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Harnessing the power of collaboration for nature-based solutions

New ideas and insights for local decision-makers

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Harnessing the power of collaboration for nature-based solutions

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Harnessing the power of collaboration for nature-based solutions:

New ideas and insights for local decision-makers

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2023 Directorate-General for Research and Innovation

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Local decision-makers are tasked with shaping the future of their cities to foster human well-being and boost resilience and local economies. Yet they also face several critical social and environmental challenges, such as climate change, biodiversity loss, or environmental justice. Nature-based solutions are one important tool available to help shape urban futures and tackle these and other challenges. This briefing paper presents practical examples and inspiration for local decision-makers on utilizing co-governance approaches to promote participatory processes and collaborative creation of nature-based solutions. It explores how to fully harness the potential of these solutions in their design, implementation, and maintenance. Options for overcoming institutional challenges in decision-making around nature-based solutions are presented, and the value of co-governance is demonstrated on the basis of city experiences, aiming to inspire other cities to try more inclusive governance approaches.

1. Introduction

Cities are facing immense policy challenges, which often do not fit cleanly within administrative boundaries. Solutions can be equally complex, requiring collaboration between different authorities and actors at various spatial scales (e.g., neighbourhood, municipal, regional, country). Some of the most pressing challenges are caused by climate change (e.g., drought, flooding, and wildfires) as well as the deterioration of ecosystems and their services, and issues of socio-environmental justice. Nature-based solutions are one important tool at the disposal of decision-makers which can help to tackle these problems. Nature-based solutions are "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits" (UNEA 2022).

Despite their potential, nature-based solutions have not yet become standard practice as a complement or alternative to traditional grey infrastructure solutions. Hesitation from decision-makers to choose these solutions to address societal challenges has several underlying cause.

Two key hurdles to uptake are firstly, lack of public support likely caused by insufficient understanding about the multiple benefits which can be delivered and secondly, a high level of risk aversiveness to challenge the status quo, which comes in part from gaps in data and prior experience about long-term cost-effectiveness.

The participation of key stakeholder groups and the general public in the design, implementation and maintenance of NBS has been shown to increase the sustainability, effectiveness and acceptance for nature based- solutions. Such 'co-governance' approaches can help to overcome institutional silos and generate

societal benefits beyond the impact of the physical NBS interventions, such as strengthening citizen engagement in civic decision-making. Inclusive processes require a delicate act of balancing multiple interests and competing demands to ensure just and inclusive opportunities for engagement. For this to happen social and community engagement skill sets are needed, which if not already present 'in-house' requires training and/or the participation of external advisors and facilitators.

The Mayor of Paris Anne Hidalgo is one city leader who has engaged with nature-based thinking. She has gone on record in support of becoming a green, "15-minute city" and sees her governance role as around social inclusion, innovation, sustainable development, and environmental issues and in an interview with contravener said that in the future 'Nature will take pride of place in the city, as it always should have'.

Source:
https://www.cntraveler.com/story/how-mayor-anne-hidalgo-plans-to-reinvent-paris

Figure 1. City of Paris ©Sandra Naumann

2. About this briefing paper

This briefing paper has been produced by the European Commissions' NBS Task Force 6, drawing together the findings of EU-funded research and innovation (R&I) projects on nature-based solutions. It can be considered as advice and guidance on good practices from R&I projects and wider literature. The guidance includes definitions and reasoning about the value of co-governance, including collaborative models and case studies. There are also reflections based on case studies on how co-governance is a valuable approach for meeting NBS implementation challenges, notably in relation to mainstreaming NBS in planning and decision-making. The audience for the report is principally, but not solely local decision-makers to encourage more participatory and collaborative processes around the design, implementation, and maintenance of nature-based solutions.

3. Understanding co-governance and co-creation for NBS

Co-governance describes a collaborative approach to designing, implementing, maintaining or monitoring NBS, where the active involvement of the local community, including NGOs and other stakeholders such as private sector actors, is encouraged to empower individuals to develop a sense of ownership for their local environment and equip them with new capacities and knowledge.

Co-creation is defined in different ways but emphasizes the joint collaboration of stakeholders and can be considered as systematic process of creating new solutions with people (not for them) involving citizens and communities in policy and service development (Mahmoud et al. 2021). The process of co-creation uses participatory methods, which can be enabled and fostered by co-governance processes. This can include for example, establishing a citizen platform with its own budget to give the citizen a voice in shaping their districts and cities and co-creating their own NBS interventions (see case studies in Annex 1). This stands in contrast to more traditional governance arrangements including top down and non-participative approaches.

Collaborative approaches to governing NBS offer a range of benefits for the implementation and effectiveness of NBS. First, by engaging more diverse actors, urban planning can enhance the pool of available competencies and benefit from wider perspectives in green spaces planning to more fully leverage the potentials of NBS (Brokking et al. 2021). Second, co-creation and genuine participation can be powerful tools to ensure the relevance and acceptance of NBS. As the acceptance of infrastructure developments is determined to a considerable extent by public attitudes, ignoring or mishandling public opinion could lead to significant criticism and may even lead to project abandonment. A further benefit of the co-governance of NBS is that it helps to dilute the influence of powerful lobbyists and partisan interests and level the playing field in power relationships.

4. Existing and emerging governance models

There are a range of potential co-governance approaches that can be applied in the development of NBS, depending on local conditions and circumstances. Generally, it should be understood that 'one model does not fit all', meaning that the success or failure of a particular approach in one setting does not mean that similar results will always be generated in a different context. Just as NBS are very locally-specific, so are their governance models.

Moving towards a system of shared governance involves changes in the stakeholders themselves and in how they interact with one another. These changes are essential to create both the trust and conditions for engagement and dialogue between stakeholder groups as well as departments and institutions to realign the way both decision-making and administrative functions occur. In this guidance, we refer to 'actors' as all those involved in the co-governance of NBS. Co-governance is not only about setting-up new decision-making models, but also challenging the status-quo to foster transformative change at both institutional and community level. This includes (Bradley et al. 2022 based on Emerson and Nabatchi, 2015):

- The creation of transformational learning opportunities to prepare actors for organisational change and ideally involving an 'all learning together' approach.
- Introducing urban agents to systems thinking to remove information silos and find solutions to complex problems.
- Changes in the way actors relate in their networks, including the levels of responsibility for day-to-day management.
- Changes in the degree of collaboration in the decision-making process.
- Adaptations in network roles and intra-network relationships that alter how and by-whom decisions are made.
- Reviewing how actors share information and communicate. Consider how information is filtered, weighed, validated and approved.
- The gradual building of trust through engagement based on agreed principles and increased transparency.

Taking the important step towards more collaborative governance approaches requires not only a shift from top-down, command and control models towards looser, more organically formed networks, but also a shift from bottom-up towards forms of organisation that include a certain degree of formal administration capabilities. This implies a move away from the usual extreme examples of a top-down or bottom-up systems towards the middle ground. This move away is usually accompanied by mixed organisational methods based on partnership networks that include community groups and representatives together with at least some actors that bring with them (or develop) administrative experience. This leads stakeholders into situations where they are learning to collaborate with other types of urban agents, such as government officials working with grassroots community groups or community members learning to work with technical or municipal stakeholders.

In the London living lab of the CLEVER Cities project, Peabody, a UK based housing association in partnership with the Greater London Authority (GLA) and Groundwork London, is incorporating community-led regeneration projects into their governance systems. The South Thamesmead Garden Estate project involved setting up the Community Design Collective (CDC), comprised of local residents that were paid to contribute their time and lived experiences as well as to share fully in the decision-making process including where development should concentrate and how budgets were spent.

https://clevercities.eu/london/

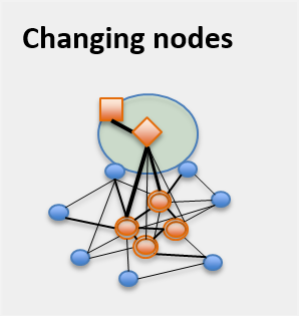
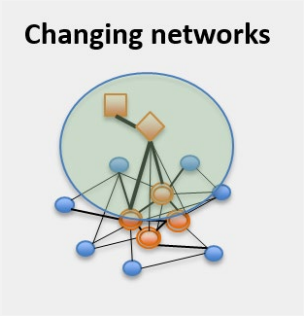
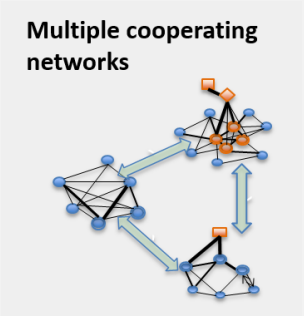
Organisations that are embarking on change, most frequently move from a top-down starting point (see Annex 2) to a new form of decision-making partnership that involves a wider range of stakeholders and can therefore be organised more horizontally. This form of organisation helps by strengthening motivation and guidance, maintaining a certain degree of structure in the decision-making process and providing a level of clear responsibility for day-to-day management activities. Examples of this type of solution can be found in the CLEVER Cities Living Labs, where cities like London, Milan and Hamburg tested various forms of power sharing.

"In the collaborative approach, active involvement of the local community and NGOs should be encouraged to empower citizens in the development of their local environment and equip them with knowledge about developing, operating and maintaining NBS [31]. Grounded on these preconditions, urban planning can enhance the merger of competencies and perspectives in the design and implementation of green spaces and leverage the potentials of NBS." (Brokking et al 2021: 3)

Less common examples refer to cases where bottom-up, grass roots initiatives are able to adopt governance models that involve some level of specialisation with leading or management roles. This can occur through the introduction, either by voting or delegating, of a group or groups to take on these activities. Bringing in specialised organisations that can guide and aid in the collaborative process is very helpful for non-specialized groups and represents an example of moving away from the more extreme types of only top-down or bottom-up organisational systems.

The move towards more collaborative forms of governance tends to occur following one of three main strategies of adaptation over time, representing three main ways changes that can occur to alter network relationships. This includes the three following options (Bradley et al. 2022):

Box 1: Options to alter network relationships

1. Changes in the network nodes, particularly to add in new roles that may promote, mediate, or change leadership dynamics. For example, adding a facilitator into the network.	2. Adaptations to portions of the networks, including or removing multiple nodes, connections and altering more significantly the power relationships between them. For example, creating a design council with a number of local organisations represented.	3. A move towards multiple cooperating networks that can bring in diversity and cross-perspective collaboration while maintaining some independence of the individual network groups. For example, creating a partnership with other existing multi-body collectives and locally networked stakeholder groups
		

Note: These diagrams show typical relationships between lead actors (orange squares), gatekeepers (orange diamonds), enablers (orange triangles), mediators (green

Circles (not shown here), and actors given some top-down appointed function (orange circles) or delegated functions by peers (double blue circles). Double circles, in general, show actors or groups that have been given administrative or other functions, and line thickness is used to illustrate that information flows vary in intensity.

Changes in co-governance networks are an integral part of the creation of collaborative forms of decision-making. As actor inter-relationships are altered in networks and their relationships become more equal and horizontal, critical community building and learning can occur and those involved can begin to develop relational thinking. This is directly tied to the process of dealing with multiple perspectives, adopting new roles and taking on multiple responsibilities.

The development of a co-governance approach in support of NBS will frequently follow a unique pathway in terms of the degree to which top-down organisations will intervene in the process. Thus, co-governance networks can be designed or guided by municipal or other organisations or they can come together more organically, controlled by grassroots organisations. The pathways (adapted from Bradley et al. 2022) include:

- Designing governance networks.

- Creating/strengthening the connections between networks.
- Creating/strengthening the connections between the parts of the same network.
- Providing incentives for new networks to form.
- Guiding new networks with limited assistance.
- Helping networks through consultations.
- Letting networks emerge organically.
- Strengthening existing stakeholder or actor participation (often with training).

These pathways provide different methods to progress towards more collaboration. There are many ways to consolidate the new relationships between actors in a community that are starting to work together in a more horizontal fashion. Some pathways are more hands-on, while others involve observation to know when to let things progress or to step in and offer guidance. For example, adopting a bottom-up perspective, a community group may need to accept a new working arrangement by accepting an appointed lead, or by forming a partnership with an organisation more connected to governmental processes in order to reach their objectives.

The diversity of outlined pathways highlights that both intentionally designed interventions in creating governance networks and subtly aiding the workings grass-roots processes are valid. As community relationships gradually form partnerships or new hybrid organisations, they often need training and support. Having the means to adapt and learn as groups move towards more collaborative networks can be more important than the way organisations are set up.

5. Effective participation and co-creation

The use of effective and inclusive participation and co-creation processes and therewith the involvement and engagement of end-users to co-create and implement NBS and associate decision-making processes (including in policy) can significantly contribute to the relevance, legitimacy, acceptance and ownership of NBS. Such processes can also help to create social impact, enhance organizational knowledge processes by involving end-users in the generation of meaning and value, foster active knowledge sharing and co-production (Mahmoud et al. 2021), and generate new ideas for example transforming brownfields, vacant or in-between spaces and make planning inclusive (Frantzeskaki et al. 2022a).

Stakeholder engagement in co-creation processes

Stakeholder engagement is a fundamental part of any co-creation process and requires the understanding of the stakeholders (people, groups or organisations) that have an interest in initiatives and/or activities carried out and can be affected by the issues concerned (Morello and Mahmoud 2018a). Moreover, the planning of an inclusive and tailored approach, suitable for the stakeholder groups

engaged, and setting up a mechanism to monitor the engagement process are key features (see box 2). The CLEVER Cities project developed a series of steps and a toolkit for the implementation of co-creation processes to support cities achieving successful implementation of NBS (Morello and Mahmoud 2018a, 2018b) and the URBiNAT project developed Guidelines for Citizen Engagement and the Co-Creation of Nature-Based Solutions (Nunes et al. 2021).

Box 2: Key points for stakeholder involvement

- **'Stakeholders' means everyone who has a stake in any aspect of your activities** - you should think broadly about who will be affected or have an interest
- **Well-planned and inclusive engagement** leads to better outcomes
- **Start by identifying** your stakeholders and then analyse their needs, interests and preferences
- You should then **map and prioritise** your stakeholders to inform the development of your engagement plan
- Engagement should be **participatory, inclusive and tailored** to each stakeholder group
- Make sure to **regularly monitor and evaluate the effectiveness of your stakeholder engagement.**

(Source: Morello and Mahmoud 2018a)

Recognising the value of such processes, municipalities started to invest more in participation and co-management as well as deepening their cooperation with citizen-led and co-creative projects and processes (Hansen et al. 2022). A few examples are listed in the table below.

Table 1. Examples of local co-creation processes in practice

City	Co-creation processes in practice
Hamburg, Germany	**Mobile Garden for the elementary school Neugraben:** The project focused on creating moveable raised beds, seats, and storage containers for three schools to be used in the schoolyards. The project was realized in collaboration with local partners, school officials, pupils, teaches and the parents' council. This co-creation activity should help students, parents and teachers feel responsible for what they have built (as a new governance model). The raised beds and benches were made through a guided workshop by a local carpenter, with participation from the school pupils. A construction guide was developed so that this project can be easily replicated in other schools, paving the way for making this a widely accepted co-governance model. (For more information see case study #4 in Annex 1)
London, UK	**Abbey Way Green Corridor:** The project focuses on developing a green corridor in the London neighbourhood of Thamesmead and thus enhancing the area's ecological value by implementing various NBS. Part of this project is to develop and implement a collaborative plan to improve the lakeside area and engage various organizations, schools, and social groups in environmental education and awareness. It is expected NBS implemented will be interactive, trackable, and integrated into residents' daily lives.
Lima, Peru	**Participatory governance for integrated and multiscale NBS:** Lima aims to strengthen climate adaptation policies by creating and enhancing synergies between stakeholders ranging from academia, local governments, private businesses and NGOs. The Lomas Programme, for example, supports initiatives that bring together different stakeholders from academia, local and national governments, private actors and NGOs who actively participate in the NBS discussions, design, and strategy-building. The Green Belt Independencia initiative is a pilot project whose objective is to create a green belt and green spaces in the middle lower-class neighbourhood of Independencia, which is particularly vulnerable to landslides. This pilot initiative relies on a consortium composed of private, public, national and international actors, supported by the municipality.
San Pedro Garza García, Mexico	**Participatory Budgeting - San Pedro Garza García:** Participatory Budgeting is an instrument through which funds are distributed to urban development projects proposed by citizens of the municipality. Each year, 100 million Mexican pesos are distributed among the 6 sectors and 177 neighborhoods into which the municipality is divided. The Participatory Budget programme also provides workshops to help citizens propose viable projects including the implementation of NBS. Examples of such initiatives include creating and renovating neighbourhood parks, pocket parks, widening and tree-lining sidewalks, and creating green corridors. The chosen projects are implemented by experts, who have focused on planting the city with native and slow-growing tree species to improve the municipality's biodiversity and resilience to climate change. (For more information see: https://interlace-hub.com/participatory-budgeting-san-pedro-garza-garc%C3%ADa)

Despite the many opportunities to co-create NBS with citizens, the potential for participation and co-management is still underutilized and often limited to lower levels of citizen involvement such as information providing or consultation. Reasons for this can include a lack of municipal capacity and expertise or the lack of organizational flexibility to facilitate citizen involvement (Wamsler et al. 2020). In the cities that support co-creation, such processes have become part of high-level city policies. These efforts have changed the perceptions and actions of citizens and city government and represent important steps on the road to co-governance (Buijs et al. 2016). Moreover, when applied to public policy in combination with effective active participation, co-creation can lead to better participation in urban regeneration processes and improves know-how for decision-making mechanisms (Mahmoud et al. 2021:4).

Apart from fostering co-creation processes in decision-making and in the implementation of NBS, there is also a need to support local bottom-up participation and citizen-led action by creating enabling policy and organizational structures, as illustrated by the citizens platform in Chemnitz (see box 3).

Box 3: Citizens Platform in Chemnitz, Germany

Associations, initiatives and individual citizens have joined forces in the Chemnitz citizens' platforms to sustainably improve living conditions in the city's neighborhoods. The platforms, which were officially recognized by the city of Chemnitz in 2014, identify common concerns and problems in the neighborhoods and serve as a framework for developing proposals for appropriate solutions. The possible implementation of the proposals is then negotiated with representatives of the city of Chemnitz.

The citizens' platforms are now an established structure that is recognized and supported by the city administration. As part of the process of Chemnitz being the European Capital of Culture in 2025, the city administration decided to give the citizens a voice in this process and creating their own intervention sites (in a participatory approach) in each neighbourhood of the citizens platform. The citizen platform Chemnitz Mitte-Ost, for example decided to create the Bürgerpark (citizen park Gablenz) as an intervention area on a former school site. The Bürgerpark Gablenz

Box 3: Citizens Platform in Chemnitz, Germany

will be a newly created neighbourhood park in a GDR (German Democratic Republic) panel construction area. The park will include many new tree plantings, a "wild" nature section, lawn areas, a playground and a sport section.

(Source: UGA: https://interlace-hub.com/citizen-platforms-chemnitz (see Chemnitz case study #1 in Annex 1), Photo: Area of future Citizen Park (Bürgerpark Gablenz) ©City of Chemnitz)

Taking an inclusive approach

Among other things, NBS can contribute to social inclusion and cohesion. However, this cannot be taken for granted, as poor design and implementation can lead to an unequal distribution of benefits. This is a fundamental challenge for adapting NBS to the different needs of stakeholders (Øian et al 2021:4). To avoid NBS reproducing social exclusions and social inequalities, it is necessary to ask: To what extent and how can NBS benefit different groups? Which groups will be affected and how? Which groups should be taken into consideration with respect to issues of social inclusion (Øian et al 2021)?

Moreover, decisions on the design and implementation of urban NBS require local knowledge and the inclusion of the cultural context in terms of inclusive design, considering all dimensions of social and environmental justice (Kabisch et al. 2022: 1393). To address social inequality and injustice through inclusive participatory approaches, it is also necessary to understand the nature of the power relations that arise from a particular set of interactions between participants. In addition, actions should also be identified and taken to change the underlying structures that foster inequality. The example of the Corredor Biológico Interurbano María Aguilar (CBIMA) in San Jose, Costa Rica (box 4) demonstrates how to successfully involve and collaborate with local communities including marginalized groups. The key driver to deploy participatory and inclusive processes for CBIMA is to ensure NBS used are adapted and responsive to local contexts (UCLG 2022).

Box 4: Participatory and inclusive approaches to implement NBS in the Corredor Biológico Interurbano María Aguilar (CBIMA)

CBIMA was established as an inter-institutional and multi-level governance body bringing together national level organizations, local governments, academia, private sectors, NGOs, and other engaged citizens and stakeholders. A key element of many of these projects are the participatory processes being used in different municipalities to ensure nature-based solutions used are adapted and responsive to local contexts. From the participatory design of the interventions in Alajuelita and San Jose, to the neighbourhood management of the community garden in Curridabat with technical assistance from the municipality, to cycling tours organized by CBIMA, cities and institutions are making various efforts to engage citizens and gain ownership of the corridor by local communities.

Successful examples of cooperation with citizen organizations and neighbourhood associations already exist within CBIMA, where local gardens have been installed with an equal share of investment by the beneficiary communities and the municipality. However, improvements can be made as usually it is the same people who participate, and underrepresented groups are rarely engaged. Officials who work on green spaces often have no experience yet in working with underrepresented groups making this a challenging process.

(Source: UCLG 2022:18, Photo: Community Garden in Curridabat ©Sandra Naumann, see also CBIMA case study #3 in Annex1)

Despite the potential benefits from applying co-creation and participatory processes, not all socio-political contexts are institutionally equipped to establish and facilitate these. Resources (capacities, time and budget), knowledge and skills in city administrations are needed. Where these are lacking, the support of external specialised organisations can be helpful.

Lessons learned from applying co-creation processes in practice include (Arlati et al. 2021):

- The cooperation between a planning (public administration) and implementing body (local development agency) is beneficial to implement co-creative processes, reach out to citizens and open up new involvement opportunities;
- Establish dialogues and cooperation not only across administrative levels, but also within the institutions themselves, which allows for interdisciplinary, cross-sectoral cooperation and a broader view of the local challenges;
- There is need for wider involvement and empowerment of civil society and social groups (also including disadvantaged groups) beside the usual suspects (e.g. via events and communication, on-site and hands-on activities, open

debates) to take into account their values and preferences, trigger join implementation, fosters the sense of ownership of implemented NBS and help maintain their interest in oversee these interventions;

- Involving the broader public requires continuous adaptation to search for a common and understandable language;
- The learning effects of the process are fundamental to the further application of co-creation activities at the local level.

6. Enhancing policy and planning capacities for NBS implementation

Co-governance in NBS design and implementation is emerging as a promising approach to shift policy decisions, combat climate change effects, and foster more inclusive cities by sharing dynamic decision-making directly with communities.

NBS are seen as key actions to meet development, biodiversity, and climate goals through, for example, promoting greener cities and the re-naturalisation of urban areas. Designing and implementing nature-based solutions (NBS) is inherently complex due to their multifunctionality, the trade-offs between different functions, and the considerations of temporal and spatial scales (Bush and Doyon, 2019). Thus, the potential of NBS to contribute to urban resilience relies heavily on the existence of appropriate policy and planning capacities as well as achieving the buy-in needed to prioritise NBS over or alongside traditional grey infrastructure (Nauman et al, 2022). These two aspects are described in more detail below.

6.1. Policy frameworks to support NBS

A key aspect to realize the full potential of NBS from a societal and economic perspective is their integration into different sectoral policies (e.g. health, economic development, finance, energy and urban planning) (McQuaid et al, 2021). Despite their promise, such integrated approaches are often lacking in practice, with responsibilities, funding, and expertise being shared across multiple departments or institutions in an uncoordinated manner. Key gaps include lacking information by urban administrations about legal instruments and requirements for implementing NBS (Kabisch et al, 2016) and insufficient guidance, technical information, capacities and resources.

While coherent policy frameworks are still not commonplace for governing NBS, there is a diversity of policy instruments which have been found to effectively promote NBS (see table 2). Such instruments can support increased awareness amongst different municipal departments about existing city goals and strategies; ensure financing for these types of solutions; and promote innovation and knowledge sharing.

Table 2: Categorization of policy instruments that support NBS (Source: Davis and Burgos, 2022)

Category	Subcategory	Examples
Legislative, regulatory and strategic instruments	Dedicated strategy or plan	NBS, green infrastructure, or green space strategy or plan
	Sectoral or overarching strategy or plan	Adaptation, biodiversity, circular city, smart city strategy or plan; masterplan, integrated plans; action plan on (innovation/green) public procurement
	Urban planning mechanisms	Spatial (zoning), infrastructure or socio-economic development plans; green space factor restrictions on development of green areas; targets (regulation and planning) standards; scoring
	Standards	Green public procurement standards
Economic and fiscal instruments	Disincentives	Taxes and charges/fees, tariffs; trading of permits for using a resource or trading
	Payments, subsidies, incentives	Subsidies or payments to landowners/ private actors for practices; public financing/grants; payments for insurance covering the risk associated with newer green technologies
	Financing mechanisms / market-based instruments	'Green finance' or debt-based instruments; blended finance; payments for ecosystem services (PES); public-private-partnerships (PPP)
Agreement-based or cooperative instrument	direct engagement of citizens / multistakeholder collaboration	Citizen science programmes, citizen assemblies, participatory budgets, neighbourhood development plans, community management of green spaces on public lands, community asset transfer
	Joint regional planning/ action	Intermunicipal exchange platforms
Knowledge, communication and innovation instruments	Communication / awareness raising	Targeted educational programs; certification (labelling) or ranking; awareness raising campaigns
	Knowledge and innovation	Communities of practice; living labs; creating workshops; pilots; constructing business cases or land use plans; green hubs

Urban planning mechanisms and integrated urban development stand out as instruments that enhance the consideration and uptake of NBS across different sectors and help mainstream multifunctional, urban green areas in urban spatial development (Albert et al.2021). A good practice example from Lima is presented in box 5.

Box 5: Integrated and multiscale nature-based solutions to tackle social and environmental challenges, Lima, Peru

Lima's NBS interventions build on a different array of strategies and policies that have been designed to face Lima's societal challenges in an integrated way, including the Water Fund initiative, the Lima Ecological Infrastructure Plan, and the payment for ecosystem services law (MERESE) that supports the Seeding Water Programme. Most of these initiatives come under the umbrella of the Lima Ecological Infrastructure Plan (PEAIE) proposed in 2014; though not yet approved. Its approach is currently being integrated into the new Metropolitan Urban Development Plan (Plan 2040) and the Lima Climate Change Plan, focused on implementing the goals defined in the Paris Agreement. The Plan is supported by an "Ecosystem" strategy which integrates NBS to conserve the largest natural areas in metropolitan Lima and improve its resilience in the face of increasing temperatures, heat waves and water scarcity.

(Source: NetworkNature (2022), see also Lima case study #5 in Annex 1), Photo: Green Belt independence Lima ©Networknature)

Another key policy frame is to build alliances between public and private actors that are promoted through urban development strategies, are the Greening the Business Improvement Districts - London (UGA, 2023). This is a public-private programme implemented in 2012-2018 to identify and deliver opportunities to enhance green infrastructure in central London. The programme is one of the implementation instruments of the 2008 London Plan (London's masterplan), which introduced the concept of green infrastructure into London urban policy-making.

The successful implementation of nature-based solutions (NBS) depends not only on well-designed policies but also on the level of collaboration during the implementation process. Building partnerships plays a crucial role in enhancing the effectiveness of policy instrument implementation. Moreover, allowing

stakeholders to contribute to the development of the strategy ensures credibility and legitimacy (Adriázola, Dellas, & Tänzler, 2018: 15). Case study experience shows that these instruments are more likely to be implemented successfully when they are designed and implemented within collaborative governance approaches (see example in box 6). In conclusion, the efficient and sustainable design and implementation of policy instruments are greatly enhanced by utilizing collaborative arrangements and integrating nature-based solutions (NBS) as part of a city's vision, in a comprehensive and synergistic manner.

Box 6: Collaborative governance approach for the management of the Serra de Collserola Natural Park, Barcelona

For example, the Metropolitan Area of Barcelona (AMB) established a collaborative governance approach for the management of the Serra de Collserola Natural Park a unique forest area of over 8,000 ha with significant ecological value. The governance of the park is supported by a dedicated policy instrument: the Collserola Preservation Plan (PEPNat). The PEPNat is a hybrid plan that combines environmental and urban planning aspects. According to the regulation, the Park is managed by a consortium where all interested city administrations are present, as well as landowners and the civil society through councils and other advisory bodies. There is also a targeted working group that focuses on aspects of public use and agroecological practices. There are two levels of NBS intervention within the park.)

(Photo: AMB, View from Ribidabo ©Robert Peña, CPNSC, see also Collserola case study #2 in Annex 1)

Planning capacities

The complexity of decision-making processes regarding nature-based solutions (NBS) challenges the traditional management and problem-solving capabilities of many local municipalities (Polk, 2011). Another crucial factor for mainstreaming NBS and ensuring their proper implementation is the presence of adequate planning capacities at the local level. This includes expertise in the technical design of NBS and capacity-building processes (Casper et al., n.d.).

Local governments encounter several challenges in NBS planning. One such challenge is the difficulty faced by decision-makers in comprehending and synthesizing the available knowledge about the effectiveness of NBS. This challenge arises from the locally specific nature of the evidence. Additionally, NBS implementations often encounter obstacles in understanding the conditions that lead to the desired impacts, particularly in terms of social and health effects (Dumitru, Frantzeskaki, and Collier, 2020).

In addition, local decision-makers may face challenges in effectively addressing potential trade-offs associated with NBS planning, such as concerns related to gentrification and social inequality. Furthermore, there may be a need to further enhance their understanding of how to make optimal use of available technical solutions (Somarakis, Stagakis, and Chrysoulakis, n.d)

In this regard, the development of a technical knowledge basis for decision-making is a key needed action area. This would include a focus on the production of references, standards for policies and guidelines that can establish a basis for adequate implementation and monitoring (Casper et al. n.d.). To help make the case for NBS, there is a need to be able to communicate their economic, social, and environmental benefits to diverse target groups (Eggermont et al., 2021). It is thus critical to compare data from diverse contexts as NBS are very locally-specific and to further develop and apply the indicators in practice as there are limited funds/willingness to collect data over the long-term.

Capacity building is a crucial aspect in addressing the challenges related to NBS. One potential solution to bridge the gaps in technical knowledge and evidence of NBS benefits is through the expansion of educational and workforce training programmes (see box 7). The development of technical capacities shows better results when supported by co-creation and collaborative governance processes between different city departments and the insights of civil society. The collaborative and inclusive process is a step forward to achieve better technical capacities while developing a more diverse, equitable workforce skilled in building NBS (see section 6.2 for more details).

Box 7: Technical knowledge and capacity building actions in Valencia, Spain

As part of the process to promote nature-based solution (NBS) actions, Valencia has developed two strategies. The first one is to organize NBS demonstrations to provide evidence on NBS benefits for climate and water resilience and other urban challenges. The

Box 7: Technical knowledge and capacity building actions in Valencia, Spain

second one is focused on the formulation of a city level strategy to raise NBS awareness. At the administration level, a local monitoring team was set up, which met on a regular basis for defining objectives, co-designing solutions and selecting monitoring indicators.

Some of the specific results of these strategies that support city wide capacity building are:

- A participatory process called #MésVerdBenicalap (#GreenerBenicalap) engages citizens in designing and implementing NBS. Several collaborative workshops have taken place, including a contest for green ideas and public family days.
- Information panels in the neighbourhood and information brochures inform local people about the NBS in their area.
- A mobile app launched in 2020 helps local people to learn about plants and wildlife in Valencia and a 'solidarity basket' will connect food producers and consumers. There is a video that shows how it works.
- Collaborative workshops, talks, an interactive website, individual and group interviews, questionnaires, and mailboxes are being used to understand the community's problems and needs.
- Collaborative Green Initiatives Contest

GrowGreen Project. (n.d.). Valencia. Retrieved April 20, 2023, from https://growgreenproject.eu/city-actions/valencia/ See also Valencia case study #7 in Annex 1), Photo: Valencia's nature-based solutions demonstration project located in the Benicalap-Ciutat Fallera ©GrowGreen Valencia)

6.2. Co-governance to overcome institutional challenges

Existing institutional structures present an array of challenges for co-creating NBS and successfully employing co-governance approaches. Barriers include, for example, the speed of the necessary adaptations to emerging challenges (e.g. climate adaptation, biodiversity loss, social cohesion), and the multifunctionality of nature-based solutions requiring cross-sectoral and cross-governmental approaches (Moser et al. 2019). City governments are ususally organised in distinct departments dealing separately with urban development, green area planning, climate change adaptation, social aspects etc., and lacking an integrated planning process and cross-sectoral cooperation.

Barriers also include limited financial resources, fixed budgets and a distribution of available funds across different departments, with different responsibilities and their own policies to fulfil. There might also be a lack of clarity of which departments are responsible for NBS or overlapping responsibilities. Moreover, the implementation of NBS in cities is limited by a limited cooperation between city governments and non-governmental and private actors or across scales.

> The **cross-sectoral approach** to urban strategies refers to the need to overcome the 'siloed' structure of sectoral divided functions which characterises public organisations, to tackle multi-dimensional challenges. The goal of the approach is to ensure coherence in policy-making principles and objectives across policy areas, and to ensure actors relating to different sectors cooperate to create policies (Fioretti 2020: 10).

Cross-sectoral approaches can tackle these challenges addressing both the horizontal (within city governments and between cities and surrounding regions) and the vertical (public-private cooperation) dimension. Cross-sectoral approaches can be also seen as a form of collaborative governance. This section outlines potential co-governance approaches for overcoming institutional silos and other barriers.

Cross-sectoral cooperation within local governments

Cross-sectoral cooperation within local governments requires an understanding of what other departments are doing as well as their priorities, interests and goals. This can be helpful to identify cross-linkages and using shared language to discuss the value of NBS for achieving their goals. Building interdepartmental collaboration can take time (Vandergert 2022), and in order to develop integrated structures in the long-term, special processes are required that can extend over long periods of time, as they may require a multitude of complex political and legal negotiations.

Local city governments can, for example, establish dedicated NBS working groups across departments to identify shared goals, planning targets and upcoming cooperation opportunities. In this context different departments working on urban planning, green area planning and climate change adaptation could regular meet and jointly develop urban greening/nature strategies, open space concepts or plans covering the different departments' interests. Alternatively, a NBS workforce/coordination point could be established to ensure that NBS are integrated within all relevant sectors and plans at city level. Overall, such approaches will not only help to develop joint solutions and operationalise

synergies between different sectors, but also to use the limited public resources more efficiently (see example from the city of Wroclaw in box 8).

Box 8: Co-creation and engaging citizens in NBS deployment in Wroclaw, Poland

The city of Wroclaw (see photo below), for example, set up a municipal co-creation team to develop urban climate change adaptation plans and blue-green infrastructure strategies, and to steer the implementation of urban investments. This team brings together different city departments and organisations (water and energy, urban planning department, Wroclaw Agglomeration Development Agency), but also involves the University of Environmental and Life Sciences, landscape designers and Eco-Development Foundation as well as local residents).

(See Wroclaw case study #8 in Annex 1), Photo: Pocket park 'Ptasi Zagajni' in Wroclaw ©City of Wroclaw, https://www.wroclaw.pl/growgreen/mapa-obszaro)

There are also cases where high-level local politicians induced profound changes and the development of new planning and governance cultures, resulting in more co-creation of NBS. The city of Aarhus (Denmark) established a new administrative unit for participation and cultural change to transform organizational routines and perspectives step by step (Hansen et al. 2022:17).

Cooperation between public and private actors, including citizens

Moving beyond silo-based approaches also requires improving the cooperation between public and private actors, including citizens. The development of cooperation models has traditionally followed a top-down approach. In partnership models, on the other hand, cities are asked to improve coordination and cooperation between central governments and local partners to enable upscaling of solutions through the exchange of best practices (Frantseskaki et. al 2022b: 8). Such partnership models can also be helpful to increase acceptance

and ownership of citizens for NBS projects, stimulate private investments, building networks and address social inequality. How such approaches can work in practice was demonstrated by the city of Sheffield, which created the Waterways Strategy Group in 2003. This initiative demonstrates how innovative partnerships between public organisations and voluntary sector groups can deliver co-created NBS projects (see box 9).

Box 9: Collaborative and partnership oriented NBS for the regeneration of the waterways in Sheffield

The Waterways Strategy Group includes representation from the City Council and local environmental and community groups. Together they have developed the Sheffield Waterways Strategy and a 5-year action plan consisting of joint actions to co-ordinate capacity building with the communities. The Strategy Group also played an important role in setting up the River Stewardship Company, which was instrumental in informing and involving the local population (via workshops and meetings) in NBS projects, jointly setting the agenda and designing policies. This process was also intended to re-engage the local population and inspire residents to get involved in taking care of waterways. In doing so, the city has adopted a collaborative planning and partnership approach that prioritises city-regional level strategies that enable local bottom-up participation and citizen-led action.

(Source: Sheffield case study, see full case study #6 in Annex 1)

NBS decision-making often also goes beyond municipal borders, tackling the restoration or revitalisation of rivers or creating ecological corridors. In such cases, the cooperation of municipalities in an urban agglomeration or metropolitan area (horizontal cooperation) as well as cooperation across different spatial levels (vertical cooperation) can be a powerful approach to facilitate more

integrated spatial development (Naumann et.al. 2018). In the case of Stockholm, for example, the County Regional Plan involves 26 municipalities as well as the Stockholm County Municipal Association, various government agencies and stakeholders, and educational and research institutions.

7. Recommendations and key take aways

This chapter provides a set of recommendations and take away messages for local decision-makers. Moving from current practice to co-governance should be considered as a process and not all of these recommendations can be implemented immediately. Local policymakers may wish to set up a local team to oversee the development of co-governance within the process of co-creation of nature-based solutions and agree timescales for progress including monitoring and evaluation of progress.

- In cities, co-governance involves the sharing of decision-making normally between a lead public administration and stakeholders across civil society. The role of the administration becomes that of an enabler as much as a leader. When applied to nature-based solutions the benefits transcend the physical outcomes to include wider socio-environmental benefits such as active citizenship and increased stewardship of green spaces.

- Co-governance of nature-based solutions can increase their acceptability to local communities who have been involved in their design and implementation. Furthermore, it can help overcome path dependency towards grey infrastructure solutions which have become normative in many situations, and which provide only temporary respite at the local level whilst not tackling the underlying global drivers of change.

- The process of co-governance can be as important as its impacts in practice. In a resource-limited environment, collaboration can draw out skills available in civil society that are not necessarily embedded within existing municipal structures.

- Co-governance linked to co-creation can result in long-term action by volunteers in terms of stewardship of nature-based interventions within local neighbourhoods.

- Co-governance may extend beyond municipal boundaries, as many nature-based solutions also cross boundaries hence cooperation and collaboration should be factored in when this occurs.

- Policymakers in local governments should be aware of the importance of breaking down silos within their own organisation as part of a wider move towards co-governance with stakeholders and local communities.

- Since urban planning mechanisms and integrated urban development stand out as instruments that enhance the consideration and uptake of NBS across different sectors and to mainstream multifunctional urban green areas in urban spatial development then this area is a starting point for co-governance engagement.

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Annex 1: Case studies

Case study 1: Providing Citizens with a Voice to Assist in the Designing of Public Intervention Sites in CHEMNITZ, Germany

Context

Chemnitz will be the European Capital of Culture (ECoC) in 2025 (ECoC 2025). As a result, many art and cultural interventions and events will take place. In order to give the citizen of Chemnitz a voice in the whole process, the administration decided to give every citizen platform and every village the chance to create their own ECoC 2025 intervention site in their area. Every village or citizen platform was asked to include, at some point of the process, all citizens within the local area in order to make it a participatory process. Every platform chose a different approach for the participatory process.

Introduction

This project began in 2018 and is ongoing. The citizen platform Chemnitz Mitte-Ost wants to create the so called Bürgerpark Gablenz as intervention area on a former school site. The Bürgerpark Gablenz will be a newly created neighbourhood park in a former construction area. The park will include many new tree plantings, a "wild" nature section, lawn areas, a playground and a sport section. The idea and the development of the park is completely in the hands of the citizen platform, with the help of a landscape architect and different departments in the city. The Nature Based Solution (NBS) co-creation part began after the initial planning phase of the park, where the rough ideas, requirements and the design of the park were considered. With respect to the co-creation element solely, citizens were invited to the park to give their opinion, thoughts and wishes for the future park. All feedback provided by citizens was analysed, grouped and then, if possible, integrated in the planning of the park. The citizen platform also tries to engage citizens during the whole development process of the park in order to create a sense of ownership for citizens. They ensure this through frequent, but short and precise E-Mail, a regularly updated website and through voluntary work assignments for the park.

Figure 2. Area of future Citizen Park (Büergerpark Gablenz)

Partnership

Citizen platforms bring together associations, initiatives and individual citizens of an urban area. They identify common concerns and problems in their neighbourhoods and develop their own proposals for solutions, the implementation of which they negotiate as citizens with representatives from politics and administration on an equal footing. The aim is to improve the living conditions in the neighbourhoods addressing cultural, social, infrastructural, residential, urban development and environmental concerns. The citizen platforms were established in 2014 in the manner to give the districts of Chemnitz an equal steering power as the village councils have for the villages.

Governance

Governance structure and characteristics	
Initiated by	Local Committee
Key stakeholders	Participants joining the individual platforms comprise for example local citizen initiatives, associations (e.g. social welfare, education), companies, public institutions and individual active citizens and residents.
Governance Model	
Type of Governance	In these citizen platforms, associations, initiatives and individual citizens of an urban area come together. They identify common concerns and problems in their neighbourhoods and develop their own proposals for solutions, the implementation of which they negotiate as citizens with representatives from politics and administration on an equal footing. The aim is to improve the living conditions in the neighbourhoods addressing cultural, social, infrastructural, residential, urban development and environmental concerns. This also includes the creation of urban green and blue spaces such as for example, parks, planting trees, flower meadows.
Characteristics/ Arrangements	The platforms support citizens' projects, ideas, associations and initiatives in planning, financial implementation, and funding. There are eight platforms which are based on the areas of the already existing citizen gatherings and the defined areas of the city development concept ('Stadtentwicklungskonzept'). The citizens' platforms and the city administration develop jointly binding standards of cooperation, which regulate the tasks of all participants and forms of involvement. To support their work, citizens' platforms receive an administrative and (participatory) citizens' budget within the overall city budget. The participatory citizens budget is primarily used to finance projects that benefit the improvement of living conditions and the development of the urban areas.
Governance enablers	When the villages (Ortschaften) were incorporated into Chemnitz they kept their village council and therefore the right to get informed, give positions and to in some extent regulate the development of their village. The idea behind the citizen platforms was to give the urban districts of Chemnitz the same steering power as the village councils' have for their villages (Ortschaften).

	The decision to establish the citizen platforms was seen as an opportunity to foster citizen participation, to showcase them, and empower them to change things. The first impulse came from an EU-Forum (transeuropäisches Netzwerk für Bürgerbeteiligung DEMOS) about citizen participation, in which Chemnitz took part. Because of this forum, to offer a low-threshold participation for the citizen and to treat the districts in the same way as the villages, two citizen platforms were established in 2012 on a trial. Later in 2019 the citizen platforms were rolled out to the rest of Chemnitz.
Participation process	
Governmental bodies	*Horizontal cooperation* The Citizen Platform has organized several citizen participation formats and individual discussions. Many ideas were taken up, discussed, discarded or tightened and a basic concept was drafted. Together with the green space office, a planner was placed at the side of the citizens' platform alongside representatives from the construction office and the cultural capital office. The plan for the Bürgerpark Gablenz was developed with added new details after each citizen participation format. *Vertical cooperation* There is only horizontal cooperation, since from the very beginning the municipal Building Department, as the financier and implementer of the project, granted full competence to the citizens' platform as the representative of the citizens of the two districts Gablenz/Yorckgebiet.
Non-governmental bodies	The core statement of the administration for the project was "we want to create something that is also wanted and used by the residents". To make this possible, the design framework had to be broadly defined and the citizens had to be involved in the development process. The respective citizen platform is an organised citizen representation which was able to fully exploit the search for a cultural and leisure area based on citizen participation. The citizens were thus able to actively discuss the design proposals and expand them with new ideas. The administration took over more and more the function of consulting and project execution. The work of the citizens' platforms is primarily focused on the concerns of the respective city area. They platforms see themselves as the contact and mouthpiece of the citizens and actors living and working in the area vis-à-vis the administration and the city council. Citizens and interested stakeholders in the specific neighbourhoods/urban areas can join the platform and to take part in the regularly happening open meetings.

Policy context

There are no policies for the creation of parks or the implementation of NBS in place in Chemnitz. In general, there are policies related to 'greening' in Chemnitz, but none of them account for NBS. For this intervention the only kind of policy which applies is in relation to the ECoC 2025. In this manner every neighbourhood has the chance to develop a space for the citizen until 2025. How it should look and what it entails is completely open and lays totally in the hands of the villages and citizen platforms of Chemnitz.

Governance outcomes (motivation/reason to implement a co-governance approach)

- **Increase acceptance and ownership of citizens** for NBS projects by establishing participatory approaches to design green and blue areas
- **Promote alternative participatory channels**, which gather community, institutional and political leaders to discuss and implement NBS strategies building networks and trust between stakeholders
- **Inclusive participation**: Allow for dialogue between participants, some of whom had traditionally been excluded and therefore, open the potential of achieving institutional learning and a range of adaptive potential goals, to implement NBS
- **Achieving governance outcomes**, characterized by the collective vision of society which influences the potential of building participatory spaces to boost action and promote the efficient implementation of NBS strategies

Results (from implementing a co-governance process)

Two key results arose as a result of this project. Firstly, it led to the institutionalisation of co-governance in public-decision making and, secondly, it led to the creation of new networks and participatory spaces, fostering and supporting independent citizens and platforms.

Challenges

Challenges	Solutions to overcome challenges
Inclusive participation	• Invitations via different channels (E-Mail, website, letters, posters) • Ensuring that a representative group of people are taking part in the meetings and the steering group
Acceptance in politics and administration	• Regular information events • Inviting of city council members to meetings • Top-down approach for the initiation of the citizen platforms • Evidence of their work through accountability

Challenges	Solutions to overcome challenges
Finding persons and non-profit organizations who want to run the citizen platform	• After the successful establishment of the first platforms in 2012 (Chemnitz Mitte-West and Chemnitz Süd), the other neighbourhoods followed quickly
No upheaval of already existing structures, no duplicate structures	• Adjustments with all departments in the administration and other already existing neighbourhood supporting structures
Election process	• Different than in the villages council the citizen platforms
Legitimation	• Accountability for their actions and projects in front of the local steering group and the city council • Open citizen forums to inform all interested citizen in the neighbourhood about the actions undertaken • Election process is open for everybody[1], but not as official as it is for the village councils

Lessons learned from implementing a co-governance approach

Several lessons were learnt from implementing a co-governance approach. Firstly, supporting voluntary work through a monetary compensation or a salary afterwards is recommended. Secondly, legitimation and acceptance by both politics and administration is crucial and, it needs to be clear for both sides what are their respective responsibilities and limitations of power/acting are. Additionally, a common understanding of the usefulness of citizen platforms in all levels of the city (political, administrative, civil) needs to be established on all levels from the beginning on. If possible, avoid duplication of structures to minimise complications with other entities and ensure good coverage of the city needs. Citizen participation increased through the establishment of the citizen platforms over the years, but this needs to be practiced from both sides: the municipality and the citizens (so that they understand that they are having a voice in specific processes and the power to change things). Lastly, by adopting a co-governance approach, it improved within each city district, the network between organisations, individuals, and the city.

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Editor(s): Clive Davies and Jonathan Hobbs

[1] Everybody who is eligible to vote gets an invitation to vote- (the election is a direct election), the steering groups of the citizen platforms are also elected in a direct election, but the process is not as official (the election is also open and secret, but the invitation/advertisement for it doesn't meet the requirements of a typical democratic election e.g. not everybody gets an official invitation)

Case study 2: The Collserola Natural Park: A Co-Governance Approach in Planning (PEPNat) in the BARCELONA METROPOLITAN AREA, Spain

Context

The PEPNat is the special plan of protection for the natural environment and landscape of the Natural Park of the Serra de Collserola in the Barcelona metropolitan area. PEPNat sets out a framework for governance and has achieved a very broad consensus. The Plan aims to guarantee the maximum protection and conservation of a natural space which is of great relevance to the region. At its core is an ecological strategy based on the improvement of biodiversity and the promotion of ecosystem services.

Introduction

The Serra de Collserola Natural Park obtained 'Natural Park' status on the 19th October 2010. The PEPNat project process began in 2012 and came into force when it was finally approved by the Catalan Government in April 2021. Collserola is a unique forest area of over 8,000 ha, with significant ecological value, located in the heart of a complex metropolitan area. A consortium where all interested administrations are present, as well as landowners and wider civil society through advisory bodies, manages the Park. For example, there is a specific working group in relation to social use and agroecology. There are two levels of Nature Based Solution (NBS) intervention within the Park. Firstly, the Park and its preservation plan is considered as an NBS in its own right and, secondly specific nature-based solutions related to the management of the park, notably forest and agro-forest mosaic management.

Figure 3. View from Tibidabo (Robert Peña/CPNSC)

Partnership

The PEPNat Plan is a direct consequence of the declaration of the Collserola Range as a Natural Park in 2010. PEPNat is a hybrid plan that combines environmental and urban planning aspects. The main goals are to conserve biodiversity and boost ecosystem services within the framework of dynamic and adaptive management. The Plan is based

on an ecological strategy which provides a cross-cutting axis and backbone to the Natural Park and is structured into six areas. The drafting of the plan has followed a co-governance approach. The architecture of the process included elected representatives and technical commissions. Besides, there was a participatory process, organised in four different phases. This participatory process was much more ambitious that what is required by law.

Governance

Governance structure and characteristics	
Initiated by	Government of Catalonia (Generalitat de Catalunya), Barcelona Provincial Council, Barcelona Metropolitan Area, Town Councils of the Park and the Consortium of the Collserola Range Natural Park
Key stakeholders	*Government:* Government of Catalonia (Generalitat de Catalunya), Barcelona Provincial Council, Barcelona Metropolitan Area, Town Councils of the Park *Management body:* Consortium of the Collserola Range Natural Park
Governance Model	
Type of Governance	Structured horizontal, delegated lead organisation and guided distributed
Characteristics/ Arrangements	The Plan development was chaired by the Director General of Environmental Policies and the Natural Environment of the Generalitat and drafted by the AMB. A broad governance and consensus framework was achieved. A technical commission and an institutional commission formed by the set of administrations involved mentored the process.
Governance enablers	AMB brought together the different administrations present in the territory, as well as the agents and citizens in general, facilitated the participatory process and met the legal requirements to approve the Plan
Participation process	
Governmental bodies	Government of Catalonia (Generalitat de Catalunya), Barcelona Provincial Council, Barcelona Metropolitan Area, Town Councils of the Park, Consortium of the Collserola Range Natural Park
Non-governmental bodies	*Private sector:* • Plenari de la pagesia (farmers) • Collserola Iniciatives (landowners) *Social associations:* • FAVB (neighbours)

	Professional/scientific associations: • Consell Científic and Assessor del Parc Natural (scientific) • SCOT, AAUC, AUS (professional)

Policy context

All existing government policies emanate from AMB's vision for a green metropolis. This vision is implemented through an integral approach that comprises planning, design and management. It seeks to bring together the different administrations present in the territory, as well as the agents and citizens in general. Within this co-governance model there are basically two formulas. One based on specific agreements with one or more of the 36 metropolitan municipalities, and another based on consortiums. In this co-governance formula, all interested administrations are present as well as landowners and the civil society through councils and other advisory bodies. As a metropolitan administration, AMB works in different contexts, taking advantage of the opportunities that might arise, with the same goal.

Governance outcomes (motivation/reason to implement a co-governance approach)

The participatory process had two important periods of citizen and non- governmental participation: one during the spring of 2015 and the other during October and November 2018, in which more than 900 people contributed with more of 2,000 suggestions. This achieved:

- Bridging existing silos by establish cross-sectoral approaches and promote collaboration between decision makers.
- Increased acceptance and ownership of citizens for NBS projects by establishing participatory approaches to design green and blue areas.
- Foster coherent and comprehensive planning that takes into account the many ecosystem services that the Park provides.
- Ensure the approval and correct implementation of the Plan.
- Overcame a complex administrative and planning framework.

Results (from implementing a co-governance process)

The main motivation/reason to implement a co-governance approach have been addressed and achieved. Besides anticipated results there have been other benefits. These positive results are mostly related to the scaling of the proposal at a metropolitan level. One key instrument is the future metropolitan master plan, currently being drafted by AMB.

Challenges

Challenges	Solutions to overcome challenges
Reluctance within the AMB itself. AMB is a public administration, subject to scrutiny and very strict laws. It is not easy to implement new ideas, especially concerning governance.	• Focus on results • Reinforcing cooperation among technical staff within AMB and among other administrations • Define clearly the structure of the agreement and the role of each partner
Uncertainty in relation to the expected results.	• Set indicators and establish the need for a continuous evaluation of results
More time needed to seek consensus. Long process.	• Allow time for discussion, consensus and coordination • Assume delays
Contradictory interests among partners. Lack of a global vision. Put one's own interests first.	• Focus on transparency • Try to avoid individual meetings and prioritize joint meetings

Lessons learned from implementing a co-governance approach

Many benefits arose from the co-governance approach, not least the ability to approve the PEPNat including its integral approach in relation to ecosystem services and biodiversity. The promotion of participatory channels and the balance between elected officials and technicians on decision-making was important. The lessons learnt through the approach are being put into practice in the drafting of the future metropolitan masterplan. One very important point is the governance of the plan which was the most important drafting decision. Even if more time and resources were needed, the adopted approach has proved to be extremely successful. What is more, it is unlikely that the Plan would have been approved without a co-governance approach. Another lesson learned is the need, from an administrative point, to be open and better prepared for this kind of approach and other co-governance models.

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Case study 3: Horizontal Governance in the Maria Aguilar Interurban Biological Corridor (CBIMA), GREATER METROPOLITAN AREA, Costa Rica

Context

The María Aguilar Interurban Biological Corridor (CBIMA) is a participatory conservation strategy established by the National System of Conservation Areas (SINAC) to enhance the quality of life and well-being of the population living in the Great Metropolitan Area of Costa Rica (GAM). This corridor aims to manage and preserve biodiversity and ecosystem services of the María Aguilar River basin through intersectoral and multidisciplinary work between the various public and private stakeholders working in the area (MINAE-GEF-UNDP 2019).

Introduction

This case study started in 1995 and is ongoing. The CBIMA is in the GAM of Costa Rica and partially covers the provinces of Cartago (Local government of La Unión) and San José (Local governments of Curridabat, Montes de Oca, San José and Alajuelita). The María Aguilar River has deteriorated ecosystems that have suffered the impacts of chaotic and spontaneous population growth in recent decades. The various human activities have produced an environmental deterioration that is visualized in the loss of biodiversity, the interruption of ecosystem services, a decline in the quality of river water, the accumulation of solid waste and the loss of vegetation cover on the riverbanks (Municipality of San José, 2009).

Figure 4. Nature Based Solutions (NBS) Intervention: Porous concrete sidewalk, Hatillo, San José, Costa Rica

Partnership

CBIMA is managed in a participatory manner by a local committee. The formal governance structure is in accordance with a diverse range of international agreements that have determined that citizen and stakeholder participation are fundamental for the conservation and improvement of ecosystems (ECLAC, 2020). It is comprised of community organisations of the area, public institutions of both the central and decentralised Government institutions and five local government administrations that cover the CBIMA.

Figure 5. Improvement of the quality of public space, Hatillo, San José

Governance

Governance structure and characteristics	
Initiated by	Local Committee
Key stakeholders	*Government:* Municipalities and central government: Minister of Health and Minister of Public Security *Public Sector Institutions:* Public SecEscuela República de Chile Escuela Jorge DeBravo, Escuela Manuel Belgrano, Escuela Miguel Cervantes (Public schools located in San José) *Private/ Voluntary Sector:* Costa Rican Gerontologic Association (AGECO), Portafolio Inmobiliario and Namaterra Travel *Non-governmental Organisations:*

	Non-government organisation/Civil society (Integral Development Association of Salitrillos, Integral Development Association of de Paso Ancho, Satellite Association of Hatillo, Specific Association for the Improvement of Hatillo 2 *Autonomous Institutions:* Autonomous institutions (National Institute of Housing and Urbanism (INVU), National Institute for Women's Affairs (INAMU), Water and Sewage Institute (AyA), and the National System of Conservation Areas (SINAC)
Governance Model	
Type of Governance	CBIMA has a horizontal governance model with two organised bodies with different responsibilities and different decision-making power.
Characteristics/ Arrangements	The main body of governance of the corridor is the 'Local Committee' which oversees decision making. There is also a Board of Directors who manage the administrative work and make the different project proposals on NBS.
Governance enablers	The environmental deterioration of the territory perceived by the individuals who live in CBIMA made them organise and demand actions from the local government administrations to improve their natural environment. The complexity of this task required the contribution of different public and private actors in a strategic alliance to work on the process of ecological and urban restoration. The mentioned process is an ongoing one and has required training of the various sectors to understand the political environment of the local governments, the social reality of the country and how these factors affect the possible execution, management, and project consolidation.
Participation process	
Governmental bodies	Institutional stakeholders that are part of the 'Local Committee' allocate a budget to develop NBS actions according to their competencies (for example, the parks department of a municipality allocates a budget for Nature-Based Solutions [NBS] interventions in parks). These actions have a positive impact on the CBIMA territory because they are improving the overall environmental condition. The horizontal relationships between the members of the local committee are essential for the implementation of NBS in the CBIMA as they facilitate the collective benefits and the impact on the corridor. It is understood that the sum of individual efforts results in a greater impact on the territory.
Non-governmental bodies	All members have one vote when it comes to making decisions. However, in CBIMA, the community's representatives are the ones who have the greatest decision-making power in the corridor as they are the ones who are affected first-hand by the environmental conditions. Community representatives are also the ones who best know the territory and they are also the ones who monitor and ensure that the projects respond to community

	needs. Additionally, these stakeholders have a fundamental role in the care and maintenance of several NBS. The participation process of the various members of the CBIMA's local committee is based on respect, cooperation, and solidarity to achieve common goals.

Policy context

The Costa Rican environmental regulatory framework embeds the right of people to enjoy a healthy environment, as well as their duty to take care of these spaces and ensure their proper use.

Governance outcomes (motivation/reason to implement a co-governance approach)

The complex environmental situation of the territory was the motivation to implement a co-governance approach. The involvement of the various stakeholders of the corridor was the strategy to accomplish changes in the living conditions and improve the quality of life of the population. The most significant governance outcomes are:

- The achievement of common and individual objectives (social and environmental)
- An opportunity to target plans more effectively, adding forces and different players together within a territory will let them see results earlier
- The establishment of partnerships at different levels influences local dynamics
- The mobilisation of communities, and organised groups towards improving their surroundings
- The improvement of communication among stakeholders
- Tackling social inequality and injustice through inclusive participation in local communities
- Promotion of an inclusive environment open for different social groups
- Partnerships between different local government organisations with other institutions
- CBIMA as an enabler to the wellbeing of its inhabitants (CBIMA) as a territory that aspires, for example, to be free of street sexual harassment.

Results (from implementing a co-governance process)

The initiation of new policy processes focusing largely on reforestation (urban and peri-urban forestry), the creation of networks and new participation spaces and the involvement of both CBIMA and Civil society.

Challenges

Challenges	Solutions to overcome challenges
To promote the involvement of social base organizations	Developing community involvement activities based on their needs using a bottom-up approach
To keep people and their well-being as the focus of CBIMAs activities	Visualising people as 'transformation enablers' in the Biological Corridor
To create a vision of CBIMA as a city, as a territorial unit	Training on various topics to create and spread collective awareness and territory appropriation
Green Justice	Accessibility of green spaces and social Integration activities

Lessons learned from implementing a co-governance approach

The CBIMA project is an example of the integration of multiple stakeholders including local authorities, public and non-public bodies as well as top-down strategic priorities. The approach taken has created new networks and participation spaces, and exchanges with other biological corridors and cooperation with other cities. Additionally, it has provided the opportunity to create new policy processes with a key emphasis placed on reforestation whilst providing a means to develop urban regulator plans taking into consideration environmental variables.

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Case study 4: Co-build: movable multifunctional Nature-based Solutions (NBS) for educational purposes in the schoolyard in HAMBURG, Germany

Context

This NBS project located in Hamburg is one of the interventions supported and realized within the framework of the Horizon 2020 funded European Project CLEVER Cities. The final NBS product consists of a series of mobile raised planter modules that can be combined in different ways. This caters to different contextual and pedagogical needs, e.g., outdoor classrooms on nature life cycle or hands-on activities with plants, involving a wide range of age groups.

Figure 6. Group photo of the co-developed solution with pupils, parents and teachers (steg mbH 2022).

Introduction

A co-build construction guide was developed to enable the assembling of single planter modules. The construction was deliberately easy and safe and allows pupils (under the supervision of teachers and parents) to co-build the modules directly. The co-building activity of the NBS is intended to help with kickstarting a co-governance process where the pupils feel a sense of ownership of what they built and thus take care of it themselves. The school was responsible for providing the space, tools, and plants and it was a key player to bridge between the project partners and the pupils and parents. The construction guide also ensures that the project can be easily replicated in other schools, paving the way for making this a widely accepted co-governance model. Two objectives were defined for this NBS. Firstly, to use nature for educational purposes in schools through the direct experience with natural elements. Secondly, the NBS is linked to teaching healthy nutrition by showing the importance of vegetables and fruits and thereby fostering physical activity. Some limitations were imposed by the context as well. The school is going to be renovated, in this sense to foresee a permanent installation was impossible. Additionally, activities related to this NBS are very much linked with high fluctuation of pupils, changing every year.

Partnership

This project has seen the collaboration between different actors from public, private, and research sectors. These actors all together organised the framework for the co-creation process, in which teachers, pupils, and their parents were engaged in a series of workshops for defining the characteristics of the final NBS product. The process was mainly initiated by the research actor with the support of a local urban development agency. The public authority set the framework conditions, leaving relative freedom to the local partners and the engaged laypersons in the development of the NBS. Nature-related activities are to be inserted in the school curricula for pupils to favour their approach to nature in general. A further expected impact is that this project will inspire other schools implementing similar solutions, with a possible transfer of this model to other education institutions in the Hamburg Federal State.

Governance

Governance structure and characteristics	
Initiated by	HafenCity University, District Office of Harburg-Hamburg, & steg
Key stakeholders	*Government:* District Office of Harburg-Hamburg *Research institutions:* HafenCity University Hamburg (HCU) *Private/ Voluntary Sector:* • steg, local urban development agency • School administration (dean, teachers) • Pupils and Pupil's parents in the form of Parents' Council • Local Foundation that co-financed the project • Private carpenter *EU:* CLEVER Cities Horizon 2020 Project funds
Governance Model	
Type of Governance	Lead partnership and network through a delegated & recognised and appointed partnership involving partially distributed and guided network management. Decision making is shared, weighted, validated, and filtered. The delegated core-network: is HafenCity Universität (HCU) & steg; the District Office of Harburg-Hamburg and network enablers include teachers, pupils/ rotating classes and Parents' Council.
Characteristics/ Arrangements	The first stage of the project saw the cooperation of the actors described above in setting up the first go-governance arrangement. At this stage, the power still lays at a high level, referring to a more top-down approach. As the process develops further, the initiation of such network allowed to build a co-governance arrangement at local level, where pupils, teachers and the Parents' Council are the main actors in play, the others remaining as supporters. Additionally, due to the situation of the school being renovated, the mobile NBS was not subject to

	pressures from overarching stakeholders in the school administration, leaving a certain degree of freedom to the local stakeholders.
Governance enablers	The focus is on voluntary groups linked to the school (e.g. Parents' Council) to enable a people-oriented approach. Pupils' needs were positioned at the centre, mediated by the Parents' Council and the teachers.
Participation process	
Governmental bodies	The District Office of Harburg-Hamburg posed the conditions for conducting the co-creation process within the CLEVER Cities framework.
Non-governmental bodies	The elementary school of Neugraben was initially not part of the CLEVER Cities Hamburg intervention area. However, HCU and steg started a dialogue with the school Neugraben and based on their interest the co-creation process was initiated. The transparency of the process was supported by the engagement and communication with the Parents' Council, along with a high commitment of teachers and the dean of the school. HCU steered the process of NBS co-creation, while steg facilitated the constant dialogue between all parties. Together with the teachers and a designated group of parents the co-building activity was conducted in May 2022.
Policy context	
This NBS project is part of the overall CLEVER Cities Hamburg intervention framework, linked with all other interventions by a physical green corridor and part of the CLEVER Action Lab 3 'NBS in schoolyards'. Outside the project framework, further concepts and projects are present at national and regional level that serve as a support for this solution: GemüseAckerdemie, Natürlich Hamburg, Umweltschule, and Klimaschule.	
Governance outcomes (motivation/reason to implement a co-governance approach)	
Alternative participatory channels involving community, institutional, and political leaders contributed to build trust and to implement NBS strategies. The inclusive participation model allowed dialogue between traditionally excluded participants and favoured the re-engagement of the local population in the care and management of natural elements. Additionally, volunteering within the community was promoted.	
Results (from implementing a co-governance process)	
The entire process resulted in creating networks and new participation spaces fostering innovative mechanisms to support volunteering mechanisms and include the population in the care and management of the movable elements. I also contributed to initiating new policy processes and replicating co-governance approaches.	

Challenges

Challenges	Solutions to overcome challenges
Flexibility of the uses of the schoolyard could be improved.	Engagement of different stakeholders to contribute to the achievement of the objectives of all
Extensive and prolonged construction work and remodeling of schoolyard expected to take place over the next 5 years. Installation of permanent large scale NBS not possible.	Movable and re-arrangeable elements for various purposes
Introduce hands-on and practical nature-related topics to the learning process (learning by doing).	Educational aspects of NBS and engagement of all stakeholders in all phases of the co-creation process
Rotation of the classes. Ownership is difficult if the activities are bound to certain lessons that occur within a particular year. Necessity of motivating always new classes.	The inclusion of such activities in the school curricular to make it more formalised could solve the problem, but for the moment not foreseen

Lessons learned from implementing a co-governance approach

The NBS intervention in the schoolyard of the Elementary School Neugraben, although small in scale, showed the huge potential for the introduction of nature-related activities at elementary school level. Despite the complicatedness of the topic, all local stakeholders committed themselves constantly and with interest in the process. In this sense, the process was able to produce an empowerment of the stakeholders engaged, as they had the opportunity and the capacity to shape the future design of the NBS and to build it directly. Expected impacts are related to a higher sense of pride towards the NBS object and the school. However, it is not possible to properly talk about ownership, as the pupils and the parents that participated in the co-creation process won't be the same in the next years. However, it is expected that the reputation of the school will increase. The flexibility by which the NBS was co-designed is expected to allow different uses and therefore suitable for a bigger spectrum of needs and stakeholders' groups. It should be noted that the process of co-creation was long and resource-consuming. However, there is high expectation that engaging local stakeholders in such a co-governance scheme, can bring higher impacts at the local level; thereby promoting the image of the school within the neighbourhood. Additionally, this example shows the advantages of adopting co-governance schemes connected with NBS for urban regeneration projects. The possibility that this experience resonates at higher levels and its potential transfer to other schools exists too and is already occurring in another elementary school in the Neugraben neighbourhood.

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Editor: Clive Davies

Case study 5: Integrated and Multiscale Nature-Based Solutions to Tackle Social and Environmental Challenges in LIMA, Peru

Context

The city of Lima, Peru aims to strengthen climate adaptation policies by creating and enhancing synergies between stakeholders ranging from academia, local governments, private businesses and Non-Governmental Organisations (NGOs). These actors are involved in Nature Based Solutions (NBS) discussions, design and strategy-building, as well as evidence-production and political influence.

Introduction

In order to tackle societal and environmental challenges in Lima, strategies and policies were designed in an integrated manner (i.e., green infrastructure and ecosystem-focused approach) that led to three initiatives: the Water Security Actions water catchment projects based on private investment, the Lomas programme and the Green Belt Independencia. The Lomas Programme created the Lomas Network to protect its ecosystem as a result of initiatives from the city government and citizen organisations. This network was designated as a Regional Conservation Area and was commissioned to draft the Ecosystem-based adaptation (EbA) Master Plan with community participation to ensure ecosystem conservation and land use/ occupation control. The latter - The Green Belt Independencia initiative - is a pilot intervention that planted an urban forest in the middle low-class district of Independencia. This project which began in 2019 is currently ongoing.

Figure 7. NBS Co-Creation process for the Green Belt Independencia (left), first stage forestation (right)

Partnership

The most recent plantation was launched incorporating Nature-based thinking and was based on a co-creating strategy established on a transdisciplinary approach comprised of actors from the local community, municipality, university, NGOs and the private sector. Co-creation seems to have continually stimulated public participation and the empowerment of the local population, thus exemplifying how co-governance can be instrumental in tackling societal and environmental issues in the context of NBS.

Governance

Governance structure and characteristics	
Initiated by	Government: The Peruvian Ministry of Environment (MIMAN)
Key stakeholders	*Government:* The Peruvian Ministry of Environment (MIMAN) *Non-government organisations:* • Aquafondo: The Water Fund for Lima (innovative financial mechanisms harnessing private and public investments for NBS) • Lomas Programme • Green Belt of Independencia *State-owned company:* SEDAPAL (Sembramos Agua Programme)
Governance Model	
Type of Governance	Participatory governance (private funding and non-profit organisations)
Characteristics/ Arrangements	Lomas Programme involves initiatives bringing the city government and local citizen organizations together. The project includes different stakeholders from academia, local and national governments, private actors and NGOs who actively participate in the NBS discussions, design, and strategy-building. The Green Belt Independencia initiative is a pilot project whose goal is to implement a green belt and greenery in the middle lower-class district of Independencia that is particularly at risk of landslide hazards. This pilot initiative is founded on a consortium formed of private, public, national, and international actors with the support of the community.
Governance enablers	The most recent plantation of native trees is in line with a NBS co-creating strategy based on a transdisciplinary approach and involving an array of stakeholders.

Participation process	
Governmental bodies	The following were involved; The Peruvian Ministry of Environment (MIMAN), Aquafondo, MERESE (Payment for ecosystem services law) and SEDAPAL (Sembramos Agua Programme)
Non-governmental bodies	Lomas Network – Regional Conversation Area and the Green Belt of Independencia pilot initiative

Policy context

Lima's NBS interventions build on a different array of strategies and policies that have been designed to face Lima's societal challenges in an integrated way, including the Water Fund initiative, the Lima Ecological Infrastructure Plan, and the payment for ecosystem services law (MERESE) that supports the Seeding Water Programme. Most of these initiatives come under the umbrella of the Lima Ecological Infrastructure Plan (PEAIE) proposed in 2014; though not yet approved. Its approach is currently being integrated into the new Metropolitan Urban Development Plan (Plan 2040) and the Lima Climate Change Plan, focused on implementing the goals defined in the Paris Agreement. The Plan is supported by an "Ecosystem" strategy which integrates NBS to conserve the largest natural areas in metropolitan Lima and improve its resilience in the face of increasing temperatures, heat waves and water scarcity.

Governance outcomes (motivation/reason to implement a co-governance approach)

- Achieving governance outcomes, characterized by the collective vision of society which influences the potential of building participatory spaces to boost action and promote the efficient implementation of NBS strategies.
- Tackling social inequality and injustice (such as water access and availability) which are usually treated separately from environmental issues.
- Create synergies between different initiatives to manage the city's water security and climate change challenges.

Results (from implementing a co-governance process)

This has enabled policy integration notably integration of NBS into sectoral policy plans, helped in the initiation of new policy processes and created networks and new participation spaces.

Challenges

Challenges	Solutions to overcome challenges
The conceptual, strategic, and operational integratrion of different levels of government and stakeholder. As a local example, Lima's jurisdictional fragmentation was a major barrier.	Having a common goal agreed upon by stakeholders To overcome the conceptual strategic and operational challenges.

Lessons learned from implementing a co-governance approach

The co-governance approach led to the creation of jobs related to sustainable production of water by empowering the local community and exchanging knowledge about NBS. This could also be inserted in the general framework of post COVID-19 economic recovery. In 2019, the EbA Master Plan was developed with intense community participation dealing with ecosystem conservation, land use and occupation control, the development of ecotourism routes and the empowerment of urban communities.

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Case study 6: Collaborative and partnership oriented NBS for the regeneration of waterways in SHEFFIELD, England

Context

Sheffield is a city in northern England with a strong industrial heritage based on steel making, manufacturing, and coal mining. Following a decline in industry in the 1980's the city has diversified, and services now feature strongly in the local economy. Sheffield is at the confluence of many water courses which originate in the nearby Peak District.

Introduction

This case study started in 2003 and is ongoing. This initiative showcases how innovative partnerships between statutory public organisations and voluntary sector groups can deliver co-created NBS projects, in promoting care and regeneration of Sheffield's waterways. Sheffield adopted a collaborative planning and partnership approach, prioritising strategies at the city-regional level while allowing for bottom-up local participation and citizen-led actions.

Figure 8. View of the City of Sheffield which lies at the confluence of many watercourses. Water management is a key environmental theme in the city.

The municipality created the Waterways Strategy Group in 2003 bringing together the City Council and local environmental and amenity groups that generated the Sheffield Waterways Strategy and a five-year Action plan composed of joined-up measures to coordinate capacity-building with communities. This was also intended to re-engage the local population and inspire residents to get involved in taking care of waterways. The Strategy's goal is twofold:

- bringing together stakeholders on the issue of waterways planning and management and,
- developing a transferable model for collaboration.

Based on a place-keeping approach, the initiative provided a new structure for volunteering and citizen-led action by involving a wide range of stakeholders, for the enhancement and maintenance of natural habitat.

Partnership

Long-standing collaboration in the city seeks to improve the quality of life of the residents of Sheffield and provide a mechanism for volunteering groups to support local projects via governance processes. To sustain the Sheffield Waterways Strategy, a series of actions are featured:

- Adopt a structured approach: explore, recast, review
- Avoid professional presumption or expert/deficit models
- Take the time to find out what the parties really want
- Expect some confusion arising from different backgrounds (internal and external conflicts)
- Provide time to think to avoid rushing to decisions
- Build confidence through formalised decision-making using evaluation criteria and tools
- Be careful to give people credit for their input

These actions are addressed with a sustainable and integrated approach that is articulated around eight goals:

- Place people at the heart of the waterway regeneration
- Help Sheffield rediscover its wealth of waterways as an economic opportunity
- Adapt to climate change and manage flood risks more sustainably
- Promote Sheffield and its waterways
- Use rivers to help celebrate the heritage, culture, and rich history
- Secure access to a city-wide network of riverside parkways
- Ensure effective stewardship and encourage everyone to care for our rivers
- high priority to protecting wildlife and enhancing habitats

In practical terms, the Sheffield Waterways Strategy has played a significant role in the regeneration of the 242Km of waterways and helped to establish a Business Improvement District to secure investment. This has resulted in the construction of fish passes allowing for the return of salmon.

Governance

Governance structure and characteristics	
Initiated by	City of Sheffield & Sheffield City Region
Key stakeholders	*Government:* • Sheffield City Council and City Region • Yorkshire Forward (former) • Transform South Yorkshire • Natural England • Environment Agency *Private/ Voluntary Sector:* • River Stewardship Company • Sheffield Waterways Strategy Group • other local environmental and amenity groups *EU:* • Interreg MARE project • Interreg VALUE project • ERDF (European Regional Development Fund) • EU SEEDS project
Governance Model	
Type of Governance	Top down and structured horizontal governance. The lead organisation is the City of Sheffield with City Region network and River Stewardship Company. It exhibits mosaic governance characteristics which mobilise community engagement thanks to a given strategic approach tailored to the local context. Governance approach also aims at scaling-out (facilitating and stimulating, place-keeping) and scaling-up (citizen-led actions).
Characteristics/ Arrangements	Sheffield Waterways Strategy and the River Stewardship Company oversee co-governance with public involvement through volunteering groups and workshops. A cross-sector partnership was chosen to enable the strengthening of social networks through public workshops and meetings such as the *'One Big River Week'* that was held in 2014 to celebrate waterways and promote more sustainable water use. A key element of the Strategy is to understand one another's views while interactively agreeing to outcomes. A process of facilitation was chosen rather than direction.
Governance enablers	The creation of River Stewardship Company has (i) enabled horizontal collaborations (ii) a focus on voluntary groups and citizen-led actions and (iii) people-oriented approach i.e. people at the heart of the waterway's regeneration.

Participation process	
Governmental bodies	The City of Sheffield initiated the strategy of collaboration and created partnerships and consortiums to manage and allow for volunteering and citizen-led actions. Hence, the process was developed through a top-down approach where different stakeholders were included by the City in setting the agenda and designing the policies.
Non-governmental bodies	The Waterways Strategy Group, a long-standing partnership between voluntary sector groups and statutory organisations, generated the Sheffield Waterways Strategy and a five-year Action plan composed of joined-up measures to coordinate capacity-building with communities. The Strategy Group played an important role in setting up the River Stewardship Company (RSC) which was instrumental in informing and involving the local population in NBS projects. All these non-governmental actors' strategies relate to the macro-scale vision of the city and wider sub-region to implement green infrastructure strategies.

Policy context

The City's NBS interventions build on several spatial green infrastructure strategies and socio-ecologically informed plans promoting practical restoration measures. The list includes the South Yorkshire Green Infrastructure Strategy, the Breathing Space Strategy, City Centre public realm masterplan, the Sheffield Waterways Strategy, a series of River Don catchment and green corridor plans, and a comprehensive set of biodiversity action plans. Most of these documents or initiatives provide frameworks, incentives and schemes to promote and deliver NBS on the ground.

Governance outcomes (motivation/reason to implement a co-governance approach)

These include (i) bridging silos by cross-sectoral approaches and collaboration between decision-makers, (ii) alternative participatory channels involving community, institutional and political leaders to build trust and to implement NBS strategies, (iii) Inclusive participation: dialogue between traditionally excluded participants and promotion of institutional learning, iv) re-engagement of the local population in the care and management of the waterways of Sheffield and (v) promotion of volunteering within the community.

Results (from implementing a co-governance process)

Creating networks and new participation spaces by creating innovative mechanisms to support volunteering and include the population in the care and management of the waterways.

Challenges

Challenges	Solutions to overcome challenges
Green strategies have not yet achieved their full potential (namely with the vision to create and improve the sub-region's green network)	Boost partnerships across disciplines and geographical administrative boundaries. For example, the South Yorkshire Green Infrastructure Strategy identified individual and connected schemes and provided the framework for partnership support in the neighbouring districts of Barnsley, Rotherham, and Doncaster.
Wider involvement of civil society and empowerment of local groups	Bring together stakeholders on the issue of waterways planning and management, to develop a locally transferable model for collaboration notably through workshops and meetings.

Lessons learned from implementing a co-governance approach

The Sheffield Waterways is an example of the integration of bottom-up local community participation alongside top-down strategic priorities. The approach taken has enabled successful funding bids for climate-proofing, walking and cycling routes, river restoration, and open space investments through the involvement of a range of different partners. By having a people-oriented approach to waterway regeneration, the Strategy is considered good practice as it also considers the value people assign to the waterways, heritage, civic pride, and sense of opportunity. This approach is visible throughout the process as the emphasis is placed on understanding partners' viewpoints and facilitating dialogue. ---

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Case study 7: Collaborative actions for urban sustainability - connecting people with nature-based solutions (NBS) in Valencia, Spain

Context

Located on the east coast of Spain, the City of Valencia includes a good example of collaborative design and implementation of Nature Based Solutions (NBS). Valencia has committed to the implementation of NBS to provide evidence of its benefits for climate and water resilience as well as other urban challenges whilst, simultaneously, developing a strategy to promote NBS.

Introduction

The collaborative actions case study began in 2017 and finished in 2021. It was facilitated by the EC funded GrowGreen project working in the neighbourhood of Benicalap Ciutat Fallera. The project objective was to turn it into a living laboratory (LivingLab) to test innovative solutions for climate change particularly higher temperatures, less rainfall and more extreme weather events. The neighbourhood has high levels of unemployment, an ageing population and deteriorating infrastructure. Several NBS were tested aimed at improving thermal comfort as well as helping rainwater to soak into the soil. These ideas were all designed and implemented collaboratively with neighbourhood residents.

Figure 9. A green-blue corridor to link existing green spaces are under development in Valencia

Partnership

The Benicalap neighbourhood of Valencia required revitalization and improvement. The co-creation and participative design of the actions in the neighbourhood alongside other social actors is crucial as the participation guarantees both the input of local knowledge and

training of citizens into the objectives of the project and community involvement in project development and replication.

Governance

Governance structure and characteristics	
Initiated by	Government City Council
Key stakeholders	The LivingLab in Valencia Benicalap- Ciutat Fallera required the participation and teamwork of a number of actors: public, private, academia, NGOs and the media: • Valencia City Council: Department of green space management, Department of urban planning • University of Valencia Instituto de Ingeniería Energética • Las Naves - Centro de innovación social y urbana de la ciudad de Valencia. • BIPOLAIRE Architects and landscape designers • Paisaje Transversal driving the stakeholder's engagement process • Centro Tecnológico LEITAT technical developers of the Green Wall • CEP Benicalap (Secondary School hosting the Green Wall) • TECNALIA Research & Innovation thermal stress modelling exercises
Governance Model	
Type of Governance	Collaborative design and implementation involving local residents and other stakeholders including the public and academic sectors.
Characteristics/ Arrangements	The framework of a Living laboratory was used to bring local community and stakeholders together and his hands and example of learning by doing offering the possibility of local replication.
Governance enablers	The GrowGreen project played a relevant role in accelerating the process whilst the initiative Més Verd Benicalap acted as an umbrella structure. A stable and committed local monitoring team was set up, which met on a regular basis tasked with defining objectives, co-designing solutions and selecting monitoring indicators. A systematic stakeholders engagement methodology was applied as close as possible to the neighbourhood and then optimised to local realities (i.e., ad hoc groups of children and teenagers, elderly persons, business interests, etc.
Participation process	
Governmental bodies	The different municipal services (mainly green space and parks, urban planning, and public works) have worked hand-in-hand with the other partners responsible for the different actions of the pilot

	to be able to respond with agility to the tight GrowGreen project schedule.
Non-governmental bodies	The participation process was structured around a 'Listening and Transforming' methodology. Several citizen engagement actions took place in public spaces to communicate the intentions of the pilot projects to the local residents in an innovative way. For example, visual messages, and painted floor signs were used in Benicalap's public spaces to explain the location of the projects and the environmental improvements they would create. The signs also acted as a demonstration of how the residents' engagement had been acknowledged and put into action because of their participation in the project. A mobile app was developed to engage local people with their new NBS and to make them aware of local plants and wildlife. The engagement process began at a disadvantage, both the choice of the place of intervention and the planned pilot projects had been designated by the Council beforehand, without a participation process. Therefore, during the development phase, these decisions had to be validated, and a relationship of trust built with the community.

Policy context

The urban agenda of the City of Valencia, aligns with the agendas of the EU, state and regional governments. It also fully responds to criteria of environmental, economic, and social sustainability. In this sense, the demonstration developed in Benicalap within the framework of the GrowGreen project responds practically and concretely to the need to promote the necessary changes in a governance model that allow it to face the current climate emergency. The current municipal urban agenda has adaptation and resilience to the repercussions of the climate emergency as one of its main lines of planning and action.

Governance outcomes (motivation/reason to implement a co-governance approach)

These include (i) increasing acceptance and ownership of citizens for NBS projects by establishing participatory approaches to the design of green and blue areas, (ii) promoting alternative participatory channels, which gather community, institutional and political leaders together to discuss and implement NBS strategies, hence building networks and trust between stakeholders and (iii) inclusive participation which allows for a dialogue between participants, some of whom had historically been excluded and hence opened the potential of achieving institutional learning and a range of adaptive potential goals, to implement NBS.

Results (from implementing a co-governance process)

Creating networks and new participation spaces to foster and support independent citizens' platforms and citizens' budgets. The initiation of new policy processes and the integration of policies focusing on NBS into several policy plans including health, construction and housing.

Challenges

Challenges	Solutions to overcome challenges
Successful integration of practices validated for this process in local public policies	Political will and commitment were crucial.
Local legislation, precautions, and requirements for the adequate execution of public works (i.e cultural heritage protection)	Extra coordination effort among different stakeholders and departments within the City Council as well as adjustment of project schedule and delivery deadlines
Public acceptance	Transparency with the neighbourhood associations allowed openness of opinion and vision throughout the process.
Financing	Focus on the relevant issues in the neighbourhood rather than on the pilot and NBS implementation.
Action	Financial resources from the public sector.

Lessons learned from implementing a co-governance approach

The GrowGreen project raised awareness regarding the importance of action against climate change and in particular, adaptation, not only among the citizens but also in different municipal departments within the City Council. Furthermore, social acceptance and co-responsibility in the implementation of NBS to transform and improve the life of the neighbourhood have (i) provided better knowledge about the causes and effects of climate change, (ii) provided better knowledge about the NBS and their benefits from the social, environmental, and economic viewpoint and (iii) improved co-responsibility in respect to the implementation, use, enjoyment, and maintenance of the interventions. Notwithstanding the above, the knowledge ascertained from this project could influence municipal public policies when it comes to introducing innovations in local government action. Additionally, the promotion of innovation through the implementation of pilot projects are crucial elements when exploring viable solutions to overcome the great challenges that Valencia and its residents face.

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Case study 8: Co-creation and engaging citizens in NBS deployment in WROCLAW, Poland

Context

The aim of the GrowGreen project in Wroclaw is to help the city to adapt to climate change using Nature-based Solutions (NBS). This involved creating a catalogue of demonstration solutions that provide shelter from heat, local temperature reduction, improve air quality and enabling the utilisation of rainwater. These include the incorporation of pocket parks, green walls and green streets into existing urban environments within the city. An extensive stakeholder and citizens engagement programme took place to mobilise the uptake and deployment of NBS.

Introduction

This GrowGreen project began in 2017 and finished in 2021. The project demonstrations in Wroclaw includes Daszyńskiego Street and the surrounding seven areas in the Ołbin estate in Wroclaw (see figure 10 below). A dedicated website was created for the project purpose, allowing effective communication about the project, and enabling education activities with local residents. Each of the seven demonstrators (identified by a green line boundary in the figure below), has its own 'sub-website' enabling citizens to follow the work and progress.

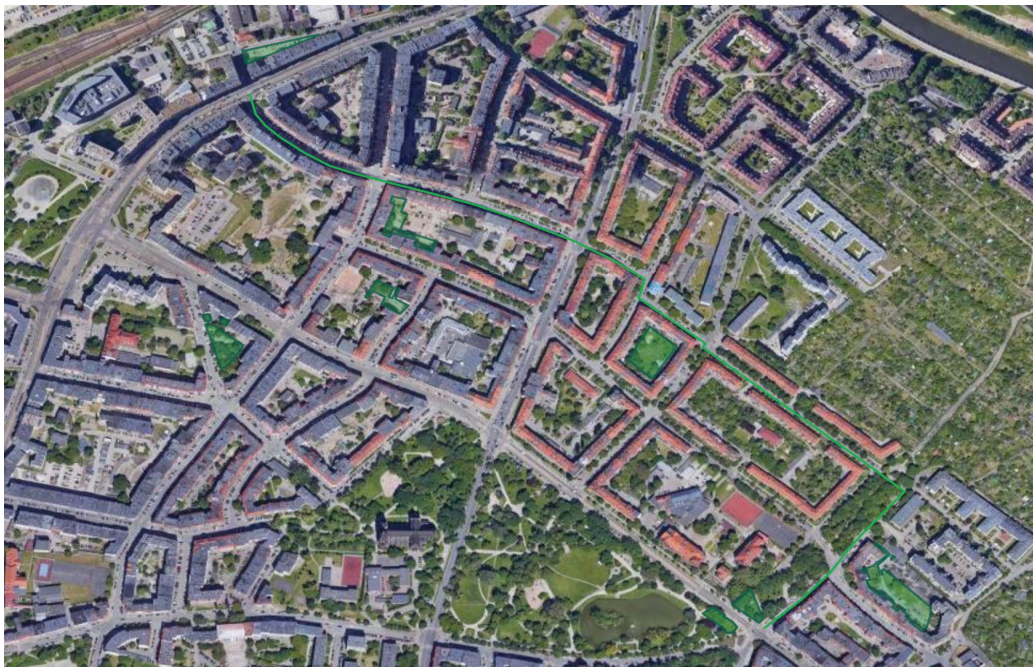

Figure 10. GrowGreen Area Map (outlined by a green line boundary are the seven 'demonstrations')

Partnership

Several co-governance instruments were used to help facilitate this project. Consultation with the local community started from the very early stages of the project. This included an online competition for selecting the preferred demonstration project locations. A co-design team was created involving the local administration and residents' representatives, in cooperation with University of Environmental and Life Sciences (WUELS) and the Wroclaw Agglomeration Development Agency (ARAW).

A series of meetings and workshops to engage with the local community in the district of Ołbin were held on the topic of nature-based solutions and co-design processes. These were run by a local NGO; the Eco-Development Foundation. Active participation of different stakeholders from the demonstration sites was undertaken. Meetings and workshops were attended by representatives of the Wroclaw Municipality, including specialists in the field of urban planning, environmental engineering and landscape architecture, the city gardener and pedestrian officer. There were also representatives of the Wrocław University of Environmental and Life Sciences, the Wroclaw Agglomeration Development Agency and a landscape architect from the Landscape Architect Office PHU Dworniczak. All these activities were supported by an online tool.

Citizens specific actions such as flower and shrubs planting, education programmes and tools such as the 'I like rain' initiative which encouraged children to create raingardens and a manual on rainwater management were undertaken.

Figure 11. Participants during a picnic as part of the GrowGreen project finale - October 2022

Governance

Governance structure and characteristics	
Initiated by	Public sector institution (e.g. school or hospital), non-government organisation/civil society, private sector/corporate/business, researchers, university, citizens and community groups. The coalition of these was initiated by the City Council.
Key stakeholders	*Government:* • Sustainable Development Department of the Municipal Office • Urban planning department, specialists in the field of urban planning, environmental engineering and landscape architecture, and the city gardener and pedestrian officer. *Others:* • University of Environmental and Life Sciences (WUELs) • Wroclaw Agglomeration Development Agency (ARAW) • Landscape designers • NGO Eco-Development Foundation
Governance Model	
Type of Governance	Consortium, civic/municipal leadership, research enablers
Characteristics/ Arrangements	Project based through the GrowGreen consortium, citizen actions, design and workshops
Governance enablers	Sustainable Development Department of Wroclaw municipality
Participation process	
Governmental bodies	The process has been mainly driven by the Sustainable Development Department of the Municipal Office of Wroclaw, together with the spatial and urban planning team and green space management. This was in the context of the Urban Adaptation Plans for climate change, Blue-Green Infrastructure Strategies and the implementation for urban investments which should consider innovative environmental solutions. There was continuous cooperation amongst the stakeholders responsible for delivering the strategies and plans.
Non-governmental bodies	The Wroclaw experience is an example of continuous consultation with local communities and non-governmental bodies. It started during preparing the application for the GrowGreen project, because the residents of Olbin district were asked to identify on 'on-line' maps places where they would like to have green interventions. A municipal co-design team was set up in

	cooperation with ARAW and WUELS. The course of the different interactions and consultations with stakeholders were run by the EcoDevelopment Foundation.

Policy context

The NBS demonstrations are part of the GrowGreen project under the umbrella of a blue and green infrastructure action plan which is connected to the Climate Change Adaptation Plan for Wroclaw. This is linked to a specific adaptation action "Construction and development of blue and green infrastructure with an emphasis on micro-retention". Hence, the blue and green infrastructure action plan complements the Climate Change Adaptation Plan for Wroclaw in terms of implementing NBS, considering the results of the GrowGreen project and the City of Wroclaw masterplan.

Governance outcomes (motivation/reason to implement a co-governance approach)

- Bridging existing silos by establish cross-sectoral approaches and promote collaboration between decision-makers
- Increase acceptance and ownership of citizens for NBS projects by establishing participatory approaches to design green and blue areas.
- Foster coherent planning and policy.
- Tackling social inequality and injustice via inclusive stakeholder engagement through understanding the nature of power relations which result from a specific series of interactions between participants and taking action to revise the underlying structures that foster inequality.

Results (from implementing a co-governance process)

Integration of NBS into sectoral policy plans (e.g. climate change adaptation, health, construction and housing, digitalisation), initiating new policy processes such as setting up blue and green infrastructure interventions and creating networks and new participation spaces (by fostering and supporting citizens platforms and citizen budgets.

Challenges

Challenges	Solutions to overcome challenges
Public procurement	Describing the right conditions and innovation in NBS in public tenders and hiring small local companies which are more open to not typical/unusual innovative solutions. Also "design and build" procurement is the better option.
Conflicts with local residents' requests i.e. parking lots versus NBS for improving water runoff	Providing a good understanding about the goals of the project and keeping local residents informed about them throughout. Cooperation with the District Council which resulted in introduction of a paid parking zone with benefits for residents.

Awareness about the benefits and co-benefits of the NBS. Some designers, engineers and professionals from municipal departments claimed that NBS were not working, were expensive, were not possible and too complicated	Evidence (fact and figures) to support the benefits and co-benefits provided by the NBS interventions.

Lessons learned from implementing a co-governance approach

Education about NBS and their role in climate change adaptation is crucial and this applies not only to citizens but also landscape designers. Fostering local citizens to take co-responsibility in NBS maintenance is valuable. NBS demonstrations allow testing and comparing new solutions that could be adapted and replicated by others, for example greening garbage and bicycle sheds. Demonstrations also influence Blue and Green Infrastructure Strategies and City masterplans and hence provided a means for NBS upscaling.

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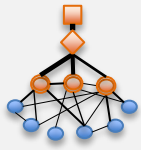
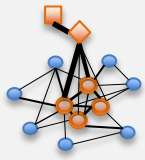
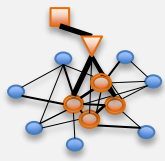
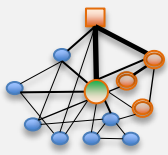
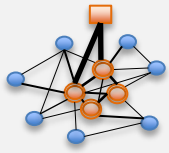
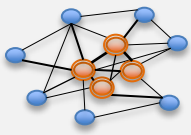
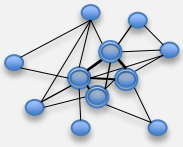
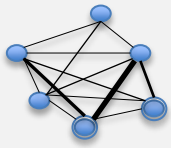
Editor(s): Clive Davies and Jonathan Hobbs

Annex 2: Range of governance models and structures

(Source: Bradly et al. 2022)

Model	Attributes	Narrative
	Top down **Lead + limiting node + appointed nodes + network** Hierarchical Command and control appointed management Decisions pass through limiting nodes Information is controlled, weighted & filtered.	Hierarchical top-down organisations may be needed to make quick decisions in emergency situations. Moves from this towards hybrid network structures is needed for some transformative learning, initial relational thinking and the first steps towards shared governance models.
	Top down + structured horizontal **Lead + limiting node + appointed partnership + network** Hierarchical + structured horizontal (partnership) Appointed network management Decisions pass through limiting nodes Information is shared, weighted & filtered.	Top-down organisations with actors appointed to lead partnerships can provide guidance and structure to decision making processes and provide clear responsibility for management activities. Gatekeepers weigh and filter information involving lead organisations only in key decisions and approvals. Moves to more shared governance involves reducing filtering and approvals.
	Top down + structured horizontal **Lead + enabler + appointed partnership + network** Hierarchical + structured horizontal (partnership) Appointed network management Enabling node facilitate decision making Information is shared, weighted & indicated.	Top-down systems with appointed lead partnerships can provide guidance and structure to decision making and provide clear responsibility for management activities. Enablers help initiate, motivate, and organise collective activities. Decisions are weighed and filtered before lead organisations are involved for approvals. Moves to more shared governance involves reducing filtering and approvals.
	Top down + structured horizontal **Lead + mediator + appointed partnership + networks** Hierarchical + structured horizontal (partnership) Lead + mediator + appointed shared management Mediator facilitates decision process Information is shared, weighted & indicated.	Top-down systems with appointed lead partnerships can provide guidance and structure to decision making and provide clear responsibility for management activities. Mediators help connect and broker relationships between grassroots and appointed nodes. Decisions are weighed and filtered before lead organisations are involved for approvals. Move to more shared governance by creating more balance between all nodes.

	Top down + structured horizontal **Lead + appointed partnership + network** Hierarchical + structured horizontal (partnership) Appointed network management Decisions confirmed by lead Information is shared, weighted, indicated & approved	Top-down systems with appointed lead partnerships can provide guidance and structure to decision making and provide clear responsibility for management activities. Lead organisations can be brought into the network of discussions and increasing collective weighting and decisions. Move to more shared governance by creating more balance between all nodes and eliminating the role of a single lead organisation.
	Top down + structured horizontal Lead + lead node + network Hierarchical + structured horizontal Delegated & recognised or appointed lead management Decisions shared, weighted & confirmed by lead Information is shared, weighted, indicated & approved	Top-down systems with an organisation either delegated by peers and recognised as a lead node or appointed as lead are useful to provide clear responsibility for day-to-day management activities. The lead organisation can be brought into the network of discussions with most weighting and decision making done collectively. Move to more shared governance eliminating the role of a single lead organisation.
	Structured horizontal **Mediated lead partnership + network** Delegated & recognised or appointed partnership Partially distributed + mediated network management Decisions shared, weighted, validated & filtered Information is shared & key weighted collectively	Structured horizontal systems with an organisational partnership either delegated by peers and recognised as leads or appointed as leads are useful to provide some guidance and responsibility for day-to-day management activities. A mediator group helps initiate, motivate and organise collective activities. Most weighting and decision making are done collectively.
	Structured horizontal **Enabled lead partnership + network** Delegated & recognised or appointed partnership Partially distributed + facilitated network management Decisions shared, weighted, validated & filtered Information is shared & key weighted collectively	Structured horizontal systems with an organisational partnership either delegated by peers and recognised as leads or appointed as leads are useful to provide some guidance and responsibility for day-to-day management activities. An enabling organisation ensures that weighting and decision making are done collectively.
	Structured horizontal **Lead partnership + network** Delegated & recognised or appointed partnership Partially distributed + guided network management Decisions shared, weighted, validated & filtered Information is shared & key weighted collectively	Structured horizontal systems with an organisational partnership either delegated by peers and recognised as leads or appointed as leads are useful to provide some guidance and responsibility for day-to-day management activities. Most weighting and decision making are done collectively.

	Structured horizontal **Lead + network** Delegated & recognised or appointed lead Mostly distributed + guided network management Decisions shared, weighted, validated & filtered Information is shared & key weighted collectively	A structured horizontal system with an organisation either delegated by peers and recognised as a lead node or appointed as lead can work to provide some guidance and responsibility for day-to-day management activities. Organisations with more experience can emerge as leads or a professional organisation can be delegated. Weighting and decision making are done collectively.
	Bottom up + delegated horizontal **Enabled network + emergent or delegated core** Self generated + delegated & facilitated horizontal Distributed + facilitate + delegated network management Decisions shared, weighted & validated Information is shared and weighted collectively	An emergent horizontal system can have a network elected or delegated by peers to take a lead role and take more responsibility for day-to-day management activities. Organisations with more experience often emerge as leads. A professional organisation can be brought as an enabler to motivate and organise activities. Weighting and decision making are done collectively.
	Bottom up + delegated horizontal **Network + emergent or delegated core** Self generated + delegated horizontal Distributed + delegated network management Decisions shared, weighted & validated Information is shared and weighted collectively	An emergent horizontal system with all groups contributing significantly. A network, elected or delegated by peers, may take a lead role and take more responsibility for day-to-day management activities. Organisations with more experience often emerge as leads. Weighting and decision making are done collectively.
	Bottom up **Network** Self generated horizontal + emergent leads Distributed network management Decisions taken and validated by network Information is shared and weighted collectively	An emergent network of groups comes together, and all are expected to produce significantly. Some groups may naturally assume a slightly more active lead role than others especially with respect to day-to-day management activities. Weighting and decision making are done collectively.

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Local decision-makers are tasked with shaping the future of their cities to foster human well-being and boost resilience and local economies. Yet they also face several critical social and environmental challenges, such as climate change, biodiversity loss, or environmental justice. Nature-based solutions are one important tool available to help shape urban futures and tackle these and other challenges. This briefing paper presents practical examples and inspiration for local decision-makers on utilizing co-governance approaches to promote participatory processes and collaborative creation of nature-based solutions. It explores how to fully harness the potential of these solutions in their design, implementation, and maintenance. Options for overcoming institutional challenges in decision-making around nature-based solutions are presented, and the value of co-governance is demonstrated on the basis of city experiences, aiming to inspire other cities to try more inclusive governance approaches.

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