green spaces or their characteristics. As an illustration, the Planning and Policy Guidance Note 17 does not encompass space left over after planning or incidental green spaces like road verges since they have no intended purpose²⁸. Furthermore, no typologies should be considered final, as improvements in technological innovation, increasing social demand, and urbanisation impacts will lead to the creation of new forms of green spaces, posing the need to continually refine and update the existing typologies of green spaces. Different typologies also have different focuses and so their own merits. For example, a typology of green spaces based on ecosystem services potential allows urban planners to evaluate green spaces based on their environmental quality and to identify areas where interventions are needed²⁹. On the other hand, classifying green spaces based on their functions helps local authorities and urban planners to allocate the right types of green spaces to meet people's needs.

The wide array of urban green spaces raises the need to develop a typology for Lund Trust's use. Since Lund Trust focuses on funding green space projects in the United Kingdom that are accessible and usable for all populations, it is important to develop a typology that is applicable to the country's context and has an emphasis on the different functionalities of green spaces.

ECOSYSTEM SERVICES PROVIDED BY URBAN GREEN SPACES

Green spaces provide a wide range of ecosystem services to people³⁰. Ecosystem services are the direct and indirect benefits that nature delivers to humans. There are four types of ecosystem services: provisioning, regulating, supporting, and cultural. Provisioning services refer to the tangible materials provided by the ecosystems, including fresh water, food, fuel, and fibre. Regulating services are the benefits humans attain thanks to the regulation of ecosystem processes such as carbon sequestration and storage, water infiltration, pollination, erosion, and flood control. Supporting services consist of the fundamental natural cycles that the ecosystem needs to maintain its functions and integrity. Examples of this type are providing habitat for species, nutrient cycling, and soil formation. Lastly, cultural services refer to people's intangible

²⁶ Guedes Vidal, D., Cunha Dias, R., Patoilo Teixeira, C., Oliveira Fernandes, C., Leal Filho, W., Barros, N., Leandro Maia, R., & Alegre, C. (2022). *Clustering public urban green spaces through ecosystem services potential: A typology proposal for place-based interventions*. <https://doi.org/10.1016/j.envsci.2022.03.002>

²⁷ Rupprecht, C. D. D., & Byrne, J. A. (2014). Informal urban green space: A typology and trilingual systematic review of its role for urban residents and trends in the literature. *Urban Forestry & Urban Greening*, 13(4), 597–611. <https://doi.org/10.1016/J.UFUG.2014.09.002>

²⁸ Communities and Local Government 2002

²⁹ Guedes Vidal, D., Cunha Dias, R., Patoilo Teixeira, C., Oliveira Fernandes, C., Leal Filho, W., Barros, N., Leandro Maia, R., & Alegre, C. (2022). *Clustering public urban green spaces through ecosystem services potential: A typology proposal for place-based interventions*. <https://doi.org/10.1016/j.envsci.2022.03.002>

³⁰ Ko, H., & Son, Y. (2018). Perceptions of cultural ecosystem services in urban green spaces: A case study in Gwacheon, Republic of Korea. *Ecological Indicators*, 91, 299–306. <https://doi.org/10.1016/J.ECOLIND.2018.04.006>

benefits from directly experiencing nature. They comprise social relationships, recreation, aesthetics, a sense of belonging, cultural identity, and spiritual enrichment³¹.

All the natural features, facilities, and amenities of green spaces can be generators of ecosystem services. However, not all green spaces have the same design and can engender the same amount of ecosystem services. It is, therefore, crucial to ensure that green spaces contain features, facilities, and amenities that and meet the needs of users.

SUGGESTED GREEN SPACE TYPOLOGIES FOR USE WITHIN LUND TRUST

The classification of green spaces as shown in table 1 is developed based on Planning and Policy Guidance Note 17, as well as other existing typologies and literature on green spaces. The table also includes the expected ecosystem services each type of green space can deliver. The lists of ecosystem services are not exhaustive but provide some examples from the wide range of services a type of green space might generate. This table does not indicate which ecosystem services are unique to, or which services are most significant for, a certain type of green space. In addition, the reason some green spaces have fewer ecosystem services than other types might be because few studies have explored those spaces.

Table 1: Diverse types of green spaces and their main purposes.

Category	Green space element	Scale	Ecosystem services
Recreational green spaces	Public parks (including pocket parks, urban and country parks, and historical parks)	Site	<ul style="list-style-type: none"> Regulating (microclimate regulation, ecological connectivity, air and water filtering, carbon sequestration)^{32,33,34,35} Supporting (habitat creation)³⁶ Cultural (social cohesion, aesthetics, recreation, mental and physical health benefits, heritage,

³¹ Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-Being: Synthesis*. Island Press. www.islandpress.org

³² Taylor, L., Leckey, E. H., Lead, P. J., & Hochuli, D. F. (2020). What Visitors Want From Urban Parks: Diversity, Utility, Serendipity. *Frontiers in Environmental Science*, 8: 1-12. <https://doi.org/10.3389/FENV.2020.595620/BIBTEX>

³³ Stępniewska, M. (2021). The capacity of urban parks for providing regulating and cultural ecosystem services versus their social perception. *Land Use Policy*, 111, 105778. <https://doi.org/10.1016/J.LANDUSEPOL.2021.105778>

³⁴ Vargas-Hernández, J. G., Pallagst, K., & Zdunek-Wielgołaska, J. (2018). Urban Green Spaces as a Component of an Ecosystem. *Handbook of Engaged Sustainability*, 1–32. https://doi.org/10.1007/978-3-319-53121-2_49-1

³⁵ Mell, I., & Whitten, M. (2021). Access to Nature in a Post Covid-19 World: Opportunities for Green Infrastructure Financing, Distribution and Equitability in Urban Planning. *International Journal of Environmental Research and Public Health*, 18(4), 1–16. <https://doi.org/10.3390/IJERPH18041527>

³⁶ Taylor et al. 2020

			environmental education, and awareness) ^{37,38,39,40,41}
	Provision for children and young people (including playgrounds, playing fields, skateboard parks, and basketball hoops)	Site	<ul style="list-style-type: none"> • Cultural (social cohesion, aesthetics, recreation, mental and physical health benefits)⁴²
	Zoological park/ garden	Site	<ul style="list-style-type: none"> • Regulating (microclimate regulation, carbon sequestration)⁴³ • Supporting (habitat creation and preservation)⁴⁴ • Cultural (recreation, culture, education, and research)⁴⁵
	Sports areas (including playing fields, golf courses, and tennis courts)	Site	<ul style="list-style-type: none"> • Cultural (recreation)⁴⁶
	Private gardens and grounds	Site	<ul style="list-style-type: none"> • Provisioning (crops, food)⁴⁷ • Regulating (microclimate regulation, pollination)⁴⁸ • Supporting (habitat creation)⁴⁹ • Cultural (mental and physical health benefits)⁵⁰
	School and institutional green spaces	Site	<ul style="list-style-type: none"> • Regulating (microclimate regulation, water flow regulation, air purification)⁵¹

³⁷ Taylor et al. 2020

³⁸ Gai, S., Fu, J., Rong, X., & Dai, L. (2022). Users' views on cultural ecosystem services of urban parks: An importance-performance analysis of a case in Beijing, China. *Anthropocene*, 37, 100323. <https://doi.org/10.1016/J.ANCENE.2022.100323>

³⁹ Stępniewska 2021

⁴⁰ Wentworth, J. (2017). *Urban Green Infrastructure and Ecosystem Services*. www.parliament.uk/post

⁴¹ Mell & Whitten 2021

⁴² Ibes, D. C. (n.d.). *Integrating Ecosystem Services Into Urban Park Planning & Design*. Retrieved August 3, 2022, from <https://digitalcommons.lmu.edu/cate/vol9/iss1/1>

⁴³ Lele, Y., Sharma, J. V., Yadav, S. P., Sharma, P., Priyanka, A., & Ghosh, S. (2020). Economic Valuation of Ecosystem Services of National Zoological Park, New Delhi. *Indian Forester*, 146(10), 883. <https://doi.org/10.36808/IF/2020/V146I10/155425>

⁴⁴ Lele et al. 2020

⁴⁵ Lele et al. 2020

⁴⁶ Balzan, M. v., & Debono, I. (2018). Assessing urban recreation ecosystem services through the use of geocache visitation and preference data: a case-study from an urbanised island environment. *One Ecosystem* 3: E24490, 3, e24490-. <https://doi.org/10.3897/ONEECO.3.E24490>

⁴⁷ Wentworth 2017

⁴⁸ Wentworth 2017

⁴⁹ Mell & Whitten 2021

⁵⁰ Mell & Whitten 2021

⁵¹ Graça, M., Alves, P., Gonçalves, J., Nowak, D. J., Hoehn, R., Farinha-Marques, P., & Cunha, M. (2017). Assessing how green space types affect ecosystem services delivery in Porto, Portugal. *Landscape and Urban Planning*, 170, 195–208. <https://doi.org/10.1016/j.landurbplan.2017.10.007>

	Amenity green spaces (most commonly in housing areas)	Site	<ul style="list-style-type: none"> Regulating (microclimate regulation)⁵² Supporting (habitat creation)⁵³
Infrastructure and street-level greening	Green verge	Corridor	<ul style="list-style-type: none"> Regulating (microclimate regulation, air purification)⁵⁴ Supporting (habitat creation)⁵⁵ Cultural (aesthetics, mental and physical health benefits)⁵⁶
	Street trees, tree alley	Corridor	<ul style="list-style-type: none"> Regulating (microclimate regulation, air purification)⁵⁷ Supporting (habitat creation)⁵⁸ Cultural (aesthetics, mental and physical health benefits)⁵⁹
	Roadside greening	Corridor	<ul style="list-style-type: none"> Regulating (microclimate regulation, air purification)⁶⁰ Supporting (habitat creation)⁶¹ Cultural (aesthetics, mental and physical health benefits)⁶²
	Green cycle routes	Corridor	<ul style="list-style-type: none"> Regulating (microclimate regulation, air purification)⁶³ Supporting (habitat creation)⁶⁴
	Green belts	Corridor	<ul style="list-style-type: none"> Regulating (microclimate regulation, air purification, noise reduction)⁶⁵

⁵² Mell & Whitten 2021

⁵³ Mell & Whitten 2021

⁵⁴ Salmond JA, Tadaki M, Vardoulakis S, Arbuthnott K, Coutts A, Demuzere M, Dirks KN, Heaviside C, Lim S, Macintyre H, McInnes RN, Wheeler BW. (2016) Health and climate related ecosystem services provided by street trees in the urban environment. *Environ Health*: 15 Suppl 1(Suppl 1):36. doi: 10.1186/s12940-016-0103-6. PMID: 26961700; PMCID: PMC4895605.

⁵⁵ Braquinho et al. 2015

⁵⁶ Salmond et al. 2016

⁵⁷ Salmond et al. 2016

⁵⁸ Mell & Whitten 2021

⁵⁹ Salmond et al. 2016

⁶⁰ Salmond et al. 2016

⁶¹ Braquinho et al. 2015

⁶² Salmond et al. 2016

⁶³ Breuste, J., Schnellinger, J., Qureshi, S., & Faggi, A. (2013). Urban Ecosystem services on the local level: Urban green spaces as providers. *Ekologia Bratislava*, 32(3), 290–304. <https://doi.org/10.2478/EKO-2013-0026>

⁶⁴ Mell & Whitten 2021

⁶⁵ Basit, A., Amin, N. U., Shah, S. T., & Ahmad, I. (2021). Greenbelt conservation as a component of ecosystem, ecological benefits and management services: evidence from Peshawar City, Pakistan. *Environment, Development and Sustainability*, 24(9), 11424–11448. <https://doi.org/10.1007/S10668-021-01890-3/FIGURES/14>

			<ul style="list-style-type: none"> • Supporting (habitat creation)⁶⁶ • Cultural (social cohesion, aesthetics, recreation, mental and physical health benefits)⁶⁷
Greening of buildings	Green rooftops	Site	<ul style="list-style-type: none"> • Regulating (microclimate regulation, air purification)⁶⁸ • Supporting (habitat creation)⁶⁹ • Cultural (aesthetics, recreation, mental and physical health benefits)⁷⁰
	Green walls	Site	<ul style="list-style-type: none"> • Regulating (microclimate regulation, air purification)⁷¹ • Supporting (habitat creation)⁷²
	Balcony greening	Site	<ul style="list-style-type: none"> • Supporting (habitat creation)⁷³
Natural, semi-natural, and feral green space	Forest	Site	<ul style="list-style-type: none"> • Provisioning (plants, timber)^{74,75} • Regulating (climate regulation, air purification, soil formation, carbon sequestration, flood protection)^{76,77} • Supporting (habitat creation)⁷⁸ • Cultural (recreation, environmental education, and awareness)⁷⁹

⁶⁶ Basit et al. 2021

⁶⁷ Basit et al. 2021

⁶⁸ Vargas-Hernández, Pallagst & Zdunek-Wielgołaska 2018

⁶⁹ Braquinho, C., Cvejčić, R., Eler, K., Gonzales, P., Haase, D., Hansen, R., Kabisch, N., Lorance Rall, E., Niemela, J., Pauleit, S., Pintar, M., Laforteza, R., Santos, A., Strohbach, M., Vierikko, K., & Železnikar, Š. (2015). *A Typology of Urban Green Spaces, Eco-System Services Provisioning Services and Demands*.

⁷⁰ Braquinho et al. 2015

⁷¹ Vargas-Hernández, Pallagst & Zdunek-Wielgołaska 2018

⁷² Braquinho et al. 2015

⁷³ Braquinho et al. 2015

⁷⁴ Grammatikopoulou, I., & Vačkářová, D. (2021). The value of forest ecosystem services: A meta-analysis at the European scale and application to national ecosystem accounting. *Ecosystem Services*, 48, 101262.

<https://doi.org/10.1016/J.ECOSER.2021.101262>

⁷⁵ Felipe-Lucia, M. R., Soliveres, S., Penone, C., Manning, P., van der Plas, F., Boch, S., Prati, D., Ammer, C., Schall, P., Gossner, M. M., Bauhus, J., Buscot, F., Blaser, S., Blüthgen, N., de Frutos, A., Ehbrecht, M., Frank, K., Goldmann, K., Hänsel, F., ... Allan, E. (2018). Multiple forest attributes underpin the supply of multiple ecosystem services. *Nature Communications* 2018 9:1, 9(1), 1–11. <https://doi.org/10.1038/s41467-018-07082-4>

⁷⁶ Grammatikopoulou & Vačkářová 2021

⁷⁷ Felipe-Lucia et al. 2018

⁷⁸ Felipe-Lucia et al. 2018

⁷⁹ Felipe-Lucia et al. 2018

	Nature reserves (protected areas)	Site	<ul style="list-style-type: none"> Regulating (microclimate regulation, soil retention, carbon sequestration)⁸⁰ Supporting (habitat creation)⁸¹
	Woodland	Site	<ul style="list-style-type: none"> Regulating (microclimate regulation, carbon sequestration, noise reduction, run-off retention, air purification)⁸² Supporting (habitat creation)⁸³ Cultural (recreation)⁸⁴
	Wetland, bog, marsh	Site	<ul style="list-style-type: none"> Regulating (microclimate regulation, carbon sequestration, flood control)^{85,86} Supporting (habitat creation)⁸⁷
	Shrubland	Site	<ul style="list-style-type: none"> Regulating (microclimate regulation, air purification, noise reduction, water flow regulation and run off mitigation)⁸⁸ Supporting (habitat creation)⁸⁹
	Wasteland	Site	<ul style="list-style-type: none"> Provisioning (food, raw material)⁹⁰
Allotment, community garden,	Allotments	Site	<ul style="list-style-type: none"> Provisioning (food, fuel, crops, livestock, genetic resources, medicine)^{91,92}

⁸⁰ Xu, W., Xiao, Y., Zhang, J., Yang, W., Zhang, L., Hull, V., Wang, Z., Zheng, H., Liu, J., Polasky, S., Jiang, L., Xiao, Y., Shi, X., Rao, E., Lu, F., Wang, X., Daily, G. C., & Ouyang, Z. (2017). Strengthening protected areas for biodiversity and ecosystem services in China. *Proceedings of the National Academy of Sciences of the United States of America*, 114(7), 1601–1606.

https://doi.org/10.1073/PNAS.1620503114/SUPPL_FILE/PNAS.1620503114.ST07.DOCX

⁸¹ Xu et al. 2017

⁸² Derkzen, M. L., van Teeffelen, A. J. A., & Verburg, P. H. (2015). REVIEW: Quantifying urban ecosystem services based on high-resolution data of urban green space: an assessment for Rotterdam, the Netherlands. *Journal of Applied Ecology*, 52(4), 1020–1032. <https://doi.org/10.1111/1365-2664.12469>

⁸³ Mell & Whitten 2021

⁸⁴ Derkzen, van Teeffelen, & Verburg 2015

⁸⁵ Wentworth 2017

⁸⁶ Braquinho et al. 2015

⁸⁷ Breuste et al. 2013

⁸⁸ Wentworth 2017

⁸⁹ Braquinho et al. 2015

⁹⁰ Braquinho et al. 2015

⁹¹ Speak, A. F., Mizgajski, A., & Borysiak, J. (2015). Allotment gardens and parks: Provision of ecosystem services with an emphasis on biodiversity. *Urban Forestry and Urban Greening*, 14(4), 772–781.

<https://doi.org/10.1016/J.UFUG.2015.07.007>

⁹² Cabral, I., Keim, J., Engelmann, R., Kraemer, R., Siebert, J., & Bonn, A. (2017). Ecosystem services of allotment and community gardens: A Leipzig, Germany case study. *Urban Forestry & Urban Greening*, 23, 44–53.

<https://doi.org/10.1016/J.UFUG.2017.02.008>

and other growing spaces			<ul style="list-style-type: none"> • Regulating (microclimate regulation, carbon sequestration, pollination, air and water purification, erosion regulation, flood protection)^{93,94} • Supporting (habitat creation, nutrient cycling)^{95,96} • Cultural (social cohesion, aesthetics, mental and physical health benefits, environmental education, and awareness)^{97,98}
	Community gardens	Site	<ul style="list-style-type: none"> • Provisioning (food)⁹⁹ • Regulating (microclimate regulation, pollination, carbon sequestration, air, and water purification)^{100,101} • Supporting (habitat creation)¹⁰² • Cultural (social cohesion, aesthetics, recreation, mental and physical health benefits, environmental education, and awareness)¹⁰³
	Arable land, pastures, meadows, grasslands	Site	<ul style="list-style-type: none"> • Provisioning (food)¹⁰⁴ • Regulating (microclimate regulation, rainwater drainage)¹⁰⁵
Burial grounds	Cemeteries	Site	<ul style="list-style-type: none"> • Regulating (microclimate regulation, carbon sequestration,

⁹³ Speak, Mizgajski, & Borysiak 2015

⁹⁴ Cabral et al. 2017

⁹⁵ Speak, Mizgajski, & Borysiak 2015

⁹⁶ Cabral et al. 2017

⁹⁷ Speak, Mizgajski, & Borysiak 2015

⁹⁸ Cabral et al. 2017

⁹⁹ Cabral et al. 2017

¹⁰⁰ Cabral et al. 2017

¹⁰¹ Clarke, M., Davidson, M., Egerer, M., Anderson, E., & Fouch, N. (2019). The underutilized role of community gardens in improving cities' adaptation to climate change: a review. *People, Place and Policy Online*, 12(3), 241–251. <https://doi.org/10.3351/PPP.2019.3396732665>

¹⁰² Cabral et al. 2017

¹⁰³ Cabral et al. 2017

¹⁰⁴ Breuste et al. 2013

¹⁰⁵ Breuste et al. 2013

			flood protection, air purification) ^{106,107} <ul style="list-style-type: none"> • Supporting (habitat creation)^{108,109} • Cultural (recreation, heritage value)^{110,111}
	Churchyards	Site	<ul style="list-style-type: none"> • Regulating (microclimate regulation, flood protection, air purification)^{112,113} • Supporting (habitat creation)^{114,115} • Cultural (recreation, heritage value)^{116,117}
	Memorial site	Site	<ul style="list-style-type: none"> • Regulating (microclimate regulation, flood protection, air purification)^{118,119} • Supporting (habitat creation)^{120,121} • Cultural (recreation, heritage value)^{122,123}
Blue spaces	Lakes/ ponds	Site	<ul style="list-style-type: none"> • Provisioning (fresh water)¹²⁴ • Regulating (microclimate regulation)¹²⁵ • Supporting (habitat creation)¹²⁶ • Cultural (recreation, social cohesion, environmental education and awareness,

¹⁰⁶ McClymont, K., & Sinnett, D. (2021). Planning Cemeteries: Their Potential Contribution to Green Infrastructure and Ecosystem Services. *Frontiers in Sustainable Cities*, 3, 136. <https://doi.org/10.3389/FRSC.2021.789925/BIBTEX>

¹⁰⁷ Clayden, A., Green, T., Hockey, J., & Powell, M. (2018). Cutting the lawn – Natural burial and its contribution to the delivery of ecosystem services in urban cemeteries. *Urban Forestry & Urban Greening*, 33, 99–106.

<https://doi.org/10.1016/J.UFUG.2017.08.012>

¹⁰⁸ McClymont & Sinnett 2021

¹⁰⁹ Clayden et al. 2018

¹¹⁰ McClymont & Sinnett 2021

¹¹¹ Clayden et al. 2018

¹¹² McClymont & Sinnett 2021

¹¹³ Clayden et al. 2018

¹¹⁴ McClymont & Sinnett 2021

¹¹⁵ Clayden et al. 2018

¹¹⁶ m McClymont & Sinnett 2021

¹¹⁷ Clayden et al. 2018

¹¹⁸ McClymont & Sinnett 2021

¹¹⁹ Clayden et al. 2018

¹²⁰ McClymont & Sinnett 2021

¹²¹ Clayden et al. 2018

¹²² McClymont & Sinnett 2021

¹²³ Clayden et al. 2018

¹²⁴ Braquinho et al. 2015

¹²⁵ Mell & Whitten 2021

¹²⁶ Mell & Whitten 2021

			physical and mental health benefits, heritage) ¹²⁷
	River corridors, river fronts, stream	Corridors	<ul style="list-style-type: none"> • Provisioning (fresh water)¹²⁸ • Regulating (microclimate regulation)¹²⁹ • Supporting (habitat creation)¹³⁰ • Cultural (social cohesion, aesthetics, recreation, mental and physical health benefits, heritage, environmental education, and awareness)¹³¹
	Canal	Site	<ul style="list-style-type: none"> • Provisioning (fresh water)¹³² • Cultural (social cohesion, aesthetics, recreation, mental and physical health benefits, heritage, environmental education, and awareness)¹³³
	Beach	Site	<ul style="list-style-type: none"> • Cultural (social cohesion, aesthetics, recreation, mental and physical health benefits, heritage, environmental education, and awareness)¹³⁴

RESEARCH GAPS

There is a lack of studies comparing the ecosystem services provided by different types of green spaces. Based on their intended purpose and actual design, diverse types of green spaces might have varying features and ecosystem services capacity. For example, parks and gardens provide cultural services like aesthetic and recreational benefits, whereas forests supply more provisioning services as they are sources of timber and wood¹³⁵.

¹²⁷ Wentworth 2017

¹²⁸ Braquinho et al. 2015

¹²⁹ Mell & Whitten 2021

¹³⁰ Mell & Whitten 2021

¹³¹ Wentworth 2017

¹³² Braquinho et al. 2015

¹³³ Wentworth 2017

¹³⁴ Wentworth 2017

¹³⁵ Chang, J., Qu, Z., Xu, R., Pan, K., Xu, B., Min, Y., Ren, Y., Yang, G., & Ge, Y. (2017). Assessing the ecosystem services provided by urban green spaces along urban center-edge gradients. *Scientific Reports* 2017 7:1, 7(1), 1–9. <https://doi.org/10.1038/s41598-017-11559-5>

Certain types of green spaces are investigated more than others. Specifically, recreational parks are the most often used and visited types of green spaces¹³⁶ in the UK¹³⁷, and are the main topic of many studies on urban greening. There is limited research on other types, such as burial grounds¹³⁸. It is important to recognise the importance and potential benefits of spaces of which purposes are not primarily for recreation, including green corridors and roof gardens. They might not deliver the same ecosystem services as parks but can still provide people with opportunities to interact with nature, relax, and escape from the confined spaces of home or office. They can also contribute positively to biodiversity conservation and environmental quality. With cities becoming denser and more prone to climate change impacts, it is useful to incorporate a wide variety of green spaces (of varied sizes and functions) to give people more exposure to green environments¹³⁹.

¹³⁶ Roberts, M., Glenk, K., & McVittie, A. (2022). Urban residents value multi-functional urban greenspaces. *Urban Forestry & Urban Greening*, 74, 127681. <https://doi.org/10.1016/J.UFUG.2022.127681>

¹³⁷ Ethos Environmental Planning. (2020). *Cheshire West and Chester Parks and Greenspaces Strategy*.

¹³⁸ McClymont & Sinnett 2021

¹³⁹ Chicago Metropolitan Agency for Planning. (n.d.). *Integrating Green Infrastructure*. Retrieved August 5, 2022, from <https://www.cmap.illinois.gov/documents/10180/516072/Green+Infrastructure+Strategy+Paper.pdf>

Chapter two: Young People and Their Engagement with Green Spaces

INTRODUCTION

Cities account for over 80% of the world's gross domestic product (GDP) but can also wreak havoc on the environment and human mental and physical health¹⁴⁰. For example, air pollution due to transportation, fossil fuel consumption, and industrial processes heightens the risk of people developing lung cancer, cardiovascular problems, and respiratory diseases like asthma¹⁴¹. It also contributes to mental illnesses like depression¹⁴² and anxiety¹⁴³. In 2021, 4.46 billion people lived in urban areas. The World Bank projects that by 2045 the global urban population will grow to six billion¹⁴⁴. The continuing trend of urbanisation presents challenges for alleviating health risks. Without appropriate interventions, most of the negative effects will fall disproportionately on the social groups that lack adequate access to urban resources and services, including women, migrants, young people, and older people^{145,146,147}.

Lund Trust aims to support young people. This report explores the connection between young people and green spaces. Notably, the definition of young people varies across different contexts. The United Nations considers individuals aged between 15 to 24 years as young people, whereas the European Union describes the youth as those aged 15 to 29¹⁴⁸. Based on the available interpretation of the term young people, Lund Trust defines young people as those from the age of 15 to 29 years old.

¹⁴⁰ World Health Organization. (2021). *Urban health*. <https://www.who.int/news-room/fact-sheets/detail/urban-health>

¹⁴¹ United Nations. (2016). *UN health agency warns of rise in urban air pollution, with poorest cities most at risk*. <https://www.un.org/sustainabledevelopment/blog/2016/05/un-health-agency-warns-of-rise-in-urban-air-pollution-with-poorest-cities-most-at-risk/>

¹⁴² Ali, N. A., & Khoja, A. (2019). Growing Evidence for the Impact of Air Pollution on Depression. *The Ochsner Journal*, 19(1), 4. <https://doi.org/10.31486/TOJ.19.0011>

¹⁴³ Braithwaite, I., Zhang, S., Kirkbride, J. B., Osborn, D. P. J., & Hayes, J. F. (2019). Air Pollution (Particulate Matter) Exposure and Associations with Depression, Anxiety, Bipolar, Psychosis and Suicide Risk: A Systematic Review and Meta-Analysis. *Environmental Health Perspectives*, 127(12). <https://doi.org/10.1289/EHP4595>

¹⁴⁴ World Bank. (2020). *Urban Development Overview*. <https://www.worldbank.org/en/topic/urbandevelopment/overview>

¹⁴⁵ United Nations Human Settlements Programme (UN-Habitat). (2020). *The Value of Sustainable Urbanization*.

¹⁴⁶ Kjellstrom, T., Friel, S., Dixon, J., Corvalan, C., Rehfuess, E., Campbell-Lendrum, D., Gore, F., & Bartram, J. (2007). Urban Environmental Health Hazards and Health Equity. *Journal of Urban Health : Bulletin of the New York Academy of Medicine*, 84(Suppl 1), 86. <https://doi.org/10.1007/S11524-007-9171-9>

¹⁴⁷ UNICEF & ARM. (2020). *Innovating for Children in an Urbanizing World*.

¹⁴⁸ Perovic, B. (n.d.). *Defining Youth in Contemporary National Legal and Policy Frameworks Across Europe*.

Young people are the cornerstone of urban development and heavy users of urban space¹⁴⁹. A great share of children and young people under the age of 25 reside in urban areas; the United Nations Human Settlements Programme (UN-Habitat) estimates that by 2030, children and young people under the age of 18 years will represent 60% of the urban population^{150,151}. At mid-year 2020, young people aged 15 to 29 years old make up 18.3% of the UK population (12,293,468 people)¹⁵². The Centre for Cities also notes that young people are the driving force for city-centre living; young people aged 22-29 accounted for nearly 49% of the total population in large city centres¹⁵³.

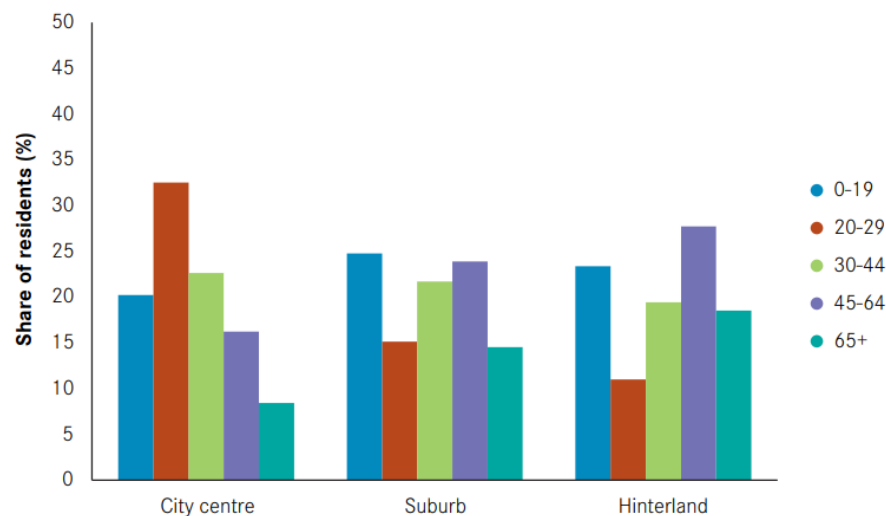


Figure 2: Young people aged 20 to 29 made up a large share of total population in city centres¹⁵⁴

Figure 2 above shows the age breakdown of the populations in city centres, suburbs, and hinterlands in England and Wales. The source data is Census 2011 data. As the figure shows, most of the residents in city centres were young people aged 20 to 29 years old (indicated by the red column). On the other hand, people living in the suburbs and hinterlands were likely to be older, or under the age of 19.

¹⁴⁹ Qiu, Y., Ding, J., Wang, M., Hu, L., & Zhang, F. (2021). Understanding the urban life pattern of young people from delivery data. *Computational Urban Science 2021 1:1*, 1(1), 1–16. <https://doi.org/10.1007/S43762-021-00027-6>

¹⁵⁰ UN-Habitat. (n.d.). *UN-HABITAT and Youth*. Retrieved August 9, 2022, from <https://www.un.org/youthenvoy/2013/08/un-habitat-and-youth/>

¹⁵¹ *Promoting Youth Innovation and Entrepreneurship for Inclusive Growth and a New Urban Agenda - Side Events | Habitat III*. (n.d.). Retrieved August 9, 2022, from <https://habitat3.org/the-conference/programme/all/promoting-youth-innovation-and-entrepreneurship-for-inclusive-growth-and-a-new-urban-agenda/>

¹⁵² Office for National Statistics. (2021). *Population estimates for the UK, England and Wales, Scotland and Northern Ireland*. <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annual/midyearpopulationestimates/mid2020>

¹⁵³ Thomas, E., Serwicka, I., & Swinney, P. (2015). *Urban demographics: Where people live and work*. www.centreforcities.org/about

¹⁵⁴ Thomas, Serwicka, & Swinney 2015

However, living in urban areas can harm young people's health. Globally, 14% of people aged 10 to 19 years old suffer from mental health issues¹⁵⁵. In the UK, urban living is one of the causes leading to psychological problems in some young people¹⁵⁶. The strong evidence of health problems in young people indicates the need for a preventative approach that could enhance their quality of life. One solution is to increase their exposure to natural and green spaces. In fact, connecting with nature helps young people, including those with experience of mental health issues, feel a stronger sense of self and a connection with their urban environment¹⁵⁷.

GREEN SPACES AND YOUNG PEOPLE

YOUNG PEOPLE'S NATURE CONNECTEDNESS AND EXPOSURE TO NATURE

Developing urban green spaces is one strategy that can improve the environment while providing young people with wellbeing benefits, including stress relief, improvement in mental health, and fewer depressive symptoms^{158,159}.

Green spaces can also connect young people living in urban areas with nature. Growing up in cities densely designed with buildings instead of green areas, young people can feel alienated from nature and less likely to visit natural and green spaces¹⁶⁰. The People and Nature Survey for England (PANS) data, which garners people's experiences and perspectives about natural and green spaces, provides information on the frequency of green space visits in the last 12 months across different age groups. The sample size is 24,989 people, and the data is weighted to represent the general population in the UK. According to the data, 829 young people aged 16-24 (26.2%) reported they visit natural and green spaces more than twice a week, and 1,297 young people (41.1%) visited green spaces only once or twice a week in the last 12 months.

¹⁵⁵ World Health Organization. (2021). *Adolescent mental health*. <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>

¹⁵⁶ Khan, L. (2016). *Missed opportunities A review of recent evidence into children and young people's mental health*.

¹⁵⁷ Birch, J., Rishbeth, C., & Payne, S. R. (2020). Nature doesn't judge you – how urban nature supports young people's mental health and wellbeing in a diverse UK city. *Health & Place*, 62, 102296. <https://doi.org/10.1016/J.HEALTHPLACE.2020.102296>

¹⁵⁸ Zhang, Y., Mavoa, S., Zhao, J., Raphael, D., & Smith, M. (2020). The Association between Green Space and Adolescents' Mental Well-Being: A Systematic Review. *International Journal of Environmental Research and Public Health*, 17(18), 1–26. <https://doi.org/10.3390/IJERPH17186640>

¹⁵⁹ UWE Bristol. (2021). *Exposure to green spaces is key to preventing anxiety and depression in young people, study finds*. <https://info.uwe.ac.uk/news/uwenews/news.aspx?id=4111>

¹⁶⁰ Mental Health Foundation. (2021). *How connecting with nature benefits our mental health*. <https://www.mentalhealth.org.uk/sites/default/files/2022-06/MHAW21-Nature-research-report-Scotland.pdf>

The Nature Connectedness Index (NCI) measures the relationship between nature and young people¹⁶¹. Figure 2 below, shows that the feeling of being connected to nature started dwindling acutely from the age of 10 to 15. The average NCI for people aged 16 and over was 61¹⁶². But figure 3 indicates that the sense of nature connectedness was under the average for young people aged 16 to 30.

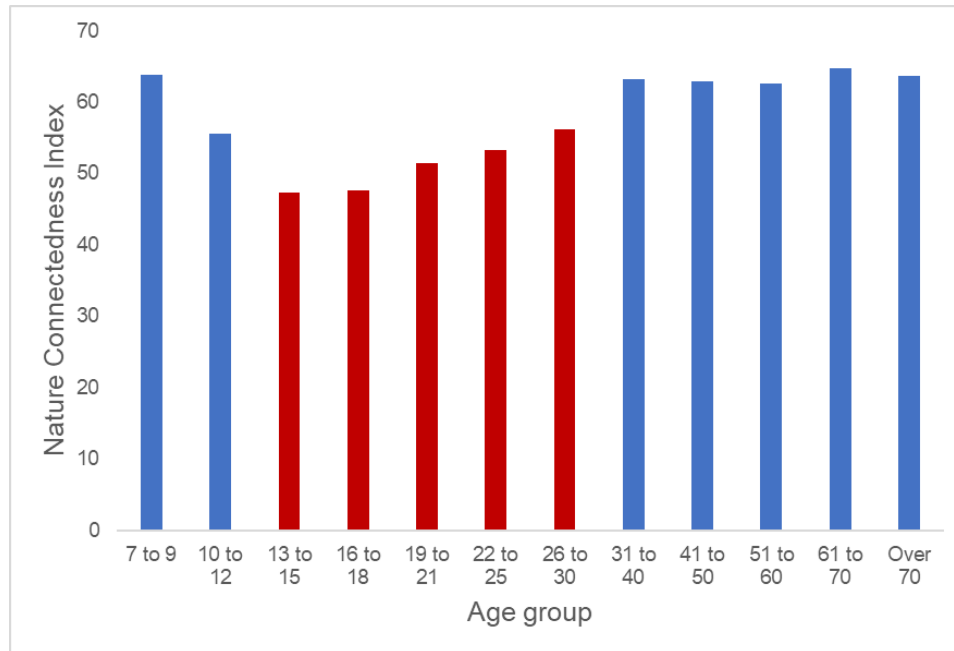


Figure 3: Young people feel less connected to nature than children and adults¹⁶³

There is a positive correlation between the sense of nature-relatedness and exposure to natural environments¹⁶⁴. Therefore, a low NCI not only indicates that young people do not feel psychologically connected to natural environments, but also shows that they have low exposure to nature. It is important to explore what factors causing such a low NCI score and low engagement of young people with natural and green spaces.

As well as health and wellbeing benefits, nature connectedness has important implications for environmental protection^{165,166}. For example, it encourages more environmental stewardship behaviours such as recycling, saving energy, and volunteering¹⁶⁷. A greater connection to

¹⁶¹ Richardson, M., Hunt, A., Hinds, J., Bragg, R., Fido, D., Petronzi, D., Barbett, L., Clitherow, T., & White, M. (2019). A Measure of Nature Connectedness for Children and Adults: Validation, Performance, and Insights. *Sustainability* 2019, Vol. 11, Page 3250, 11(12), 3250. <https://doi.org/10.3390/SU11123250>

¹⁶² Richardson et al. 2019

¹⁶³ Adapted from Richardson et al. 2019

¹⁶⁴ Richardson, M., Hunt, A., Hinds, J., Bragg, R., Fido, D., Petronzi, D., Barbett, L., Clitherow, T., & White, M. (2019). A Measure of Nature Connectedness for Children and Adults: Validation, Performance, and Insights. *Sustainability* 2019, Vol. 11, Page 3250, 11(12), 3250. <https://doi.org/10.3390/SU11123250>

¹⁶⁵ Richardson et al. 2019

¹⁶⁶ Chawla, L. (2020). Childhood nature connection and constructive hope: A review of research on connecting with nature and coping with environmental loss. *People and Nature*, 2(3), 619–642.

<https://doi.org/10.1002/PAN3.10128/SUPPINFO>

¹⁶⁷ Chawla 2020

nature can help young people manage their feelings about environmental problems, including climate change and biodiversity loss, and can encourage them to take practical actions to care for the environment¹⁶⁸. Due to the vast array of benefits green spaces can provide to both the environment and young people's daily life, there is a need to invest in projects that aim to increase their exposure to nature and sense of nature connectedness.

BARRIERS TO VISITING GREEN SPACES FOR YOUNG PEOPLE

This section investigates the potential barriers hindering young people from accessing or using green spaces using the PANS data. The barriers considered in the survey are mostly structural, meaning they are external and systemic factors that people cannot control. Some factors are intrapersonal and linked to people's interests and perspectives. A high proportion of young people aged 16 to 24 chose to stay at home to avoid the chance of getting COVID-19. This is reasonable since the data collection process started during the pandemic. 262 young people (18.2%) reported not going to natural and green spaces due to fear of crime or getting hurt. 75 people (5.1%) said no green spaces were nice enough for them to visit, 113 people (7.5%) were not interested in green and natural spaces, 128 (7.9%) prefer conducting other activities, and 118 (11.7%) said it was costly accessing the green and natural spaces. The barriers listed in the survey were not exhaustive and should be expanded to include social and cultural barriers (e.g., differences in social, religious, or cultural value), people's perceptions or feelings (e.g., a sense of loneliness or social isolation), and so on.

In London, young people aged 14 to 19 are under-represented in green spaces. This is because local authorities do not consider the differences in how varying demographics use and demand green spaces. Parks and green spaces have features for recreational and sporting pursuits. However, there is a lack of design to support cultural, community-building, and environmental activities¹⁶⁹. Current urban planning and decision-making processes do not involve young people¹⁷⁰ and, therefore, cannot address their needs sufficiently. Urban planners and decision-makers should co-design green spaces with young people to ensure newly built spaces can accommodate their needs and provide them with opportunities for social interaction and recreation.

RESEARCH GAPS

Many studies investigate the health benefits green spaces can provide to children aged 0 to 18. There is a lack of research focusing on young people aged 15 to 29¹⁷¹. Different age groups use

¹⁶⁸ Chawla 2020

¹⁶⁹ Parks for London. (2019). *A review of London's parks and green spaces: strategy, governance and value for the London Green Spaces Commission*. <https://www.localgov.co.uk/London%27s-parks-on-the-brink-of-%27privatisation%27/38911>

¹⁷⁰ UNICEF & ARM 2020

¹⁷¹ Reece, R., Bray, I., Sinnott, D., Hayward, R., & Martin, F. (2021). *Exposure to green space and prevention of anxiety and depression among young people in urban settings: a global scoping review*. <https://doi.org/10.1108/JPMH-02-2021-0030>

green spaces and experience their benefits differently, so findings from one group might not be applicable to the other. Studies that combine children and young people also cannot distinguish the specific needs of different groups and cannot provide decisive findings on the role of green spaces in young people's lives. While there can be overlaps, more research should investigate how green spaces can benefit those between the age of 15 to 29 years old, how this age group uses green spaces, and what features of green spaces are crucial to improve their wellbeing.

Besides the need to explore and analyse the green space use of different age groups of young people, it is important to investigate youth engagement with green spaces through the lens of gender equity. To understand teenage girls' use of green space, Women in Sport conducted case studies of three parks in the Yorkshire area. The results show that girls do not feel safe doing exercises in their local parks due to harassment anxiety and fear of anti-social behaviours. In addition, parks do not provide the appropriate equipment or facilities that girls need and, consequently, do not feel welcoming or comfortable to girls¹⁷². The research done by Make Space for Girls further indicates that park design does not consider the needs of teenage girls, and it is important to involve girls in the development and management processes to ensure parks are inclusive and usable for people of different ages and genders¹⁷³.

Socioeconomic background, which is measured by an individual's financial capability, wealth, educational level, race or ethnicity, or heritage¹⁷⁴, is another determinant of greenspace use and access¹⁷⁵. Particularly, people of ethnic minority backgrounds, residents of deprived areas, women, the elderly, and the disabled have low access to high-quality green spaces with decent amenities¹⁷⁶. In addition, public resources in deprived neighbourhoods tend to be unsafe, have no equipment for physical or recreational activities, and lack basic facilities like toilets and benches¹⁷⁷. Future research should analyse how young people of low socioeconomic status use green spaces and what factors would motivate them to engage more with the existing green spaces.

¹⁷² Yorkshire Sport Foundation, & Women in Sport. (2022). *Make Space for Us*.

¹⁷³ Walker, S., & Clark, I. (2020). *Make Space for Girls Everything you need to know in one (relatively) easy document*.

¹⁷⁴ *Socioeconomic Status - an overview | ScienceDirect Topics*. (n.d.). Retrieved August 21, 2022, from <https://www.sciencedirect.com/topics/medicine-and-dentistry/socioeconomic-status>

¹⁷⁵ Public Health England. (2020). *Improving access to greenspace A new review for 2020*.

¹⁷⁶ Public Health England 2020

¹⁷⁷ Hoffmann, E., Barros, H., & Ribeiro, A. I. (2017). Socioeconomic Inequalities in Green Space Quality and Accessibility—Evidence from a Southern European City. *International Journal of Environmental Research and Public Health*, 14(8). <https://doi.org/10.3390/IJERPH14080916>

RECOMMENDATIONS FOR LUND

Lund Trust can consider

- Investing in projects that aim to create new green spaces that address the demands and needs of the local people, with an emphasis on young people aged 15 to 29 years old.
- Allocating funds for research projects investigating how to increase access to green spaces for young people of low socioeconomic backgrounds.
- Investing in projects that support young people who are currently not using green spaces to have a more positive attitude.

CONCLUSION

This chapter provides a snapshot of young people's engagement with green spaces. Young people make up the largest and fastest-growing segment of the urban population and can benefit tremendously from green spaces. However, compared to other groups, young people have low green space exposure and a low sense of nature-connectedness. This poses a need to invest in projects that aim to increase young people's access to green spaces and feeling of nature connectedness.

Providing green spaces near their homes or neighbourhoods might be an effective strategy to encourage people to use them. But increased provision needs to be accompanied by greater quality, and green space design and development need to be sensitive to the local contexts and young people's preferences and concerns. Currently, there is a lack of research investigating their needs and types of green spaces this specific age group prefers. Hence, future research should focus on young people and use qualitative methods such as interviews and focus groups to explore strategies to enhance their green space use.

Chapter three: Analysis of Green Space Policies and Guidelines in the UK

INTRODUCTION

WHO (World Health Organization) recognises the provision of green spaces can help make cities more liveable and sustainable¹⁷⁸. The 11th Sustainable Development Goal on Sustainable Cities and Communities also recognises the need to design and provide safe, accessible, and inclusive green spaces to all, particularly women, children, the elderly, and people with disabilities¹⁷⁹. As green spaces have become an instrumental part of improving people's health and wellbeing as well as supporting the environment, the number of policies, guidelines and tools aiming at expanding and enhancing the current green spaces has been increasing. In the UK, creating new green spaces and improving existing ones are the focus and priority of many policies at local, regional, and national level¹⁸⁰. For example, the National Policy Planning Framework provides broad planning principles that guide the design of green spaces. It emphasises the importance of designing, conserving, and developing public spaces that can provide environmental, social, and economic benefits for local people¹⁸¹. Chapter 8 in the London Plan 2021 provides guidance for developing and designing green infrastructure across London¹⁸².

Green space policies and guidelines may vary in respect of scope, standard, coverage level, and context. Even though many policies and guidelines are available, there is a lack of research synthesising the differences and similarities between them. This research aims to analyse UK policies, guidelines, action plans, and strategies on green space design and planning and examine their content, applicable scale, constructs, and evaluation metrics.

DEFINITION OF POLICY AND POLICY IMPLEMENTATION

Policies establish the essential foundation and framework to guide the planning and implementation process. They also clarify a vision, define the roles of different groups, and

¹⁷⁸ WHO Regional Office for Europe. (2016). *Urban green spaces and health*.

¹⁷⁹ The Global Goals. (n.d.). *Goal 11: Sustainable cities and communities - The Global Goals*. Retrieved August 19, 2022, from <https://www.globalgoals.org/goals/11-sustainable-cities-and-communities/>

¹⁸⁰ Essex Green Infrastructure Partnership. (2019). *Green Essex Strategy*. <http://www.greenarc.org/>

¹⁸¹ Ministry of Housing, Communities & Local Government. (2021). *National Planning Policy Framework*. <http://forms.communities.gov.uk/3>

¹⁸² Greater London Authority. (2021). *The London Plan - The Spatial Development Strategy for Greater London*. https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf

provide reference targets and priorities¹⁸³. This research defines policies as a set of guidelines developed and adopted to achieve specific outcomes¹⁸⁴. Policy implementation entails translating the policy aims and objectives into pragmatic actions or incorporating the policy into a strategic development plan. It can also allude to actions conducted to reinforce the applicability and relevance of the policy¹⁸⁵. Actions to realise the goals of a policy usually come in the form of strategic plans, programmes, procedures, and so on¹⁸⁶. So, in addition to analysing policies, this research assesses guidelines, strategies, and action plans that directly address green space management and planning.

POLICY IMPLEMENTATION BAROMETER

The development and implementation of policies usually involve the participation of governmental agencies. Policy implementation can occur at distinct levels (macro, meso, and micro)^{187,188}. *Macro* refers to the national and systemic level. Policies at the macro level usually have a wide national reach and provide a broad and conceptual direction for those at the meso and micro levels. Meanwhile, *meso* relates to the organisational or community level. Organisations or communities at the meso level turn policies into programmes with determined scale and deliverables based on the local context^{189,190}. This research defines organisations as entities with distinct cultures, structures, sizes, and networks. On the other hand, communities are a group of people with one or more of the following characteristics: shared interests, shared backgrounds (e.g., race or ethnicity, heritage, religion, culture), shared geography (e.g., neighbourhood, borough). The characteristics and capacities of an organisation or community can influence the implementation ecology and outcomes¹⁹¹. *Micro* refers to the individual level and is where direct interactions between different individuals happen^{192,193}.

¹⁸³ Mugwagwa, J., Edwards, D., & de Haan, S. (2015). Assessing the implementation and influence of policies that support research and innovation systems for health: The cases of Mozambique, Senegal, and Tanzania. *Health Research Policy and Systems*, 13(1), 1–7. <https://doi.org/10.1186/S12961-015-0010-2/TABLES/3>

¹⁸⁴ Lobczowska, K., Banik, A., Romaniuk, P., Forberger, S., Kubiak, T., Meshkovska, B., Neumann-Podczaska, A., Kaczmarek, K., Scheidmeir, M., Wendt, J., Scheller, D. A., Wieczorowska-Tobis, K., Steinacker, J. M., Zeeb, H., & Luszczynska, A. (2022). Frameworks for implementation of policies promoting healthy nutrition and physically active lifestyle: systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 19(1), 1–12. <https://doi.org/10.1186/S12966-021-01242-4/FIGURES/2>

¹⁸⁵ Lobczowska et al. 2022

¹⁸⁶ Mugwagwa, J., Edwards, D., & de Haan, S. (2015). Assessing the implementation and influence of policies that support research and innovation systems for health: The cases of Mozambique, Senegal, and Tanzania. *Health Research Policy and Systems*, 13(1), 1–7. <https://doi.org/10.1186/S12961-015-0010-2/TABLES/3>

¹⁸⁷ Aizawa, I., & Rose, H. (2019). An analysis of Japan's English as medium of instruction initiatives within higher education: the gap between meso-level policy and micro-level practice. *Higher Education*, 77(6), 1125–1142. <https://doi.org/10.1007/S10734-018-0323-5>

¹⁸⁸ Hongoro, C., Rutebemberwa, E., Twalo, T., Mwendera, C., Douglas, M., Mukuru, M., Kasasa, S., & Ssengooba, F. (2018). Analysis of selected policies towards universal health coverage in Uganda: The policy implementation barometer protocol. *Archives of Public Health*, 76(1), 1–12. <https://doi.org/10.1186/S13690-018-0258-4/FIGURES/3>

¹⁸⁹ Caldwell, S. E. M., & Mays, N. (2012). Studying policy implementation using a macro, meso and micro frame analysis: the case of the Collaboration for Leadership in Applied Health Research & Care (CLAHRC) programme nationally and in North West London. *Health Research Policy and Systems*, 10(1), 1–9. <https://doi.org/10.1186/1478-4505-10-32/PEER-REVIEW>

¹⁹⁰ Pfadenhauer et al. 2017

¹⁹¹ Pfadenhauer et al. 2017

¹⁹² Caldwell & Mays 2012

¹⁹³ Pfadenhauer et al. 2017

Meso- and micro-level policies tend to align with and follow the guidance provided by macro policies. However, there might still be certain differences in the design and content across policies of distinct levels depending on the local or organisational contexts. To understand the implementation of green space policies, it is important to discuss the national, regional, and local policies for green space development and management. In addition, investigating green space-related policies at diverse levels can provide insights into the scope of green spaces, the range of green space functions addressed, and the institutions and communities involved in the implementation process¹⁹⁴. These insights can be useful in designing a framework for evaluating the value and impact of an urban greening project.

IMPLEMENTATION FRAMEWORK

Policy implementation frameworks can be either a graphical or narrative description of factors, constructs, or determinants associated with a phenomenon¹⁹⁵. They are useful in guiding the design of a method or assessment and supporting the explanation of results¹⁹⁶. They can also serve as a tool for cascading and implementing strategies and plans. In addition, implementation frameworks are helpful for communicating complex concepts; they help organise and interpret information as well as show the associations between different constructs¹⁹⁷.

Research conducted by Nilsen indicates that implementation frameworks are descriptive in nature and can serve the following purpose: guiding the implementation process (process framework); explaining the factors that affect the implementation outcomes (determinant framework); and appraising the implementation (evaluation framework)¹⁹⁸. Depending on its purpose, a framework might describe the implementation process in the form of many phases or stages; barriers and facilitators that influence the process; strategies that inform the process; and the outcomes of the implementation process. Different frameworks have different focuses and express the included concepts in varying levels of detail¹⁹⁹. In addition, an implementation framework can have a sophisticated scope and serve multiple purposes at once; there are

¹⁹⁴ Bush, J. (2020). The role of local government greening policies in the transition towards nature-based cities. *Environmental Innovation and Societal Transitions*, 35, 35–44. <https://doi.org/10.1016/J.EIST.2020.01.015>

¹⁹⁵ Lobczowska, K., Banik, A., Romaniuk, P., Forberger, S., Kubiak, T., Meshkovska, B., Neumann-Podczaska, A., Kaczmarek, K., Scheidmeir, M., Wendt, J., Scheller, D. A., Wieczorowska-Tobis, K., Steinacker, J. M., Zeeb, H., & Luszczynska, A. (2022). Frameworks for implementation of policies promoting healthy nutrition and physically active lifestyle: systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 19(1), 1–12. <https://doi.org/10.1186/S12966-021-01242-4/FIGURES/2>

¹⁹⁶ Moullin, J. C., Dickson, K. S., Stadnick, N. A., Albers, B., Nilsen, P., Broder-Fingert, S., Mukasa, B., & Aarons, G. A. (2020). Ten recommendations for using implementation frameworks in research and practice. *Implementation Science Communications* 2020 1:1, 1(1), 1–12. <https://doi.org/10.1186/S43058-020-00023-7>

¹⁹⁷ Moullin, J. C., Dickson, K. S., Stadnick, N. A., Albers, B., Nilsen, P., Broder-Fingert, S., Mukasa, B., & Aarons, G. A. (2020). Ten recommendations for using implementation frameworks in research and practice. *Implementation Science Communications* 2020 1:1, 1(1), 1–12. <https://doi.org/10.1186/S43058-020-00023-7>

¹⁹⁸ Nilsen, P. (2015). Making sense of implementation theories, models and frameworks. *Implementation Science*, 10(1), 1–13. <https://doi.org/10.1186/S13012-015-0242-0/TABLES/2>

¹⁹⁹ Moullin, J. C., Dickson, K. S., Stadnick, N. A., Albers, B., Nilsen, P., Broder-Fingert, S., Mukasa, B., & Aarons, G. A. (2020). Ten recommendations for using implementation frameworks in research and practice. *Implementation Science Communications* 2020 1:1, 1(1), 1–12. <https://doi.org/10.1186/S43058-020-00023-7>

implementation frameworks that aim to not only elucidate the implementation process but also explain its determinants (facilitators and barrier)²⁰⁰.

This study aims to scrutinise policies, guidelines, and action plans at various levels and compare their purpose (process, determinant, or evaluation), operational level (macro, meso, or micro), and their included factors.

POLICY CONTEXT IN THE UK

The United Kingdom has adopted a plan-led system since the implementation of the Town and Planning Country Act of 1990. This means that the local authorities are responsible for devising a development plan that serves as the starting point for future planning decisions and actions²⁰¹. The introduction of the Localism Act 2011 further gives the local authorities and communities more freedom and power to shape their own development plans²⁰². Moreover, paragraph 14 in the National Planning Policy Framework sets out a presumption of sustainable development that requires local plans to adopt the principles of sustainable development as the basis for any planning or development²⁰³. Local authorities need to ensure that they make appropriate references to the National Planning Policy Framework and meet its expectations while devising policies that are relevant to their local context that address the needs of the area²⁰⁴.

The inclusion of green spaces into new developments and the provision of new green infrastructure help realise the principles of sustainable development in the National Planning Policy Framework²⁰⁵. So, local policies play a crucial role in establishing a local vision and standards for green spaces regarding quality and quantity²⁰⁶. They also serve as guidelines on how to protect and enhance existing green spaces, as well as provide new ones²⁰⁷. Development proposals need to reflect the principles and frameworks set out in the local plans²⁰⁸.

²⁰⁰ Lobczowska, K., Banik, A., Romaniuk, P., Forberger, S., Kubiak, T., Meshkovska, B., Neumann-Podczaska, A., Kaczmarek, K., Scheidmeir, M., Wendt, J., Scheller, D. A., Wieczorowska-Tobis, K., Steinacker, J. M., Zeeb, H., & Luszczynska, A. (2022). Frameworks for implementation of policies promoting healthy nutrition and physically active lifestyle: systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 19(1), 1–12. <https://doi.org/10.1186/S12966-021-01242-4/FIGURES/2>

²⁰¹ Gordon, K. (2019). *Why our planning system must be made fit for purpose | Policy and insight*. <https://policy.friendsoftheearth.uk/opinion/why-our-planning-system-must-be-made-fit-purpose>

²⁰² Department for Communities and Local Government. (2011). *A plain English guide to the Localism Act*. www.communities.gov.uk

²⁰³ Ministry of Housing, Communities & Local Government. (2021). *National Planning Policy Framework*. <http://forms.communities.gov.uk/3>

²⁰⁴ Local Government Association. (2013). *Successful plan-making - Advice for practitioners*. <http://www.pas.gov.uk/pas/core/>

²⁰⁵ Essex County Council. (2019). *Green Essex Strategy*. <http://www.greenarc.org/>

²⁰⁶ Department for Levelling Up, Housing and Communities, & Ministry of Housing, Communities & Local Government (2021). *Plan-making*. <https://www.gov.uk/guidance/plan-making>

²⁰⁷ Essex County Council 2019

²⁰⁸ Department for Levelling Up, Housing and Communities, & Ministry of Housing, Communities & Local Government 2021

There are many challenges to integrating green space policies into local agendas. The slash in local government budget for green spaces has led to negative impacts on the delivery and maintenance of green spaces²⁰⁹. Local authorities in England spent £327 million less on parks and open spaces from 2020 to 2021 than they did from 2010 to 2011. Deprived areas experienced the deepest budget cuts²¹⁰. In particular, the budget cuts have affected the Northern and Midlands areas in England the most²¹¹.

The reduction in green space funds has created a shortage in staff to manage parks, and to support volunteer recruitment and park user groups, thus deteriorating the quality of existing green spaces^{212,213,214}. Open spaces such as parks and other green space types are not statutory services. This means that local authorities are not legally responsible for providing or caring for green spaces²¹⁵. Although many policies recognise the importance of green spaces, there are no mandatory requirements for the local authorities to provide and manage green spaces. For example, the National Planning Policy Framework, the official national policy that guides the local planning policy, only provide recommendations on the development and design of open spaces, which also encompass amenities like green spaces. It does require that the local and neighbourhood plans ensure new developments incorporate sustainable design features. According to the policy, the local authorities have the obligation to consider health infrastructure and ensure the health and wellbeing of the community²¹⁶. However, the National Planning Policy Framework does not directly address green spaces or require authorities to plan for green space development.

The acute budget cuts make it difficult for the local planning authorities to fund both statutory and non-statutory services. In fact, the fund for services such as children's activity, sports, and care centres has decreased²¹⁷. Green spaces are also not statutory services, so the local authorities reduce their green space budget to fund other statutory services like social care²¹⁸. Without proper funding, management, and maintenance, local green spaces face the risk of

²⁰⁹ Orr, S., Paskins, J., & Chaytor, S. (2014). *Valuing Urban Green Space: Challenges and Opportunities*.

²¹⁰ Martinsson, K., Gayle, D., & McIntyre, N. (2022). *Funding for England's parks down £330m a year in real terms since 2010*. The Guardian. <https://www.theguardian.com/environment/2022/aug/23/funding-for-englands-parks-down-330m-a-year-in-real-terms-since-2010>

²¹¹ Heritage Lottery Fund. (2016). *State of UK Public Parks*.

²¹² Orr, Paskins, & Chaytor 2014

²¹³ Martinsson, Gayle & McIntyre 2022

²¹⁴ Heritage Lottery Fund 2016

²¹⁵ Friends of the Earth. (2020). *England's green space gap - How to end green space deprivation in England*. <https://friendsoftheearth.uk/nature/access-green-space-england-what-does-picture-look-your-area>

²¹⁶ Ministry of Housing, Communities & Local Government (2021). *National Planning Policy Framework*. <http://forms.communities.gov.uk/3>

²¹⁷ Mell, I. (2018). Establishing the costs of poor green space management: mistrust, financing and future development options in the UK. *People, Place and Policy Online*, 12(2), 137–157. <https://doi.org/10.3351/ppp.2018.7698488596>

²¹⁸ Friends of the Earth. (2020). *England's green space gap - How to end green space deprivation in England*.

degradation and even sell-off²¹⁹. Although there is increasing park use and visitation, the available resources cannot keep up with people's demands²²⁰.

In addition, the implementation of permitted development rights, a governmental scheme that authorises some building work or land-use change to take place without the need to apply for a planning permission, has imposed certain challenges on local authorities' capacity to regulate and monitor development. Although permitted development rights help simplify the planning application process, they undermine the local plan and democratic community involvement in its creation. Consequently, new developments might not meet local interests²²¹.

The UK has more than 27,000 green spaces, and over half of the population use them regularly. Given the health and wellbeing benefits parks and green spaces can potentially provide to the community, it is crucial to reform funding and management structures to ensure their quality. Partnering with local networks and involving the communities in green space management are some effective strategies²²². The Localism Act 2011 attempts to decentralise power from Whitehall and provides councils, communities, and individuals with greater power and autonomy to address the local priorities and shape the neighbourhoods they live in. This act is a great push for community power since it allows the local people to be more involved in the management, design, and protection of local services and assets²²³. Therefore, community engagement and involvement are important for the development and maintenance of green spaces^{224,225}.

However, there are certain limitations to the Localism Act 2011 as well as community power. Although the Localism Act 2011 recognises the importance of placing control in the hands of individuals and communities, it has not been able to disperse power from the central government. Specifically, the act does not acknowledge the need for the representation of the local people in the councils that negotiate with the central governments and developers as a representative of the local government. In fact, localisation disperses responsibility and power across many small local authorities who lack the regulatory capacity, institutional mechanism, and funding to effectively manage green space. Cities in the UK still rely on central grants and the local authorities do not have a lot of autonomy due to limitations in funding²²⁶. Overall, the central government still has the main decision-making power and the community's power is only emerging.

²¹⁹ Friends of the Earth 2020

²²⁰ Heritage Lottery Fund 2016

²²¹ Gordon, K. (2019). *Why our planning system must be made fit for purpose | Policy and insight.* <https://policy.friendsoftheearth.uk/opinion/why-our-planning-system-must-be-made-fit-purpose>

²²² Heritage Lottery Fund 2016

²²³ Department for Communities and Local Government. (2011). *A plain English guide to the Localism Act.* www.communities.gov.uk

²²⁴ Heritage Lottery Fund 2016

²²⁵ Nesta, Big Lottery Fund, & Heritage Lottery Fund. (2016). *Learning to Rethink Parks.* www.nesta.org.uk

²²⁶ Pipe, J. (2013). Two years on, what has the Localism Act achieved? The Guardian.

<https://www.theguardian.com/local-government-network/2013/nov/02/localism-act-devolution-uk-local-authorities>

ANALYSIS OF UK GREEN SPACE POLICIES, STRATEGIES, TOOLS, AND PLANS

When devising a strategic framework for evaluating the accessibility of green space, it is crucial to consider the focuses of, and issues identified in, national, and local policies on urban greening. This ensures that the framework addresses the system level and is relevant to and compatible with national as well as local contexts. The following section discusses relevant national and local policies and guidelines on the design of urban greenspace and identifies the requirements and metrics currently used. It is worth noting that some policies directly address urban green infrastructure or green spaces, but in some others, greenspace is not the main subject but forms part of a wider strategy.

DATA COLLECTION, CODING, AND ANALYSIS

This research analysed 11 documents that guide the design and development of green spaces in the UK. The researcher manually performed the search. Inclusion criteria include:

- Planning documents that were endorsed and approved by authoritative bodies in the UK; and
- Documents that guide the planning, development, or design of green spaces.

The research codes the data according to four categories:

- The purpose of the document (describing the implementation process, identifying determinants/ strategies, or evaluating the implementation process);
- The level at which the document is devised (macro, meso, micro);
- The target audience; and
- The factors included in the framework (distance, quantity, quality, and equity).

SUMMARY OF INCLUDED DOCUMENTS

National Planning Policy Framework (2019)²²⁷

The National Planning Policy Framework presents the Government's planning policies. It emphasises that urban planning should support the transition to sustainable development and recognises the importance of high-quality open spaces in supporting people's health and wellbeing, enhancing biodiversity, and alleviating the impacts of climate change. It does not discuss specific metrics to evaluate greenspace, but states that for a land to be designated as Local Green Space, it should

- Be located close to the local community;
- Reflect local characteristics; and

²²⁷ Ministry of Housing, Communities & Local Government 2021

- Be special to and add value to the local community.

A Green Future: Our 25 Year Plan to Improve the Environment (2018)²²⁸

The Government's 25 Year Environment Plan presents national actions to improve and protect the UK's natural landscapes and habitats. The key goals and outcomes of the plan include improving air and water quality, enhancing wildlife, reducing risks from environmental hazards like flooding, using natural resources in a sustainable and effective manner, increasing resilience in a changing climate, and so on. The plan recognises the importance of green spaces in realising its goals. It states that exposing people to more green spaces can help improve their health and wellbeing.

Public Health England: Improving Access to Greenspace (2020)²²⁹

Public Health England, an executive agency of the Department of Health, was established to protect and enhance the nation's health and wellbeing as well as to reduce health inequalities through research, science, partnerships, and so on. This document analyses the physical and mental health benefits of green living environments and devises recommendations on how local authorities and decision makers can better monitor and enhance the provision of green spaces. Particularly, it discusses the issues of inequities in the distribution, quality, and quantity of greenspace and highlights the need to augment access to greenspace particularly in regions with a high deprivation level to minimise health inequalities and deliver sustainable benefits to different populations, including disadvantaged groups.

Sport England – 10 Active Design Principles (2015)²³⁰

Sport England, a public body supported by the Department for Digital, Culture, Media, and Sport, is responsible for promoting sporting activities. This guideline sets out 10 principles that help create an environment that promotes active lifestyles and provides everyone with opportunities for physical activity. The 10 principles are:

- Activity for all.
- Walkable communities.
- Connected walking and cycling routes.
- Co-location of community facilities.
- Network of multi-functional open space.
- High quality streets and spaces.
- Active building.
- Management, maintenance, monitoring, and evaluation.

²²⁸ HM Government. (2018). *A Green Future: Our 25 Year Plan to Improve the Environment*.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

²²⁹ Public Health England. (2020). *Improving access to greenspace A new review for 2020*.

www.facebook.com/PublicHealthEngland

²³⁰ Sport England. (2015). *Active Design: Planning for health and wellbeing through sport and physical activity*.

- Activity promotion & local champions.

Natural England: 'Nature Nearby' Accessible Natural Greenspace Guidance²³¹

Natural England is a non-departmental public body founded by an Act of Parliament in 2006 and sponsored by the Department for Environment, Food, and Rural Affairs. It aims to protect, improve, and manage the natural environment and has published many guidelines on how to deliver accessible natural green spaces for practitioners, decision-makers, and managers of green spaces. According to Natural England, accessible green areas are those that have adequate accessibility and quantity, service, and quality standards. There are three standards that Natural England deems important when assessing whether green spaces can meet people's needs. They include Accessible Natural Green Space Standards (ANGSt), Visitor Service Standards, and Greenspace Quality Standard.

Access to Natural Green Space Standards (ANGSt)²³²

This standard, which was first introduced in 1996, provide a tool to evaluate the appropriate provision of greenspaces. It was built based on three main principles: improving access, improving naturalness, and improving connectivity and can be used to map accessible green spaces that are already existing as well as potential spaces that need to be improved to meet the criteria set out by ANGSt.

ANGSt recommends that everyone, wherever they live, should have an accessible natural greenspace:

- of at least 2 hectares in size, no more than 300 metres (5 minutes' walk) from home;
- at least one accessible 20-hectare site within two kilometres of home;
- one accessible 100-hectare site within five kilometres of home; and
- one accessible 500-hectare site within ten kilometres of home; plus
- a minimum of one hectare of statutory Local Nature Reserves per thousand population.

Woodland Access Standard²³³

The Woodland Access Standard, developed by the Woodland Trust, is an accessibility standard that compliments the ANGSt. Its main goal is to ensure that everyone has adequate access to woodland. According to this standard, people should have access to at least one area of woodland with a minimum size of two hectares within 500 metres of their homes. In addition, they should have access to at least one area of woodland with a size of at least 20 hectares within 4,000 metres of their homes.

²³¹ Natural England. (2010). "Nature Nearby" Accessible Natural Greenspace Guidance. http://www.ukmaburbanforum.co.uk/documents/other/nature_nearby.pdf

²³² Natural England 2010

²³³ Woodland Trust. (2017). *Space for people - Targeting action for woodland access.*

Building with Nature Standards Framework²³⁴

Building with Nature Standards Framework outlines 12 standards for high-quality green spaces. They are classified into four main groups: core, wellbeing, water, and wildlife.

- The six core standards require that the urban greening projects should connect to a wider network of green infrastructure, provide a wide array of functions, help reduce the risk of climate change, maximise environmental net gains, protect and enhance the local characteristics.
- The two wellbeing standards emphasise that the green spaces should meet the needs of the local people and are accessible and usable by all populations. They should enhance social cohesion, reduce health inequalities, and support active lifestyles.
- The two water standards require that the green spaces help enhance the water quality, reduce the risks and impacts of flood and drought, and provide features that can deliver benefits to people, wildlife, and the environment.
- The last two wildlife standards indicate that the urban greening projects should be sensitive to the local ecological environment and provide spaces to support the existing wildlife and ecological features of the area.

Green Flag Award²³⁵

The Green Flag Award is the nationally accepted quality accreditation for publicly accessible parks and green spaces. There are eight criteria used to assess the quality of green spaces as described in table 2.

Table 2: Green Flag criteria²³⁶

Criteria	Description
A welcoming place	People should feel welcomed whenever they enter or visit a park or green space, no matter what their visiting purpose is.
Healthy, safe, and secure	Parks or green spaces should be safe, healthy, and secure places for everyone in the community to use.
Clean and well maintained	Parks or green spaces should be properly maintained and cleaned to ensure aesthetics, health, and safety.
Sustainability	Parks or green spaces should be managed in a sustainable and environmental-friendly way. All facilities in the parks or green spaces should also be environmentally sustainable.
Conservation and heritage	Natural features, flora and fauna, landscape features, and building and structural features of parks or green spaces should be maintained and protected carefully
Community involvement	Members of the community should be able to engage with the management of parks or green spaces.

²³⁴ Building with Nature. (2022). *Standards Framework (BwN 2.0)*.

²³⁵ Ellicott, K. (2016). *Raising the standard: The Green Flag Award guidance manual*.
<https://www.greenflagaward.org/media/1019/green-flag-award-guidelines.pdf>

²³⁶ Adapted from Ellicott 2016

Marketing	Marketing strategies are needed to encourage people to use green spaces more frequently
Management	The management plan of parks or green spaces should be vigorously implemented and reviewed regularly. The plan should also be financially sound.

Urban Greening Factor²³⁷

The Urban Greening Factor (UGF), which was introduced in the London Plan Policy G5, is a planning tool used to assess the provision and quality of urban greening a new development proposes to deliver. The goal of implementing this tool is to ensure that urban greening is considered and integrated at the initial stage of development planning, and that proposed green spaces align with the Policy G5 Urban Planning of the London Plan and contribute positively to London’s landscape.

Different kinds of greenery are assigned a rating that ranges from 0 to 1 based on their environmental contribution. For instance, semi-natural vegetation such as woodland and trees is rated 1, while sealed surfaces like concrete and stone have a rating of 0. The rating is then multiplied by the area of cover in square metres and added together with the ratings of other surface types. The combined rating is divided by the total site area in square metres to find the urban greening factor rating of the site. The Mayor of London suggests a minimum UGF score of 0.4 for major residential developments, and a score of 0.3 for commercial schemes.

Currently, the regional policy only requires major developments to reach a certain UGF. Nonetheless, the London Plan Policy G6 still compels development proposals to minimise their impacts on biodiversity. In addition, each borough should devise its own UGF standards that are relevant to the local context.

Fields in Trust: Guidance for Outdoor Sport and Play: Beyond the Six Acre Standard (2015)²³⁸

The guidelines established by Fields in Trust, an independent charity that operates across the United Kingdom with the aim of protecting parks and green spaces, have been used by local authorities for benchmarking purposes. They mainly concern the spatial distribution and quantity of green spaces, although they do provide general recommendations on the ideal qualities of green spaces, including safety, provision of footpaths, as well as provision of plants and other features.

Quantity guideline

Fields in Trust recommends that the levels of provision should be adjusted based on the local context. But the general guidelines set a standard of 0.8 hectares per 1,000 people for parks

²³⁷ Greater London Authority. (2021). *London Plan Guidance Urban Greening Factor*. www.london.gov.uk

²³⁸ Fields in Trust. (2015). *Guidance for Outdoor Sport and Play: Beyond the Six Acre Standard*.

and gardens, 0.6 hectares for amenity green space, and 1.8 hectares for natural and semi-natural spaces.

Accessibility guideline

The guidelines highlight the importance of ensuring that people, particularly children and those with mobility impairment, can safely, conveniently, and equitably access outdoor facilities. Here, accessibility is measured in terms of walking distance from dwellings and the accessibility guidelines vary depending on the types of green spaces. For parks and gardens, Fields in Trust recommends a walking distance of 710 metres from dwellings, which is equivalent to 10 minutes’ walk. A walking distance of 480 metres from dwellings (approximately six minutes’ walk) and 720 metres from dwellings (about 10 minutes’ walk) is suggested for amenity green spaces and natural and semi-natural green spaces respectively.

Quality guideline

The guidelines emphasise the need to design green spaces in a way that motivates people to use facilities. Although they do not address in-depth which qualities a green space should have, they state that green spaces should be safe, appropriately landscaped, managed sustainably, have adequate footpaths, have Green Flag status, and are Fields in Trust protected sites.

RESULTS

Table 3 shows the characteristics of the included documents.

Table 3: Characteristics of the studied documents

Name of policy/tool/guideline	Characteristics										
	Type			Level			Intended audience	Included Factors ⁱ			
	Process	Determinant	Evaluation	Macro	Meso	Micro		Distance	Quantity	Quality	Equity
National Planning Policy Framework (2019)	o	-	o	o	-	-	Local planning authorities	o	-	o	-
A Green Future: Our 25 Year Plan to Improve the Environment (2018)	o	-	-	o	-	-	Not mentioned	-	-	-	-

Public Health England: Improving Access to Green Space (2020)	0	0	0	0	-	-	Local planning authorities, those working with local authorities	0	0	0	0
Fields in Trust: Guidance for Outdoor Sport and Play: Beyond the Six Acre Standard (2015)	0	0	0	-	0	-	Local planning authorities, developers, planners, urban designers, landscape architects	0	0	0	0
Natural England: 'Nature Nearby' Accessible Natural Greenspace Guidance	0	0	-	0	-	-	Local planning authorities, green space professionals	0	0	0	0
Access to Natural Green Space Standards	0	0	0	0	-	-	Local planning authorities	0	0	0	-
Sport England: 10 Active Design Principles (2015)	0	0	0	-	0	-	Planners, local planning authorities, developers, health professionals	0	-	0	0
Woodland Access Standards	0	0	0	-	0	-	Local planning authorities	0	0	-	-
Building with Nature	0	0	0	-	0	-	Local planning authorities, developers, professional experts	-	-	0	0

Green Flag Award	-	0	0	0	-	-	Local planning authorities, managers of green spaces	0	-	0	0
Urban Greening Factor	-	0	0	0	-	-	Local planning authorities, architects, landscape architects, ecologists, and applicants	-	0	0	-

Nine documents (81.8%) describe the implementation process, nine (81.8%) discuss the evaluation of the implementation process, and nine (81.8%) specify the implementation determinants. 10 documents (90.9%) include two or all three purposes.

There are seven macro-level documents (63%), and four meso-level documents (36%). No documents are at the micro level. Most planning policies and guidelines come from governmental agencies (e.g., Public Health England, Natural England). The rest are developed by organisations such as charities (e.g., Woodland Trust, Fields in Trust). All the documents are for the use of local planning authorities, developers, planners, or other green space professionals. None of them are for community use.

Different frameworks have different purposes and set out different factors or metrics for creating green spaces. Eight of the included documents (72.7%) set out specific distance metrics, six (54.5%) provide quantity metrics, and nine (81.8%) set quality metrics. Six documents (72.7%) discuss equity, highlighting that everyone should have equal access to green spaces. 10 documents (90.9%) address more than two factors.

DISCUSSION

The research analysed 11 documents, including national policies, guidelines, and tools, that guide the design and management of green spaces. The findings show that most of the documents have more than two purposes. Furthermore, the documents discuss aspects of quantity, distance, quality, and equity. When evaluating urban greening projects, Lund Trust

should evaluate them against those factors to ensure alignment with existing policies, guidelines, and tools.

COMMON RECOMMENDATIONS ON QUALITY AND ACCESS

Although different guidelines and policies have different focuses, there are some common standards regarding the quantity, quality, and accessibility of green spaces. Specifically, green spaces should be accessible within walking or cycling distance. The presence of safe, well-maintained, and accessible routes to connect different areas of green space is also important since they encourage active travel²³⁹. There should be at least one green space with a minimum size of two hectares near people's homes^{240,241}. However, the size and distance requirements may vary depending on the type of green space. Studied documents also accentuate the need to focus on the qualities of green spaces, including safety, security, cleanliness, and maintenance²⁴². In addition to those physical qualities, it is crucial to ensure green spaces have features that confer ecosystem services. All the included documents highlight the need to provide green spaces that contribute to the health and well-being of the local people through promoting physical activity. Furthermore, green spaces should deliver environmental benefits such as biodiversity enhancement, air and water quality improvement, and climate change mitigation^{243,244,245}. Lund Trust should prioritise funding urban greening projects that outline clearly their environmental, social, and economic values and how they fit into the local context.

Drawing on the key points identified in the policies and guidelines, this research argues that it is important to ensure that green space is of high quality and can provide the local area with appropriate ecosystem services. Additionally, all social groups should be able to access green space easily through walking or cycling. This research also finds that most documents are concerned with green space's health, wellbeing, and environmental benefits. There should be more detailed guidance on how to evaluate green space's performance and ecosystem services. It is equally useful to have a guideline summarising and assessing existing tools currently used to evaluate the benefits of green space.

THE IMPORTANCE OF INCORPORATING EQUITY FACTORS

Given the disproportionate distribution of green spaces within the community, the inclusion of equity factors is crucial to address the diversity of the population and reduce the existing disparities. However, most of the documents just emphasise the need to provide green space accessible to all groups in the community. They do not specify the equity factors associated with low green space access. The fact that decision-makers incorporate equity as a component in

²³⁹ Sport England 2015

²⁴⁰ Natural England 2010

²⁴¹ Woodland Trust 2017

²⁴² Ellicott 2016

²⁴³ Building with Nature 2022

²⁴⁴ Ellicott 2016

²⁴⁵ Greater London Authority 2021

policies and guidelines means that they recognise its importance in ensuring the value and use of green space. The Equality Act 2010 also mandates that public authorities must act in accordance with the public sector equality duty and provide services and facilities that serve all populations, particularly those of protected characteristics such as age, disability, race, religion or belief, and so on²⁴⁶. So, equity is a legal requirement, and green space provision needs to consider the needs of the local people, including those of protected characteristics set forth in the Equality Act 2010. Lund Trust should invest in urban planning projects that have equity, inclusion, and diversity elements, and do not have barriers to entry. They should be open for all users and have features that support different types of activities.

Although the metrics set out in each document are useful in guiding the development and maintenance of green spaces, they should be altered to fit the local context. Different areas have different character features, spatial configurations, and street hierarchies, so applying a pre-defined distance metric without considering the topography or unique characteristics of the local area might limit the utility of green spaces²⁴⁷. The functions and values of green spaces for the local environment and people also vary. Planners should investigate the needs of the community and consider the context of green infrastructure within the local area to design green spaces that form a vital part of an interconnected and multifunctional green infrastructure network. In a nutshell, it is important to contextualise the standards to ensure that the delivery of green spaces enhances the local characteristics and provides value to the community. Policies and guidelines also place an emphasis on moulding the development to the local context^{248,249}.

RECOMMENDATIONS FOR LUND TRUST

Since there is clear evidence that certain groups have less access to greenspace and their needs are not considered in the planning process, Lund Trust should invest in urban planning projects that address the inequity in provision and quality and ensure that all groups can easily get access to and can benefit from green space. Whilst the main goal is to provide access to all populations, Lund Trust should focus particularly on addressing the needs of people who are underrepresented in green spaces. Young people aged 15 to 29 years have low green space exposure and do not feel connected to or safe in nature²⁵⁰. Although many studies have discussed the engagement of children with green spaces, there is a lack of research focussing on young people. Lund Trust could help solve this research gap and improve young people's connection with nature through investing in projects that aim to improve green space access for young people.

²⁴⁶ Equality Act 2010

²⁴⁷ Mell, I., & Whitten, M. (2021). Access to Nature in a Post Covid-19 World: Opportunities for Green Infrastructure Financing, Distribution and Equitability in Urban Planning. *International Journal of Environmental Research and Public Health*, 18(4), 1–16. <https://doi.org/10.3390/IJERPH18041527>

²⁴⁸ Ministry of Housing, Communities, & Local Government 2021

²⁴⁹ Fields in Trust 2015

²⁵⁰ Mental Health Foundation. (2021). *How connecting with nature benefits our mental health*.

<https://www.mentalhealth.org.uk/sites/default/files/2022-06/MHAW21-Nature-research-report-Scotland.pdf>

In addition, Lund Trust should ensure that the projects involve the public in project development and management and consider the area's unique characteristics and wider green infrastructure network. The projects need to become an integral part of the existing green infrastructure network, contribute to improving the local environment, and meet the needs of local people. Moreover, there should be detailed monitoring, maintenance, and management regimes to ensure the quality of green spaces does not diminish over time. Sustainable and diverse funding sources are crucial to ensure the quality of green spaces. Since local authorities are facing budget cuts, partnership with and funding from non-traditional sources might present support for green space planning and management²⁵¹.

In terms of qualities, Lund Trust should consider projects with clear ecosystem services benefits and various features and functionalities to meet identified needs. Notably, the projects should address critical environmental challenges facing the local area. The studied documents focus on the benefits of green spaces in areas like climate change, biodiversity, water, and pollution. These might be the environmental areas Lund Trust should take into consideration while evaluating urban greening projects.

LIMITATIONS AND FUTURE DIRECTIONS

Due to time constraints, this research does not take a systematic approach to identifying policies and guidelines on green space design and management in the UK. Although it includes some of the most influential planning documents that guide the development of green spaces across the UK, it might still miss out on some important documents. Future research should conduct a systematic review to collect all the relevant documents on the topic.

Another limitation is that only one researcher conducted the document selection, screening, extraction, and analysis. As a result, there might be risk of bias in the appraisal of the documents. Although the researcher consulted with another expert regarding the search strategy, it is important to have another researcher assessing the characteristics of the included documents to ensure objectivity.

CONCLUSION

This research synthesises the key points of 11 documents that provide guidance on green space design and management. It analyses the purpose of each document, the level at which it is developed, its target audience, and the included factors/metrics.

²⁵¹ Mell 2018

There are a myriad of planning guidelines, policies, and tools available, making it challenging to decide which one to use as a reference when devising a framework for evaluating urban greening projects. By recapitulating and comparing the characteristics of the studied documents, the research can inform the development of the framework and help ensure that it best matches Lund Trust's aims and objectives. In particular, the framework should incorporate factors/metrics highlighted in the documents as important, including distance, quality, quantity, and equity. Although many documents recognise the importance of providing green space access to all populations, they do not specifically state which demographic groups have low access and should be prioritised. To address this gap, the framework developed for the use within Lund Trust should have specific equity indicators. It should also have a public involvement component and is appropriate for the local context. It is important to ensure that the proposed development enhances and preserves the existing landscape.

This research has methodological limitations. Future research should adopt a more systematic approach to collecting and analysing the documents to ensure accuracy and objectivity. Nonetheless, this research contributes to the existing knowledge by providing an analysis of green space planning documents in the UK and highlighting their key focuses as well as drawbacks.

CASE STUDY

CASE STUDY OF LONDON

In Greater London, green areas make up 47% of the total area, with 33% being publicly open spaces and 14% private green spaces. There are 3,000 publicly accessible parks of assorted sizes, which account for around 18% of London's area²⁵². Green spaces in London play a large role in improving the city's resilience to climate change and provide many environmental benefits such as reducing urban temperatures and enhancing air and water quality. For example, the total value of carbon stored in trees in Greater London is about eight million pounds each year²⁵³.

Although London has considerable green areas, there is an unequal distribution of greenspace across different regions; nearly half of people residing in London lack access to parks. In addition, the quality of parks has declined due to a lack of maintenance funding²⁵⁴. The goal of the Mayor of London is to make London the first National Park City in the world, with green space making up more than half of its area²⁵⁵. The London Environment Strategy also highlights

²⁵² Greenspace Information for Greater London CIC. (2022). *Key London Figures*. <https://www.gigl.org.uk/our-data-holdings/keyfigures/>

²⁵³ London Green Spaces Commission. (2020). *London Green Spaces Commission Report*. <https://www.london.gov.uk/WHAT-WE-DO/environment/environment-publications/london-green-spaces-commission-report>

²⁵⁴ Mayor of London. (2018). *London Environment Strategy*. www.london.gov.uk

²⁵⁵ Mayor of London 2018

the plan to protect the natural environment and ensure that everyone living in London has equal access to green infrastructure²⁵⁶.

The London Plan is a statutory development strategy, meaning that boroughs of London must align their local development plans with the London Plan²⁵⁷. It also reflects the national agendas and obligations, including the public-sector equality duty of the Equality Act 2010²⁵⁸. Within the London Plan, there are 16 key policies on the management, protection, and improvement of parks and green spaces in London. The policies of chapter 8 (highlighted green in table 4 below) directly address green infrastructure. Although the other ones do not explicitly mention green spaces, they indirectly relate to green spaces.

Table 4: London’s green space-related policies²⁵⁹

Policy	Key points
G1 - Green infrastructure	This policy emphasises the need for an integrated approach to planning and managing green space system so that it can provide a wide array of benefits to people.
G2 - London’s Green Belt	This policy states that the development should not damage London’s Green Belt and emphasises the significance of Green Belt in London’s green infrastructure network.
G3 - Metropolitan Open Land	This policy aims to protect large open spaces that contribute to London’s landscapes.
G4 - Open space	This policy mentions that new development must not damage the local protected open spaces and should address the local deficiency.
G5 – Urban greening	This policy aims to encourage an increase in vegetation cover such as trees, green roofs, green walls.
G6 – Biodiversity and access to nature	This policy promotes the construction of green roofs and walls as they have many benefits such as reducing flood risks, conserve biodiversity, and food growing.
G7 – Trees and woodlands	This policy champions the protection and management of urban forest and woodlands in London and encourages the protection of ‘veteran’ trees and ancient woodland that are currently not included in designated sites.
G8 – Food growing	This policy supports the protection of existing allotments and promotes the creation of new spaces for urban agriculture such as community gardens. It also mentions the need to identify locations for food production such as in vacant or under-utilised areas.
G9 – Geodiversity	This policy highlights the importance of providing access to all Londoners and mentions that new development should protect and enhance the existing geodiversity.

²⁵⁶ Mayor of London 2018

²⁵⁷ Greater London Authority. (2022). *What is the new London Plan?* <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/what-new-london-plan>

²⁵⁸ Greater London Authority 2021

²⁵⁹ Adapted Greater London Authority 2021

D3 – Optimising site capacity through the design-led approach	This policy requires that the development helps preserve and enhance the local characters. It also implies that the development should not damage but improve and respect the existing heritage, landscapes, and architectural characteristics of the local area.
D8 – Public realm	The policy states that development plans and proposals should integrate green infrastructure like street trees into the public realm to help manage rainwater, decrease air pollution levels, regulate air temperature, and support biodiversity.
S1 – Developing London’s social infrastructure	This policy stresses that the new development needs to meet the diverse needs of the community. It should also be accessible conveniently by public transport, cycling, and walking.
S4 - Play and Informal Recreation	This policy stresses that development meant for the use of children and young people should have trees or other greenery types and have safe and accessible streets and footpaths that allow them to move around easily.
GG3 – Creating a healthy city	This policy mentions that to support people’s health and minimise health inequalities, planners and developers need to increase access to and quality of green spaces, provide new green infrastructure, and areas for recreational and sporting purposes
SI 4 – Managing heat risk	Development proposals should provide green infrastructure to reduce urban heat island effects and restrict heat gains into buildings.
SI 12 – Flood risk management	Development proposals should have natural flood management methods to help reduce flood risks while enhancing the habitat.
SI 13 - Sustainable Drainage	This policy stresses the importance of minimising surface water flooding risks.
SI 14 – Waterways – strategic role	Development plans and proposals need to consider the importance of the connected London’s waterway system and should aim to optimise its benefits.
SI 17 – Protecting and enhancing London’s waterways	Development plans and proposals should improve the biodiversity and facilitate river restoration.
T2 – Healthy Streets	Development plans and proposals should have land use features that allow residents to make short journeys and can reach the new development by either walking or cycling.

AREAS OF DEFICIENCY IN ACCESS IN PUBLIC OPEN SPACES

The London Plan emphasises the need to measure open space supply and deficiency. The plan outlines a maximum distance that people should have to travel to reach a public open space. The London Plan identifies the areas where green spaces are not within the designated distances as areas of deficiency²⁶⁰.

²⁶⁰ Greenspace Information for Greater London CIC. (n.d.). *Areas of Deficiency in Access to Public Open Space*. Retrieved September 1, 2022, from <https://www.gigl.org.uk/our-data-holdings/open-spaces/areas-of-deficiency-in-access-to-public-open-space/?highlight=open%20space%20deficiency>

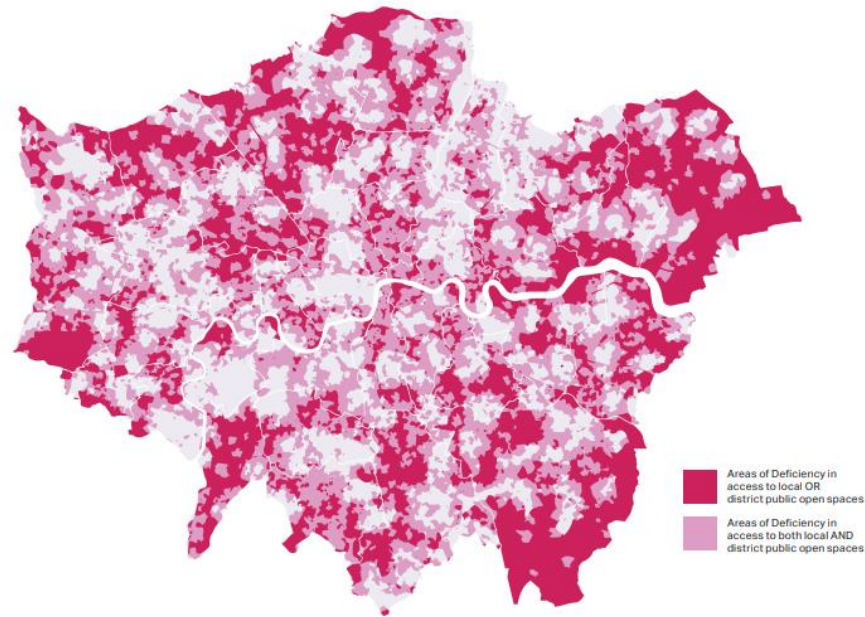


Figure 4: Areas of deficiency in London²⁶¹

Figure 4 shows that many areas in London have low access to local and/or district public open spaces. Research conducted by Fields in Trust also indicates that the green space provision per person in London is 19 metres square, which is much lower than the UK average of around 30 metres square²⁶². In London, children, particularly those of Black, Asian, and Minority Ethnic backgrounds or those from low-income households, are less likely to use a park or green space on a regular basis compared to those in other parts of England²⁶³.

In addition to tackling the inequitable distribution of green spaces, it is also important to improve green space services so they can better respond to future challenges. Moreover, the London Plan emphasises the need to make sure that the local green spaces support and contribute to the wider green infrastructure network²⁶⁴.

CASE STUDY OF SHEFFIELD

Sheffield is the greenest city in the UK according to the Green Cities report, which ranks the UK's 25 largest cities by population based on their performance on six criteria including green

²⁶¹ Mayor of London 2018

²⁶² Fields in Trust. (2022). *Green Space Index reveals importance of local parks for achieving Levelling-Up*. <https://www.fieldsintrust.org/News/green-space-index-reveals-importance-of-local-parks-for-achieving-levelling-up>

²⁶³ London Green Spaces Commission 2020

²⁶⁴ London Green Spaces Commission 2020

space, waste and recycling, and pollution²⁶⁵. It has a vision of becoming an outdoor city²⁶⁶ and has a considerable green space area of 22,600 acres in total²⁶⁷. This is equivalent to 155 metres square of green space provision per resident²⁶⁸. In Sheffield, there are 13 city parks, woodlands, and gardens, 20 district parks with a combination of landscape features and facilities, and 50 local parks that have a mix of landscape, play, and green space features²⁶⁹. The city has over two million trees, and 10% of its area is covered in woodland²⁷⁰. Nonetheless, the provision and management of green spaces in Sheffield still encounter certain challenges. Austerity hinders the local authorities from maintaining the quality of green space and delivering new models. In addition, not all green spaces in the city are of high quality and can deliver the same ecosystem services to the community²⁷¹.

Sheffield City Council is preparing a new Local Plan. The current implemented Local Plan that guides local development consists of the 2009 Sheffield Development Framework Core Strategy and some relevant policies and proposals from the 1998 Sheffield Unitary Development Plan²⁷². The vision and objectives of Sheffield Development Framework reflect the guidance of the regional strategies and the national planning policy²⁷³.

In addition to the main Local Plan, Sheffield City Council has a Green and Open Space Strategy that advises the monitoring and delivery of green spaces in the area. It links to and supports the goals of the local development frameworks and plans as well as the regional and national policy and strategies. It focusses on four strategic themes: People, Places, Environment and Sustainability, and Quality Management. It aims to ensure that the local population can access and enjoy safe and clean green spaces. The green and local spaces also need to be of high quality, preserve the local character and heritage of the area, and provide benefits to the local economy. They should help minimise climate change effects, improve the quality of the environment and biodiversity, and promote people's connection with nature. Lastly, the strategy emphasises the need to effectively manage and maintain the quality of green and open spaces in the area²⁷⁴.

²⁶⁵ NatWest Group. (2021). *Sheffield named UK's greenest city*.

<https://www.natwestgroup.com/news/2021/11/sheffield-named-uk-greenest-city.html>

²⁶⁶ Sheffield Green Commission. (2016). *Sheffield's Green Commitment*.

https://sheffield.citizenspace.com/place/sheffield-green-commission/supporting_documents/Sheffield%20Green%20Commitment%20Report_FINAL.pdf

²⁶⁷ NatWest Group 2021

²⁶⁸ NatWest Group 2021

²⁶⁹ Sheffield City Council. (n.d.). *Parks and green spaces*. Retrieved August 30, 2022, from

<https://www.sheffield.gov.uk/parks-sport-recreation/parks-green-spaces>

²⁷⁰ Sheffield Green Commission 2016

²⁷¹ Sheffield Green Commission 2016

²⁷² Development Services. (2015). *Sheffield Plan: Our City Our Future - Draft Sustainability Appraisal and Strategic Environmental Assessment Scoping Report*. www.sheffield.gov.uk/sheffieldplan

²⁷³ Sheffield City Council. (2009). *Sheffield Development Framework Core Strategy*.

²⁷⁴ Sheffield City Council. (2010). *Sheffield's Great Outdoors - Green and Open Space Strategy 2010-2030*. www.sheffield.gov.uk

The strategy also highlights the importance of understanding the local area's characteristics and the people's needs and perspectives to devise suitable green space strategies. Particularly, the quality assessment and local survey in 2008 suggested three key areas that Sheffield needs to improve on: 1) the quality of small, local spaces for community use such as local parks and amenity green spaces; 2) quality and provision of recreational spaces for children and young people; 3) quality and availability of allotments. Some other concerns include safety, maintenance, and cleanliness of green and open spaces²⁷⁵.

²⁷⁵ Sheffield City Council 2010

Chapter four: Evaluation Framework

Introduction

Green space design, development, and management are complicated and necessitate long-term planning of financial resources. They should involve identifying the needs of the local community and understanding the area's characteristics and existing green infrastructure network. Many policies and guidelines have emphasised the importance of addressing local concerns, including the National Planning Policy Framework, Sport England's 10 Active Design Principles, and Public Health England's Improving Access to Greenspace. It is unnecessary to create new green spaces in areas where there is already a decent amount of green space as this can lead to the under-usage of some facilities. In those areas, assessing the local green spaces and improving their quality to make sure they contribute positively to the local community can generate more value. But in areas highly deprived of green spaces, creating new ones will help improve people's lives.

It is crucial to have a framework defining what a high-quality green space is. This research provides an evaluation framework drawing on UK policies and guidelines identified in the previous section as well as insights from experts. Lund Trust should use the framework to decide whether urban greening projects can deliver multiple ecosystem services to the community and contribute positively to the local area.

FRAMEWORK FOR EVALUATING GREEN SPACE ACCESS AND QUALITY

The framework contains four dimensions: people, sustainable living, the local environment, and climate resilience. Each dimension has specific standards that the project should meet. All the standards ensure that the project helps support people's health and wellbeing while improving the local nature and biodiversity, mitigating climate change risks, and adding more value to the local area. Importantly, green spaces should meet people's needs in both the present and future.

Lund Trust should choose urban greening projects that achieve as many standards as possible. However, not all standards are relevant to all contexts or situations, so there can be slight modifications to suit the local context.

PEOPLE

Urban greening projects should be accessible to all and take into consideration the needs of everyone, particularly those who are currently under-represented in green spaces, like young people. The features of the green spaces should be inclusive and should not stigmatise or separate users.

Table 5: People dimension of green space evaluation framework

People Dimension	
Standard 1	Everyone can freely and easily access green spaces by walking or cycling
Standard 2	Everyone can enjoy all the features and ecosystem services green spaces provide without experiencing any barriers
Standard 3	Everyone should feel safe and welcome in green spaces
Standard 4	The planning and provision of green spaces should consider and meet the needs of all groups in the community, particularly young people
Standard 5	The planning and provision of green spaces should engage with and empower local people, particularly young people, to make decisions relating to the planning/ management of green space

LOCAL CONTEXT

Urban greening projects need to consider the wider green infrastructure system of the area and should aim to integrate into the system and enhance its capacity. In addition, they should consider the local environment and make sure that the ecosystem services and types of green spaces provided are appropriate and suitable for the local context.

Table 6: Local context dimension of green space evaluation framework

Local Context Dimension	
Standard 1	The type and function of green spaces should be suitable for the local context
Standard 2	Green spaces should respect and contribute to local heritage, landscapes, and characteristics
Standard 3	Green spaces should connect with surrounding facilities and other green spaces to optimise use of space and accommodate a variety of needs
Standard 4	Green spaces should be well linked to pedestrian and cycle routes as well as public transportation systems

SUSTAINABLE AND HEALTHY COMMUNITIES

Urban greening projects should have varied functions to align with the identified needs of local people. There should be provision for monitoring and maintenance of green spaces to ensure they can continue to play the role in supporting the health and wellbeing of the local people.

Table 7: Sustainable and healthy communities dimension of green space evaluation framework

Sustainable and Healthy Communities Dimension	
Standard 1	Green spaces should be appropriate for and enhance the wider green infrastructure system
Standard 2	Green spaces should have features that encourage active lifestyles
Standard 3	Green spaces should help reduce and prevent health inequalities
Standard 4	Green spaces should provide opportunities for social interaction and promote social cohesion
Standard 5	Maintenance and monitoring regimes should be in place to ensure green spaces remain of high quality and usable for the community

CLIMATE AND ENVIRONMENTAL RESILIENCE

Urban greening projects should minimise adverse environmental effects and improve local biodiversity. They should also help improve water quality and be responsive to local environmental problems. Importantly, the projects should take into consideration the surrounding ecological features and other green spaces and aim to complement them.

Table 8: Climate and environmental resilience dimension of green space evaluation framework

Climate and Environmental Resilience Dimension	
Standard 1	Green spaces should support and connect with the wider green infrastructure network and surrounding ecological features
Standard 2	Green spaces should use sustainable materials that do not harm the environment or wildlife (e.g., FSC/PEFC certified wood).
Standard 3	Green spaces should help improve the local water quality, manage water resources, reduce flood, drought, and other climate risks
Standard 4	Green spaces should support the wildlife and habitats of the local area
Standard 5	Green spaces should regulate the local thermal environment , especially during heat waves
Standard 6	Green spaces should have features to reduce impacts of climate change
Standard 7	Planning and maintenance of green spaces should ensure that they can adapt to a changing climate and withstand extreme weather events

Overall, urban greening projects should contribute positively to the local community and environment by providing inclusive and high-quality infrastructure and facilities and creating opportunities for social interaction and physical activity.

THE FOUR-STEP APPROACH FOR ASSESSING GREEN SPACE PROJECT

This section outlines the toolkit for planning and assessing urban greening projects (figure 5). The researcher develops this toolkit based on the available literature and inputs from experts. This research also suggests potential tools, indices, and datasets that Lund Trust can refer to whilst conducting the evaluation.



Figure 5: Four-step approach to evaluate urban greening project

Harnessing research evidence and gathering local data are crucial to the planning and development of an urban greening project. Lund Trust should make sure that the project gathers data on:

- Number of green spaces in an area;
- Distance from local residential areas to green spaces;
- Quality of green space (e.g., cleanliness, pathways, facilities) and the specific ecosystem services they provide (provisioning services, regulating services, supporting services, and cultural services); and
- Suitability of the urban greening projects for the local context and local green infrastructure network.

The collected data can inform Lund Trust's approach to green-space investment. There are four types of urban greening projects that Lund Trust can consider: conservation, improvement, restoration, and creation. Some projects might represent several types.

- Conservation projects aim primarily to protect natural resources (e.g., National Trust's Wimpole project).
- Improvement projects aim to manage and enhance the quality of existing green space (e.g., National Trust's woodland management project).

- Restoration projects aim to recover natural resources (e.g., Citizen Zoo’s Restored Reserves project and Returning Beavers to London’s Waterways project).
- Creation projects create new green space.

STEP 1: IDENTIFY AREAS THAT NEED GREEN SPACE INVESTMENT

Lund Trust should create a map of the existing green spaces in the area and analyse how well they deliver ecosystem services to the local environment and to the community. This step is crucial as it allows Lund Trust to understand the quantity, distribution, and type of green spaces in the area and their capacity. By mapping out the green space network, Lund Trust can recognise areas with a high demand for but low supply of green spaces, or gaps in ecosystem service provision.

When creating a map, Lund Trust should also incorporate data on deprivation and population to know if existing green spaces are accessible for all social groups. If socioeconomic deprivation such as low income, poor education, and poor health correlates with low amounts of green space, there is unequal access to green space in the area.

Table 9: Useful tools and data sources for step 2

Step	Description	Tools and data sources
Identify areas that need green space investment	Understand which areas are deprived of green spaces	<ul style="list-style-type: none"> • Friends of the Earth’s Green Space Gap map²⁷⁶ • ‘Near me’ tool²⁷⁷
	Use GIS to map out the local area’s existing green space network (including green space type, location, and quantity) and explore potential sites for investment	<ul style="list-style-type: none"> • Data obtained from local authorities (e.g., population density, environmental risks, deprivation data) • DEFRA Magic Map²⁷⁸ • Natural England’s Open Data Geoportal²⁷⁹ • DataShine census²⁸⁰

²⁷⁶ Friends of the Earth. (n.d.). *Access to green space in England*. Retrieved September 5, 2022, from https://friendsoftheearth.uk/nature/access-green-space-england-are-you-missing-out?_ga=2.66586734.1566093893.1662375440-427285841.1657806238

²⁷⁷ Friends of the Earth. (n.d.). *Near me*. Retrieved September 5, 2022, from <https://friendsoftheearth.uk/near-me>

²⁷⁸ *Magic Map Application*. (n.d.). Retrieved September 5, 2022, from <https://magic.defra.gov.uk/MagicMap.aspx>
This interactive map shows connectivity, access, and natural environment such as environmental schemes, and landscape types

²⁷⁹ Natural England. (n.d.). *Natural England Open Data Geoportal*. Retrieved September 5, 2022, from <https://naturalengland-defra.opendata.arcgis.com/>

This portal provides a wide range of data, including data on ancient woodland, priority habitat inventory, and so on.

²⁸⁰ Oliver O’Brien & James Cheshire. (2016). Interactive mapping for large, open demographic data sets using familiar geographical features, *Journal of Maps*, 12:4, 676-683 DOI: [10.1080/17445647.2015.1060183](https://doi.org/10.1080/17445647.2015.1060183)

This map shows census data by post code

		<ul style="list-style-type: none"> • Ordnance survey open greenspace²⁸¹ • English indices of deprivation 2019²⁸²
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STEP 2: UNDERSTAND THE LOCAL CONTEXT

An urban greening project should be appropriate for the local context. Urban greening projects should connect with local authorities and analyse local plans and strategies to know more about the local context, challenges, and priorities. They should also explore the settings and characteristics of the local area, including cultural, social, and geographical contexts.

In addition, projects should engage with local people and gather data on how and why they use green spaces, and their current concerns and preferences, in order to identify green space features that can appropriately address their needs. Gathering local perspectives is crucial when evaluating local priorities and green space quality, since local people are the most significant use group.

Table 10: Useful tools and data sources for step 1

Step	Description	Potential tools and data sources
Understanding the local context	Know the local priorities, context, and challenges	<ul style="list-style-type: none"> • Local plans and strategies²⁸³ • Consultation with local planning authorities who are responsible for development of land and resources (e.g., Sheffield’s Parks and Countryside’s Service, Richmond)

²⁸¹ Ordnance Survey. (n.d.). *OS Open Greenspace*. Retrieved September 5, 2022, from <https://www.ordnancesurvey.co.uk/business-government/products/open-map-greenspace>

This dataset provides the location of different types of green spaces, including allotments, playing fields, sport facilities, public parks, and so on.

²⁸² Ministry of Housing, Communities and Local Government (2019). *English indices of deprivation 2019*. <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>

²⁸³ Examples of local plans and strategies:

- North East Lincolnshire Council. (n.d.). *Green Space Strategy*. <https://www.nelincs.gov.uk/assets/uploads/2022/05/Green-Space-Strategy.pdf>
- City of Plymouth. (2009). *Plymouth’s Green Space Strategy 2008-2023*. <https://new.plymouth.gov.uk/sites/default/files/GreenSpaceStrategy.pdf>
- Sheffield City Council. (2010). *Sheffield’s Great Outdoors - Green and Open Space Strategy 2010-2030*. www.sheffield.gov.uk

		government's parkguards) <ul style="list-style-type: none"> Local people's responses collected through surveys, interviews, focus groups, etc.
	Gather data on the local settings and characteristics	<ul style="list-style-type: none"> Direct observation Local people's responses Consultation with local authorities
	Investigate the needs of young people in the local area	<ul style="list-style-type: none"> Voice opportunity power²⁸⁴

STEP 3: DECIDE THE SPECIFIC ISSUES TO TACKLE

Lund Trust should aim for multifunctional urban greening projects that can provide a wide range of ecosystem services and are accessible for all population groups. However, Lund Trust should still identify specific environmental or social issues it wants to particularly focus on to assist with monitoring and evaluating the environmental and social benefits of green spaces. In terms of environmental issues, air pollution, flood risk, waste, climate change, and increase in temperature are some major concerns in the UK. So, Lund Trust could place a heavier emphasis on those issues. As one of the main objectives of Lund Trust is to increase green space exposure for young people, addressing their needs and incorporating their voices into green space development and planning should be key components when Lund Trust evaluates urban greening projects. Lund Trust should support urban greening projects that aim to reduce the inequality gap and focus on groups affected by inequalities.

Table 11: Useful tools and datasets for step 3

Step	Description	Tools
Decide the specific issues to tackle	Focus on the environmental issues that most affect the local area	<ul style="list-style-type: none"> Local environmental data Local plans and strategies²⁸⁵

²⁸⁴ Voice Opportunity Power. <https://voiceopportunitypower.com/>.

This toolkit aims to foster conversation among young people and integrate their voices and opinions in the decision-making process.

Case study using this toolkit: <https://voiceopportunitypower.com/uploads/MYF-Case-Study-long.pdf>

²⁸⁵ Examples of local plans and strategies that identify priorities of the area:

- Sheffield City Council. (n.d.). *Green City Strategy*. Retrieved September 19, 2022, from <https://democracy.sheffield.gov.uk/documents/s30197/10-%20Green%20City%20Strategy%20Appendix%201.pdf>
- South Somerset District Council. (n.d.). *Environment Strategy*. Retrieved September 19, 2022, from <https://www.southsomerset.gov.uk/your-council/your-council-plan-and-strategies/environment-strategy/>

	Identify and focus on groups affected by inequalities	<ul style="list-style-type: none"> • Local data²⁸⁶ • Local plans and strategies
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STEP 4: QUANTIFY THE PROJECT'S BENEFITS

The last step involves evaluating the benefits of the project, including its ecosystem services and contributions to equity and inclusion in the local area. It is important to understand the ecosystem services, or the other benefits and functions, of urban greening projects to make an investment decision. Lund Trust can map and calculate the monetary values of ecosystem services to make an informed decision on which projects to invest in.

Monetary valuation of ecosystem services is not a novel idea, with cost-benefit analysis being the most widely used and well-known tool. This method represents the values of green space in monetary terms, so people understand better its contributions. Currently, the Greater London Authority uses natural capital accounting to calculate the economic value of public parks and green spaces in London. It demonstrates that green spaces contribute significantly to improving people's mental and physical health, storing carbon, and reducing temperatures. Representing green space benefits in monetary terms allows funders to better understand the value of different projects and make informed decisions²⁸⁷. Although natural capital accounting is gaining attention from both governments and businesses, it is not firmly established and might not be able to account for all the impacts of ecosystem services²⁸⁸. In addition, assigning monetary values to the non-physical benefits of green spaces can be challenging and contentious.

There has not been a widely approved approach that can evaluate the ecosystem services of an area. Therefore, Lund Trust should rely on proxies to categorise the ecosystem services and make it easier to calculate their monetary values²⁸⁹. For example, climate proxies or vegetation indices are suitable for calculating the productivity of ecosystem services, whereas species-based proxies can measure the quality of the habitat. However, to decide on which proxies to use, Lund Trust should consult with the local planning authorities and the communities to understand what they are most concerned about and use proxies that are relevant. Proxies should be appropriate for the scale of the area and the population number. For a small area, Lund Trust should use data garnered at higher and finer spatial resolution instead of large-scale spatial resolution to effectively inform green space creation or management at the local scale²⁹⁰.

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- Greater London Authority. (n.d.). *London Environment Strategy*. Retrieved September 19, 2022, from <https://www.london.gov.uk/what-we-do/environment/london-environment-strategy>

²⁸⁶ Examples of data: Local income deprivation data (<https://www.ons.gov.uk/visualisations/dvc1371/#/E07000223>)

²⁸⁷ National Trust, Heritage Lottery Fund, & Mayor of London. (2017). *Natural capital accounts for public green space in London*. https://www.london.gov.uk/sites/default/files/11015viv_natural_capital_account_for_london_v7_full_vis.pdf

²⁸⁸ Weber, J.-L. (2014). *Ecosystem Natural Capital Accounts: A Quick Start Package*.

²⁸⁹ Brown, C., Reyers, B., Ingwall-King, L., Mapendembe, A., Nel, J., O'farrell, P., Dixon, M., & Bowles-Newark, N. J. (2014). Measuring ecosystem services: Guidance on developing ecosystem service indicators. In *UNEP-WCMC*.

²⁹⁰ Stephens, P. A., Pettorelli, N., Barlow, J., Whittingham, M. J., & Cadotte, M. W. (2014). *Management by proxy? The use of indices in applied ecology*. <https://doi.org/10.1111/1365-2664.12383>

In addition, previous findings have demonstrated the importance of incorporating equity in the allocation of green space to ensure that everyone can benefit from green space. As a result, Lund Trust should conduct equalities impact assessments to understand how a project can protect and ensure the rights of groups of protected characteristics. The equalities impact assessment should align with the Equality Act 2010.

Table 12: Useful tools and datasets for step 4

Step	Description	Tools
Quantify the project's benefits	Understand the ecosystem services the project can deliver	<ul style="list-style-type: none"> • Urban greening factor²⁹¹ • Natural capital accounting²⁹²
	Investigate the impacts of the project in reducing inequity	<ul style="list-style-type: none"> • Equalities impact assessment according to the guidelines of the Equality Act 2010²⁹³

²⁹¹ Mayor of London. (2021). *Urban Greening Factor (UGF) guidance*. <https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/london-plan-guidance/urban-greening-factor-ugf-guidance>

²⁹² National Trust, Heritage Lottery Fund, & Mayor of London 2017

²⁹³ Example: South Gloucestershire Council. (n.d.). *Greener Places Strategy 2021 - Equality Impact Assessment*. Retrieved September 19, 2022, from <https://beta.southglos.gov.uk/wp-content/uploads/Green-Infrastructure-Strategy-Equality-Impact-Assessment.pdf>

Chapter five: Conclusion

This final chapter outlines recommendations that Lund Trust should consider while working on an urban greening project. The researcher consolidates the recommendations from research findings from previous chapters and insights from experts. In addition, it discusses the research's limitations and future directions.

RECOMMENDATIONS FOR LUND TRUST

CO-DESIGN THE PROJECT WITH DEVELOPERS AND CITIZENS

Lund Trust should work in partnership and co-plan with green space managers, developers, and consultants from devising a vision for the green space to co-designing features, and developing, and delivering the project. Direct engagement in every phase of the project, from inception to completion, helps ensure that the project takes into consideration the standards of the framework and conducts all the essential assessment and background work.

In addition, to ensure the successful outcomes of the project, it is important to involve recipients of the benefits of green spaces in the process of planning and managing green spaces. Lund Trust should consider funding projects that attempt to communicate with groups that are currently disengaged and are not represented in green spaces. The projects should build partnerships with representative community groups to enhance their relationships with the local communities. They should especially reach out to the young population of the area to understand their perspectives and encourage them to participate in the planning of green spaces. This way, Lund Trust can ensure that young people's voices are heard, and the projects can contribute positively to their lives. Overall, engaging with the residents and allowing them to co-design their local spaces can build trust, promote potential use of the spaces, and deliver successful outcomes across social groups.

There is also a need to engage with the public sector and local authorities. Green space planning should take into consideration local policies and priorities and aim to help tackle local social and environmental challenges. Furthermore, local authorities have the data that can inform project planning and scoping and can provide advice and guidance on how to tailor the project to best suit the local context.

Lund Trust should also consider forming partnerships with organisations that have the same interests in the area or in the project. Collaboration with other organisations can bring more funding to the projects and allows Lund Trust to fund other projects that meet its objectives.

Partnership and co-design approaches allow for the development of a green space that can meet the community's identified needs, deliver a wide range of essential ecosystem services, and address local challenges. Engaging with different community groups and empowering them to participate in decision-making can help narrow the inequity gap and push for systemic change toward a just, inclusive, and sustainable neighbourhood.

PLACE THE RESIDENTS, PARTICULARLY THE DISENGAGED, AT THE HEART OF GREEN SPACE PLANNING

One of Lund Trust's objectives is to ensure everyone can benefit from green spaces. Therefore, the planning, design, and delivery need to be inclusive of different social perspectives and nobody should feel excluded from entering or using green spaces. Lund Trust should require the project to conduct stakeholder mapping to identify the groups or individuals who are involved in or affected by the project as well as their interests or concerns. It should then devise suitable engagement strategies that leverage the identified actors' participation in the project.

Citizen engagement in the decision-making processes has evolved from being informed to the integration of local voices to co-design, where people play an active role in shaping the project. The concept of citizen engagement is important in the green space context as people are the end-users and recipients of green space benefits. Lund Trust should require the project to investigate the area's demographic structure and challenges and consult directly with the local community to understand their needs and demands. It is important to not only consult with people who are using green spaces, but also those that are not represented. The project should consider visiting places such as schools or community centres to engage with the wider community. This way, the project can formulate specific requirements for the project that align with the local people's interests.

In addition to funding urban greening projects, Lund Trust can empower local people to shape their own environment through organising workshops, seminars, or discussions on this matter. These platforms can also be useful for collecting and identifying local people's needs and demands. Lund Trust can take advantage of the collected data for future research. One example of an investment programme that focuses on educating communities is Grosvenor's Greener Futures. This programme lasts from 2021 to 2025 and aims to improve the access to nature of disadvantaged young people, empower communities to take climate action, and provide training for green skills. This programme has funded nine different community projects since 2022²⁹⁴.

²⁹⁴ Grosvenor. (n.d.). Greener Futures. <https://www.grosvenor.com/greenerfutures>

Since research has shown an absence of young people in the decision-making process, Lund Trust should attempt to raise awareness and build knowledge among young people about the importance of green space for their lives. It can organise different programmes to facilitate sustained engagement of young people into the development, delivery, and management of their local green space.

GO BEYOND SPATIAL DISTANCE TO GREEN SPACE

Spatial proximity and quantity have always been the main measures of accessibility to green space. Many policies and guidelines, including the Accessible Natural Greenspace Guidance and the Woodland Access Standard, focus on defining the ideal distance to the nearest green space and the number of green spaces an area should have. However, in addition to spatial proximity and quantity, there are others that can determine green space access. They include the quality and equity of green space. As mentioned in previous chapters, people might not use green space if it does not have the essential features, and certain populations have less access to green space compared to others. Therefore, it is important to recognise the multifaceted aspects of accessibility in terms of not only quantity, spatial proximity, but also quality. This research also suggests viewing accessibility under the lens of social justice since there is inequitable access to green space among different socio-economic groups.

From a social justice perspective, access means eliminating the barriers that hinder people from using the space. Therefore, green spaces should cater to the physical and wellbeing needs of local people, especially those identified to be underrepresented in green spaces. The spaces should have facilities that are important for different populations. For example, older people tend to appreciate clean and well-managed paths and seating whilst teenage girls and young women value clean toilets. Lund Trust should make sure the urban greening projects have features and amenities that all social groups can use.

Educating and raising awareness about local green space can also help improve access and usage. People might not be aware of where green spaces are and may not have a sense of community ownership over a green space. Therefore, urban greening projects should attempt to involve the community in the planning and management of green space and make clear that it is constructed for people's use. To further increase awareness about the green space, urban greening projects should provide information about how to access the green space via different transportation modes.

FOCUS ON HAVING A MANAGEMENT AND MAINTENANCE PLAN

It is crucial to plan for the whole life of a green space to make sure that it can provide continual benefits to the local community. Lund Trust should choose urban greening projects that have a clear maintenance and management plan and consider the future needs of local people. Lund Trust might also want to identify potential partners that could help with the maintenance and

management of green spaces. The partners can be community groups, local environmental groups, or local planning authorities.

CLEARLY DEFINE ROLES AND RESPONSIBILITIES

Good quality green space requires a long-term approach to funding, maintenance, monitoring, and assessment. Therefore, there should be a plan to ensure that green space can provide long-term benefits to the local community and environment.

The roles and responsibilities of governance bodies involved in the green space projects should be clear. If the scale of the project is large, it is likely that many different partners will participate in the development and management of green space. So, to ensure efficiency and transparency, the project should clarify the governance structures and the responsibilities of those in charge. Importantly, there needs to be involvement of local communities and/ or local planning authorities to guarantee that the green space is responsive to the local people's needs and suitable for the characteristics of the local area.

USE EVIDENCE TO EVALUATE THE POTENTIAL IMPACTS OF THE PROJECT

To ensure that the project is essential for the local area and has the potential to deliver all its promised benefits, Lund Trust should collect and analyse the relevant quantitative and qualitative data. Quantitative data such as population statistics, location of green spaces, and deprivation data can provide Lund Trust with a snapshot of the green space situation in the local area. On the other hand, qualitative data such as people's responses to surveys and interviews can shed light onto their specific needs and allows Lund Trust to assess whether the urban greening project meets local people's needs. Due to the variety of data needed, Lund Trust should collaborate with different organisations to facilitate the data gathering process. For example, to gather local people's perspectives, Lund Trust should work with community groups. When collecting data on location of green space within a local area or population density, Lund Trust should consult with the local planning authorities.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Due to time constraints, this research could not delve more deeply into each topic. Particularly, this research does not use a systematic method to analyse the existing literature. It was also able to interview only seven people. It might be useful to conduct more interviews as well as focus group discussions among experts in order to polish the framework. In addition, future research could conduct further investigation into the policies and guidelines on green space management and planning. To avoid subjectivity, more researchers should participate in the process of evaluating the policies and guidelines against predefined criteria.

Future research should also explore what types of projects (conservation, improvement, restoration, and creation) are the most transformative. More research should assess the ecosystem services provided by different types of green space to know which one can generate the most values to the community.
