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Dis-integrated urban biodiversity: an analysis of urban policies and plans in Italy

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Abstract

This contribution presents the outcomes of an analysis of urban policies and plans in Italy where the objectives of UB safeguarding, restoration, provision, and enhancement are explicitly acknowledged. The objective is to understand the interface between biodiversity and urban policies and identify guidelines and strategies for reorienting the action of city governments towards conserving and enhancing UB. The survey has a two-fold focus, respectively, on the urban policies adopted at regional, sub-regional, municipal levels, and on the spatial plans in charge of translating the general objectives identified in policies into concrete actions, and monitoring their implementations. The research findings show that, while at the European and national levels, a clear trajectory of policies regarding urban biodiversity can be observed, at the local level policies mainly have a sectoral focus as well as an ambiguous impact on UB and lack tools and mechanisms for monitoring their implementation. Concerning the plans, the survey highlighted the pervasive, although rhetorical, diffusion of UB strategies and actions in spatial plans. Nevertheless, the scarce integration between thematic and statutory plans results in the difficulty of implementing and monitoring in an integrated way the objectives related to the protection and restoration of urban biodiversity.

Keywords: urban biodiversity, urban policies, spatial plans.

1 Introduction

Since its recognition as a major global challenge at the Cities for Life Summit parallel to the 11th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD) held in Hyderabad (India) in 2012, Urban Biodiversity (UB) has become a central topic in science and policy worldwide. Indeed, several research have pointed out the potential that cities have in supporting a broad array of plants and animals but also in playing a critical role in biodiversity conservation with initiatives that enhance residents' knowledge and stewardship of biodiversity (Secretariat of the CBD, 2012). Nonetheless, there are still several challenges and obstacles to overcome when scaling up the key benefits of UB through effective policies and plans in cities.

This contribution presents the outcomes of an analysis of urban policies and plans in Italy where the objectives of UB safeguarding, restoration, provision, and enhancement are explicitly acknowledged. The research is conducted within the framework of the National Biodiversity Future Center (NBFC) (2022-25), one of the five national research centers funded by the Italian Recovery and Resilience Plan within the NextGenerationEU program, aimed at aggregating and sustaining the scientific research on biodiversity in the different national territorial contexts. The three-year project was funded to aggregate and sustain scientific research at the national level to understand, monitor, preserve, and restore biodiversity in the marine, terrestrial and

urban ecosystems of the Italian peninsula, making it a central element of country's sustainable development. The goal of the NBFC is to investigate different levels of biodiversity and establish technological innovations to identify new products, processes (Bioprospecting) and solutions (Nature-Based Solutions–NBS) for promoting its economic, social and environmental value for communities (BenDor *et al.*, 2015; Chan *et al.*, 2016).

The research activities promoted by the NBFC refer to three main areas of study: marine, terrestrial, and urban. These areas are connected by the "One Health" strategy and the principle of «not causing significant damage to the environment» (DNSH). The purpose is to provide a holistic and pragmatic vision of biodiversity and identify sustainable management strategies for achieving this vision (WHO *et al.*, 2022). In particular, this article is part of the research activities conducted by Spoke 5 of the NBFC dedicated to investigating biodiversity in cities and urban areas. In Italy, the surface area occupied by high and medium-dense urban areas constitutes the 27.5% of the country's territory and the cohabitation between human beings and other living beings is made complex by the structural absence of nature in cities and the high fragmentation of natural spaces in urban areas, considering that only 2.7% of the territory of the provincial capitals is classified as urban greenery (ISTAT, 2014). At the same time, biodiversity in the city provides multiple benefits for urban communities which concern several environmental, health, social, and economic aspects (Müller, Werner and Kelcey, 2010).

Cities appear to be the places where the functional biodiversity is largely neglected with the presence of many groups of *taxa* (for example plants) that historically have had an aesthetic and ornamental role, but which do not belong to the local eco-regions, where the state of soil quality is scarcely known, and where the presence of plant and animal species is in continuous competition with the presence of humans. Therefore, in urban areas, beyond focusing on the conservation and monitoring of existing biodiversity, it is necessary to work on the development of strategies, guidelines and actions aimed at restoring and/or improving functional biodiversity and promoting the provision of ecosystem services (Woodruff and BenDor, 2016; Salata, 2023).

The research of the Spoke 5 is divided into 7 activities ranging from mapping the quality of soils and ecosystem services, to integrated and sustainable planning and design strategies, and to the management of interventions aimed at ecological and environmental restoration. As part of Activity 3 aimed at developing integrated and sustainable planning and design, the state-of-the-art on the relationship between policies, planning and urban biodiversity was investigated, identifying attributes, drivers and regulatory and strategic devices for contributing to strengthening the patterns of animal and plant diversity in cities (Nilon et al., 2017; Pierce et al., 2020).

Methodologically, the analysis relies on a mapping activity of the relevant urban policies and plans adopted by the provincial capital cities in Italy addressing UB in its multiple benefits. The objectives are to understand the interface between biodiversity and urban policies and identify guidelines and strategies for (re)orienting the action of city governments towards conserving and enhancing UB. The survey has a two-fold focus, respectively, on the urban policies adopted at regional, sub-regional, municipal levels, and on the spatial plans in charge of translating the general objectives identified in policies into concrete actions, and monitoring their implementations (Nilon et al., 2017). The first level emphasizes the discursive construction of, and the tools/mechanisms employed for, UB policies and their multi-level and multi-actor dimensions oriented to downscale general objectives from the EU and national levels to the local level (Uchida et al., 2021). The second focuses on the sectoral and thematic plans addressing UB, with attention to investigate the relationships with the statutory spatial plans and identify the relevant objectives, indicators, targets and resources for supporting the implementation of UB objectives (Pierce et al., 2020).

This research article is structured in five parts after the introduction; the following section two refers to the research background related to the topic of urban biodiversity and

planning from a general point of view. Afterwards, the sections three and four refer to methodological approach used for undergoing to the analysis related to public policies and urban planning procedures for biodiversity in Italy. Section five and six treat the discussions and conclusions consecutively, related to the emerging nodes from the disintegration between policies and planning rules and regulations related to the implementation of urban biodiversity actions and monitoring.

2. Research Background on urban biodiversity and planning

The concept of bringing nature and biodiversity to cities and urban areas is not new; the notion that surrounds the history of urban biodiversity research and practice dates back to the urban ecology studies from the 1980s (Nilon *et al.*, 2017; Rega-Brodsky *et al.*, 2022). While urban biodiversity is intertwined with the development of several associated sub-disciplines of urban forestry, urban wildlife, and urban nature conservation; the importance and impact of nature on citizens of cities is observed in social studies, cultural and urban planning, design and management. The research by Ossola, Irlich and Niemelä (2018) puts in evidence the importance of urban biodiversity as an ecological term interchangeably used with urban green space and urban green infrastructure, which is mainly underlined in some disciplines such as urban planning, landscape architecture and environmental management. The current landscape of research on urban biodiversity shows a mismatch between discourses and practices, mainly due to the lack of measurable actions in urban greening plans, as well as a lack of governance specificity and consistency across multinational scales and city scales particularly (Pierce *et al.*, 2020).

Meanwhile as the research on urban biodiversity advances, since 2020 the European Union has launched the Biodiversity Strategy 2030 to put biodiversity on the path to recovery for people, climate and the planet. The strategy is composed of specific actions, targets and includes relationships with other related strategies such as the Green Deal, the climate change adaptation plans and other food policies (such as the Farm to Fork Strategy) tackling nature restoration, protection and adaptation to resilient ecosystems. Another turning point in the year 2022 when the already mentioned Conference of Parties (COP 15) has adopted the Kunming-Montreal Global Biodiversity Framework (GBF)[1] which builds on "*The Biodiversity Plan"* that commits all parties to setting national targets by 2030. Specifically, targets 12 and 14 focus on urban planning for human well-being and biodiversity as well as on integrating biodiversity in decision-making at every level into policies, regulations, planning and development processes.

In Italy, the declination of the EU Biodiversity Strategy came in the form of the *"Strategia Nazionale Biodiversità 2030"* known as SNB 2030 (MASE, 2023), in the year 2023. That outlines a vision and sets 18 actions distributed along eight areas of interventions to *"bring nature back into our lives"* focusing on health, climate and economy. At the urban level, the most relevant aspect of this strategy is the promotion of urban greening and diffusion of nature-based solutions (NBS) in the urban and peri-urban green ecosystems which is one of the main 18 actions described in the Italian biodiversity strategy (Action B.10). It is also worth noting that the downscale from the EU Biodiversity Strategy implies for European cities and towns of at least 20 thousand inhabitants to develop "ambitious urban greening plans" with a particular stress on the importance of collaborative processes and inclusion of citizens and other stakeholders, and cross-departmental working and integration with other urban development aspects (European Commission, Eurocities and ICLEI, 2022).

One of the most interesting aspects of both strategies whether at the European Union level or the Italian national one, is that their implementation requires multi-disciplinarity of governance, active and shared management approach as well as constant and effective

[1] https://www.cbd.int/gbf

evaluation and monitoring for tracking the planned actions at the local level (Mahmoud *et al.*, 2021). Several research related to urban biodiversity and urban greening reiterate the concept of multi-level policies and multi-actor governance as an intrinsic aspect of urban biodiversity planning (Uchida *et al.*, 2021; Nilon, 2023; Lazzarini, Mahmoud and Pastore, 2024). This attention to the urban biodiversity and governance aspects delves into the need of alignment between stakeholders' values, the community needs, and the possible organizational support to forwarding the implementation of actions at the local level through partnerships and collaborations (Soanes *et al.*, 2023).

3. Mapping the urban biodiversity policies

As mentioned above, the research investigates public policies that deal with urban biodiversity. The definition of public policy is diversified in the literature (Bobbio *et al*, 2017). In this paper, by public policy we mean not only policies that deal with an issue that is perceived and defined as collective, but we look at policies developed by public bodies. Increasingly populated urban areas – by 2050, 70 % of humans will live in cities – are at the center of the global policy debate creating a sustainable and resilient future for cities (UN-Habitat, 2024: 54). The role of biodiversity in the city is addressed as a collective issue: international and national public bodies recognize that biological diversity is essential for species life, ecological balance and the ecosystem services it provides. To examine the variety and the interrelationship of public policies that deal with urban biodiversity in Italy, we considered it necessary to study the different levels of government and land management: from the European level to the national level, and then to delve into the local level for some case studies. We investigated eight northern Italian regions: Valle d'Aosta, Piedmont, Liguria, Lombardy, Trentino-Alto Adige, Veneto, Friuli-Venezia Giulia and Emilia-Romagna. This in-depth study stems from the need to understand possible alignments between the policies at different levels having the specific goal to preserve, enhance and restore urban biodiversity.

In this perspective, we put European, national, regional and municipal (Italian provincial capitals) policies in relation. The research sought to understand the tools that public actors deploy to address the challenge of implementing urban biodiversity. To this end, we investigated not only policies that deal centrally with the issue of urban biodiversity, but also policies centered on other issues that address the issue of urban biodiversity in a secondary manner, such as those that deal with forestation, sustainable development, climate change and agriculture. Public actors deploy both substantive (Hood, 1983) and procedural policies (Howlett, 2011). Substantive policies regulate through the imposition of obligations or prohibitions and related sanctions. These are policies that compel the implementation of processes to protect and increase biodiversity. Substantive policies are policies based on incentives or disincentives to encourage precise processes that result in calls for tenders that encourage and finance projects supporting urban greening. Examples include the Climate Decree Call for Proposal 2019 (Bando Decreto Clima) and the Forestation Programs 2020, 2021 related to the National Recovery and Resilience Plan (Programmi di Forestazione del Piano Nazionale di Ripresa e Resilienza). Procedural policies are guidelines or strategies that direct without binding. In this case, if policy-makers – when deciding – do not have all the elements to adopt a specific measure or standard and can prefer to design a pathway in which other actors can specify the content of the policy. Emblematic cases are the EU Biodiversity Strategy 2030 and the Italian Biodiversity Strategy 2030.

4. Mapping the urban biodiversity: a focus on the greening plans

As far as the level of plans is concerned, the research involved an activity of mapping of the spatial plans dealing with urban biodiversity in provincial capital cities in Italy. The objective is to understand which planning instruments the municipal and metropolitan

administrations adopt to protect, restore, and increase urban biodiversity. The mapping led to the identification of various typologies of planning instruments, where urban biodiversity takes on different forms, meanings, and degrees of cogency. Due to the significant role that the issues related to urban biodiversity assume and the policy consideration given to this typology of plan by both the EU Commission and the national government, attention was oriented to map and investigate the Greening plans.

Within this framework, the research has seen a systematic mapping of the Greening plans adopted by the provincial capital cities in Italy. The main policy reference for the Greening plans in Italy is the document of "Guidelines for the management of public green spaces" which was published in 2017 as an instrument for implementing the Law 14 January 2013, n. 10 "Regulations for the development of urban green spaces" (Norme per lo sviluppo degli spazi verdi urbani). The document was drafted by the National Committee for the Development of Public Green Spaces, a multidisciplinary group of experts formed by the Ministry of Environment to monitor the interventions introduced by law n.10/2013. It is aimed at responding «to the widespread need to have homogeneous technical guidelines on the national territory to support governmental policies for the rich and biodiverse green heritage of our cities» (Committee for the Development of Public Greens 2017: 4). The document recognizes three specific tools for the planning, programming, and management of public green spaces: the Green Census (Censimento del verde), the Green Regulation (Regolamento del verde) and the Greening Plan (Piano del verde).

Within this contribution, attention is oriented to the Greening plans which the Guidelines define as the policy instrument in charge of strategically addressing the problems and challenges linked to the integrated planning, management and monitoring of green areas.

The research has conducted a survey of the Greening Plans' documents on the websites of the provincial capital administrations, carried out between April and December 2023 in collaboration with the other researchers from the University of Florence and the University of Molise involved in Activity 3 of the Spoke 5 of the NBFC. The information collected through the survey was subsequently validated with the ISTAT survey "Environmental data in cities" updated to 2021, coordinated by the Statistics Office of the Municipality of Venice. The survey contains data on the Greening plans, the arboreal survey (bilancio arboreo) and several other issues related to the monitoring of the implementation of law 10/2013 in the 109 provincial capital cities in Italy (ISTAT, 2021).

At a methodological level, due to the still limited diffusion of the Greening Plan in our country as outlined in the Guidelines document, the research also took into consideration the Green Infrastructure Strategies and Action Plans. While the former share with the Greening Plans the objective to outline a strategic framework for green planning, the latter are more focused on the implementation dimension of the plan, giving space to strategic actions, and investment priorities for the improvement and valorization of the natural capital.

The mapping led to the identification of 19 Greening Plans and Strategies adopted in the provincial capital cities and 3 Greening Plans currently being developed (Greening Plan of Florence, Rimini, and Ascoli Piceno). 3 cases (Pisa, Cagliari, Sondrio) concern greening plans approved before 2017, while the remaining 16 refer to recent plans, approved during the last five years. An interesting aspect concerns the distribution of the mapped plans across the national territory: the north-south disparity is evident with the localization of the plans mainly in the central-northern Italian regions, with only two Greening plans mapped respectively in the southern regions (Avellino and Matera) and one in the island regions (Cagliari). Overall, the image shows a scarce diffusion of this instrument in our country: in the 109 Italian provincial capitals, the Greening Plan is present in less than 2 cities out of 10.

5. Discussions

As anticipated in the previous sections, the study of public policies on urban biodiversity has allowed some general considerations to emerge on the panorama of European policies as a fertile ground for the budding of national policies, on the type of policies currently dealing with this issue, and finally on the relevance of the theme of urban biodiversity in the various instruments investigated.

Firstly, the European Green Deal ushered in a new era of public policies on the environment and biodiversity (European Commission, 2020a). From agriculture to climate policy, there is a convergence of goals on the protection, enhancement and restoration of biodiversity. Among the various and numerous areas of research of the European Green Deal, some policies deal centrally with the relationship between nature and the city. Regarding the research area 'Environment and Oceans', one of its 11 actions is the EU Biodiversity Strategy for 2030, a policy that is also relevant to urban spaces. Action Trackers Nos. 51, 52 and 53 give indications on how member states are to draw up 'Urban Greening Plans' for cities of over 20,000 inhabitants. In addition, one of the four actions of the EU biodiversity strategy is the New Nature Restauration Law, a bill including urban areas among the ecosystems to be restored by setting targets to be reached in 2030 and 2050 for green areas. In this context, Italy's 'National Biodiversity Strategy 2030' was drawn up, adopted in August 2023 and aligned with European guidelines. This strategy constitutes the reference document about biodiversity for the entire national territory. This policy also addresses urban biodiversity by reaffirming the goal of implementing ambitious urban greening plans. The Italian 'National Biodiversity Strategy 2030' affirms the importance of urban green systems in cities and nature-based solutions (NBS) to provide ecosystem services to citizens. Encouraging their implementation in the urban environment allows cities to increase biodiversity and system resilience and to adapt to climate change. Biodiversity can provide multiple benefits, such as improved air quality and social benefits.

The second consideration concerns the role of urban biodiversity in the policies mapped. At the national level, few policies address the issue of urban biodiversity in a central way. The protection of urban biodiversity is a secondary and consequential objective of urban policies that directly address other issues such as sustainable development or climate change. The same situation can be observed at the local level. Taking Emilia-Romagna as an example, the region has not produced any policies explicitly focused on urban biodiversity in the last 10 years. Also, regarding provincial capital municipalities, the only document identified is the Guidelines for the management of biodiversity in public and private green areas (Linee guida per la gestione della biodiversità nelle aree verdi pubbliche e private) adopted in 2022 by the municipality of Piacenza. The other policies identified at regional, metropolitan and municipal level deal with urban biodiversity in a secondary or marginal manner, having as other topics as their focus: forestry, sustainable development, climate change and agriculture. Concerning forestry we mapped the Regional Forestry Plan (Piano Forestale Regionale, 2016), the Guidelines for Metropolitan Forestry (Linee Guida per la Forestazione metropolitana, 2021); concerning sustainable development we have the Metropolitan Agenda for Sustainable Development (Agenda metropolitana per lo sviluppo sostenibile, 2019), the Urban Transformation Agendas for Sustainable Development of Piacenza, Ferrara, Ravenna, Modena, Cesena, Rimini, Forlì, Reggio and Parma (Agende trasformative urbane per lo sviluppo sostenibile – ATUSS, 2023); concerning climate change we have the Climate change mitigation and adaptation strategy (Strategia per la mitigazione e l'adattamento per i cambiamenti climatici, 2015), the Jobs and Climate Pact (Patto per il Lavoro e il Clima, 2020), the Reggio Breathes programme (Programma Reggio Respira, 2016), the Local Adaptation Strategy Reggio Emilia (Strategia locale di adattamento Reggio Emilia, 2021), the Green strategy for Bologna's urban climate (Strategia del verde per il clima urbano di Bologna, 2022), the Bologna Resilient City (Bologna Città Resiliente, 2020); and concerning agriculture we have the Regional Programme European

Regional Development Fund 2021-27 (Programma regionale FERS), the Rural Development Completion 2021-27 (Completamento Sviluppo Rurale). On the one hand, this analysis has allowed us to deduce that there is a commitment to integrate different themes and various axes of urban development even if they are always linked to the environmental aspects, but on the other hand, we observe that the role of urban biodiversity in these documents is sometimes merely rhetorical.

The last consideration concerns the type of policies currently in place to protect and increase biodiversity in cities. According to the investigations done, at the European level, if we consider that the New Restoration Law is only a bill for now, the EU Biodiversity Strategy for 2030 is a procedural policy that devolves to the member states the drafting of instruments for the implementation of the defined objectives. At the national level, the Italian Biodiversity Strategy for 2030 is also a procedural policy, while Law no. 10 of 2013 is the only law that gives indications and obligations on the development of urban green even if it does not give precise indications on urban biodiversity. This law has been followed by other procedural policies – the Guidelines for urban green management first indications for sustainable planning (Linee guida per la gestione del verde urbane prime indicazioni per una pianificazione sostenibile, 2017) and the National Urban Green Strategy (Strategia Nazionale del Verde Urbano, 2018) – that address and encourage the planning and design of green areas at different scales (territorial, urban, architectural) but that have actually led to the development of few thematic plans.

As far as the analysis of greening plans is concerned, we mentioned in the previous section that the recency is an important aspect characterizing the sample under investigation. Most of the Greening plans have been adopted in the past 6-7 years, with just three plans adopted before 2017. Despite the still scarce diffusion of this instrument in Italy (less than 2 provincial capital cities have an adopted greening plan), the analysis shows that the Guidelines introduced at the national level are slowly producing an impact on the elaboration and adoption of greening plans throughout Italy, providing a useful framework for the local administrations that manifest the political commitment to develop a greening planning framework. Another catalyst is the already mentioned EU Biodiversity Strategy that calls on the European cities and towns of at least 20,000 inhabitants to develop Urban Greening Plans including "measures to create biodiverse and accessible urban forests, parks and gardens; urban farms; green roofs and walls; treelined streets; urban meadows; and urban hedges" (European Commission, 2020b: 13). In the case of the EU Biodiversity Strategy, the reference goes to the "Guidance for cities to help prepare an Urban Greening Plan", which was adopted as a draft version in 2022. The guidance stresses the importance of the collaborative process underlying the Greening plan elaboration, including the need for working with citizens and other stakeholders, and for cross-departmental dialogue and integration with other aspects of urban development, from mobility and health, air and water, to energy and climate adaptation (European Commission, Eurocities and ICLEI, 2022). While in some Greening plans the relationship with these documents of guidance appears to be clear and direct, it is interesting to notice that other cases show a different pathway which is related to specific EU-funded projects that display knowledge and economic resources for their elaboration. For instance, this is the case of the Green Infrastructures Action Plan of Ferrara adopted in 2019 as an outcome of the Interreg Project PERFECT (Planning for Environment and Resource efficiency in European Cities and Towns) or the case of the Bologna Urban Climate Green Assets Plan, which comes as one of the results of the LIFE Clivut project (Climate Value of Urban Trees).

A second relevant aspect emerging from the analysis concerns the structure of the Greening plans. The research has pointed out a high level of heterogeneity and differentiation in the contents and arrangement of the plans. Despite the identification of some basic contents that the greening plans *should* have according to the National Guidelines (Pastore and Lazzarini, 2024), the weight that the Greening plan gives to the analytical and strategic dimensions varies

significantly from plan to plan. In some plans, the analytical part prevails over the strategic one, which means that the description and investigation of the local green system is rich and articulated, but this is not accompanied by a set of effective strategies and actions for supporting the transition towards greener and more resilient urban spaces. In others, the strategic and/or design dimension is dominant but the analytical part that should be at its basis is not sufficiently developed.

This differentiation also translates into the role that the objectives and strategies related to urban biodiversity have in the greening plans. For instance, some plans, as the one of Avellino, treat the topic of biodiversity mostly working on consolidating and completing the ecological network of the municipal territory, strengthening the connections between the protected natural areas present in the hinterland and the urban green spaces located in the town. Other plans, such as the one of Padova, introduce a set of specific objectives, strategies and actions explicitly tackling biodiversity. These rely on a survey made by local experts to monitor the diffusion of selected animal species in specific areas of the municipality.

One problem that emerged from the analysis concerns the weak commitment to implementation characterizing the majority of the greening plans investigated. Several plans do not specify which devices, tools, mechanisms, and processes are needed to implement the objectives and strategies. It is also often reported the lack of specification of the economic and human resources that would be required to bring those objectives to implementation. Despite this weakness, the greening plans mapped make an extensive use of quantitative indicators to monitor the actions included which mainly refer to the increase of both habitat area (e.g., total green surface area, number of trees and their canopy cover, etc.) and biodiversity performances (e.g., number of animal species or percentage of tree species diversity reported in each portion of green area) (Lazzarini, Mahmoud and Pastore, 2024). One open issue concerns the lack of quantitative targets that should accompany the monitoring indicators for preserving or increasing biodiversity habitats and species. Indeed, greening plans often introduce a set of specific indicators for monitoring the achievement of biodiversity objectives and actions, but they do not establish any specific quantitative target for these objectives, making their commitment to implementation weak.

6. Concluding remarks

From the research conducted, our observations are mainly considering the evident challenges from integrating urban biodiversity objectives between the EU and national to the regional and local level, even though the European policies and roadmap clearly facilitate the adhesion to increasing urban and blue greenery to improve quality of life and well-being in cities.

On one hand, and in some rare cases, the national policies and local policies align with the same vision on urban biodiversity conservation, restoration and increment, as highlighted in the case of Bologna. On the other hand, the urban greening plans are clearly sectorial, and in some cases, they do not dialogue with other thematic plans also operating on urban development themes that could have actions related to urban biodiversity in them. A clear disintegration happens at the spatial planning level whereas the planning regulations and thematic plans operate locally in municipalities and in cities abiding by the statuary planning laws and regulations that, nonetheless, do not get combined with each other towards creating a wider urban nature strategy at a larger scale, except in some cases.

Another disintegration happens within the same municipality governance level itself; in some cases, the technical knowledge and expertise needed for developing an urban greening/nature plan are sitting within the directorate of urban planning and do not dialogue with other sectors or directorates such as the mobility and infrastructure, health and built environment, etc. This disintegration is however a challenge that should be looked at from

within the governance process of the urban biodiversity strategy itself, by increasing the dialogue between stakeholders, citizens and decision-makers while trying to break silos circles.

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