



Public-Private Partnerships for the Promotion of Nature-based Solutions in Urban Settings

Amalia Calderón-Argelich¹, Fiona Löwe², Danijela Glušac³, in collaboration with the
Regional Academy on the United Nations (RAUN)⁴, and the Food and Agricultural
Organization of the United Nations (FAO)⁵

¹*Universitat Autònoma de Barcelona, Spain*

²*Georg-August-Universität Göttingen, Germany & Rijksuniversiteit Groningen, Netherlands*

³*University of Novi Sad & University of Kragujevac, Serbia*

⁴*Peer+: Elisabeth Bergler (University of Klagenfurt), Ingrid Setz (Austrian Academy of Science)*

⁵*Mentor: Gilles Martin, Simone Borelli (FAO)*

31st of January, 2022

Abstract

Nature-based Solutions are an innovative strategy to address numerous environmental and social challenges, which have been exacerbated by the current COVID-19 pandemic. As cities promote greening strategies as a pivotal sustainability target to promote ecosystem services to city residents, challenges related to its financial, institutional, and governance implementation need to be addressed to guarantee its mainstreaming. This research focuses on the potential of Public-Private Partnerships (PPP) in creating sustainable and equitable green spaces in cities. We examine the case of PPP of three cities from different continents (Barcelona, Buenos Aires, and Kampala) to identify benefits, enabling factors, challenges, and good practices. We pinpoint innovative practices and examples of collaborations between the public and private sectors in implementing and managing urban green spaces and challenges for the performance of partnerships. Finally, we provide new evidence and recommendations to policymakers and stakeholders from the public and private sector to promote sustainable and inclusive greening strategies to build back better from the COVID-19 crisis.

Keywords: Nature-based Solutions, Ecosystem Services, Green Cities, Urban Green Infrastructure, Governance, Public-Private Partnerships, Environmental Justice, Sustainable Business Models.

Table of Contents

1 Introduction	1
2 Literature review and research framework	1
2.1 Benefits from urban green spaces	1
2.2 Governance, partnerships and economic models of NbS	1
2.3 The UN framework	2
3 Methodology	3
4 Results	3
4.1 Barcelona (Spain)	3
4.1.1 Enabler: expertise and commitment on NbS	4
4.1.2 Enabler: creation of networks and knowledge transfer	5
4.1.3 Enabler: dissemination and mutual trust	5
4.1.4 Enabler: social innovation and participatory processes	6
4.1.5 Challenge: administrative regulations in building PPP	6
4.1.6 Challenge: awareness-raising and engagement	7
4.1.7 Challenge: long-term commitment, common objective and evaluation processes	7
4.1.8 Challenge: dense and compact model of the city	8
4.1.9 Challenge: environmental injustices and green gentrification	8
4.1.10 Implications of COVID-19	9
4.2 Buenos Aires (Argentina)	9
4.2.1 Enabler: common understanding of urban green space benefits	10
4.2.2 Enabler: collaborative work and political commitment	10
4.2.3 Enabler: civil society participatory processes	11
4.2.4 Challenge: material and livelihood inequalities	11
4.2.5 Challenge: unfamiliarity among partners and sectorial silos	12
4.2.6 Challenge: uncertainty about divergent targets of actors and transparent partnership contracts	12
4.2.7 Challenge: recognition, mutual trust and shared commitment	12
4.2.8 Implications of COVID-19	13
4.3 Kampala (Uganda)	14
4.3.1 Enabler: complementary resources for a common target	14
4.3.2 Enabler: political agenda	14
4.3.3 Enabler: incentive mechanisms	15
4.3.4 Challenge: lack of resources	15
4.3.5 Challenge: recognition of social innovation	16
4.3.6 Implications of COVID-19	16
5 Discussion	16
5.1 Institutional framework and governance	16
5.2 Awareness and acknowledgement of complementary capacities and partners	17
5.3 Participatory processes and social innovation	18
5.4 COVID-19 building back better	18
6 Conclusion	18
7 References	19
A Appendix	24
Glossary	27

1 Introduction

With more than half of the population living in urban areas, cities are facing increasing environmental and social challenges related to climate change, urbanization, and socio-economic inequities (United Nations, 2019). Additionally, planetary urbanization and land-use changes play a pivotal role in facilitating the spread of infectious zoonotic diseases like COVID-19. In urban areas, which have been the epicentre of the COVID-19 pandemic, economic and health inequalities have worsened (Cole et al., 2020; Ribeiro et al., 2021). Lockdown and isolation measures highlighted the distinct social values of urban green spaces as an essential element of public space (Ugolini et al., 2020) questioning the way we design, use, and perceive public spaces (Honey-Roses et al., 2020).

The adoption of the 2030 Agenda for Sustainable Development in 2015 is a milestone in operationalizing pathways to sustainable development and private sector integration (United Nations, 2015d). As stated in the Sustainable Development Goals (SDG) 11, there is a need to make cities more inclusive, safe, resilient, and sustainable (United Nations, 2015d). Additionally, the SDG 17 on partnerships manifests global and multi-stakeholder partnerships for sustainable development. It reflects a shift in responsibility from government to a broader understanding of governance that involves a variety of actors in the provision of public goods and services (Marx, 2019).

Despite progress, there is a need to explore the potential contribution of Public-Private Partnerships (PPP) to increasing the social, environmental, and economic benefits of urban green spaces in different geographic contexts (Mayor et al., 2021). Mainly, it is to identify how the environment and framework of PPP in Nature-based Solutions (NbS) policies relate to their performance in sustainably and equitably transform cities. In addition, there is little evidence about cities' learnings from the COVID-19 pandemic in terms of urban green infrastructure implementation. With vulnerable populations primarily affected by the pandemic crisis, cities must be sustainable and inclusive and make efforts to leave no one behind. It is critical to promote synergies and to incorporate the diverse interests and capabilities of different stakeholders, like national and local policymakers, academia, various private actors, and civil society.

This paper seeks to answer the research question of what the potentials of PPP are to scale up sustainable and equitable green spaces after the COVID-19 disruption and what learnings can be derived from past actions to establish best practices. The objective of our investigation is to identify the conditions that have enabled and challenged the development of effective policies and PPP in the cities of Barcelona (Spain), Buenos Aires (Argentina), and Kampala (Uganda). For each location, learnings about best practices in PPP shall promote more effective NbS after the COVID-19 disruption.

This paper proceeds as follows: Section 2 introduces

the terms and provides a state-of-the-art of scientific literature on NbS and PPP in urban settings. Section 3 introduces our conceptual and methodological design. Section 4 outlines our findings from the literature review of policy documents and interviews on each city. It identifies the main examples of PPP in NbS and the enabling factors and challenges related to partnerships from each specific context. In Section 5 we summarize our findings according to key dimensions of partnerships and compare them with the previous literature. Section 6 concludes. See Glossary A.1 for a detailed definition of the key terms used in this article.

2 Literature review and research framework

2.1 Benefits from urban green spaces

NbS are appraised for their cost-efficient qualities addressing a wide range of urban sustainability problems. They foster the provision of ecosystem services, contribute to climate change adaptation and mitigation, preserve biodiversity, improve urban resilience towards climate change and promotes public health, social inclusion, and ultimately the liveability of cities (Chu, Anguelovski, & Roberts, 2017; Gómez-Baggethun & Barton, 2013; D. Haase, Frantzeskaki, & Elmqvist, 2014; Ranjan, 2016; Simon, 2016). Embracing all dimensions of green spaces into the urban planning process widens the spectrum of value articulation, amplifies the dialogue about possible trade-offs of land use and fosters local legitimacy (Ernstson & Sörlin, 2013).

Further, unequal distributions across communities and socio-economic profiles predominate in the exposure and vulnerability to environmental burdens and the access to green amenities and benefits. The urban environmental justice scholarship has examined historically uneven access to the benefits derived from green spaces, including disenfranchised communities having fewer green amenities and of poorer quality (Heynen, Perkins, & Roy, 2006; McDonald et al., 2021; Nardone, Rudolph, Morello-Frosch, & Casey, 2021). Meanwhile, urban green planning can intensify trade-offs and potential social and racial inequities in the way new green infrastructure is being deployed, which can lead to gentrification, polarization, segregation, invisibilization, and displacement of residents (Anguelovski, Chu, & Carmin, 2014; Garcia-Lamarca et al., 2021; Wolch, Byrne, & Newell, 2014). We highlight how the interaction among governance and finance models should take into account the environmental justice perspective to ensure an equal delivery of NbS and ecosystem services.

2.2 Governance, partnerships and economic models of NbS

Aligning the environmental concepts of ecosystem services and NbS with economic considerations, United Nations Environment Programme (UNEP) promotes a

green economy as “[an economy] that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities” (UNEP, 2011). This concept acknowledges the power of economic factors in the political decision-making process but stresses the need for fundamental changes towards the more sustainable treatment of the environment (Ring, Hansjürgens, Elmqvist, Wittmer, & Sukhdev, 2010). A green economy provides (co-)benefits for multiple actors on four pillars: economic competitiveness, business opportunities, economic efficiency, and the investment in urban environmental quality (Andersson, Kronenberg, Cvejić, Elmqvist, & Pintar, 2015). Firstly, the availability and quality of urban green infrastructure increase the attractiveness and competitiveness of cities for inhabitants and businesses (Jiang & Shen, 2010). Public green spaces foster the inclusiveness, social cohesion, and feeling of belonging to a community which positively impact the mental and physical health as well as the economic resilience and productivity (Andersson et al., 2015). As these interlinkages are particularly strong for socio-economically disadvantaged population segments, cities can actively counteract social inequalities by introducing and implementing greening agendas (Wolch et al., 2014). Secondly, green spaces promote social entrepreneurship that presents innovative and sustainable technologies and management processes (Andersson et al., 2015). Thirdly, urban green spaces reduce costs of deprived health and mitigate environmental risk. Finally, urban green infrastructure is considered an investment into urban environmental quality (Wolch et al., 2014).

Despite the relevance of urban greening strategies and the emergence of green city agendas, public sector agencies, particularly in so-called developing countries, are limited in their institutional, administrative, and financial capacities. These factors hamper the implementation of sustainable green interventions and justice criteria in urban planning (Ayers & Dodman, 2010; Bicknell, 2010; Dodman & Satterthwaite, 2008; D. Haase et al., 2014; Konijnendijk van den Bosch, Sadio, Barfoed Randrup, & Schipperijn, 2004; Mayor et al., 2021; Pelling, 2012).

As a response, the international community increasingly recognizes the private sector as the key actor in achieving sustainable green projects (United Nations, 2015a). In this regard, PPP are a promising tool to catalyze and enhance know-how, financial resources, and effectively scale-up urban greening interventions (J. Koppenjan & Enserink, 2009; Marx, 2019). PPP are collaborative engagements in public service provision aiming to add value to all stakeholders (Herms, Geerling-Eiff, Potters, & Klerkx, 2019; Khan, Riley, & Wescott, 2012; PPIAF, 2009). PPP rethink traditional governance models and assign responsibilities, risks, and tasks to both stakeholders structured as contractual partnerships. Borrás and Edler (2014, 2020) developed a framework of governance in socio-technical transition, such as with nature-based solutions. For the shift toward “smart cities,” they pro-

pose a *primus-inter-pares* governance model in which government actors drive actions that are heterarchical and non-dominant. It requires a wide range of capabilities brought to bear by different actors in terms of resources and services and managed within a PPP framework. State bodies function as a facilitator, lead user, and co-designer, initiator of projects, promoter of specific solutions, enabler of societal engagement, gatekeeper on infrastructure and data, and watchdog for goals with societal interests for the common good (Borrás & Edler, 2014, 2020). Generally, the public sector holds regulatory capacity, social representation and responsibility, local knowledge, and environmental awareness (J. Koppenjan & Enserink, 2009). The private sector can contribute in different modalities, including technical know-how, entrepreneurial and innovation efforts, financial and human capital resources, as well as efficiency concepts (Carbonara & Pellegrino, 2020; J. Koppenjan & Enserink, 2009). Another type of PPP are Design, Build, Finance, Maintain and Operate (DBFMO) contracts, which were amongst others considered by the Organisation for Economic Co-operation and Development (OECD) for their contribution to realize and scale-up low-carbon, climate-resilient infrastructure (Corfee-Morloti et al., 2012).

Nevertheless, involving multiple stakeholders in the greening agenda incorporates challenges of collaboration, such as transparency and compatibility of processes or goals (Kang, Mulaphong, Hwang, & Chang, 2019; Khan et al., 2012; Klijn & Teisman, 2003; J. F. M. Koppenjan, 2015; Marx, 2019). In addition, urban green governance is often neglected and undervalued by public policies and private actors (Cilliers, 2009; Gwedla & Shackleton, 2015; Konate Djibril, Aboubakar Coulibaly, Xiangrong Wang, & Dembele Ousmane, 2012). Pre-evaluation tools, such as monetary-based cost-benefit analyses and contingent valuation methods, tend to neglect social and cultural ecosystem services (Chan et al., 2012; Dumenu, 2013).

Several positive rationals increase the adoption of PPP as a policy instrument. PPP should overcome fiscal and efficiency constraints. They should provide performance improvement, cost reduction, environmental protection, and increased competition (Miller, 2000; OECD, 2010). Yet, there are few systematic assessments of enabling factors and challenges, especially in green interventions and in emerging and developing countries (Kang et al., 2019).

2.3 The UN framework

Several initiatives on the supranational level promote the development of green cities and sustainable urbanization. Broadly, the New Urban Agenda (United Nations, 2017), the 2030 Agenda for Sustainable Development (United Nations, 2015d), the Paris Agreement (United Nations, 2015b), the Sendai Framework for Disaster Risk Reduction (United Nations, 2015c), the Addis Ababa Action Agenda (United Nations, 2015a), the Rio Declaration on Environment and Development (United Nations, 1992), the World Summit on

Sustainable Development (United Nations, 2002), the World Summit for Social Development (United Nations, 1996), and the Programme of Action of the International Conference on Population and Development (United Nations, 2014) are of interest for the topic of sustainable and equitable urban greening and multi-stakeholder engagements. In particular, the Food and Agriculture Organization (FAO) Green Cities Initiative (GCI) aims to foster “people’s well-being through increased availability of and access to products and services provided by green spaces including urban and peri-urban forestry, agriculture and by sustainable food systems” (FAO, 2020, p.1). The target group and main beneficiaries are urban dwellers in participating cities, governments, and related stakeholders. Global initiatives emphasize the importance of green cities and partnerships and provide a platform for exchange supported by national and local action plans.

3 Methodology

To explore the potential and lessons learned from PPP, our strategy follows three steps. Firstly, we conducted a literature review to depict the state-of-the-art on PPP and NbS business models, green spaces, urban settings, and COVID-19. Our references cover scientific articles, publications from international organizations, policy reviews, and grey literature. Secondly, we conducted case studies on Barcelona (Spain), Buenos Aires (Argentina), and Kampala (Uganda), examining urban greening policies and the stakeholder landscape. We chose these three areas of investigation based on the availability of information, the accessibility of stakeholders, and the representation of global and environmentally, socially, and economically diverse contexts. Thirdly, we applied a qualitative research method by conducting semi-structured expert interviews. We selected our interview partners based on their availability and representativeness. Our FAO mentors made the initial contacts, after which we used the snowball technique. We are aware that our interview sample may be biased towards known contacts and highly motivated individuals already working in the sustainability sector. However, we chose the stakeholders to represent the different sectors involved in our research question, including the local and national public sector, academia, and private entities such as non-profit organizations, local cooperatives, and social enterprises. We conducted fourteen interviews between August and October 2021 using a semi-structured guide found in the Appendix A.1. For a list of the interviewed stakeholders, see Table 1. We conducted these via videoconference and recorded them after the interviewee gave written consent. Subsequently, we coded the interviews according to identified subthemes and categories agreed upon among the authors and then analyzed the collected data through qualitative content analysis concerning our initial research question (Bogner, Littig, & Menz, 2009). Most of the interviews were held in English, except two that were in Spanish and two in

Catalan. All quotes from the interview transcriptions were translated by ourselves. Finally, we acknowledge that our point of view, based on our socio-economic context, may imply some bias toward the research subject based on individual interpretations. We made an effort to back up our statements with extensive quotations to allow respondents to express themselves on their terms.

4 Results

The following section presents our findings based on the methodological steps outlined above. Firstly, we give a general overview of the status quo of strategic policy documents for each city. Then, we present the results of our interviews on the typology and examples of PPP. Finally, we identify the main prerequisites and challenges for the realization of PPP in each city context.

4.1 Barcelona (Spain)

Barcelona is the capital of the Catalunya region and the second-largest city in Spain with 1,664,182 inhabitants in 2020, and 3.34 millions if we consider the metropolitan area (Ajuntament de Barcelona, 2020a). It is one of the most compact and densely populated cities of Europe and has prevailed in the last 30 years as an international lure and as a top cultural and touristic destination. With an area of 10,135 hectares, it is delimited by the Mediterranean coast on one side, the Llobregat and the Besòs River on the other two, and the Collserola Mountain, the largest peri-urban forest natural park in the city (Ajuntament de Barcelona, 2020a). Due to its compactness, Barcelona has a relatively low ratio of green spaces per inhabitant when compared to other European cities (Fuller & Gaston, 2009), with 7 m² of urban green areas per capita. If we consider the peri-urban natural park of Collserola, the number increases to 17.2 m² per capita and around 28% of its surface. Furthermore, the distribution of the urban green infrastructure is not homogeneous across the city, ranging from 2m²/inhabitant in the district of Eixample to 18 m²/inhabitant in Sants-Montjuïc. The City Council approved in 2013 its first strategic document on the urban green infrastructure of the city called “Barcelona Green Infrastructure and Biodiversity Plan” that developed a plan to increase and improve the urban green infrastructure. Recently, a new strategic policy document called "Pla Natura Barcelona 2021-2030" was published to maintain and improve the city’s green infrastructure and biodiversity, consolidate nature’s environmental management, and involve and engage civil society. Barcelona also has a climate plan called "Pla Clima 2018-2030", a strategic document that defines the actions to counter climate change. It targets the increase of green spaces as an adaptation strategy to mitigate the effects of climate change and enhance the well-being of citizens. In addition, the City Council of Barcelona declared the

Table 1: List of interviewees per city.

Interview	City	Sector	Organization
I 1	Buenos Aires	Academia	National Scientific and Technical Research Council (CONICET)
I 2	Buenos Aires	Public	Buenos Aires City Government
I 3	Buenos Aires	Public	Environmental Protection Agency City of Buenos Aires
I 4	Buenos Aires	Private nonprofit	Instituto Internacional de Medio Ambiente y Desarrollo para América Latina (IIED)
I 5	Buenos Aires	Public	Ministry of Territorial Development and Habitat
I 6	Buenos Aires	Public	Matanza-Riachuelo Basin Authority (ACUMAR)
I 7	Kampala	Public	Ministry of Water and Environment Uganda
I 8	Kampala	Private nonprofit	Climate Smart Agriculture Youth Network (CSAYN)
I 9	Kampala	Private	Plants for Africa (P4A)
I 10	Kampala	Public	Kampala Capital City Authority (KCCA)
I 11	Barcelona	Private nonprofit	TarpunaCoop
I 12	Barcelona	Public	Barcelona Metropolitan Area (AMB)
I 13	Barcelona	Public	Barcelona Metropolitan Area (AMB)
I 14	Barcelona	Private	Eixverd

Climate Emergency in January 2020, to accelerate a series of actions to tackle climate change impacts. The resulting document identifies the urban model of the city as "compact, with high residential density, an old housing stock, a shortage of green spaces and a mobility system that is over-dependent on motor vehicles" (Ajuntament de Barcelona, 2020b).

The city of Barcelona has developed several PPP that conform an innovative diversity of initiatives. Partnerships developed in the metropolitan region include participatory organs and consortiums where land owners and farmers' unions participate in advisory bodies. These bodies decide and implement the management practices of the agricultural landscape and protected areas in the peri-urban areas of the city. A similar figure is the "management plan for the private states" (Interview 12). When striving to implement certain activities in existing traditional farm houses, the owner is obliged to take care and manage the surrounding landscape. Parallely, this is linked to a variety of sustainability criteria in the agriculture surface and the water network, coordinated by the administration. In a similar way, the Barcelona Metropolitan Area is working on a new kind of contract to establish partnerships with local farmers offering them economic benefits in exchange of the ecosystem services provided by their managed lands. For instance, with human impact actions having positive impacts in the ecosystems such as regulation of the water cycle and control of the soil erosion through specific agricultural practices or traditional constructions (Interview 13). Other example of punctual partnerships include the co-management of the forest surface in collaboration with local shepherds that bring their sheep into strategic parts of the Collserola mountain (Interview 12). From that, they developed a stamp with a brand of local agroecological products that explain the project and how this initiative helps to mitigate the fire risk within Mediterranean basin (Ramats de foc, 2021). Another project includes the agreement with a private electric

company to dismantle parts of their electric lines and to replace some of them with more integrated and less brid-threatening structures as part of the company's social responsibility strategy (Interview 12). Additionally, the new greening strategic plan of the city "Pla Natura 2030" aims to promote and include the private green areas of the city as part of the overall UGI of the city. Therefore it aims to boost green elements in the private surface and coordinate with owners to establish good practices (Àrea d'Ecologia Urbana Ajuntament de Barcelona, 2021). In coordination with this, they have also developed some incentive programs to promote community urban gardens and green roofs, promoting the social benefits of the former and with the latter creating a public contest to finance private owners proposing green roof projects in their building (Ajuntament de Barcelona, 2020c).

4.1.1 Enabler: expertise and commitment on NbS

The city of Barcelona is increasingly establishing greening strategies on the the political agenda and promoting initiatives related to NbS. It is reflected in numerous strategic policy documents and governance mechanisms on greening and sustainability, as well as on ecology, urbanism, and mobility networks in which the city participates at international and regional levels (Ajuntament de Barcelona, 2021). In this sense, local authorities from Barcelona are pushing to become a referent in transformational urban adaptation, investing in innovative plans such as the "Barcelona Superblock" (Zografos, Klause, Connolly, & Anguelovski, 2020). Furthermore, an ecosystem of grassroots movements and civil society organizations also constitutes an indispensable part of the actors involved in pushing for a greener and more livable city and participating in the city governance (Satorras, Ruiz-Mallén, Monterde, & March, 2020). In this sense, an equilibrium between bottom-up initiatives

and the political top down agenda has shown to be crucial when establishing new goals and initiating partnerships:

“The political momentum, it’s given by the legitimized people elected in a democratic process. I mean, not everything comes from bottom-up initiatives.” (Interview 13, public)

Furthermore, long-term knowledge and the commitment of public administration bodies led to a professionalization of the greening sector from both the municipal technicians and the private sector entities. Working in collaboration with them allows for the materialization of NbS projects in a satisfactory way:

“What works well is that there’s a municipal technician who believes in it, who boosts it, and who’s in there and says ‘this is worth it’. When we have this, we have an accomplice in the good sense of the word, an ally in whom we build projects, evaluate it, go on doing it, have confidence and work very well, really. [...] Sometimes in places where we are working very well there is a change of staff and everything falls apart.” (Interview 11, private nonprofit)

The actors involved have shown strong motivation for building new greening interventions to promote environmental and social benefits, sometimes prioritising over the economic benefits. This commitment and motivation have shown to be effective for establishing collaborations:

“There are many places where I am very interested in making them green. I proactively go around the city finding places [...] [The public administration] saw that what was behind me wasn’t the money or anything, it was just to increase the green, and green that is durable. [...] I am very happy that they are promoting the green, that they are moving ahead the green, that they are helping from different entities from the city council. They are helping people that are doing green projects.” (Interview 14, private)

4.1.2 Enabler: creation of networks and knowledge transfer

One crucial factor when establishing partnerships is building a diversity of networks where partners can get to know each other, exchange expertise, and create an enabling environment to propose collaborations. For this, formal and informal networking has been an essential tool in the context of Barcelona, with initiatives such as "Barcelona+Sostenible" or the "Pobles i ciutats per la Sostenibilitat" where small businesses, NGOs, administration and civil society organizations can meet. Therefore, it is important that those networks incorporate actors from different sectors where different expertise can be shared, partners can increase their visibility and actions can be taken in

coordination:

“The collaboration networks are working very well [...] networks of municipalities that do training, that do things, all these aspects of networking are very interesting because they make us known and allow us to work very well. [...] [For instance] in this network there have been meetings of groups of gardens that generated documentation and guidelines on how to cultivate urban orchards. [...] Now that all city councils have municipal gardens and faced it as a new municipal facility, with this network things could be done quite well.” (Interview 11, private nonprofit)

Networks with regional and international stakeholders have also shown to be a positive experience and a place where the public and private sector can collaborate:

“These European projects are more a kind of a side thing that is related with your work and you learn from it. And what we learn from it we can apply in other projects. [...] But for me it’s more kind of positive, an inspiration, the opportunity to know people who are working on this in another geographical discipline and context.” (Interview 12, public)

In addition, the regional and cross-scale coordination from those wider networks also allows for actions that would otherwise be more difficult to implement at the local level. For instance, it creates a window of opportunity for implementing environmental policies that transcend municipal boundaries:

“At the decision-making level, the metropolitan area [of Barcelona] is a second-level administration. [...] that alleviate the burden of the politicians’ [decisions]. [If somebody tells the mayor of a municipality] ‘Hey you spent the money on the birds from the river and here we need another thing’ the politician can reply ‘this is from another administration that is in charge of these issues’” (Interview 13, public)

Further, to gain visibility and facilitate coordination, it has been shown to be positive to establish self-organized groups before participating in the networks mentioned above:

“Owners that have been associated among themselves. Like, you don’t talk to one or two people, but with a union or an association. I think this makes things easier for us. And I think for the society it is much better as well.” (Interview 12, public)

4.1.3 Enabler: dissemination and mutual trust

The dissemination of the objectives of a partnership is also a relevant factor to imply other actors and also to legitimize their actions towards civil society:

“One important point which I think is very bene-

ficial for the private sector, is to disseminate the results. To explain to the society what we are doing, why, to raise awareness and then to encourage maybe other stakeholders to try similar experiences or collaborations or approaches. [...] This dissemination and this publicity of the actions, and pedagogy as well. Like, explaining to the population, because it can be seen with certain suspicion as well, so you have to be very clear with what are you doing, why are you doing it, what do you expect and report the results." (Interview 12, public)

Dissemination can be better informed when accompanied with a monitoring and evaluation of the PPP, which is also key to inform about the actions carried out and their impact. Besides, legitimacy is also linked to trust. When building partnerships and collaborations, building trust is a pivotal component that enables the success and continuity of the project and is very important in both the public and private sectors.

"That, for the partnership, should stay. They trust me and I trust them, and they help me." (Interview 14, private)

Public-private partnerships can also create the conditions to build trust with civil society. For instance, the presence of private or nonprofits can create a different relationship distant from the top down dynamics of subsidies (Interview 13).

4.1.4 Enabler: social innovation and participatory processes

Barcelona has a strong social fabric of civil society organizations, activist movements, and nonprofits. Since 2015, the local government led by "Barcelona en Comú" has developed governance mechanisms that promote citizen participation and co-production of actions (Satorras et al., 2020). For instance, the open-source digital platform "Decidim Barcelona" was launched in 2016 to coordinate the participatory processes of the city. The construction of such platforms has led to co-governance processes between the administration, civil society, and activist movements that shape the political agenda:

"There is this, it is something kind of new, I think a new culture, of trying to incorporate stakeholders and citizens in general in the process of decision making. And I think being part of the European project has helped us in this direction as well, since this, they ask you for co-design and they use this concept of co-governance" (Interview 12, public)

It is also interesting to see how the above-mentioned enabling factors of commitment in greening and participation and networking also allow for the involvement of actors in multiple sectors, such as academia, activism, and specific private actors:

"This is a global phenomenon between science and activism [...] We have participatory sessions and debate where we try to identify emerging conflicts in the metropolitan area and we find that all scientists, people who teach at the University, are in associations related with their field. [...] This path of community association, with activism, with the small scale of the private sector, I think is very productive, very interesting, but on the other hand it is not very systemic. Because sometimes you have people, sometimes you don't... but it's important for the whole topic of communication and networking." (Interview 13, public)

4.1.5 Challenge: administrative regulations in building PPP

The administrative hurdles that must be overcome in establishing a public-private partnership were a recurring theme in our research. Transparency and strict regulations of the collaboration from the public sector can compromise the feasibility of some partnerships or limit their scope:

"We have a strict regulation in how we interact with the private sector that can meet our interests, but they are not exactly the same. We always go for the common good, and then we have very strict controls and measures that ensure free competition. This makes this kind of collaboration quite complex and we have been working on this strategy for quite a long time but always modest, step by step, doing small things." (Interview 12, public)

So, although PPP such as public procurements can be an strong and efficient tool for transformation, the processes for establishing partnerships can also be slow. It involves getting to know the partners, creating opportunities for collaboration, and finally achieving a mutual target. However, this process can take up to years and involve different stakeholders with varying levels of commitment:

"This has been very slow. It's a work of 10 years, you know? Little by little... we have participated in some networks of municipalities and municipal technicians, and with the years they started to consider us." (Interview 11, private nonprofit)

A common way of forming PPP is through public tenders. One challenge with this type of partnership is that the selection criteria focus on economic aspects and neglect social and environmental deliverables. We have found that it is necessary to create a criteria guide that recognizes the quality and expertise of the private sector instead of only focusing on economic efficiency. It is particularly relevant for NbS initiatives where the environmental and social benefits are long-term and where the knowledge and specialization of the sector are pivotal to the implementation and

maintenance of the operation.

“By law, [in a public tender] there must be some criteria for automatic calculation, which has traditionally been the price. [...] At the end, public tenders tend to be an economic auction. It is the reality. Anybody can do more or less a good project, but if you make the cheapest price, you have it. And that’s a very serious problem, because you end up working for little money and in very poor conditions, you know? [...] The public administration must make a change in public tenders, and lawyers and bureaucrats, secretaries and such, must try to adjust the specifications so that quality and professionalism are the main element.” (Interview 11, private nonprofit)

4.1.6 Challenge: awareness-raising and engagement

However, not all stakeholders support or know the implementation of NbS and green areas in the city. It can create conflicts of legitimacy from the decision-making processes to the recognition of civil society’s needs:

“One should also be aware of this, that the general population has a diverse environmental culture. Not everyone sees investing in the environment as an improvement. [...] The ideas or objectives of a project that we or the city council propose, do not always coincide with people’s needs.” (Interview 11, private nonprofit)

NbS interventions that require an investment and active engagement also face different barriers and inertia that come from their implementation stage:

“There are a lot of people that are just against change, basically. And they see more problems than benefits. ‘Who is going to pay the maintenance and the water? Why do we need this?’ [...] There are a lot of architects who do not believe in green roofs either. [...] Sometimes even if it is free they [the owners] don’t want it. Because they don’t believe in the benefits, or they don’t want the hassle of having to do this.” (Interview 14, private)

Finally, participatory processes on urban green spaces sometimes face the difficulty of having enough participants, especially when they are involved voluntarily like with civil society organizations:

“The element of participation of the different actors and involve people or entities that participate in a collective way... this is a central element and the most difficult. [...] I remember that in this project [...] we had many letters of support from entities that wanted to collaborate in the project. But when it was time to get involved, no one got involved, we were alone. Things on paper are very simple but then everyone has their priorities, it is normal.” (Interview 11, private

nonprofit)

4.1.7 Challenge: long-term commitment, common objective and evaluation processes

A common challenge is misunderstanding the expectations and procedures of the partnership. It requires going beyond the financial aspect of the partnership and establishing shared goals and an agreed-upon commitment:

“We don’t just go to the public administration to get money. I think collaboration needs to go beyond that. [...] In the end, we are supposed to be working together for shared goals. [...] When a council approaches to me, I always tell them ‘What do we want this to do? Where do we want this to go? Which is the real purpose? How much time? Where will those hours come from?’ [...] In other words, the public administration is very focused on the work or the infrastructure, and it is very difficult to focus on how this will work over time.” (Interview 11, private nonprofit)

A specific challenge in this process is the long-term commitment in the partnership. It is particularly relevant for the private sector:

“The continuity. The administration, hopefully, we are always there. Like, it’s long-term, when we do a project. But for the private sector it’s not so... sometimes I feel that the successful and continuity of the collaboration depends on the people that you meet in the different departments. And of course, people change, certain agreements are not of interest of the new people coming.” (Interview 12, public)

Another challenge is faced when green interventions are conducted with participatory processes that involve civil society:

“Risks are always related to long term management. [...] The challenge is to turn that initial enthusiasm into something sustained at the level of management. It is not always easy, because disappointed expectations can bring conflicts and frustration. You have few people participating on it, or some of them take too much power which is also a problem... there are many cases, but the most important problem is still, to get a critical mass that participates and is well organized in a real community.” (Interview 11, private nonprofit)

Finally, it is crucial to have evaluation mechanisms that can help to diagnose the outputs from the partnerships and suggest improvements for the future:

“I think we have to go step by step, because sometimes on paper [a project] sounds great and then in reality can be very deceiving. And we are talking about public resources, so we have a strong responsibility here, and

I think you don't see if it works after a few years. You have to try monitor, like, which were the objectives, which have been the results, and then try to publish, to disseminate this results.” (Interview 12, public)

4.1.8 Challenge: dense and compact model of the city

Increasing the total surface of green spaces remains as one of the biggest challenges of the greening policies of the city due to the urban model of the city, which is characterized by the compact and urban form. Increasing the surface of green in Barcelona is difficult as empty spaces are very scarce or in poor conditions:

“The plots are all compacted and full of rubble. When you want to do a very participatory community project, the more inside the city the better. But then you don't find a land in good conditions.” (Interview 11, private nonprofit)

For this reason, several initiatives from both public and private sectors are promoting different elements of the urban green infrastructure that can provide benefits in little space, such as urban gardens, green façades, street trees, and green roofs. This intensive or opportunistic greening, based on increasing the surface of green space with very little intervention, can attract the establishment of private sector entities that can provide expertise and technical support for implementing new greening opportunities:

“I did find that Barcelona was missing a lot of green areas and that green roofs are a perfect solution for fighting the climate change and adapting to the changes.” (Interview 14, private)

Finally, we did not find a clear criteria by our interviewees when prioritizing some partnerships among others:

“I haven't got into the position when I have multiple projects and I have to prioritize.” (Interview 14, private)

“We don't have as many offers to choose from, you know? When the opportunity arises, we go for it. [...] There is always a bit of a conflict here between the survival of the entity and doing what we believe should be done and how it should be done.” (Interview 11, private nonprofit)

“I have never considered which ones do I think are more relevant or strategic or important because it is more a question of opportunity. When we see an opportunity to have some kind of agreement we move in this direction, and we have experiences with different stakeholders.” (Interview 12, public)

4.1.9 Challenge: environmental injustices and green gentrification

Finally, environmental justice remains a large challenge to guarantee access to green space benefits for all regardless of their income level, nationality, gender, age, or condition (Anguelovski et al., 2020). This responsibility has tended to fall within the public sector, and remains a challenge how the private sector can contribute to it and not perpetuate environmental injustices. In the case of Barcelona, gentrification and tourism have impacted the affordability of deprived neighborhoods, especially before COVID-19. Green gentrification, that is, gentrification processes triggered or aggravated by the investment in new urban green interventions, has been demonstrated within the city (Anguelovski, Connolly, Masip, & Pearsall, 2017).

“The actions you take to renovate and improve the urban environment [...] providing a much better environmental quality than before... you are also exposing yourself to a certain gentrifying risk. That is, it affects the people who live there. This whole thing is complicated [...] the relationship between urban investment and what this can bring on housing prices. One of the problems you can have when you do something so necessary [...] you should also be aware that by improving the quality of some streets, you could increase their rent.” (Interview 13, public)

One interviewee explained their experience in the development of a subsidy program that would allow neighbors to implement a green roof in their building through a contest:

“There are several people from the marginalized neighborhoods in Barcelona that are the ones that are backing down. [...] This person sent a message to the city saying that ‘we are in a low income neighborhood, and our building is even lower income, because it is all retired people, old people that don't have much money. We were not able to access this contest because we cannot upfront the money.’ It was very frustrating to these people. ‘You prefer to fund a 100,000€ green roof somewhere else, than pay upfront our green roof, whose costs were only 30-40,000€.’ He had a good point. Instead of doing many 100,000€ projects, why don't you do many more of 30,000€? And we would have many more green roofs in depressed areas. [...] So, yeah, only those richer neighborhoods are the ones that even with a 75% construction paid are the ones who are moving ahead. [...] So that's what is causing a little bit of gentrification.” (Interview 14, private)

In addition to that, when a PPP promotes an urban greening intervention, there are other risks about the motivations and benefits that can derive from it:

“When we speak about collaborations with large companies... [...] If we speak about a large-scale

private partnership, we have to be aware of the things that happen in urban planning, the capacity of influence. Sometimes it is also an exchange of talent, of enthusiasm. There are many companies from which we can learn a lot, like their efficiency, but there are also some serious risks. [...] It is complicated, because they will do what interests them the most, and legitimately, if you think about it. But maybe it is not what interests the most to society as a whole." (Interview 13, public)

From an equity perspective, achieving gender equality is a major target at all stages of the decision-making process, implementation, and maintenance of interventions:

"We are an all-female organization in the building sector, so we are contributing from the point of view like of gender equality in a sector that is always man-related." (Interview 14, private)

4.1.10 Implications of COVID-19

The COVID-19 crisis has shown certain aspects from urban green spaces that were not as present before. The value of near and accessible green spaces was a clear result of the lockdown:

"People with the first lockdown especially, locked up at home without being able to leave, suddenly realized the importance of being able to go to the park, to be able to go to the garden [...] I think the pandemic highlighted that this has a very important value." (Interview 11, private nonprofit)

This also opens a path for novel greening opportunities in the built infrastructure:

"People are more interested in greening the roof. Because they saw that the only place where they could go out was in the roof. [...] People rediscovered the roofs during the pandemic. And they want to make it more accessible now." (Interview 14, private)

However, the intensive use of green spaces that were derived during the municipal lockdown and the travel limitations opened a new dilemma about the conservation of urban and natural green spaces:

"Especially in such dense areas as a metropolitan area, with the kind of housing that we have. This need of being in contact with nature. [...] The balance within the social enjoyment and the ecological preservation of our open spaces. I think that we need to work harder to make both of them compatible." (Interview 12, public)

In addition, the rediscovery of the local benefits of green spaces also came with the popularity of local agricultural producers:

"The local resources, that is, the local food, the direct access to food or the garden... or to what local producers can offer ... I think this was a certain boom." (Interview 11, private nonprofit)

However, the COVID-19 crisis has also brought several crises that have affected the economic performance of the population and the ability of certain actors to invest in NbS:

"But the economy out there is weak. People are in ERTOS [unemployed], the economy we don't know where it is going, people are saving, just in case... at the same time that there is more interest in the green roofs, they are more cautious in terms of spending money that are not necessary, because we don't know if there is going to be another pandemics or what is going to happen." (Interview 14, private)

4.2 Buenos Aires (Argentina)

Buenos Aires experienced an influx of European colonizers during the 16th and the 19th centuries. Today, with 2,890,151 inhabitants Buenos Aires (officially Ciudad Autónoma de Buenos Aires) is the most populated city in Argentina (INDEC, 2010). Buenos Aires is a grid-planned settlement of 20,000 ha built around a main square of the city (Gobierno de la provincia de Buenos Aires, 2021; Scroope, 2018; UN Department of Economic and Social Affairs Population Dynamics, 2018). Its design is highly influenced by European architecture. The recent trends of suburbanization and downtown revitalization go hand in hand with global economic and social integration. The greening of suburbs and urban centers and the creation of green corridors increasingly happens with traditional pampa vegetation (Faggi & Ignatieva, 2009). In 2018, 9.40% of the surface of Buenos Aires was covered by green spaces (Estadísticas y Censos, 2018). It represents a mean density of urban green spaces of 6.3 m²/person. However, the urban green space density is highly heterogeneous ranging from 22.9 m²/inhabitant to 0.2 m²/inhabitant (Estadísticas GCBA, 2019). In 2014, the government of Buenos Aires launched the "Ciudad Verde" a strategic greening program concerned with investigating and promoting urban greening actions during the following 20 years, including the implementation of new green corridors, street trees and green spaces (Álvarez De Celis et al., 2014).

In addition, in 2021 the city presented the Climate Action Plan 2050, establishing a series of actions to mitigate and adapt to climate change. Among those groups were some representatives of the private sector involving different chambers and business councils (Gobierno de la Ciudad Autónoma de Buenos Aires, 2021), who took part in several workshops to share and collaborate in the design of different strategies and actions. This document was developed with participation of different social groups through an inclusive and participatory approach, including the ongoing "Foro de lucha contra el cambio climático", a participatory space

among different sectors and public representatives. Resulting from that participatory process, the Climate Action Plan 2050 displays which sector is particular interested on each of the proposed actions of the document. For instance, the private sector is displayed in actions related with improving major public work facilities, implementing NbS, low-emission public transport and logistics, and more efficient energy and buildings (Gobierno Ciudad de Buenos Aires, 2021).

Further actions done by the Climate Change department and targetting the private sector include the participatory co-creation of "City Compromises", the participation in the program "Friends of the sustainable and safe mobility", the creation of a network among civil society organizations that seek donations, volunteers and Corporate Social Responsibility initiatives, and the program "Ecosellos" to promote sustainability practices in business in the city (Gobierno de la Ciudad Autónoma de Buenos Aires, 2021). Finally, another example of PPP led by different local and international NGOs is the "Transformative Urban Coalitions: Catalysing Urban Partnerships to Drive Systemic Transformation Towards Sustainability" project. The goal of this project is to co-create a transformative change with the local people to improve their living conditions while integrating the greening and decarbonization actions and a more equitable urban development (Interview 1 and 4).

Buenos Aires involves researchers and consultants in green urban planning, such as universities or international research programs like CONICET. In addition, Buenos Aires uses participatory processes, including a Department of Urban Anthropology in the Buenos Aires Municipality, which coordinates civil engagement in designing green spaces (Interview 2).

4.2.1 Enabler: common understanding of urban green space benefits

Working for the implementation of NbS in urban settings requires a common understanding of the environmental, economic, and social benefits that derive from the green infrastructure. It can enable the recognition and incorporation of those benefits in the policy agenda and the establishment of partnerships:

"Everyone benefits if you improve the environment, including the private sector. But this involves also a wider understanding of benefits. [...] Understanding the green system of the city or the initiatives to green or bring back more green spaces to the city, understanding it in terms of infrastructure is a way of mainstreaming these initiatives. It is a way to make it easier for the decision-makers to prioritize this in the agendas and in the budget, so I think this is an important point. [...] Once you understand and you conceptualize it in terms of ecosystem provider, and you can quantify and to some extent monetize the ecosystem services, that these components of the blue green infrastructure provide, you can make a better case to prioritize it in the official budget, etc." (Interview 1, academia)

Furthermore, being urban planning a transdisciplinary field, concerns related with the urban green infrastructure requires actively building common knowledge and understanding among the different sectors involved, even within the public sector:

"We started to discuss a bit about what green spaces are all about. Because each one has a different definition. If you go to urban development [department], a green space is one thing, and if you go to the green infrastructure area it is another, and if you go to the climate change area it is another... So now we are trying to find definitions for these things." (Interview 3, public)

Acknowledging the direct benefits for the private sector helps to develop a business case for engagement:

"Because they benefit directly, it is typical that you have, I don't know, an office building which is surrounded by neglected public spaces and it is somewhat easy to make the case for this company to participate in the budget for improving their own environment." (Interview 1, academia)

However, our results show that sometimes the conceptualization and quantification of different benefits derived from green spaces also imply potential conflicts of commensurability when reducing them to one specific benefit or to monetary terms. In other words, to what extent it can be translated into one single measure and whether that makes it comparable to other benefits:

"Every dollar or euro that you put into blue green infrastructure networks in a city, it is also working for at least five or ten different budgets in the city. [...] Unlike all the other traditional urban infrastructure in the city, there are multiple benefits and co-benefits and very indirect benefits that sometimes are somewhat easier to conceptualize than to quantify and monetize." (Interview 1, academia)

4.2.2 Enabler: collaborative work and political commitment

As mentioned, the conceptualization and the recognition of multiple and (in)direct benefits support partnerships between different sectors. However, to achieve this, collaborative work and intersectoral communication is a necessary step that requires overcoming inertia and an investment of time and resources:

"The climate action plan helped us a lot last year, when we had to work with all areas. We were working with everyone. With the ministries of urban development, with those who work in the neighborhoods, with everyone. [...] We bothered everyone a lot and they all got to know us and understood what we do. Now it is easier. Before it was difficult, they did not answered us directly 'Well, climate change is going to happen in

20 years, I have priorities for tomorrow!' Then it is difficult." (Interview 3, public)

However, the policy agenda can significantly influence and prioritize coordination between public and private sectors. This agenda, at the same time, is interrelated with international organizations and networks such as the C40, which can promote and provide resources for actions:

"Our mayor is vice-president in C40 and he established the issue of climate change as a line. And he wants to run for president in 2023, so he is leading... [...] That makes life easier for us, because he can go and say 'Climate change is a priority, let's work on this plan. We have a commitment with C40.'" (Interview 3, public)

4.2.3 Enabler: civil society participatory processes

Participatory processes and civil society engagement increase the acknowledgment and usability of green spaces as well as their environmental benefits and reduce political polarization in Buenos Aires' urban planning processes:

"Civil society is the one that is pushing the green agenda, is pushing for native species, more than anyone else, anyone in the government. [...] When people are involved in the process they are all more content with the results. So in a way with the high political polarization, to have people a little more content or happy with the results and what is happening in that public space gives you the possibility to develop it faster. So because there is no, for example, slowing down of the building process, or some kind of boycotts. A co-benefit is we gain time, because we try to circumvent the political polarization." (Interview 2, public)

However, only local government and the neighboring private individuals are rolling out participatory processes in designing urban public spaces.

"And we work with neighbours from the neighbourhood that come to the workshop in this kind of inquiry about the pre-diagnostics of the area, what is wrong and right, what are dangerous and good places, what is missing, what is actually working well for them in the neighbourhood. After that we work in a co-creating workshop about specifically the future public space, talking about what do you need specifically here, what kind of public space do you imagine to have here, what do you think you will be doing, with whom are you coming." (Interview 2, public)

4.2.4 Challenge: material and livelihood inequalities

Social and territorial inequities dominate in Buenos Aires. Our results show that the city faces a lack of resources to implement policy agendas related to urban greening. It includes a lack of physical resources where nurseries do not meet the demand for trees and a lack of coordination capacities between actors and resources.

"Another issue that we have is the lack of communication with the nurseries. [...] The network of nurseries is weak and they cannot comply with the demand of trees that we ask for. [...] Another thing is the lack of organizations of these sectors. [...] The unfamiliarity, the lack of the product that you are looking for and the lack of focalization with the counterpart that you need to be associated with are three factors that go against this possibility in an easy way." (Interview 5, public)

From an environmental justice perspective, Buenos Aires exhibits a distribution pattern in which historically marginalized neighborhoods do not have the same amount of green facilities and services. It implies that disenfranchised communities lack access to the benefits derived from NbS and have a higher vulnerability towards the effects of climate change. Re-urbanization processes offer an opportunity to reverse this trend and include those communities in to improve their livability and resilience:

"Buenos Aires has many many slums that were redeveloped. But the redevelopment was not thought from the green infrastructure aspect, they just put a little bit of green in these new buildings. But the truth is that we went there and thought: 'Nobody thought about this?' And no, they did not think about it. So now we are starting to work this with the housing department, that works in these neighborhoods, to start thinking about strategies for how to increase green infrastructure in vulnerable neighborhoods. That is difficult because of the type of housing, the way they build, there are places where it is impossible to put anything green..." (Interview 3, public)

It is also relevant in terms of political agenda and environmental target. Ambitious greening plans that do not take into account distributional injustices in terms of urban green infrastructure can exacerbate social and environmental inequities:

"The city of Buenos Aires can display a lot of indicators that improved in everything related with green spaces, etc. Great, but in the part of the informal settlements, those are much more behind." (Interview 4, private nonprofit)

The lack of resources sometimes also presents a dilemma about how to proceed in investment and redevelopment. Furthermore, in these cases, the priori-

tization among greening interventions does not always meet the local needs or expectations, which can bring conflicts of legitimization or the viability of the project:

"Working in vulnerable neighborhoods, what is green space or the environment, always comes last... [...] they were not priority issues. Or it was difficult to give them the importance that they should have, when they were trying to solve access to water, or access to sewer service, better housing, or property ownership. So it's always kind of a complex issue. That is seen as necessary, but always remains postponed. [...] Because we were working with government programs that did not include it in their plans, or because the community itself did not see it as a priority. So, it is very difficult to force things when that need is not yet seen, or there are other needs that need to be covered." (Interview 4, private nonprofit)

4.2.5 Challenge: unfamiliarity among partners and sectorial silos

The private sector expresses interest in working with the public sector, especially for reputational reasons. However, administrative barriers and a lack of knowledge among partners and their respective goals limit the frictionless implementation of PPP:

"Some important point the private actor wants to have is to show that they work for the public sector, that they are accountable, that they have the necessary structure to provide services on a big scale. So just being mentioned as a company working for the government is an incentive. [...] They don't know that the agenda of these sectors is related with this kind of services." (Interview 5, public)

A recurrent challenge is the niche development and the excessive sectionalization within the private and public sector that impedes the correct development of green urban interventions:

"Another risk that we see [...] is that, in general, these [community] programs or this type of [urban planning] interventions are within one area and are linked to a government area but not to a lot of others that would be necessary. [...] There is always a very compartmentalized work in governments. From the most local to the national, each one works separately. If they [private sector] have resources, they have know-how, ideas to contribute and work with the community or the local government... otherwise things will never change. [...] I understand that no solution will come from a separate actor. So, unless there are several actors working together and transforming, things are not going to change." (Interview 4, private nonprofit)

4.2.6 Challenge: uncertainty about divergent targets of actors and transparent partnership contracts

In other areas, like the conservation of protected areas such as the Riachuelo River, the public sector views the private sector as a polluter rather than a supporter. It results in a dialogue about restrictions and compliance with regulations instead of partnerships:

"If we look at the land uses and the possibilities of creating new green spaces or protection wetlands, the private sector in this sense has been more a rival than a contributor. It has been an actor which we have to look at more as someone with whom you need to negotiate that to contribute because they have an opposite objective." (Interview 6, public).

Public commitment for establishing long-term PPP often needs better coordination and timing with the private sector delivery:

"Opportunities for collaborations with the private sector. There certainly are. But the difficult part [...] is that the return of the investment in many cases, it tends to be long, because of the nature of these matters. [...] So the private sector tends to work with shorter periods of return on investment and they have to or usually the way things are understood and built, they expect a very clear cut return on investment." (Interview 1, academia)

In this context, a legal framework that facilitates transparency is a decisive contribution to a sustainable and widely accepted partnership:

"The problem is that we have a very thorny relationship between public and private sector. [...] I mean, certain contractors get the best contracts due to these strong links and not very accountable links with governments or certain agents. [...] Not in the most transparent way and that is something that this new administration tries to avoid." (Interview 5, public)

"It's not easy, you see? Creating the covenants and receiving donations is a total hassle because of the bureaucracy. That is why sometimes people [private sector] want to make a donation and you cannot because there is no legal figure to do so." (Interview 3, public)

4.2.7 Challenge: recognition, mutual trust and shared commitment

Political commitment in urban greening is the first step to bring the private sector on board in terms of a PPP:

"I think the city is advancing in the green agenda but is actually still lagging behind other cities about the power the green agenda has inside the government. I think we are pretty good at saying it but still not good enough at doing it. We need more doing and less

saying to have a quite strong green agenda." (Interview 2, public)

Another recurrent topic is the lack of shared goals in the PPP and the lack of trust that derives from it. A paradigmatic case is a perception from the public and non-profit sector that the private sector only seeks financial and fiscal incentives:

"Businesses always ask you for incentives 'I need money, I need lower taxes'. Things that are difficult to do for the government. But we are trying." (Interview 3, public)

"It is difficult for us to always find the interest from the private sector [...] At least, what I see here in Argentina, the companies that sometimes get involved is because they fall within a branch of resources that completes them, on the other hand, corporate social responsibility and tax improvements. And when there are projects as highly visible which somehow gives a good image to that group, that private sector, that company. [...] And if not, they make donations for something, but we could never see it as something to build a long-term alliance. [...] When the private can approach the green structure, for example, I would like to know better with what interest it is coming and what other things it sees. Because In the case of informal neighborhoods, the private who comes, obviously, I have to see very well how they want to come to work in that territory and under what conditions. [...] With the private sector, I think about the large corporations that suddenly come with a fund and without much connection with the territory. [...] The private sector is so diverse that there are a lot of private groups that are collaborating with different things." (Interview 4, private nonprofit)

The lack of a sound financial system and problems of inflation paired with uncertainty about the private sector's intention cause public agents to doubt the viability of partnerships:

"Later on if you have the resources to pay for a private actor to carry on a certain policy, what happens if you have no more money to pay for it? [what] if the business is not more sustainable for the contracting part and the service provider? And that is why we try first to empower the public agents to do this kind of jobs without depending on a private actor. Because once the private actor is doing the thing they try to gain more money and to implement their gains, and the public sector cuts the program because it is getting very expensive. And that is not sustainable. That is why so far this is hard for me to promote an agenda related with the private sector." (Interview 5, public)

Joint political and private engagement can become inefficient if the partnership arrangement neglects sustainability and technical criteria:

"The problem is that we select the winners of the bid because of the lowest price. So there is not a technical criteria. You set the conditions and they offer. But you don't see how they are going to achieve those goals but just the price that you have to pay to get this done and maybe the system does not work properly." (Interview 5, public)

Traditional and dominant private players often come into play, focusing on grey infrastructure and lacking knowledge of innovative, nature-based solutions:

"Something the private sector does not have and maybe its an obstacle for these innovations, is that the main actors that are always working for the government don't have the practice to built green infrastructure. So they don't know how to create a sustainable draining system, how to maintain certain type of trees (...) They just know how to construct the traditional or more artificial way but not regarding the different things that nature requires to live or system to work." (Interview 5, public)

4.2.8 Implications of COVID-19

The disruption caused by the pandemic made it clear that more and better urban green spaces are needed and that a reorganization of public space is possible:

"The pandemic taught us the importance of green spaces. That now, they are used a lot. In fact here, children's birthdays are held in the plazas, it's like that, and it shows, that there is a need for more green spaces. [...] People are now going to green spaces all the time, and are re-acquiring them. [...] The public space was opened to the people." (Interview 3, public)

This re-appropriation of the public space promoted the intensive use of those spaces and the mobility of citizens within the city. It also allowed for the re-discovery of some parts of the public space and new greening opportunities:

"Any kind of space that is not necessarily intended as a space for public use was full of people. Something that I had never seen before. Any space that had a little bit of green was used by people. Sometimes moving from different places, coming far from one place to another. [...] I think that in some way it will be very positive to start what I say, these changes that require a lot of time... perhaps this [the pandemic] can help to accelerate, to make visible that need, and the enjoyment that a public space can give you." (Interview 4, private nonprofit)

This need was not only recognized by civil society but also found its way into the political agenda and the election campaign:

"The government understood the need that people

have, and more now that we are in elections [...] he is going to start doing a lot of actions on green spaces because this did come out of the pandemic." (Interview 3, public)

4.3 Kampala (Uganda)

The Greater Kampala Metropolitan Area, the capital city of Uganda, spans over 970 km². It emerged in a hilly landscape connected by wide valleys and river channels that flow into Lake Victoria. About 23% of Kampala is fully urbanized, 60% is semi-urbanized, rural settlements characterize the remaining part (World Bank, 2015). Kampala city has 1,650,800 inhabitants over an area of 18,900 ha (KCCA, 2020). Only 8% of Kampala's wetlands are estimated to be functional while the others disappeared due to urbanization or harbor informal settlements (KCCA, 2014). Urban trees and forests cover 58 ha, 3% of Kampala's surface (KCCA, 2012). In addition, an estimated 70% of Kampala's land is privately-owned, so the public cannot use it (KCCA, 2014). It makes the city prone to environmental burdens like stormwater runoffs, flooding, and air pollution (World Bank, 2015).

Kampala politically follows numerous international initiatives and establishes national regulations and laws on green infrastructure with a particular focus on urban trees and forests. Most prominently, the national implementation of the Bonn Challenge and the Reducing Emissions from Deforestation and Forest Degradation (REDD+) Initiative, streamline political actions. A prominent PPP in this regard is the Running Out of Trees (ROOT) national campaign to raise awareness and plant trees, which involves several larger private companies motivated by social responsibility (Interview 7). On the local level, the Kampala Urban Greening Infrastructure Ordinance (UGIO) and the National Forestry and Tree Planting Act (2003) built the foundation for action against deforestation on public and private land¹. Fostering an understanding of urban trees, Kampala Capital City Authority (KCCA) leverages its resources of mapping trees, amongst others within the Environmental Assessment and Kampala Urban Forest Management Programme (Interview 7). Furthermore, a vibrant social enterprise movement run by organizations and private individuals politically and practically pushes for green jobs within Kampala. They promote and implement opportunistic greening innovations such as greening road reserves or running public gardens (Interview 8 and 9).

4.3.1 Enabler: complementary resources for a common target

Widely accepted among actors, scaling up efficient and self-sustaining green interventions require joint

¹defines green spaces as an area covered with grass, trees, green roofs, parks, gardens, urban forests, and shrubs. Here, public spaces have a tree every 120 m², private spaces every 80 m², and commercial and industrial areas a minimum of 10% to 30% of green spaces.

actions with complementary resources of diverse actors working towards a common goal (Interview 9):

"We cannot do it alone as an entity so partnership is really important." (Interview 10, public)

"I see a combination of private, public sector and civil society organizations playing their role. If we do not work together in this context, there will be a continuous blame game. And at the end of the day the environment and the people living here are suffering." (Interview 8, private nonprofit)

The public sector contributes technical knowledge such as new climate-smart technologies, nature-based solutions, and cartographic capacities (Interview 7 and 8). Larger private companies provide valuable technical equipment for mapping green infrastructure. Private entrepreneurs support joint actions with their critical mass and a viable business model for urban green (Interview 9).

"You can't directly quantify [the contribution of private actors] in terms of trees but the support is immense [...]. Because [providing technical equipment and mapping tools] sustains the trees more. So you find this more expensive than the cost of [planting] trees." (Interview 7, public)

4.3.2 Enabler: political agenda

A policy agenda and coordination between national and local authorities are necessary prerequisites for PPP in Kampala. Generally, the public sector streamlines activities and prioritizes interventions by defining city development plans, managing and judging on appropriate resources from different partners (Interview 7). National authorities grant jurisdictional powers to state agencies, provide state resources, and create an enabling environment through their legislative power, for example, in allocating land and deciding on land use (Interview 10). They also function as a catalyst of international contributions (Interview 7). Because of their broader reach, national agencies can work with international and national private actors. The local authorities use their mandate to act and feedback jurisdictional needs. They represent the social and environmental interests of the local population and are therefore able to cooperate with local entrepreneurs:

"And one they have [the Kampala Urban Green Infrastructure Ordinance] in place it should go a long way. So you ensure that we have a sustainably green city, because the law has been democratically developed. And what we provide as the government is the guidance and making sure it remains consistent with the national laws and policies." (Interview 7, public)

4.3.3 Enabler: incentive mechanisms

"The most important thing is that corporate world has come to honor social responsibility." (Interview 9, private)

There are a variety of tools that motivate private sector involvement, such as legislative support, financial reimbursements, and the provision of land and mandates to entrepreneurs. First, the private and public sectors agree that financial incentives from national and local governments motivate private contributions to greening. The first step is for the public sector to capture and quantify the contributions:

"Once we have the national accounting system institutionalized for forestry and land resources, I am sure we will have more private sector players coming on board because of the obvious benefits. Because at the moment it is more of the advantage of corporate social responsibility, they don't take it as mandatory." (Interview 7, public).

"The public sector, the government and KCCA, there have been more contributions towards legislation, towards tax leverage. [...] so you are going to pay a lesser tax. Or we are even providing you the space where you can set up the vegetable gardens." (Interview 8, private nonprofit)

Secondly, reporting and placarding motivate social responsibility actions:

"You go to the newspaper and you pay one thousand dollars for one big advertisement, and the paper is gone. But put that one thousand dollars into a park and it will stay there for ever." (Interview 9, private)

Finally, institutionalized (financial) incentives to the private sector for contributing to greening beyond building green spaces increase scope and willingness of their contributions.

"We are slowly launching [the private sector] implementing their sustainability reports on recycling beyond the green spaces [...]. Once we have the national accounting system institutionalized for forestry and land resources, I am sure we will have more private sector players coming on board because of the obvious benefits. Because at the moment it is more of the advantage of corporate social responsibility, they don't take it as mandatory. (Interview 7, public)

4.3.4 Challenge: lack of resources

As noticed by the environmental justice scholarship, the colonial past of a city can mediate the distribution of resources and green amenities (Anderson et al., 2020). Our findings point to this connection of environmental justice with the historical legacy of the British colonization of Uganda:

"The most important thing is that Kampala was a very few public areas. However small it is, it is normally found in the upper area. You know, the upper class. So you find that the people who are the majority don't have that luxury of having a park. [...] The upper areas used to be for people who had jobs. So they were living in that areas and they had jobs, originally. And then the British government, is for people who is working within the government. They had built for them houses." (Interview 9, private)

The capacity for representation and knowledge of local needs is greatest among local governments. However, they lack the financial and landscape resources to expand their agendas:

"We have a lot of problems as far as managing the green assets is concerned in the city because of limited resources." (Interview 10, public)

A large amount of private land requires that private companies provide land resources for greening measures. However, the traditional private sector often lacks innovative capabilities. The government must coordinate its actions and collaborate closely with social entrepreneurs who provide innovative solutions that are mostly piloted in smaller areas:

"Because we also realized there is not so much innovation in the area of environment within the private sector. So we take these proposals to them and they are slowly getting on board." (Interview 7, public)

"Not all locals do appreciate [a higher tree coverage]. Hence, the need for us to raise awareness [about the multiple environmental and social benefits of urban trees] to ensure that we bring everyone on board, every stakeholder with corporate entities, government entities." (Interview 10, public)

"Convincing would have been easy if we had the land. [...] So it has to be [the larger private corporates], to give some of their properties and say this area is going to be a park." (Interview 9, private)

Apart from the knowledge gap of private enterprises, they often show opportunistic behavior and maximize public awareness for minimal effort:

"[...]especially where we have corporate entities [...] nothing happens beyond the cameras. Once the announcement is made, there is no following through. So we called them to see some of these things through to the very end, and we are providing the technical support by putting in place the mapping." (Interview 7, public)

4.3.5 Challenge: recognition of social innovation

Fruitful partnerships require mutual trust and a mandate for the private sector to engage. Particularly small social enterprises lobby for recognition and a mandate to implement their social innovation business models:

"The municipality is the controlling authority. [...] [I] have to have the permission from the city council." (Interview 9, private)

"We are involving KCCA [...] we are coming in to tell them that we don't have spaces in the city but just give us this opportunity for one or two years to run some of these gardens." (Interview 8, private nonprofit)

"So here we are trying to change the perception of the private sector, to appreciate that actually young people are involved in climate smart agriculture as a social enterprise but also trying to involve the government saying that if you can give us a conducive environment we can actually do better." (Interview 8, private nonprofit)

Entrepreneurs face challenges regarding market potential, as larger and wealthier private companies and individuals may disproportionately benefit from government incentives (Interview 8 and 9). Small private actors, for example, claim that current policy programs do not fully support their green innovations, instead of focusing on larger companies to support high-visibility government campaigns:

"The criteria to evaluate our programs are too generic and general. They may not easily get the best out of us, or they may not appreciate the context in which we are operating and the challenges we unpredictably face. [...] If I want to get a loan to buy a car to do Uber services in 36h I can get the loan from the bank. But if I can't get a loan to do urban farming or green enterprises, in Kampala's context it would take me almost 2 months or next to impossible." (Interview 8, private nonprofit)

4.3.6 Implications of COVID-19

For individuals, COVID-19 opened the possibility of virtual learning and self-study in nature and strengthened cultural heritage and local knowledge of medicinal plants:

"But during this COVID, most of the population went back to the herbs. And this are indigenous trees that were used by our great-grandmothers, but we had abandoned them and went for the tablet and the injection. But now, during COVID, [people are buying to] this traditional herbalist..." (Interview 9, private)

However, this meant increasing budgetary tensions for the public sector as the cost of awareness and tree planting campaigns increased while budgets for greening strategies contracted (Interview 7 and 8):

"Instead of having a national day of tree planting, we required mass mobilization and support and all these movements of logistics, gatherings in [...] the places where there is tree planting. We had to size downwards [...] because we cannot gather in groups of more than 20 people." (Interview 7, public)

5 Discussion

The results of this study helped us answer our question about the potential, priorities and new issues related with partnerships being taken into consideration by both the public and private sector. We identified similar aspects that enable and challenge partnerships within the three cities. In this section, we summarize the challenges and opportunities according to common dimensions and highlight the relevant trade-offs. At the end of each subsection we add some lessons for policy and practice marked by arrows.

First and foremost, NbS is a complex concept which unifies a multitude of actions for an effective intervention that can provide simultaneously environmental, social, and economic benefits to cities (Voskamp, de Luca, Polo-Ballinas, Hulsman, & Broelsma, 2021). Similarly, partnerships enable integrated and cross-sectoral planning and governance strategies, making them an effective tool for implementing complex and multifaceted policies.

5.1 Institutional framework and governance

Our research has shown that an explicit institutional framework and the ability to steer are essential prerequisites for creating incentives and stabilizing joint activities. It shall include administrative mandates and financial structures and be well integrated on the international, national, and local levels.

On the contrary, PPP create tensions between profitability and sustainability. Private sector participation in NbSs is motivated by financial incentives, which can arise from direct financial flows or public relations and marketing measures. At the same time, the public sector tends to give preference to cost-effective measures that impede innovative greening interventions. Public project tenders often emphasize financial criteria and neglect environmental aspects. Thus, sustainable solutions or smaller enterprises are disadvantaged. Therefore, policy and decision-makers need to include environmental and social considerations in the selection criteria of tendering processes and other mechanisms for prioritizing public-private partners. In addition to that, the establishment of PPP can be slow

processes, and therefore needs to be anticipated by the local governments. In the cases of Buenos Aires and Barcelona, for example, public project tenders are focused on larger private companies and follow mainly financial criteria, which hinders the possibility to the small and medium-sized enterprises to participate (Interviews 5, 11, 14). While large companies can provide financial resources and long commitment to PPP and greening projects, small and medium-sized ones have shown to be particularly active in urban greening. From our results, we have found that these profiles tend to display a clear environmental and social motivation and commitment well-aligned with the goals of the business, a specialization in their technical knowledge and capacities for implementing NbS and more flexibility to adapt to the conditions of the PPP.

Furthermore, building from the environmental justice scholarship on green gentrification (Anguelovski & Connolly, 2021) interventions that enhance the quantity or quality of green spaces can increase property values. This allows private actors such as real estate companies to use these spaces more profitably. Therefore, as stated by previous research, coordinated, participatory and intersectoral policies need to be established to avoid the increase of social inequality by displacing lower-income groups from the more expensive, greener areas (BCNUEJ, 2021).

→ The lack in government capacity impedes the effectiveness of partnerships. It is particularly relevant to have governance mechanisms and an institutional framework that acknowledges the multiple direct and indirect benefits of NbS within the fiscal and political agendas. Only then can financial incentives for private involvement be justified to policymakers (Interview 1). Hereby, a mixture of incentives and regulations can exhaust the contributions of the all actors.

→ In addition, sustainable public procurement facilitates long-term partnerships. This involves a long-term public sector strategy that leaves room for flexibility and adaptation to private sector proposals (Leigland, 2018) and therefore the maximization of benefits from NbS.

5.2 Awareness and acknowledgement of complementary capacities and partners

Partnerships promote broader legitimacy, advocacy, and awareness of urban greening and NbS. Collaboration lends legitimacy through a shared, explicit vision and mutual control mechanisms that guarantee the economic, ecological, and social viability of projects. Communication and recognition of each other's capabilities increase commitment and utilization of resources for shared goals. It has been shown to be indispensable that the benefits of NbS are measured and evaluated, and that the associated benefits are understood by the different stakeholders from public,

private and civil society sector based upon their local contexts (Bayulken, Huisingh, & Fisher, 2021). Additionally, partnerships mobilize and combine complementary resources such as human capital, financial resources, expertise, innovative capacity and administrative resources for urban greening actions. First, it improves the scope, visibility, and performance of projects. Second, a collaboration between the public and private sector enables a long-term prospect of interventions, as public policy is designed to achieve short-, medium-, and long-term goals. It allows the full development of NbS, which can provide a larger share of environmental benefits. Third, the private sector's profitability and efficiency orientations ensure the economic viability of projects, especially when the measures affect the core business.

In sum, the combination of innovation and regulatory capacity increases the effectiveness of greening interventions. Channeled resources in the development of efficient projects and the joint application of environmental criteria can increase the benefits of the measures. This applies for the example of the Barcelona Metropolitan Region, which actively involves private owners in the management of their land that falls under a protected area. In this way, private owners will have the information necessary to commit to ecosystem conservation and restoration processes that will ensure the sustainability of their own land (Interview 12).

In contrast, partnerships face the challenge of compromised stability in the long term. As efficiency criteria and the goal of constant capital flows and returns dominate private sector strategies, their business models are more volatile and more dependent on external factors than the public sector. At the same time, election cycles and pressure from politicians and private lobby groups constrain public sector activity. Consequently, there can be situations where long-term collaborations hinder new innovative ideas and fair opportunities for new actors to participate.

NbS planning and implementation often involve multiple stakeholders. Stakeholder engagement and the establishment of PPP require time and administrative effort. If not properly managed, this can compromise the full performance of interested stakeholders. Inappropriate governance of processes can hinder performance in terms of innovation or social and environmental sustainability or even lead to the failure of a partnership (McQuaid, 2019).

→ Creating long-lasting relationships fosters mutual trust, transparency, and understanding. Thus, aligning strategies of the public and private sector on a long term and within an explicit partnership agreement enhances cooperation and communication for an effective partnership (Leigland, 2018; Marx, 2019).

→ Involving the core business of the private sector increases their expertise, the efficiency of resources, and their willingness to engage.

→ There is a need to develop capacity-building tools to improve knowledge about the benefits of NbS and business models, especially in the private sector (Mayor et al., 2021). Networks to share and disseminate experiences and practices have proven to be a very positive initiative in cases such as the city of Barcelona. The PPIAF (2009) has presented a detailed online toolkit for PPP in road infrastructure in low- and middle-income countries that can serve as an example.

5.3 Participatory processes and social innovation

Partnerships allow for the emergence of innovative social practices. It can be the case with Corporate Social Responsibility (CSR) initiatives, non-profit private entities, or social entrepreneurs that prioritize and engage with environmental initiatives or disenfranchised communities to ensure fair access to the benefits derived from green spaces. Taking into account local market structures increases the amplitude for private entities to efficiently and innovatively contribute to NbS. Where markets are fragmented and dominated by many smaller players, designing partnerships on a smaller scale entitles entrepreneurs to contribute. A role model partnership with some individuals may scale up into a collective movement where multiple entrepreneurs experience partnerships for greening interventions as a business opportunity. Smaller-sized projects additionally reduce the risk of coordination and performance failures of partnerships (Leigland, 2018). For instance, in Kampala, individual entrepreneurs proposed a contribution towards transforming the road reserves into green islands where they can follow their commercial interests by selling plants and other consumables (Interview 9).

Furthermore, establishing co-governance mechanisms that allow scientific expertise and grassroots movements and activists to participate can offer new opportunities to engage with civil society and allow for demand-driven and cost-effective greening interventions while promoting the legitimisation and democratic quality of the decision-making processes. However, bottom-up consultation procedures do not always imply just outcomes of urban NbS. (Un)intended justice impacts must be carefully monitored during the different stages of governance processes (Toxopeus et al., 2020).

→ If high risk and uncertainty limit the acceptance of partnerships, smaller size projects can reduce the risk of divergent interests and coordination failure (Leigland, 2018).

→ Participatory processes and co-governance mechanisms that engage civil society, businesses, and academia opens a promising path towards social innovation and procedural justice in NbS.

5.4 COVID-19 building back better

The COVID-19 pandemic has been disrupting cities worldwide, as they are particularly vulnerable to COVID-19 due to a high population density and social inequities. Similar to recent literature, our results highlight the importance and interest that emerged during the pandemic towards the exposure to nature, particularly for the physical and mental health outcomes (Herman & Drozda, 2021; Isabel et al., 2021; Larcher et al., 2021; Luo, Xie, & Furuya, 2021; Soga, Evans, Tsuchiya, & Fukano, 2021; Ugolini et al., 2020). From an environmental justice standpoint, green spaces have emerged in urban areas as an important demanded common element of the public space. However, they are unequally distributed, leading to inequitable outcomes and pointing out new justice challenges for cities (A. Haase, 2020). Green spaces and future urban planning strategies must be designed to be accessible for disadvantaged communities in order to promote livable, sustainable, and inclusive cities for all.

→ COVID-19 highlighted the vital importance of accessible green spaces in cities. Exposure to nature should be promoted and incorporated into urban planning interventions to avoid inequitable outcomes and the aggravation of inequities during future health crises.

→ COVID-19 has shown as the power of global networks and platforms of knowledge exchange to create viable local solutions.

6 Conclusion

In this paper, we investigated enabling factors and challenges for the performance of PPP in the delivery of green spaces and NbS. We elaborated on three empirical case studies about Barcelona, Buenos Aires, and Kampala conducting a literature review on policy documents, and expert interviews from academia and the public and private sector. We identified three key dimensions that can foster or impede partnerships: firstly a sound institutional framework and governance capacity, secondly a common understanding of benefits from NbS and the urban green infrastructure along with the the awareness of the stakeholder landscape and the recognition of complementary capabilities of the multiple stakeholders, and thirdly participatory processes and social innovation that can leverage the delivery of partnerships. Even though these dimensions have generally shown to foster partnerships, considering the local context such as environmental and social inequities and needs as well as public and

private stakeholder structures is necessary to form fruitful partnerships.

In our study, we extend the NbS literature with an international focus, and hope to bring together previous literature on PPP and the environmental justice scholarship. Drawbacks from the COVID-19 pandemic and its implementations increased the awareness for the benefits of NbS among the public and private stakeholders. Additionally, it emphasized the need to increase efforts to expand green spaces and NbS and to make them more inclusive and equitable. We, therefore, hope this paper will help build on the momentum created by COVID-19 to promote greening partnerships that support building back better and work to make sure that we leave no one behind.

7 References

- Ajuntament de Barcelona. (2020a). *Anuari estadístic de la ciutat de barcelona*. Retrieved 19.09.2021, from https://ajuntament.barcelona.cat/estadistica/catala/Anuaris/Anuari/Anuari2020_AAFF.pdf
- Ajuntament de Barcelona. (2020b). *Climate emergency declaration | Barcelona City Council*. Retrieved 2021-12-09, from <https://www.barcelona.cat/emergenciaclimatica/en>
- Ajuntament de Barcelona. (2020c). *Segon Concurs de Cobertes Verdes | Ecologia, Urbanisme, Infraestructures i Mobilitat*. Retrieved 2021-12-09, from <https://ajuntament.barcelona.cat/ecologiaurbana/ca/concurs-cobertes-verdes>
- Ajuntament de Barcelona. (2021). *Proyectos internacionales | Ecología, Urbanismo, Infraestructuras y Movilidad*. Retrieved 2021-12-09, from <https://ajuntament.barcelona.cat/ecologiaurbana/es/con-quien-lo-hacemos/proyectos-internacionales>
- Álvarez De Celis, F., Álvarez Insua, J., Fernández Marty, C., Eguía, S., Pérsico, M. E., Tripoli, F., ... Talia, B. (2014). *Buenos aires verde: una estructura de soporte a la transformación de los espacios públicos*.
- Anderson, P., Charles-Dominique, T., Ernstson, H., Andersson, E., Goodness, J., & Elmqvist, T. (2020). Post-apartheid ecologies in the City of Cape Town: An examination of plant functional traits in relation to urban gradients. *Landscape and Urban Planning*. Retrieved from <https://doi.org/10.1016/j.landurbplan.2019.103662> doi: 10.1016/j.landurbplan.2019.103662
- Andersson, E., Kronenberg, J., Cvejić, R., Elmqvist, T., & Pintar, M. (2015). *Integrating green infrastructure ecosystem services into real economies* (No. GREEN SURGE D4.1).
- Anguelovski, I., Brand, A. L., Connolly, J. J. T., Corbera, E., Kotsila, P., Steil, J., ... Argüelles Ramos, L. (2020). Expanding the Boundaries of Justice in Urban Greening Scholarship: Toward an Emancipatory, Antisubordination, Intersectional, and Relational Approach. *Annals of the American Association of Geographers*, 1–27. Retrieved from <https://www.tandfonline.com/doi/full/10.1080/24694452.2020.1740579> doi: 10.1080/24694452.2020.1740579
- Anguelovski, I., Chu, E., & Carmin, J. (2014). Variations in approaches to urban climate adaptation: Experiences and experimentation from the global south. *Global Environmental Change*, 27, 156–167. doi: 10.1016/j.gloenvcha.2014.05.010
- Anguelovski, I., Connolly, J. J., Masip, L., & Pearsall, H. (2017). Assessing green gentrification in historically disenfranchised neighborhoods: a longitudinal and spatial analysis of Barcelona. *Urban Geography*, 39(3), 1–34. Retrieved from <https://doi.org/10.1080/02723638.2017.1349987> doi: 10.1080/02723638.2017.1349987
- Anguelovski, I., & Connolly, J. J. T. (2021). *The Green City and Social Injustice*. doi: 10.4324/9781003183273
- Àrea d'Ecologia Urbana Ajuntament de Barcelona. (2021). *Pla Natura Barcelona 2021 – 2030* (Tech. Rep.). Retrieved from <https://ajuntament.barcelona.cat/ecologiaurbana/ca/que-fem-i-per-que/ciutat-verda-i-biodiversitat/pla-natura>
- Ayers, J., & Dodman, D. (2010). Climate change adaptation and development. *Progress in Development Studies*, 10(2), 161–168. doi: 10.1177/146499340901000205
- Bayulken, B., Huisingsh, D., & Fisher, P. M. (2021). How are nature based solutions helping in the greening of cities in the context of crises such as climate change and pandemics? A comprehensive review. *Journal of Cleaner Production*, 288, 125569. Retrieved from <https://doi.org/10.1016/j.jclepro.2020.125569> doi: 10.1016/j.jclepro.2020.125569
- BCNUEJ. (2021). *Policy and Planning Tools for Urban Green Justice* (Tech. Rep. No. April). Barcelona: Author.
- Bicknell, J. (Ed.). (2010). *Adapting cities to climate change: Understanding and addressing the development challenges* (Reprint ed.). London: Earthscan.
- Bogner, A., Littig, B., & Menz, W. (2009). Introduction: Expert interviews — an introduction to a new methodological debate. In A. Bogner, B. Littig, W. Menz, & B. Kittel (Eds.), *Interviewing experts* (pp. 1–13). Houndmills: Palgrave Macmillan. doi: 10.1057/9780230244276\textunderscore1
- Borrás, S., & Edler, J. (2014). *The governance of socio-technical systems: Explaining change*. Cheltenham: Elgar. doi: 10.4337/9781784710194
- Borrás, S., & Edler, J. (2020). The roles of the state in the governance of socio-technical systems' trans-

- formation. *Research Policy*, 49(5), 103971. doi: 10.1016/j.respol.2020.103971
- Bouman, S., Frierson, R., Gielen, M., & Wilms, P. (2013). Public-private partnerships in developing countries. *IOB Evaluations*(378).
- Calderón-Argelich, A., Benetti, S., Anguelovski, I., Connolly, J. J., Langemeyer, J., & Baró, F. (2021). Tracing and building up environmental justice considerations in the urban ecosystem service literature: A systematic review. *Landscape and Urban Planning*, 214, 104130. doi: 10.1016/j.landurbplan.2021.104130
- Carbonara, N., & Pellegrino, R. (2020). The role of public private partnerships in fostering innovation. *Construction Management and Economics*, 38(2), 140–156. doi: 10.1080/01446193.2019.1610184
- Chan, K. M. A., Guerry, A. D., Balvanera, P., Klain, S., Satterfield, T., Basurto, X., ... Woodside, U. (2012). Where are cultural and social in ecosystem services? a framework for constructive engagement. *BioScience*, 62(8), 744–756. doi: 10.1525/bio.2012.62.8.7
- Chu, E., Anguelovski, I., & Roberts, D. (2017). Climate adaptation as strategic urbanism: assessing opportunities and uncertainties for equity and inclusive development in cities. *Cities*, 60, 378–387. doi: 10.1016/j.cities.2016.10.016
- Cilliers, E. (2009). Future directions in urban planning and space usage compensating urban green spaces. *Interdisciplinary Themes Journal*, 1(1).
- Cole, H. V. S., Anguelovski, I., Baró, F., García-Lamarca, M., Kotsila, P., Del Pérez Pulgar, C., ... Triguero-Mas, M. (2020). The covid-19 pandemic: power and privilege, gentrification, and urban environmental justice in the global north. *Cities & Health*, 1–5. doi: 10.1080/23748834.2020.1785176
- Corfee-Morloti, J., Marchal, V., Kauffmann, C., Kennedy, C., Steward, F., Kaminker, C., & Ang, G. (2012). Towards a green investment policy framework: The case of low-carbon, climate-resilient infrastructure. *OECD Environment Working Papers*. doi: 10.1787/5k8zth7s6s6d-en
- Da Rosa, A., van Tulder, R., & Pfisterer, S. (2012). Public-private partnerships in developing countries: A systematic literature review. *IOB Evaluations*(378).
- DaSilva, C. M., & Trkman, P. (2014). Business model: What it is and what it is not. *Long Range Planning*, 47(6), 379–389. doi: 10.1016/j.lrp.2013.08.004
- Dodman, D., & Satterthwaite, D. (2008). Institutional capacity, climate change adaptation and the urban poor. *IDS Bulletin*, 39(4), 67–74. doi: 10.1111/j.1759-5436.2008.tb00478.x
- Dumenu, W. K. (2013). What are we missing? economic value of an urban forest in ghana. *Ecosystem Services*, 5, 137–142. Retrieved from <https://www.sciencedirect.com/science/article/pii/S221204161300048X> doi: 10.1016/j.ecoser.2013.07.001
- Ernstson, H., & Sörlin, S. (2013). Ecosystem services as technology of globalization: On articulating values in urban nature. *Ecological Economics*, 86, 274–284. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0921800912003746> doi: 10.1016/j.ecolecon.2012.09.012
- Estadísticas GCBA. (2019). *Distribución porcentual de los hogares por personas por ambiente. ciudad de buenos aires. año 2008/2019*. Retrieved 02.05.2020, from <https://www.estadisticaciudad.gob.ar/eyc/?p=50357>
- Estadísticas y Censos. (2018). *Espacios verdes públicos*. Retrieved 17.09.2021, from <https://data.buenosaires.gob.ar/dataset/espacios-verdes>
- European Commission. (2021). *Evaluating the impact of nature-based solutions: A handbook for practitioners*. doi: 10.2777/2498
- Faggi, A., & Ignatieva, M. (2009). Urban green spaces in buenos aires and christchurch. *Proceedings of the Institution of Civil Engineers - Municipal Engineer*, 162(4), 241–250. doi: 10.1680/muen.2009.162.4.241
- FAO. (2020). *Fao green cities initiative: Green cities action programme: building back better*. Rome: Author.
- Fuller, R. A., & Gaston, K. J. (2009). The scaling of green space coverage in european cities. *Biology Letters*, 5(3), 352–355. doi: 10.1098/rsbl.2009.0010
- García-Lamarca, M., Anguelovski, I., Cole, H., Connolly, J. J. T., Argüelles, L., Baró, F., ... Shokry, G. (2021). Urban green boosterism and city affordability: For whom is the 'branded' green city? *Urban Studies*, 58(1), 90–112. doi: 10.1177/0042098019885330
- Gobierno Ciudad de Buenos Aires. (2021). *Climate Action Plan 2050 City of Buenos Aires* (Tech. Rep.). Gobierno de Buenos Aires.
- Gobierno de la Ciudad Autónoma de Buenos Aires. (2021). *Plan de Acción Climática 2050 / Buenos Aires Ciudad - Gobierno de la Ciudad Autónoma de Buenos Aires*. Retrieved 2021-12-08, from <https://www.buenosaires.gob.ar/cambioclimatico/pac-2050>
- Gobierno de la provincia de Buenos Aires. (2021). *Census buenos aires*. Retrieved 17.09.2021, from <https://www.gba.gob.ar/>
- Gómez-Baggethun, E., & Barton, D. N. (2013). Classifying and valuing ecosystem services for urban planning. *Ecological Economics*, 86, 235–245. doi: 10.1016/j.ecolecon.2012.08.019
- Graham, S., Barnett, J., Fincher, R., Mortreux, C., & Hurlimann, A. (2015). Towards fair local outcomes in adaptation to sea-level rise. *Climatic Change*, 130(3), 411–424. doi: 10.1007/s10584-014-1171-7
- Gwedla, N., & Shackleton, C. M. (2015). The de-

- velopment visions and attitudes towards urban forestry of officials responsible for greening in south african towns. *Land Use Policy*, 42, 17–26. doi: 10.1016/j.landusepol.2014.07.004
- Haase, A. (2020). Covid-19 as a Social Crisis and Justice Challenge for Cities. *Frontiers in Sociology*, 5. doi: 10.3389/fsoc.2020.583638
- Haase, D., Frantzeskaki, N., & Elmqvist, T. (2014). Ecosystem services in urban landscapes: practical applications and governance implications. *Ambio*, 43(4), 407–412. doi: 10.1007/s13280-014-0503-1
- Hansen, R., Frantzeskaki, N., McPhearson, T., Rall, E., Kabisch, N., Kaczorowska, A., ... Pauleit, S. (2015). The uptake of the ecosystem services concept in planning discourses of european and american cities. *Ecosystem Services*, 12, 228–246. doi: 10.1016/j.ecoser.2014.11.013
- Herman, K., & Drozda, L. (2021). Green infrastructure in the time of social distancing: Urban policy and the tactical pandemic urbanism. *Sustainability (Switzerland)*, 13(4), 1–24. doi: 10.3390/su13041632
- Hermans, F., Geerling-Eiff, F., Potters, J., & Klerkx, L. (2019). Public-private partnerships as systemic agricultural innovation policy instruments – assessing their contribution to innovation system function dynamics. *NJAS: Wageningen Journal of Life Sciences*, 88(1), 76–95. doi: 10.1016/j.njas.2018.10.001
- Heynen, N., Perkins, H. A., & Roy, P. (2006). The political ecology of uneven urban green space. *Urban Affairs Review*, 42(1), 3–25. doi: 10.1177/1078087406290729
- Honey-Roses, J., Anguelovski, I., Bohigas, J., Chireh, V., Daher, C., Konijnendijk, C., ... Nieuwenhuijsen, M. (2020). *The impact of covid-19 on public space: A review of the emerging questions*. doi: 10.31219/osf.io/rf7xa
- INDEC. (2010). *Censo nacional de población, hogares y viviendas 2010*. Retrieved 02.2021, from <https://www.indec.gov.ar/indec/web/Nivel4-Tema-2-24-84>
- Isabel, A., Triguero-Mas, M., Jardim Santos, C., Gómez-Nieto, A., Cole, H., Anguelovski, I., ... Baró, F. (2021). Exposure to nature and mental health outcomes during COVID-19 lockdown. A comparison between Portugal and Spain. *Environment International*, 106664. Retrieved from <https://doi.org/10.1016/j.envint.2021.106664> doi: 10.1016/j.envint.2021.106664
- Jiang, Y., & Shen, J. (2010). Measuring the urban competitiveness of chinese cities in 2000. *Cities*, 27(5), 307–314. doi: 10.1016/j.cities.2010.02.004
- Kang, S., Mulaphong, D., Hwang, E., & Chang, C.-K. (2019). Public-private partnerships in developing countries. *International Journal of Public Sector Management*, 32(4), 334–351. doi: 10.1108/IJPSM-01-2018-0001
- KCCA. (2012). *Kampala physical development plan: Updating kampala structure plan and upgrading the kampala*.
- KCCA. (2014). *Kcca strategic plan 2014/15-2018-2019. laying the foundation for kampala city transportation*.
- KCCA. (2020). *Kampala capital city: Strategic plan 2020/21 to 2024/25*. Retrieved 19.09.2021, from <https://www.kcca.go.ug/uDocs/Kampa-City-Strategic-Plan-2020-2025.pdf>
- Khan, M., Riley, T., & Wescott, C. G. (2012). Public-private partnerships in bangladesh’s power sector: Risks and opportunities. *SSRN Journal*. doi: 10.2139/ssrn.2186468
- Klijin, E.-H., & Teisman, G. R. (2003). Institutional and strategic barriers to public–private partnership: An analysis of dutch cases. *Public Money and Management*, 23(3), 137–146. doi: 10.1111/1467-9302.00361
- Konate Djibril, Aboubakar Coulibaly, Xiangrong Wang, & Dembele Ousmane. (2012). Evaluating green space use and management in abidjan city, cote d’ivoire. *International Journal of Economics and Management Engineering*, 2(3), 108–116. Retrieved from <https://www.deepdyve.com/lp/world-academic-publishing-co/evaluating-green-space-use-and-management-in-abidjan-city-cote-d-DZ050cHHAI>
- Konijnendijk van den Bosch, C., Sadio, S., Barfoed Randrup, T., & Schipperijn, J. (2004). Urban and peri-urban forestry in a development context - strategy and implementation. *Journal of Arboriculture*, 30(5).
- Koppenjan, J., & Enserink, B. (2009). Public-private partnerships in urban infrastructures: Reconciling private sector participation and sustainability. *Public Administration Review*, 69(2), 284–296. doi: 10.1111/j.1540-6210.2008.01974.x
- Koppenjan, J. F. M. (2015). Public–private partnerships for green infrastructures. tensions and challenges. *Current Opinion in Environmental Sustainability*, 12, 30–34. doi: 10.1016/j.cosust.2014.08.010
- Larcher, F., Pomatto, E., Battisti, L., Gullino, P., Devecchi, M., Archbold, D., & Niu, G. (2021). Perceptions of Urban Green Areas during the Social Distancing Period for COVID-19 Containment in Italy. Retrieved from <https://doi.org/10.3390/horticulturae7030055> doi: 10.3390/horticulturae7030055
- Leigland, J. (2018). Public-private partnerships in developing countries: The emerging evidence-based critique. *The World Bank Research Observer*, 33(1), 103–134. doi: 10.1093/wbro/lkx008
- Lewis, E. (2015). *Green city development tool kit*. Mandaluyong City, Philippines.
- Luo, S., Xie, J., & Furuya, K. (2021). “We Need such a Space”: Residents’ Motives for Visiting Urban Green Spaces during the COVID-19 Pandemic. *Sustainability*, 13(12), 6806. doi:

- 10.3390/su13126806
- Marx, A. (2019). Public-private partnerships for sustainable development: Exploring their design and its impact on effectiveness. *Sustainability*, *11*(4), 1087. doi: 10.3390/su11041087
- Mayor, B., Toxopeus, H., McQuaid, S., Croci, E., Luchitta, B., Reddy, S. E., ... López Gunn, E. (2021). State of the art and latest advances in exploring business models for nature-based solutions. *Sustainability*, *13*(13), 7413. doi: 10.3390/su13137413
- McDonald, R. I., Biswas, T., Sachar, C., Housman, I., Boucher, T. M., Balk, D., ... Leyk, S. (2021). The tree cover and temperature disparity in us urbanized areas: Quantifying the association with income across 5,723 communities. *PloS one*, *16*(4), e0249715. doi: 10.1371/journal.pone.0249715
- McQuaid, S. (2019). *Nature-Based Solutions Business Model Canvas Guidebook* (Tech. Rep. No. June).
- Miller, J. B. (2000). *Principles of public and private infrastructure delivery* (Vol. 101). Boston, MA: Springer. doi: 10.1007/978-1-4757-6278-5
- Nardone, A., Rudolph, K. E., Morello-Frosch, R., & Casey, J. A. (2021). Redlines and greenspace: The relationship between historical redlining and 2010 greenspace across the united states. *Environmental health perspectives*, *129*(1), 17006. doi: 10.1289/EHP7495
- OECD. (2010). *Dedicated public-private partnership units: A survey of institutional and governance structures*. Paris: Organisation for Economic Co-operation and Development Publishing. Retrieved from <http://gbv.eblib.com/patron/FullRecord.aspx?p=514730>
- Pace, R., Churkina, G., & Rivera, M. (2016). How green is a “green city”? a review of existing indicators and approaches. *IASS Working Paper*.
- Pelling, M. (2012). *The vulnerability of cities: Natural disasters and social resilience*. Hoboken: Taylor and Francis. Retrieved from <http://gbv.eblib.com/patron/FullRecord.aspx?p=982107>
- PPIAF. (2009). *Toolkit for public-private partnerships in roads and highways*.
- Ramats de foc. (2021). *Ramats de foc*. Retrieved 2021-12-08, from <https://www.ramatsdefoc.org/ca/projecte/>
- Ranjah, S. (2016). *Green infrastructure: planning for sustainable and resilient urban environment*. Dresden.
- Ribeiro, A. I., Triguero-Mas, M., Jardim Santos, C., Gómez-Nieto, A., Cole, H., Anguelovski, I., ... Baró, F. (2021). Exposure to nature and mental health outcomes during covid-19 lockdown. a comparison between portugal and spain. *Environment international*, *154*, 106664. doi: 10.1016/j.envint.2021.106664
- Richardson, J. (2008). The business model: an integrative framework for strategy execution. *Strategic Change*, *17*(5-6), 133–144. doi: 10.1002/jsc.821
- Ring, I., Hansjürgens, B., Elmqvist, T., Wittmer, H., & Sukhdev, P. (2010). Challenges in framing the economics of ecosystems and biodiversity: the teeb initiative. *Current Opinion in Environmental Sustainability*, *2*(1-2), 15–26. doi: 10.1016/j.cosust.2010.03.005
- Satorras, M., Ruiz-Mallén, I., Monterde, A., & March, H. (2020). Co-production of urban climate planning: Insights from the Barcelona Climate Plan. *Cities*, *106*, 102887. doi: 10.1016/j.cities.2020.102887
- Schlosberg, D. (2013). Theorising environmental justice: the expanding sphere of a discourse. *Environmental Politics*, *22*(1), 37–55. doi: 10.1080/09644016.2013.755387
- Scroope, C. (2018). *Argentine culture*. Retrieved from <https://culturalatlas.sbs.com.au/argentine-culture/argentine-culture-religion>
- Simon, D. (2016). *Rethinking sustainable cities: Accessible, green and fair. sustainable cities: Accessible, green and fair*. Retrieved from policypress.co.uk
- Soga, M., Evans, M. J., Tsuchiya, K., & Fukano, Y. (2021). A room with a green view: the importance of nearby nature for mental health during the COVID-19 pandemic. *Ecological Applications*, *31*(2), 1–10. doi: 10.1002/eap.2248
- Toxopeus, H., Kotsila, P., Conde, M., Katona, A., van der Jagt, A. P., & Polzin, F. (2020). How ‘just’ is hybrid governance of urban nature-based solutions? *Cities*, *105*(October 2019), 102839. Retrieved from <https://doi.org/10.1016/j.cities.2020.102839> doi: 10.1016/j.cities.2020.102839
- Ugolini, F., Massetti, L., Calaza-Martínez, P., Carriñanos, P., Dobbs, C., Ostoic, S. K., ... Sanesi, G. (2020). Effects of the covid-19 pandemic on the use and perceptions of urban green space: An international exploratory study. *Urban Forestry & Urban Greening*, *56*, 126888. doi: 10.1016/j.ufug.2020.126888
- UN Department of Economic and Social Affairs Population Dynamics. (2018). *World urbanization prospects 2018*. Retrieved 17.09.2021, from <https://population.un.org/wup/>
- UNEP. (2011). *Towards a green economy: Pathways to sustainable development and poverty eradication - a synthesis for policy makers*. Paris, France.
- United Nations (Ed.). (1992). *Report of the united nations conference on environment and development: A/conf.151/26* (Vol. 1). Rio de Janeiro: United Nations General Assembly.
- United Nations (Ed.). (1996). *Report of the world summit for social development*. New York: United Nations.
- United Nations. (1998). *Principles and recommendations for population and housing censuses* (Revision 1 ed.) (No. 67).
- United Nations (Ed.). (2002). *Report of the world summit on sustainable development*.
- United Nations. (2008). *United nations demographic*

- yearbook 2005*. UN. doi: 10.18356/b8da26b5-en-fr
- United Nations. (2014). *Programme of action: Twentieth anniversary edition: adopted at the international conference on population and development, cairo, 5-13 september 1994*. New York: United Nations Population Fund.
- United Nations (Ed.). (2015a). *Addis ababa action agenda of the third international conference on financing for development: adopted by the general assembly on 27 july 2015*. United Nations.
- United Nations (Ed.). (2015b). *Paris agreement: adopted under the united nations framework convention on climate change*. United Nations.
- United Nations (Ed.). (2015c). *Sendai framework for disaster risk reduction 2015-2030*. United Nations Office for Disaster Risk Reduction.
- United Nations (Ed.). (2015d). *Transforming our world: the 2030 agenda for sustainable development: adopted by the general assembly on 25 september 2015*. United Nations.
- United Nations (Ed.). (2017). *Human rights in cities and other human settlements: adopted by the human rights council on 23 june 2017*. United Nations.
- United Nations. (2019). *World urbanization prospects: The 2018 revision*. New York: Author.
- Voskamp, I. M., de Luca, C., Polo-Ballinas, M. B., Hulsman, H., & Brolsma, R. (2021). Nature-Based Solutions Tools for Planning Urban Climate Adaptation: State of the Art. *Sustainability*, 13(11), 6381. Retrieved from <https://doi.org/10.3390/su13116381> doi: 10.3390/su13116381
- Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'. *Landscape and Urban Planning*, 125, 234–244. doi: 10.1016/j.landurbplan.2014.01.017
- World Bank. (2015). *Promoting green urban development in african cities: Kampala, uganda: Urban environmental profile*.
- Zografos, C., Klause, K. A., Connolly, J. J., & Anguelovski, I. (2020). The everyday politics of urban transformational adaptation : Struggles for authority and the Barcelona superblock project. *Cities*, 99(June 2018), 102613. Retrieved from <https://doi.org/10.1016/j.cities.2020.102613> doi: 10.1016/j.cities.2020.102613

A Appendix

A.1 Interview guidelines

1. Questionnaire for public sector representatives

Semi-structured interview of approximately 45-60 minutes intended to public officials, city planners, departmental/sectoral managers including environmental department

1.1 Background

Can you present yourself and define what your specific role and responsibilities in your organization are?

To begin with a bit of an overview: thinking about the period of the last 5-10 years, what has been the approach of [AGENCY/ORGANIZATION NAME] to urban greening? What have been the main focal points and approaches for creating a greener [City Name]?

What were the most important trigger points or incentives for the city deciding to approach urban greening in those ways? What are the most important benefits and values that you see in creating a greener [City Name]?

How has the greening agenda been integrated into the other agendas of the city? What is the relevance of the greening agenda related to the others? What has been the evolution of it in the last 10 years?

1.2 Partners and projects

Who do you consider as the most important partners from government, nonprofit, and private sectors in creating a greener [City Name]?

How do/did you work with them (if at all)? Can you describe how partnerships that you think were particularly important developed?

Have you done any public-private partnership promoting green spaces or Nature-based Solutions? Can you describe it? How did the collaboration with the private sector begin?

How would you evaluate the public-private partnership when working for greening initiatives? What are the main strong and weak points? How can it be improved?

As the main greening interventions have been executed [name a few], what, was your role/responsibility in those projects? If any, what were the greatest challenges the city/you encountered? To what extent was the municipality able to overcome them? How?

What would you say to convince a private sector representative to start a public-private partnership on a greening initiative?

1.3 Equity and COVID-19

Do you see a relationship between your work and addressing issues of social equity – one way or another? If yes, in which way? If not, why?

Do you have any measures or decisions or projects to highlight that protect or guarantee the access to green space benefits to long-term residents and vulnerable communities?

If any, with which other public, private, and community actors do you (or does the city) consider as central to work to ensure that urban greening is equitable, inclusive, and affordable?

What has been the impact of COVID-19 on the greening agenda of the city? How were you affected in relation to the use of public space and green spaces?

What have you learnt with COVID-19 referring to green spaces in cities? What has been reinforced and what has been weakened?

1.4 Closing

Have you encountered specific cases in [e.g., Argentina, Latin America] where a municipality has done interesting work on urban greening with public-private partnerships? If yes, what have they done?

Is there anyone else you suggest we can talk with about issues related to greening, private sector and social equity in [City name]? Can you provide us with contact details?

2. Questionnaire for private sector representatives

Semi-structured interview of approximately 45-60 minutes intended to private sector representatives who have been part of public-private partnerships on NbS or green space projects and other stakeholders particularly acknowledged in green space investment projects

2.1 Background

Can you present yourself and define what your specific role and what your responsibilities in your organization are? Which sector does your business operate in?

To begin with a bit of an overview... thinking about the period of the last 5-10 years, what has been the approach of [AGENCY/ORGANIZATION NAME] to urban greening? What have been the main focal points and approaches for creating a greener [City Name]?

What were the most important trigger points or incentives for your organization when deciding to approach urban greening in those ways? What are the most important benefits and values that you see in creating a greener [City Name]? Which types of environmental benefits would you consider (most) relevant?

2.2 Partners, projects and perceived business case (cost, benefits and risks)

Who do you consider as the most important partners from government, nonprofit, and private sectors in creating a greener [City Name]? Are other stakeholders involved in your urban greening actions? Which ones?

How do/did you work with them (if at all, if not, ask why)? How would you describe the relationship you have with other stakeholders?

Have you done any public-private partnership? How did the collaboration with the private sector begin and develop? What were your main incentives? And what were your main concerns or worries?

What was your role/responsibility in those projects? If any, what were the greatest challenges the city/you encountered? To what extent were your organization and/or the municipality able to overcome them? How?

What are the main benefits of the private sector when investing in urban greening interventions and environmental services?

What is your main motivation to contribute to urban greening interventions? Do you consider engagement as compensation for other activities of your company or as engagement apart from other activities of your company?

What would encourage you to engage more in urban greening projects in the city/region you operate in?

What are your perceived costs of urban greening interventions?

Which risks do you expect when engaging in urban greening interventions?

Overall, how would you evaluate the public-private partnership when working for greening initiatives? What are the main strong and weak points? How can it be improved?

What would you say to convince a public sector representative to start a public-private partnership on a greening initiative?

2.3 Equity and COVID-19

Do you see a relationship between your work and addressing issues of social equity – one way or another? If yes, in which way? If not, why?

Do you have any measures or decisions or projects to highlight that protect or guarantee the access to green spaces benefits to long-term residents and vulnerable communities?

If any, which other public, private, and community actors do you (or does the city) consider as central to work with to ensure that urban greening is equitable, inclusive, and affordable?

Do you have any pre-/post- evaluation tools/mechanisms which specifically consider sustainability criteria (such as equity, sustainability, resilience etc.)?

Do you have any processes/mechanisms to prioritize sustainability criteria?

What has been the impact of COVID-19 on the greening agenda of the city? How were you affected in relation to the use of public space and green spaces?

What have you learnt with COVID-19 referring to green spaces in cities? What has been reinforced and what has been weakened?

2.4 Closing

Have you encountered specific cases in [e.g., Argentina, Latin America. . . adjust as needed] where a municipality has done interesting work on urban greening with public-private partnerships? If yes, what have they done?

Is there anyone else you suggest we can talk with about issues related to greening, private sector and social equity in [City name]? Can you provide us with contact details?

Glossary

Business case A business case outlines inputs and outputs of one specific project in order to justify and provide reasoning for its investment. Thereby, economic, social, environmental and possible other input and output factors are monetized and outweighed against each other.

Business model The term “business model” is widely debated but is commonly defined as “a specific combination of resources which through transactions generate value for customers and the organization” (DaSilva & Trkman, 2014). A business model outlines the value creation and its scalability of a company. It is separated into the three pillars: 1) the value proposition, defining the concrete performance of the company and the respective customer of this performance, 2) the value creation classifies this performance along the value chain, and 3) the value capture identifies the monetary value-added for the company (Richardson, 2008).

Ecosystem Services Benefits that humans obtain from urban ecosystems and their components (Gómez-Baggethun & Barton, 2013).

Environmental Justice Plural set of conditions related to the fair distribution of resources, inclusive political processes, and institutionalized recognition of communities that allow for full human flourishing (Schlosberg, 2013).

Equity The just distribution of social, economic and environmental goods and burdens (Calderón-Argelich et al., 2021).

Fairness Individuals’ perceptions of justice arising from a judgment process (Graham, Barnett, Fincher, Mortreux, & Hurlimann, 2015).

Green city A key concept of sustainable urbanization, which can be defined as “a city that takes responsible political and societal action in order to achieve high environmental quality, which by itself contributes to well-being” (Pace, Churkina, & Rivera, 2016). Other definitions also include, among others, sustainable or green development, green behavior such as the use of public transportation, high quality urban environments, economic considerations, sustainable consumption, and resilience to external disturbances (Lewis, 2015).

Nature-based Solutions Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience (European Commission, 2021).

Public-Private Partnerships Literature does not provide one unique definition for public-private partnership, however most definitions align on the dimensions of 1) multi-actor engagement, such as private, non-governmental and academic actors which 2) share objectives, goals and challenges and 3) cooperate in an interactive and independent manner in the provision of public goods and services while benefiting from complementary resources, risk and responsibility sharing (Bouman, Frierson, Gielen, & Wilms, 2013; Da Rosa, van Tulder, & Pfisterer, 2012).

Urban The United Nations states that “because of national differences in the characteristics that distinguish urban from rural areas, the distinction between urban and rural population is not amenable to a single definition that would be applicable to all countries” (United Nations, 1998). However, a set of definitions according to the national census definition of different geographical contexts can be consulted at the UN Demographic Yearbook 2005, table 6 (United Nations, 2008).

Urban Green Infrastructure A strategically planned network of green and blue spaces in urban areas, designed and managed to deliver a wide range of ecosystem services and other benefits at various spatial scales (Hansen et al., 2015).

Glossary: Ecosystem Services, Urban, Public-Private Partnerships, Equity, Urban Green Infrastructure, Nature-based Solutions, Environmental Justice, Fairness, Green city, Business case, Business model.



GLOBAL CHALLENGES

> 50% of the global population reside in cities

Cities consume 75% of the global natural resources due to demand for goods and services, transportation systems, industrial activities and land clearing

Cities' populations are disproportionately affected by climate change

Environmental justice and equal access to environmental benefits to marginalized communities is an important concern in cities

GLOBAL EFFORTS

The FAO Green Cities Initiative aims to „increase people's well-being, through better availability of and access to products and services provided by urban and peri-urban forestry, agriculture and food systems" – FAO (2020)

Nature-based-Solutions (NbS) provide an innovative approach to sustainable and livable cities → SDG 11

Shift in **governance** calls for private actors to consider their negative externalities and support the delivery of public goods → SDG 17

Public-Private-Partnerships (PPP) are increasingly employed as policy instrument

POLICY IMPLICATIONS

Institutional framework and governance

Governance capacity and an institutional framework that acknowledges the multiple direct and indirect benefits of NbS within the fiscal and political agendas allow for effective partnerships. This also justifies public financial incentives for private involvement.

A long-term public sector strategy that leaves room for flexibility and adaptation to private sector proposals facilitates long-term partnership and therefore the maximization of benefits from NbS.

Awareness and acknowledgement of complementary capacities and partners

Long-lasting relationships foster trust, transparency, and mutual understanding. Aligning strategies of the public and private sector in the long term and within an explicit partnership agreement enhances cooperation and communication.

Involving the core business of the private sector increases their expertise, the efficiency of resources, and their willingness to engage.

Capacity-building tools improve the knowledge about the benefits of NbS and partnerships. Global and local networks to share and disseminate experiences and practices support this capacity building process.

Participatory processes and social innovation

Small-sized projects can reduce the risk of divergent interests and coordination failure in case high uncertainty limit the acceptance of partnerships.

Participatory processes and co-governance mechanisms that engage with civil society, businesses, and research opens a promising path towards legitimacy, social innovation, and procedural justice in NbS.

COVID-19 and building back better

COVID-19 highlighted the vital **importance of accessible green spaces** in the city. **Exposure to nature should be promoted and incorporated into urban planning interventions** to avoid inequitable outcomes and the aggravation of inequities during future health crises.

COVID-19 has shown the power of **global networks** and **platforms of knowledge exchange** to create viable local solutions.

...NEED LOCAL SOLUTIONS

Barcelona (Spain)

"This is a global phenomenon between science and activism [...] This path of community association, with activism, with the small scale of the private sector, I think is very productive, very interesting, but on the other hand it is not very systemic. [...] But it's important for the whole topic of communication and networking." – Interview 13



1,666,530 inhabitants, **11.5%** of the surface of covered by green spaces



Efforts towards urban greening:

- **Agencies and legislations:** e.g. Barcelona Metropolitan Area, "Pla Natura Barcelona 2021-2030", "Pla Clima 2018-2030"
- **Private actors:** civil society and grassroots movement, private corporates, institutions (e.g. Barcelona+Sostenible network), social enterprises (e.g. Eixverd), and non-profit organizations (e.g. TarpunaCoop)



Buenos Aires (Argentina)

"Everyone benefits if you improve the environment, including the private sector. But this also involves a wider understanding of benefits. [...] Once you understand and you conceptualize it in terms of ecosystem provider, and you can quantify and to some extent monetize the ecosystem services." – Interview 1

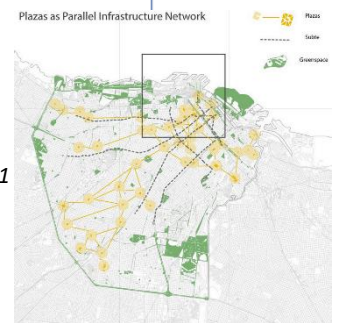


2,890,151 inhabitants, **9.40%** of the surface of covered by green spaces



Effort towards urban greening:

- **Agencies and legislations:** e.g. National Scientific and Technical Research Council, Buenos Aires City Government, Environmental Protection Agency City of Buenos Aires, Ministry of Territorial Development and Habitat, Matanza-Riachuelo Basin Authority, Buenos Aires City Government
- **Private actors:** civil society engagement, multinationals, and non-profit organizations (e.g. Instituto Internacional de Medio Ambiente y Desarrollo para América Latina)



Kampala (Uganda)

"I see a combination of private, public sector and civil society organizations playing their role. If we do not work together in this context, there will be a continuous blame game. And at the end of the day, the environment and the people living here are suffering." – Interview 8



1,650,800 inhabitants, **17%** of surface covered by green spaces and agriculture



Effort towards urban forestry:

- **Agencies and legislations:** e.g. KCCA, Ministry of Water and Environment Uganda, Kampala Urban Greening Infrastructure Ordinance, the National Forestry and Tree Planting Act
- **Campaigns:** e.g. Running Out of Trees (ROOT), The Bonn Challenge, REDD+ Initiative
- **Private actors:** civil society and grassroots movement, multinationals, institutions (e.g. schools, hospitals), social entrepreneurs (e.g. Plants 4 Africa) and non-profit organizations (e.g. Climate Smart Agriculture Youth Network)

