

Editorial to the special issue “Advancing urban ecosystem service implementation and assessment considering different dimensions of environmental justice”

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Editorial to the special issue "Advancing urban ecosystem service implementation and assessment considering different dimensions of environmental justice"

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1 Introduction

2 The ecosystem service (ES) concept is mainstreaming and increasingly taken up by urban
3 policymakers striving for safe, resilient and sustainable cities as stated under UN Sustainable
4 Development Goal 11¹. In particular, the ES framework is gaining momentum as a conceptual
5 basis for the operationalization of benefits of urban green infrastructure strategies (Demuzere
6 et al. 2014) and, more recently, nature-based solutions (Raymond et al., 2017). Yet, the ES
7 concept has been criticized for its insufficient consideration of fairness and justice, hence ES-
8 based assessments, policies and the implementations of greening projects bare the risk of (re-
9)producing social inequalities in cities, for example through 'green gentrification' (e.g.
10 Ernstson, 2013; Haase et al. 2017, Marshall and Gonzalez-Meler, 2016; Anguelovski et al.,
11 2020). Urban ES research is increasingly taking up this criticism, highlighting the need to
12 strengthen the inclusion of equity issues, especially with regard to the distribution of ES in
13 terms of trade-offs, availability, and accessibility of benefits (Daly and Farley, 2011; Kabisch
14 and Haase, 2014, Rigolon et al. 2019). Also, many cities, such as Berlin and Barcelona, are
15 putting increasing emphasis on justice in their new urban green space planning strategies (e.g.
16 Berlin, 2020; Barcelona City Council, 2018).

¹ See: <https://sustainabledevelopment.un.org/sdg11>

17
18 This Special Issue (SI) aims to be an additional cornerstone in firmly anchoring
19 considerations of equity and justice in urban ES research and praxis, and intends to advance
20 ES justice in cities conceptually, methodologically and empirically. In this SI we build on
21 conceptual legacies from social and environmental justice (Fraser, 1995; Kabisch and Haase,
22 2014) in order to address the implementation and assessment of 'urban ES justice'
23 (Langemeyer and Connolly, 2020), which includes aspects of distributive justice, i.e., fair
24 allocation/access of ES for all social groups; procedural/participatory justice, i.e., fair
25 integration of all affected groups into ES-related decision-making processes; and
26 interactional/recognition justice, i.e., recognizing the needs, values, and preferences of all
27 urban residents in relation to ES in a safe, fair, well-coming and non-discriminatory
28 environment, across different spatial and temporal scales.

29 We asked authors to advance new conceptual and theoretical approaches, empirical case
30 studies, and methodological and analytical developments critical for providing new models,
31 tools and approaches for the integration of these three dimensions of justice in urban ES
32 implementation and assessments, and also to come up with particular recommendations for
33 urban environmental planning and policies. Thereby, the SI addresses the need for a
34 comprehensive approach to urban ES that recognizes justice in its multiple dimensions,
35 including potential historic inequalities in ES distributions, diverging values and demands by
36 different population groups, such as children, elderly or historically marginalized groups (cf.
37 Anguelovski et al., 2020), and that allows for the effective inclusion of their interests in the
38 governance and planning of urban green spaces.

39 **2. Core themes and contributions**

40 The SI comprises eleven manuscripts, which we have clustered with regard to their different
41 ways to address the overarching aims of the SI. First, we highlight the conceptualization of
42 justice in urban ES research, mainly through the paper by Langemeyer and Connolly (2020).
43 Second, we synthesize those papers including an integrated, interdisciplinary or
44 transdisciplinary approach to urban ES assessments as a way to navigate towards generating,
45 improving or maintaining environmental justice in cities, considering recognition, procedural
46 and distributive dimensions. Third, we focus on contributions that include quantification,
47 mapping and assessment of urban ES through innovative methodological and analytical

48 approaches to understand the (mainly distributive) justice implications for vulnerable groups,
49 including low-income residents, migrants, children or older people. Finally, two papers
50 specifically address the phenomenon of green gentrification through the lens of ES. Though
51 the SI only addresses European case studies, there is a good balance across European regions
52 (Southern, Central, Northern and Eastern). In the following, we provide a brief summary of
53 the eleven papers structured around the three aims of the SI.

54 *2.1. Conceptualization of justice in urban ecosystem service research*

55 As ES are becoming more and more important to the daily experience of urban residents, and
56 thus to urban planning, **Langemeyer and Connolly (2020)** highlight the urgent need to
57 weave notions of justice into urban ES research and practice. By developing an ES justice
58 model from an urban perspective, the authors provide theoretical entry points and practical
59 examples to address this aspect in urban ES service research. The study highlights the
60 argument that to build an urban ES justice model, some core limitations embedded in the
61 ecological and economic legacy of the ES concept need to be overcome (Norgaard, 2010;
62 Lele, 2013; Pascual et al., 2014). First, this includes moving beyond the classical (rural)
63 framing of stocks of natural capital that deliver benefits to people, which oversimplifies the
64 deeply interconnected character of social-ecological systems in the co-production of benefits
65 for human wellbeing (Andersson et al., 2007; Peterson et al., 2018). Secondly, the
66 predominance of economic understandings of values guiding ES assessments generates an
67 overemphasis on Pareto-optimal solutions, which by definition do not account for inequitable
68 distributive effects of ES (Chaudhary et al., 2018; Saarikoski et al., 2016). The authors
69 highlight critical entry points to overcome these limitations building on the urban
70 environmental justice literature, which – taken together with recent advancements in research
71 on ES services – allows for the development of a new model for urban ES justice. The model
72 presented by Langemeyer and Connolly (2020) considers three relevant filters, namely
73 *infrastructure, institutions and people's perceptions* (cf. Andersson et al., 2019), that can
74 either facilitate or hamper the flow of ES benefits. It combines a conceptual model of how
75 these filters impact ES in urban environments with the classical environmental justice triad of
76 recognition, procedural and distributive justice (Fraser, 1995). The paper then contextualizes
77 this combined conceptual framework within larger theoretical arguments about spatial and
78 temporal justice. Spatial justice includes accounting for the benefits and burdens from ES

79 planning outcomes at the micro scale through inter-scalar teleconnections affecting people
80 globally (cf. Swyngedouw and Heynen, 2003). Temporal justice embeds historical
81 perspectives of injustice (cf. Anguelovski et al., 2020), as well as mid and long-term temporal
82 dimensions of ES justice that are related to urban resilience and long-term sustainability
83 (Elmqvist et al., 2019).

84

85 *2.2. Integrated urban ecosystem service justice assessments*

86 From the conceptualization of environmental justice by Langemeyer and Conolly (2020),
87 particular case studies addressing ES and justice in specific urban green spaces are presented.
88 Park user behavior of different age groups is explored by **Kabisch and Kraemer (2020)**¹.
89 Using two differently designed parks in the German city of Leipzig, authors identify a trend
90 wherein particular park facilities, i.e., infrastructural and vegetation characteristics of parks,
91 determine park use by age group under summer heat conditions in a way that e.g. sports fields
92 invite young generations (teenagers) to be active in groups, to play and to socialize while
93 older people are nearly exclusively observed on benches. From a socio-environmental justice
94 perspective, authors conclude that inviting all age groups to visit urban parks requires an
95 equal provision and maintenance of age-appropriate park design elements, which particularly
96 contributes to a qualitatively improved distributive justice dimension that addresses the needs
97 of younger and older generations.

98 **Enssle and Kabisch (2020)** explore the patterns of older people's health and visitation of
99 urban parks and green spaces in the city of Berlin. Authors find that beyond the distributive
100 dimension of urban green spaces, social inclusion into the neighborhood via a social network
101 such as closer relationships and friends is positively associated with park use. From there,
102 Enssle and Kabisch (2020) propose a framework of the three dimensions of socio-
103 environmental justice in regard to ES provision which should help urban planning to consider
104 both the physical and the social environment to be designed in a way that invites older people
105 to visit and use urban green spaces for recreational and social activities, but also to foster the
106 integration of older people in planning processes and the establishment of local community
107 programs.

108 The particular integration of local stakeholders in urban development and regeneration
109 processes and their interactions in relation to ES provision is assessed by **Olsson et al. (2020)**.

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110 Using the district of Sofielund in Malmö, Sweden as a study case, authors interviewed local
111 stakeholders, including property owners, managers, businesses and local representatives from
112 the Swedish Union of Tenants. In terms of environmental justice, findings show that a
113 distributive injustice of ES provision influences the local perception of what is just. This has,
114 in turn, consequences for the willingness to participate in planning processes. Authors
115 highlight that a comprehensive involvement of local stakeholders and acknowledgement of
116 their perspectives in planning processes is key to a perception of just urban ES governance.
117 Recommendations for improvements include the establishment of more structured
118 participatory processes, better communication between property owners and the municipality
119 and the recognition of power structures.

120 *2.3. Methodological and analytical applications*

121 Spatial approaches to assess inequities in the distribution of urban ES represent a substantial
122 contribution to the SI with five papers. **Baró et al. (2019)** explicitly focus on regulating ES
123 while the others address cultural ES. Baró et al. (2019) analyze the distributive justice
124 implications of the amount of air purification, runoff mitigation and temperature regulation
125 provided by almost 200,000 street trees in the city of Barcelona. The authors find that, unlike
126 previous evidence on urban tree distribution and equity, the provision of regulation ES by
127 street trees is positively associated with the distribution of certain vulnerable groups, such as
128 older people. In light of these results, authors argue that street tree planting strategies can play
129 a relevant redistributive role in terms of local ES provision, especially in compact cities.

130 As part of the assessments of cultural ES, **Suárez et al. (2020)** use an environmental justice
131 lens to analyze outdoor recreation opportunities provided by urban and peri-urban green
132 spaces in the Oslo metropolitan area. Their findings show that population preferences for
133 daily outdoor recreation areas differ depending on age and place of residence and that
134 migrants and low-income households have relatively less access to these amenities. The
135 authors underscore the point that in order to properly address urban environmental justice,
136 cultural ES assessments should go beyond the analysis of uneven or unequal access and also
137 account for people's (diverse) preferences.

138 **Liotta et al. (2020)** develop a methodological framework to assess inequities in access to the
139 cultural benefits of urban green spaces based on a multidimensional definition of well-being,
140 which integrates aspects related to health, education, insecurity and social relations. In line

141 with Suárez et al. (2020), the application of this approach in the Paris metropolitan region
142 highlights the importance of considering different indicators of social inequity for the
143 prioritization of green infrastructure interventions rather than assessments merely based on
144 green space inequality.

145 Finally, two papers analyze the equity implications of cultural ES distribution in Eastern
146 European cities. **Łaszkiewicz and Sikorska (2020)** evaluate welfare disparities among
147 children living in Lodz in relation to the nature-based aesthetic appreciation benefits provided
148 by the greenery surrounding home-school routes. They highlight the point that the distributive
149 environmental injustice is not only understood in terms of the inhabitants' place of living but
150 also regarding inhabitants' spatial movement (spatially dynamic environmental justice).
151 **Sikorska et al. (2020)** focused on the role of informal green spaces to reduce distributive
152 inequity in the access to recreational ES for children and elderly residents of Lodz and
153 Warsaw. Both studies found distributive environmental injustices affecting those age groups
154 and highlight the potential role of unmanaged street greenery (i.e., beyond formal green
155 spaces such as parks) in providing ecosystem services in a way that may limit disparities in
156 the access to cultural ES.

157 *2.4. Urban ecosystem services and green gentrification*

158 Green (ecological, environmental) gentrification is the process where the implementation of
159 new urban green spaces increases neighborhood attractiveness, and consequentially real estate
160 values, potentially foster social displacement or segregation (Anguelovski et al., 2018);
161 thereby increasingly limiting access to ES for vulnerable urban populations over time
162 (Amorim-Maia et al., 2020). Two papers published in this SI address green gentrification as
163 the consequence of new greening initiatives and discuss it in the context of ES (Maia et al.,
164 2020) and real estate market valuation (Bockarjova et al., 2020).

165 **Amorim-Maia et al. (2020)** demonstrate that factors determining green gentrification are not
166 limited to the social and historical conditions of urban green spaces. With the use of geo-
167 located social media data, they show that cultural ES provided by urban parks play a
168 significant role in determining whether these parks are associated (or not) with green
169 gentrification processes or produce environmental injustices in Barcelona. The findings
170 obtained by Amorim-Maia et al. (2020) have relevant policy implications. In particular, they
171 find green gentrification to be primarily attributed to the built infrastructure (such as

172 architectural and artistic features) present in or surrounding the parks enhancing aesthetic and
173 recreational ES, while the actual level of 'greenness' does not play a significant role in
174 explaining gentrification processes.

175 Finally, **Bockarjova et al. (2020)** focused on how the valuation of urban green spaces and ES
176 by real estate buyers relates to green gentrification. In particular, they highlighted the process
177 by which green interventions have an impact on housing markets. With the use of a meta-
178 analysis based on hedonic pricing models, the authors demonstrate that the impact of green
179 interventions on the property market differs by the type of greening and the related ES
180 provision. In particular, real estate buyers value the presence of a park or blue space in the
181 vicinity of their property more than the presence of other types of urban nature.

182

183 **3. Concluding remarks**

184 Previous urban ES assessments have provided useful information for planning urban green
185 infrastructure and the implementation of nature-based solutions, but some have also lacked
186 context in terms of how different residential groups benefit, especially when considering
187 diverse needs. In this Special Issue we presented case studies, new concepts, and advanced
188 methodologies that provide some of this context by integrating the ES concept with
189 considerations of environmental justice. The studies embedded in this Special Issue highlight
190 the point that, in order to make environmental justice considerations explicit, urban ES
191 assessments need to address the societal distribution of ES, people's multiple values,
192 perceptions and needs, fairness of ES-based decision-making processes, and aspects related to
193 spatial, temporal and interactional justice.

194 For instance, the studies show that certain ES provided by urban green spaces might favor
195 green gentrification processes, and that the complex role of the 'green' in these processes
196 needs to be carefully scrutinized. Particularly in recent debates over fostering nature-based
197 solutions, more in-depth research is needed to create a sound understanding of how it can be
198 ensured that these interventions (and the related ES provision) benefit all potential user
199 groups. Furthermore, several papers also highlight a need to more strongly consider informal,
200 unmanaged or street green infrastructure and the critical role they can play in reducing
201 distributive injustices in the access to ES, potentially compensating for the patchy and

202 generally uneven distribution of more formal green spaces such as urban parks.

203 In short, urban green spaces are an important part of the urban socio-ecological system which
204 provides numerous benefits to residents that are of particular importance in the context of
205 challenges coming with climate change, urbanization and even with the current Covid-19
206 pandemic. We, as researchers, can help urban planning to identify and even quantify these
207 benefits and – most importantly – try to assess to whom these benefits are available or not to
208 provide most informed recommendations. Continuously highlighting the importance of
209 environmental and social justice aspects in these assessments raises awareness in urban green
210 space planning and implementation campaigns and may help urban planners and decision
211 makers in creating and applying instruments that contribute to developing more sustainable
212 and just cities. However, creating just planning processes that foster participation and
213 inclusion without sacrificing efforts to ensure future justice, resilience and sustainability
214 remains a challenging task.

215

216 **Declaration of Competing Interest**

217 The authors declare that there are no conflicts of interest.

218

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236

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239 Note: ¹Please, note that Kabisch and Kraemer (2020) is referred to by Kabisch et al. (2020).

240

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