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Perspective

Renaturing for Urban Wellbeing: A Socioecological Perspective on Green Space Quality, Accessibility, and Inclusivity

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Abstract: This perspective examines renaturing cities, the strategic reintroduction of nature, as a potential solution to the negative health impacts of rapid urbanisation. By utilising nature-based solutions to maximise ecosystem services and reintegrate human and natural systems, renaturing offers access to high-quality, accessible green spaces. Studies suggest such access is associated with reduced depression, high blood pressure, and cardiovascular disease risk. Renaturing also presents opportunities for physical activity and daily exposure to nature, which can further enhance well-being and happiness. However, challenges include ensuring equitable access to these spaces and avoiding gentrification. To achieve this equitable distribution and ensure the project truly benefits the community, a bottom-up approach involving residents in the planning process is crucial. Longitudinal studies and evidence from design projects are necessary to understand which types of nature-based solutions can most effectively improve wellbeing and happiness for disadvantaged groups. Further research is needed to better refine the renaturing concept, as it is sometimes used interchangeably with other similar but distinct approaches.

Keywords: biodiversity; public health; green infrastructure; nature-based solutions; urban regeneration

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Citation: Russo, A. Renaturing for Urban Wellbeing: A Socioecological Perspective on Green Space Quality, Accessibility, and Inclusivity. *Sustainability* **2024**, *16*, 5751. https://doi.org/10.3390/su16135751

Academic Editors: Rui Leandro Maia and Nelson Barros

Received: 1 June 2024
Revised: 1 July 2024
Accepted: 2 July 2024
Published: 5 July 2024

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1. Introduction

Urbanisation is rapidly changing the quality of the built environment, with most of the world's population now residing in cities. This trend comes with a cost that impacts the quality of life and has detrimental health effects [1,2]. One such effect is the increased risk of chronic diseases [3]. Shrinking green spaces have a negative impact on our daily contact with nature [4], which is scientifically proven to be crucial for human wellbeing [5–8]. The theory of biophilia, which suggests humans have an innate need to connect with nature, lays the groundwork for understanding our connection to nature [9]. Building on this foundation [10], theories developed in the late 20th century, such as Attention Restoration Theory (ART) proposed by Kaplan and Kaplan (1989) [11] and Kaplan (1995) [12], support the idea that exposure to nature can help restore mental fatigue and improve our ability to concentrate after our attentional capacity has been depleted by urban environments [10,12–14]. On the other hand, Ulrich et al. (1991) [15] proposed the Stress Recovery Theory (SRT), which suggests that exposure to natural environments can alleviate psychological and physiological stress [16]. Studies have further demonstrated that spending time in nature can reduce stress, improve mental health, decrease anxiety and rumination, and boost cognitive function [7,17,18]. It can also lead to increased brain activity, lower blood pressure, and reduced cortisol levels and feelings of loneliness [19–21].

However, the rise of the 'Homo urbanus' [22] or 'indoor generation' raises concerns about the health consequences of limited exposure to nature. Cox et al. (2018) [23] utilised a nature-dose framework to examine the association between urbanisation and nature exposure in a UK population of 3000. Their findings revealed a negative exponential relationship, with decreasing frequency, duration, and intensity of nature interactions

as levels of urbanisation increased. While weak positive correlations emerged between nature dose and all health domains (depression, self-reported health, social cohesion, and physical activity), the study suggests that specific aspects of nature exposure hold stronger positive associations with certain health outcomes, particularly in urban environments [23]. Interestingly, residents in highly urban areas with low nature dose exhibited poorer health across multiple domains but also presented the greatest potential for health gains through increased exposure to nature [23]. Furthermore, the study demonstrated that the environment surrounding the home is a key factor influencing nature dose. Residents of rural areas tend to experience more frequent weekly exposure to nature compared to their urban counterparts [23]. Additionally, the study also found that people in towns and cities had a greater sense of community when there was more greenspace surrounding the house [23].

This highlights the importance of supporting the development of a connection to nature [23], for example improving green spaces' access, quality, and quantity as explicitly required by UN SDG target 11.7: "By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities" [24]. The urgency for such action is further amplified by the recent COVID-19 pandemic, which has further removed us from contact with nature, impacting mental health [25,26]. This underlines the need to invest in improving access to urban green spaces and renaturalising our cities. The 19th-century cholera outbreaks provide a clear example of how concerns about public health led to the development of some of the world's most well-known urban landscapes [27].

One such figure impacted by these outbreaks was landscape architect Frederick Law Olmsted. Driven by the personal loss of a child to cholera, Olmsted became a strong proponent of the miasmatic theory, which held that disease spread through "bad air" [27]. He envisioned parks as 'urban lungs' that could purify the air, and his writings emphasised the importance of open spaces for access to fresh air and sunlight [27]. Following the devastating cholera outbreak in New York, Olmsted collaborated with Calvert Vaux to design Central Park, a project that promoted the implementation of over a hundred public parks across the United States [27].

In 1839, in the UK, physician William Farr recognised the potential of public parks for improving health [28,29].

His report argued that creating a park in London's eastern reaches could lead to a substantial decline in mortality rates, potentially saving thousands of lives for the entire population [28,29]. Particularly for the underprivileged residents, these improvements would offer significant health benefits [29]. Influenced by Farr's report, residents submitted a petition to Queen Victoria in 1840, urging the creation of a park in the Tower Hamlets district [29,30]. The subsequent Act of Parliament passed in 1841 established London's, and indeed the world's, first public park designed specifically to address the needs of local communities [30]. The architect James Pennethorne (1801–1871) took the lead on designing the park, while botanist Samuel Curtis (1779–1860) oversaw plant selection [31]. Pennethorne's initial design from 1841 underwent revisions before construction commenced in 1842 [31]. The park finally opened its doors to the public in 1845 [31]. Victoria Park swiftly became a popular destination for working-class families seeking refuge from the cramped living conditions prevalent in the East End [32].

The construction of urban parks in the mid-1800s, driven by public health concerns, has influenced the health geography of contemporary cities [29], and the health benefits of greenspaces have attracted policymakers' attention since then [33].

Nowadays, scientific studies are finally quantifying the 'daily dose' of nature [34–37] we need for wellbeing, and GPs are prescribing this dose through green prescribing programmes [38–40], highlighting its positive impact on mental and physical health. This reinforces the long-held intuition about the benefits of spending time in nature. Inspired by Biophilia Theory, researchers have conducted studies, including correlational and experimental designs, to explore the restorative and synergistic effects of spending time in nature on human health and wellbeing, revealing associations between nature affiliation (or nature

immersion) and positive indicators of mental health [41]. Alongside these studies, several reviews have specifically examined the mental health benefits of blue spaces (e.g., rivers, lakes) [42,43] and green spaces (e.g., parks, forests) [44,45]. This association is reinforced by a recent systematic review on urban green spaces and happiness, which emphasises their contribution to urban happiness [46]. However, subjective measurements, sociodemographic characteristics, and socioeconomic issues, particularly in the global south, all affected how strong these connections were [46]. For instance, Kwon et al. (2021) [47] investigated the link between green spaces in cities and happiness across developed countries. Analysing data for 60 nations, the study found a positive correlation—countries with more green spaces tended to have happier citizens [47]. This connection was stronger in wealthier nations, where, while economic prosperity mattered for happiness, green space became more important once a certain level of wealth was achieved. Social connections seemed to be a key factor, with green spaces potentially increasing happiness by fostering them among people [47]. However, there are concerns about equitable access to these happiness-boosting green spaces, with residents of deprived areas often experiencing limited availability. Furthermore, research on green gentrification suggests that new green infrastructure, particularly greenspace development, can exacerbate environmental and climate injustice [48]. This occurs when increased access to green spaces fosters social and racial disparities in who benefits from their associated advantages [48].

A study by Wen et al. (2013) [49] examined access to parks and green spaces in the USA. They found that in urban areas, levels of poverty and percentages of minority ethnicities (Black and Hispanic) were not negatively associated with park access (distance). In fact, there was a surprising trend of these areas being closer to parks [49]. However, this might not translate to better park utilisation due to limitations in social access [49]. Green space coverage, however, did follow the expected pattern, with lower coverage in deprived urban neighbourhoods [49]. In rural areas, the picture was reversed. Poverty was positively associated with green space, while the relationship between race/ethnicity and park access was less clear [49].

In Europe, Csomós et al. (2021) [50] examined how socio-economic factors and residential areas affect access to urban green spaces in three Hungarian cities. The study found that wealthier residents have better access to urban green spaces, while lower-income groups often live in areas with limited green spaces [50].

The environmental health literature emphasises the importance of both the quantity and quality of urban green spaces [51,52]. Understanding this link is crucial for understanding the rationale behind urban green space use and its effects on human wellbeing and health [51]. Therefore, ensuring not only the quantity of green spaces but especially equitable access to high-quality urban green spaces for all is essential to achieve social justice [52,53]. In recent years, a growing body of research has emerged, proposing various approaches or terminologies for incorporating nature into cities. These approaches include 'Bringing nature back into cities' [54], urban rewilding [55–57], renaturing [58,59], biophilic cities [60], and urban reforestation [61], along with the 3-30-300 rule [62,63]. They aim to address land consumption and the biodiversity emergency, while improving quality of life, biodiversity, the human-nature connection, and access to green spaces [54,59,61–64].

Such approaches have also been promoted by developers, which are examples of greenwashing, as they emphasise ecological values in their promotions to gain public support for their projects, even though these claims may not reflect their true environmental impact [65]. Therefore, development projects often involve actions like deforestation and the removal of informal recreational spaces [65,66], and they cannot be identified as projects for renaturing.

However, a research gap exists in understanding the terminology used in approaches such as renaturing cities and the potential benefits they can bring. Further exploration is needed to clarify the definitions and implications of terms like 'renaturing' and to determine the specific health and environmental advantages they may offer in urban settings. In addition, while the potential of urban nature to address public health challenges in a rapidly

urbanising world is increasingly recognised, significant knowledge gaps remain [35]. This is particularly true regarding the optimal dosage of nature exposure for human health benefits [35]. Current research offers limited guidance on the frequency, duration, and specific characteristics of urban nature that are most effective in mitigating the public health consequences of urbanisation [35].

Consequently, more research is necessary to explore both the terminology and potential benefits of renaturing initiatives, particularly concerning public health. In response to this research gap, this paper first examines the concept and challenges of renaturing cities—strategically incorporating nature back into urban environments. Then, based on the literature, it discusses the potential mental health and physical benefits of renaturing in order to address the following research question: Can renaturing be an approach to provide access to high-quality, usable green spaces, thereby promoting wellbeing, happiness, and a healthier urban future for all?

2. The Concept of Renaturing Cities

The concept of renaturing cities represents a critical response to pressing global and societal challenges [67]. This is achieved through the implementation of green infrastructure (GI) and other nature-based solutions (NBS) in the urban environment [68]. This approach contrasts with the dominance of grey infrastructure in poorly designed cities [68]. Mitigating this imbalance has the potential to increase cities' resilience to environmental hazards [68].

In the pursuit of sustainable cities, renaturing presents an opportunity to bridge the gap in connection between human and nature [58]. As argued by Casagrande and Vasquez (2010), it represents "an intentional and reflective attempt to restore human relationships with natural processes of ecosystems" [69] (p. 195), moving beyond a sole focus on biophysical restoration [58,69]. This emphasis on human–nature reconnection positions renaturing as a key pathway towards achieving nature-positive cities, where nature is seamlessly integrated into the urban environment [58,70]. By maximising the ecosystem service provision of urban GI, renaturing fosters a more symbiotic relationship between human and natural systems [71]. Renaturing cities, as described by Pietta and Tononi (2021) [72], aims to reconnect urban planning with nature, enhancing a city's sustainability. This approach integrates social and ecological aspects [72]. It recognises nature as shaped by human interaction and calls for a re-evaluation of the city–nature relationship, reflecting the principles of Urban Political Ecology [72].

Cities around the world are increasingly implementing naturalisation initiatives. This trend is evident in efforts that span continents, such as the creation of naturalised areas in Winnipeg, Canada [73]. In Europe, the Etablissement Public Foncier (EPF), a public land developer in France's Hauts-de-France region, contributes to this shift by renaturing brownfield sites [74].

Another example is a small creek in Ipswich, Queensland, Australia. This creek was renaturalised by transforming a 1.6-kilometre concrete waterway into a more natural state, resulting in a thriving ecosystem [75]. The initiative stands out for its collaborative approach, which was co-designed with the local community [75]. This emphasis on community engagement is critical to the project's success, as evidenced by its numerous awards [75].

This surge in activity is reflected in the increasing body of academic literature on urban renaturing [57,58,71,72,76–78] and the rise of funding programs like NextGenerationEU [79]. Past and present EU research projects, like URBAN GreenUP (2017–2022), further demonstrate this growing momentum, all focused on incorporating nature-based solutions for renaturing cities [80].

However, the idea of renaturing cities is not new [81]. For example, in Spain, the concept has been around for decades and implemented with various initiatives, such as the green belt and green corridor programmes [81].

The literature reports that ecological restoration and renaturing are used synonymously [82].

Reflecting this interchangeability, Deboeuf de Los Rios et al. (2022) in "Renaturing cities: method, examples and recommendation" [74] adopt the definition of ecological restoration developed by the Society for Ecological Restoration (SER) in 2004 [83] to explain the concept of renaturing. This definition defines urban renaturing, in its broadest sense, as the process of restoring ecosystems degraded by human activity to a natural or semi-natural state [74]. There are two main approaches to renaturing: active renaturing uses interventions to speed up ecosystem recovery, while passive renaturing relies on natural processes in areas with less damage [74]. Within urban environments, the concept of renaturing is frequently misconstrued as merely an application of ornamental horticulture designed to enhance the city's aesthetics through the creation of verdant spaces. In France, for example, this perception is influenced by the historical emphasis on formal gardens, which prioritised exerting control over nature for decorative purposes [74]. However, in the field of ecological restoration, a key distinction exists between renaturing and the act of simply greening a city [74]. Urban greening initiatives often prioritise aesthetics, favouring the use of non-native or poorly adapted horticultural elements that necessitate continual inputs such as irrigation and fertilisation [74]. This distinction is exemplified by urban living walls [84]. While living walls are undeniably green, they deviate from genuine renaturation projects by using often exotic plant species within a man-made structure that requires significant human intervention to flourish [84] (Figure 1).



Figure 1. Patrick Blanc's living wall at the Musée du Quai Branly-Jacques Chirac, Paris, France (photo: Alessio Russo).

The concept of "bringing nature back into cities" (BNB) shares similarities with the concept of greening and renaturing but there are also distinctions between them. Often used interchangeably, the main difference, according to Mata et al. (2020), is that while urban greening actions primarily concentrate on plant species and their use as physical structures for designed engineering nature-inspired solutions, BNB actions target any taxa and exclusively focus on local, native species, recognising them as living organisms deserving existence within cities [54]. Moreover, BNB extends beyond the traditional scope associated with ecological restoration practices, as it may involve specific actions aimed at reintroducing particular species at the population or even individual level [54]. Additionally, BNB diverges from rewilding, as it operates specifically in urban areas and acknowledges the historical presence of Indigenous peoples within these environments [54]. However, recent research highlights that rewilding, not in sensu stricto of the term, can also be implemented in urban areas, causing an overlap and confusion of the different terminologies used in landscape architecture, ecology, and urban planning [56,85].

The literature also shows that renaturing is different from rewilding; rewilding requires less maintenance than renaturing, especially when contrasted to meticulously maintained parks and gardens [59]. However, renaturing and rewilding are two strategies that can provide several ecosystem services, such as addressing urban overheating, supporting biodiversity which is essential for healthy ecosystems [59].

Despite these differences, BNB, rewilding, and renaturing have promise as vital components of the urban sustainability agenda, with BNB representing a more species-focused approach [54]. However, renaturing can be considered a subset of BNB if it involves the reintroduction of native species, as exemplified by initiatives such as the City of Calgary's policies aimed at bringing native plant species back into green spaces [54,73].

Drawing on the scientific literature, renaturing can be defined as an approach to urban green infrastructure that combines ecological restoration with biodiversity-led design to achieve multifunctional benefits [71,86]. This approach emphasises the use of genetically diverse, locally sourced native plants [86], contrasting with the generic "blandscaping" practices that often rely on homogenised designs and non-native species [87]. Renaturing projects aim to create habitats for pollinators, birds, and other fauna [86], aligning with the principles of reconciliation ecology [88]. As espoused by Rosenzweig (2003), reconciliation ecology seeks to modify human-dominated landscapes to foster the coexistence of wildlife with human populations [88]. This is exemplified by UK-based projects like "Making Space for Nature", which has been introducing wildflower meadows, hedges, and woodland in several areas across Cornwall [89]. These initiatives create habitats for pollinators, bugs, birds, hedgehogs, and other wildlife, while also creating spaces for people's wellbeing. This is achieved by improving areas for relaxation and exercise, offering volunteer opportunities, and encouraging participation in activities that benefit the environment [89].

Similarly, the restoration of the lake in Stratford Park (Stroud) prioritises both people and wildlife, incorporating community engagement and educational activities (Figure 2).

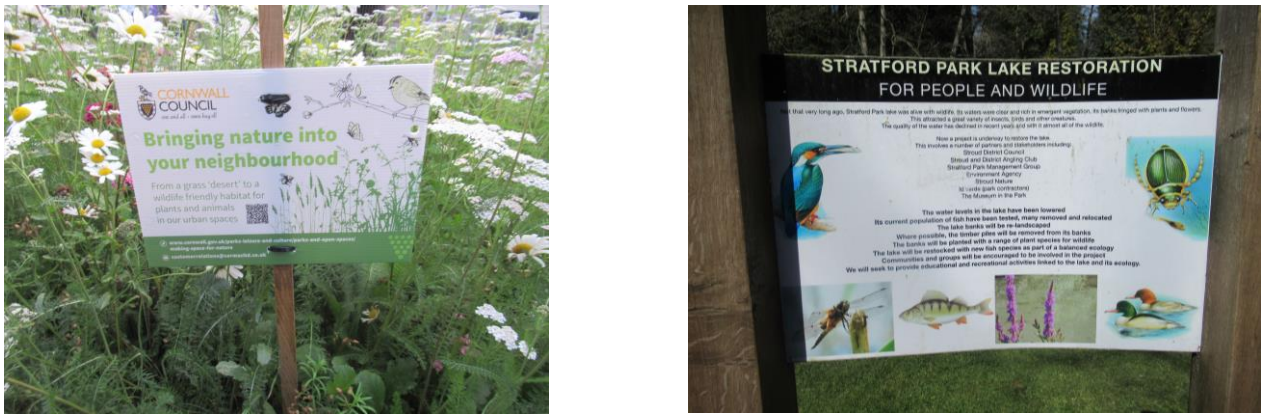

Figure 2. Examples of projects integrating people with wildlife conservation: (**left**) wildflower meadow in Penzance, Cornwall, established as part of the "Making Space for Nature" initiative, and (**right**) restoration of the lake in Stratford Park, Stroud, incorporating native species on the banks, fostering community involvement, and offering recreational and educational activities centred around the lake (photos: Alessio Russo).

The Final Report of the Horizon 2020 Expert Group on 'Nature-Based Solutions and Re-Naturing Cities' identifies key aspects of this urban renaturing strategy [90]:

Urban Regeneration through Nature-Based Solutions: This approach involves utilising underused and unused land, as well as grey infrastructure, for new purposes. Nature-based solutions themselves often play a central role in this process. This could involve the transformation of abandoned railway yards or brownfields into parks and public spaces [90].

Ecosystem Restoration and Green Infrastructure Development: This aspect focuses on restoring ecosystems and establishing green infrastructure that provides a wide range of

societal benefits. These benefits can include reduced stormwater run-off or decreased costs associated with managing extreme temperatures. Green infrastructure can include features like rain gardens, bioswales, and urban forests [90].

Within the field of landscape architecture, urban regeneration projects have increasingly focused on "recycling landscapes". This refers to the reuse of abandoned industrial sites, grey infrastructure, and contaminated land (including disused railway yards, brownfields, old docks, landfills, and quarries) for the creation of new parks and public spaces [91]. This trend emerged in the 1970s due to a confluence of factors, including the decline of manufacturing in the United States, a shift in transportation logistics, and a growing appreciation for historic preservation projects [91].

These urban restoration projects include large-scale redesign schemes that provide "novel landscape features and learning opportunities" [92] (p. 634). Examples of such projects in North America include Downsview Park in Toronto and the High Line, Governor's Island, and Fresh Kills Park in New York City [91]. In Europe, Parc de la Villette and Parc André Citroën in Paris stand out; while Asia boasts examples like the resurfacing of the buried Cheonggyecheon River and the Gyeongui Line Forest Park in Seoul, South Korea, and Zhongshan Shipyard Park in China [91,92].

The mentioned projects created novel and designed ecosystems with different functions and structures within the urban environments [86,93]. While the complete restoration of post-industrial landscapes to their envisioned ecological state might be the ideal scenario, it is often unrealistic, particularly for heavily impacted sites like disused mines. The challenges associated with restoring the original ground terrain and achieving full ecosystem structure and function are significant [94]. In such cases, rehabilitation emerges as a more pragmatic approach. Rehabilitation focuses on repairing ecosystem processes, productivity, and services, with less emphasis on recreating the exact species composition and structure [94]. Therefore, the restoration or rehabilitation of mines can contribute to the overall GI urban transformation of former coal-mining cities and positively impact the regional ecological environment [95]. These benefits can include improved climate and air quality, carbon sequestration and storage, and the prevention of soil erosion [95]. Abandoned mines close to urban areas can be repurposed as parks, providing recreational opportunities and green space for residents [95].

3. The Benefits and Challenges of Renaturing Cities

Our current urban design, dominated by buildings and cars, has demonstrably fragmented natural spaces within cities [96,97].

This has led to a troubling decline in the connection between humans and nature. A growing body of research, including Soga and Gaston (2016) [98], highlights a concerning cycle.

People's daily interactions with nature are becoming fewer and further between; this ongoing alienation is known as the "extinction of experience" [98]. This is especially true for children [98,99]. Spending less time outdoors weakens the emotional bond people feel with nature, which further contributes to a decline in pro-environmental attitudes and actions [98]. Ultimately, this cycle of disinterest in the natural world harms both ecological and human health [98]. Renaturing offers a powerful solution by strategically integrating a diverse range of GI elements, including parks, gardens, natural and semi-natural green spaces, greenways, corridors, buffers, streetscapes, wetlands, amenity spaces, and community gardens, into the urban fabric [96,100].

These interventions promote regular encounters with nature, potentially increasing access to the critical daily dose of nature and green exercise for city dwellers [23,37].

Residents who are currently inactive or experiencing mental health issues could accrue significant health benefits by engaging in regular physical activity within accessible renaturated green spaces [37]. Research conducted in Brisbane, Australia, demonstrates a positive correlation between exposure to green spaces and both mental and physical health [35]. The study linked visits to green spaces with reduced rates of depression and

high blood pressure, while also revealing that more frequent visits were associated with stronger social cohesiveness among residents [35].

Furthermore, the findings suggest that spending at least 30 min a week in outdoor green areas can lower the prevalence of depression and high blood pressure in the population by up to 7% and 9%, respectively [35].

In line with Richardson et al.'s (2013) investigation in New Zealand, urban renaturalisation presents a potential dual benefit for public health [101]. Their research found that increased neighbourhood greenspace is associated with both greater adherence to recommended physical activity levels and a reduced risk of cardiovascular diseases and mental health issues [101]. Although a dose–response effect for cardiovascular disease was not observed [101], improving access to green spaces via renaturalisation initiatives within cities could offer a strategic approach to concurrently address these prevalent health concerns.

In terms of shaping future spatial design, a European study examined the precise influence of green spaces on physical activity levels and health in cities [102]. The analysis revealed an important finding with significant implications for urban planning: even greenness in very close proximity (100 m) had positive effects on physical activity, leading to indirect positive effects on health [102]. This suggests that strategically designed green spaces directly surrounding residences can yield measurable improvements in public health by encouraging increased physical activity [102]. In addition, residents living within 1100 m of easily accessible green spaces—defined by the presence of walking paths, diverse vegetation, and connecting green corridors—demonstrated significantly higher levels of physical activity [102]. The positive association between green spaces and physical activity was strongest at approximately 600 m from residences. Additionally, the study identified a positive correlation between surrounding green areas (500–1100 m) and health outcomes, with green corridors within an 800-m network distance showing a similar positive association [102]. However, the study also identified that high density of green space uses and a large amount of surrounding green space measured in a wider radius (1100–1500 m) were negatively correlated with physical activity levels and their indirect health benefits [102]. This suggests that either an over-concentration of activities within green spaces or a vast expanse of green space further away might discourage some residents from using them for exercise [102].

A recent study conducted in Cali, Colombia by Patino et al. (2023) [103] investigated the correlation between residential green space and self-reported happiness. Their findings revealed a positive association, suggesting that living near green spaces contributes to increased happiness, particularly for younger residents [103].

A study by Mouratidis and Yiannakou (2022) [104] explored what makes cities liveable by examining factors contributing to neighbourhood satisfaction and happiness. Their research, which included a case study in Oslo, Norway, revealed that access to green spaces significantly impacts wellbeing [104]. Residents in Oslo reported greater happiness in neighbourhoods with more parks and trees, highlighting the importance of nature for city dwellers [104].

However, a large-scale field experiment in Singapore investigated the link between public spaces and momentary happiness [105]. While the study found the strongest associations with happiness occurred in parks and community centres compared to commercial areas, evidence for a direct green or blue space effect on momentary wellbeing was less conclusive [105]. This suggests that specific types of public spaces, rather than simply the presence of nature, may be more influential in promoting happiness, though further research is needed to disentangle the independent contributions of green spaces and other environmental factors [105]. The economic benefits of renaturing and greening cities have also been studied [57]; for example, Park and Kim (2019) [106] examined how converting unused railways into parks can revitalise nearby neighbourhoods. Specifically, they examined the Gyeongui Line Forest Park in Seoul, which replaced an old railroad with a popular urban park (Figure 3).



Figure 3. Gyeongui Line Forest Park in Seoul, after the conversion of a former railway line into a public park (photos: Alessio Russo).

Originally a 6.3-kilometre railway connecting Seoul with the northern border, the line fell into disuse in the 2000s. A significant regeneration project saw the decommissioning of the existing railway and the construction of a new subterranean subway system. This transformation fits perfectly with the concept of 'recycling landscapes' and offers a model for other cities seeking to revitalise underutilised spaces and exemplifies the potential of transforming neglected infrastructure into valuable GI [106].

The study found that businesses near the park saw increased sales after it opened. This suggests that new parks can attract people and boost the local economy, especially in areas with existing commercial spaces [106].

However, other researchers have pointed out the potential drawbacks associated with such projects, like the risk of gentrification [107]. This has also been reported in research on similar initiatives (e.g., New York's High Line), where homes closest to the High Line experienced a 35.3% increase in housing values [108].

The literature demonstrates the potential benefits of renatured cities. However, there are also significant challenges. Modern cities are compact with dense networks of grey

infrastructure, such as buildings, roads, and underground utilities [52]. Retrofitting these areas to incorporate NBS can be complex and expensive.

As we have seen, renaturing abandoned spaces like disused railways, abandoned quarries, or demolished buildings presents opportunities to create new urban spaces within the city. To avoid greenwashing and gentrification, urban renaturalisation projects should ensure equitable distribution of these resources.

A bottom-up approach that involves the community in the planning process is crucial. This can create inclusive green spaces, as shown by Lafrenz's study [109]. Including public health experts and the local community in the restoration of natural areas can ensure these spaces provide the important health benefits associated with human interaction with nature [109]. Lafrenz's study also emphasises the importance of community- and public health-involved frameworks during the design phase of green space development [109].

Pietta and Tononi (2021) [72] examined the importance of public engagement in naturalisation projects, using the Brescia Quarry Park in Italy as a case study [72].

Involving the community throughout the design and implementation process demonstrably increases the success of projects in achieving environmental protection, social equity, and long-term sustainability. This reflects the needs and values of the people who will use the park [72]. Public participation, as seen in the context of green infrastructure for climate adaptation, plays a key role in ensuring inclusive, high-quality, and resilient spaces [110]. However, for renaturalisation projects to be truly successful, community involvement must be representative of all demographic groups, especially those who are socially excluded. By including these voices, particularly during design, we can create accessible, high-quality green spaces. These efforts can address environmental and social challenges while also contributing to the happiness and wellbeing of all citizens. Thus, renaturing cities allows residents to connect with nature and improve their quality of life and social inclusion.

4. Conclusions

This perspective argues for the potential of renaturing urban environments to address public health concerns. As an approach, renaturing can provide access to high-quality, usable green spaces, rich in biodiversity, for all citizens, promoting wellbeing, happiness, and a healthier urban future. Renaturing projects should prioritise ecosystem function, supporting rich biodiversity. This is closely linked to wellbeing for individuals who have access to it [111,112]. To achieve this, landscape architects should apply biodiversity-positive design concepts [86,113].

Strategically designed urban renaturation initiatives can modify and diversify anthropogenic habitats, potentially facilitating the reintroduction of diverse species to their native ranges while minimising disruption to human populations [114].

To expedite the restoration of these novel urban ecosystems, established, species-rich, and well-functioning urban ecosystems can serve as valuable reference points [115]. These reference points, likely present in many cities, offer important details regarding the composition and structure of successful urban habitats, guiding renaturation efforts and maximising their contribution to urban wildlife conservation [115].

This helps ensure the creation of urban green spaces that are both accessible and biodiverse [112]. These initiatives can help create a healthier and more active community by providing high-quality, accessible green infrastructure that encourages interaction with nature within a thriving, biodiverse ecosystem.

Additionally, research suggests that spending at least 20 min in such spaces can significantly improve wellbeing [116]. This emphasises the importance of designing these green spaces to be engaging and attractive enough for visitors to stay for extended periods, ideally exceeding 20 min [116].

Renaturing has the potential to increase urban canopy cover, thereby reducing air pollution [117,118], creating green patches to alleviate heat island temperatures [119] and reducing mortality and morbidity during heat waves [120].

Furthermore, renaturing can play a crucial role in reducing habitat fragmentation, creating corridors for wildlife, and promoting biodiversity within the city. This, in turn, can contribute to a richer natural environment and a stronger connection to nature for urban residents. Importantly, Shen and Lung (2018) [121] suggest that maximising green space patch area and minimising fragmentation and patch distance may be associated with a reduction in suicide rates.

While the concept of a 'healthy dose' of nature for health and wellbeing is receiving increasing attention [23,34,35,37], recent scholarship has highlighted potential limitations [34]. This approach, driven by the policy need to quantify the value of nature [122], could inform policymakers but may, crucially, fail to fully accommodate individual preferences and needs [34].

Future research should prioritise a closer examination of the relationship between a potential healthy dose of nature and the unique needs of individuals in renaturing projects [34]. This focus would not only inform the development of more targeted interventions but also guide the design of inclusive natural spaces that maximise wellbeing for all.

Furthermore, longitudinal studies, together with evidence from renaturing design initiatives, are critical for determining which types of NBS (e.g., wetlands versus linear parks) might promote wellbeing and happiness in disadvantaged communities. Such studies should use a pre-test/post-test design to assess the benefits received by participants prior to the start of the renaturalisation project and after the intervention. This would allow researchers to determine the time window in which these benefits would arise.

Funding: This research received no external funding.

Acknowledgments: I want to wholeheartedly thank my friend, Prof. Sung-Kyun Kim, who sadly passed away in 2020. He designed the masterplan of Gyeongui Line Forest Park in Seoul and introduced me to the project during a walk we took, which is documented in the pictures included in this paper.

Conflicts of Interest: The authors declare no conflicts of interest.

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