



Local action for Green and Blue Infrastructure – lessons learned from transdisciplinary and co-creation processes in cities

Introduction

Green and blue infrastructure (GBI) is increasingly recognised as a resource and support for different strategies to address cities' challenges, including for climate change adaptation, provision of recreational space and stormwater management (Kabisch et al., 2017). However, to make effective use of GBI potential in urban planning and governance can be challenging, as it requires a systems approach that spans sectoral and, quite often, administrative boundaries. Local authorities encounter many difficulties in mainstreaming GBI and its benefits into city plans and policies, as well as expanding the active engagement with GBI on the ground. Partnerships and co-creation processes with researchers may offer support to local stakeholders to access and make use of knowledge on how to promote benefits from GBI, as well as build the networks and relationships for future collaborations (Hurley et al., 2016; Borgström 2019). Such collaboration is important for research as well. It can ensure research questions are relevant, improve access to data and encourage a holistic approach to the topic. It also enhances opportunities for dissemination, making research more actionable. Constructive dialogue and collaboration require a number of preconditions to be understood and supported, and while cases differ there are still useful insights from a critical examination of existing or past co-creation processes.

Throughout the course of the ENABLE project, a team of researchers have worked together with municipal staff (and other stakeholders) in the project cities of Łódź (Poland), Halle (Germany), Barcelona (Spain), New York (United States), Oslo (Norway) and Stockholm (Sweden), in the context of engaging with a range of policy processes related to urban challenges and the role of GBI. The collective experiences from the

project highlight several strategies that can be used by researchers and urban municipalities to build successful collaborations that are credible, relevant and legitimate. This brief highlights the requirements for collaboration and, when these are in place, the benefits accrued from a collaborative approach, and the success factors and challenges faced in taking such processes forward.

Matching aims, objectives and processes of cities and scientists

The ENABLE project aimed to advance knowledge of how to plan, design and implement green and blue infrastructure in a way that maximises the delivery of benefits and ensures fair access across user groups. Through the course of the ENABLE project, researcher teams engaged with a range of policy processes and topics in the project cities, including providing guidance on how to support and promote GBI functionality, and input to green infrastructure and resilience strategies and standards. Engaging in different processes, the researchers shared multiple types of knowledge and tools, including data, maps, methodological support and designs for effective co-creation processes.

Effectively integrating research outcomes into policy processes is often seen as difficult, due to different priorities, languages used and timescales, with research results often not being available at the time they are needed in the policy process (Rose et al., 2015). However, through their long-term engagement with municipal stakeholders and thorough understanding of the cities' contexts, ENABLE researchers have been able to take advantage of windows of opportunity to integrate research into policy making. In Barcelona, for example, the resilience assessment undertaken with the municipal resilience office should inform the city's resilience strategy for open space.

ENABLE engagement in Barcelona

The ENABLE researchers in Barcelona developed a new working relationship with the municipal resilience office, allowing their research outcomes from a resilience assessment workshop to feed into the city's open space resilience strategy. The working relationship involved identifying common or compatible goals to create a conducive environment for working on green and blue infrastructure based on a high level of trust. The team ensured that workshops were always co-hosted by local organisations and in line with other municipal processes, meaning that their results were useful for stakeholders. Although the collaboration with the resilience office developed with a focus on ENABLE research, the engagement of the researchers was not limited to the project. The process was set up so that it can continue as projects begin and end, with stakeholders being mostly unaware of the transition from one project to another, which provides continuity for stakeholders and avoids burnout. As a result of the engagement process, the municipality was introduced to the resilience approach to providing ecosystem services, based on an understanding of the multiple factors that drive their provision and sensitivity to change. These outcomes of the resilience assessment conducted in the city directly informed its open space resilience strategy.

The research teams used personal meetings, the co-development of workshops and joint project work, amongst other approaches, to engage with the municipalities. The data and analyses conducted during the project were also shared and discussed with local stakeholders. For example, researchers in Łódź provided an overview of the benefits of green infrastructure and maps of green spaces and ecosystem

services. In most cases, the researchers had long-standing relationships with municipal staff working on green and blue infrastructure based on trust and shared, clear responsibilities and mandates. The researchers also started to develop new relationships with other municipal offices and stakeholders over the course of the project.

The added value of co-creation and collaboration in urban GBI planning and implementation

The ENABLE research teams' engagement with the project cities has provided state of the art research and case relevant findings directly to relevant decision and policy making processes. It has led to increased knowledge and awareness among stakeholders of GBI and how their flows of benefits can be enabled.

Raising awareness of the role of GBI for nature-based solutions, and how different stakeholders can contribute is an important first step for greater uptake by cities. However, understanding the potential of GBI is not enough to unlock it. Therefore, the ENABLE researchers focused on building the knowledge needed for effective implementation and on increasing understanding of key issues. This included, for example, participation in technical committees on standards for GBI and discussions of the limitations of flood models.

The planning and implementation of GBI often requires input or action from multiple departments, including development (zoning and permits), transportation (mobility as well as barriers), parks and green spaces planning, environment (storm water, water quality, local climate) and many others. It is not only policy makers who can influence the extent to which GBI is used in a city – educators, investors, developers, NGOs and many others have a role to play. The ENABLE research team engaged with these stakeholders via direct communication or by including them in co-creation and engagement processes. For example, in Łódź, the team approached NGOs, as well as city stakeholders to identify potential areas of collaboration. These experiences illustrate the range of outcomes from co-creation processes that can support policy development and implementation via non-municipal stakeholders.

Policy impact in Oslo

The ENABLE team in Oslo engaged a diverse group of stakeholders in co-creation processes related to policy. For example, a co-creation process focused on green roofs involved green roof suppliers, building owners and managers, social entrepreneurs and the green buildings council, as well as municipal stakeholders. The process resulted in a set of targeted and broadly supported policy recommendations communicated to politicians, as well as an online mapping tool to support the prioritisation of green roofs in Oslo. In addition, the team participated in technical committees on development of official guidance and standards for green and blue infrastructure, ensuring research findings could inform policy.

The ENABLE training sessions, workshops and co-creation events helped participants to connect across different disciplines (sectoral, professional, administrative) and make new contacts, expand their networks and access research. For example, in Halle, the municipality can now consult researchers on methods such

as mental mapping of spatial preferences as well as fore- or back-casting scenario building, and their respective outcomes of interest to local stakeholders. This helps make research results locally relevant and more accessible to non-academic users.

Barriers, success factors and lessons learned from GBI planning and implementation in ENABLE cities

The diverse methods and outcomes of researcher-municipality engagement from across the ENABLE project allow factors enabling or hindering successful engagement to be identified. The lessons learnt during this process can assist other researchers and teams in building effective collaborations.

Challenges in researcher-city engagement

The ENABLE teams encountered several challenges in engaging with local stakeholders and in contributing research to implementation of green and blue infrastructure. These challenges were associated with resource constraints in municipalities, inflexible communities of practice, limited mandates, management of expectations of multiple stakeholders, and the realities of policy and decision making, high workloads and understaffing in municipalities.

Not only do these challenges prevent municipal staff from attending meetings and workshops, but they also make it difficult for staff to absorb research outcomes and incorporate them into daily work. Even when staff are able to participate in research, a proliferation of policy and engagement processes make it difficult to align, coordinate and focus appropriately. Taking these factors into account when planning engagement, for example by working with multiple individuals and ensuring workshops are concise and targeted, is critical.



Stakeholder engagement processes involving a wide range of sectors and individuals will likely have diverging opinions, priorities and ways of doing things. For example, ENABLE research teams found that some city agencies had different priorities in relation to the topic and different levels of strength in discussions, as well as that the priorities sometimes changed. Navigating different and changing tensions and points of divergence can be difficult during a research project with limited resources. Additional avenues, led by other stakeholders, can and need to complement research or government led collaborative processes – different actors have different opportunities and mandates for mediating conflicts and flexible options are needed to match different contexts and changing circumstances.

There are a number of moments where different stakeholder processes may diverge or mismatch. For example, the timing of research outputs

and windows of opportunity for policy are difficult to align. Research funding often requires development of new and state-of-the-art tools, which may be too advanced or complex for what is needed for decision making on the ground, limiting their uptake. Early efforts to understand municipalities' priorities and ways of working may help to relieve some of these difficulties.

The political processes and norms in place in a city can limit partnerships' ability to make changes. For example, decision makers may be reluctant to diverge from business as usual, especially in regard to infrastructural investments. Decision-making horizons often tend to be short and focused on short-term economic gains. Nevertheless, the experiences of ENABLE researchers show that direct and indirect impacts on policy are possible with careful and well-planned engagement with municipal offices.

Factors for success in collaboration

For successful engagement between researchers and municipalities, it is important to carefully consider the aims of the research and cooperation process, how it will work, and what

topics and research questions will be addressed (Biodiversa, 2014). The experiences of ENABLE researchers illustrate what these mean in the context of urban green and blue infrastructure.

When developing new relationships with other municipal departments or external agencies, the partners recommended developing a **shared understanding** of the problems being studied and using **common language** to communicate. For example, in New York, a partnership with city agencies focused on assessing flood risk, developing a shared understanding of its current and potential future severity was necessary for the project to proceed. As part of this, it was imperative that an agreed strategy for managing the uncertainty associated with assessing flood risk and incorporating new information was also developed to avoid those issues derailing the process.

Successful partnerships between researchers and municipalities offer value to both parties, by being based on the parties' **common goals**, addressing both their needs and aiming to develop win-win outcomes. Municipal needs could include information on site-specific design, implementation and maintenance to understand



the costs and benefits of specific blue and green infrastructure interventions, or support for standardisation. Research that addresses the problem-context, establishes a solution-oriented design and process, and involves the relevant stakeholders is more likely to contribute to create an impact.

The research project for which municipalities are engaged should be designed with **flexibility**. This ensures that it can remain responsive to stakeholders' changing needs and priorities, as well as developments in the context for the research. Flexibility also means that outcomes of earlier steps in the process can be incorporated into the research and the engagement design.

ENABLE researchers working in all project cities identified the importance of **trust** in the relationships between researchers and municipalities as a critical factor for successful engagement. A first important step is to make sure that the **mandates, roles and responsibilities** are clear. In many cases, the researchers had long-standing relationships with municipalities and some stakeholders prior to ENABLE, which had allowed trust to develop over time. For example, researchers in Łódź recommended engaging with city stakeholders even outside the context of projects to develop relationships. In some cases, reaching some stakeholder groups who may be less

communicative or organised remains a challenge for the inclusiveness of the process, however.

Involving **multiple sectors**, such as economic development, biodiversity, social cohesion and climate change, both inside and outside the municipality, as well as at multiple levels of government, helps to incorporate the relevant sources of knowledge and perspectives and serves as the first step in building coalitions for implementation of green and blue infrastructure. The **systems framework** developed by ENABLE can serve as an example of a bridging element that may provide common ground. When working with such a diverse range of stakeholders, it is critical that the process is given sufficient time and resources, as well as skilled facilitation, to ensure that all perspectives are included. **Staying neutral** in political debates and decisions is also important to maintain trust with all stakeholders.

The **workshops and meetings** used to collaborate with stakeholders on research questions should be designed to retain the focus on common goals and reinforce the trust that has developed. Co-hosting workshops with the municipality or finding an **individual to champion green and blue infrastructure** from within can help to build legitimacy for the process and ensure it stays aligned to municipal needs.

Conclusions

In an urban arena where the need for reliable and locally adapted evidence is high, there is an urgent need to design research and co-creation processes to successfully foster the uptake of research results for improved green urban planning and decision-making. The ENABLE project has found that for research to be considered as 'valid and valuable', it needs to be undertaken with credibility, relevance and legitimacy (Lemaitre et al. 2018), relying largely on researchers' collaboration with diverse stakeholders to identify and explore novel methods and concepts and new ways of thinking to achieve maximum benefits for society (Harris et al. 2013).

The ENABLE research team has engaged with various stakeholders, including local authorities, businesses and NGOs throughout the project, building long-term relationships and trust. This created opportunities for the project's research outcomes to inform policy and raise awareness of GBI and its benefits. While there are many challenges to effective engagement, designing a flexible process to meet common goals and prioritising trust-building with multiple sectors has been shown to increase the chances of success.

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Project partners

