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Citation for published version (APA):

RESEARCH ARTICLE

Environmental Policy and Governance | WILEY

Policy integration in urban living labs: Delivering multi-functional blue-green infrastructure in Antwerp, Dordrecht, and Gothenburg

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Abstract

Policy integration required for delivering multi-functional blue-green infrastructure (BGI) is difficult to achieve, because environmental policymaking is characterised by sectoral responsibilities and institutional structures that hinder collaboration. Both theory and practice consider urban living labs (ULLs) as promising vehicles for policy integration, as ULLs can overcome institutional structures. This article presents a framework that assesses how the urban living lab can contribute to policy integration in BGI projects and applies this to three case studies in Antwerp (Belgium), Dordrecht (the Netherlands), and Gothenburg (Sweden). Our findings demonstrate that ULLs can enhance policy integration through defining integrative aims, creating shared accountability structures, and assigning a clear problem owner with authority. ULLs can equally hinder policy integration because their dependence on sectoral funding results in narrowed-down goals. Moreover, their experimental, non-committal position gives them limited power to pull down institutional structures. Thus, ULLs do not automatically enhance policy integration in BGI projects.

KEYWORDS
climate adaptation, blue-green infrastructure, urban living lab, policy integration, collaborative governance

1 | INTRODUCTION

Cities are increasingly facing the impacts of climate change, such as more intense rainfall and heat stress, and therefore have no choice but to adapt (Susskind, 2010). A key approach to climate adaptation in cities, which seeks to address multiple climate issues simultaneously, is the construction of blue-green infrastructure (BGI). BGI capitalises on the benefits of greenspaces and the natural waterflow. The European Commission defines BGI as 'a strategically planned network of high quality natural and semi-natural areas with other environmental features, which is designed and managed to deliver a wide range of ecosystem services and protect biodiversity', consisting of both green

(land) and water (blue) spaces (European Commission, 2013, p. 7). BGI projects can occur at different geographical scales: from the individual building scale (green roofs) to neighbourhoods and cities (parks, ecological corridors) (Sharifi et al., 2021). BGI projects transcend the policy domain of urban water management and planning, as adaptation measures can contribute to wider environmental, social and economic values (Raymond et al., 2017). To illustrate, the construction of green roofs can increase not only water storage capacity, but can also contribute to higher property values, increased biodiversity and more social cohesion between residents as an outcome of collective maintenance. The success of climate adaptation policies crucially depends on how well such policies are integrated with other sectorial policies

in order to do justice to the multiple benefits of BGI (Frantzeskaki, 2019; Matthews et al., 2015). Therefore, policy integration—which is intended to align and bundle existing policy goals and instruments across policy sectors—is needed (Tosun & Lang, 2017; Trein et al., 2021).

To date, however, local governments have encountered many difficulties with integrating policy domains for urban climate adaptation, such as seen in the difficulty of breaking through institutional silos (Oseland, 2019) and aligning municipal departments (Wamsler et al., 2020). Due to the fact that multiple functions have to be accommodated, interests often conflict, and resources are scarce, implementing adaptation measures on the local level is challenging (Matthews et al., 2015), especially when one is confronted with traditional forms of subsystem policymaking within hierarchic governance systems (Candel & Biesbroek, 2016).

Consequently, local governments have been exploring new governance forms in order to enhance policy integration for climate adaptation in cities (Bulkeley & Castán Broto, 2013; Frantzeskaki, 2019). More integrative, place-based policy processes are proposed to facilitate the implementation of climate adaptation measures within the complex urban context (Nevens et al., 2013). A recent development in implementing urban climate adaptation policies at the neighbourhood level is doing so through experimentation (Juhola et al., 2020). Experimentation can be appealing because new technologies and policies can be tested in real-life settings in highly visible ways that can spur radical social and technical change in a rather safe and tolerant context (Baccarne et al., 2014). One promising form of experimentation in this field is the urban living lab (Bulkeley et al., 2016). Urban living labs are deliberate experimentation and learning grounds, in which actors can work in a collaborative nature and incorporate different interests (Franz, 2015). Living labs are normally designed as a safe haven where ingrained institutional structures are temporarily lifted, which could foster innovative multi-actor collaborations as a condition for policy integration (Nylén, 2021; Van Buuren & Loorbach, 2009; Van Popering-Verkerk & Van Buuren, 2017). Living labs have a promising departing point for achieving policy integration: they can bring stakeholders together and better account for the multiple benefits of BGI projects (Raymond et al., 2017).

Although a fair amount of empirical research on new collaborative governance structures has been conducted in which the emergence of climate governance experiments—such as living labs—is acknowledged, questions remain about the effectiveness of these initiatives with respect to policy integration (Juhola et al., 2020; Runhaar et al., 2014). For example, Voytenko et al. (2016) argue that a lack of consensus exists regarding the role of urban living labs in urban governance, and whether they represent a completely new phenomenon that is replacing other forms of participation, collaboration, experimentation, learning and governing in cities. To better understand its contribution to policy integration, we therefore have to unpack the concept of urban living labs. Previous research has defined different dimensions of urban living labs (Hossain et al., 2019; Van Geenhuizen, 2018; Voytenko et al., 2016), but how these dimensions could contribute to policy integration has not been researched

yet. We therefore aim to fill this research gap, specifically for the field of urban climate adaptation. Our research question is: *How do the dimensions of an urban living lab contribute to integrative policymaking in BGI projects, and why?*

The article contributes to the existing literature by providing insights into the relationship between urban living labs and policy integration. In contrast to the main traditional top-down notion of cross-sectoral policy making as a means for policy integration (Candel & Biesbroek, 2016), this article discusses the contribution of urban living labs—as disruptive practices that can cut across policy domains—as a vehicle for policy integration. In doing so, we echo Tosun and Lang's (2017) suggestion that research on policy integration can be greatly improved by paying more attention to the nexus of micro-management instruments and their effects on macro-regime characteristics and vice versa. By unpacking urban living labs into five distinct dimensions, we can identify more precisely how urban living labs could enhance policy integration, specifically in the context of blue-green infrastructure projects. The article presents a framework that allows for a critical assessment of urban living labs as a deliberate experimentation space for policy integration.

Section 2 presents a literature review leading to a framework with key dimensions of urban living labs that could enable policy integration. Section 3 explains our methodological approach. We applied our framework to three European case studies of urban living labs—Sint-Anneke Plage (Antwerp, Belgium), the Vogelbuurt (Dordrecht, the Netherlands) and Frihamnen (Gothenburg, Sweden)—that have been established by local governments for climate adaptation and broader urban regeneration goals. The findings in section 4 show the impact of different living labs' dimensions on policy integration. Finally, section 5 presents the conclusions and a discussion of the findings.

2 | LITERATURE REVIEW: HOW URBAN LIVING LABS CAN ENABLE POLICY INTEGRATION

2.1 | Policy integration

Policy integration is defined by Tosun and Lang (2017, p. 559) as 'policy-making in certain domains that take policy goals of other, arguably adjacent, domains into account'. This could happen either horizontally (between domains on the same level, such as the urban level) or vertically (linking the [supra-]national, regional and the local level with each other) (Hertin & Berkhout, 2003). Horizontal integration is described as the establishment of intra- or inter-organizational relationships between different municipal departments and/or public and private partners. If we apply this to the implementation of climate adaption policies, we see that blue-green infrastructure (BGI) projects are usually defined as a responsibility of the domain of urban drainage (urban water management) at the local government level (Farrelly & Brown, 2011), but the co-benefits of BGI indicate the potential of overlap with policy domains beyond urban water management (Rauken et al., 2015; Willems et al., 2021). For the purpose of this

article, we therefore focus on horizontal policy integration on the local level, assessing how the field of urban water management is connected to other policy domains. The success of climate adaptation policies depends largely on the extent to which they are 'integrated' with other sectoral strategies that are rooted in different value perspectives (Tosun & Lang, 2017). If applied to BGI for example, core values in urban water management, such as reliability and cost-effectiveness, have to be connected to spatial, environmental and economic values (Raymond et al., 2017).

Literature on policy integration typically distinguishes between different degrees of policy integration (Cejudo & Michel, 2017). At the bare minimum, policy integration (as coordination) can reduce duplication and eliminate loopholes between domains. More ambitious policy integration can turn into fully institutionalised forms of interactions between domains that mutually develop priorities and strategies (Cejudo & Michel, 2017). More recently, research has argued for a more processual understanding of policy integration, in which policy integration is seen as an unfolding, dynamic activity (Candel & Biesbroek, 2016; Newig & Fritsch, 2009). This viewpoint fits a reality in which public services are coproduced between a variety of actors, as is common in urban climate adaptation (Frantzeskaki, 2019).

Previous research has demonstrated that policy integration for urban climate adaptation is hindered by institutional silos and misalignment between municipal departments (Oseland, 2019; Wamsler et al., 2020). To illustrate, local governments have developed sectoral organisational structures and routines that easily conflict with each other in terms of organisational goals, resources and time horizons, and hinder alignment (Uittenbroek et al., 2013). Although such fixed decision-making structures help protect certain standards when values conflict, they also encourage powerful actors to rely on a technical approach whereby measurability in models ensures justification (Ford et al., 2019).

2.2 | Urban living labs as potential enablers of policy integration

As a means to overcome institutional fragmentation, we argue that urban living labs (ULLs) can be useful vehicles that allow for experimentation with policy integration (Bulkeley & Castán Broto, 2013; Nevens et al., 2013). An ULL can be considered a disruptive practice that is deliberately looking for new solutions for complex policy challenges, while simultaneously providing a relatively safe environment for experimentation (Franz, 2015). ULLs are an example of urban experimentation as a new form of governance, typically focused on single projects and solutions (Davidson et al., 2019; Kronsell & Mukhtar-Landgren, 2018). The terminology of urban living labs may be used differently among authors, but—generally speaking—living labs share two elements: (1) a focus on service and product innovation, knowledge and learning, and (2) an emphasis on co-creation, participation and empowerment (Bulkeley et al., 2016; Voytenko et al., 2016).

The concept of living labs originates from the field of innovation studies (Van Geenhuizen, 2018) and has more recently been applied to the fields of urban governance (Bulkeley et al., 2016; Franz, 2015) and transition studies (Frantzeskaki, 2019; Nevens et al., 2013). In those settings, users and producers jointly work on creating new designs, prototypes and innovations to increase the performance of the service. More recently, living labs have also been applied to real-life environments (hence the notion of *urban* living labs) as a means for co-creating urban development, bringing governments, business and civil society together (Bulkeley et al., 2016). Urban experimentation can be contrasted with more traditional and neoliberal forms of governance by decentralising responsibilities among public, private and civic actors (Davidson et al., 2019). Accordingly, ULLs are put forward as arenas for developing integrative and joint actions for tackling urban issues in a participatory setting (Frantzeskaki, 2019; Franz, 2015) that allow for horizontal policy integration. At the same time, ULLs could be used by governments as a strategy to withdraw from their (public) responsibilities (Kronsell & Mukhtar-Landgren, 2018).

Altogether, horizontal policy integration is difficult to realise in regular implementation practices, yet the literature presents ULLs as a disruptive practice that creates an experimentation ground for policy integration (Nylén, 2021). If we adopt this more technical perspective, we can unpack ULLs into different dimensions and assess how each dimension could be a contributing factor to policy integration (Van Geenhuizen, 2018). Three review articles have defined five key dimensions of an urban living lab (summarised in Table 1; Voytenko et al., 2016; Van Geenhuizen, 2018; Hossain et al., 2019). We will discuss below the potential contribution of each dimension to policy integration.

First, the setting refers to the urban real-life context of the living lab, that is, the geographical embeddedness (Bulkeley et al., 2019). Urban living labs territorialise 'urban innovation at a more manageable scale' (Voytenko et al., 2016, p. 47). Area-based living labs will contribute more to policy integration because it fosters the integration of different land use claims (e.g., water storage, recreation facilities, and community garden) and directs attention to the physical environment where the lab takes place (Von Wirth et al., 2019). The real-life environment is further operationalized by the institutional setting of the living lab (Marvin & Silver, 2016). Whereas the field of urban water management is often defined by a risk-averse setting (oriented towards controlling uncertainties), the living lab can create a more flexible institutional setting that allows for the experimentation and exploration needed for policy integration (Farrelly & Brown, 2011). Relative autonomy helps to provide the right conditions for innovation to flourish (Willems et al., 2020), which could lift (at least temporally) the barriers for policy integration.

Second, urban living labs bring together different groups of stakeholders, ranging from citizens, governments, NGOs and businesses (Bulkeley et al., 2016; Franz, 2015). For urban climate adaptation, a living lab can bring together different municipal domains (Wamsler et al., 2020), as well as the private sector (real estate developers, housing associations) and civil society. Urban living labs often refer to civic innovations, thus engagement of the wider public is key (Voytenko et al., 2016). Accordingly, often a core group of partners exists that is surrounded by a broader network of stakeholders (Van

TABLE 1 Framework: potential contribution of the urban living lab on policy integration

	Urban living lab dimension	Hossain et al. (2019)	Voytenko et al. (2016)	Van Geenhuizen (2018)	Contribution to policy integration for BGI projects
1	Setting	Real-life environment	Geographical embeddedness	Real-life environment	Integration of land-use claims at a specific physical location requires stakeholders to bridge policy domains
2	Stakeholders	Public-private partnerships (3Ps) or public-private-people partnerships (4Ps)	Partnerships with 'quadruple helix of public bodies, universities, government and industry together	Learning partners and broader network partners	Development of shared accountability between municipal departments, civic organisations and private sector, led by a clear 'problem owner'
3	Activities	Innovation and collaboration (experimentation, testing, validation, co-creation)	Experimental activities: processes of innovation and learning	Product/service development through learning and co-creation	Experimentation and learning with integrated BGI projects through prototype development
4	Approach	Methods, tools, and approaches	Participation and user involvement	User involvement in learning and co-creation	Active involvement of municipal domains and users (communities, businesses) in BGI projects using participatory methods
5	Resources and networks	Business model (viability) and network	Funding bodies (research organisations, government)	Present motivation and capabilities of actors (e.g., expertise, tools, finances)	Additional (external) resources (expertise, finances) allow for working outside existing (sectoral) structures.

Geenhuizen, 2018). Stakeholder interactions can quickly become complicated, since stakeholders may have competing interests (Hossain et al., 2019). In order to deal with competing interests, three process-related elements need to be taken into account. First, successful living labs require a clear leader or 'problem owner' (Tosun & Lang, 2017; Van Popering-Verkerk & Van Buuren, 2017; Voytenko et al., 2016). This leader accounts for inter-organizational working and the pursuit of common goals leading to policy integration. Next, there must be trust and a mutual understanding developed between the stakeholders in order to facilitate the exchange between policy domains (Van Popering-Verkerk & Van Buuren, 2017). Finally, the development of a structure of shared accountability is conducive to policy integration because the different involved stakeholders have clear roles assigned that clarify what the responsibility is with regard to the integrated policy goals (Tosun & Lang, 2017). Such shared accountability can be structured informally or formally.

The third dimension relates to the activities of the living lab. In general, urban living labs focus on the co-development of city and living environment (Bulkeley et al., 2016; Franz, 2015; Voytenko et al., 2016). As a consequence, an urban living lab can connect urban climate adaptation goals with broader urban development goals (Nevens et al., 2013). Both developments can mutually reinforce each other: for instance, climate adaptation measures not only contribute to tackling global challenges such as climate change, but also improve

an area's biodiversity or social cohesion. In realising urban co-development, urban living labs typically take an action-oriented stance, deliberately aiming at change or transformation (Frantzeskaki, 2019). The living lab's aim can be specified as tangible outcomes, such as prototypes and solutions, or intangible outcomes, such as knowledge and idea generation (Hossain et al., 2019). Following Frantzeskaki (2019), the better-defined these outcomes are, the more effective an urban living lab becomes and the clearer it is which policy domains need to be involved. Moreover, the outcomes can more easily be captured and replicated in other locations. Altogether, the activities aim to improve a specific service (i.e., more integrated forms of blue-green infrastructure) through innovation, learning and collaboration (Van Geenhuizen, 2018).

Fourth, in the living lab's approach, Voytenko et al. (2016) distinguish between, on the one hand, experimentation and learning and, on the other hand, participation and user involvement. Experimentation refers to actual testing and validation of new ideas, services and products (Hossain et al., 2019), which can foster learning between stakeholders and help them to integrate policy agendas (Hertin & Berkhout, 2003). For example, living labs can develop prototypes (Voytenko et al., 2016) or can become demonstration projects (Van Buuren & Loorbach, 2009). Prototyping leads to mutual learning between policy domains, which can subsequently enable policy integration. Participation goes hand in hand with the construction of

shared meaning (Van Popering-Verkerk & Van Buuren, 2017) and the co-production of knowledge and ideas (Voytenko et al., 2016). Participation presupposes the active involvement of multiple policy domains and users, as they can help with improving services and products, either as active co-creators, or as advisors (Van Geenhuizen, 2018). Accordingly, this active involvement is likely to enhance policy integration.

The fifth and final dimension has to do with the availability of resources, specifically financial resources (funding), human capacities and support (Hossain et al., 2019; Van Geenhuizen, 2018). Targeted funding, often derived from external public sources, will make stakeholders less dependent on their individual budgets, so policy integration is more likely and the urban living lab becomes viable (Bulkeley et al., 2019; Voytenko et al., 2016). Capacities refer to knowledge, skills and labour that help to integrate policy domains (Van Geenhuizen, 2018). Domains with sufficient boundary spanning (connective capacity) and creative capacity are more likely to engage in policy integration. Boundary spanning activities are important in order to bridge actors' viewpoints (Van Meerkerk & Edelenbos, 2014). Next, creative capacities are important to foster innovation and thinking 'outside the box' (Van Geenhuizen, 2018). Finally, support refers to both the political and administrative support a living lab receives, and, accordingly, whether participants have the necessary backing of different policy domains.

All in all, this leads to an assessment framework, in which the five dimensions of an urban living lab explain how and why labs can become a useful vehicle for policy integration (summarised in Table 1).

3 | METHODOLOGY: A THREE-STEP APPROACH

We conducted a comparative case study examining three European cities, Antwerp (Belgium), Dordrecht (the Netherlands), and Gothenburg (Sweden) to determine how the potential contribution of each dimension of the urban living lab appears in the practice of integrative policymaking for climate adaptation. Case study research allows for acquiring in-depth, context-specific knowledge (Yin, 2003), which is crucial for understanding collaborative policy processes.

3.1 | Case selection

Our choice for the cases of Antwerp, Dordrecht and Gothenburg is an informed one (Flyvbjerg, 2006). These cities are all developing climate adaptation measures through a living lab, for which they exchange experiences in the European Interreg-project BEGIN.[1] Although the goals of the urban living labs all relate to BGI creation and urban regeneration, the living labs differ, especially in terms of the three living lab dimensions: resources, activities, and approach. Consequently, we have selected a maximum variation on the independent variable in cases (Flyvbjerg, 2006) to see how different interpretations for each dimension impact the policy integration achieved. The cases are introduced in Table 2.

3.2 | Data gathering and analysis

We used triangulation and gathered two data sources per case in order to understand how each dimension of the urban living lab influences policy integration. In each city, a series of semi-structured interviews was conducted with key stakeholders representing the main involved parties in each living lab (both from involved municipal departments and non-governmental actors). In total, 19 interviews were conducted between November 2018 and February 2019 (see Appendix 1). Initially, project representatives who had participated in the BEGIN network were approached; additional participants, such as local stakeholders, were selected and interviewed through snowballing. The interview questions focused on the aims and set-up of the urban living lab, the involvement of the interviewee and other stakeholders, and the evolution of the living lab over time (Appendix 2). The interviews were conducted at the home organisation of the interviewee and ranged between 30 and 90 min. The interviews were complemented with a document analysis of local strategic plans for the case study areas, internal documents, and research papers (Appendix 3).

The gathered data were used to interpret how each dimension of the urban living lab was operationalized, and subsequently how each dimension supported policy integration. We used qualitative content analysis to code quotations about living lab dimensions and factors (Flick, 2013). The code tree mirrored the five dimensions as distinguished in Table 1, centring on the living lab's setting, stakeholders, activities, approach, and resources.

4 | URBAN LIVING LABS FOR INTEGRATIVE POLICYMAKING IN BGI PROJECTS: EVIDENCE FROM THREE CASES

Section 4.1–4.5 will review the influence of the various interpretations of the five dimensions of the living lab in the three cases on policy integration objectives, based on the framework presented in Table 1.

4.1 | Setting

The living labs in Antwerp and Gothenburg were strongly rooted in the area, while the living lab in Dordrecht was more loosely defined. Antwerp City Council considered Sint-Anneke Plage a promising area for adaptation measures, as there is a relatively large amount of under-used greenspace (City of Antwerp, 2016[2]). At the same time, the Council aims to improve the area's socio-economic situation: there is diminishing interest in the recreation possibilities and local cafes and restaurants are less frequently visited. An official argued:

> You can consider Sint-Anneke Plage as a small pilot
> area to create a green-blue landscape on the left banks
> of the Scheldt. [...] That can boost commercial

TABLE 2 Introduction to the case studies

	Sint-Anneke Plage, Antwerp BE	Vogelbuurt, Dordrecht NL	Frihamnen, Gothenburg SE
Setting	Former recreation area on the Left Banks of the Scheldt River and low-density housing.	Post-war neighbourhood with a lower socio-economic status and a large social housing stock.	Former harbour area that is currently uninhabited, yet close to the city centre.
Initiator	Antwerp City Council	Dordrecht City Council	Gothenburg City Council
Stakeholders	Other municipal departments; Vlaamse Waterweg (landowner); NGOs such as Natuurpunt; local businesses and residents	Other municipal departments; housing association Woonbron; neighbourhood organisations such as Vogelnest and local sport club	Other municipal departments; the public enterprise River City Company (landowner); the NGO Passalen; artists; local residents
Activities and approach	Living lab Sint-Anneke Plage was started to explore the potential of BGI for the area by creating a BGI prototype, facilitated by the municipal CityLab2050 department	Living lab Vogelbuurt was established to connect different investments for the neighbourhood (linked to distinct 'departmental silo') and to attract additional funding for BGI	Jubileumsparken 0.5 was started as a placebuilding project for co-creating prototypes for the area with local residents before the major urban regeneration would start.
Resources	Financial support from European project Interreg BEGIN (exploration) and Flemish government (implementation), with in-kind contributions from stakeholders	Financial support from European project Interreg BEGIN, small in-kind contributions (expertise) of stakeholders	Financial and human capacity from City of Gothenburg and River City Company, complemented with European subsidy (BEGIN)
Period of time	2017-current	2018-current	2013-current
Policy integration outcomes	Blue-green vision for the redevelopment of Sint-Anneke Plage: combining climate adaptation measures with socio-economic redevelopment, feeding into the future redevelopment of Antwerp's Left Bank. Transformation of the car parking at the Gloriantlaan into a wetland as a green 'entrée' to the area	Blue-green vision for the redevelopment of the Vogelbuurt and adjacent sport park: creating a multi-functional park in which goals related to climate adaptation, biodiversity, and recreation and public health would return). The vision is used as a guiding document and will be realised step-by-step.	Creation of six temporary land-uses in Frihamnen preluding the Jubilee Park. The prototypes contributed to BGI (both awareness-raising and more blue-green physical structures), to social wellbeing (e.g. labour market reintegration), and to city branding.

activities... you can hike there... It's the best of both worlds, an urban metropolitan environment in a green landscape. (#9).

Later on, the geographical area became more narrowed down to a paved parking at Sint-Anneke Plage (on Gloriantlaan), which is in the City of Antwerp's vision for the redevelopment of the area (City of Antwerp, 2019). The narrowed-down focus in the document was the result of limited resources, as the team could only acquire funding from the Flemish government for de-pavement (see also 4.5). This minimised the opportunities for policy integration.

In Gothenburg, Frihamnen was identified as a 'testbed area' in which innovations related to water, mobility, and energy could be developed, as part of the ambitious municipal River City Vision to transform the area from a former harbour area into a residential area (City of Gothenburg, 2012). The land is currently uninhabited and, as a civil servant stated, 'if we can't do this [here], it won't be possible anywhere'. Once Gothenburg City Council announced they would create a Jubilee Park as part of the city's 400-year anniversary in 2021, the feeling was that 'we [the municipality] should put it in Frihamnen, because so much is going on in Frihamnen anyway'.

In Dordrecht, the living lab started more inductively after city-wide explorations to identify neighbourhoods in which adaptation

measures could easily be created (summarised in City of Dordrecht, 2018).

We sat around the table with very different parties to match ambitions and projects with each other. We were looking at places where ambitions were really adding up. The Vogelbuurt neighbourhood was the most striking one, of which we were not fully aware [as a municipality]. Then we started to define it as an urban living lab with the stakeholders and directors in order to make sure we would align ambitions. (#2).

Although the Vogelbuurt was one of the promising areas, the living lab kept its geographical boundaries open, so neighbouring areas could be included as well. This hindered integrative policy-making, as neighbourhood organisations felt less committed to the city-wide orientation. To illustrate, a social entrepreneur stated: 'I have mainly focused on what we want to do and where connections exist with other developments. But that's maybe paper thin'. (#5) In contrast, the geographical embeddedness in Antwerp and Gothenburg created opportunities for policy integration, linking climate adaptation, green space and urban regeneration.

The institutional setting complicated policy integration, as bridging 'departmental silos' was considered difficult in all three cases. For example, interviewees in Gothenburg argued that municipal departments operate in silos and have different mandates. Moreover, the land in Frihamnen is owned by the public enterprise River City Company, which primarily aims to make a profit from selling land. An official explained:

> The City Planning Office is always in charge of the planning, so we start. We always involve the transportation department, the real-estate office, then the water and sanitation department, the parks and greenspace department. [...] The special thing with Frihamnen was not only this work between departments, but we also have the River City Company. It owns the land, but it is a municipal company. [...] They are an important part of the planning process, because it's very stupid of us to plan something that the landowners, the River City Company, says no to. (#19).

In Dordrecht, interviewees mentioned that many financial resources were allocated in long-term sectoral investment plans. Consequently, particularly implementation departments can be influential, as they typically drive the agenda for large-scale investments. This was illustrated by an official who insisted: 'We need to replace the sewage system from an engineering point of view, otherwise we may have issues. That's imperative. We have the budget and it needs to be spent'. (#1).

In particular Antwerp and Dordrecht have a rich tradition of urban water management, but it is difficult to link that tradition with broader municipal goals. In Antwerp and Gothenburg, new departments were established, such as Antwerp's CityLab2050. This department can experiment with 'new solutions for complex problems in becoming a sustainable city' (CityLab2050, 2018). Although new temporary interdepartmental structures would allow for experimentation, these structures were somewhat disconnected from existing silos. A public official responsible for participation explained:

> We had already established a participation process at Sint-Anneke Plage. Then, all of a sudden, one part became a CityLab with its own process. That started from scratch and then it stopped, and the previous participation process will continue, because [the redevelopment of] Sint-Anneke Plage will not be finished by then. (#12).

Despite these new structures, the sectoral competition between departments dominated: the living lab as a helping structure was not strong enough to break the hegemony of the silos, especially those with a clear mandate and accompanying resources.

4.2 | Stakeholders

In terms of leadership, each living lab had a clear municipal actor in the lead. In Antwerp, the Spatial Planning department of Antwerp City Council initiated the living lab, and had to navigate amid the innovative CityLab2050 department and their own department responsible for the implementation. While the CityLab2050 was looking for experimental ideas, the municipal team members had to be reassured that the solutions developed were realistic. As CityLab2050 brought in its own experts, the lab made little use of the already-gathered experience: 'We have to explain to locals that another part of the municipality was responsible for [the living lab], but residents do not care about that'. (#10) The project team of the Spatial Planning department was not able to bring both departments together.

Likewise, in Dordrecht, the municipal department, assigned to create a 'climate-sensitive city', was in the lead and had to bridge its own climate adaptation goals with societal goals of the neighbourhood. The department had an agenda-setting role, as well as a connecting role in bringing different parties together. For example, it launched a leaflet on the potential of redeveloping the Vogelbuurt (City of Dordrecht, 2019). This was valued by other stakeholders, yet it remained difficult to keep this energy, as a civil servant stated:

> I really liked it, but we all have our own jobs and tasks and this should not hinder that. We did not really create an organisational structure or a project out of it. It was a loose connection, just a brainstorm. (#3).

By contrast, in Gothenburg, a project team was created consisting of members from the City Planning Office and the River City Company. The team could work with relatively a great deal of freedom and operated as a sort of 'firewall' for new goals coming from the City Council and the River City Company. According to one project member:

> We are a small and sort of tightknit team, so we can find shortcuts and activate and test things. If we were the big City Planning Office, if I had to do something within this structure, I would have to have it planned eight to twelve months ahead of time. [...] Now, we can do things really quickly with municipal money. (#18).

The three living labs managed to establish trust. For example, in Antwerp, participants from *De Vlaamse Waterweg* and *Natuurpunt* mentioned in the design sprint that they appreciated the close involvement in the regeneration of Sint-Anneke Plage. In Gothenburg, the team and its collaborators have established a high level of trust, for example by organising many informal meetings with the architects. One architect mentioned:

> I noticed during the process little details, of which I thought: Well, that's just really unusual. I remember one day we arrived from the airport with our bags, and they were barbequing on site, and said: Ah, okay, let's eat together. I've never had this. (#17).

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Despite the trust, participants in Antwerp and Dordrecht mainly participated 'to hear what was going on'; they were reluctant to commit themselves because of the open-ended goals and the lack of clarity about resources (see also section 4.5). Therefore, a shared accountability was not developed. To illustrate, participants in Dordrecht committed themselves as long as the new vision would not clash with their own suborganisation's goals. For example, the chair from the local sports council explained: 'If the municipality is going to change something near the sports park, we take the opportunistic stance to join forces. Because then we can realise the vision we have developed ourselves too'. (#6).

The established tasks and organisational structures operated as rigid structures, which required leadership to breakthrough. The inductive approach of the living lab did not facilitate that because the voluntary network came without obligations. Therefore, policy integration was difficult to get off the ground. In Gothenburg, the project team managed to develop a sense of shared responsibility. Interviewees noted that typically municipal departments are competing with each other to push for their interests, and the City Planning Office and the River City Company have different viewpoints. The lab managed to bypass this and created shared commitment for the integrated urban redevelopment of Frihamnen.

4.3 | Activities

The three living labs all developed integrative goals, in which climate adaptation measures also contribute to greener and more liveable areas for residents. For example, in Antwerp, the living lab focused on the creation of a BGI prototype—the green entrée—emphasising the multiple benefits of both urban climate adaptation measures and broader socio-economic goals. A project document (City of Antwerp, 2019) presented the prototype as a 'nexus of nature, recreation, and the Scheldt river' that could show results on the short term. Moreover, the team behind the living lab hoped that the process would raise awareness for the potential of BGI. For instance, an official stated: 'It's definitively a gain that we currently know that the story of greening the city is difficult to sell, but we learned to create a story, in which green also contributes to health, a liveable city and social cohesion'. (#7) Although broad ideas were developed for the transformation of the wider Sint-Anneke Plage, over the course of the living lab the aim narrowed to the greening of a car parking lot because of funding limitations (see section 4.5). The wider benefits of greening the city therefore faded into the background.

Equally, the living labs often tried to match their goals with ongoing developments in the area in order to increase success. In Dordrecht, the living lab tried to 'incorporate climate adaptation in concrete projects' (City of Dordrecht, 2018, p. 5), such as the already planned renewal of the sewage system and social housing estates. The new green space will be used to enhance recreation opportunities and engage residents with their neighbourhood, for example through the co-maintenance of greenspace. As one interviewee summarised it, these improvements would hopefully lead to a situation in which the

Vogelbuurt is no longer known as a deprived neighbourhood, but as a neighbourhood of which residents are proud and feel a sense of ownership. The project leader: 'These are all little steps, but they are needed to make the neighbourhood pleasant again'. (#1) In Gothenburg, the goals became more narrowly defined over the course of the lab as well. The development of the Jubilee Park through several prototypes was framed as 'Phase 0.5'. A researcher explained: 'The '0.5' park explores what might be called half- or part-way measures that can inform the design of the future (1.0) park' (Dahl, 2016, p. 77). Furthermore, an official stated: 'The Jubilee Park is a place where we can try ideas; it's not permanent from the start, so we can try something and get information from the citizens, and [...] then along the way see what the needs are'. (#16) This co-development of the park is executed in a bottom-up manner, according to an official: 'We can invite the citizens to try things and together create, in a dynamic way, part of the city'. (#16) Through experimentation and close cooperation with residents, the aim of creating a park facilitated integrative policymaking in different small-scale projects.

4.4 | Approach

Regarding experimentation and learning, Antwerp and Gothenburg focused on prototype creation. In Antwerp, the project team developed a plan to get from the exploration of potential solutions towards the selection of one solution and the actual testing and implementation of the prototype. To this end, the CityLab2050 department and external facilitators were hired. Interviewees mentioned that they did a great job to legitimise a different approach in which experimentation is allowed. Because of the label 'CityLab', more innovative ideas could be explored; thus, a distinctive space for experimentation has been ensured. According to a municipal official: 'Now it is a CityLab, so the techniques are a bit more innovative. You get things like a 'design sprint'. But the question remains: are you involving the right stakeholders in the right way? People have mixed opinions about that'. (#10).

In Gothenburg, the framing of the park as 'Phase 0.5' emphasised experimentation (Dahl, 2016). The project team guided the experimentation for the park, building further on a study that inventoried the suggestions from local residents. The experimentation was specified into five projects, of which one was for instance the creation of a sauna emerging from the theme 'bathing culture'. These creations were defined as prototypes that could be improved along the way. A civil servant (#16) argued: 'That's the beauty of it: Let's try something, and if it works, it's really appreciated so let's keep it', which suited the definition of Frihamnen as a testbed.

In Dordrecht, the living lab consisted of three ateliers, in which three municipal departments and several local stakeholders participated. A municipal official explained:

> We organised it, but also the water authority, regional government, nature organisations, and neighbourhood groups joined. We put our cards on the table. You

could see that often different parties were operating in the same neighbourhood, working on projects that had a lot of overlap but that were not aligned. (#2).

These sessions focused on alignment and building trust rather than the development and testing of a shared prototype. Consequently, Dordrecht produced less tangible outcomes of policy integration compared to Antwerp and Gothenburg.

The three labs provided ample space for participation. In Antwerp, the CityLab2050 department invited a selected group for participation in the lab, of which some interviewees are critical, stating that this small group of progressive people does not represent all interests. Local stakeholders were less involved by the Council because Antwerp City Council already had a regular participation trajectory running on the larger Left Bank area with residents and local businesses. Interviewees stated their concerns, as having two trajectories can be confusing for locals.

The different trajectories hindered policy integration because stakeholders were not brought together. In Dordrecht, interviewees stated that—to their surprise—they sat together with parties they usually do not interact with and that they were pushed to think beyond their individual interests. A municipal official from the social domain stated: 'We were put together for the first time in ages. I met colleagues I have had never seen. Like, those people from the sewage department, when should I suppose to meet them?' (#3) Local residents did not participate in these sessions, but were represented by a neighbourhood organisation that is responsible for weekly neighbourhood activities and was considered a linking pin that could transfer the ideas of residents to the municipality. The representative from his organisation explained:

> We can make the challenges [like climate adaptation] very relatable. Residents do not see or feel that, but you can translate that. We have a lot of paved public spaces here, and it was sweltering hot in the summer. At the sport parks with greenery and trees over there, [the temperature] differs ten degrees you know. We can tell people that, and they can take actions themselves by greening their garden. (#5).

In Gothenburg, the project team adopted a 'strategic place-building' method that would enable 'many people, irrespective of expertise, to gain access to the project and play a role in its development' (RCC, 2016, p. 3), for example through participatory artmaking. Artists and architects were hired to develop the prototypes, and local residents could help with the construction. Residents valued this highly, as many of them were curious about what was going on in the riverfront area. The prototyping process, consisting of an open, issue-based approach, is appealing to a wide variety of stakeholders, which benefitted policy integration. The architect who led the prototyping explained:

> People were very curious about this River City idea. The city wants to reclaim its waterfront, this post-

industrial era, and how do we do that? It's all this momentum that starts building up and that gives a lot of push to a project. It grounds the project a lot, giving it strong anchors in terms of stakeholders.[...] There are people who were involved in this phase who still go to the sauna weekly and take care of it because they feel it's theirs. (#17).

4.5 | Resources

Both Antwerp and Gothenburg invested substantially in the facilitation of the living lab. In Antwerp, European Interreg funding was used for the hiring of external facilitators and designers who helped in creating new ideas. Less resources were spent on bridging municipal departments and local stakeholders. A few interviewees were critical about the allocation of resources:

> Another problem is that a CityLab costs quite a lot of money. To organize those design sprints and such. If I add up what the costs of these activities are, it's great that people get inspired, but really... The input of money far exceeds the value of the output. (#11).

In Gothenburg, funding came from the City Planning Office and the River City Company for the realisation of a Jubilee Park. Two new project leaders were appointed especially for this lab, as they had ample experience with the place-building method in other Swedish cities (RCC, 2016). They secured 'experimentation freedom' for their project right from the start in order to develop prototypes, which has put the living lab on a distance from the City Planning Office and River City Company. Additional funding from the European Interreg project BEGIN was used to increase the involvement of local stakeholders.

The team in Dordrecht did not have significant financial resources, which meant that they had to collaborate with regular departments to ensure investments in climate adaptation. Dordrecht City Council managed to establish a network of actors who usually do not collaborate with each other, but did not secure financial commitment. While European Interreg funding was used to found the living lab, an internal document underscores that additional resources had to come from another European subsidy (City of Dordrecht, 2016). However, this subsidy was not granted. A civil servant explained: 'If we would have received that subsidy, then we would have had a lot of possibilities to actually start realising projects'. (#1).

The three living labs had both connective and creative capacities in place. For example, external experts (architects, facilitators) ensured creative capacities, while the teams managed to build up a broad social network. For instance, in Gothenburg, open calls were a means for approaching artists and architects. Moreover, the team consisted of members who were fully employed for fostering citizen participation.

Antwerp and Dordrecht struggled with receiving support and lacked authority for developing the prototypes. In Antwerp, political

TABLE 3 The urban living lab in the three cases, and its impact on policy integration

Dimension	Sint-Anneke Plage, Antwerp	Vogelbuurt, Dordrecht	Frihamnen, Gothenburg
Setting	Sint-Anneke Plage as location that needed an upgrade, later on narrowed down to a paved parking minimizing opportunity for policy integration	Loose geographic demarcation due to city-wide explorations limited policy integration, as stakeholders felt less connected.	Frihamnen was identified as a 'testbed area' allowing for a place-based approach that helped integrating policy domains
Activities	New BGI is used as 'carrier' of the area in order to match climate adaption goals with ongoing developments in area, promoting policy integration	Realising climate adaption goals along already planned urban renewal (housing improvements, replacing sewage system), thus narrowed-down opportunities for policy integration	Co-creating BGI prototypes to co-develop Jubileumsparken with local residents and school pupils, with potential for policy integration
Approach	BGI prototyping to show multiple benefits (social, economic, recreational, and ecological) created policy integration opportunities, but participation of residents was hindered as the living lab competed with regular public consultation	Bringing together municipal domains and local NGOs who do not usually come into contact with each other led to thinking beyond individual interests, creating a receptive setting for policy integration	Place-building method that is open to different policy domains: local residents as co-developers and co-producers of BGI prototypes
Stakeholders	Spatial planning department as leader, however no authority to officially commit other actors active in the area. The lab did not define shared accountability; parties participated to be informed rather than to commit, so policy integration was hindered	A blue-green department dedicated to create a 'climate-sensitive city' had an agenda-setting role. Their informal meetings led to building up trust, but did not result in shared accountability; other parties participated to be informed and to seize opportunities	Shared accountability and high level of trust between City Planning Office and River City Company in dedicated project team, involvement of other municipal domains, architects, NGOs and local residents
Resources	Mixed opportunities for policy integration. External facilitators and designers helped to create new ideas, but the team needed to attract provincial funding after municipal funding was stopped. Also mixed political support, leading to limited authority for integrative solutions	No additional funding; living lab was also not able to re-allocate financial resources of long-term sectoral investment plans. A local network of stakeholders was built, but financial commitment was not secured, making policy integration open-ended	Financial investments secured by 400-years-anniversary provided resources to work together with artists and architects; also stable political support

support was mixed, especially since a more populist, right-wing party won the local elections in 2019. A civil servant stated:

> On the one hand, local politicians are putting their money on the liveable city. A city has to be green, liveable, with good air quality and cycling possibilities. On the other hand, politicians are afraid that this will be unpopular with citizens, so car mobility and car parking continue to receive a lot of attention. (#7).

Therefore, they had limited authority for integrative solutions for climate adaptation, although on paper ambitions may be high. Similarly, in Dordrecht, climate adaptation received widespread political support after the latest elections in 2018, but without an implementation agenda.

Gothenburg, on the other hand, had abundant resources available (RCC, 2016). This gave the living lab authority, yet translation to other places may be challenging. Financial resources were secured relatively easily because of the importance of the 400-year-anniversary, while there are ongoing political discussions about the exploitation of the whole *Frihamnen* area for the wider urban regeneration. Altogether, resources enabled policy integration.

4.6 | Comparison and discussion

When we compare the three case studies on the five dimensions (Table 3), especially the dimensions of stakeholders and resources come to the fore with regard to enforcing policy integration in BGI projects. A shared vision creates a promising point of departure for policy integration, yet it needs to be enforced. This can be achieved via stakeholders (development of shared accountability structures) and resources (leadership and financial capacity). To illustrate, the experimental, non-committal position of the living labs without shared accountability structures complicated policy integration because the projects remained too voluntary. The living lab in Gothenburg already had these structures more defined, whereas the cases of Antwerp and Dordrecht still had to define these responsibilities along the way. For example, Gothenburg created a dedicated project team that consisted of both the City Planning Office and the landowner River City Company, which were mutually responsible for the living lab, reflecting novel interdependencies (Tosun & Lang, 2017). In Antwerp and Dordrecht, other municipal departments and stakeholders felt less ownership of the lab and mainly participated to represent their interests and to be informed, and therefore it proved difficult to retain their commitment.

Our findings confirm that integrative aims and shared accountability structures are needed to enhance policy integration and that they indeed make urban living labs a disruptive practice, in line with Voytenko et al. (2016). Our empirical results further underscore that the need for creating novel interdependencies as discussed in the policy integration literature (Tosun & Lang, 2017; Trein et al., 2021) also has to be reflected in accountability structures of living labs (Hossain et al., 2019). Our cases demonstrated that their non-committal structures hampered the effectiveness of living labs to realise policy integration.

At the same time, our findings show that living labs can equally obstruct policy integration by creating distinct experimentation spaces that remain disconnected from other policy domains and departments (Juhola et al., 2020). Accordingly, our study contributes to the policy integration and experimentation literature by showing how a living lab can actually hinder policy integration instead of accommodating it. The cases set up new participation trajectories with local stakeholders, but these temporary trajectories had to 'compete' with existing participation trajectories and plans in the area. Living labs can easily add to the existing fragmentation because of their isolated position and tendency to focus on their own assignment instead of on their added value for their environment, which is a common observation in the literature on project management (Gann & Salter, 2000). Although some kind of distance from the regular institutional structures is necessary for a pilot to flourish, it also easily results in limited embedding and thus upscaling (Van Buuren et al., 2018).

The non-committal set-up of the living labs (its 'organized irresponsibility'; Beck, 1998) and relatively weak position in relation to existing institutional positions made it difficult to contribute to disruptive change. In our cases, dedicated strategies to facilitate upscaling and transformative change were almost completely absent (Von Wirth et al., 2019). Our study demonstrates that creating viable urban living labs is complicated by the dependency upon external funding streams (Hossain et al., 2019), which often promotes sectoral goals. As seen in our cases, integrative aims defined in an open-ended way are likely to lead to rejection by funding bodies because of the undefined impact and the mismatch with sectoral funding streams. To illustrate, the cases of Antwerp and Dordrecht demonstrated how attracting new funding disturbed the prototyping process and led to a narrowing of integrative policy goals in order to meet the requirements of the funding bodies.

With regard to stakeholders, the living labs that had secured financial resources and authority were more successful in bringing actors together and working towards implementation of a joint product that reflects multiple interests. However, ambitions were often narrowed due to funding limitations, complicating policy integration. Similarly, leadership was needed for enhancing policy integration. For example, the cases in Antwerp and Dordrecht revealed a dedicated municipal department as the problem owner, but powerful actors (such as potential funding bodies and landowners) often had to be convinced to get (and remain) on board. These actors often did not feel the urgency, which decreased the department's capacity to act. In contrast, the urban living lab in Gothenburg was supported by the local government and the landowner (the River City Company). In this case, there was a clear problem owner with authority that guided the other stakeholders through the process, so results on the ground could be realised.

5 | CONCLUSIONS

The aim of this article was to understand how the different dimensions of urban living labs (ULLs) can contribute to the policy integration required for blue-green infrastructure projects. We based our analysis on a comparative case study of ULLs in three European cities. We approached ULLs as potential enablers of policy integration, most notably through the geographical focus that requires stakeholders to actually solve competing land-use claims (Nevens et al., 2013; Von Wirth et al., 2019). This geographical element is often absent in policy integration literature (Trein et al., 2021).

Based on our study, we conclude that ULLs can be effective vehicles to come up with more integrated ideas, concepts and plans. They bring actors together in a supportive context in which they can develop more collaborative capacity and can also contribute to trust-building and agenda-setting. In addition, living labs can raise awareness and help to underscore the importance of BGI. Consequently, ULL can be a promising tool for more horizontal forms of policy integration (Bulkeley et al., 2019). In particular, two of the ULL dimensions, namely stakeholders (shared accountability structures) and resources (finances, authority), are major contributing factors to the actual enforcement and sustainment of policy integration in BGI projects. If they lack sufficient accountability structures and resources, ULLs may remain too weak to break through existing institutional structures and may only lead to an optimisation of established practices with few opportunities for social learning (Ananda et al., 2020).

Therefore, although ULLs have the potential to foster policy integration, it remains questionable whether ULLs as experimentation sites are powerful enough to affect the bureaucratic core, which is not only necessary to secure implementation of the plans but also to realise transformative change in the long term (Nylén, 2021; Willems et al., 2020). This also largely depends on whether their sponsors (most often the city government) take up their role seriously (Kronsell & Mukhtar-Landgren, 2018) and prevent the earlier-mentioned risk of 'organized irresponsibility' (Beck, 1998). Further research, using longitudinal studies, is needed to understand under which circumstances living labs can have that lasting impact. Future research could also aim to distinguish the elements of the living lab architecture that promote trust-building and agenda-setting and the elements that enable implementation and more enduring institutional change in favour of more integrated ways of working. This could further refine the dimensions of ULLs defined in this article. A multi-layered framework may be necessary because the dimensions that explain one-off results may differ from those that explain enduring change.

and Ellen Kelder (City of Dordrecht) for providing access to the interviewees.

CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

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ENDNOTES

[1] BEGIN is the abbreviation of *Blue Green Infrastructure through Social Innovation*.

[2] The documents referred to in the results can be found in Appendix 3.

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APPENDIX 1: List of interviewees

#	Interviewee	Organisation
	Sint-Anneke Plage, Antwerp (BE)	
1	Policy advisor urban climate adaptation and BEGIN representative	City of Antwerp
2	Policy advisor urban planning	City of Antwerp
3	Policy advisor urban water management	City of Antwerp
4	Policy advisor urban water management	City of Antwerp
5	Policy advisor participation and communication	City of Antwerp
6	Policy advisor participation and communication	City of Antwerp
	Vogelbuurt, Dordrecht (NL)	
7	Project leader Vogelbuurt	City of Dordrecht
8	Policy advisor water management and BEGIN representative	City of Dordrecht
9	Policy advisor social domain	City of Dordrecht
10	Project leader Vogelbuurt	Housing association Woonbron
11	Social entrepreneur	Vogelnest initiative (social welfare partner in Vogelbuurt)
12	Chair	Sports Council Dordrecht
	Frihamnen, Gothenburg (SE)	
13	Policy advisor urban water management	City of Gothenburg
14	Project leader Jubilee Park 0.5	River City Company
15	Researcher	Gothenburg University
16	Project leader Rain Gothenburg	City of Gothenburg
17	Architect	ConstructLab
18	Project leader Jubilee Park 0.5	City of Gothenburg
19	Policy advisor spatial planning and BEGIN representative	City of Gothenburg

APPENDIX 2: Interview guide

Introduction

- What is your function and background?
- What is your role in the project?

Climate adaptation and blue-green infrastructure

- What does City X regarding climate adaptation? What form of BGI has been created?
- How are different values and goals brought together?
  - How are physical-spatial goals combined with social goals?
  - To what extent is policy integration common within City X?

BGI project and urban living lab

- What is the aim and purpose of the project?
- Which experiment does take place in the living lab? (approach, activities)
  - How does that contribute to BGI?
- Which stakeholders are participating? (and which are missing?)
  - Internal collaboration: with which policy sectors does collaboration occur?
  - External collaboration: with which stakeholders does collaboration occur?
- What is the stakeholder's motivation to participate?
  - How do they participate? Who leads these collaborations?
- Which resources were needed to establish and execute the ULL?
- What is the novelty of the urban living lab? (outcomes)
  - What is the added value of a living lab in regard to realising blue-green infrastructure?

APPENDIX 3: List of documents

#	Document
	Sint-Anneke Plage, Antwerp (BE)
1	City of Antwerp (2016) *Masterplan Sint-Anneke Plage*
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