Exploring Ecourbanism: A Whole-Systems Approach to Healthier Cities, People, and Environments

Luke Engleback [1], Alessio Russo [2]

[1]Studio Engleback, Tunbridge Wells, UK, [2] School of Architecture and Built Environment, Faculty of Engineering, Queensland University of Technology, Brisbane, Australia

Abstract

This paper explores the intersection of urban design, human health, and environmental sustainability, proposing Ecourbanism as a transformative approach to creating salutogenic, resilient cities. Building on the World Health Organization's Ottawa Charter (1986), which emphasises that health promotion extends beyond the health sector, Ecourbanism advocates for a regenerative, bottom-up approach to urban planning that fosters both human and environmental wellbeing. The paper highlights the importance of biodiversity in human health, particularly through the human microbiome, which is shaped by environmental exposures and essential for physical and mental wellbeing. However, modern urban living often disconnects us from nature, and contributing to the rise of non-communicable diseases, which are now the leading cause of death globally.

Given the significant role that cities play in climate change, biodiversity loss, and pollution, the paper argues that urgent action is needed to address these intertwined health crises. It demonstrates the Ecourbanism approach integrating green and blue infrastructure, promoting biodiversity, and fostering community engagement—can address these challenges. Thinking holistically and in systems enhances ecosystem services that support community wellbeing, promote physical activity, combat loneliness, and ultimately enable human flourishing.

The aim of the paper is to show how Ecourbanism, as a landscape-led whole-systems design philosophy, offers a solution to the urgent need for transformational change in urban environments. By prioritising environmental quality and human health, Ecourbanism proposes a shift towards regenerative urban landscapes, where traditional grey infrastructure is replaced by nature-based solutions that improve soil health, reduce carbon emissions, and foster resilience. These urban spaces, interwoven with nature, will require new frontline workers who manage and tend to the living environment, complementing public health professionals in the delivery of co-benefits such as increased biodiversity, water and thermal regulation, urban food production, and improved health outcomes.

As the global community works towards the 2030 Sustainable Development Goals and major carbon emission cuts, the paper concludes that now is the critical time to act. By adopting the Ecourbanism approach, cities can transform into healthier, more sustainable environments, ensuring a resilient future for both people and the planet.

Introduction

The climate and biodiversity crises are deeply interconnected and exacerbated by population growth and urbanisation, further intensifying public health inequities. The United Nations Environment Programme (UNEP), through its call to 'Make Peace with Nature,' highlights evidence from global environmental assessments, emphasising that the Sustainable Development Goals (SDGs) provide a unified framework to address these compounded challenges.

Whilst urban areas only occupy around 2-3% of global land (metrics vary), their vast global footprints extend across the Earth. These vary, 2.2global hectares/person in Alexandria, Egypt, 4.5-5.5 gha/person for many European Cites, Egypt, 7.1gha/person in San Francisco (Baabou, W. et al 2017) demonstrating urban populations and lifestyles have a significant effects beyond cities (Kronenberg et al 2024). Quaranta et al showed that greening 35% of the European Unions' Urban Surface would decrease urban temperatures 2.5-6˚C, reduce energy demand for cooling by up to 92TWh/year avoiding +/-55.8Mtons year^{-1}CO_{2e}, whilst the transpiration of 10km^3 rainwater year^{-1} would convert 17.5% of 'blue' urban runoff into 'green' water reducing downstream pollution and flooding. Additionally, London's Natural Capital Accounts (2017) showed that public greenspaces had prevented £950 000 000 in avoided hospital admittances. Cities are drivers of the global economy, which in its current form is harming our life support systems. Kate Raworth's 'Doughnut Economics' (2017) established a safe and just space for humanity located between a social foundation based on the SDGs and the ecological ceiling of the nine planetary boundaries. The Danish Architectural Press adapted this concept in the 'Doughnut for Urban Development' (2023), promoting regenerative and distributive design. This combination of issues provides a strong rationale to amend or create better urban environments for people and planet; this requires simultaneous multi-scale thinking in systems rather than silos.

The urgency to achieve key environmental and equality goals in the SDGs by 2030 is intensified by the combination of rapid urbanisation and rising ageing populations in developed countries, alongside major health and equity challenges in developing nations (Racioppi *et al.* 2020). By 2030, 60% of the global population will be urban, rising to 70% by 2050 (United Nations 2018). Urban living without nature has an adverse effect on health, and Kondo et al. (2018) show a favourable correlation between exposure to urban green spaces and physical activity, attentiveness, and mood, as well as a consistent negative correlation with mortality, heart rate, and violence. Moreover, it is the quality and proximity of the green space and vegetation that matters for human health and wellbeing whether filtering the air, mitigating heat, or improving the urban aerobiome (Files et al, 2020), or emitting scents that have beneficial psychological and physiological effects (Willis, 2024).

Achieving transformational change in urban areas requires amended planning laws and regulations that require Environmental Net Gain to promote planning/design for human health and environmental resilience. In 2015, 175 countries committed to deliver the 17 Sustainable Development Goals by 2030 (UN General Assembly 2015, Racioppi *et al.* 2020). Of these,

SDG 3 ‘Good Health and Wellbeing’ recognised the importance of health in all ages to make a sustainable future, and SDG 11 ’Sustainable Cities and Communities’ focuses on making cities and human settlements inclusive, safe and sustainable (UN General Assembly 2015). Target 11.7 states that access should be provided to safe, inclusive green and public spaces (UN General Assembly 2015). Current urban planning frameworks often fail to recognise the importance of holistic re-greening in addressing today’s environmental challenges. The urban landscape, which includes diverse streetscapes, plazas, alleys, and boulevards, as well as parks, frequently falls short of meeting tree cover targets. These spaces, as the most frequently used public areas, offer significant opportunities for creating healthier, greener urban environments. However, much of the existing research treats climate change, biodiversity loss, and public health equity as separate issues, overlooking the potential benefits of an integrated approach.

The aims of this paper are to explore ‘Ecourbanism’ as a holistic approach for the regreening of the urban fabric, focusing on designing healthier, greener streetscapes that enhance both human and environmental well-being while showcasing the multiple benefits of green infrastructure investments.

Ecourbanism: A Landscape-Led Approach to Regenerative Urbanism

Ecourbanism is a landscape-led, regenerative, whole-systems approach to planning and design that fosters healthier and more equitable urban neighbourhoods while addressing the interconnected challenges of climate change and biodiversity loss. This approach draws inspiration from Ian McHarg’s seminal work Design with Nature (1969) and Donella Meadows’ principles of systems thinking (Thinking in Systems, 2008). It is also informed by Nigel Crisp’s maxim, “Health starts at home, hospitals are for repairs” (Crisp 2020), and the argument by Davies and Pearson-Stuttard (2020) that the terms environmental ‘drivers’ as opposed to ‘determinants’ of health embraces opportunities change. Urban environments for better health outcomes.

The term Ecourbanism was first introduced by Ruano more than 25 years ago in a review of 60 projects, including one in which the author had participated. Ruano defined it as “the creation of multi-dimensional sustainable human communities within harmonious and balanced built environments” (Ruano 1998, Bibri 2020). Since 1998, Studio Engleback has further developed Ecourbanism, grounding urban design in the principles of ecological sustainability and integrating natural systems with social processes. This synergy enables dynamically interactive and collaborative outcomes that exceed the sum of their parts, particularly when addressing the threefold dimensions of sustainability: environmental, social, and economic (Bibri and Krogstie 2019, Bibri 2020).

For a discipline that bridges science and the humanities, the late E.O. Wilson’s emphasis on the importance of “synthesizers, people able to put together the right information at the right time, think critically about it, and make important choices wisely” (Consilience: The Unity of Knowledge, 1998) holds particular relevance. Figure 1 illustrates the Ecourbanism approach and its connection to salutogenic design principles, which enhance human health and foster environmental resilience through a whole-systems design philosophy.

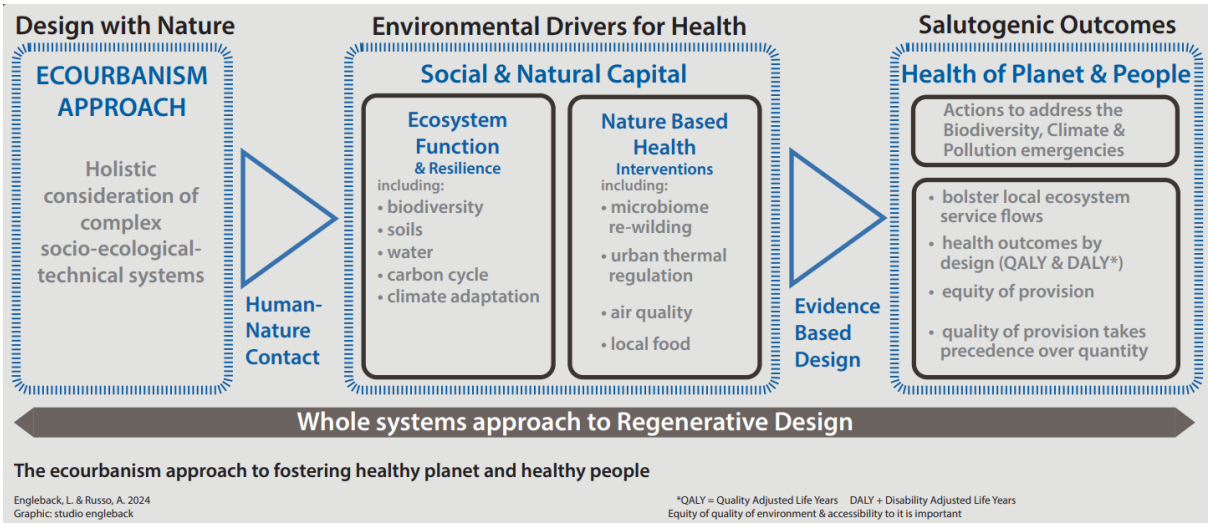

Figure 1: Ecourbanism Approach to Health and Environmental Resilience.

The figure highlights the integration of socio-ecological-technical systems (McPhearson *et al.* 2022) to foster human-nature interaction and evidence-based interventions, enhancing both social and natural capital. Environmental drivers such as biodiversity, soil health, water management, carbon cycling, and climate adaptation are central, leading to salutogenic (health-promoting) outcomes. These including augmentation of human microbiome , urban thermal regulation, and air quality improvement. By prioritising local ecosystem service flows and equitable, high-quality environmental provision, the approach addresses urgent biodiversity, climate, and pollution challenges. This design philosophy highlights regenerative design principles and refers to the quality of life and disability-adjusted life years (QALY & DALY) as metrics for health outcomes.

Ecourbanism: A Systems Thinking Approach – From Microbe to Macro

Ecourbanism operates as a systems thinking approach, spanning from the microbe to the macro level, acknowledging the interconnectedness of all components in urban environments. Recent research on the human 'exposome' has highlighted the profound impact of the invisible environmental factors on our health over time, underscoring the importance of the environments in which we live (Münzel et al. 2023). For ecosystems to function optimally and remain resilient in the face of change, biodiversity must be present at all trophic levels. Design approaches that create niches, foster diversity, and allow for elements such as unsealed urban soils are essential to supporting this biodiversity.

The benefits of green living environments—compared to grey, built environments—are increasingly evident, particularly in educational settings. Research has demonstrated that green spaces can enhance children's cognitive abilities and attention spans (Dadvand et al. 2015, Vella-Brodrick and Gilowska 2022, Russo and Andreucci 2023). Additionally, a Finnish study has revealed the positive effects of introducing nature and soil into typically sterile preschool playgrounds. This intervention not only improves children's microbiome diversity but also strengthens their immune systems (Roslund et al. 2020). These findings further highlight the importance of integrating natural systems into urban design to promote both human and environmental health.

Ecourbanism: A Bottom-Up Approach to Urban Planning and Design

Ecourbanism advocates for a bottom-up approach to urban planning, contrasting with the limitations of traditional top-down methods. While a coordinated green/blue network strategy provides a broad framework for interventions, the true value lies in investments in numerous small-scale, achievable local greening projects, both in existing urban areas and new housing developments. This approach prioritises community-led design and co-design, ensuring that local needs and perspectives are at the heart of the process rather than imposed from above.

Deploying Nature-Based Solutions to enhance city infrastructure yields a range of benefits. For example, the Natural Capital Accounts for London revealed at east a £27 return on every £1 spent on public greenspace. London is now planning to increase its tree cover by 10%, adding approximately 3,300 hectares to its 'urban forest' to mitigate the urban heat island effect and promote health and well-being. This bottom-up approach mirrors the way nature itself operates—through gradual, interconnected processes that yield collective benefits over time. It also serves as a mechanism for engaging communities, enabling them to shape their environment rather than have it dictated through top-down planning.

Ecourbanism: A Key Component of Environmental Net Gain & Salutogenic Design

Ecourbanism promotes Environmental Net Gain and Salutogenic Design, addressing the need for both ecological sustainability and human well-being. In England, there are legal requirements to reduce carbon emissions and increase biodiversity in all new developments. However, these measures do not yet extend to environmental net gain or salutogenic design principles. This gap must be addressed to ensure that the benefits of urban planning extend to the creation of the proposed 1.5 million new homes and reduce demands on overstressed healthcare system.

Prioritising human and environmental health simultaneously is essential, as it leads to positive knock-on effects not only for individual well-being but also for productivity and the economy. In the planning of new streets, space must be allocated for interconnected green/blue infrastructure, replacing the 'business-as-usual' approach that relies on high-embodied carbon underground solutions. These traditional systems often divert surface water to remote locations, rather than utilising it as a resource to create healthier and more enjoyable living environments.

There is no single solution to achieving this transformation, but multiple pathways can lead to significant positive change. The examples in Figure 2 illustrate how Studio Engleback's Ecourbanism approach contributes to this shift, demonstrating how thoughtful, integrated design can foster both environmental resilience and human health.

Figure 2: Examples of projects by Studio Engleback, a UK-based environmental design practice specialising in ecourbanism. Their whole-systems approach to planning and design delivers innovative solutions for regenerative urban development. Projects shown: (a, b) Watercolour, Redhill, Surrey; (c) Loftus Garden Village, Newport, Wales; (d) Cashes Green, Stroud, Gloucestershire; (e, f) Chippenham Cattle Market Quarter, Wiltshire; (g, h, i) Cannock Mill, Colchester, Essex (winner of the SALUS Best Healthy Neighbourhood 2024, Architect: ATAP, Client: Anne Thorne); (j) The Triangle, Swindon, Wiltshire. (Photos: L. Engleback)

Linking Ecourbanism with the Healthy City Generator

Ecourbanism's emphasis on creating healthier, greener urban environments aligns closely with the objectives of the newly launched Healthy City Generator tool, developed by EIT Urban Mobility. This interactive, evidence-based tool utilises 20 urban determinants of health, 30 health indicators, and a database of average healthcare costs in the EU to estimate the monetary health benefits of designing streets and neighbourhoods in specific ways. By prioritising nature-based solutions, interconnected green/blue infrastructure, and community-led design—core principles of Ecourbanism—cities can foster environments that not only enhance environmental sustainability but also reduce healthcare costs, as demonstrated by the Healthy City Generator tool.

For example, a pilot study presented at the SALUS Healthy City Design International Conference in October 2024, which focused on a major urban landscape project in Bradford, a former mill town, predicted health-related savings of over €70 million annually. These savings, which span both physical and mental health improvements, reinforce the importance of integrating Ecourbanism's regenerative design principles into urban planning. In this way, the Ecourbanism approach directly supports the growing recognition that urban design has a

profound and measurable impact on public health outcomes, ultimately contributing to reduced healthcare costs and improved quality of life for urban residents.

Conclusions

In conclusion, this paper illustrates how Ecourbanism offers a comprehensive, landscape-led approach to urban planning and design, advocating for the integration of ecological sustainability with human health. The examples provided, particularly through the work of Studio Engleback, demonstrate how Ecourbanism fosters regenerative urban environments that tackle climate change, biodiversity loss, and public health inequities. By drawing on foundational theories such as Ian McHarg's Design with Nature and Donella Meadows' systems thinking, this paper showcases Ecourbanism's potential to create more equitable and resilient cities.

Ecourbanism spans both micro and macro levels, emphasing the interconnectedness of all urban components. It highlights the importance of biodiversity, the human exposome, and the integration of green spaces into urban environments, which can enhance cognitive abilities, immune function, and overall health. The approach also advocates for a bottom-up planning model that prioritises community-led design and Nature-Based Solutions, as opposed to top-down approaches that often overlook local needs.

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Authors Biography

Luke Engleback, CMLI FRSA, is a Chartered Landscape Architect and Ecourbanist based in the UK. He founded Studio Engleback in 1999 and brings nearly 40 years of experience in landscape architecture and ecourbanism. Since 1984, Luke has taught at the university level and regularly presents on ecourbanism, biodiversity, climate change adaptation, and health, both in the UK and internationally. A former member of the INTEGER Intelligent & Green think tank (1999–2005), he currently works with 'Our Green Group.' He stays updated through Nature and Science, integrating insights into design practices. He became a Fellow of the RSA in 2022.

Alessio Russo, PhD, is a Senior Lecturer in Landscape Architecture at the School of Architecture and Built Environment. Prior to joining QUT, Dr Russo held senior academic positions at the University of Gloucestershire, UK (Senior Lecturer, 2019–2024), RUDN University in Moscow, Russia (Associate Professor, 2018), and FEFU, Vladivostok (Professor and Head of the Laboratory of Urban and Landscape Design, 2016–2018). Dr Russo's research focuses on regenerating cities through nature-based solutions that provide multiple ecosystem services, such as thermal comfort, food production, pollution removal, and water runoff reduction.