“Learning-by-doing” from Co-creation Processes: success factors, failures, and opportunities for improvement.

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Abstract. Since 2018, the CLEVER Cities project has put into practice an inclusive co-creation processes that aims at involving stakeholders (particularly: citizens, civil society, public and private entities) in decision-making for the implementation of large-scale, urban Nature-based Solutions (NBS). The scope of this research is to highlight the importance of co-creation process as an added value beyond the benefits of the actual NBS implemented in the CLEVER Action Labs (CALs). To evaluate success factors and failures from the relative impacts generated in the project, a systematic approach was developed to gather lessons learned along the co-creation pathway. Six criteria of analysis were identified from the data gathered over the project lifetime which included: i) the shared governance of the co-creation process, ii) co-design experiences and openness to public participation, iii) stakeholders’ engagement practices, iv) policy-making and administrative contexts, v) political and economic resource as well as vi) communication and dissemination processes. Lastly, the lessons learned of the co-creation process were considered by looking at the overall impact of the process itself in achieving its common goals, objectives, and key results.

Keywords: Co-creation, Shared governance, Stakeholder engagement.

1 Introduction

The CLEVER Cities Project[1], like many experimental living lab approaches, has been collecting evidence and identifying the lessons needed to strengthen our capacity to co-create with communities the critical structure that support both human and natural flourishing and interactions. This involved collecting data from a wide range of cities and looking at both contextual, processual, and actor-focused issues. Some of the financial, political, and administrative complexities may be beyond the power of one project to change, but the co-creation process can create the opportunities to challenge the status-

[1] See https://clevercities.eu/

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quo and to present successful alternatives. Other challenges are within the purview of the stakeholder engagement and public participation as they involve significantly increasing openness with the public.

The development of co-creation processes in urban regeneration, especially those related to NBS within cities, have developed much within the last few years [1]. There has been an increase in the possibilities for stakeholders to be engaged in longer term public participation as well as a wider range of local organizations and associations getting involved. Cities are complex and multi-layered, and the issues encountered in a co-creation process will always be contextual to each project. It is not reasonable to expect a co-creation process to solve larger governance and wider systems issues. However, the iterations of co-creation can be a strong positive force for advancing urban transition. Co-creation process hence stands for the whole approach in which stakeholders can engage in shared governance of decision-making along all phases of the project (co-planning, co-design, co-implementation, co-monitoring, and co-development) [2,3]. Co-design is a subsection of the co-creation process where collective efforts and decisions are made and the NBS are decided upon with a larger group of stakeholders and local communities. While co-design is not a panacea bringing forward solutions to everything, it can contribute to better governance, more effective implementation of NBS as well as increasing the sense of community belonging and overall improving social cohesion [4,5].

2 Project scope – A possible clustering of success and failures of the CLEVER Cities approach for the co-creation of NBS.

Co-creation application in living labs is a new paradigm, often including governance approaches, which explores community-led development processes, through experimentation in urban contexts [6,7]. It must also be noted that in counterpoint to the many benefits of utilising co-creation approaches found in the literature, some obstacles can be encountered such as higher demands in time, training, and other resources required at the local level down from co-planning to operational scale. This paper summarizes some of the key findings from the experience acquired co-creating NBS. This includes both positive and negative aspects encountered over a period of four and a half years, from June 2018 until December 2022, within the framework of the Horizon 2020-funded project CLEVER Cities. *Research question: In order to begin to systematically understand how the co-creation of NBS has and can still advance in the context of urban living labs, the following research question was tested: What are the success factors, failures, and opportunities to improve co-creation processes of NBS?*

The aim of the project was to develop locally tailored NBS through a co-creation process using a Living Lab approach in socially marginalized neighborhoods in Milan, London, and Hamburg [8,9]. This format involved and engaged a diverse range of actors, beyond the usual suspects [10]. As the CLEVER Cities project included several living labs, multiple co-creation pathways were developed individually by each city to adapt to its specific context, which led to similar but distinct results through the experimental phase of NBS implementation [2,11,12]. The pathways were variations of a

common set of planned phases such as co-planning (the Urban Innovation Partnership, UIP2), co-design, co-implementation, co-monitoring, and co-development, [13].

3 Methodology and data collection

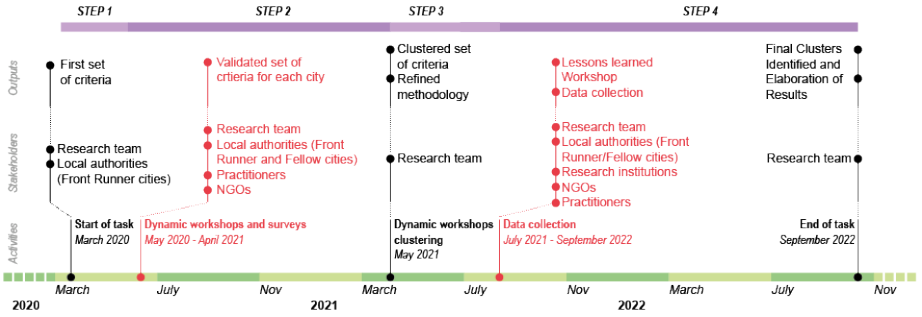

Fig. 1. Methodological process development from 2020 to 2022, source: the authors.

The methodological approach of this research paper was elaborated in four different steps, see **Fig. 1.** The authors collected data throughout different in person and online workshops, surveys, and dynamic 1-to-1 discussions with the project consortium. The analysis is based on a set of criteria related to stakeholders' engagement, shared governance and co-design processes that were identified by the co-creation guidance research team, starting from a literature scoping and scaling activity initiated in March/April 2020. The framework established started with the participation of the main three cities' local authorities, namely the Municipality of Milan, the Greater London Authority, and the City of Hamburg Chancellery and the involvement of key responsible partners from within the consortium as *a first step. As a second Step,* a criteria validation process was progressed through workshops and surveys which were conducted with a larger group of consortium partners. These surveys were conducted starting May 2020 with 8 co-creation facilitators from the Front Runner cities (FRC) and Fellow cities (FEC) and were followed by three online workshops that included a scoped clustering of topics in order to identify the main lessons learned in each, subsequently.

The Third step (May 2021)*,* in which 37 participants actively and collectively participated, was an intermediate data gathering milestone in a dynamic workshop with further clustering of topics elaborated by the guidance research team, namely: governance of co-creation, stakeholder engagement, and co-design. The methodology was then further refined in order to gather data over the following two years, 2021 and 2022.

The fourth step focused on data collection and was concluded at an annual consortium meeting in September 2022 with three face-to-face workshops with 18 partners. The latter focused on collecting co-creation lessons learned related to tools, instruments, and benchmarking experiences from the FRC and FEC. Lastly, an automated clusterizing technique was adopted to the synthesized results elaborated in the final workshop, see **Fig. 2.**

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[2] The UIP is the local public private partnership group of actors and stakeholders that conduct the implementation of the project in the local context of each city.

4 Results

Fig. 2. Automated Clustered data collected from September 2022 workshop - showing the tendencies in the gathered data with respect to success factors in purple (FRC) and yellow (FEC), failures in red and opportunities to improve (blue teal) in the respective categories of Policymaking, Governance, stakeholders' engagement, Communications, co-design, and economic resources. Source: the Authors.

The following table represents a summary of the results collected from the workshops and the data gathered utilising the methodology during the years 2020-2022. It was clustered against the set of criteria that emerged from the last workshop activity and the topic patterns that emerged as lessons learned by the three FRC and the six FEC of the consortium. This list of lessons learned and the opportunities to improve co-creation processes included here is not meant to be exhaustive, but it represents a set of positive solutions that can come from sharing ideas and solutions.

Table 1. Summary table of the analysis criteria from the data gathered throughout the project.

Criteria of Analysis	**Lessons learned from co-creation processes**		
	Success Factors	**Failures**	**Opportunities to improve**
Governance Process of co-creation	• There were benefits from exploring new group and power dynamics which included, in some cases, moving from a top-down towards a more bottom-up organizational model. • Having the steps of co-creation standardised [13], helped focus everyone on the core goal of implementing NBS. • Increasing the co-creation culture in the administration and involving directors and municipality officers who are not used to shared processes was important.	• It was difficult to translate the results of the co-creation process into reality. Many variables can interfere with the process and what is practicable: e.g., available budget, safety, assignment procedures, maintenance procedures, even taxation on the project. • In some cases, local communities, their associations and citizens do not want to take part in long-term processes due to changes in policies, the lack of interest and the overtaxing of people to the point of dropping out.	• Mainstream co-creation practices in urban green planning and by enabling facilitation procedures that are more transparent and embedded into planning procedures. • Explore more horizontal and integrated governance models as evidence shows these yield increased diversity of perspectives in different contexts. [14,15] • Connect the improvement in urban regeneration and delivery of NBS to the localization of SDGs in order to increase social inclusivity [16].
Co-design and openness to public participation	• Increased sense of ownership over the co-created NBS. • There was a high level of adaptability in the process during the pandemic. • Different levels of participation were tested.	• Difficulties to start the process due to bureaucracies, locked-in methods and risk aversion. • Challenges were encountered to set timely meetings and avoid delays	• Involve local embedded stakeholders to help identify other stakeholders. • Set up multiple facilitated sessions and workshops, staggered over time, to attend to a wide, diverse set of actors' groups.

Criteria of Analysis	Lessons learned from co-creation processes		
	Success Factors	**Failures**	**Opportunities to improve**
	• Communications about delays and non-project related issues helped the process flow.	due to public procedures. • Large group facilitation has proven to be challenging.	• Explore training, mentoring and the creation of communities of practice for local stakeholders. • Involve skilled specialists in management at the right moment. It is not always a purely grassroots process.
Stakeholder engagement	• Involved grass roots groups and neighbourhood associations early in the process. • Public, private and grass roots involvement brought a diversity of perspectives together, increasing the quality of the results. • New and fruitful synergies were created among the participants.	• Conflicts among different interest groups. • Difficulties occurred in sharing a common vocabulary.	• Invest time in the creation of a common understanding of fundamental definitions, such as NBS and co-creation. • Engage administrative officers to be able to promptly embed mitigation measures. • Bridge technological and social aspects of dealing with NBS.
Policy-making and administrative contexts	• Shared governance of decision-making processes was effectively practiced. • Co-creation is more mainstream than in the recent past. • Positive experiments with tendering processes were realized.	• Co-creation was given verbal recognition but not fully practiced in different urban regeneration processes. • Departmental incoherence and siloing were common. • Often there were delays from external public processes that are out of the team's hands. • It was hard to involve multiple departments and sectors in an integrated manner.	• Develop NBS guidance for construction, works departments, and dealing with tenders. • As early as possible, get as many institutions as possible, city departments and administrative officers aware and on board for the co-creation of NBS. • Map out and discuss the evolution of collaborative governance for political and management continuity in decision making process. • Develop silo-breaking techniques including cross fertilizing events, personnel exchanges, interdisciplinary meetings, and committees.

Criteria of Analysis	Lessons learned from co-creation processes		
	Success Factors	**Failures**	**Opportunities to improve**
Political and economic resources	• A diverse range of actors provided a pool of different types of expertise, financial resources, and political support.	• The scarcity of project funds limits some options. • Political and administrative changes threatened the continuity of the process.	• Explore how a mix of actors can help gather further resources. • Define and share a common pathway that goes beyond short-term political goals.
Communication and dissemination	• Different channels of communication ranging from newsletters to social media channels were explored. • Good communications brought a diversity of stakeholder groups to work together.	• The COVID-19 emergency forced the use of digital communication (online surveying forms, digital collaboration boards, etc.) which was a challenge for more vulnerable populations.	• Increase the transparency of the procedures to make the process more accessible and clearer for everyone. • Establish shared social media and newsletter channels within the teams and citizens to increase the potential of transparency and more fluid communications.

5 Discussion

In this section, we highlight and summarise core considerations from the lessons learned in each of the 6 clusters as follows:

The **Governance** of the co-creation process faces hurdles when it comes to the planning and implementation of NBS. In most of the FRC and FEC, the local administration responsible for urban green planning and execution procedures were not equipped with either the mind-set to start a bottom-up co-creation process, nor with relevant tools and instruments to increase the co-creation culture within their public participation processes. Co-design must be seen as an approach capable of helping build some social cohesion and a greater sense of ownership over the co-created NBS. Despite the larger number of stakeholders involved, there was a significant degree of adaptability in the process to deal with problems and issues that arose, most notably during the pandemic. Other ways of making the process more robust have emerged which include diversifying the times and locations of engagement events to better deal with a wide set of actors. Preparing for the process and eventual complications involves investing in training and mentoring and building up a culture of participation and a community of practice in co-creation. However, as there are many pathways involved in co-creation, it is important to know when to involve skilled specialists who can fit into the governance network in a manner to advance the programme.

Concerning **stakeholder engagement**, having a rich mix of actor types was both beneficial and problematic. The mix of actors contributed to enriching the discussion, bridging technological and social components of working with NBS. Especially during the initial phases, there was an enthusiasm for an innovative approach to participation

which was highly welcomed by community members. On the other hand, it was a challenge working with a fluctuating number of participants over the co-creation process as the project evolved from a top-down towards a more bottom-up approach. The necessity of finding a common vocabulary to work co-creatively and in describing how nature is integrated was evident from the start of the process. In fact, in the initial phases, much effort was put into the specification of the main concepts to reach a mutual understanding. Critical terms like NBS and co-creation needed to be clarified. The common identification of what the core problems are for the specific context was also important. Given the vital role of nature, those actors able to represent non-human agents (i.e., nature as a stakeholder) played a significant role in the process, raising the awareness among the participants of the critical role of non-anthropocentric viewpoints and addressing other relevant knowledge gaps.

Difficulties related to **the policy and planning, and administrative context** were the most notable in the process. There was often as sense that co-creation processes were given verbal recognition limited to more superficial consultation and engagement commonly employed, but true co-creation, that expands in significance and impact with each iteration, is still not widely practiced. There is still much departmental incoherence and sectors working in silos, following the standard, minimal procedures for public participation. This leads to delays from review processes and other external issues that are most often out of the team's hands.

Concerning **financial resources**, the support of the Horizon 2020 programme was helpful to kick-off the co-creation process using a possible common guidance[3] for the nine participating FRC and FEC. However, the effort needed in time and resources was underestimated in some cases, which led to the cutting of certain phases or the rejection of some interesting alternatives. Besides economic resources, political resources played a relevant role. Having the support of the administration was essential to promote NBS integration in planning and to have it inserted into the political agenda. As these changes are mostly outside the control of the project, it is suggested to draft an agreement with power holders that assures the fulfilment of essential targets. This reinforces the need to have administrative actors on board, which helps in foreseeing future problems in relation to organisational procedures, permits, and the like.

With respect to the **communication and dissemination processes** there are many challenges to overcome in the standard, business-as-usual approach, which is followed by instinct. Issues following public procedures and timescales can bring delays to the communication process that leave engagement processes on stand-by and without the necessary momentum. Furthermore, there is always the difficulty of engaging both deeply and in a wide-ranging fashion. There are particular challenges in working with large groups, as the number of conflicting opinions begins to rise. Good communications about the difficulties and delays as well as anticipating non-project related issues that can side-track the co-creation process have been critical in helping the process flow in the partner cities.

[3] https://clevercitiesguidance.wordpress.com/

Despite the difficulties in involving multiple departments and sectors in an integrated manner, some significant sharing of decision-making processes was effectively practiced in each of the three cities. With ongoing upscaling processes within the CLEVER Cities project, co-creation is expanding through the success stories of living labs. This has included community design, community panels, new collaborative networks, and positive experiments with inter-departmental cooperation and tendering. By mapping out the possibilities of new forms of collaborative governance for all participants to prepare for, some level of political and management continuity can begin to be established. In more entrenched administrations, some form of silo-breaking should be applied which may include cross fertilizing events, personnel exchanges, interdisciplinary meetings, and committees. Anticipating and preparing for difficulties is highly recommended and contacting relevant departments and administrative officers to discuss the needs and changes associated with true co-creation is a solid first step.

Hopefully, the collective work summarised here can pass on some of the experience accumulated in CLEVER Cities to other groups, municipalities or individuals who may be beginning a community-led regeneration project and that with this information it is possible to co-creation mutual benefits for both people and the natural environment.

6 Conclusions

Co-creation of NBS is a hard, multifaceted, and intertwined journey. This contribution has collected the results from surveys, workshops, interviews, and face-to-face discussions conducted in the framework of the Horizon2020-funded project CLEVER Cities. The findings from this research are organized into six topics. The results show that initiating the process of co-creation as a non-linear framework in a context where such an approach is new, it is critical to deal with socio-cultural and contextual issues.

First, economic resources are fundamental to support co-creation processes, due to the significant expenditures of human resources and time. This should be coupled with a supportive political environment, allowing inclusion of participative practices to find their way onto the political agenda and transversally into departments and sectors.

Second, concepts that are new or that utilise technical jargon must be discussed among all participants so a collective understanding can be assured.

Third, the co-design phase of the co-creation process seems to be the most important in terms of consolidating stakeholders' engagement. Here, it is possible to witness the most representative variety of actors in action, determining the critical problems and shaping the solutions accordingly.

Fourth, the results show that participation tends to taper off, while other relevant actors become more visible, such as administrative officers. The latter, however, should be involved at the very start of the process in order to reduce bureaucratic obstacles.

Fifth, including elevated levels of co-creation integrated into many existing governance and policy frameworks has revealed itself to be a rather difficult task. The implementation of collaborative approaches to project development and longer-term governance models is still a challenge to be resolved at the administrative level, as institutional resistances and siloing are still critical issues.

Sixth, bringing together a diverse range of actors can lead to initial unexpected complications and obstacles but with positive results overall. In fact, the difficulties were compensated, to a certain extent, by the overall resilience the network generates by being more attuned to the range of possible local issues and, therefore, more prepared, and adaptable as the project progresses.
To conclude, co-creating NBS necessitates a supportive environment that should be continuous and flexible and that brings together different resources. It is an ongoing process that needs to be able to continually rouse further actors and to incorporate local knowledge into decisions, using dialogue and mediation to resolve conflicts and advance collaboratively negotiated goals.

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