

The Incremental Demise of Urban Green Spaces

Johan Colding ^{1,2,*} , Åsa Gren ²  and Stephan Barthel ^{1,3} 

¹ Department of Building Engineering, Energy Systems and Sustainability Science, University of Gävle, Kungsbäcksvägen 47, 80176 Gävle, Sweden; stephan.barthel@hig.se

² The Beijer Institute of Ecological Economics, Royal Swedish Academy of Sciences, 104 05 Stockholm, Sweden; asa.gren@beijer.kva.se

³ Stockholm Resilience Centre, Stockholm University, Kräftriket 2B, 114 19 Stockholm, Sweden

* Correspondence: johan.colding@hig.se

Received: 27 April 2020; Accepted: 19 May 2020; Published: 20 May 2020



Abstract: More precise explanations are needed to better understand why public green spaces are diminishing in cities, leading to the loss of ecosystem services that humans receive from natural systems. This paper is devoted to the incremental change of green spaces—a fate that is largely undetectable by urban residents. The paper elucidates a set of drivers resulting in the subtle loss of urban green spaces and elaborates on the consequences of this for resilience planning of ecosystem services. Incremental changes of greenspace trigger baseline shifts, where each generation of humans tends to take the current condition of an ecosystem as the normal state, disregarding its previous states. Even well-intended political land-use decisions, such as current privatization schemes, can cumulatively result in undesirable societal outcomes, leading to a gradual loss of opportunities for nature experience. Alfred E. Kahn referred to such decision making as ‘the tyranny of small decisions.’ This is mirrored in urban planning as problems that are dealt with in an ad hoc manner with no officially formulated vision for long-term spatial planning. Urban common property systems could provide interim solutions for local governments to survive periods of fiscal shortfalls. Transfer of proprietor rights to civil society groups can enhance the resilience of ecosystem services in cities.

Keywords: urban greenspace; privatization; property rights; incremental greenspace loss; ecosystem services; the tyranny of small decisions; resilience planning; urban densification; baseline shifts; urban nature connection

1. Introduction

Preserving greenspace quantity and quality in the face of increasing urbanization is a pressing global challenge [1]. Greenspaces provide invaluable ecosystem services to humans that are important to plan for in cities [2]. Economic motives and urban neoliberal policies are liable explanations behind the loss of public space in many cities [3,4]. Public greenspace is an important component of public space [5] and could be defined as “any vegetation found in the urban environment, including parks, open spaces, residential gardens, or street trees” [6] (p. 113). Here, by public space is meant spaces in cities that are “owned by the government, accessible to everyone without restriction, and/or fosters communication and interaction” [7] (p. 9). This definition encapsulates Louis Wirth’s notion of urbanism [8], taking into account how individuals interact with one another and with spaces. Public spaces facilitate human exchange and interaction, as in the form of urban squares and market places that traditionally have served as arenas for public communication and social interaction [9]. However, there is a massive shift towards the privatization of public land and resources in many cities today [3,10], affecting green spaces in a multitude of ways with repercussion for long-term management of ecosystem services. While urbanization causes the direct loss of urban greenspace, comprising habitat fragmentation that involves both loss and/or the breaking apart of habitats [11], there exist more subtle forms of

greenspace loss that ultimately are linked to property-rights arrangements. We here refer to such loss as incremental, occurring over a series of gradual declines or small steps but experienced at the cognitive level of urban space as ‘baseline shifts’ among urban residents.

Based on the literature related to institutions, economic geography, urban ecology, and social theory, we present a set of subtle drivers for why public green spaces gradually erode in cities. This gradual erosion, we argue, is often “invisible” in that it can almost exclusively be revealed by high spatial resolution remote sensing data [12] and that their effect can be translated into high social-ecological¹ costs that impinge negatively on human wellbeing [13,14]. Based on a set of examples of incremental greenspace change, this paper briefly discusses how urban planning authorities should avoid ‘day-to-day planning’ [15] and be more long-term oriented to meet an ever-increasing unpredictable future. Property rights theory in relation to natural resource management emphasizes institutions at the interface between social and natural systems [16,17], where the term ‘institutions’ signifies the rules and conventions of society that facilitate coordination among people regarding their behavior [18]. At a more general level, institutions are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behavior, conventions, and self-imposed codes of conduct), and their enforcement characteristics; thus, they shape incentives in human exchange, whether political, social, or economic [18]. Ecologically oriented scholars define institutions simply as working-rules or rules-in-use, meaning “the set of rules actually used by a set of individuals to organize repetitive activities” [19] (p. 19). Thus, property rights link people to nature, and have the potential to coordinate the social and natural systems in a complementary way for both ecological and human long-term objectives [20].

Property-rights could also be viewed as slow variables in urban transformation; however, their monoculturalization in favor of urban privatization schemes may gradually erode urban resilience (i.e., ‘buffering capacity’ to deal with disturbance and novel events) and make planning bodies and local authorities less pertinent to propel urban growth along more sustainable trajectories that value ecosystem services as risk insurance and as adaptive capacity for responding to known and unknown disturbances. The paper concludes by proposing common property systems as a viable alternative for local governments to survive economic disruptions and in turning public spaces into places that urban residents themselves can manage for improving and protecting greenspace and associated ecosystem services.

2. Urban Green Space Dynamics and Reasons for Their Incremental Demise

The availability of public green spaces is foremost linked to the geographical location of a city [21]. However, urban expansion in many cities takes place almost exclusively at the expense of farmland [22], with changes in greenspace predominantly occurring in the urban-rural periphery [12]. Urban greenspace consists mainly of semi-natural areas, such as different gardens, road and rail networks and their associated land, airfields, golf courses, parks, allotment areas, urban agriculture, etc. that together with formally protected nature reserves and Natura 2000-sites contribute to the generation of urban ecosystem services [23].

Quantifying spatiotemporal patterns of urban greenspace at more precise levels is reliant upon modern remote sensing techniques. Hence, more steadfast comprehensive assessments of detailed greenspace change are scarce in the ecological literature related to urban systems [24]. Previous studies have also come to different results. For example, Kabisch and Haase [6] could not find a significant change in Western and Southern European cities between 1990 and 2000; but found a significant increase of greenspace in the period from 2000 to 2006. In a study of 386 European cities, Fuller and Gaston [1] found a dramatic drop in per capita green space provision in cities with high population

¹ By the term ‘social-ecological’ is here meant a set of critical natural, socioeconomic, and cultural resources (or, capitals) whose flow and use is regulated by a combination of ecological and social systems.

density, likely due to more people being packed into the urban matrix rather than buildings replacing existing green spaces. They also found that access to greenspace rapidly declines as cities grow, decreasing opportunities for people to experience nature. Following post-socialist changes many East-European cities have experienced a decline in greenspace [25,26]. Similarly, McDonald et al. [24] found an open space loss between 1990 and 2000 for all the examined 274 metropolitan areas in the contiguous United States. While many Chinese cities show mixed results, with both increases and decreases, cities in many developing countries are losing green spaces at a rapid pace [12].

Despite the massive shift towards privatization of public land and resources [3,10], comprehensive studies that have examined the relationship between loss of green spaces and ownership regimes are greatly lacking. However, it may not be far-fetched to assume that much of the privatization of public space involves greenspace. While this loss comprises direct habitat loss and the breaking apart of habitats [11], few scholars have addressed more subtle causes behind urban greenspace loss, but see Mensah [27]. In the following we present a set of examples of incremental demise of public urban greenspace.

2.1. *Lack of Financial Support*

One of the major reasons behind the privatization of public space is financially strained local government budgets, that strain results in the outsourcing and the alienation of land to private interests and the privatization of services that previously were publicly delivered. There exist plenty of examples of how tightening budgets are leading to declines in the quality of green spaces and loss of ecosystem services, due to the lack of staff and maintenance resources [27,28]. The Heritage Lottery Fund—a large funder of heritage in the UK—reported in 2013 that almost half of the local park authorities were considering selling parks and green spaces or transferring their management to private entrepreneurs [29]. Considering the current recession due to the Covid-19 pandemic, one can only imagine how this situation will worsen.

There has also been an increase in long-term leaseholds to allow the transfer of public land, such as parks and other green spaces, to not-for-profit trusts and to resident-led management bodies [30]. While public land may be alienated from the ownership of local governments, privatization predominantly takes place through a mixture of transfers of governance and management responsibility from the public sector to a number of other actors in the private, voluntary, and community sectors [7,30], and with the degree of privatization ranging from full to partial outsourcing of responsibilities [4].

Public–private partnerships (PPP) constitute a well-known example of ‘contractual governance’, which increasingly is used to re-develop and manage public spaces, especially as capital investments [30]. Through a PPP, a local authority or a central-government agency sign a long-term contractual arrangement with a private supplier for the delivery of services and taking of responsibility for building infrastructure, financing the investment, and managing and upholding the facility [31]. PPPs are increasing across Europe, Canada, and the United States, as well in some developing countries [31]. Business improvement districts (BIDs) are an example of a PPP in which a local authority and a business community together develop schemes to benefit a local district area [32]. The services provided through this type of contractual arrangement could, for example, include improvements and attractiveness of physical areas [7] and management of public parks [33,34].

2.2. *The Separation of Attributes*

A critical fate that can affect underfinanced public spaces is the separation of attributes, which in economic theory can be expected when it is cost-effective and if sufficient demands for this exist [3]. In an overcrowded public domain, markets and governments will strive towards a separation of rights to land according to different attributes. This may be done in order to reduce potential conflicts and to lower transaction costs related to the governance of public space. In this way, the rights to different attributes of a park can be separated and granted to various user groups, such as devising demarcated land for leisure, habitats for wildlife, sporting areas, etc. [35]. Separation of attributes can also involve

alienation or leaseholds of bits and pieces of public greenspace. There exist several cases where underfinanced public parks have been opened up to private interests, such as to restaurants, cafés and other social spaces. While local governments can reinvest the revenues from rents and/or property taxes for restoring degraded greenspace, profits are often instead used for other purposes [28,35].

2.3. Increased Private Control

Another subtle form of driver linked to urban greenspace change is the increased control and surveillance of public space [7,36]. Increased surveillance and policing over public space will likely intensify with an increased number of terror attacks as witnessed in many parts of the world. Today, much control of public space is outsourced to private corporations, making the boundary between public and private policing complex [37]. New York and Tokyo are telling examples of cities that lose much public space [36]. With increasing fear of terrorism after the Tokyo sarin gas attack in 1995 and the 9/11 attack in New York, many places where people formerly could relax from stress and annoyance have been eradicated [38]. Not only has an increased fear of terrorism acted as a vindication for imposing restrictions on the use of public sidewalks and plazas, but also in the use of natural habitats [38]. During the Covid-19 pandemic, the lack of public space in New York City prompted the banning of cars on certain streets in order to provide more space for pedestrians to upkeep social distancing. In contrast, green spaces in Sweden served as vital areas for social distancing [14].

Control of public space could be in the form of private police and/or surveillance equipment. While it may not directly lead to the loss of public space it can affect public space in more indirect ways, such as making people feel monitored and subsequently avoiding such spaces. The integrity of peoples' personal lives is increasingly also becoming jeopardized as digitalization is increasing in many cities [39]. While control can affect public green spaces the same way as it affects any other type of monitored public space, it especially can affect people's accessibility and use of urban green space. Many dwellers in urban areas display a fear of nature due to cultural reasons [40]. Lush green area habitats may be frightening for people due to lack of safety; hence, such habitats are sometimes replaced for safety reasons, e.g., increasing the width of sidewalks or increasing the occurrence and brightness of street lights, [41] thereby affecting greenspace negatively.

2.4. Under-Utilization

Under-utilization of public space represents yet another subtle driver behind greenspace loss. One example is the London Green Belt where green spaces are avoided by people due to poor management that have made them less accessible and attractive to be in. Residents may feel insecure and fearful of crime in unmanaged green spaces with short view distances [6]. So called 'boundary parks', located between vastly differing neighborhoods, are particularly susceptible of being underutilized which in turn can contribute to the decline of parks [42]. Accessibility of the public space itself can be argued as being one of the most effective factors and deterrents to utilization of a public space [9]. For example, public space will be less used by people if a user population does not live nearby [43].

2.5. Congestion

Direct over-use (congestion) of public greenspace is another indirect reason behind the demise of public urban space [3,35]. Congestion refers to the degree of competition within a public domain, or to "the numbers of individuals who jointly consume it and the range of tastes amongst those individuals (or groups)" [3] (p. 34). When congestion generates excessive transaction costs, such as the costs of queuing or resolving conflicts between different users, economic theory predicts that there is a high probability for pressures to reform the property rights and subdivide public space either into private domains or into smaller public domains (e.g., club goods). When public domains become congested, they must be governed in such a way that use rights to public space are clear and enforceable [3,44]. However, transaction costs for designing, creating, and administering such a system

becomes increasingly high the more over-used a space becomes, and if costs for governance become too high in political or financial terms, then public space could become subject to land alienation where the local government seek to dispose of the property [3].

2.6. Activity Intensification

Activity intensification can also act as a subtle driver behind the transformation of public space [45]. To cut costs and for energy conservation, planners can, for example, resort to multifunctional land use. Haccou et al. [46] distinguish four types of multifunctional land use: interweaving, intensifying, layering, and timing. Interweaving combines different functions on the same piece of land; intensifying increases the effectiveness and efficiency of a certain land use on the same piece of land; layering mixes functions in the vertical dimension if possible; and timing uses the same building or space for different functions at different moments in time [47]. The first two types are also applicable to green spaces. In Stockholm—one of the fastest growing regions in Europe—planners have been taken by surprise by the sudden population boom, with over 300,000 new homes in need of being built in the coming decade. To cope with increased urban densification and population growth, multi-functionality in the use of public parklands has become a quick fix for dealing with overcrowding effects [48]. However, such a development may run contrary to planners' aspiration of making cities more resilient to various effects of climate-change and for securing biodiversity that depend on green spaces of a certain size and with certain ecological qualities that do not always rhyme well with social aspirations.

3. Baseline Shifts and Benefits of Nature

As cities develop over space and time, the different attributes of green spaces also change. Urban residents experience nature most of the time at “the cognitive level of urban space,” that is, at the level where “people in the street” experience the city [49].

Human beings also constantly use memories of previous experiences to interpret current experiences [50]. When it comes to experience of urban nature, psychologists talk about baseline shifts, where each generation of humans tends to take the current condition of an ecosystem as the nondegraded state: the ‘normal’ experience, disregarding the fact that the ecosystem might have changed considerably over time [51]. Baseline shifts can lead to environmental generational amnesia [52], referring to the psychological process whereby each generation perceives the environment into which it is born as the norm, no matter how developed, urbanized, or polluted the environment is [51].

According to Hartig and Kahn [51], baseline shifts can help explain inaction on environmental problems in that people do not feel the urgency of the problems because the experiential baseline has shifted (Figure 1). Experiencing nature during childhood is crucial for shaping sustainable decision-making processes in adulthood [53].

The incremental changes of urban greenspace, previously dealt with herein, likely contribute to baseline shifts. To what extent is hard to determine. There might also be overlaps in the drivers previously dealt with, e.g., under-utilization of greenspace can at many times be explained by a lack of financial support. However, environmental generational amnesia may spread as more and more people are devoid of direct contact with nature in cities [54]. This in turn may make it more difficult to reach public acceptance of policies to deal with environmental problems, like climate change. Environmental illiteracy may further lead to the erosion of public green spaces since people will not value the ecosystem services they derive from nature (Figure 2). This is especially the case in countries where destruction of ecological sensitive areas and open spaces are rapidly urbanized due to weak urban planning institutions [55].

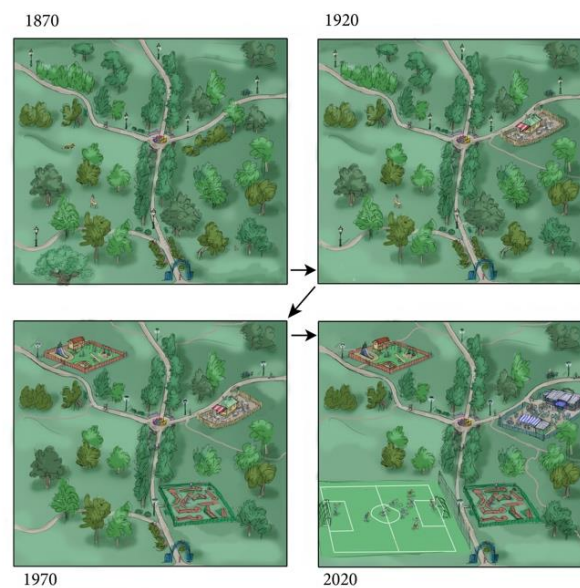


Figure 1. Schematic illustration of a baseline shift of a hypothetical public park over a 150-year period. Each development stage is perceived as being the nondegraded (normal) state by each new generation of humans—a situation that can contribute to environmental generational amnesia.

PROVISIONING SERVICES	REGULATING SERVICES	CULTURAL SERVICES
<i>The “products” obtained from ecosystems</i>	<i>Benefits obtained from the regulation of ecosystem processes</i>	<i>Nonmaterial benefits obtained from ecosystems</i>
Foods	Climate regulation	Educational
Fibers	Flood prevention	Recreational
Ornamentals	Erosion control	Sense of place
Medicines	Pest control	Spiritual
Biofuels	Pollination	Cognitive development
Fresh water	Seed dispersal	Stress relief
Genetic resources	Disease regulation	Gardening
SUPPORTING SERVICES		
<i>Services necessary for the production of all other ecosystem services</i>		
Biodiversity		
Nutrient recycling		
Primary productivity		

Figure 2. Ecosystem services from urban greenspaces. These include provisioning services, regulating services, cultural services, and supporting services. Source: Millennium Ecosystem Assessment. Ecosystems and Human Well-Being. Reprinted from Colding and Barthel [56].

4. Long-Term Resilience Planning

The incremental changes and loss of urban greenspace elaborated on in this paper fit the pattern of decision making that the economist Alfred E. Kahn once referred to as ‘the tyranny of small decisions’, representing a situation in which a number of decisions, individually small in size and time, result in non-optimized and socially undesirable outcomes [57]. According to Kahn the ‘small decision effects’ are common in market economics. In an urban planning context, many small-scale, independent decisions taken over time by a planning unit could culminate in outcomes that are neither intended nor preferred [58]; hence, even well-intended planning decisions in countries with strong state control can result in undesirable social-ecological outcomes that run contrary to the common good of a city and its inhabitants.

Nilsson [15] has described how leading politicians often abstain from restricting options in order to handle future planning issues—a phenomenon that often leads to an ad hoc form of planning,

termed “day-to-day planning”. It is mainly designed to manage acute problems and to resolve problems as soon as possible and is related to a discourse of economic development “in the way in which it tries to satisfy the short-term requirements of industry and commerce, and tends to emphasize the economic dimension of sustainable development” [15] (p. 441).

Accessibility to green spaces in cities is ultimately determined by property-rights arrangements that regulate their omission or entry. Institutional scholars have long recognized the role of property rights for linking people to nature, but as institutional research suggests, no single type of ownership regimes (i.e., state, private, or common property rights) can be prescribed as a remedy for resource overuse or environmental degradation [59]. Instead, policy should focus on establishing a multitude of property rights regimes that are designed to fit the cultural, economic, and geographic context in which they are to function [20].

How space and property rights are arranged to ensure access to urban nature will be of direct importance for building general urban resilience to human wellbeing in the long-term [14]. The gradual shift towards privatization of public property in cities, and even of common property systems [60,61] is a worrisome sign since it may negatively affect resilience planning, which needs to be long-term oriented. Property-rights could be viewed as slow variables in urban transformation. In resilience science, slow variables—like evolution, coral regrowth, or nutrient transportation through soils—play a substantial role for a system’s resilience to change [62]. C.S. Holling’s work [63] demonstrated that an ecosystem can absorb an entire chain of disturbances without being adversely affected until it suddenly changes to a completely different state where past functions and services no longer can be provided. A gradual loss of the system’s slow variables often causes such abrupt change. Critical, slow social variables are characterized by normally being stable or changing slowly over long periods of time, providing continuity of functions. However, even property rights that have existed for millennia may change abruptly, causing changes in land use, social disruption, and even declines in human well-being [60,64].

Lindholm [10] describes how sightlines in cities commonly become blocked by new private developments, with less daylight reaching the ground and with more land areas constantly in shadow, resulting in poorer conditions for plants and biodiversity, and also how people at the eye level of cities experience their local socio-physical environment. New sightlines are often aggravated due to visible landmarks of private interest. Hence, indirect effects of private property may negatively impinge on ecosystem services that are nurtured in the public domain. While private building consortia often launch their development projects as “sustainable”, they often constitute examples of “green washing” [10]. An often-time neglected aspect of green roofs and green walls that commonly replace natural areas on the ground, is that they only are accessible to a limited set of urban residents.

The slow variables, such as the amount and quality of public green spaces, determine how a fast variable, like daily visits to green spaces, is possible when external drivers are in operation, such as excessive heat waves or pandemics. The gradual transfer of public to private property rights and services will in the long run weaken the power of local planning units and local authorities. If left unchecked, the increasing privatization of public space could ultimately become a huge democratic problem.

5. Concluding Remarks

The ratio of public/private land is diminishing, affecting cities in a multitude of ways. The drivers of incremental change of urban greenspace presented herein are ultimately a result of urban densification schemes (spatial and/or population), which seemingly propel a monoculturalization of property-rights regimes towards economic efficiency and private and semi-private solutions. As elaborated on herein, congestion in the use of public space is but one outcome of urban densification, leading to such phenomena as the separation of attributes, activity intensification, and even to alienation of public space to private interests. Underutilization of greenspace coupled to inadequate funding for greenspace management make these spaces more vulnerable to urban encroachment, especially when cities grow inwardly, posing an overall negative effect on the maintenance and generation of ecosystem services.

To counter shifting baselines that may result from the incremental demise of urban green spaces, Hartig and Kahn [51] propose that cities should provide more opportunities for people to experience more stable, healthy, and even wilder forms of nature. Property rights, however, ultimately determine such opportunities, as no single space should be expected to meet the demands of all users at all times, nor will any single type of property-rights arrangements fulfill the multitude of functions that a vibrant city depends on. Designing urban commons as an alternative to land privatization is no guarantee, however, for halting the demise of urban greenspaces, as the effects of privatization and commodification of commons is also high in some countries, such as in Europe [65]. However, maintaining a well-balanced diversity and mixture of property-rights regimes could be a wise policy for planners to adhere to in order to increase preparedness to meet an increasingly disturbance-prone future.

Although common property resource systems have been known to collapse due to overuse, there are promising signs that these systems are experiencing a revival in urban settings and boosting collective environmental action [44,66]. There are important linkages among urban common property systems, social–ecological learning, and management of biodiversity and ecosystem services. Urban gardening projects provide not only cultural and provisioning ecosystem services but also regulating ecosystem services to city neighborhoods [44]. There are also examples of whole public parks being managed as common property systems [67]. By granting management rights of greenspace to residential collectives and social networks, local governments can still maintain control and ownership of public space. Long-term leaseholds and the establishment of ‘user rights contracts’ that transfer management rights of public space to civil society groups can be a viable interim solution for local governments in order to survive periods of fiscal shortcuts. Studies have shown that urban common property systems can serve a multitude of social-ecological purposes [11] and turn spaces into meaningful places that urban residents themselves can manage to improve and protect urban nature. The transferring of proprietor rights down to local levels can also lower transaction costs for greenspace management and governance [44]. To safeguard ecosystem services policy makers and planners should take advantage of these benefits and more meticulously address the incremental demise of public greenspace.

Author Contributions: Conceptualization, J.C. Writing—Original Draft Preparation, J.C., S.B., Å.G.; Leading of the writing process, J.C.; Corresponding author, J.C. All authors have read and agreed to the published version of the manuscript.

Funding: Johan Colding’s and Stephan Barthel’s work have partly been funded by University of Gävle. Barthel’s work has also been funded by FORMAS/The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning. The project is called Spatial and Experiential Analyses for Urban Social Sustainability (ZEUS) (reference number: 2016-01193). Barthel’s work is also funded by the Stockholm Resilience Centre. Johan Colding’s and Åsa Gren’s work has also been partly funded through a research grant (reference number: 2017-00937) received from the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS), and through means provided by the Stockholm County Council and the Stockholm University (SU-SLL Grant 2017: no. 20160884), and from core funding provided by the Beijer Institute of Ecological Economics, Stockholm, Sweden.

Acknowledgments: The authors wish to thank Jonas Adner for the nice Figure illustration.

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

References

- Fuller, R.A.; Gaston, K.J. The scaling of green space coverage in European cities. *Biol. Lett.* **2009**, *5*, 352–355. [CrossRef]
- Colding, J. The Role of Ecosystem Services in Contemporary Urban Planning. In *Urban Ecology*; Oxford University Press: Oxford, UK, 2011; pp. 228–237.
- Lee, S.; Webster, C. Enclosure of the urban commons. *Geojournal* **2006**, *66*, 27–42. [CrossRef]
- Leclercq, E.; Pojani, D.; Van Bueren, E. Is public space privatization always bad for the public? Mixed evidence from the United Kingdom. *Cities* **2020**, *100*, 102649. [CrossRef]
- World Health Organization. Urban green spaces: A brief for action. *Reg. Off. Eur.* **2017**. Available online: http://www.euro.who.int/__data/assets/pdf_file/0010/342289/Urban-Green-Spaces_EN_WHO_web3.pdf?ua=1 (accessed on 6 March 2020).

6. Kabisch, N.; Haase, D. Green spaces of European cities revisited for 1990–2006. *Landsc. Urban Plan.* **2013**, *110*, 113–122. [CrossRef]
7. Kohn, M. *Brave New Neighborhoods*; Routledge: Abingdon-on-Thames, UK, 2004; ISBN 9780203495117.
8. Wirth, L. Urbanism Way of Life. *Am. J. Sociol.* **1938**, *44*, 1–24. [CrossRef]
9. Pasaogullari, N.; Doratli, N. Measuring accessibility and utilization of public spaces in Famagusta. *Cities* **2004**, *21*, 225–232. [CrossRef]
10. Lindholm, G. Land and Landscape; Linking Use, Experience and Property Development in Urban Areas. *Land* **2019**, *8*, 137. [CrossRef]
11. Fahrig, L. Effects of Habitat Fragmentation on Biodiversity. *Annu. Rev. Ecol. Evol. Syst.* **2003**, *34*, 487–515. [CrossRef]
12. Zhou, W.; Wang, J.; Qian, Y.; Pickett, S.T.A.; Li, W.; Han, L. The rapid but “invisible” changes in urban greenspace: A comparative study of nine Chinese cities. *Sci. Total Environ.* **2018**, *627*, 1572–1584. [CrossRef]
13. Ogen, Y. Assessing nitrogen dioxide (NO₂) levels as a contributing factor to coronavirus (COVID-19) fatality. *Sci. Total Environ.* **2020**, *726*, 138605. [CrossRef]
14. Samuelsson, K.; Barthel, S.; Colding, J.; Macassa, G.; Giusti, M. *Urban Nature as a Source of Resilience during Social Distancing Amidst the Coronavirus Pandemic*. OSF Preprint. 2020. Available online: <https://osf.io/3wx5a/> (accessed on 6 March 2020). [CrossRef]
15. Nilsson, K.L. Managing Complex Spatial Planning Processes. *Plan. Theory Pract.* **2007**, *8*, 431–447. [CrossRef]
16. Ostrom, E. *Governing the Commons*; Cambridge University Press: Cambridge, UK, 2015; ISBN 9781316423936.
17. Berkes, F.; Colding, J.; Folke, C. *Navigating Social-Ecological Systems*; Berkes, F., Colding, J., Folke, C., Eds.; Cambridge University Press: Cambridge, UK, 2001; ISBN 9780521815925.
18. North, D.C. *Institutions, Institutional Change and Economic Performance*; Cambridge University Press: Cambridge, UK, 1990; ISBN 9780521397346.
19. Ostrom, E. *Crafting Institutions for Self-Governing Irrigation Systems*; ICS Press: San Francisco, CA, USA, 1992; ISBN 9781558151680.
20. Hanna, S.; Folke, C.; Mäler, K.-G. Property Rights and the Natural Environment. In *Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment*; Island Press: Washington, DC, USA, 1996.
21. De Sousa Silva, C.; Viegas, I.; Panagopoulos, T.; Bell, S. Environmental Justice in Accessibility to Green Infrastructure in Two European Cities. *Land* **2018**, *7*, 134. [CrossRef]
22. Gren, Å.; Andersson, E. Being efficient and green by rethinking the urban-rural divide—Combining urban expansion and food production by integrating an ecosystem service perspective into urban planning. *Sustain. Cities Soc.* **2018**, *40*, 75–82. [CrossRef]
23. Colding, J.; Lundberg, J.; Folke, C. Incorporating Green-area User Groups in Urban Ecosystem Management. *AMBIO A J. Hum. Environ.* **2006**, *35*, 237–244. [CrossRef] [PubMed]
24. McDonald, R.I.; Forman, R.T.T.; Kareiva, P. Open Space Loss and Land Inequality in United States’ Cities, 1990–2000. *PLoS ONE* **2010**, *5*, e9509. [CrossRef] [PubMed]
25. Hirt, S.; Kovachev, A. The changing spatial structure of post-socialist Sofia. In *The Urban Mosaic of Post-Socialist Europe. Contributions to Economics*; Tsenkova, S., Nedović-Budić, Z., Eds.; Physica-Verlag HD: Heidelberg, Germany, 2006; pp. 113–130.
26. Haase, D.; Kabisch, S.; Haase, A.; Andersson, E.; Banzhaf, E.; Baró, F.; Brenck, M.; Fischer, L.K.; Frantzeskaki, N.; Kabisch, N.; et al. Greening cities—To be socially inclusive? About the alleged paradox of society and ecology in cities. *Habitat Int.* **2017**, *64*, 41–48. [CrossRef]
27. Mensah, C.A. Destruction of Urban Green Spaces: A Problem beyond Urbanization in Kumasi City (Ghana). *Am. J. Environ. Prot.* **2014**, *3*, 1–9. [CrossRef]
28. Jones, R. Managing the green spaces: Problems of maintaining quality in a local government service department. *Manag. Serv. Qual. Int. J.* **2000**, *10*, 19–31. [CrossRef]
29. Heritage Lottery Fund. *State of UK Public Parks*. 2016. Available online: https://www.heritagefund.org.uk/sites/default/files/media/attachments/state_of_uk_public_parks_2016_final_for_web%281%29.pdf (accessed on 10 March 2020).
30. De Magalhães, C.; Freire Trigo, S. Contracting out publicness: The private management of the urban public realm and its implications. *Prog. Plan.* **2017**, *115*, 1–28. [CrossRef]

31. Iossa, E.; Martimort, D. The Simple Microeconomics of Public-Private Partnerships. *J. Public Econ. Theory* **2015**, *17*, 4–48. [\[CrossRef\]](#)
32. Gross, J.S. Business improvement districts in New York: The private sector in public service or the public sector privatized? *Urban Res. Pract.* **2013**, *6*, 346–364. [\[CrossRef\]](#)
33. Anderson, L. A business improvement district for a park? Hey, it just might work. *Villager* **2008**, *78*, 14.
34. Kennedy, D.J. Restraining the Power of Business Improvement Districts: The Case of the Grand Central Partnership. *Yale Law Policy Rev.* **1996**, *15*, 283–330.
35. Colding, J. Creating Incentives for Increased Public Engagement in Ecosystem Management through Urban Commons. In *Adapting Institutions*; Boyd, E., Folke, C., Eds.; Cambridge University Press: Cambridge, UK, 2011; pp. 101–124, ISBN 9781139017237.
36. Cybriwsky, R. Changing patterns of urban public space. *Cities* **1999**, *16*, 223–231. [\[CrossRef\]](#)
37. Sparrow, M.K. Managing the Boundary between Public and Private Policing. In *Modern Perspectives on Policing: Selected Papers*; National Institute of Justice: Washington, DC, USA, 2015; ISBN 9781634639705.
38. Low, S.M. The Erosion of Public Space and the Public Realm: Paranoia, surveillance and privatization in New York City. *City* **2006**, *18*, 43–49. [\[CrossRef\]](#)
39. Colding, J.; Barthel, S.; Sörqvist, P. Wicked Problems of Smart Cities. *Smart Cities* **2019**, *2*, 31. [\[CrossRef\]](#)
40. Skår, M. Forest dear and forest fear: Dwellers' relationships to their neighbourhood forest. *Landsc. Urban Plan.* **2010**, *98*, 110–116. [\[CrossRef\]](#)
41. Cervero, R.; Duncan, M. Walking, Bicycling, and Urban Landscapes: Evidence from the San Francisco Bay Area. *Am. J. Public Health* **2003**, *93*, 1478–1483. [\[CrossRef\]](#)
42. Vischer, J.C.; Cranz, G. The Politics of Park Design: A History of Urban Parks in America. *Soc. Forces* **1984**, *63*, 287. [\[CrossRef\]](#)
43. Miller, H.C.; Gratz, R.B.; Mintz, N. *Cities Back from the Edge—New Life for Downtown*; John Wiley & Sons: Hoboken, NJ, USA, 2000.
44. Colding, J.; Barthel, S.; Bendt, P.; Snep, R.; van der Knaap, W.; Ernstson, H. Urban green commons: Insights on urban common property systems. *Glob. Environ. Chang.* **2013**, *23*, 1039–1051. [\[CrossRef\]](#)
45. Williams, K.; Burton, E.; Jenks, M. Achieving the Compact City through Intensification: An Acceptable Option? In *The Compact City*; Burton, E., Jenks, M., Williams, K., Eds.; Spon Press: London, UK, 2010; pp. 71–83.
46. Haccoû, H.A.; Deelstra, T.; Krośnicka, K.; Dol, M.; Kramer, M. *MILU Guide Practitioners' Handbook for Multifunctional and Intensive Land Use*; Habiforum Foundation: Gouda, The Netherlands, 2007; ISBN 978-90-806647-5-3.
47. Westerink, J.; Haase, D.; Bauer, A.; Ravetz, J.; Jarrige, F.; Aalbers, C.B.E.M. Dealing with Sustainability Trade-Offs of the Compact City in Peri-Urban Planning Across European City Regions. *Eur. Plan. Stud.* **2013**, *21*, 473–497. [\[CrossRef\]](#)
48. Stadsledningskontoret. *Grönare Stockholm: Riktlinjer för Planering, Genomförande och Förvaltning av Stadens Parker och Naturområden*; Stadsledningskontoret: Stockholm, Sweden, 2016.
49. Marcus, L.; Colding, J. Toward an integrated theory of spatial morphology and resilient urban systems. *Ecol. Soc.* **2014**, *19*, 55. [\[CrossRef\]](#)
50. Samuelsson, K.; Colding, J.; Barthel, S. Urban resilience at eye level: Spatial analysis of empirically defined experiential landscapes. *Landsc. Urban Plan.* **2019**, *187*, 70–80. [\[CrossRef\]](#)
51. Hartig, T.; Kahn, P.H. Living in cities, naturally. *Science* **2016**, *352*, 938–940. [\[CrossRef\]](#) [\[PubMed\]](#)
52. Miller, J.R. Biodiversity conservation and the extinction of experience. *Trends Ecol. Evol.* **2005**, *20*, 430–434. [\[CrossRef\]](#)
53. Giusti, M.; Barthel, S.; Marcus, L. Nature Routines and Affinity with the Biosphere: A Case Study of Preschool Children in Stockholm. *Child. Youth Environ.* **2014**, *24*, 16. [\[CrossRef\]](#)
54. Barthel, S.; Belton, S.; Raymond, C.M.; Giusti, M. Fostering Children's Connection to Nature Through Authentic Situations: The Case of Saving Salamanders at School. *Front. Psychol.* **2018**, *9*, 928. [\[CrossRef\]](#)
55. Korah, P.I.; Cobbinah, P.B.; Nunbogu, A.M.; Gyogluu, S. Spatial plans and urban development trajectory in Kumasi, Ghana. *GeoJournal* **2017**, *82*, 1113–1134. [\[CrossRef\]](#)
56. Colding, J.; Barthel, S. The Role of University Campuses in Reconnecting Humans to the Biosphere. *Sustainability* **2017**, *9*, 2349. [\[CrossRef\]](#)

57. Kahn, A.E. The Tyranny of Small Decisions: Market Failures, Imperfections, and the Limits of Economics. *Kyklos* **1966**, *19*, 23–47. [[CrossRef](#)]
58. Cooper, C.B.; Dickinson, J.; Phillips, T.; Bonney, R. Citizen Science as a Tool for Conservation in Residential Ecosystems. *Ecol. Soc.* **2007**, *12*, 11. [[CrossRef](#)]
59. Ostrom, E. Collective Action and the Evolution of Social Norms. *J. Econ. Perspect.* **2000**, *14*, 137–158. [[CrossRef](#)]
60. Ensminger, J. Changing Property Rights: Reconciling Formal and Informal Rights to Land in Africa. In *The Frontiers of The New Institutional Economics*; Drobak, J.N., Nye, V.C., Eds.; Academic Press: San Diego, CA, USA, 1997; pp. 165–196.
61. Schumacher, M.; Durán-Díaz, P.; Kurjenoja, A.K.; Gutiérrez-Juárez, E.; González-Rivas, D.A. Evolution and Collapse of Ejidos in Mexico—To What Extent Is Communal Land Used for Urban Development? *Land* **2019**, *8*, 146. [[CrossRef](#)]
62. Crépin, A.-S. Complexity, resilience and economics. In *Global Challenges, Governance, and Complexity*; Galaz, V., Ed.; Edward Elgar Publishing: Cheltenham, UK, 2019; pp. 166–187.
63. Holling, C.S. Resilience and Stability of Ecological Systems. *Annu. Rev. Ecol. Syst.* **1973**, *4*, 1–23. [[CrossRef](#)]
64. Folke, C.; Kofinas, G.P.; Chapin, F.S. *Principles of Ecosystem Stewardship*; Springer: New York, NY, USA, 2009; ISBN 978-0-387-73032-5.
65. Schicklinski, J. *The Governance of Urban Green Spaces in the EU*; Routledge: Abingdon-on-Thames, UK, 2017; ISBN 9781315403823.
66. Colding, J.; Barthel, S. The potential of ‘Urban Green Commons’ in the resilience building of cities. *Ecol. Econ.* **2013**, *86*, 156–166. [[CrossRef](#)]
67. Bendt, P.; Barthel, S.; Colding, J. Civic greening and environmental learning in public-access community gardens in Berlin. *Landsc. Urban Plan.* **2013**, *109*, 18–30. [[CrossRef](#)]



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).