



## Greening cities – To be socially inclusive? About the alleged paradox of society and ecology in cities



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### ABSTRACT

Greening cities, namely installing new parks, rooftop gardens or planting trees along the streets, undoubtedly contributes to an increase in wellbeing and enhances the attractiveness of open spaces in cities. At the same time, we observe an increasing use of greening strategies as ingredients of urban renewal, upgrading and urban revitalization as primarily market-driven endeavours targeting middle class and higher income groups sometimes at the expense of less privileged residents. This paper reflects on the current debate of the social effects of greening using selected examples. We discuss what trade-offs between social and ecological developments in cities mean for the future debate on greening cities and a socially balanced and inclusive way of developing our cities for various groups of urban dwellers. We conclude that current and future functions and features of greening cities have to be discussed more critically including a greater awareness of social impacts.

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### 1. Introduction

Global environmental change and urbanization are major issues of the international political agenda and are highly interlinked. As

of today, 54% of the world's population resides in urban areas, and more than two thirds of the world's population is projected to urbanize by 2050 (United Nations, Department of Economic and Social Affairs, 2014). One of the major challenges for future urban planning is, thus, to prepare urban spaces for an increasing number of people while developing and maintaining cities as sustainable and liveable places. When urban green areas are put increasingly under pressure, e.g. because of ongoing urban land conversion for housing and transport, it becomes important to acknowledge their

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multifunctionality in maintaining and improving human health and wellbeing by providing ecosystem services such as flood and climate regulation and air filtration (Larondelle, Haase, & Kabisch, 2014).

The European Commission has introduced legislation and several strategies for developing and enhancing urban green and blue spaces, such as the Green Infrastructure Strategy (EC, 2013), the Biodiversity Strategy (EC, 2011), the Habitats Directive (CEC, 1992) and the Water Framework Directive (CEC, 2000). These initiatives (more indirectly) and the current research EU research programme Horizon 2020 (EC, 2016) emphasize two concepts in particular – Green Infrastructure (GI) and Nature-based Solutions (NBS) – as important concepts in the discussion about sustainable cities and as ways to address the UN Sustainable Development Goal No. 11: Make cities and human settlements inclusive, safe, resilient and sustainable (<https://sustainabledevelopment.un.org>). Both GI and NBS are concepts based on the different contributions of green spaces to the urban environment: GI refers to an interconnected network of green spaces that helps stop the loss of biodiversity and enable ecosystems to deliver their many services to people and nature (Benedict & McMahon, 2002). NBS are instruments inspired by nature and using the properties and functions of ecosystems to enhance ecosystem services (EC 2013) and multiple health benefits (Kabisch et al., 2016; Mathey, Rößler, Banse, Lehmann, & Bräuer, 2015). They claim to provide solutions for a broadly contextualized ‘environmental and health challenge’ in cities mainly referring to air pollution, extreme heat and flood events and increasing numbers of cardio-vascular diseases, asthma or obesity on the one hand, and losses of life and disproportional property values on the other (UN Habitat, 2012). These arguments build upon the ‘healthy city debate’ (e.g. World Health Organization, 2012), and the discussion around climate change adaptation (Cohen-Shacham, Walters, Janzen, & Maginnis, 2016) where urban green spaces play an important role in mediating climate change related impacts.

At the same time, GI and NBS often claim to address social issues such as social cohesion, socio-spatial inequalities and an unequal distribution of goods and burdens in/across cities. EU documents on GI and NBS (European Commission, 2015) argue that the multiple benefits of their installation include ‘fostering social cohesion’ (p.5), and contribute to the solution of ‘various societal challenges’ (p.5). The EC’s report uses the term social *inclusiveness* to describe the cumulative social benefits created and supported by GI and NBS in cities: ‘... Nature-based solutions use the features and complex system processes of nature, [...] in order to achieve desired outcomes, such as [...] improved human wellbeing and *socially inclusive green growth*.’ (p.5). However, in reality, little is known about how the implementation of green strategies or policies affect health and wellbeing, livelihood and the living conditions of the urban poor in the mid and longer term (Anguelovski et al., 2015).

This paper (1) reflects on current debates about the relationship between greening cities and social inclusiveness; (2) provides examples from cities where trade-offs between social and ecological development can be observed; and (3) draws conclusions on what this means for the future debate on how to use greening to shape more liveable and healthy urban environments that meet the needs and wants of various groups of urban dwellers in a socially balanced and inclusive way.

## 2. Greening cities: the concepts of green infrastructure and nature-based solutions and what they say about social inclusiveness

To green cities is an active intervention to enlarge and to maintain the quantity, enhance the quality and improve the

network of green spaces in a city. As mentioned above, two main concepts, GI and NBS are at the forefront of the agenda, in Europe and elsewhere, of innovation and demonstration relating to the greening of cities.

GI is a strategically planned and designed network of natural and semi-natural areas, integrated with other environmental features and managed to conserve biodiversity and to deliver a wide range of ecosystem services (Benedict & McMahon, 2002). In cities, it may include any kind of vegetation cover such as parks, forest, public green spaces, private gardens, and roof gardens. Furthermore, blue spaces and other physical features in terrestrial (including coastal) and marine areas are also considered as GI. GI embodies the principles of multi-functionality and connectivity and offers a strategic planning approach to make use of ecosystem properties to support human health and wellbeing (Landscape Institute, 2013; Rouse & Bunster-Offa, 2013). GI relies on the principle that conscious integration of measures to protect and enhance nature and ecosystem processes into spatial planning and territorial development support and safeguard many essential benefits for human society in cities (EC, 2013). GI is assumed to have general and largely positive effects on people’s quality of life, health and wellbeing. However, whether these effects are fairly distributed over a city’s population or to what extent they directly contribute to a decrease in inequalities is much less clear and awaits further more in-depth analysis including qualitative studies (e.g. as discussed by Botzat, Fischer, & Kowarik, 2016; De la Barrera, Reyes-Paecke, & Banzhaf, 2016a).

NBS are living solutions inspired by, continuously supported by and using nature. They are designed to address various environmental challenges in a resource efficient and adaptable manner and to provide simultaneously economic, social and environmental benefits (European Commission, 2015; Kabisch et al., 2016). NBS might include anything from genetically modified organisms, biomimicry developments, to small-scale land management, ecosystem restoration, greening of artificial surfaces such as rooftops or walls in cities. At a larger scale, NBS can include integrated climate change mitigation and adaptation measures such as afforestation, natural flood control and potentially geo-engineering. NBS are supposed to contribute positively to social inclusiveness even beyond their functions to increase social wellbeing, health and quality of life for urban residents. This should happen through urban gardening, ecologically well-adapted forms of housing and transport, quality of life support through activities in green and clean environments as well as the reduction of environmental burdens through nature-based technologies (European Commission, 2015). All of this is expected to have (generally) positive socially inclusive effects; however, as mentioned above for GI, empirical evidence for this relation has to be gathered yet.

## 3. The (dis)connection between the green space and the social space

It is this alleged straightforward relation between GI, NBS and the socio-spatial dimensions of urban life as described above that we seek to challenge and scrutinize in this paper. As these concepts become more popular and political processes mainstream their use, it is important to establish a more nuanced understanding of the social implications of greening strategies central to both GI and NBS concepts. We argue that, under certain circumstances, greening strategies carry a paradoxical risk of fostering greater inequality among social groups rather than fostering social cohesion and inclusiveness: “[...]. Projects that benefit one district may have negative impacts next door.” (Wachsmuth & Cohen, 2016, p. 392) Undoubtedly, greening cities – installing new parks and using the space along the streets for diverse greenery for example –

contributes to an increase in wellbeing and enhances the attractiveness of open spaces in cities despite potential disservices like pollen allergies (Döhren & Haase, 2015). At the same time, we observe an increasing use of greening strategies that are officially adopted as ingredients of urban renewal, upgrading and revitalization projects but are in reality first and foremost market-driven endeavours primarily catering for higher income residents (Anguelovski, 2015; Sham, 2012). Less affluent, low income and homeless people, in contrast, are threatened by displacement (see Cucca, 2012 for examples from different cities). “Cleaning up and clearing out”, or the contradiction between environmental and social ethics during processes of infill, upgrading and urban renewal, are central arguments in the emerging debate on green or eco(logical) gentrification (Bunce, 2009; Ceaser, 2010; Cucca, 2012; Dooling, 2009; Gould & Lewis, 2017; Lees, Slater, & Wylie, 2007; Quastel, 2009; Wolch, Byrne, & Newell, 2014). It questions whether social-ecological trade-offs are unintentional (seen as unexpected policy effects or externalities), or whether they are deliberately accepted or even desired when employing green strategies for urban renewal.

This debate is not just theoretical; many studies analysing real estate markets have shown that the presence of nearby urban green spaces increase housing prices (see the meta-analysis by Brander & Koetse, 2011). Unequal socio-spatial distribution is reflected by differences in the quantity and size of green spaces, the structure of vegetation, and their quality (De la Barrera et al., 2016a). Poorer areas often have less vegetation, especially fewer trees, in contrast to more affluent urban areas with plenty of private gardens and shady green spaces, providing a larger amount and diversity of ecosystem services (De la Barrera, Rubio, & Banzhaf, 2016b). In this context, greening projects may be seen as “ways that entrepreneurial urban regimes have sought to incorporate the green agenda” into a neoliberal development, something While, Jonas, and Gibbs (2004) articulated as a ‘sustainability fix’. One effect (intended or not) is that existing social inequalities in access to public resources and the possibilities for urban dwellers to benefit from environmental goods are, in some cases, not improved by urban renewal activities, and might be even exacerbated (Curran & Hamilton, 2012; Gould & Lewis, 2009; Wolch et al., 2014). There is a documented trend of growing inequality in many cities across Europe, as evidenced by, among other things, increasing socio-spatial segregation, even polarization (Cucca, 2012). This is reflected in an increasingly uneven distribution of environmental goods and burdens among urban residents, e.g. access to urban green, recreational areas or the possibility to live in a healthy place (Kabisch & Haase, 2014), as well as the uneven exposure to risks. Such processes have happened despite an almost continuous rise in total income of urban dwellers in Europe since World-War-II (Eurostat, 2015). The rise of neoliberalism has contributed to an increasing socio-spatial differentiation in cities. This is evident in both western welfare states that increasingly suffer from cuts in welfare and austerity policy (Curran & Hamilton, 2012; Scoppetta, 2014), and post-socialist Eastern European states that largely shifted from state-socialist towards neoliberal policies and practices (Hirt, 2012). Particularly in these post-socialist cities, as a consequence of a neoliberal ‘marketization’ of the housing stocks, infill development replaced green spaces in many quarters with negative effects such as collateral noise, more traffic and less spaces for informal meetings (Westerink et al., 2012).

Although greening strategies that can incorporate GI and/or NBS have many positive aspects, they may also contribute to (further) socio-spatial segregation, exclusion and displacement in cities. Hence, they may favour those who could actually afford to pay for expensive houses and apartments which costs include specific

environmental qualities (Krellenberg, Welz, & Reyes-Päcke, 2014). Thus, they do not directly pay for ecosystem services or environmental qualities. As Banzhaf and Walsh (2006, p. 122) put it, such strategies result in new residents to benefit from “gain of the environmental improvement, leaving the original residents worse off”.

#### 4. Greening cities and social inclusiveness: a reality check

Looking at history, green spaces have been part of the urban fabric and of its segregated structure for a long time (Breuste, Pauleit, Haase, & Sauerwein, 2016). However, lessons about past city greening practices are missing from many current discussions about GI and NBS. Quantitative and qualitative increase in green space has, as a rule, positive impacts on the price and location assessment of housing (Kolbe & Wüstemann, 2014). Exceptions are brownfield sites and vacant lots, especially if they are characterized by decay and wilderness (Lorance Rall & Haase, 2011). During the global industrialization-urbanization process in the 19th century in Europe and the US, cities grew spatially and “entered” hitherto natural areas. While this period saw the systematic establishment of many parks and green spaces, bourgeois or middle class districts were privileged with respect to the size and quality of parks and other green spaces compared to working class districts (Birch & Wachter, 2011). Post-World-War-II urbanization tried to change this structure by promoting a more perforated housing development, interspersed with green spaces, not least as a response to the legacies of the war bombardments in Europe. The results, however, met the ambitions only in a few cases; especially mass housing construction to eliminate the huge housing shortage were built with high densities, and rare green spaces inside the estates, but, more green in the adjacent surrounding municipalities. In the 1950s, many disadvantaged districts were endowed with more and higher quality green space as greening strategies became a general approach of upgrading within the framework of urban restructuring, especially in working class districts in Europe as well as in the US (Birch & Wachter, 2011). The underlying idea was that new, high-quality green space would bring benefits for large groups of inhabitants. In the last decades, greening strategies have also been used to maintain and improve residential qualities in shrinking urban districts and brownfield sites (Birch & Wachter, 2011). How greening kept the promise of improving the residential quality but thereafter may result in a rising of house and apartment prices being a fertile ground for income-segregation and social exclusion will be shown in the next section using some exemplary case study stories.

#### 5. Selected examples of urban green space development projects involving social trade-offs

The first example that we would like to introduce is the Lene-Voigt-Park in Leipzig, Eastern Germany. This park serves as an example for a strategy of upgrading a dilapidated district and close-by brownfield sites, through a greening strategy, among other strategies. It was created in 2001 on the area of a former local railway station encompassing 10 ha. In an area characterized over several decades by vacant buildings and extensive brownfields, the park has now become part of a green network between the eastern districts and the ‘green lung’ of the city, an area covered by flood-plain forests. The housing area around the former railway station reflects the ongoing industrialization of Leipzig in the 1870s as a typical worker’s neighbourhood. Since 1942, the railway station and its surroundings had turned into a brownfield. After the German reunification in 1990, the city started a large rehabilitation



programme, which included the refurbishment of brownfields. Thus, and in line with counteracting urban population shrinkage and housing vacancy which characterized Leipzig between 1995 and 2005, the city council created the Lene-Voigt-Park; residents' opinions and desires were included in the process through workshops. The main aim of this park creation was to offer more green space for the dense housing area and to create playgrounds for kids. The park was accepted very well and became popular shortly after it was constructed.<sup>1</sup> It helped to initiate residential change of the surrounding areas and the development of the local urban infrastructure, e.g. cafés, shops. New residents moved there and housing vacancies started to decrease. Among the new residents, there were more young families with kids and higher incomes. As a consequence, rents started to rise from 4.5 Euro per sqm in 2000 to almost 7 Euro per sqm as of today. The Lene-Voigt-Park is the heart of an increasingly expensive housing area with young and educated residents where the former dwellers – among them elderly and less affluent households had to leave the area due to increasing housing costs.<sup>2</sup>

While in the Lene-Voigt-Park example, gentrification was an unexpected result of a greening project, greening strategies can be employed deliberately as drivers of gentrification to address the wants and needs of better-off urban dwellers (Atkinson & Bridge, 2005). Typical examples for such strategies are waterfront developments in former harbour or industrial areas in many western European cities, e.g. Liverpool, London, Hamburg, Bristol, Amsterdam, Copenhagen, Barcelona (Haase, Wolff, & Rink, 2016) and in the United States cities such as New York City (NYC), Chicago, Pittsburgh and Baltimore. These projects include high-quality (using GI and NBS) and high-priced housing for those who can afford it; lower-income groups are either displaced or ex ante excluded. Urban research speaks here of “exclusionary displacement” (Dale & Newman, 2009; Marcuse, 1985) that can be posed as an opposing force to the inclusiveness alluded to in the GI and NBS concepts.

Support for projects with an obvious potential for “exclusionary displacement” is not uniform and their development is often accompanied by protest. A case in point, although not waterfront development, is the project to build luxury housing in ‘Tempelhofer Feld’, the former airport flight field in Berlin, Germany, that has so far been left as a large green open space (Jensen, 2014). Atypically, the renewal project was prevented by a plebiscite in 2014 initiated by protests of residents from all over Berlin. The plebiscite indicated that Berlin citizens preferred the maintenance of the green space for all residents and opposed the construction of costly apartments. In a still more complex turn of events, and despite the plebiscite, the quarters neighbouring the ‘Tempelhofer Feld’ are now seeing processes of gentrification due to the high attractiveness of the park itself.

When it comes to innovative greening strategies, one of the pioneer projects can be found in the US – the High Line Park in NYC. The High Line is a 2.5 km linear park built in Manhattan on an elevated section of a disused New York Central Railroad called the West Side Line. Inspired by earlier projects such as the Promenade Plantée in Paris from 1993, the High Line was redesigned and planted as an aerial greenway and ‘rails-to-trails’ park. It opened partially to the public in 2009, and its construction was completed in 2011. Having started as a neighbourhood initiative *Friends of the High Line*, later on accepted and financially supported by the government of NYC, the High Line is often cited as a success story, seen by its supporters as well as many tourists and real estate

representatives (Alvarez & Wright, 2012). However, there is another side to the story – the complete remaking of the neighbourhoods around the park. The creation of the High Line was grounded in a rezoning resolution by NYC council in 2005 (NYC Planning, 2005) that allowed luxury and high-rise development in an area previously dominated by low-rise, light manufacturing and mixed commercial uses. The combination of the park and rapid new development around it had significantly raised property prices. Between 2003 and 2011, median market value per square foot within 5 min' walk of the High Line rose by 103% putting it well above the Manhattan median value (NYCEDC, 2011).

In fact, the High Line and its neighbourhood may be seen as suffering from its own success: With more than 5 million estimated visitors to the site each year, this greening initiative has managed to transform the entire socio-economic character of the neighbourhood (Pearsall, 2010). Many small businesses and moderate-income residents have been forced to leave and to relocate due to rising property prices, while even those who can afford it have begun to experience the downsides of living or working in an area that panders to tourists. The High Line is thus a good example of green gentrification when looking at the rising property prices in the wake of this famous urban greening project and the empirically found subsequent displacement of the low-income residents (Millington, 2015). It has been discussed as an example for the “contemporary neoliberalization of park space that privileges high profile parks over the broader provisioning of green space” (Millington, 2015, p.13, see also Gandy, 2013). The example also shows that innovative greening strategies may reinforce already on-going gentrification processes – be it in purpose or not. In fact, the High Line pushed gentrification of Southern Manhattan, and housing and real estate prices skyrocketed quickly after its opening in 2009; retail and catering were adapted to the needs of tourists.

Still, the effects of greening are much more diverse. The following example indicates that the argument is not only about introducing new green spaces, or changing their legal status (e.g. from brownfields to formal green space), but also about protecting and managing the public access and use of those green spaces that already exist. Here, we introduce examples from countries where regulations meant to protect urban greenery are insufficient or not properly enforced, such as in Eastern European post-socialist countries. There are evident examples of how this weak regulatory environment is seized by developers for example by ensuring that their housing development projects are located close to green spaces. For example, in Poland, many residential and office development projects are created along the boundaries (or sometimes even within) of parks (Kronenberg, 2015). This strategy obviously attracts potential buyers or tenants and makes it possible to sell or rent buildings for higher prices. However, it also imposes a cost on the general public sector because of the reduction in the size or availability of green space or a degradation of its quality. In Poland, a building built next to a small park in a city centre means that trees and shrubs are removed not only due to the building's construction but also in the neighbourhood to prevent shading of the new apartments. One spectacular example of such a building is located in the centre of Lodz (the third largest Polish city), along the small Sienkiewicz park. This huge Solaris building, which dwarfs the neighbouring park and contributes to its degradation for traditional users, has the most expensive apartments in the city. Even though the prices of these apartments are positively related to the proximity of the park, they are so high that these apartments – as outliers – had to be eliminated from a recent hedonic pricing study carried out in Lodz to check the impacts that green spaces have on real estate prices (Czembrowski & Kronenberg, 2016). The experience in Lodz is part of a larger problem in the treatment of green spaces in east European cities. In Sofia (Bulgaria), for example,

<sup>1</sup> <http://www.leipzig.de/freizeit-kultur-und-tourismus/parks-waelder-und-friedhoeefe/parks-und-gruenanlagen/lene-voigt-park/>.

<sup>2</sup> <http://prinz.de/leipzig/artikel/114136-im-osten-was-neues/>.

about one third of the green areas in the city were lost in the first 15 years of post-socialist transformation. Largely, this loss was related to the so-called ‘construction terrorism’, based on exploiting the neoliberal economic system, combined with poor legal protection of green areas and the abuse of numerous legal loopholes (Hirt, 2012). As a result, many public green spaces are lost or degraded because of private interests.

This is not to say that greening necessarily leads to environmental inequalities; there are also examples where greening policies explicitly target social inclusiveness. For example, in the European Nordic countries the development of new residential areas in the suburbs includes a target of equal accessibility to forest space for all residents regardless of their income and wealth (Vierikko & Niemelä, 2016). Nevertheless, as Vierikko and Niemelä (2016) describe for Helsinki, despite the abundance of green space in these suburbs some of them still experience socio-economic decline and marginalization. Therefore, much more attention needs to be paid to the interplay of greening policies with housing market dynamics or processes of socio-spatial segregation.

## 6. Reflecting reality and claims or the challenge to be socially inclusive

The reality reflected in the aforementioned examples and together with the claims of urban greening strategies lead us to the following conclusion: Greening, without disregarding its many positive effects on urban quality of life, does not lead per se to social inclusiveness. In some cases, like in the marked examples, greening strategies can support or contribute to the displacement of lower income households and to the transformation of a residential environment into higher cost or luxury environments.

In the recognition that under some circumstances greening strategies can be drivers of gentrification processes, resulting in intended and unintended effects, major questions emerge: How can the implementation of GI and NBS strategies support social inclusiveness and avoid or minimize effects that amplify urban inequalities? What processes, regulations and instruments are suitable to accomplish this task?

Many important variables are at play when considering the potential impacts and trade-offs of GI and NBS strategies: the respective local urban and institutional context in which they are implemented, including the areas affected, the type of green or urban nature that is developed, the actors who realise this strategy, and the urban dwellers who are winners or losers of a strategy or a project.

While GI and NBS are often generally supposed to contribute to an improvement of living and health conditions for all people in cities and to foster even social inclusiveness. “Hard evidence” for such assumptions is in most cases not provided (Jong, Joss, Schraven, Zhan, & Weijnen, 2015). Studies addressing the social context and a diversity of social perspectives as crucial part of assessing ecosystem service benefits and the existence of winners and losers when implementing greening projects/strategies are still rare (Curran & Hamilton, 2012; Fisher, Turner, & Morling, 2009). Thus, urban greening does not automatically mean that cities become more sustainable in a socially inclusive way. Strategies of the implementation of high profile urban greening and waterfront developments do, sometimes consciously, the opposite (Curran & Hamilton, 2012; Dooling, 2012; Wolch et al., 2014), even if their roots can be found in neighbourhood or city initiatives as in the case of the NYC High Line. Many urban renewal projects deliberately employ urban nature as a commodity and the actors driving them accept, if not purposely support, that their decisions and

actions do not contribute to social inclusiveness and may increase socio-spatial segregation. Therefore, results of such projects might be environmentally progressive but remain socially selective. This makes the contribution of such developments to wellbeing of larger parts of the population questionable and the debate about their sustainability complicated.

Finally, how could greening strategies support sustainable and socially inclusive urban futures? In the following section, we offer some prerequisites for both research and urban planning and practice that should be addressed in future debates and decision-making.

## 7. Prerequisites for a sustainable and socially inclusive urban green space development

Simply establishing and implementing GI and NBS for improving quality of life bring to light a comparatively narrow vision of what it means to bring green into the city. It appears to ignore the drawbacks of such greening projects for low and moderate-income residents. As such, greening, which does not consider social impacts, might serve, unintentionally, as another malign sign of current urban policies. We should not consider greening strategies as panaceas or silver bullet solutions in cities, meaning that they alone cannot deliver improvement of quality of life. Nevertheless, they are important solutions to include in policy and planning mixes for socioecological regeneration of areas and cities overall. A number of prerequisites might support greening as social inclusive solution:

A **first** prerequisite is the deliberate acknowledgement and consideration of socio-spatial inequalities in the planning, implementation and monitoring/evaluating of greening strategies by scientists and planners. Still, such consideration is not automatic in the view of experts addressing environmental or ecological questions. As mentioned by Hodson and Marvin (2009), decision-makers need to be aware of the difference between “open and inclusive eco-urbanism” and “exclusive eco-urban settlements” (Chatterton, 2010, p. 241). Strong ideas are needed to foster the former and regulate the latter. These inequalities will not disappear once greening strategies will be implemented. In many cases, greening strategies seem more like ‘repercussions’ of these inequalities, e.g. when parks are expensively renovated in residential locations and this renovation leads to rising costs for housing which, again, only affluent households can afford. Thus, inclusive greening should aim at avoiding to further privilege middle class and high income districts, that are privileged anyway, at the expense of the social structure of the city.

The **second** prerequisite is to consider and include not only different groups of actors into the design, planning and implementation of urban green areas or greening strategies but also different opinions and, as far as possible, contrasting views, needs and demands (Ernstson, 2013), including tacit and community knowledge (Anguelovski et al., 2015). There is not just one view of the shape, functionality and benefit of urban nature. Inclusiveness means not just to give all people access to urban green, but to recognize their views and demands, sometimes even if they oppose experts’ preferences.

A **third** prerequisite is the acknowledgement and in-depth treatment of existing trade-offs between ecological and social processes or outcomes of a greening strategy or project. There is much evidence that greening is not socially just or fair per se, and more knowledge has to be gathered on how greening strategies and projects can be planned and implemented to maximize and widespread social benefits, too.

A **fourth** prerequisite is that green spaces are planned and managed, regardless of top-down, bottom-up or jointly, in a way that they can serve as places of encounter for different groups of people. To serve such function, green spaces have to be located and designed in a way that makes them accessible for diverse populations ('multiple effects'), for example by including natural and infrastructural elements appreciated by a wide range of culturally diverse people (Botzat et al., 2016). It is not just about green availability, distribution and accessibility of green. Greening strategies can only work as an 'inclusive' tool of the demands and requests of different groups of people if different 'social environments' are seriously considered and included, and not just in form of participation but also as criteria for decisions even if they are more costly or less market-friendly.

As a **fifth** prerequisite, we call for a multi-actor governance structure to steer greening agendas in cities. Such governance structures may include national and local governments together with civil society organisations to ensure an inclusive representation of all residents and to prevent the aforementioned negative side-effects (Kabisch et al., 2016). In this way, urban GI and NBS – when properly co-designed, co-implemented and co-managed – may foster urban quality of life and support social justice in terms of people's benefitting from environmental goods and ecosystem processes (Kabisch et al., 2016). As an example to such multi-actor governance structures, Elmqvist et al. (2013) report that Porto Alegre, Brazil, now has "urban ecolinks", 70 "green tunnels" in form of tree-lined streets, created and protected by local residents and environmental groups. However, a remaining challenge, even in successful governance cases as reported for Brazil, is that many of the people who potentially have a stake in participatory greening do not tend to participate in public participation processes.

A **sixth** prerequisite is that even when the focus is on environmental issues, research should explicitly look at the political and economic context and related power constellations to avoid underestimating the embeddedness of greening into market-oriented strategies and pay more attention to ambivalences and trade-offs (Checker, 2011; Curran & Hamilton, 2012; Frantzeskaki, Jhagroe, & Howlett, 2016). Too often green and blue elements are used to upgrade a place, and hence to provide upmarket solutions. The future discussion (by different actors, looking at it from different perspectives) about the effects of GI and NBS should be 'realistic', and point also to the limits of such solutions as well as their potential undesirable side-effects.

## 8. Where are we heading to?

When returning to the research questions posed earlier, we can summarize the answers as follows: Although the relation between greening and social inclusiveness is not clear-cut but a complex one, this complexity and the various trade-offs and twists existing in social-ecological processes are not appropriately acknowledged in both ecological and social science literature and the debate around greening strategies. While in recent years there have been more attempts from both sides to cross-fertilize, we still lack explicitly integrated research. This is not to undermine the case studies and examples that already exist and give insight and direction for a more conceptual, theory-oriented debate. Real-life examples of planning and implementation of green in our cities show that green and greening strategies per se are neither socially inclusive nor are they socially sustainable. There are many factors that decide on their role: in some cases, greening is employed for upgrading and leads to or supports social segregation and thus exclusion. Research should emphasize these issues explicitly. The existing strands of discussion such as green gentrification or the embedding of urban ecosystem service provision research into

social and power relations in cities are promising avenues opened up in recent years.

As cities will be the 'human habitat' of the 21st century (Seto & Reenberg, 2014), we have to focus on a more equity-oriented and inclusive way of urban greening to make sure that it serves the whole of the urban society in all parts of our cities. Hitherto conceptions, ideas and practices do not seriously address the social challenges and the relevant trade-offs. They do not lack environment or ecology-related qualities but a realistic or serious adherence towards societal realities such as social and socio-spatial inequalities or different capacities of urban dwellers to benefit from goods and not to suffer from burdens. They lack a truly comprehensive look at the role in terms of both chances and threats that greening strategies can pose for improving quality of life in cities. First and foremost, negative side effects of greening such as social exclusion and displacement remain almost completely out of sight in the frame of market economy conditions and contexts.

In the European Union, the Strategic Environmental Assessment (SEA) which is mandatory for many local and regional land-use plans asks for an analysis of all potential environmental impacts of a given plan or programme. Ways of also formally integrating social inclusion into planning of urban green would be to move on towards a "Sustainability Appraisal" as it is being done in the UK 2016<sup>3</sup> which includes an assessment of the social effects of planning; Pearsall (2012) proposes the inclusion of the vulnerability analysis and indicators into existing urban sustainability planning or environmental quality reviews. Curran and Hamilton (2012), not least, discuss the approach of "just green enough", i.e. to interrogate how urban sustainability can be used to open up a space for diversity and democracy in the neoliberal city.

When addressing trade-offs and limits of greening strategies too, we do not dwarf their importance or relevance for sustainable liveable cities. By contrast, they can help in successfully balancing expectations to their effects and can address their matching with other goals of urban development such as urban functionality or health promotion. In doing so, we should more precisely discuss their transformative potential for increasing goods and services of urban nature for people and to balance possible burdens. Green spaces need to be distributed evenly in a city and furnished by diverse vegetation – to make sure that all inhabitants not only have equal access but also equal benefits. Ultimately, any GI and NBS should help increase liveability in cities in a socially inclusive way.

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