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Governance analysis for planning and implementation of urban NBS

Governance practices, challenges and needs of INTERLACE Cities

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Executive Summary

In this report, we summarise the outcomes of a governance analysis conducted for the INTERLACE cities: CBIMA (Costa Rica), Chemnitz (Germany), Envigado (Colombia), Granollers (Spain), Metropolia Krakowska (Poland) and Portoviejo (Ecuador). The aim of the governance analysis is to gain insights in each city's current governance practices for policymaking and policy implementation of Nature-based Solutions (NBS), encountered challenges, factors supporting governance and needs for tools and knowledge to improve NBS-governance. The outcomes inform the baseline for INTERLACE's objective to increase the capacity of local governments to implement integrated and ecologically coherent urban planning and governance approaches for NBS.

Governance is the means to an end. Locally adapted NBS - which aim to tackle the recovery of degraded, damaged, or destroyed ecosystems, utilise nature to address societal challenges, build resilience and provide environmental, social and economic benefits - can be considered the objective. A (governance) process should be established which reflects these ambitions. Various types of viewpoints, knowledge and expertise are needed in such a process. In other words, multi-sector, multi-stakeholder and multi-scale processes are key to meet its end. This consideration underlies the governance analysis.

Interviews and focus groups were conducted within each INTERLACE city. We found that each city engages itself in various forms of engagement with academic, civil and/or business stakeholders for NBS policymaking and policy implementation. Nevertheless, all INTERLACE cities experienced challenges regarding collaborating with stakeholders, both internally within city departments as well as with external stakeholders. Either it was difficult to engage a diverse group of stakeholders, or to develop a shared vision or effective collaboration within the process. In addition, many cities find it challenging to develop, plan, design or adopt strategies for multifunctional green spaces because they lack appropriate scientific and technical knowledge. Tools that provide evidence of multiple benefits can support cities in making scientific arguments in favour of NBS. Moreover, funding hampers the planning and implementation of NBS in all INTERLACE cities. In search for alternative pathways to achieve and maintain NBS, different forms of governance with multi-actor and multi-sector constellations can be a driving force to find agreements on design, benefits, costs, funding, responsibilities, etc.

The findings of this report is meant to inform multiple INTERLACE products to increase their relevance and applicability for the INTERLACE cities. The overarching themes of challenges, the factors that support the NBS governance and the specific city needs can act as a starting point for other INTERLACE tasks. More specifically, results will inform the identification and co-production of local governance solutions in each INTERLACE city (task 2.3), the development of city impulse papers (task 2.4), and the definition of relevant standards and tools (WP3). Furthermore, Annex B with the city results can be consulted to gain a more detailed understanding of the cities' context, practices, challenges and needs.

1. Introduction

Urbanization processes provide housing, jobs and business opportunities and are one of the main causes and indicators of economic growth. At the same time urbanization degrades and destroys natural habitats, fragment ecosystems, and jeopardize ecosystem service (ES) provisioning as well as have consequences for human health and well-being, biodiversity, social cohesion and equity, and city resilience.

Processes of ecological restoration and rehabilitation are well suited to address these complex challenges given their aim to recover ecosystem conditions to a stage reflecting their inherent values before disturbance, and to provide goods and services that people value (Martin, 2017). **Nature-based solutions (NBS)** are particularly suitable for tackling the recovery of degraded, damaged, or destroyed ecosystems, utilising nature to address societal challenges, build resilience and provide environmental, social and economic benefits. Moreover, they can be more efficient and cost-effective compared to traditional solutions (European Commission, 2015). However, it should be noted that in urban areas NBS may not be the most cost-effective way of delivering ES when space is highly constrained (Gomez-Baggethun and Barton, 2013) and that it is hardly possible to fully recover ecosystem conditions (compared to before disturbance) without having a disproportionately loss of economic benefits.

Multifunctionality, **equity** (or environmental justice), **efficiency** and **sustainability** are considered important principles that should guide the development of NBS as well as the protection and improvement of existing urban green spaces (Langemeyer and Connolly, 2020; Langemeyer et al., 2020; Venter et al., 2020). The idea of multifunctionality is that one NBS intervention can provide several ES and other values (such as enhancing biodiversity, reducing heat island effects, improving physical and mental health, creating job opportunities). Which benefits NBS will generate is largely determined by its design. Basically, designing NBS is doing ethics, as design largely determines which groups receive what benefits through availability, accessibility, and functionality. To ensure an understanding of plural values, fair decision-making and equal and fair distributions of benefits among the local population, environmental justice considerations should be combined with designing (multifunctional) NBS (e.g., justice in ES planning: Langemeyer and Connolly, 2020).

These principles should be reflected in policies - and therefore also during policymaking -, planning and implementation of NBS to operationalize them and to support the realization of locally appropriate solutions. Considering these principles for NBS-planning, multi-sector, multi-stakeholder and multi-scale governance processes are needed to gain valuable expertise and knowledge on all locally relevant challenges (environmental, social and/or economic) and societal demands. Specifically, the involvement of local citizens, including underrepresented groups, is important to incorporate local knowledge on various viewpoints, needs and demands, to respond to environmental justice issues, and to generate public support.

INTERLACE aims to increase the capacity of local governments to implement integrated and ecologically coherent urban planning and governance approaches that respond to the local needs and challenges. With that in mind, WP2 will produce a NBS governance atlas (D2.3: an interactive online database with good practice examples of policy and governance instruments for restorative urban NBS)

and co-develop governance instruments together with the INTERLACE partner cities (D2.4). To increase the relevance of WP2 deliverables by fitting the cities' challenges and needs, task 2.1 aims to assess how restorative NBS and related green space interventions are planned, implemented and embedded in the cities' urban policy (D2.1) and governance contexts (D2.2).

This deliverable (D2.2) thus focuses on the governance practices applied by the INTERLACE cities for the development of NBS policies, initiatives and projects (legislative and regulatory processes) to identify the cities' governance challenges, good practices and needs.

1.1 About governance

When public agencies develop new land-use policies, initiatives or projects, the planning ideally follows the phases of a planning cycle (figure 1). A similar planning cycle can be applied for policymaking and policy implementation (i.e. planning and realizing a NBS project), however, the scale and scope of the process differ. Policymaking and adoption are typically focused on a specific scale (from (inter)national to neighbourhood), while policy implementation is more targeted to a specific site. Therefore, each process ideally goes through their own planning cycle to match the right context. For example, an urban NBS policy of a municipality is focused on the whole city while one of the policy implementation actions focuses on one specific park. Governance is placed in the middle of the planning cycle as it consists of the rules, mechanisms and processes (Ostrom, 2005) through which the planning and decision-making is organized and conducted. In relation to the planning cycle, this raises the following questions about governance:

- How is the understanding made of which issues, threats and opportunities the policy or project should address?
- How is the vision built?
- How are decisions made about the content of a policy, the design of a NBS or which actions are carried out?
- How is the policy adaption or project implementation organized?
- How is the policy or project monitored and evaluated?

Strongly linked to the question of 'how?', is the question of 'who?'. The question of 'who?' is related to power distribution and rights within the governance process and the legitimacy of the process: who is involved to provide input? And who has the power to make decisions? For example, the involved stakeholders influence which issues, threats and opportunities are identified. If a climate expert is included, issues, threats and opportunities related to climate are better identified and included in the scope of the planning process.

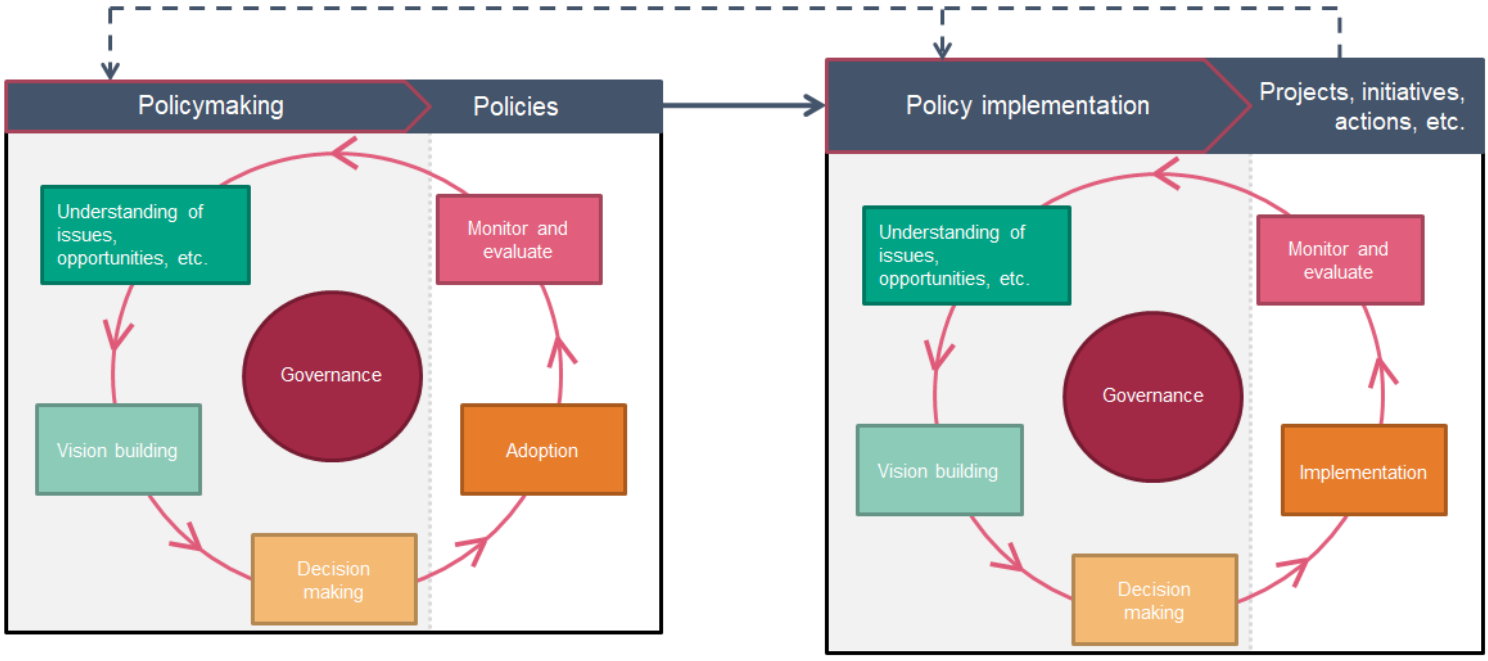

Figure 1. Planning processes in relation to policymaking and policy implementation

Different forms of governance exist (see figure 2). At one side of the spectrum the government itself determines the issues, the solutions and which instruments are needed (figure 2; Traditional Public Administration). At the other side of the spectrum initiatives are planned by civil society or the market with little to no involvement of the government (figure 2; Grassroots Initiatives and Market Governance) (Ambrose-Oji et al. 2017). Between those ends, there are various forms through which governments, civil society and/or the market sector collaborate in different constellations and power relations for land-use planning and decision-making.

With collaboration through one of the governance forms, we mean that stakeholders are involved in one or more of the phases of the planning cycle during policymaking and/or policy implementation (figure 1). A trend seen over the last decades in land-use planning is that governance shifted from 'traditional public administration' to other forms of governance (see figure 2) as the government was not always able to properly respond to certain issues. The complexity of issues increased and the government became more dependable on other stakeholders (for knowledge, expertise and/or resources), while there is also an increasing demand for more participation and democratisation in decision-making. Nowadays, it is more often expected that a variety of stakeholders are involved in land-use planning (Cowell and Murdoch, 1999).

When the aim is to realize NBS with multiple benefits and to be equitable, it is especially important to have all relevant voices included in its policymaking and planning processes. Leaving out voices risks leaving out their needs and values, and risks overlooking the wellbeing of those who embrace these values (Jax et al. 2013). Governance forms that allow or encourage collaboration between an inclusive range of relevant stakeholders are therefore considered to be more appropriate for the creation of NBS policies or projects.

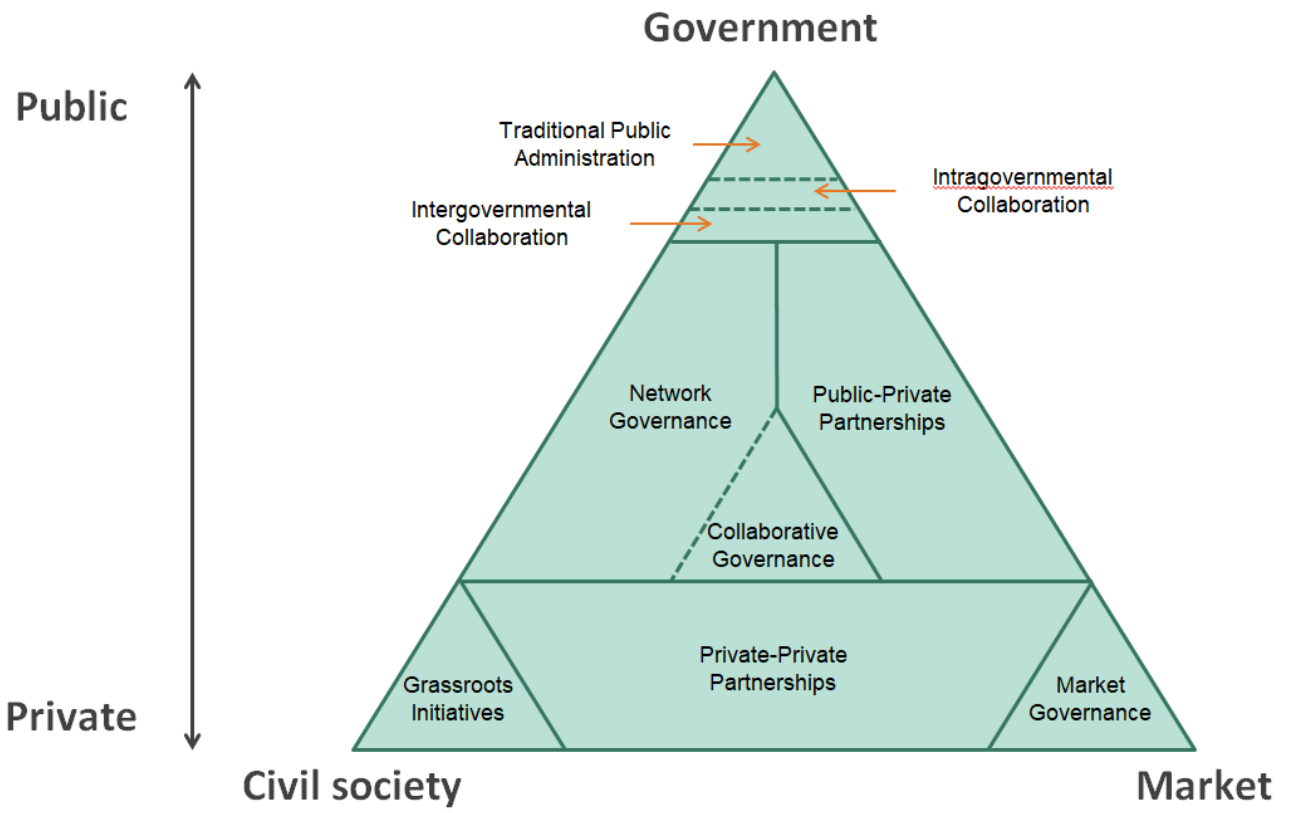

Figure 2. Governance triangle depicting governance forms in which public and private stakeholders collaborate different constellations. Adapted from Nature 4 Cities (2019)

To support the NBS governance of the INTERLACE cities, this study focuses on governance forms in which the government (municipalities) is involved (figure 2). Municipalities can lead or facilitate different governance forms depending on the scope and ambition:

- **Intragovernmental Collaboration:** a form of traditional public administration in which multiple departments from one municipality collaborate on cross-cutting themes. For example, local collaboration between a green department, social department, mobility department and economy department on sustainability issues.
- **Intergovernmental Collaboration:** a form of traditional public administration in which multiple governmental agencies, possibly from multiple scales, collaborate on cross-cutting themes. For example, multiple municipal and regional administrations collaborating on green infrastructure.
- **Network Governance:** collaboration between stakeholders from the government, civil society and/or academia. Governmental roles can vary from leading to being a partner to facilitating.
- **Collaborative Governance:** a form of network governance in which market actors are involved besides stakeholders from the government and civil society. For example, upgrading a park with multiple uses in a city centre, collaborative governance might be the most relevant form through which the municipality, local inhabitants, civil organisations and local commercial parties (e.g., local producers, local cafés) collaborate on the planning and implementation.

- **Public-Private Partnerships:** collaboration between government and market actors. Usually, the government takes the role of partner. An example of when this governance form might be relevant is when the ambition is to increase NBS on industrial sites.

1.2 Objective

This report aims to get a better understanding of the current governance practices of the INTERLACE cities in terms of the various governance forms a city can be engaged in for NBS policymaking and policy implementation. For each INTERLACE city, the report identifies challenges regarding NBS governance, factors that supported NBS governance, and needs for tools and knowledge that can support local NBS governance. Finally, an outlook is made on how the findings can be used within INTERLACE such as increasing relevance and applicability of INTERLACE products to tailor them to the local (governance) context.

2. Methodology

Interviews and focus groups were conducted to collect data on each INTERLACE city's governance practices, challenges and needs. The data collection was conducted by the respective knowledge brokers[1]. An interview guideline was developed by EV-INBO to guide the knowledge brokers with the data collection (see annex A). In short, the interviews focused on the following governance aspects:

- The governance process of NBS **policymaking:** Policies are important as they provide a (political) mandate to do something a certain way and may also provide instruments (e.g., resources, rules/laws, incentives) for implementation;
- The governance process of **policy implementation** for the (re)development of NBS: i.e. the implementation of (policy) plans on the ground.

The focus was on governance practices the city leads or in which it collaborates with other stakeholders. For governance practices where the city plays little or no role, we only looked at whether the city supports such initiatives (e.g., how does the city respond to grassroots initiatives). Furthermore, the concept of NBS is relatively new and has not yet entered each local policy arena. Time and commitment is required for a new (environmental) concept to be taken up in policy and planning (e.g., Di Marino et al., 2019). Therefore, during the interviews we rather spoke about '*urban (within municipal borders) green-blue spaces or elements providing multiple benefits*' as not all cities have adopted the term NBS. The term 'multiple benefits' was used rather than 'ES' to include a wide vary of functions as the participant saw fit and to avoid technical and academic terms. Also in the results section, similar terms are used rather than NBS.

WP2 members and the knowledge brokers had the opportunity to provide feedback during the development of the guidelines. Furthermore, a presentation was given to the bi-weekly City Focal Point[2] (CFP) meeting to set the scene of the deliverable and to give the cities the opportunity to provide input through an online survey (Mentimeter). Lastly, a meeting was organized with the knowledge brokers to give instructions on the guidelines and to answer any final questions.

The knowledge brokers were given the option to collect the data through one-on-one interviews, focus groups or both (table 1). Interviews allow for more personal and in-depth answers, while focus groups stimulate interaction and discussions on the topic. Two cities decided to first have a focus group with a general discussion among the participants about the governance of their green spaces, followed by interviews to have a more structured and in-depth conversation with the same participants. Participants were the members of the CFP and others who are closely involved in policymaking or policy implementation of urban green spaces in the INTERLACE city. When needed, the knowledge broker asked the participants who else could be relevant to interview. In each city, five to eight participants took part with the data collection. The interviews and focus groups were conducted in May and June 2021.

[1] The knowledge broker is the local research partner. Each INTERLACE city has one knowledge broker.

[2] Each INTERLACE city has one CFP and consists out of city officials and the knowledge broker.

The interviews and focus groups were recorded and participants signed an informed consent for the recording and their participation. The interviews and focus groups were conducted in the local language (Spanish, German and Polish). The knowledge broker then translated a summary of each answer into English for analysis.

Table 1. Method applied and participants involved for each INTERLACE city

INTERLACE City	Method	Number of participants
CBIMA	Focus group	7
	Interviews	6
Chemnitz	Interviews	6
Envigado	Interviews	5
Granollers	Interviews	6
Metropolia Krakowska	Focus group	8
	Interviews	8
Portoviejo	Interviews	5

EV-INBO conducted a thematic analysis to assess and categorize the governance forms and needs. For the governance challenges and supporting factors, the categories are developed on the basis of the data. Each city analysis was shared with the CFP to seek feedback on the key findings.

3. Results

In this section, we highlight the key findings on governance forms currently applied for policymaking and policy implementation (section 3.1), challenges each city faces regarding governance (section 3.2), factors supporting governance for multifunctional urban green spaces (section 3.3) and needs of cities for tools or knowledge to support decision making on multifunctional urban green spaces (section 3.4). We refer to Annex B for more detailed results of each city, as well as an introduction to each city that sets the scene in which context the city's governance is embedded.

3.1 Governance forms

The INTERLACE cities apply multiple governance approaches for policymaking or for policy implementation of urban green spaces. The process of **policymaking** (table 2) is usually different for each policy and is in most cities done through collaboration with various municipal departments at a minimum (intragovernmental collaboration) and in some cases expanded with input from academia and/or civil society (network governance). Chemnitz is the only example in which market stakeholders were involved in policymaking besides public stakeholders and civil society (collaborative governance). CBIMA and Metropolia Krakowska (both inter-municipal organizations) currently do not have a regional policy yet that address urban green spaces of the participating municipalities. However, CBIMA does have cross-municipal policies for the biological corridor of the Maria Aguilar river. Metropolia Krakowska is currently in the process of developing their first strategy that addresses green spaces, among other topics. Both are presented in table 2.

Table 2. Applied governance forms for urban green policymaking per city

City	Governance form	Explanation
CBIMA	Network governance	Multi-scale and multi-stakeholder processes were conducted for the development of a policy for the Maria Aguilar river corridor. Intergovernmental, national and local governments collaborated for the development of the policy (such as the 5 municipalities that are part of the corridor, the Ministry of Environment, Institute of Housing and Urbanism, UNDP). Furthermore, civil society was involved such as NGOs and community groups. These policies guides cities towards good practices for the corridor. However, the lack of knowledge among some officials impedes the management of these spaces.
Chemnitz	Network governance	For the development of the Urban Nature Master Plan, different municipal departments collaborated, such as the Parks Department, Environment Department, Urban Planning Department, and Health Department. Furthermore, the city also collaborated with TU Dresden for input through studies and citizens participated through a survey to provide input on what they want.
	Collaborative governance	All municipal departments, companies (e.g., energy industry, housing industry), social and environmental associations and social groups were involved during the development of SEKo (a city-wide development program for 10 years). The city planning office had the lead and various topics were discussed through working groups. The collaboration resulted in a consensual joint working paper.
Envigado	Intragovernmental collaboration	The Planning Office, with the participation of the Environmental Office, Transportation Office, Works Office, and Education Office developed the Green Space Plan, which was later incorporated into the POT (Plan de Ordenamiento Territorial). Results of this collaboration were reaching a consensual plan, strengthening governance and cohesion between sectors. However, there is still work to be done to further improve these aspects.
	Network governance	The Planning Administrative Office led the POT formulation with collaboration of the Environmental Office, Mobility and Transportation Office, Public Works Office. The CTP (Territorial Planning Council of the municipality of Envigado) was involved in the development of the most recent POT. The CTP includes voices of LGTBI, minorities, Afro-Colombians, sport communities, and private sector communities, among others.

Granollers	Intragovernmental collaboration	A paradigm shift occurred by promoting more collaboration among municipal departments, also for policymaking on green spaces. For example, through collaboration with the Department of Works and Projects, the Department of Urbanism and the Environment and Green Spaces Service, the decision was made that for each new development project within the city, 1/3 part should be green, 1/3 part should be soft (permeable pavement) and 1/3 should be hard urbanization (fully sealed).
	Intergovernmental collaboration	Through inter-municipal working groups (at the scale of the province of Barcelona), all municipalities have similar objectives regarding water management, waste and the circular economy, noise and air quality, green spaces (particularly the development of green space indicators). Some municipalities have been able to move forward on some issues more than others. These groups help to move forward to those municipalities that are staying behind.
	Network governance	The municipality has an Environmental and Sustainability Council. It is an advisory body consisting of experts that aims to advise about SDG related issues. The Science Museum of Granollers, the Universitat Politècnica de Catalunya (UPC), and the Cartographic and Geological Institute of Catalonia have provided data and input on solutions that ended up influencing the city when making policies.
Metropolia Krakowska	Network governance	The Kraków Metropolis Development Strategy " Strategia Metropolia Krakowska 2030" is currently in development and is the first document to address green spaces. Consultations on the strategy were attended by non-governmental organizations, representatives of the scientific sector, county authorities, voivodeship (provincial) authorities and municipalities not belonging to the Metropolis.
Portoviejo	Intragovernmental collaboration	Within the municipality, there was mainly collaboration between the Urban Planning and Territorial Sustainability department and the Risk department. The Risk department identified, prior to the planning, the flood zones, medium and high risk zones and policies were formulated based on that.
	Network governance	For the development of the Plan 2035, Urban Master Plan and other relevant policies for urban green spaces, the city collaborated with universities and citizens. The universities shared methodologies to model, to create maps, etc. in order to guide the city and to provide evidence and scenario's on which the city could base their policies on. For the Urban Master Plan, the city involved specific groups such as cyclists, landowners and citizens living at the foot of the river. It was considered beneficial because it included the voice of the citizens in the process and created public support to what is being planned.

Inclusion of civil society in the governance processes for **policy implementation** (table 3) of urban green spaces is more common compared to the process of policymaking. Each city has their own approach to the engagement of civil society, in some cases with formal structures and mechanisms. For example, in Chemnitz citizen participation is required by law and recently the city set up a 'citizen platforms' in which citizens have a political vote. When considering the inclusion of underrepresented groups in the planning and implementation of urban green spaces, the differences between the cities are larger: from rarely represented in governance processes to formal structures such as advisory councils within the city. Other governance forms are not commonly applied in the INTERLACE cities. There are only a few examples of public-private partnerships (CBIMA and Envigado). Instead, there are regulations in every city for market actors, especially real estate developers and industry, who have to compensate for green space in new projects. Metropolia Krakowska did not plan and implement any urban green space in its territory yet. In section 3.3 (Supporting factors) and Annex B (City results Metropolia Krakowska) there are a few examples of governance practices applied in the city of Kraków.

Table 3. Applied governance forms for policy implementation of multifunctional green spaces per city

City	Governance form	Explanation
CBIMA	Network governance	CBIMA has implemented strategies to involve various public and civil stakeholders through participatory processes for the planning of green spaces. For example, CBIMA has strategic alliances with certain neighbourhood associations for planning, design, implementation and maintenance which resulted in citizens being involved in activities and a better alignment with their needs. However, improvements can be made as usually it is the same people who participate, and underrepresented groups are rarely represented. Officials who work on green spaces have no experience yet in working with underrepresented groups.
	Public-private partnerships	The CBIMA local committee consists of local public and private partners, which resulted in a few opportunities. For example, CBIMA could intervene in sites of interest with corporate volunteering and work was done on environmental education and reforestation. Furthermore, there are regulations for real estate developers that require them to leave 5 – 20% of space for parks (depending on the average size of the lots, the intended land use and the development plans of the municipality). However, these green spaces are not always of high quality. Municipalities had made mistakes in the past accepting land for parks and public green space from developers in steep slopes, with accessibility issues, bad soil quality among other factors that compromise the quality and availability of green space in the city.
Chemnitz	Network governance	Network governance is a common form of governance applied in Chemnitz. Citizen participation in planning is mandatory by German law. Besides municipal departments and citizens, other public institutions (such as universities) have been involved in some initiatives as well. The involvement of stakeholders strengthened the decision-making. Recently, citizens' platforms have been set up and are part of the public bodies to put districts on equal footing. Eight locations received their own platform with local representation, local chiefs, local councils and have political vote. During citizen participation, attempts are made to address all groups, but it is not known how well this works. However, there are advisory councils for specific groups in the city, such as a senior citizens' advisory council, a migration advisory council, an advisory council for the disabled, etc. Advisory councils are heard as needed when the relevant groups are affected (e.g., children/youth are explicitly addressed for new playgrounds).
	Public-private partnerships	There is no agreement-based collaboration between public and market actors for the planning of urban green spaces. However, there are regulations for private lands regarding green space. For new industrial areas or large construction projects, compensation areas for nature conservation must be developed within the city boundaries by the responsible body. Furthermore, new statutes are proposed (not yet adopted) for green roofs and facades (especially for companies) and greening of parking lots (both public and private, especially larger parking lots). Also a statute on prohibition of gravel gardens is proposed. Statutes are in principle obligatory, but exceptions are possible.
Envigado	Network governance	All planning activities have a citizen participation component. This ranges from addressing complaints, considering citizen views, requesting/demanding urban green spaces or implementing or financing them. There are several parks in Envigado that were initiated from citizens' demand. As a result, citizens use the park, take care of the park, and feel safe in the park, where initially there were doubts if this would be the case. However, an explicit intention for citizen participation in general or specifically to involve underrepresented groups is often missing in the municipality and could thus be improved. A higher citizen commitment to participate could be realized if they were better heard. Furthermore, universities are asked to cooperate to include scientific knowledge in the planning and management of green spaces.
	Collaborative governance	There are committees for each of the territorial zones of the municipalities (9 urban and 4 rural). The community, the education sector, the state, and the private sector form these committees. They accompany the planning processes of all kinds of municipal actions projects, not only for urban green spaces. Their involvement depends on the area and the projects that are taking place. This mechanism is a law mandate and that makes it a weakness as stakeholders are missing intrinsic motivation to participate.
	Public-private partnerships	There is little to no agreement-based collaboration between public and market actors for the planning of urban green spaces. There is one example of a public-private company (that administers energy, water and sewerage) that supported restoration activities, but this was a small involvement. Furthermore, the municipality offers support to private owners for restoration (providing plants and technical advice), but this is very little in urban areas. There are regulations for real estate developers that require compensation for green spaces depending on the footprint of the real estate project.

Granollers	Intragovernmental collaboration	Compared to the past, there is more joint work between municipal departments to incorporate urban green spaces, due to the existence of the Master Plan and the work of the staff of the Environment and Green Spaces Service that highlighted the necessity of joint work. However, the collaboration could be improved. Now they are often temporary and relatively small. There is usually one actor who leads it, while the other actor validates it. Some decisions are made but they are not always very consensual.
	Network governance	Involvement of civil society is not standard practice for each project. Nevertheless, there are multiple projects that have a participatory approach with citizens, including underrepresented groups, youth organizations, charities or schools. There are a few governance bodies that promote the participation of youth (Children's Council and the Adolescent Council), who otherwise don't participate. However, such councils do not exist other underrepresented groups such as migrants or seniors. Furthermore, the city is open to make stewardship agreements for the maintenance of public or private land or support other proposals from citizens.
	Collaborative governance	There is one recent example where local government, civil society and business collaborated in planning. It is called the City Pact and it was made to recuperate the economic and social activity during the covid-19 pandemic. It was a participatory process through which several actions were identified and to be implemented by the City Council, other actions implemented by citizens and others by the local businesses. Forty measures were proposed to restore the dynamism of the city, which included the promotion of green spaces within the city. For instance, there was the proposal to encourage the participation of companies and citizens in making the city greener. One of the proposed actions is to put plants on the balconies, on the street, instead of always looking for the administration to make green available to the citizens.
	Public-private partnerships	There is no agreement-based collaboration between public and market actors for the planning of urban green spaces. For the maintenance of green spaces or elements there is some collaboration, e.g., shop owners taking care of the plants in the commercial streets, or companies participating in a clean-up. Attempts to collaborate with industrial estates were made, but proved to be difficult, especially when discussing budgets. There are regulations for real estate developments to compensate when building. The City Council dictates the guidelines and criteria to be followed and the real estate developer drafts the projects. There is often a struggle to convince the developers about the quality of the new green space they will have to create.
Metropolia Krakowska	-	-
Portoviejo	Network governance	There is no policy that makes citizen participation obligatory. Nevertheless, there are instances of neighbourhood participation. This is done through a project called 'Microplanning' and only involves well-structured neighbourhood councils. This is only a fraction of all the neighbourhoods of Portoviejo (211 neighbourhoods, 70 neighbourhood councils of which 40 are considered well-structured). The project prioritises green areas, roads and urban facilities through participation. Citizens have been involved with new proposals, including thinking about where the public spaces, roads and service facilities were going to be located. It was considered successful as it allowed the city to adjust several projects to make it more in line with the wishes of the community. The citizens are considered the eyes and ears of the local area. They know the territory better, such as locations of recent landslides, and this knowledge is beneficial for local planning. Due to citizens sharing individual problems during participation moments, the city limited participation to neighbourhood leaders. The city considers that the neighbourhood leader has the competence to decide for the neighbourhood. Although, the city recognizes that the scope of citizen participation processes was not always that clear. There is also one example of collaboration between the city and the local university. For the Rotonda Park, the city collaborated with the University of Manabí because the land was owned by both parties. There was a process of cooperation to implement the park.
	Public-private partnerships	There is no agreement-based collaboration between public and market actors for the planning of urban green spaces. Although, in two instances the municipality made a concession agreement to swap a green area close to the river belonging to a private entity with public land located elsewhere. The city is focusing on developing policy instruments and tools that regulate the private sector, such as enforcing minimum percentages of green spaces with new real estate developments. They need urban green spaces with certain planning standards which are publicly available. Also, the city is working on an instrument which can aid in the management of nature (which is defined in land-use plans as nature / green area) that is located on private land.

During the interviews, a few examples of grassroots initiatives were given by most of the cities (box 1). Although this is a governance form in which the government is (almost) absent, once initiatives have started, the government can support (or repress) them.

Box 1. Grassroot initiatives

Chemnitz

There are associations that take care of neglected green spaces and try to redesign them. The city tries to cooperate while keeping their own costs as low as possible. However, there are still legal uncertainties, which are currently being figured out, such as insurance if someone gets hurt when present at these green spaces, who owns the land, who will pay for the maintenance if the associations stop with their work, etc.

Envigado

The citizens felt affected by the disorderly urbanization processes and "abuse" by real estate developers that were negatively impacting natural resources. For this reason, the community organized themselves, they held demonstrations, took legal actions such as the 'Popular Action instrument' (a law mechanism for citizens to claim and ensure their rights) and the 'Right of Petition' (a petition against the real estate developers), and had dialogues with the mayor. As a result, the communities managed to stop the construction works, regained public spaces and donated it to altruistic organizations. Later this space was used to build a park.

Granollers

There are initiatives to clean up the river initiated by civil society. The City Council is not involved but when requested, it helps these initiatives by providing material, such as gloves and bags. The main challenge is to deal with safety issues related to the activity. If an accident occurs, the city needs to cover the citizens with insurance. The city advises them as they know the areas with a high risk of landslides or to avoid specific bridges (for children) where people take drugs.

Kraków city

Civil society often initiates community garden projects in the city of Kraków. This can be informal groups from a neighbourhood or formal groups such as housing cooperatives, senior clubs, community centres, etc. The community gardens are generally established on urban land - often in wastelands, degraded, neglected and undeveloped areas. The areas of community gardens are usually designed by the local community who uses the resources at their disposal. The municipality supports them through assisting with formal and accounting matters, providing a starter package (basic tools, wheelbarrows, a water tank) and often provides dendrological, botanical and other practical information.

Portoviejo

Some people organize themselves and utilize the riverbanks of a smaller river (not the main Portoviejo river) by planting crops and vegetation. Among others, guinea beans and corn can be found there, as well as small handmade parks and a lookout made of bamboo. The city neither repressed nor encouraged this usage.

3.2 Governance challenges

The INTERLACE cities experience different challenges during the process of policymaking and policy implementation of multifunctional urban green spaces. For **policymaking** the cities experienced the following governance challenges:

- There is currently no shared policy for the **CBIMA** region specifically regarding urban green spaces (note: there are shared policies for the river corridor). A first challenge is to realize that green spaces are of low priority for policy-makers within the participating municipalities. For many years, the priorities have been directed towards the infrastructure of streets and roads. Moreover, the multiple labour obligations make the issue of creating a public policy on green space not a priority. For example, in one of the municipalities there is neither an official nor a department in charge of this whole process. A second challenge is a low and inconsistent uptake of the NBS concept. NBS is not taken up in the policies of most of the CBIMA municipalities. Only the municipality of Curridabat includes the NBS in its regulatory plan and Montes de Oca contemplates certain elements that bring benefits to its inhabitants. All municipalities should have a similar understanding when developing a joint CBIMA policy.
- Challenges that **Chemnitz** encountered during policymaking is to estimate the effects of multifunctionality. Not knowing how much exactly a green space contributes to a certain benefit (e.g., the effect of a row of additional trees on health or noise reduction) makes it difficult to have informed considerations and decisions. Furthermore, tight budgets of the department responsible for the management restrict policymaking. The department must know beforehand if additional maintenance tasks can be taken up within the budget before it can be included in a policy.
- In **Envigado**, one of the main challenges is that political interests may privilege real estate developments above the environment. Also, within municipal departments it was challenging to realize a paradigm break that nature areas could also be realized within cities and not only in pristine rural areas (e.g., within the Amazon). To introduce nature protection policies within an urban setting was new for the planners and citizens. Furthermore, there was little consideration for taking into account the needs of citizens during policymaking (e.g., the POT (Plan de Ordenamiento Territorial)). The Social Wellbeing Office had low representation during the policymaking of environmental policies. As a result, tension was created between real estate development, social welfare, and environmental aspects. Attempts for collaboration (among others, with the regional government and real estate developers) during policymaking had a low impact and few concrete commitments were achieved. It was not possible to harmonize opinions and interests.
- One of the main challenges in **Granollers** is that urban green space policies are influenced by electoral points of view rather than a technical and objective point of view and this is unfavourable for long-term beneficial and sustainable green spaces. The public opinion influences the ruling party and therefore also the implementation of certain policies. Furthermore, the Environment and Green Spaces Service and the City Council sometimes have different visions. For example, due to the limited size the Environment and Green Spaces Service wants to reduce car parking spots and create new green spaces. The municipal

government pulls these back as they fear criticism from citizens. In some cases, this leads to tensions between politicians and the department. Also, there are opportunities to create joint urban green space policies with neighbouring municipalities. However, there is a lack of time and resources to bring such proposals forward.

- The **Metropolia Krakowska** is currently developing the strategy "Strategia Metropolia Krakowska 2030" and is the first cross-municipal document to address green spaces. Encountered challenges are conflicts of interests, especially at municipal borders where green infrastructure can abruptly end. The municipalities do not have a common vision nor a common understanding on the importance and urgency of environmental problems or the benefits that urban green spaces can provide. Furthermore, there is insufficient trust between authorities, and local citizens are expressing little interest in the development of the strategy. All this makes it difficult to work together to develop a common strategy.
- The main challenge **Portoviejo** faces during policymaking is a rigid legal framework for land classification. This framework classifies the land (productive land, forest protection, etc.) and cannot be modified in 12 years. This can make new proposals for e.g., new green spaces difficult when they do not fit within the land classification framework and therefore risk being illegal. The city must look for alternative approaches to comply with this framework. It is also a challenge to find common ground in inter-municipal policymaking for the Portoviejo river corridor. The city made attempts to include the cantons which are crossed by the river when updating the River Corridor Plan (Part of the Urban Master Plan, Network governance, table 2). Each municipality was more focused on their own interests and competences instead of building a common approach and made it difficult to concretise and carry out joint actions.

Table 4 presents the main challenges each city faced during the governance processes of **policy implementation** of multifunctional urban green spaces. Elaboration on these challenges can be found in Annex B (City results). Although each city has their specific challenges, there are overarching themes that multiple cities experience. These themes are challenges with resources to plan, implement and maintain green spaces, collaboration with stakeholders, designing multifunctional green spaces, decision-making in favour of multifunctional green spaces, having sufficient public awareness and support, policies supporting implementation, limited public space for new developments and finally challenges with the private sector.

Table 4. Main challenges during governance processes of policy implementation for each city

CBIMA	Chemnitz	Envigado
Resources Insufficient budgets to manage and restore existing green spaces and to implement new plans. Insufficient staff to manage and restore urban green spaces. Insufficient knowledge within the municipality regarding urban green matters. *Collaboration* Different visions, lack of consensus and little collaboration between stakeholders. Lacking agreements on responsibility for implementation. *Designing NBS* Difficulties in making green spaces multifunctional. *Public awareness and support* Low public awareness and support. *Policy* Lack of a cross-municipal green space policy and set of instruments. *Private sector* Real estate developers who do not always include the environmental considerations in their plans.	*Resources* Insufficient budgets to manage and monitor existing green spaces and to implement new plans. Insufficient staff to manage and monitor existing green spaces and to implement new plans. *Collaboration* Difficulties in creating a shared vision and approach during multi-actor processes. Slow, little or lacking coordination and communication between municipal departments. Difficulties involving more diverse user groups. *Decision-making* Short term (economic) choices and benefits vs. long term benefits.	*Resources* Insufficient budgets for development of new green spaces. Insufficient continuity of staff. *Collaboration* Little collaboration between different stakeholders (except citizens). *Designing NBS* Insufficient scientific and technical knowledge to design for multiple benefits. *Policy* Planning policies are strong in theory, but implementation and enforcement of those policies is troublesome. Insufficient policy cohesion. *Limited space* Scarcity of urban public lands. *Private sector* High pressure from - and poor response to - real estate development.
Granollers	**Metropolia Krakowska**	**Portoviejo**
Resources Insufficient budget for maintenance and implementation of green spaces. Lacking tools and resources for monitoring of project impacts. *Collaboration* Instances of little or late collaboration across departments. Insufficient coordination between participatory processes. *Designing NBS* Balancing ecological and social values. *Public awareness and support* Low citizen awareness regarding multifunctional green spaces. *Policy* The Urban Green Master Plan is insufficiently multidisciplinary. *Limited space* Limited space for development of new green spaces. *Other* Slow bureaucratic procedures.	*Resources* Insufficient budget for planning and implementation of new green spaces. *Collaboration* Insufficient collaboration with stakeholders. *Designing NBS* Old fashioned spatial design. *Decision-making* Grey solutions are chosen over NBS. *Public awareness and support* Weak public support.	*Resources* Insufficient budget for implementation of new green spaces. Insufficient (experienced) staff for implementing policies and plans. *Collaboration* Insufficient time to organize and conduct a participatory process. *Public awareness and support* Low citizen awareness regarding multifunctional green spaces. Unclear communication with citizens. *Private sector* (Political) opposition when private land or property is affected. Difficulties of expropriation. Insufficient social and environmental responsibility with real estate development.

3.3 Supporting factors

The interviews asked about factors that support the processes of policymaking and policy implementation of multifunctional urban green spaces. The INTERLACE cities highlighted similar factors. In some cases, supporting factors were already present or actions were taken to realize them and contributed to policymaking and/or policy implementation. When actions have been undertaken to create these supporting factors, they can be considered good practices. In other cases, the supporting factors were identified as something that could support their current governance practices. The following factors were mentioned by at least four INTERLACE cities of which some include some good practice examples (the examples are not a comprehensive list of what is mentioned in the interviews but have been picked from the City Results (Annex B)):

- **Policies and instruments at a local, regional and (inter)national level** that support the realization of multifunctional urban nature: when policies at different levels aim to improve urban green spaces, it gives municipalities a mandate to implement these visions and to work a certain way (e.g., multi-stakeholder involvement in planning). Besides giving a mandate, visions from a higher level can also guide and inspire cities for innovative solutions. Policies might be combined with legislation (e.g., protection of nature or regulation of allowed or illegal types of activities), tools and instruments (e.g., financing of certain actions, or possibilities for land acquisition), guidance or requirements (e.g., development of a master plan, cross departmental collaboration or involvement of citizens) and supports cities in their processes of policymaking and policy implementation of urban green spaces. Multi-level (and multi-sectoral) policies are more effective when they are aligned with each other (e.g., a State Development Plan and a Municipal Development Plan are aligned and share the same norms and regulations). Furthermore, having all policies and plans related to local urban green spaces collected in one document (e.g., Master Plan) creates more clarity to the staff.
    - To turn a railway crossing into a green corridor, Chemnitz applied all planning instruments that were available to them. When the railway company requested for subsequent commercial use of the railway, the plans in the SEKo (the municipal urban development policy) overruled the request. The municipality acquisitioned the land, which was unique to do for such a scale for urban green spaces. The urban green funding programme further supported the implementation of the plans. To acquire land is a strategy Chemnitz has applied a few times as the availability of land is decisive for increasing urban green spaces. Areas were exchanged or bought through which the municipality came into the ownership of areas suitable for the development of urban green space.
    - The city of Kraków applied an instrument that co-finances water retention installations and found that citizens reacted better to such incentives than to regulations or penalties.
- **Political will and support**: It is beneficial to have decision-makers who prioritize urban green spaces over grey solutions on the agenda. It makes the process of policymaking and policy implementation easier when new ideas and proposals by municipal departments are encouraged, welcomed and valued by the city council. Budgets are more easily made available (although it remains a challenge to have sufficient budget) and a higher political ambition also has higher chances to reach impact. For long term planning, political stability is important, which

is not always a given (elections every x years).

  - In Granollers, the Master Plan was approved unanimously by all political parties, which ensures long term political support. Efforts were made to reach full political support by sharing the plan with all the political parties, explaining how the document was drafted, collecting contributions and sharing which ones were included.

- **Stable and long-term financing** or to have alternatives to finance planning, implementation, maintenance and monitoring activities.

  - There is a gradual increase of budget for urban green spaces in the city of Kraków, combined with the establishment of a new municipal unit dedicated only to the management and maintenance of green areas, which gave a higher priority to the development of green spaces in the city.
  - The Municipality of La Unión in CBIMA applies a “water rate” for several years, which is a payment for ecosystem services scheme. The collected funds for water usage are used for financing conservation actions or purchase of lands with forest.
  - The Municipality of San José and Hatillo District in CBIMA have made strategic alliances with certain neighbourhood associations to take over maintenance of local green spaces. These have been valued positively since the public institutions do not have sufficient resources to do so.

- **Multi-stakeholder processes** to co-create urban green spaces that match the local needs. The involvement of environmental, civil or economic stakeholders can enrich the process in various ways:

  1. The involvement of environmental stakeholders (e.g., experts on ecology, water or climate) can improve the understanding of the local environmental issues and provide alternatives for locally adapted solutions.
  2. Urban green spaces can be made more inclusive when citizens and social organizations (including underrepresented groups) are involved. Involving civil stakeholders also improves the understanding of the local issues and provides opportunities for them to express their needs and wishes that can be incorporated in the design. When participating, the citizens can also learn about the environmental issues at hand, the importance of nature, and what is and what is not possible at the site in question. Furthermore, a sense of ownership can be created through such a process, and motivates them to contribute during the implementation or maintenance of the green space.
     - The municipalities of CBIMA had tried to develop participatory processes and to involve neighbourhood committees, blue flag committees, watershed committees, associations, non-formal neighbourhood committees as a reflection of participatory and voluntary governance mechanisms and resulted in participatory reforestation, citizen science brigades, green space interventions among other activities.
  3. The involvement of economic actors can support the implementation of solutions on private property, execute plans on public land or provide possibilities for (co-)funding, while also

receiving benefits (e.g., attract new clients, happier staff when working in a green environment, maintain/improve the image of the company, etc.).

- **A strong vision with clear goals and consensus** among partners through e.g., a long-term systemic thinking exercise. Having a clear vision and a common goal allows to maintain focus and improves the collaboration among partners. Furthermore, collaboration is stimulated when the cities' vision focuses on cross-cutting issues. Moreover, new concepts and new ways of thinking can be incorporated in new visions. Overall, better results can be expected when multiple projects are integrated in a shared vision instead of having isolated projects. For example, combining a mobility project with a greening project.
- **Champions** to lead new and innovative developments. Champions are often key to initiate the use of new concepts, advocate for more collaboration, start up and push a project. Champions that have been mentioned are mayors or (one or multiple) individuals in the municipal departments who take the lead on one or multiple initiatives.
- **Gaining experience, knowledge, tools and/or data through regional or (inter)national (research) projects**. Such projects are a valuable source for cities to develop their capacities for local implementation of urban green spaces. Through collaboration in such projects, the cities can network, learn about new practices, approaches, concepts, tools, etc. as well as to increase motivation among participating staff members. Gained experience can also be applied to get into new regional or (inter)national (research) projects, leading to further innovation.
    - Through international collaboration with CBIMA, the 'Green Atlas' was generated, where currently maps and statistics called "Atlas of Ecosystem Services of the Greater Metropolitan Area (GAM)" can be viewed. This initiative provides geospatial information to a wide range of audiences, which include ministries, public entities, decision makers, local governments, interurban biological corridor management committees, researchers and civil society in general to support decision-making processes.

The following factors also contribute to the governance process of policymaking and policy implementation of urban green spaces, but received less emphasis as they were mentioned by three or less INTERLACE cities:

- **Citizen awareness**. When citizens are aware of the importance and benefits of urban green spaces, there is often less opposition to new plans. In other cases, citizens make their demands clear regarding green spaces in their living spaces, or even start initiatives that support public green spaces.
- **Understanding of the importance** of urban green spaces and the multifunctionality aspect by internal (see also next bullet) and external planners and architects as they play a key role in its design.
- Having **criteria and target indicators** to support decision making. Criteria allow for decision making based on the goals and indicators on the performance of policies or projects allow for evidence-based decisions for new policies or projects.
    - Granollers applies multiple criteria when making decisions about urban green areas, such as

ecological connectivity, connectivity for users, reduction of heat island effect, reduction of water demand for vegetation (by using climate adapted species), etc.

  - Also in Portoviejo, standards (from the concept 'cities for people') were applied in recent investments in green spaces. These investments match better with what the citizens want and need, and therefore also have a political return.
  - Granollers and Envigado monitor and evaluate some of their policies and actions. As a result, difficulties (e.g., public space deficit or heat islands in Envigado or the performance of the Agenda 21 actions in Granollers) are detected and actions are proposed for following policy iterations. Furthermore, Municipalities in the Diputació de Barcelona (a regional administration of the province of Barcelona) developed comparative indicators to follow up urban green management between the municipalities. Indicators allow making decisions based on evidence. However, Granollers indicated that the quality of the comparative indicators and the monitoring and evaluation of policies and actions could be further improved.

- **Qualified staff** within the municipal department who have a good awareness of and knowledge on the issues at hand. Qualified staff can make valuable contributions to new local policies. A diverse team with different expertise (e.g., green management, air pollution, circular economy, biomass, etc.) supports having multiple perspectives in (policy) proposals, initiatives and projects. Regular training (as well as participating in regional or (inter)national (research) projects) supports the professional growth of staff.
- When there is a high **urgency**, funding is made available and opportunities open up for new (inter)national collaborations for the creation of green spaces.
  - To rebuild the city after the earthquake, Portoviejo got access to large amounts of funding, and provided a (temporary) opportunity to build (mega-)parks.
- **Freedom and tranquillity** to work on a project (opposed to cumbersome bureaucratic procedures).

3.4 City needs

The INTERLACE cities were asked which tools, instruments, knowledge, etc. can support their decision-making processes for urban green spaces (to which they do not have access to yet). The needs are specific for each city and are divided in needs for tools and knowledge needs (table 5). A few needs are common across some cities, such as tools that provide evidence of multifunctionality to support decision making, tools for planning with multiple stakeholders, or knowledge about NBS in similar climate zones.

Table 5. Needs for tools and knowledge that can support local governance per city.

CBIMA	Chemnitz	Envigado
Tools Tools for decision making with local communities. Technological tools (geographic information systems) that allow the	*Tools* Tools for planning with different actors. Tools that provide evidence of multi-functionality to be able to prove positive effects of green spaces with numbers (e.g.,	*Tools* Tools to support collaborative spaces for multi-stakeholder processes for urban (green) development. Decision support systems for urban

visualization of data. Tools to build public policies. *Knowledge* Increase knowledge amongst municipal officials to facilitate improved management of green spaces. Increase knowledge and competence of municipal officials on the national law, legal frameworks and local rules. This can be done from the *CBIMA por la naturaleza*. Collaborate with the education sector to develop a joint strategy towards environmental, research and development issues.	positive effects on health of urban nature) and to be able to practice fact-based politics. Also monetary to motivate decisions for green solutions rather than grey solutions. This should be as concrete as possible for the project at hand instead of abstract extrapolations. Tools to transform "regular green space" into NBS that have been specifically designed to provide multiple benefits. *Knowledge* Better understanding of the NBS concept needed within the administration but also at architectural firms. Good examples of visionary urban green policies that can act as inspiration.	planning. Tools that provide evidence about multifunctionality (ecosystem services) and to select adequate management. Tools for urban developers in order to include environmental aspects. Tools that link management to specific land uses. Tools that help to better specify allowed and prohibited land uses. Tools to define concrete action regarding hydrologic planning. Virtual communication tools to widen participation in a variety of age ranges. *Knowledge* Examples of other consolidated (compact) cities that have succeeded in implementing NBS.
Granollers	**Metropolia Krakowska**	**Portoviejo**
Tools Tools to get objective information on costs and effectiveness (of multiple benefits) of an urban green project to base decision on, for political discourse, and to inform citizens. Tools to quantify the benefits that green spaces produce (per year). To manage the benefits, they need to be known better first. This can then also be communicated to citizens. *Knowledge* Clear guidelines, manuals or strategies on nature-based solutions applied to the Mediterranean ecosystem. Examples of successful implementations from other cities that implemented green spaces. Expertise on citizen participation and communication. Training on interdisciplinarity among the municipal departments to further strengthen awareness of environmental issues and their interconnectedness. An INTERLACE webinar with an introduction to the tools presented in D3.1, as some are not familiar with this list of tools.	*Tools* Tools to define priorities and select appropriate directions and actions. Tools that provide evidence on multi-functionality (ecosystem services), NBS and its impact on the quality of life. Result, target and performance indicators for NBS and a common database for all municipalities. *Knowledge* Knowledge about technical (engineering) conditions: designing, implementation and maintenance of NBS. Good practices of already existing NBS in similar climate zones. Guidelines for interdisciplinary and intersectoral cooperation to overcome working in silos and to develop joint actions. Training of specialists in applying various types of solutions enabling the management of rainwater.	*Tools* Tool for communication towards citizens on local urban green spaces and their benefits, and the implementation process. E.g., through a webpage where technical aspects can be found and people can do research. The city has all the basic information but they don't have the platform. *Knowledge* Strategies for alliances with the private sector. Manuals, strategies and technical assistance to develop plans for urban green spaces. Knowledge on which species are beneficial for different purposes. E.g., tree canopy (shade), which trees are ideal for terraces (soil or water retention), carbon sequestration, water usage, etc. Knowledge to strengthen policy instruments to: • manage nature on private lands; • finance implementation of NBS; • expropriate landowners on risk areas; • sanction those who do not respect agreements and/or laws regarding land use.

4. Outlook

The INTERLACE cities plan and implement NBS (policies) in different contexts and have their own structures, approaches, challenges and needs. Generally (for all INTERLACE products), we recommend considering the main findings of this report to increase relevance and applicability of the INTERLACE products for the INTERLACE cities. An interesting starting point are the overarching themes of the challenges, the factors that support the governance of NBS (which contain commonalities for most of the cities) and the specific city needs. More specifically, results will inform the identification and co-production of local governance solutions in each INTERLACE city (task 2.3), the development of city impulse papers (task 2.4), and the definition of relevant standards and tools (WP3). WP3 products could investigate how their products respond to the governance challenges, contribute to the factors that support NBS governance or respond to the cities' needs. Furthermore, WP4 activities could investigate if knowledge exchange activities could be organized to respond to certain governance challenges or knowledge needs. Also, for the INTERLACE cities, the results can be an interesting overview of governance approaches and supporting factors that can act as inspiration for future developments of NBS policies and initiatives.

For city-specific products to be developed within INTERLACE (e.g., the co-development of governance instruments (D2.4) or the INTERLACE city impulse papers (D2.5)), we recommend gaining a better understanding of the cities' context, practices, challenges and needs by using the city results in Annex B as a starting point in order to create a fit for purpose product.

Finally, we want to highlight a few results that could be a further focus of attention within INTERLACE:

- The results show that cities apply different governance forms for policymaking and policy implementation of NBS. For policymaking, we mainly found collaboration between different government agencies, with the involvement of academia and civil society as well in some cases. For policy implementation, we found that collaboration with civil society is more common. While different collaboration forms are taking place, all INTERLACE cities also experienced challenges regarding collaboration with stakeholders, both within the municipality as with external stakeholders. Either it seemed difficult to involve a diverse group of stakeholders or within the process it was difficult to create a shared vision or reach effective collaboration. The difficulty to involve a diverse range of stakeholders includes the involvement of underrepresented groups in most INTERLACE cities. Some cities do not have mechanisms, structures (such as an advisory council) or priority to include stakeholder voices in city processes. In cases when underrepresented groups are included in a governance process, it is often not evaluated how well they are represented, what is done with their input, etc. It is important to support inclusive and holistic collaboration processes to realize effective, multifunctional and equitable NBS.
- Multiple cities find it difficult to make policies to plan, design or decide in favour of multifunctional green spaces due to insufficient scientific and technical knowledge. Tools that provide evidence of multiple benefits would support cities in making (scientific) arguments in favour of NBS.

- All INTERLACE cities have difficulties to secure funding for planning and implementing NBS. The Portoviejo case demonstrates that a sense of urgency can make more budget available. Despite the numerous challenges cities try to address with NBS, the sense of urgency does not seem high enough with (local) politicians or others who can fund NBS. Unfortunately, often a natural disaster is needed before there is a substantial increase in funding. In search of (innovative) alternatives to realize and maintain NBS, different forms of governance with multi-actor and multi-sector constellations can be a driver to find innovative solutions. Responsibilities, costs, and benefits can be agreed upon and shared among parties.
- Within the INTERLACE cities, there are only a few examples of public-private partnerships. There might be untapped opportunities to realize NBS on industry or company terrains, to collaborate with local producers (e.g., urban farmers or beekeepers) or other local entrepreneurs, or with real estate developers to include publicly accessible green spaces or elements in their designs. However, in Latin America, the interviews showed multiple examples of bad or poor practices from real estate developers. Therefore they are not an obvious partner as there may be insufficient trust between involved parties. Nevertheless, an analysis of incentives for poor practices and a focus on 'bright spot' examples of good practices could provide valuable insights and lessons learned for future partnerships.
- Collaborative governance is also not a common governance form used in INTERLACE cities. It should be investigated how local coalitions with governmental, civil society and market actors could improve the planning and implementation of NBS (policies) that are multifunctional and equitable. However, a risk of having too many stakeholders is that it can considerably increase complexity. This underlines the importance of well-designed processes with clear objectives, scope and stakeholder roles.

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Annex A. Interview Guidelines

Steps to follow

1. Set up interviews or focus groups. Initially with the members of the City Focal Point and later with other potential participants (see step 4).
2. Get **consent for the interview(s) and recording**. All participants should sign a consent form before the interview, also participants who have previously signed a consent form for Interlace. There is a Google form for online meetings and a Word doc you can print for in-personal meetings. This can be signed right before you start the interview, but can also collected earlier through the Google form.
3. Conduct the interview or focus group and record/take notes:
    a. **For one-on-one interviews**: Record the interview (this can also be on a smartphone) to prevent from answers being lost - not everything can be captured in notes made at the spot. **Tip**: Make sure there is **sufficient battery** on your recording device, have a spare set of charged batteries, avoid locations that have a lot of background noise and make sure the recording quality is understandable.
    b. **For focus groups**: Have at least 1-2 colleagues organized to support with note-taking, while you are moderating the discussions. Also these sessions can be recorded, however in big spaces and having many people present may reduce the quality of the recording.
4. After the discussion, ask the participant(s) who else is **closely** involved with making policies or planning urban green spaces. This can be people from city departments that are not part of the CFP or people from organizations that collaborated with the city on policy or planning of urban green spaces (there may be external partners who were closely involved with certain governance practices that can provide valuable insights) and will help to identify further participants.
5. Listen to the interview recordings and/or review the notes and provide a summary of each answer. This does not have to be a transcription of every word that has been said, but should be an **English summary** of the most important points raised in the answers to each question. Please filter out the irrelevant parts of the answers and leave this out of the summary.

Send one summary per **interview and/or focus group** to Michael (michael.leone@inbo.be).

Interview Guideline

Before starting the interview, check if:

- *The purpose of the interview is clear for the participant*
- *The consent form is signed*
- *The recorder is on*

1. Setting the scene: Introducing the interview

1.1 Interlace and NBS *(for participants not familiar with the project)*

INTERLACE is a research project funded by the European Union which focuses on the topic of nature-based solutions in the EU and Latin American regions. The project aims to support exchange between participating cities on approaches for planning, designing, implementing and monitoring restorative nature-based solutions.

[Note to interviewer: during the interview we will not use the term NBS, but it might be useful to shortly introduce the concept to the participant to give an understanding about what we understand with "green spaces or elements providing multiple benefits"]

Nature-based solutions are defined by the European Union as "Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience." These can be green spaces such as parks, floodplains, sustainable urban drainage systems, or green roofs. Such natural areas can deliver environmental benefits such as biodiversity conservation, climate adaptation, or improved air quality. Social benefits may include enhanced social cohesion or improved physical and mental health Economic benefits can include increased tourism or the production of marketable products like crops or honey.

1.2 Objective and focus of the interview

This interview is part of a governance assessment taking place in the INTERLACE research project, focusing on the needs and challenges of the project's partner cities. It aims to assess which knowledge, experiences and good practices already exist within the cities around urban green spaces or elements (or NBS) governance. We will be focusing on *policy making* and *policy implementation of urban green spaces or elements (or NBS)*, as well as *policies supporting certain forms of governance.*

2. Introduction of the participant

1) Please introduce yourself, where you work and what function you have:

2) Are you involved with the governance of:

a) Creating policies for urban green space

b) Planning and implementing urban green space (management)

c) Both

d) Other, please specify:

[Note to interviewer: this answer indicates which questions are relevant for the participant. Only involved with creating policies (a), then sections 3 and 6 are most relevant. Only involved with planning and implementing urban green spaces (b) then the sections 4 and 5 are most relevant. If the participant says both (c), then all sections are relevant. If the participant is only involved with the governance of one specific example (d), then select the most relevant questions of sections 4, 5 and 6 that are relevant for that example.]

3) What is your role in the governance of [answer question 2]?

3. Policy-making: governance challenges and good practices

4) What are the main policies governing urban green spaces in your city?

[Note to interviewer: this is mainly a warming up question and to know about which policies we speak about in the next (sub-)questions. A link can be made here to the policy coherence analysis]

a) To which (urban) challenges do current urban green policies aim to contribute to?

E.g., biodiversity, heat island effect, flood risks, social cohesion, education, …

[Note to interviewer: this can relate to the interlace city challenges (task 1.3) but may include also other challenges.]

b) Are you aware of any challenges that came up when the policy was being designed in terms of trying to address multiple challenges? Or have any arisen in its implementation in this regard? Please describe these.

E.g., understanding the state of the challenges, including or limiting challenges, …

5) Was there collaboration with other sectors/departments (both internal and external of the municipality) in developing the most recent urban green policies?

a) If yes, with whom?

b) If yes, what were the impacts of this collaboration? Can you identify any concrete aspects of the

policy which were the result of inter-sectoral/-departmental collaboration?

E.g., additional focus on certain challenges within the policy or collaboration with certain sectors or departments for the implementation of the policies.

6) What are important factors leading to the creation of policies that support the implementation of multi-beneficial green spaces or elements? Please describe.

E.g., (new) political agenda of a (new) mayor/city council, (new) policies or instruments from regional/national level influencing local policies, collaboration between departments or other stakeholders, champion in the government leading innovative ideas.

7) Were there factors that have hindered the creation of policies that aimed for multi-beneficial green spaces or elements? If yes, please describe?

E.g., insufficient political support, insufficient external support (e.g., external funding) or lack of the right knowledge or resources to base policies on.

8) What sort of tools or knowledge would help to improve the policymaking for urban green spaces and elements? Try to be as concrete as possible.

The term "tool" is used here in a broad sense, including criteria, models, decision-support systems, methodologies, strategies, manuals, guidelines, and standards.

4. Policy implementation: main governance challenges

9) What are reappearing challenges facing the planning and implementation of urban green spaces in your city? Please explain the challenges.

10) What factors support the planning and implementation of multi-beneficial green spaces or elements? Please describe how they supported planning and implementation.

E.g., sufficient long-term funding, co-creation with or involvement of (certain) stakeholders, clear (co-created) vision, public support, guidelines or other tools that supported planning and implementation.

11) What factors hinder the planning and implementation of multi-beneficial green spaces or elements? Please describe how it hindered.

E.g., insufficient funding, insufficient participation of stakeholders, insufficient public support, lack of vision, insufficient guidelines or other tools to support planning and implementation.

12) What sort of tools or knowledge would help you improve the planning and implementation of urban green spaces and elements? Try to be as concrete as possible.

The term "tool" is used here in a broad sense, including criteria, models, decision-support systems, methodologies, strategies, manuals, guidelines, and standards.

5. Policy implementation: exploration of different governance approaches

Note for interviewer: This section will ask about examples of different applied governance approaches. If there are many examples when discussing one question, then steer the interview towards the most successful approaches (good practices) and to the ones with the most severe challenges. During a focus group, more examples can be discussed (compared with an interview) as there are multiple people present, each possibly with different examples.

The governance triangle at the end of the document might be useful to guide the participant through questions 15 to 24. However, don't forget the sub-questions of these questions.

13) What are some of the **greatest achievements** of planning and implementing (multi-beneficial) urban green spaces or elements in your city in the last 10 years?

a) Why do these achievements come to mind? What makes them stand out?

b) Which factors contributed to the success of these achievements?

c) Which challenges arose along the path to achieving these accomplishments?

d) Were there specific (policy) instruments contributing to these achievements? If yes, what were they and how did they contribute?

14) Are there examples of **collaboration between multiple sectors** (e.g., nature, water, recreation, health, economy) in the planning and implementation of urban green spaces? If yes, which sectors were involved in your example(s)?

[Note to interviewer: to avoid confusing, Q5 asked about collaboration during policymaking. This question focuses on collaboration during on the planning and implementation of actual green spaces]

a) How were they involved?

E.g., with gaining an understanding of issues and opportunities, vision making, decision-making, implementation,

with the setting up of monitoring and evaluation, or a combination of these -or other- examples?

b) To what did the multi-sectoral collaboration lead to and was it considered as beneficial/successful? Why or why not?

c) What challenges were encountered during multi-sectoral collaboration?

d) Were there specific (policy) instruments contributing to this collaboration? If yes, what were they and how did they contribute?

E.g., funding required or encouraged multi-sector collaboration or a specific program that accepts multi-sectoral projects

[Note to interviewer: if the participant is aware of the content of the city's policies, then Q19 can be asked as a follow up question]

15) Are there examples of collaborations between the **municipality and private sector** (businesses) with the planning or realization of green spaces (on private or public land)?

a) If yes, how was the private sector involved, and what was their interest?

E.g., with gaining an understanding of issues and opportunities, vision making, decision-making, implementation, with the setting up of monitoring and evaluation, or a combination of these -or other- examples?

b) What did the involvement of the private sector lead to, and was it considered as beneficial/successful? Why or why not?

c) What challenges were encountered during collaboration with the private sector?

d) Were there specific (policy) instruments contributing to this collaboration? If yes, what were they and how did they contribute?

E.g., specific funding or program for public-private partnerships.

[Note to interviewer: if the participant is aware of the content of the city's policies, then Q20 and Q21 can be asked as follow up questions]

16) Are there examples of collaboration between **municipality and citizens/civil society** in the planning and implementation of urban green spaces?

[Note: we are interested in more than just informing the public, but rather e.g., them giving input or having decision-making power]

a) How were they involved?

E.g., with gaining an understanding of issues and opportunities, vision making, decision-making, implementation, with the setting up of monitoring and evaluation, or a combination of these -or other- examples?

b) Were attempts made to include vulnerable or marginalized groups (e.g., women, minorities)? How successful was this?

c) What did the citizen involvement lead to and was it considered as beneficial/successful? Why or why not?

d) What challenges were encountered?

e) Were there specific (policy) instruments contributing to this collaboration? If yes, what were they and how did they contribute?

E.g., funding required or encouraged co-creation with citizens or a specific program that accepts co-creation projects.

[Note to interviewer: if the participant is aware of the content of the city's policies, then Q22 can be asked as a follow up question]

17) Are there examples of collaboration between **municipality, citizens/civil society and private sector** in the planning and implementation of urban green spaces?

a) How were the different groups involved?

E.g., with gaining an understanding of issues and opportunities, vision making, decision-making, implementation, with the setting up of monitoring and evaluation, or a combination of these -or other- examples?

b) What did the collaboration lead to and was it considered as beneficial/successful? Why or why not?

c) What challenges were encountered during this type of collaboration?

d) Were there specific (policy) instruments contributing to this collaboration? If yes, what were they and how did they contribute?

E.g., funding required or encouraged collaboration with citizens and private sector or a specific program that accepts projects in which municipality, citizens and private sector collaborates.

[Note to interviewer: if the participant is aware of the content of the city's policies, then Q23 can be asked as a follow up question]

18) Are there examples of "Grassroots Initiatives" (citizens organize themselves and (re)develop and/or manage a green space themselves, with no decision-making of the city involved) in your city?

a) What is the city's response to these initiatives?

E.g., no response/letting it happen, shutting it down, encouraging through supporting an initiative with resources or having a policy instrument where citizens can apply for funding or other support. [Note to interviewer: if the participant is aware of the content of the city's policies, then Q24 can be asked as a follow up question]

6. Policies supporting different governance approaches

19) Do your city's policies for urban green space stimulate collaboration between multiple sectors in the planning and implementation of urban green? If yes, what result did it have?

E.g., new (type of) projects, new (type of) collaborations, green spaces designed to provide more benefits, more public support for the city's plans.

20) Do your city's policies for urban green space stimulate the collaboration between public and private partners? If yes, what result did it have?

E.g. new (type of) projects, new (type of) collaborations, green spaces designed to provide more benefits (that are also interesting for private partners), increased involvement of private sector regarding urban green spaces or elements.

21) Do your city's policies for urban green space stimulate the development of improved green spaces on private lands (e.g., on business parks or private gardens)? If yes, what result did it have?

E.g., new (type of) projects, new (type of) collaborations, more (multi-beneficial) green spaces and elements on privately owned land, mobility of private land owners to improve (their) urban green spaces or elements.

22) Do your city's policies for urban green space stimulate collaboration with citizens? If yes, what result did it have?

E.g., new (type of) projects, new (type of) collaborations, green spaces designed to the better meet the needs of citizens and/or vulnerable groups and minorities, more public support for the city's plans.

23) Do your city's policies for urban green space stimulate the collaboration between municipality, citizens **and** private sector for the planning and implementation of urban green? If yes, what result did it have?

E.g., new (type of) projects, new (type of) collaborations, green spaces designed to provide more benefits, more public support for the city's plans.

24) Does your city have policies that encourage or support citizens to improve and manage public (green) spaces or elements (grassroots initiatives)? If yes, what result did it have? *E.g., new (type of) projects, new (type of) collaborations, increased stewardship, more public support for urban green spaces or elements.*

7. Outlook (only for participants that are part of the CFP)

25) Are you aware that within INTERLACE, city-specific instruments should be co-produced and tested during the project duration?

Info: Activity is planned to built on the Urban NBS Governance Atlas and thus to start in M20 only. However, the city focal points should be made aware that this task is foreseen and coming so that they can include this in their internal planning processes.

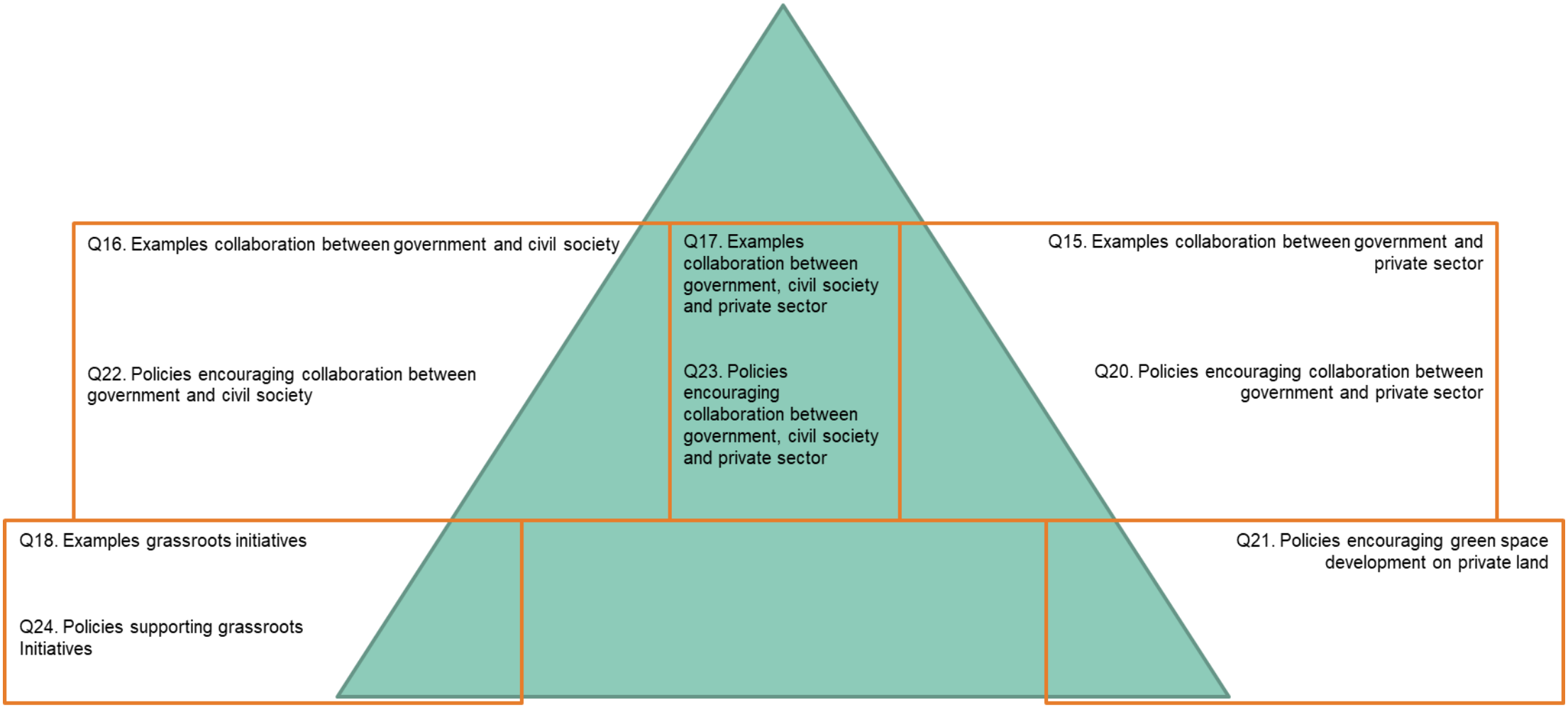
8. Closure of interview

26) Do you have anything to add based on what we discussed today?

27) Can you recommend other individuals involved with the governance of urban green spaces of the city, which you would suggest we interview? These can be people from within your city (e.g., other departments) or external partners with who the city collaborated.

28) Thank the participant(s) for their time and input. Ask if we can contact them again in case of any follow-up questions, and if they would like to see the notes/summaries of the interview for validation. Include in the closure that we will send them a copy of the report, and that also other governance (WP2) products will be shared with them (e.g., the Governance Atlas).

Governance triangle



Annex B. City results

CBIMA

Context of the city

CBIMA (Corredor Biológico Interurbano Maria Aguilar) is a Biological Corridor established by the National System of Conservation Areas (SINAC) as a conservation strategy to protect the Maria Aguilar River and surrounding areas to achieve ecological connectivity and improve human wellbeing. It is directed by a Local Committee (Comité Local) as an inter-institutional governance body that is made up of different stakeholders. It includes five municipalities that are part of the corridor (Alajuelita, Curridabat, San José, La Unión, Montes de Oca) and other public institutions and private stakeholders of the area. Local governments have a key role in CBIMA because they administer the territories. CBIMA is located in the metropolitan area of Costa Rica and covers an area of 3876,63 hectares of which 62.46% is urban land and 29,04% is green space.

This Biological Corridor was born as a response to concerns about the rapid expansion of residential and commercial land uses, illegal encroachments that affected riverbanks, environmental contamination affecting public health, fragmented landscapes, disaster risk, threatened biodiversity and surface water quality. Insufficient ecosystem connectivity of the area had increased species vulnerability. Furthermore, each inhabitant of this biological corridor has 0.95m2 of green space, which is far below the 10 m² established by the World Health Organization. Therefore, elements such as the availability, accessibility and quality of these spaces are the main challenges facing the CBIMA in this matter.

Each of the 5 municipalities of CBIMA each have their own regulation plans for the development of their territory, and each has their own management of green spaces. CBIMA does not have an overarching policy for the implementation and management specifically for urban green spaces for the combined territories (it does for the river corridor). Urban green spaces are heterogeneous and depend a lot on the vision of the municipality that administers it, on the resources available to the municipality and on the decisions taken in the past by the administrators of the territories.

Governance forms

Policymaking
Network governance
• Multi-scale and multi-stakeholder processes were conducted for the development of a policy for the Maria Aguilar river corridor. Intergovernmental, national and local governments collaborated for the development of the policy (such as the 5 municipalities that are part of the corridor, the Ministry of Environment, Institute of Housing and Urbanism, UNDP). Furthermore, civil society was involved such as NGOs and community groups. These policies guides cities towards good practices for the corridor. However, the lack of knowledge among some officials hinders the management of these spaces.
Policy implementation
Network governance
• Alliances between government and civil society does exist in the CBIMA. They link the local government and organized community groups with planning, project management, proposal generation, design, execution, maintenance, and the search for financing mechanisms. This type of participation is generated from a need felt by the community that is answered by the local government. • The strategic alliances with certain neighbourhood associations have been very positive to give maintenance to green

space since many of the institutions do not have the resources to do so.

- CBIMA through its local committee has implemented strategies to involve different stakeholders around the Maria Aguilar river to work to improve the integrity of ecosystems surrounding this water body and contributing to biological connectivity and people wellbeing. The municipalities of CBIMA had tried to develop participatory processes and to involve neighbourhood committees, blue flag committees, watershed committees, associations, non-formal neighbourhood committees as a reflection of participatory and voluntary governance mechanisms and resulted in participatory reforestation, citizen science brigades, green space interventions among other activities.
- The INVU (National Institute of Housing and Urbanism) - SINAC strategy for the elaboration of the policy for the recovery of protection areas stands out as a result. This policy aims to generate the strategic and national action framework for the recovery of the tree cover and protection of the protection areas of rivers, streams, and springs, with the purpose of facilitating the spaces and mechanisms for joint work between the different social and institutional actors that allow environmental sustainability, the protection of these areas and the generation of multiple benefits for the population. The municipalities are concerned about the lack of economic resources to carry it out.
- Working with underrepresented groups is a challenge since from the officials who work on the issue of green spaces there is no experience with this type of population.
- Currently, participatory processes are not true citizen participation, because it is usually the same people who join the various processes and underrepresented groups are rarely represented. It is necessary to improve the methodology of working with the various social actors so that they have a real representativeness and that more and more citizens join the processes. Another important aspect mentioned by the interviewees is that there is no policy that encourages citizens to improve and manage green spaces.

Public-private partnerships

- Law requires real estate developers to leave between 5 - 20% of the space for parks (depending on the average size of the lots, the intended land use and the development plans of the municipality).
    - Municipalities had made mistakes in the past accepting land for parks and public green space from developers in steep slopes, with accessibility issues, bad soil quality among other factors that compromise the quality and availability of green space in the city. Participants wanted this practice to change, developers should leave high quality spaces lots for the parks of the communities.
    - Sometimes developers don't contact the municipal environmental department when they are planning the green space or projects and implement green space lots that are in poor conditions or need a high investment to become an adequate green space.
- Examples of collaboration between municipalities and the private sector are with: Coca Cola, Florida Bebidas, Pozuelo, Colegio Federado de Ingenieros y de Arquitectos and CATIE through volunteer work in cleaning campaign, reforestation and educational activities.
    - The CBIMA Local Committee has worked with Namaterra Travel to intervene in specific sites of interest with corporate volunteering and have also worked together in environmental education. The Costa Rican Gerontological Association (AGEGO) has also worked with the committee in different sensibilization activities. Furthermore, CBIMA is working on a citizen science project and an accessibility project for the senior citizen, with a real estate company Portafolio and the Yamuni Tabush Foundation, respectively.

Challenges

Policymaking

- Low priority for green space policymaking:
    - The multiple labor obligations make the issue of creating a public policy on green space not a priority. For example, in one of the municipalities there is no official nor a department in charge of this whole process.
    - For many years, the priorities have been directed towards infrastructure of streets and roads.
    - Urban planning is regulated by each local government complying with regulations established by INVU through their regulation plans. However those plans don't always take into account other public policy guidelines (decarbonization, green infrastructure, ecological connectivity).
- Low uptake of NBS concept:
    - The concept of NBS and incentives for its implementation has not yet been taken up in regulatory plans (except for Curridabat) as the concept is still new. Curridabat includes the NBS in its regulatory plan and Montes de Oca contemplates certain elements that bring benefits to its inhabitants.

Policy implementation
Resources

• Insufficient resources to manage and restore existing green spaces:
  ○ Lacking personal and limited budget.
• Insufficient resources for implementation of new plans.
• Insufficient knowledge within municipality regarding urban green matters:
  ○ Insufficient knowledge of staff and officials in green area management, legal framework, and other related issues.
  ○ Lack of research related to the impact of nature-based solutions (NBS), to better justify and demonstrate the importance of their application.
  ○ Scientific knowledge and management skills are lacking to combat invasive (plant) species such as “elephant grass” (Pennisetum purpureum) which displaces native vegetation.

Collaboration

• Different visions, lack of consensus and little collaboration between stakeholders:
  ○ The vision of environmental departments is sometimes not shared by officials from other departments. Civil engineers, surveyors and other officials have a vision of grey infrastructure and not an integrative vision of spaces with green as an important element. This compromises the innovative creation of multifunctional spaces.
  ○ The work with other institutions, other sectors and other departments of the municipalities (INVU-SINAC , MINAE, Presidential House, MIDEPLAN, International cooperation and municipalities of the Greater Metropolitan Area) is a challenge because teamwork and individual visions to improve urban green spaces is an issue.
  ○ The lack of internal coordination between municipalities weakens the processes. There is a lack of consensus for the creation and management of green spaces.
• Lacking agreements on responsibility for implementation:
  ○ The Ministry of Environment is by law entitled to the protection areas bordering water bodies within the country. This creates conflicts with municipalities on who should take care of the green spaces. Both lack resources to do so. Local governments consider that work on these green spaces should be done 50% by the Ministry of Environment and 50% by the municipalities.

Designing NBS

• Difficulties in making green spaces multifunctional:
  ○ Existing (small) green spaces should be renewed to meet the different requirements that users have to generate quality of life benefits.
  ○ NBS should also be accompanied by measures that promote sustainable food and production styles, from a circular economy approach.

Public awareness and support

• Low public awareness and support:
  ○ Low community participation for local plans.
  ○ There is a part of society that is not aware of the importance of maintaining green spaces. At CBIMA a considerable amount of public green space has been invaded or are open dumps. All these reflects the need for environmental education programs directed at different target groups.

Policy
• Lack of a cross-municipal green space policy and set of instruments: ○ The management of green spaces is carried out very individualized per municipality. The planning is not carried out according to a unified vision of the territory. Intersectoral and inter-institutional work on green space issues should be a goal for CBIMA to aim for.
Private sector
• Real estate developers who do not always include the environmental considerations in their plans.

Supporting factors

- **Citizen participation:**
  - Active demands (from citizens) for better green public space are key elements to improve municipal work.
  - Working with local communities contributes to designing and developing better projects that positively impact climate, nature, and people.
  - Strategic alliances with certain neighbourhood associations have been very positive to give maintenance to green space since many of the institutions do not have the resources to do so. San José and Hatillo have advanced with this methodology, so it is applicable to the CBIMA.
- **Support from local to national policies and instruments to give additional mandate for implementing NBS:**
  - Inclusion of NBS in the Nationally Determined Contributions (NDCs).
  - The Municipality of La Unión is developing an instrument to guarantee the sustainability of the socio-productive activities of the canton, as well as the improvement and use of natural resources. This tool is a Sustainable Development Regulation, to regulate existing and future productive activities in terms of their efficiency and environmental responsibility, as well as contribute to the recovery and conservation of degraded natural resources and landscapes and guarantee the protection of existing ones.
- **Political will and technical interest at municipal level:**
  - Among the factors that support the planning and management of these spaces are the political will of the mayor and the municipal council.
  - Because of political will and technical interest, the municipality of Alajuelita is creating a policy for the management of public spaces and the regulation of green areas to be included in their Regulation Plan.
- **International cooperation:**
  - Through international cooperation, the "Green Atlas" was generated, where currently maps and statistics called "Atlas of Ecosystem Services of the Greater Metropolitan Area (GAM)" can be viewed. This initiative provides geospatial information to a wide range of audiences, which include ministries, public entities, decision makers, local governments, interurban biological corridor management committees, researchers and civil society in general to support decision-making processes. The tool allows identifying sites where the presence of natural areas generates various benefits for the inhabitants, such as recreational spaces and microclimate, water supply, mental and physical health, carbon sequestration, provision and production of food, among others. In addition, it determines those regions with little link with ecosystem services and that require special attention through intelligent monitoring. This supports developing an adequate design of ecological connectivity and provision of green areas that provide quality of life to its inhabitants.
- **A common vision among institutions:**
  - To allow the realization of projects in conjunction with other institutions.
- **New financing schemes:**
  - The Municipality of La Unión has a “water factor” or “water rate” for several years, that allows financing conservation actions or purchase of lands with forest, through the payment of the water environmental service.

Needs

- Increase knowledge amongst municipal officials to facilitate improved management of green spaces:
    - It is deemed necessary to empower the municipalities and train its officials about their competences according to the national law, and local rules. This can be done from the *CBIMA por la naturaleza*.
    - The importance of having informed local governments.
    - Knowledge of the legal framework on green spaces.
- Tools to build public policies.
- Technological tools (geographic information systems) that allow the visualization of data (geospatial location).
- Tools for decision making with local communities.
- To incorporate the formal education sector to develop a joint strategy towards environmental, research and development issues.

Chemnitz

Context of the city

The City of Chemnitz in Saxony (Germany) is an intermediary sized city. Major building activity has been taking place in Chemnitz's centre since 1999, filling the vast open space left by WWII destruction and post-war demolition. Chemnitz is the city with the highest share of green space per person in Saxony (6ha), but the centre is very sealed and the streets are very wide resulting in heat islands. Besides the reduction of heat islands, the city targets to increase biodiversity, increase environmental education/awareness, improve flood protection / reduction of spring tide, increase liveability and aesthetics of neighbourhoods, as well as reduce noise amongst others, through greening.

The urban development concept (SEKo) is a city-wide development program for 10 years and it is the guideline for action for the open and green spaces. The urban development plan is currently under the process of being updated. Within the framework the essential projects are described in detail that the city aims to implement by 2020. The SEKo covers many areas such as education and transport. The green spaces for the entire city are to be networked and structural green spaces are to be secured and, if necessary, supplemented. Besides increasing the connectivity of green spaces, it also aims to realize meaningful additions of green spaces.

The Urban Nature Master Plan (Masterplan Stadtnatur) aims to further strengthen green space, connecting them and to provide a response to the (cross-sectoral) challenges Chemnitz faces. At the time of writing the plan is still under development and should bring all the policies and ambitions of Chemnitz related to urban nature in one place to create more clarity for decision makers from different departments. The Master Plan is a prerequisite to apply for funding at the federal level.

Governance forms

Policymaking
Network governance
• For the development of the Urban Nature Master Plan, different municipal departments collaborated, such as the Parks Department, Environment Department, Urban Planning Department, and Health Department. Furthermore, the city also collaborated with TU Dresden for input through studies and citizens participated through a survey to provide input on what they want.
Collaborative governance
• All municipal departments were involved during the development of SEKo (a city-wide development program for 10 years), as well as other external stakeholders. Companies (e.g., energy industry, housing industry), social and environmental associations and social groups were involved. The city planning office had the lead and through working groups various topics were discussed. The collaboration resulted in a consensual joint working paper.

Policy implementation

Network governance

- Chemnitz works with “Neighbourhood concepts”, which aims to create more (and nearer) green and more energy efficient neighbourhoods. This is being developed in collaboration with an array of different actors, such as universities (TU Dresden, TU Chemnitz), energy suppliers and citizens. The involved actors defined common goals and shared costs, supported by the presence of a funding programme. Citizen participation is also an important aspect in the development of plans and projects. Neighbourhood managers are positive about the close involvement of citizens through citizen’s platforms.
- A railway crossing in Chemnitz will be turned into a green corridor (called Pleißenbach). The transformation to a green corridor was taken up in the SEKo. When the railway company requested for subsequent commercial use of the railway, the plans in the SEKo overruled the request. With participation of the municipality (politics and different administrations) and citizens a framework plan was developed, which strengthened the decision to realize the green corridor. The municipality purchased the land, which was unique to do for such a scale for urban green spaces. With the purchase, there was pressure to implement the plans and was further supported by the urban green funding program and the SEKo. All planning instruments that exist were applied. The planning included development of apartments, green and water, and therefore included different sectors. Exchange between different stakeholders and the administration happened through a joint working group in which decision-makers were present as well. This resulted in short administrative channels (fast decision-making and action). When there was disagreement between parties, a referee would try to solve them. The corridor was developed piece by piece over the years and is considered a success.
- Participation in planning processes is mandatory by law in Germany. Citizen participation in planning is applied in varying degrees in Chemnitz. There is a citizen participation team in Chemnitz, i.e. each department has a position for citizen participation. During citizen participation, attempts are made to address all groups, but it is not known how well this works. However, there are advisory councils for specific groups in the city, such as a senior citizens' advisory council, a migration advisory council, an advisory council for the disabled, etc. The advisory councils advise the politics and administration in Chemnitz. It is assumed that the advisory councils are heard as needed when the relevant groups are affected. When it comes to playgrounds, children/youth are explicitly addressed.
- In 2019, a new instrument for citizen participation was permanently installed, called citizens’ platforms. In order to put other districts on an equal footing, citizens' platforms have been set up and are part of the public bodies. Eight locations received their own platform with local representation, local chiefs, local councils and have political vote. The citizens’ representatives are included in the usual procedures as public interest groups but also proactively contribute with suggestions. Also underrepresented groups are aimed to be part of the platforms.
- The environmental centre is a contact point for citizens. They organize information events, there are discussions, also between administration and citizens (not only about green spaces). Furthermore, there is a participation portal for the Saxony province with current participation opportunities and Chemnitz also has a website on which the current participation processes are listed.
- The local community is also sometimes involved with the implementation and management. For example, a park in front of a housing association was created together with its residents or flowering meadows that were funded by the city, but implemented locally (by district managers, the Environment Centre and citizens). At the green spaces office there is the possibility to volunteer as a helper for green spaces, and citizens can sign up for tree sponsorships. They can take up the pruning, weeding and watering of individual trees on the street (not in parks). The Park Department hopes that more citizens take up tree sponsorships in the future so that they have less management work.
- Furthermore, there are collaborations with associations who take care of neglected green spaces and try to redesign them. The city tries to cooperate while keeping their own costs as low as possible. However, there are still legal unclarities, which are currently in a process of figuring out, such as insurance if someone gets hurt at these green spaces, who owns the land, who will pay for the maintenance if the associations stop with their work, etc. Working with such associations, which want quick action, is at odds with the usual administrative structures of the city, who are relatively slow in their response to provide guidance, material or legal clarity. Protocols for such collaborations may improve them.

Public-private partnerships

- No collaboration with the private sector has been mentioned during the interviews (as in public-private partnerships), however there are regulations for private lands regarding green space:
  - Statutes are proposed for green roofs and facades (especially for companies) and greening of parking lots (both public and private, especially larger parking lots such as parking lots at supermarkets). Also a statute on prohibition of gravel gardens is proposed. Statutes are in principle obligatory, but exceptions are possible.
  - For new industrial areas or large construction projects, compensation areas for nature conservation must be developed within the city boundaries by the responsible body.

Grassroots initiatives
• There are a few associations who take care of neglected green spaces and try to redesign them. The city tries to cooperate while keeping their own costs as low as possible. However, there are still legal unclarities, which are currently in a process of figuring out, such as insurance if someone gets hurt at these green spaces, who owns the land, who will pay for the maintenance if the associations stop with their work, etc. Working with such associations, which want quick action, is at odds with the usual administrative structures of the city, who are relatively slow in their response to provide guidance, material or legal clarity. Protocols for such collaborations may improve them.

Challenges

Policymaking
• For new policies, management must be clarified in advance as the Parks Department / Green Areas Management Authority is not well equipped financially to also take additional maintenance. • Effects of multifunctionality are difficult to estimate.   ○ How much does it actually contribute to other areas (e.g., the effect of a row of additional trees on health or noise reduction)? • Not a high priority for some political parties. Some political orientations are not as open to it.
Policy implementation
Resources

• Insufficient resources to manage and monitor existing green spaces to implement new plans:
  ○ Limited budget.
  ○ Planning funds are available, but implementation is difficult as there is a lack of funding. The municipality is always dependent on funding programs.
• Insufficient staff to manage and monitor existing green spaces and to implement new plans:
  ○ Lacking personal.

Collaboration

• Difficulties in creating a shared vision and approach during multi-actor processes:
  ○ The complex process combined with the different interests and opinions make the balancing process difficult in order to achieve a result that everyone can conclude and agree on.
• Slow, little or lacking coordination and communication between municipal departments:
  ○ There is regular collaboration between municipal departments, and it creates meaningful linkages during local planning. E.g., the city planning office, the environmental office, the green spaces office, and sometimes the civil engineering office discuss regularly. An example of this result is that flood protection / retention areas also serve nature conservation. However, participants also experienced challenges during inter-municipal collaboration.
  ○ Coordination between departments that collaborate could be better. The responsibilities of each department are difficult to understand among each other and there are long administrative channels (decisions take a long time).
  ○ Communication between departments on project level is “okay” but in everyday life communication structures are not established. Consequently, the information flow within the departments is too slow or lacking. E.g., information from other departments is not forwarded.
  ○ Communication to external parties sometimes takes too long or is too inconsistent (as a result of poor communication between departments). As a result, windows of opportunity are closed again. E.g., investors are put off when sets of conditions change because of poor communication between departments.
• Difficulties with involving a more diverse user groups:
  ○ Will be taken into account in order to improve the involvement process.

Decision-making

• Short term (economic) choices and benefits vs. long term benefits:
  ○ There is a tendency to implement things quickly, so the long term perspective is sometimes neglected.
  ○ Strong conflicts of interest regarding land/surface use (e.g., between parking lots, building area and additional green space).
  ○ Grey infrastructure is chosen by the Parks Department, because at first glance less costly in the maintenance.

Supporting factors

- Policies from local and higher level supporting urban nature.
- Vision from a higher level (federal / EU) that can guide and inspire cities.
- Stricter legislation combined with financing tools.
- For funding, but also to apply for funding the federal government required an Urban Nature Master Plan, which was an important driver to develop one in Chemnitz.
- The Urban Nature Master Plan is (seen as) an improvement for more and better networked green spaces in Chemnitz when it is finalized. It places all info on urban nature in one place and should create clarity for decision makers.
- Having decision-makers (political parties) that prioritize urban green spaces on the agenda. Implementation process remains the same, but lead time is easier.
- Long-term financing.
- A strong vision with clear goals and consensus among partners that allows for smooth collaboration:
    - Long-term systemic thinking.
    - A consistent picture of where a project should go, i.e. what task should green space perform, why is it there, etc. A rationale for why it should be maintained and worth preserving.
    - The city decides in favour of vision which then needs to be communicated at all city development departments and also be converted into functioning statutes.
- Understanding of the multifunctionality aspect by (in case of large projects, external) planners and architects. They play a key role in its design.
- Involvement of economic actors, so NBS can be implemented on private terrains or that the private sector implements NBS on public terrain.
- Incorporation of wishes of citizens.
- Involvement of other offices in planning to take care to link as many functions as possible in a meaningful way.
- Champions to lead new and innovative developments.

Needs

- Good practical examples:
    - Good examples of urban green policies as inspiration. In Chemnitz there is less visionary thinking about urban green spaces.
- Evidence of (multifunctional) benefits:
    - To be able to prove positive effects of green spaces with numbers (e.g., positive effects on health of urban nature) and to be able to practice fact-based politics.
    - As concrete as possible for the project at hand instead of abstract extrapolations.
    - Also monitory to motivate decisions for green solutions rather than grey solutions.
- Better understanding of the NBS concept needed within the administration but also at architectural firms.
- Tools to transform “regular green space” into NBS that has been specifically designed to provide multiple benefits.
- Tools for planning with different actors, so that not everything is done at department level.

Envigado

Context of the city

The municipality of Envigado (Antioquia, Colombia) is part of the metropolitan area of the Aburrá Valley, which is made up of ten municipalities including Medellín. Envigado has high population density and the city aims to realize sufficient green public spaces for its population. The goal is to have 15.3 square meter of green spaces per inhabitant by 2030. Given that the city is already established, over-urbanized and having limited public spaces, the challenge is to improve and create green spaces. Reconverting grey areas into green is seen as a challenge. Furthermore, the height of new buildings affect current green such as trees.

Although the construction of buildings and housing was a necessity for the population, its accelerated growth has led to problems. In the past there were no clear policies for green spaces and little guidelines or strategies which resulted in regulatory gaps. For example, some green corridors have been lost due to inappropriate development processes and it is a challenge to restore them. Other issues with construction of buildings in Envigado are that building permits do not or poorly consider environmental aspects and that there are private lands located inside protected areas.

The main policy in Envigado is the Land Use Planning policy, hereafter POT (Plan de Ordenamiento Territorial). The Green Space Plan of 2018 was included in the POT of 2019. The POT guides and dictates the possible land uses in the municipality, including management of urban green and protected areas as a response to revert disorganized urbanization processes. It determines the optimum green space per inhabitant value and the adequate ecological structure. It also guides the Local Protected Areas System (SILAPE) for both rural and urban areas.

Challenges the city is facing are the protection of the creeks' retreats and high slopes which are under threat from urbanization. At the same time, urbanization contributes to challenges such as deforestation, deterioration of watersheds, the decrease of green space through real estate developments. At present it is done under compliance with the norm, however it has gaps that can harm the environment. Furthermore, the city aims to find a response to heat island effects, poor air quality, landslides and floods, while aiming to improve biological corridors, landscape enjoyment and recreation.

Governance forms

Policymaking
Intragovernmental collaboration
• The Planning Office, with the participation of the Environmental Office, Transportation Office, Works Office, and Education Office developed the Green Space Plan, which was later incorporated into the POT. Results of this collaboration were reaching a consensual plan, strengthening governance and cohesion between sectors. However, there is still work to be done to further improve these aspects.

Network governance

- Multiple municipal departments were involved with the development of the POT. The Planning Administrative Office led the POT formulation with collaboration of the Environmental Office, Mobility and Transportation Office, Public Works Office. Each involved sector reflects its own interest in the POT. As an example, the Environmental Office´s interest in protected areas was institutionalized in the POT and in the establishment of the Local Protected Areas System - SILAPE, and four years later, protected lands were declared based on that. Two other direct impacts were the Main Ecological Structure concept and the green space per inhabitant indicator inclusion in the POT. In addition, there were also cross-sectoral impacts, such as the creation of a sustainable Transportation Committee.
- The CTP (Territorial Planning Council of the municipality of Envigado) was involved in the development of the recent POT (2019). The CTP includes voices of LGTBI, minorities, Afro-Colombians, sport, and private sector communities, among others.

Policy implementation

Network governance

- All plans have a citizen participation component. The community accompanies and observes the processes, their views are taken into account and complaints are addressed. However, the interviews also indicate that the municipality could go further in this. An explicit intention is missing and a higher level of citizen commitment could be reached if they would feel more heard.
- There are multiple projects in which citizens were involved:
    - Citizens have participated in the Public Space and Urban Trees Plan and requested for such spaces to be improved and have a good quality.
    - El Dorado urban park was built and designed as the result of citizen consultation and vigilance. Initially, there was a fear that once the parks were built the community would not use them, or that green areas became unsafe. As a result of citizen involvement, citizens use the park, take care of the park, and feel safe in the park.
    - The creation of the Cerro Tutelar Protected Area has been a participatory process, which was born as a demand from the community.
    - Entre Senderos park was part of an initiative between the municipality and community consultation. The community selected the proposal for the park, which was then implemented. It is a passive recreation park for the contemplation and enjoyment of nature, with composting activities and learning of resource management, and spaces for the community.
    - Las Mariposas Park: This park was built and paid by the community with the support of the Municipality. Now it is open to everyone.
    - There are some other initiatives such as composting in urban parks, and environmental education.
- Universities are frequently hired as consultants to certain studies, and there is cooperation with institutions such as Humboldt and the Medellin's Botanical Garden. This is usually in the form of technical support for environmental authorities or guidance for the incorporation of regulations. As a result, knowledge of the territory is increased from scientific studies, and this knowledge can be applied to improve the management of the territory.

Collaborative governance

- There are committees by each of the 13 territorial zones of the municipality (9 urban and 4 rural). This mechanism is a law mandate. The community, the education sector, the state, and the private sector form these committees. They can also have a professional committee for technical advice. They accompany the planning processes of all kinds of municipal actions projects, not only for urban green spaces. Their involvement depends on the area and the projects that are taking place. While there is collaboration between multiple sectors, the fact that this is a mandate by law is a weakness of this collaboration as they participate by obligation and not by personal motivation.

Public-private partnerships

- There is little agreement-based collaboration with the private sector on green spaces, most of it is limited to regulations:
    - EPM (a public-private company that administers energy, water and sewerage) has supported restoration activities, but this was a small involvement.
    - The Municipality offers support to private owners for restoration (providing plants and technical advice), but this is very little in urban areas.
    - The creation of green spaces is encouraged through regulations such as the occupation index, which defines the footprint that an urban development should have. If the project does not reach the optimum value, it has to compensate in a public space at a rate of 1:1, 1:2: 1:3 or 1:4, depending on the characteristics of the project and area. This index is also applied to the building height. The higher the building the higher the green space it has to implement or thus compensate.
        - Building in high-risk flood areas cannot be licensed as easily as before, detailed studies are needed, where mitigation measures are proposed to reverse the threat or risk. By having more knowledge about the threats the development is restricted. Although the social and environmental aspects do not directly restrict development, they do generate alerts for which the Municipality must generate actions that generate solutions to improve the quality of life.

Grassroots initiatives

- Citizen concerns and involvement key to claim green spaces instead of more real estate development:
    - Due to the “abuse” from real estate developers, the community organized themselves. The citizens felt affected by the disorderly urbanization processes that was negatively impacting natural resources. For this reason, they held demonstrations, took legal actions such as the ‘Popular Action instrument’ (a law mechanism for citizens to claim and ensure their rights) and the ‘Right of Petition’ (a petition against the real estate developers), and had dialogues with the Mayor. As a result, the communities managed to stop the construction works, re-gained public spaces and donated it to altruistic organizations. Later this space was used to build a park (La Guayacana).
    - The citizen protests gained more traction as they were accompanied by affirmative actions such as alternative proposals (e.g., the protests at Corantioquia, lead to the Guayacana park). These affirmative actions were disclosed by all means: social networks, local press, etc.
    - The community is an active observer of the construction and development processes in the city. They are critical and aim to protect green spaces. There is a strong relationship between the Municipality and the community, even though sometimes it brings difficulties.
- The Trianon Wetland initiative was born from a grassroots group, but there is a lack of cohesion among them. There is another group called “Colectivo Cuidadano” that defends urban parks. There is a potential to working with them in environmental activities.

Challenges

Policymaking

- It was challenging to realize a paradigm break that protected areas could also be realized in cities and not only in pristine rural areas (e.g., within the Amazon). To introduce conservation policies within an urban setting was new for the planners and citizens.
- Impacts from collaboration (among others, with the regional government and real estate developers) during policymaking are generally low and few concrete commitments are achieved. It was not possible to harmonize opinions and interests.
- The low representativeness of the Social Wellbeing Office in planning and implementing environmental policies.
- Within the city there was a lack of knowledge on considering the needs of citizens in their policymaking (e.g., the POT). As a result, a tension was created between development, social welfare, and environmental aspects.
- Political interests may privilege development sectors above the environment.

Policy implementation

Resources

- Insufficient resources for development of new green spaces:
    - There are insufficient resources to buy private lands, including private land inside Protected Areas.
    - Currently, most of the implementation resources are spent on building infrastructure. Investments for urban green space or the environment are limited.
- Insufficient continuity of staff:
    - Manpower: constant changes in professional staff.

Collaboration

• Little collaboration between different stakeholders (except citizens, see supporting factors):
  ○ Little social cohesion and integration of stakeholders.
  ○ Collaboration and coordination among sectors were challenging.
  ○ Weak synergies with regional bodies (such as the Regional Autonomous Corporation).
  ○ Collaboration is not stimulated by the municipality, little intention to let stakeholders participate. The municipality mainly tends to comply with the stipulations from norms and laws.

Designing NBS
• Insufficient scientific and technical knowledge to design for multiple benefits: ○ E.g., to formulate and implement the urban heat island effect issue.
Policy

• Planning policies are strong in theory, but implementation and enforcement of those policies is troublesome:
  ○ For example, adjacent land to springs and creeks need to be protected (30 m of protection for headwaters, 100 m for springs, etc.) but in reality it is not working that well due to lack of control.
• Insufficient policy cohesion:
  ○ The Transportation Plan tends to fragment ecosystems.
  ○ Some policies are out-dated (such as the Infrastructure Development Plan) which have a lack of integration of environmental aspects.

Limited space

• Scarcity of urban public lands:
  ○ Urban areas are densely populated, making it difficult to define places to be designated as new public green areas or protected areas.
  ○ Most of the space to develop new green areas is located on private lands, and the square meter is very expensive.

Private sector

• High pressure from - and poor response to - real estate development:
  ○ The insatiable appetite of real estate development.
  ○ The beliefs that concrete constructions are synonymous with progress and development.
  ○ Insufficient trust between the different actors.
  ○ Difficulties with dealing with private landowners.
  ○ On some occasions, removal of green spaces, e.g., builders knock down trees at night.
  ○ Insufficient instruments to regulate, align or deal with (big) developers.
  ○ Insufficient funds to pay for legal action fees.

Supporting factors

- **Policies and instruments supporting implementation of green spaces:**
  - POT (2019) is aligned with other policies (such as State Development Plan, Municipal Development Plan, other POTs, and the Metropolitan Area Development Plan), as well as local norms and regulations from Envigado, making it more effective.
  - There are some enabling instruments that regulate implementation and maintenance of green spaces that provide a budget for such actions. For example, the national law 99, art. 11, refers to land acquisition for conservation around water springs or water sources.
  - The 'Popular Action' and the 'Right of Petition' instruments (see grassroots).
- **Citizen awareness and considering societal needs:**
  - The residents are aware of their natural environment and demand that it does not lose quality, to maintain their quality of life or to avoid devaluation of their property.
  - Citizens' views on conservation are against decreasing green areas. The general opinion accepts the climate change concept and cares about wildlife in the city.
  - The Secretary of the Environment asked to study urban trees and the public green space availability. This initiative started from the citizen demand that has a high level of education and environmental awareness. The Urban Trees Plan was accompanied by workshops for

citizens. It was time to review and update the POT for which evidence was needed about green space and the quality of life of animals and people.
    - Considering societal needs made the parks successful. The functionality and inclusiveness (culture and community sharing) contributed to the active/passive enjoyment of the community.
- **Environmental awareness of public officials and taking leadership:**
    - Officials from different entities identify that if there is no implementation of multi-benefit green spaces, the quality of life of the municipality will be affected. Current public officials have more environmental awareness.
    - The Mayor was inclined to these topics.
    - A team of public officials took these topics into account and proposed different initiatives.
    - The Environmental Office leading was a key aspect which gave importance to biodiversity.
    - Within the Planning or the Environment Office, manuals and guides for sustainable construction have been developed, which were the basis for a policy in Envigado.
    - Successful communication and visibility of the environmental professionals.
- **Tools that help visualise the biological connectivity and biodiversity in urban ecosystems.**
- **Monitoring and evaluation of the POT:**
    - As a result, difficulties (e.g., public space deficit, heat islands) are detected and actions are proposed to solve these difficulties in following policy iterations.

Needs

- Tools to support collaborative spaces for multi-stakeholder processes for urban (green) development.
- Decision support systems for urban planning.
- Tools to identify environmental goods and services.
    - Technical tools to provide evidence about ecosystem services and adequate management.
- Tools that link management to specific land uses.
- Tools that help to better specify allowed and prohibited land uses.
- Tools to define concrete action regarding hydrologic planning.
- Tools for urban developers in order to include environmental aspects.
- Virtual communication tools. The pandemic has made the need for virtual communication tools evident. Such tools have widened the participation in a variety of age ranges.
- Sharing knowledge and examples of other consolidated (compact) cities that have succeeded in implementing NBS.

Granollers

Context of the city

The City of Granollers in Spain is located in the Metropolitan Region of Barcelona. Granollers is a small municipality located in a valley surrounded by mountains, a river, railways and agricultural land (La Plana de Palou) which is aimed to be maintained. Therefore, there is very little space to develop the city and it's green spaces. Between the 1960's and 1990's - also a period in which preserving the natural environment was not so fashionable - Granollers became very urbanized. One of the main consequences of this rapid urbanization was the pollution of the Congost river, a river which crosses Granollers. At that time, it was one of the most polluted rivers in Europe. During the last two decades, a huge amount of efforts have been focused on restoring the river. Nowadays, Granollers aims to increase the amount and enhance the value of green spaces, while facing the challenges of having densely urbanized spaces.

Important policies guiding the current developments of urban green are the Municipal Urban Planning Plan (POUM), Special Plan of Natural Heritage and the Green Space Master Plan. The POUM defines the strategies about how green space should be structured and sets out objectives and forecasts. The POUM was drafted in 2006, however, it is possible to add modifications within the framework to improve it. Since then, the conceptualization of the green structuring elements and the environmental policies have changed a lot. For example, the paradigm of the Sustainable Development Goals (SDGs) or challenges regarding climate change have been incorporated. The POUM provides the main guidelines and more detailed policies are specified in separate documents. The SDGs are a part of the agenda 2030 of Granollers, which was developed through a participatory process to define actions. One of the pillars focus environmental issues.

The Special Plan of Natural Heritage is a series of catalogues of the most important trees in the city, of the best-preserved natural spaces and of the green paths network. It provides guidance on how to preserve these spaces. The Green Space Master Plan deals with the management of parks and gardens in the city and addresses some issues of the most natural areas.

Early green space policies mainly focused on the aesthetic values of green. The more recent policies focus on a wider range of values, such as reducing heat island effects, increasing permeable soil, increasing retention and reuse of water, improving air quality (if this can be done by green spaces), increasing biodiversity as well as spaces for leisure and well-being.

Governance forms

Policymaking
Intragovernmental collaboration
• Now sustainability is considered as a cross-cutting theme, whereas before it was considered relevant only for the Environment and Green Spaces Service. A paradigm shift occurred by promoting more collaboration among municipal departments, also for policymaking for green spaces. E.g., through collaboration with the Department of Works and Projects, the Department of Urbanism and the Environment and Green Spaces Service, the decision was made that for each new development project within the city, 1/3 part should be green, 1/3 part should be soft (permeable pavement) and 1/3 should be hard urbanization. This is established in the Master Plan and greatly conditions new projects.
Intergovernmental Collaboration

- The experiences shared through intra-municipal working groups (at the scale of the province of Barcelona) are considered useful. There are working groups on water management, waste and the circular economy, noise and air quality, green spaces (particularly the development of green space indicators). All municipalities have similar objectives regarding these topics. Some municipalities have been able to move forward on some issues more than others. These groups help to move forward to those municipalities that are staying behind. Every four years, the municipalities decide which topics will be worked on, whether there will be conferences, whether a joint diagnostic study will be carried out, etc.
- A inter-municipal plan concerning air pollution was drawn up in 2016 by the Urban Ecology Agency and the Diputació de Barcelona (the regional provincial council of Barcelona) as a response to high levels of air pollution, but is not approved individually by the city councils.

Network governance

- The municipality has an Environmental and Sustainability Council. It is an advisory body that aims to advise, by qualified people with prestige, the issues related to the SDG.
    - In the past the council had a different composition and included associations, companies and citizens. It was more consultative. Most of the time information was provided unidirectional from the top to the bottom and the public could only give their opinion. The dynamic changed to advisory by inviting experts to give their qualified opinion from a professional point of view.
- The Science Museum of Granollers, the Universitat Politècnica de Catalunya (UPC), and the Cartographic and Geological Institute of Catalonia have provided data and input on solutions that ended up influencing the city when making policies.
    - E.g., sensors are used to measure the temperature at different heights of the trees, at different points on the street, along with another study that will detect the hotspots of the city through an aerial flight. The information on the hotspots will guide the decision for locations to intervene to increase the green area.

Policy implementation

Intragovernmental collaboration

- Within the administration there have been changes, an effort was made to learn, to be open to receiving inputs from each other, and for the transversal work within the city council. Compared to the past, more and more work is done together with several municipal departments.
- The application of a multilayered look (instead of working in silos) with municipal projects, making departments seeking for input from each other. In the past, sectoral policies were planned in isolation and there was no co-design between departments. It was difficult to incorporate different objectives into the projects. A paradigm shift was realized by promoting more coordination between departments.
- In the past, urban projects were carried out without consulting the Environment and Green Spaces Service. Many municipal departments did not take into account the needs of the trees they wanted to plant, e.g., the necessary space for the roots of the trees. Nowadays, there is joint work between municipal departments to incorporate urban green spaces, due to both the existence of the Master Plan and the work of the professionals of the Environment and Green Spaces Service that highlighted the necessity of joint work. The collaboration with the Environment and Green Spaces department implies a broader perspective to look at the programs and good practices that are being developed everywhere and try to implement them here.
    - The Environment and Green Spaces Service and the Economic Department have had joint projects on the promotion of regenerated water within the industrial sector, to promote the biogas, or even to ensure that the small river that passes through the middle of the polygon has a good environmental quality.
    - There is collaboration with the Education Department on the design of schoolyards (Let's make a garden-program, see also network governance). The Environment and Green Spaces Service is responsible for maintaining them and when they were not involved with the design, the projects did not thrive as the target group (children), management issues and resources were not sufficiently considered. The collaboration between the two departments improved this.
    - The Environment and Green Spaces Service decides on the vegetation to be planted on projects of the Works and Projects Department.
    - The construction of paths next to the river was done with involvement of the Health and Sports Department. They use and publish the green itineraries. Furthermore, there are regulations from the Health and Sports Department regarding public health (prevention of legionella) that affects the management of green spaces. To maintain a watered meadow, the irrigation system must be changed or there need to be other types of species such as shrubs adapted to the climate.
- However, the collaboration could be improved. Now they are often temporary and relatively small. There is usually one actor who leads it, and the other actor validates it. Some decisions are made but they are not always very consensual. Usually, one actor proposes what he/she wants to do, the others make amendments and improvements and give some follow-up support.

Network governance

- There are some examples of involving civil society in the planning and implementation of green spaces, but it is not standard practice for each project.
    - For the river restoration, a participatory approach was applied to understand how citizens saw the river, and how to strengthen the relationship between the inhabitants and the river. It's been 20 years since the first restorative actions in the river, and now it's one of the most popular places for people to walk and play sports. Citizens' perceptions of the river have changed positively.
    - The program "Let's make a garden" (fem un jardí) is based on the cooperation between schools and the city to design green spaces (e.g., a park near or adjacent to schools) with the schools and also do environmental education. It is a co-production process with the Environment and Green Spaces Service, the Department of Education, schools and children. The Environment and Green Spaces Service is responsible for maintaining them and guides the design to a realistic and implementable plan that takes into account management issues and resources. While being popular among schools, this project does not happen yearly because it requires a lot of work.
    - An association or a school can plant a tree and take care of its maintenance through a program called "Friends of the Trees" (Amics dels arbres). E.g., trees have been planted with a youth organization or as part of a meeting of an European project.
    - Some streets have been remodelled with collaboration with the residents in which green elements are added and in some cases maintained by the residents.
- There are governance bodies that promote participation of various (underrepresented) groups, such as the Children's Council and the Adolescent Council. E.g., in the Playable City Project, children are involved in the design of green space. On one occasion, a green space had to be refurbished and the plan was to change the children's play area. A local youth shelter was contacted and the youth was asked what they would like to find in the children's play area. Most were children of immigrant parents. The children made proposals.
- There are possibilities for stewardship agreements, but it is not widely known:
    - There is also the possibility that the city takes the stewardship of a privately owned land if it is made publicly available. This also gives the city the possibility to preserve the ecological functioning of the area.
    - The city tries to accept every proposal that comes from the citizens and give them some practical indications. Citizens do not end up participating in many of the activities the city council organises, so when it is the citizen who proposes, the city tries to accept the proposal. For instance, now a girl who is doing arts in high school wants to do graffiti in a green space.
    - Vegetation in public space can be managed by citizens. However, this is not always as successful as citizens might lose interest in the maintenance after a period of time. Plants may die and people abandon it. Also, it happened that the public perceives such locations as abandoned because it did not have proper maintenance.
- There are also examples of underrepresented groups involved with the management of green spaces (not governance):
    - There are allotment gardens managed by charity or schools as well as allotment gardens for social homes. There are instances of municipal plots intended for social housing which have not yet been built, and are allowed to be used as temporal urban gardens.
    - An agreement was made with the Department of Justice for 3 or 4 years, that prisoners could do the maintenance of a peri-urban area. It worked well, but after some time the prisoners came on their own and had to integrate them into the gardeners team. It caused doubts and complaints from the staff and the agreement stopped.
    - There was a program called "employment workshops", which established a one-year contract with unemployed people to develop tasks to improve a natural space. They had a theoretical part and a practical part on conservation and the program lasted 4 or 5 years.
    - A part of gardening is outsourced. One of the contracted companies works with people with disabilities.

Collaborative governance

- There is one recent example called the City Pact, which was made to recuperate the economic and social activity during the covid-19 pandemic. It was a participatory process through which several actions were identified and to be implemented by the City Council, other actions implemented by citizens and others by the local businesses. Forty measures were proposed to restore the dynamism of the city, which included the promotion of green spaces within the city. For instance, there was the proposal to encourage the participation of companies and citizens in making the city greener. They even talked about putting plants on the balconies, on the street, instead of always looking for the administration to make the green available to the citizens. The process was very accelerated as the Pact needed to be approved in two months, and it brought a lot of participatory and decisive dynamics. There were proposals made by citizens and companies and many of the contributions were in the political line of the City Council.

Public-private partnerships

- There is no collaboration with the private sector for the planning and implementation of urban green space. A few examples of collaborations are more about management and maintenance of green spaces or elements:
    - Some vegetation in public space is managed by private businesses. E.g., in the commercial streets of the city, the municipality put up vegetation in large pots as barriers to prevent terrorist attacks by vehicles. Small businesses (shopkeepers) and neighbours made a commitment to maintain them, of which some have worked properly. The city will evaluate if it works good enough or if the project should be rethought.
    - Some companies have participated in cleaning up the river through the "Let's Clean Up Europe" program. The city offered to disseminate their activities through the city's channels and to collect the waste they had picked up. The action is considered successful.
    - There was an agreement with the Ibis Hotel, located next to a forest, that the city would train the staff on environmental issues and in exchange the hotel cleans up the forest area from common waste and offers their customers the possibility to learn about ecological issues of the forest. This stopped when the hotel changed management, the new manager did not care about this agreement.
- Through regulation, the private sector has to compensate when building:
    - The City Council dictates the guidelines and criteria to be followed and the private sector drafts the projects. The private sector always has some fear about the amount of money they may need to spend. There is always this struggle to convince them about the quality of the new green space they will create. They have to see that it is an added value they have to integrate in the urban project.
- Participation and joint management are very costly. In some industrial estates, collaboration was tried, but it did not end up consolidating due to a lack of understanding between the individuals. When they have to put money, it is difficult to get a consensus.

Grassroots initiatives

- There are initiatives to clean up the river initiated by civil society. The City Council is not involved but when requested helps these initiatives by giving material, such as gloves and bags. The city advises them as they know the areas with landslides which are dangerous to go or to avoid bridges (for children) where people take drugs. The city gives permission which is mandatory to develop the activity. It was very popular 12 or 13 years ago, the whole Granollers river was cleaned in sections and many people participated, but now there are only two schools keeping it and some citizen projects. The main challenge is to deal with safety issues related to the activity. If an accident occurs, the city needs to cover the citizens. In the case of collaboration with a school, the student is already covered by the school insurance.
    - E.g., a music group called Congost, they make electronic music, they promoted a clean-up initiative of the river.

Challenges

Policymaking

- Politicization of green spaces:
    - Granollers is governed by a Municipal Action Program (PAM) that is determined by the political program. To achieve long-term beneficial and sustainable green spaces, these policies should be made from a technical (objective) point of view, and not from an electoral point of view. The public opinion influences the implementation of certain policies, and some of them are not finally executed. The ruler is very powerful.
    - Due to the political system there are elections every four years, most things end up being part of a political campaign. It creates barriers with citizens. It would be interesting to give them objective information instead of a political discourse.
    - There was a clear evolution towards the naturalization of green spaces management, and also an increase of citizen participation. But if there is a government change, it may have a different management view and change the policies towards a more traditional view of green space management that would give electoral profitability. Most citizens tend to mainly value aesthetic green (see also later).
- Different vision between the city council and the Environment and Green Spaces Service:
    - The Environment and Green Spaces Service wants to introduce some "risky policies", such as reducing car parking spots to create space for green spaces. Due to the limited space, such "risky policies" are needed to improve the urban green spaces according to an interviewee. The municipal government pulls these back as they fear criticism from citizens. In some cases this leads to tensions between politicians and the department.
- Insufficient resources:
    - Staff is oversaturated with work and has issues with reaching the (strict) deadlines of the administration.
    - There are ambitions and structures in place for supra-municipal collaboration on joint issues (such as the working groups of the "Diputació de Barcelona" (a regional administration)). There could be opportunities to create joint urban green space policies with neighbouring municipalities. However, there are no resources to pull proposals

forward. Also the lack of time of municipal staff is an issue.

Policy implementation

Resources

- Insufficient funding for maintenance and implementation of green spaces:
  - The Environment and Green Spaces Service has their own basic budget to carry out maintenance of green spaces, but for innovative projects (such as the restoration of the Congost river) it is dependent on external funding. Currently, there is funding from multiple EU projects, when this ends there may be a large deficit of funding for innovative projects.
  - Cleaning rubbish is a substantial expense that could have been spent on e.g., plantations or environmental education. During recent years, there have been many illegal spills and the presence of rubbish. Furthermore, even though urban green spaces are considered public roads, they are not cleaned by the cleaning brigade of the city. The pay rate of the Environment and Green Spaces Service's staff is higher than the garbage collectors.
  - Little yearly budget for (environmental) activities in green spaces to increase green and raise public awareness (this year no budget due to the COVID pandemic). The department has to use their own resources meant for maintenance of the green spaces.
  - The Environment and Green Spaces Service participates in policymaking during the course of the legislature. Many plans are made but they are not scheduled nor have their own budget.
- Lacking tools and resources for monitoring of project impacts:
  - There is a lack of tools and resources to monitor everything that has been done. The departments value certain projects as technically successful and the perception of experts is good about them. However, there is no scientific evidence that those projects have a positive impact. For example, a strong commitment to improve the quality of the river was made. However, there is no data to prove that the restoration actions mitigate the impacts of flooding. Moreover, if there is a strong flood there may be impacts anyway. Therefore, the city's claim of success could be misunderstood if there is no evidence to prove it.

Collaboration

- Instances of little or late collaboration across departments:
  - Although collaborations across municipal departments substantially improved over the years, sometimes the request for collaboration or request for advice comes at a very late stage. It is harder to provide new ideas or steer the content when a policy or action has already had an extensive design process. Early collaboration should increasingly be promoted.
  - The POUM (implemented by the Works and Projects Department) determines the free spaces in the city. Free space means that it is not buildable. However, most of these free spaces are grey as they can also be parking lots and squares without any green. There could have been opportunities to include more green in these spaces. However, there is a paradigm shift. The Works and Projects Department aims to collaborate more with the Environment Service to integrate projects. One participant thinks more integrated work can be done by including climate change mitigation measures, greening measures, more drainage zones, a gender perspective, benefits of green spaces, etc.
- Insufficient coordination between participatory processes:
  - It happens that similar participatory processes with citizens are created by different municipal departments. This can create confusion and overloading of citizens, and is inefficient use of resources. New proposals have been made to better coordinate and align participatory processes to make participation clearer and easier for citizens.
  - Also communication about on-going participatory processes can be improved. It would be beneficial if communication focused on certain issues over a period of time, to prevent overloading companies and people with too many topics.

Designing NBS

- Balancing ecological and social values:
  - Green spaces are elements with a lot of fragility and not all uses are suitable. Misuse or non-adequate uses can lead to the loss of vegetation units that have taken many years to grow. Sometimes, the city is not able to preserve the spaces according to what they are, but priority is given to the uses. "*We need to adapt the uses to the reality of the spaces, or even adapt the activities to the spaces, or assume that there are certain designs of green spaces that cannot be developed everywhere.*"

Public awareness and support

- Low citizen awareness regarding multifunctional green spaces:
  - There is a lot of pressure, both in the green space inside the city, in the peri-urban spaces and in the river. The city is struggling to raise awareness among citizens of the importance of caring for and maintaining these peri-natural spaces.
  - There are people with preconceived notions on how urban green should look like (e.g., old people). They understand urban green as an aesthetic issue. In their view, this requires regular mowing, pruning, clearing of leaves, no wild animals, etc. Usually, the design of purely aesthetical green spaces and it's management are not beneficial for biodiversity and other ecosystem services. It is a recurrent challenge to make people understand the types of actions the city does. Green management projects are being carried out to promote biodiversity and other benefits, and it is difficult for some citizens to understand it.
  - Many citizens do not see the benefits green spaces provide such as reducing the heat island effect, they only see the nuisances. Awareness needs to be raised about the multiple benefits of green.
  - When more natural arrangements are made, criticism is generated. (Specific) citizens, sometimes representatives of neighbourhood associations, or through petitions, can put strong pressure on politicians, who end up forcing decisions to e.g., place a swing in a green area, or to make a dog area smaller, or to cut down trees which was not technically necessary. Complaints from (groups of) neighbours can overrule the Master Plan.
  - It is difficult to communicate environmental issues to the general public. A reason could be the way the Communication department of the City Council works. It is uncommon for them to use their channels to inform the public about environmental issues. The Environment and Green Spaces Service of another Catalan municipality has a really good twitter account through which they e.g., denounce the dumping of rubbish in green spaces, "scolding" the public. They do not just present the beautiful things. It could be beneficial to communicate more freely about projects.
  - Sometimes participatory processes are undertaken that do not provide enough information to citizens to understand the state of the issues, the problems that need to be addressed, and so on. They need to have this information to be able to make proposals, otherwise, they participate without knowing why some actions are needed and proposals made by the City Council seem arbitrary.
  - Environmental activities organized by the city are not as successful as expected. Often those who participate are already aware of environmental problems. The challenge is to increase awareness of people who are not aware of environmental issues to be interested.
  - "Incivility" is a big problem in green areas, such as drinking in the street, dogs that run freely, people that do not collect the excrement of their dogs, breaking glass, damaging the irrigation systems. This attitude generates a high economic cost, problems of coexistence among neighbours, dissatisfaction among users and among the people who have to maintain these green spaces. It is a challenge to increase the sense of responsibility of people. This also affects the design of green spaces, e.g., making parts on purpose inaccessible for dogs, which was originally not intended.
  - There has been a change with the COVID. People preferred to take the car to a natural park (Montseny) but now they have discovered these green paths around the city and they like them. That needs to be promoted.

Policy

- The Urban Green Master Plan is insufficient multidisciplinary:
  - Despite being a recently approved document, it mainly focuses on green management / gardening aspects. A more comprehensive look which combines environmental issues, with social issues, etc. is missing. Concepts that support a more comprehensive look, such as Ecosystem Services, Green Infrastructure, Nature-Based Solutions are insufficiently present in the Master Plan. Having more multidisciplinary in a policy document gives a mandate to enact it.

Limited space

- Limited space for development of new green spaces:
  - There is a lot of cement in the city centre, which makes it difficult to introduce green. It would involve building less, the City Council would have to buy private plots of land and allocate them to green spaces.
  - A balance has to be found between the physical reality of the city's design and the demands of citizens. Citizens can be contradictory, they don't want cars in the city but when trees are planted to replace parking spots, they complain.

Other

- Slow bureaucratic procedures:
  - Due to the necessity to be transparent and rigorous, procedures are slow and cumbersome, which puts additional pressure on reaching the deadlines.

Supporting factors

- **Financial resources:**
  - The Diputació de Barcelona (a regional administration of the province of Barcelona) co-funded 50% of the development of the Master Plan.
- **Local, regional and national policies and regulations guiding local planning and decision-making:**
  - Nowadays, there is a joint work between municipal departments to incorporate the urban green, due both to the existence of the Master Plan and the work of the professionals of the Environment and Green Spaces Service that highlighted the necessity of joint work.
  - The Municipal Action Plan (MAP) which promotes collaboration between departments and citizens, the Green Spaces Master Plan which supports the implementation of green spaces or the Protection Plan of Botanical Elements of municipal interest which can protect trees for their historical value.
- **Clear criteria and target indicators:**
  - Sometimes the main goal is lost and the only focus is the political discourse and an electoral dynamic. Having clear city goals and target indicators would help a lot.
  - Using criteria when making decisions about urban green areas, such as ecological connectivity, connectivity for users, reduction of heat island effect, reduction of water demand for vegetation (by using climate adapted species), pleasant public space, etc.
  - Indicators allow to make a decision based on evidence.
  - An evaluation process about the actions that had been done in Agenda 21 was carried out and fed the development of the Agenda 2030. Also Agenda 2030 is evaluated through indicators.
  - Within the working groups of the Diputació de Barcelona (a regional administration of the province of Barcelona), comparative indicators were developed to follow up urban green management between the municipalities.
- **Working on a bigger picture:**
  - Within the city there is an increasing focus on cross-cutting issues (e.g., the city pact). This stimulates collaboration. However, improvements could still be made. For example, nowadays, only the heads of departments participate in inter-departmental commissions. This should be widened according to some interviewees.
  - The greening projects at the river were not isolated projects, but all of them were integrated in a continuous line. The results were greatly enhanced and was one of the keys of success.
  - Following European guidelines has enabled a broader vision and new perspectives.
- **Freedom and tranquillity to work on a project (opposed to the cumbersome bureaucratic procedures).**
- **Political support:**
  - Several proposals brought by the technical staff of the Environment and Green Spaces Service have been welcomed by the City Council. They may change some aspects but they generally value the proposals and defend them. Sometimes political difficulties appear (due to (possible) pressure from citizens, see challenges), but the City Council increasingly values proposals because they have impact.
  - Currently, there is a progressive government that has been working for years to promote green spaces in the city and the recovery of the river. The river Congost, which was an open sewer and now is a space full of life, is a success story. There has been a progressive government in charge for more than 20 years and contributed that there were no political changes of direction.
  - The political conviction to decide in favour of river restoration. Although it would cost money, it was still prioritized. Even though the citizens might be more satisfied with other alternatives. It implied a vision of future and transformation.

  - A 4-year term is a very short period of time to develop a strategic planning. Political stability is important to be able to build a trajectory over time, then you have long-term planning.
  - Support from the city council to participate in EU / international projects.
  - The Master Plan was approved unanimously by the political parties. Efforts were made to reach full political support by sharing the plan with all the political groups, explaining how the document was drafted, collecting contributions and sharing which ones were included.
- **Gaining experience through (international) collaborations:**
  - Through collaboration in (international) projects, the department is able to network and learn about other practices, approaches, etc. from partners.
  - Granollers participates with the Comparison Circles of the Urban Green of the Diputació de Barcelona (a regional administration of the province Barcelona). It is a network group for municipalities of the Diputació de Barcelona where, among others, indicators of management and maintenance of the urban green are discussed. The most powerful participating municipalities are developing Master Plans, and Granollers has the pressure to also develop them, both technically and politically.
  - The participation in European projects has generated personal motivation, knowledge, tools for staff members.
  - Experience to get into and participate in EU projects, leads to innovation
  - Influence of concepts and good practices developed elsewhere, e.g., incorporating the SDGs.
- **Qualified staff:**
  - The City Council has recruited qualified technical staff who have promoted policies.
  - There is a good technical team with proper knowledge behind proposals. It is a diverse team with different expertise (air pollution, circular economy, eco-management, biomass network, etc.)
  - The technical staff has not stopped training and is eager to implement those experiences that work elsewhere.
- **Communication with the public:**
  - There is the need to communicate and explain the benefits of more natural urban green spaces to citizens, including the mayor as a citizen as well. Explain things and let others understand it with empathy.

Needs

- To have sufficient objective information and criteria on the costs and effectiveness of a project for decision making, both for political discourse as well as to inform citizens with. The tool would be to be able to make decisions based on both cost and effectiveness priorities.
- To have clear guidelines, manuals or strategies on nature-based solutions applied to the Mediterranean ecosystem.
- Examples of successful implementations from other cities that implemented green spaces, that can also be communicated to citizens.
- An INTERLACE webinar with an introduction to the tools presented in deliverable 3.1, as some are not familiar with this list of tools.
- Expertise on citizen participation and communication.
- Training on interdisciplinarity among the municipal departments to further strengthen awareness of environmental issues and their interconnectedness.
- Quantify the benefits that the green spaces produce (per year). To manage the benefits, they need to be known better first. This can then also be communicated to citizens.

Metropolia Krakowska

Context of the city

Metropolia Krakowska (Kraków Metropolis) in Poland was created in 2014 as a cooperation platform for Kraków and its 14 surrounding municipalities. Metropolia Krakowska (MK) serves as a platform to integrate activities for sustainable urban planning and the protection of urban green space and ecosystems, while preserving the strong role of local communities and governments. To this end, MK applies the concept of "the Metropolis of Standards", a tool to develop the strategic framework for governing the region. This approach incorporates the development of strategies in key thematic areas and linking these to strategies and actions at the municipal level. During MK's 6-year of cooperation it has not dealt with green areas so far. The Kraków Metropolis Development Strategy "Strategia Metropolia Krakowska 2030" is currently in development and is the first document to address green spaces.

Currently, there is a lack of coherence in local strategies and policies of ecosystem restoration and protection, as well as continuity of green infrastructure between the municipalities as they are discontinued at the borders of municipalities. Other environmental challenges that MK wants to address are protection against the effects of drought by retaining rainwater and using it for soil irrigation and watering vegetation, flood hazards, mitigation of negative effects of climate change, heat island effects, loss of biodiversity, while improving the quality of life of its inhabitants. The development of new housing areas puts pressure on remaining natural areas and the services they offer (such as retention of rainwater) and increasing challenges such as urban island effect.

Governance forms

Policymaking
Network governance
• An important element for the creation of the Kraków Metropolis Development Strategy is a multi-stage public consultation, starting as early as defining the strategy's goals. Consultations on the strategy were attended by non-governmental organizations, representatives of the scientific sector, county authorities, voivodeship authorities and municipalities not belonging to the Metropolis.

Challenges

Policymaking

- Insufficient alignment between the different municipalities:
  - There is no supra-municipal decision-making. Each municipality plans to develop the space within its administrative boundaries. The areas near the border with another municipality are consulted with the neighbours. When agreements are made between neighbouring municipalities, they are gestures of goodwill. There is no statutory obligation to come to an agreement.
  - The fundamental problem may be conflicts of interest, especially at the borders of the neighbouring municipalities. It will be difficult to find a consensus on the preservation of open areas, especially those located on plateaus and other elevations with great scenic / landscape values. Metropolia Krakowska is developing a functional space structural model for the metropolitan area that will support the municipalities to agree on the purpose of various spaces. The model will serve as an introduction to a structured discussion on land use between the communes of Metropolia Krakowska.
  - It will be a challenge to integrate and standardize the implementation of green and blue infrastructure and to optimize solutions for all municipalities. A common approach (including cooperation) and tools need to be developed for inventorying, developing, managing and monitoring (through a system of shared indicators and data) green areas. Common data would allow for the determination of result, target and performance indicators that informs policymaking. E.g., an uniform water balance measurement system would give better insights on needs, possibilities and threats (such as drought) related to the use of water. Legal instruments need to be created that enable such an approach.
- Insufficient common understanding and vision between municipalities:
  - The municipalities do not have the same understanding of the importance of the environmental problems as well as an understanding of the benefits green infrastructure provides. Especially in rural areas, where greenery is present everywhere and its protection may not be seen as a priority for the authorities.
  - A common vision is missing on green and blue infrastructure, its continuity and distribution across the metropolis.
- Insufficient collaboration:
  - Insufficient trust or even conflicts between authorities, NGOs and residents.
  - There is a reluctance or a lack of time to invest in partnership building and networking.
  - Insufficient experience in wide stakeholder consultation (especially in the smaller municipalities).
  - Insufficient cooperation between housing associations and cooperatives and green space.
- The content of the strategy was subject to public consultation, but residents did not express interest in the strategy (MK assumes that a supra-local strategy does not appeal to local communities).

Policy implementation

Resources

- Insufficient financial resources for planning and implementation of new green spaces:
  - To plan and implement solutions at metropolitan level, stable financing needs to be secured.
  - Also at the municipal level, there is a lack of financial resources to implement larger investments for green space as well as a lack of expertise and skills to efficiently apply for financing NBS from external sources (national, EU, etc.).

Collaboration

- Insufficient collaboration with stakeholders:
  - Insufficient stakeholder participation in the planning and implementation of green spaces.
  - No legal instruments that require cooperation (e.g., between municipalities, society and / or enterprises).
  - There are national laws that require consultation in the case of public investment, but they are treated 'mechanically' as an obligation and they rarely result in a meaningful process and effective cooperation. The mechanism that seems to be more important and gives hope for good cooperation is the increasingly common understanding that without participation and consultation it is impossible to implement complex investments (especially common and important in the case of greenery management, NBS).

Designing NBS

- Old fashioned spatial design:
  - "City for cars" kind of approach instead of "city for residents".
  - Lack of knowledge among municipal workers about new technologies, e.g., rainwater infiltration or engineering issues in the field of rainwater management.

○ Lack of knowledge among designers (e.g., you get the project of a house without drainpipes and without a rainwater management project in the house area, some architects are not even able to do it at the explicit request of the investor (the architects education system must be changed). ○ Now it is necessary to focus on educating and informing investors and contractors, it is also necessary to modify the education of architects, etc., and to expand their knowledge about blue-green infrastructure systems.
Decision-making
• Grey solutions are chosen over NBS: ○ No legal obligation to choose NBS over grey solutions. ○ Constant tendency to cover more and more areas with concrete. ○ Decisions are made on the construction site and the fastest solutions are always proposed (i.e. draining the water "somewhere") , these problems refer to individual family houses. ○ “Grey" investments are perceived as cheaper, therefore local authorities may argue that they are economical in spending public funds when deciding on a particular investment.
Public awareness and support
• Weak public support: ○ Lack of awareness or knowledge on benefits from green spaces hamper its planning and implementation. Benefits need to be emphasized to citizens to increase understanding and support from society. E.g., raise awareness on the retention and re-using of rainwater for the maintenance of green spaces as a response to drought and to limit the use of drinking water for watering. Citizens use drinking water for watering their backyards and refuse to manage rainwater on their property - they would rather drain it away to the sewage system. ○ People complain about the intended effects of NBS. E.g., there have been complaints that the water remained in a rain garden, which is the intended function. Through public consultations, citizens should learn about the specific benefits of the planned activities. ○ Specific investments (e.g., community gardens) should be made for the community to increase their support. ○ Various unlawful actions by residents (cutting trees and shrubs, filling ditches or dumping rubbish into them, depositing soil of unknown origin, illegal discharge of rainwater to combined sewerage and roadside ditches, etc.).

Needs

- Knowledge of ecosystem services, blue-green infrastructure and its impact on the quality of life.
- More knowledge about technical (engineering) conditions: designing, implementation and maintenance of green and blue infrastructure (e.g., technical catalogue developed by the Sendzimir Foundation).
- Exchange of good practices of already existing NBS in similar climate zones.
- Tools to define priorities and select appropriate directions and actions.
- Training of specialists in applying various types of solutions enabling the management of rainwater.
- Guidelines for interdisciplinary and intersectoral cooperation to overcome silocity and to develop joint actions. This should focus both on internal cooperation (between municipal departments) as well as cooperation between cities and other stakeholders. Development of joint management structures within the Metropolia Krakowska.
- Target and performance indicators for green and blue infrastructure.

The creation of the strategy is one of the first actions of MK to address urban green spaces, therefore there are no examples of governance forms applied for planning and the implementation of green spaces at the scale of the Metropolis. During the interviews examples and supporting factors from the city of Kraków were mentioned and reported below. This can inspire future developments of green spaces for MK or other INTERLACE cities.

Governance forms:

Policymaking
Network governance
• For the creation of the Climate Adaption Plan of Kraków various stakeholders were involved. First of all, various municipal departments contributed to the plan. Furthermore, representatives of Kraków universities, NGO's and citizens were consulted for the plan. The consultation focussed on details and nuances. The consultation was late in the process as stakeholders were only invited to provide feedback on a final draft version of the plan. However, it did provide citizens with relevant information about its assumptions and the planned solutions. • Similar stakeholders were involved in the creation of the "Directions for development and management of green areas in Kraków for 2019-2030" (KRiZTZ). Also in this case, different municipal departments collaborated. One difference is that this time the stakeholders were involved at subsequent stages of the document development. Besides local residents, there were also other stakeholders present during the public consultations such as business representatives and local activists. In addition, there was a panel of experts (mainly representatives of universities), which also supported the creation of the document on a continuous basis and provided consultations with the academic community in Kraków. • "Kraków climate panel" - a citizens' panel. It is a way for significant decisions to be made by a randomly selected group of citizens whose role is to decide an issue taking into account the common good. This group is meant to reflect the general population. During the panel 35 recommendations were developed and subjected to voting. As many as 32 recommendations received the approval of at least 80% of voters, which means that they are binding for the Mayor of the City of Kraków, who undertook to implement them.
Policy implementation
Network governance

• In the green budget of Kraków there is a budget for participation of citizens. The involvement of the residents takes various forms: public consultations, collecting opinions and conclusions from interested parties, collecting specific ideas and projects, which are then assessed by all residents.
  ○ The creation of pocket parks (small green areas) are made in close cooperation with residents (see examples of pocket parks: https://zzm.krakow.pl/parki-kieszonkowe.html). Pocket parks embody the idea of having green spaces close to home (in a crowded city) and can play an important role to connect local residents to green spaces and have, among others, recreational, educational and health benefits.
  ○ Citizens were involved in the entire process from design to execution of the "Park na Ruczaju".
• The City Greenery Board made an agreement with the Polish Railway regarding the lease of land under railway flyovers in order to create a "Railway Park".

Grassroots initiatives
• Civil society often initiates community garden projects in Kraków. This can be informal groups from a neighbourhood or formal groups such as housing cooperatives, senior clubs, community centres, etc. The community gardens are generally established on urban land - often in wastelands, degraded, neglected and undeveloped areas. The financing of the community garden depends on its initiators - funds for maintaining a green corner may come from members' contributions, public collections, the organization's budget, local programs or competitions. The areas of community gardens are usually designed by the local community who uses the resources at their disposal. The municipality supports them through assisting with formal and accounting matters, providing a starter package (basic tools, wheelbarrows, a water tank) and often provides dendrological, botanical and other practical information.   ○ An example is the establishment of a community garden in the courtyard of the Town Hall. The initiative resulted in a common space that is friendly from children to seniors. Vegetables and herbs were planted together with the residents. The initiative will help define the needs and opportunities for further development of social gardens.

Supporting factors

- **Policy support from higher levels (regional, national, EU):**
  - The Climate Adaptation Plan of Kraków city was created as part of a wider nationwide project (financed by the EU), implemented by the Ministry of the Environment, whose aim was to create Adaptation Plans for all Polish cities inhabited by over 100 thousand residents.
- **Ambition of the authorities in charge:**
  - The ambitions of Kraków city supported the Climate Adaption Plan of Kraków and KRiZTZ (Directions for development and management of green areas in Kraków for 2019-2030). This ambition includes a strong emphasis on creating new urban green areas, revitalizing

and effectively protecting the existing ones; allocating a significant budget for this purpose, creating a separate urban unit for management of urban green areas – namely City Greenery Management)

- **Policies and incentives guiding new developments:**
  - The KRitZTZ contains relevant concepts for the development of green areas and an action plan
  - Developing green management standards and a "green checklist" for new investments would support new developments as well.
  - There is a “My water” program that co-finances rainwater barrels and other retention installations.
    - Similar programs could be introduced e.g., for green roofs, rain gardens, elimination of illegal water drainage from the plot as well as introducing and maintaining financial instruments that would enable the development and operation of green and blue infrastructure in the private sector.
- **Understanding the importance of NBS and the benefits it may provide.**
- **Support and involvement of various stakeholders, including residents, social organizations:**
  - There was a social demand for more green due to the previous lack of greenery in places of residence.
  - Demonstration and pilot programs on public buildings, like schools, could work well, provided that they are combined with an educational program for children and interested parents.
- **Stable and long-term financing for development and monitoring activities for NBS:**
  - The establishment of a municipal unit dedicated only to the management and maintenance of green areas (City Greenery Board (ZZM)) as well as the gradual increase of their budget, gave priority to the development of greenery in the city.
- **Participating in international projects to support implementation:**
  - E.g., Kraków city participated in the URBAN project, that supported the implementation of community gardens.

Portoviejo

Context of the city

Portoviejo (Ecuador) is an intermediary city and a capital of the coastal region of Manabí. The urban development that has taken place in the city was unplanned and it had a strong effect on natural ecosystems. Portoviejo is surrounded by hills and is crossed by a river and both ecosystems have been degenerated and urbanised, resulting in an increase in landslides and floods. Furthermore, in general, real estate development has left few green spaces in the city. Today, there is still a strong pressure from real estate development to further urbanize, also in green spaces (riverbank, hills, etc.).

In April 2016, the city was hit by a fatal 7.8 magnitude earthquake that destroyed most of the city centre. The post-earthquake reconstruction process provided an opportunity to rethink the city. With funding becoming available for the reconstruction, new green spaces, such as the Las Vegas Park, were realized in the city centre.

Current policies of the city aim to increase urban green spaces (with the ambition to reach 14m² per inhabitant) and to recover areas in the hills and riverbanks in order to revive these ecosystems and lower the risks of landslides and floods. The latter is linked with the question whether these areas should be inhabited or not. Places where the most impact can be achieved are the most difficult to implement as there are (illegal) human settlements. These people also face the most risks to landslides or flooding. Furthermore, the policy aims to have more widely distributed green spaces across the city and attention is paid to spaces for walking and cycling. One of the main policies is the 'Land Use and Management Plan' (Plan de Uso y Gestión de Suelo (PUGS)) and is also known as Plan 2035. Plan 2035 regulates and plans the future developments of the city, including the development of urban green spaces. Furthermore, an important policy document for urban green spaces is the Urban Master Plan, which also contains an updated plan for the Portoviejo River Corridor.

A challenge that the city faces to implement their policies is that a lot of land within the municipality borders is private property, also in areas in which the city would like to restore or conserve nature or establish urban green spaces. It is complex to intervene on private property and there is likely to be costs related to it (economic or political).

Governance forms

Policymaking
Intragovernmental collaboration
• Within the municipality, there was mainly collaboration between the Urban Planning and Territorial Sustainability department and the Risk department. The Risk department identified, prior to the planning, the flood zones, high risk zones, medium risk zones and policies were formulated based on that. With their input risk mitigation strategies will be generated as soon as possible and when not possible to formulate other strategies that have to do more with the generation of green public space.
Network governance
• For the development of the Plan 2035, Urban Master Plan and other relevant policies for urban green spaces, the city collaborated with universities and citizens.   ○ The city worked together with different universities over the years, such as the University of Berkeley, Technical University of Manabí and the San Gregorio University. The universities shared methodologies to model, to create maps, etc. in order to guide the city and to provide evidence and scenario's on which the city could base their

policies on. The New York University contributed with a study on urban footprint, carbon footprint and climate risk. This is considered an important contribution as it provided evidence on the importance of local ecosystems and productive soils and indicated risk areas.

- The city involved citizens in their policy making. Besides 'general citizens', the city involved specific groups such as teams of cyclists, landowners and citizens living at the foot of the river. It was considered beneficial because it included the voice of the citizens in the process and created public support for what is being planned.

Policy implementation

Network governance

- There are approximately 211 neighbourhoods in Portoviejo, but there are only 70 neighbourhood councils, which are organised grouped neighbourhoods. Of these 70, only 40 are well structured and only the well-structured councils benefit from a project called 'Microplanning', which prioritises green areas, roads and urban facilities through participation. Citizens have been involved with new proposals, including thinking about where the public spaces, roads and service facilities were going to be located. It was considered successful as it allowed the city to adjust several projects to make it more in line with the wishes of the community.
- The citizens are considered the eyes and ears of the area. They know the territory better, such as locations of recent landslides, and this knowledge is beneficial for local planning.
- Although, some citizen participation processes were not always that clear. When the city wanted to learn about community problems, the citizens mainly took the opportunity to share individual problems. To better direct this, the number of participants were reduced and limited to neighbourhood leaders. The city considers that the neighbourhood leader has the competence to decide for the neighbourhood.
- There is no policy that dictates or encourages citizen participation when concretizing projects. Project design is considered to be quite vertical.
- For the Rotonda Park, the city collaborated with the University of Manabí because the land was owned by both parties. There was a process of cooperation to implement the park.

Public-private partnerships

- There are not many public-private partnerships for the implementation of urban green spaces in Portoviejo. There are a few initiatives which involve the private sector in planning and implementing public urban green spaces.
  - Through a concession agreement, it was possible to swap a green area of the riverbank that belonged to the Corporación Nacional Eléctrica with a piece of land at the former Portoviejo airport. With the IESS Hospital, the municipality did an exchange as well: an area near the river in exchange for some buildable areas.
  - A shopping centre sponsoring a park was made when the shopping centre was built.
- The city is focussing on developing policy instruments and tools to regulate the private sector.
  - Enforce minimum percentages of green spaces with new real estate developments. They need urban green spaces with certain planning standards and be publicly available (not only for the residents of the building).
  - The city is working on an instrument so that they can manage nature that is located (and defined in land-use plans as nature / green area) on private land.

Grassroots initiatives

- There are small green spaces that people do intervene with their small tires, but at the foot of the river we have not been able to see them, they cannot be made public because they are private, mostly blocked by building facades, but small public parks can be seen, as if people or even a pavement that has very large trees put more plants in them.
- There are not many grassroots initiatives known. One example is that some people organize themselves and utilize the riverbanks of a smaller river (not the main Portoviejo river) by planting crops and vegetation. Among others, guinea beans and corn can be found there, as well as small handmade parks and a lookout made of bamboo. The city neither repressed nor encouraged this usage.

Challenges

Policymaking

- Rigid legal framework:
  - The COOTAD law (Organic Code of Territorial Organisation, Autonomy and Decentralisation) is extremely rigid and cannot be modified for 12 years. Among other things, it classifies land (productive land, forest protection, etc.). This can make it difficult to implement new policies. In the LOOTUGS (which allows the regulation of urban growth, the management of urban fauna and encourages the establishment of green areas) there is an obligation to consider the network of green areas. The 2035 Plan proposes actions in favour of green issues. The plan is in line with the framework of the LOOTUGS and there are several restrictions in urban issues. However, in the COOTAD there are contradictions in these issues. One law allows these actions while the other does not, leading to contradictions between these two legal frameworks. For example, new elements, such as the network of urban parks proposed in Plan 2035 (which is part of the LOOTUGS framework), are not legally implemented in the COOTAD law and, therefore, their implementation could face further complexity. The city has to look for alternative approaches to comply with COOTAD. In this example, the city used the LOOTUGS framework as a management tool in order to resolve the legal issue (after consultation with a co-author of the law) (click here for a detailed background on the legal frameworks in Portoviejo).
- Insufficient common ground during inter-institutional policy making:
  - When updating the Master Plan of the river corridor (which crosses Portoviejo and several other municipalities), each party was more focused on their own interests and competences instead of building a common approach. The process was complicated to manage and coordinate. This makes it also difficult to concretise and carry out joint actions.

Policy implementation

Resources

- Insufficient budget for implementation of new green spaces:
  - Plan 2035 has an ambitious (“utopian”) vision. With current budgets, it is unrealistic that this can be implemented.
  - Since the creation of the parks, some neighbourhoods have asked for the construction of parks, but not all of them can be accommodated due to budgetary constraints.
- Insufficient (experienced) staff for implementing policies and plans:
  - There are not many people within the city who have experience in preparing a land use plan and implementing green projects and social facilities. There is too little capacity to execute and to manage such processes.
  - It is a very large area where plans should be implemented. E.g. the riverbanks represent a very large area of the city and much of it is in a risk zone, so there is a lot of work to be done.

Collaboration

- Insufficient time to organize and conduct a participatory process:
  - Due to the tight implementation time for projects at the municipality, there is insufficient time to set up a full participatory process. If this was done, there wouldn’t be enough time to execute the project after the participatory process.

Public awareness and support

- Low citizen awareness regarding multifunctional green spaces:
  - The paradigm about green spaces needs to change. People see it as places that can be privatised and built upon. There is little understanding that these spaces generate multiple benefits, from reduction of risks, play locations for children, to generating commerce.
- Unclear communication with citizens:
  - Project(s) (plans) must be translated to a clear story for citizens: what is the city going to do, the quality it will have, how it will be, what is the investment cost and what is the benefit that will be realized. It is not always that clear for citizens when communicating with GIS maps and about applied policy instruments. The municipality received negative reactions to the plan because the benefits are not communicated well.
  - People who are affected can protest a lot. It would be most beneficial if the people who are around the space become your allies and promote and defend the project. In that sense, the co-participation in the plans can help the governance and maintenance of these areas as the municipality does not have sufficient funds for the maintenance in a long time, strong policies of communication and participation are thus essentials.

Private sector

- (Political) opposition when private land or property is affected:

- To work with privately owned land is complex, also politically speaking. There are mixed responses from politicians. When private property is affected, there is political opposition. There is friction in the process because of political issues when individual interest is affected. In some cases decent housing was created to expropriate people who were exposed at risk, but these new housing are very far away from the initial places and people come back despite the risk. In other cases there are expropriations that have been contested.

- Difficulties of expropriation:
  - The administration commits itself to recover risk areas and wants to guarantee a safe habitat for the people. That implies reducing the people who are living in risk areas. The city seeks to manage the mobilisation of people who live there. Over the years, people seem to understand the risks well, however, land tenure remains a problem. On one hand, the city is restricting new housing, on the other hand, the city is looking for alliances or ways intervening to share burdens and benefits with the people.
  - The realisation of other urban green spaces also involved expropriations (expropriation is compensated economically through a real estate valuation of these plots of land. In certain cases, the GAD may offer you new housing in specific municipal housing programmes). This created a lot of criticism and bad press as housing remains an important issue. However, when the parks were finished, and during the midst of the pandemic, the public opinion about the parks was positive.
  - Through regulations, the city can block new constructions on land (that are at risk). However, once the project is announced, the city has two years to execute it. This puts pressure on the expropriation process. Once the block is lifted, people can raise the value of their property which makes it more expensive to expropriate.
- Insufficient social and environmental responsibility with real estate development:
  - The municipality has policies to protect green spaces or ecosystems, but that does not stop real estate developers from deforesting patches of land and constructing new buildings, due to many lands being privately owned. The city prefers not to involve the sector in urban green development as they make the process ungovernable.

Supporting factors

- **Long term vision and a common goal:**
  - Having a long term vision. An expert advised on taking a long-term approach for public space planning, and the city followed by developing the long-term policy in Plan 2035.
  - The municipality is working as a whole, there is a very positive atmosphere to achieve the common objectives. The riverbanks is a project that has a lot of strength and conviction among all those who work on it.
  - This Cycleway Plan includes an improvement in public transport while the Green Areas Plan mitigates heat islands and improves walkability in the city of Portoviejo. They are complementary manuals.
- **Applying a standard to support decision making:**
  - The city introduced the concept of ‘cities for the people’ in their vision. Cities have to be designed for the people, for everyone, inclusive, safe and without enclosures. It is a standard that is being incorporated into policies. Portoviejo 'personalized’ that by saying "For Portoviejo the best in every way" in 2014.
  - Investing in qualitative (meeting the standards of ‘cities for people’) public spaces. When these investments generate what the people need/want they contribute to the development and transformation of the city. Investments in the public space are worthwhile and have a political return.
  - The planning of Las Vegas park applied the standards and focused 100% on people. This influenced the typology of materials, colours, real estate, etc. It was designed specifically for its civic and historical connotation, it highlights the architectural heritage.
- **Access to funding after urgency:**
  - To rebuild the city after the earthquake, Portoviejo got access to a lot of funding, and provided an opportunity to build (mega-)parks.
  - There was also international funding after the earthquake.
- **Citizen awareness:**
  - People living at risk areas better realized the risks of their living spaces after the earthquake and are less opposed to the city plans for the riverbanks and hills. The citizens understood

that the way things were being done was not working and allowed new projects to take root in this new vision.

- Measuring the risk and the studies that have been done for this. The people are better aware of the risk they are in and it has been positive for the creation of green spaces. The main green spaces that are being promoted in Portoviejo have to do with risk mitigation.

- **International cooperation supports local implementation:**
  - The city received technical advice from (international) universities and NGOs on local issues which supported their policymaking (methodology, data, formulation) and guided implementation.
- **A champion paving the way:**
  - The mayor is a visionary person and through his policies he invests in green spaces such as the parks constructed after the earthquake. Another example of the mayor's policies is to have trees besides all roads, where possible.

Needs

- Tool for communication towards citizens on local urban green spaces and their benefits, and the implementation process. For example, through a webpage where technical aspects can be found and people can do research. The city has all the basic information but they don't have the platform.
- Strategies for alliances with the private sector. These are new things for the municipality and the staff is not yet trained. Advice would be very useful.
- Manuals, strategies, technical assistance to develop partial plans (local land use regulation, at district scale) and plans for urban green spaces.
- Knowledge on which species are beneficial for different purposes. For example, tree canopy (shade), which trees are ideal for terraces (soil or water retention), carbon sequestration, water usage, etc.
- Develop or strengthen policy instruments to:
  - Finance implementation;
  - Manage nature on private lands;
  - Expropriate landowners on risk areas;
  - Sanction those who do not respect agreements/laws regarding land use.

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Project Partners

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