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Exploring co-creation in municipal planning practice: a Seedbed Intervention for NbS in Versailles

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ABSTRACT

This paper examines how collaborative experimental approaches can strengthen urban resilience by actively involving communities in the implementation of Nature-based Solutions (NbS) within the framework of local governance. Using Versailles as a case study, it examines how a co-creative initiative supported the development of an NbS intervention aimed at fostering social cohesion and community ownership. This process was shaped by the Seedbed Intervention format – a context-sensitive experimental approach – designed to create conducive conditions for the implementation of NbS. While the Seedbed Intervention format itself is not the central focus of this study, we explore its function as a strategic mechanism for embedding participatory urban interventions into governance structures. Grounded in the principles of Gender, Inclusion, and Diversity (GID), this research employs a mixed-methods approach, integrating art-based methodologies and Focus Group Discussions to critically examine the interplay between social and environmental challenges in urban contexts. Findings underscore the need to institutionalise experimental co-creative processes as an integral component of urban planning rather than as ad hoc or project-specific participatory exercises. When systematically embedded within governance frameworks, such approaches can enhance the durability, scalability, and institutional integration of participatory NbS, supporting their long-term impact across planning systems and policy cycles.

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KEYWORDS
Co-creation; nature-based solutions; health and well-being; resilience; municipal governance; Seedbed Interventions; focus group discussions

Key Policy Highlights

- Co-creation processes strengthened local identity, enhanced residents' sense of belonging, and increased engagement in pro-environmental behaviours.

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- The application of art-based methods effectively captured nuanced community perspectives, informing context-specific design of Nature-based Solutions.
- Early community engagement fostered trust, ensured inclusivity, and supported sustained participation throughout the project lifecycle.
- Despite coordination challenges, findings emphasise the imperative to institutionalise co-creative approaches within urban planning frameworks to promote resilient and inclusive development.
- The Versailles case study illustrates how integrating co-creative methods can bolster urban resilience and community ownership.

1. Introduction

Urban areas face unprecedented challenges, from climate change and demographic shifts to social fragmentation (Dilk 2019; Plüschke-Altof and Sooväli-Sepping 2022). Yet, cities also offer unique opportunities for fostering sustainable development through innovative, community-driven design processes (Janko et al. 2019). Current urban planning frameworks, however, often fall short in addressing the dynamic complexities of modern cities, necessitating a shift toward adaptive, inclusive, and co-creative methodologies. Research highlights the limitations of traditional planning tools, which frequently overlook intangible local knowledge, community ownership, and flexible, place-based solutions (Drobek and Tran 2017; Sanders and Stappers 2008). Integrating dynamic community perspectives into planning not only ensures resilience but also enhances the capacity of municipal governance systems to adapt to evolving challenges as well as increases a sense of belonging and wellbeing of the community (Srinivasan 2024). The concept of resilience generally aims at enhancing and sustaining the adaptive capacity to sudden or gradually emerging disturbances such as natural disasters, climate change, or social transformation (Folke et al. 2002).

While the need for developing urban resilience is widely recognised, the discourse on resilience in urban development is often heavily technology focused, for example developing urban spaces following the principles of the sponge city to lower risks of flood (Li, Xu, and Yao 2018). Even though socially oriented processes are also developed within the framework of resilience, there is a need to further explore the potential of integrating social issues within the concept of resilience: "The resilience of cities – that is, urban systems designed to be more flexible, robust, and intelligent – is closely related to the establishment of experimental sites or real-world laboratories in the local environment" (Schneidewind et al. 2020). Thus, resilience in urban design, while often framed through technological innovations, requires deeper integration of social dimensions to support equitable, inclusive, and context-specific solutions (Schneidewind et al. 2020). It is imperative to develop flexible strategies for creating resilient, locally appropriate interventions in cities that offer a high quality of life.

This paper presents a case study of a participatory NbS intervention in Versailles where, within a collaborative initiative temporary intervention, Seedbed Interventions, were implemented as a novel framework for developing a co-created NbS intervention. The European Commission describes NbS as approaches that draw inspiration from and are supported by nature, offering cost-effective ways to generate environmental, social,

and economic benefits while enhancing resilience (European Commission n.d.). These solutions integrate diverse natural elements and processes into urban, rural, and marine environments through locally adapted, resource-efficient, and systemic strategies (European Commission n.d.). Examples of NbS in cities include green roofs, living walls, interconnected parks, and initiatives that restore or improve the quality of natural habitats.

The idea of the Seedbed Intervention approach starts from the premise that early and continuous community engagement ensures longevity in terms of the efforts towards maintenance and the distribution of benefits of NbS for all (Gäckle et al. 2025). To achieve this aim, the Seedbed Intervention seeks to bridge gaps in participatory planning by combining Gender, Inclusion, and Diversity (GID) principles with experimental urbanism and artistic methods, such as Photovoice and participatory canvases, to engage diverse stakeholders and fostering a sense of ownership. By integrating art-based methods alongside traditional ones (e.g. survey, interviews, etc.), Seedbed Interventions uncover implicit, often unspoken local knowledge. This expands the scope of input beyond the consciously accessible insights typically captured through conventional tools like interviews or questionnaires. Such an approach broadens participation and promotes the design of more user-centered, inclusive NbS (Gäckle et al. 2025).

The empirical study demonstrates the practical use of the "Seedbed Intervention" approach and – based on follow-up focus groups – discusses the benefits and challenges of integrating co-creative approaches into planning for urban resilience. Key insights from this research reveal the necessity of embedding co-creative planning as a systematic approach in municipal structures, highlight the critical role of individual actors and communities, who must be empowered to make meaningful contributions and stress the importance of fostering pro-social and environmentally conscious behaviours among citizens enabling them to actively engage with and understand their roles in the urban knowledge ecosystem. Consequently, this paper investigates the following research question: How can co-creative processes be systematically integrated into routine municipal governance practices to facilitate a paradigm shift in local politics and promote the development of more resilient cities?

Overall, the Versailles case provides an insight into a case study which shows that the systematic integration of co-creative and experimentally oriented approaches, such as the Seedbed Intervention, into municipal governance structures can substantively strengthen the social dimension of urban resilience. Embedding local knowledge, Gender, Inclusion and Diversity (GID) principles, and art-based participatory methods in the early stages of Nature-based Solutions (NbS) planning enhances contextual sensitivity, fosters trust and place attachment, and supports long-term stewardship of implemented measures. At the same time, the findings reveal the institutional and organizational adjustments required to move from *ad hoc* participatory experiments toward the routinization of co-creation within established planning frameworks. Addressing these structural challenges is critical for advancing a governance paradigm that operationalises inclusive, adaptive, and socially embedded resilience strategies in contemporary urban development.

2. Background: the role of co-creation in building urban resilience

In recent years, multiple policies and initiatives at the EU level have acknowledged the need to develop and institutionalise co-creative processes in urban planning for resilience

against the backdrop of climate change, environmental and social transformation. Championing these co-creative approaches in urban planning has underscored the importance of engaging a diverse array of stakeholders from the outset of the planning process. This has fostered the trend towards innovative approaches with a stronger focus on community input enhancing NbS solution through social acceptance and inclusion of local knowledge. The most prominent case, with possible high impact and outreach, is the European Green Deal. It was launched in 2019 and set the goal to achieve climate neutrality until 2050, while highlighting the importance of collaborative processes, including all groups of our society, industry and politics (ReGeneration 2030 2021). The European Green Deal also includes the European Climate Pact, a movement to link individuals and organizations, such as cities, to foster co-creative methods in citizen engagement. Sharing thoughts and exchanging experiences within this stakeholder network aims to develop resilient urban environments (European Commission 2020).

Related to the European Green Deal and to further help implementing it, the New European Bauhaus (NEB) initiative started in 2020. It focuses on local stakeholders, developing specific solutions for their own areas in participatory processes. The key principles – sustainability, inclusivity and beauty – highlight the importance of innovative and locally anchored projects (Climate-KIC 2024). By connecting individual projects, synergies are supposed to be created to start a systematic change with an "ecosystem of solutions" (Climate-KIC n.d.): "Through its transdisciplinary and participatory approach, the New European Bauhaus reinforces the role of local and regional communities, industries, innovators and creative minds that work together to improve our quality of life" (Ferreira in: ReGeneration 2030 2021). The initiative's programme "Co-create NEB" focuses on local communities and public authorities to Co-creatively design urban spaces people are identifying with, supporting intergenerational dialogue as well as highlighting ecological belongings (Climate-KIC 2024). These initiatives set the focus on including all stakeholders to ensure that every voice has been heard and future users of the urban space can identify with the specific solutions that have been substantiated. Projects should not be seen as stand-alone solutions, but in the overall context of other interventions.

Focusing on NbS, the 2030 EU Biodiversity Strategy as a long-term plan to protect existing and build new ecosystems, aims to create benefit for "people, climate and the planet" (European Commission n.d.). Co-creative approaches are key to foster community action, which is necessary to achieve small-scale goals on a local level. Lepori and Noukas (2023) point out the importance of Co-creation when NbS Interventions are developed, because local culture and the needs of citizen can be included to ensure ownership and identification (Lepori and Noukas 2023). The point to be emphasised here is that the identification of city residents with their city, or also referred to as "urban identity" plays an important role, which should not be underestimated, as generating a sense of identification can lead to a pro-social and environmental change in citizens' behaviour and their own understanding of their urban role. (Nientied, Aliaj, and Stachowiak-Bongwa 2022). Establishing a stronger connection between individuals and their urban environment is essential to create healthier and more locally appropriate cities (Nientied, Aliaj, and Stachowiak-Bongwa 2022). How can this sense of belonging be effectively fostered?

The shift towards co-creative approaches in planning processes also reflects a broader under-standing of governance that emphasises collaboration among diverse stakeholders, including governmental bodies, civil society organizations, businesses, and

citizens. Thus, co-creation in the context of the EU can be understood as a participatory process that seeks to enhance democratic governance by integrating the voices of various stakeholders (Ruess, Müller, and Pfotenhauer 2023). This approach is different from traditional top-down planning processes, where decisions are often made by a limited number of policymakers without adequate input from those affected by such decisions, as well as from user-centred approaches, where the user is a passive object of study (Sanders and Stappers 2008).

In contrast, co-creative methods prioritise inclusivity, transparency, and shared responsibility, thereby fostering a sense of ownership among stakeholders. The individual who will ultimately benefit from the creative process plays an expert role actively contributing to knowledge development, idea generation, and concept creation (Sanders and Stappers 2008). In this context, the enhanced integration of local knowledge into urban planning processes, with implications for policies, is a means to more effectively shape locally appropriate cities. Corburn (2003) emphasises that incorporating local knowledge serves to fill the *gaps* in the knowledge of planners and policymakers. Focus Group Discussions are specifically a suitable tool for contextualizing this knowledge. In the traditional design process, the researcher served as a translator between the *users* and the *designer*. In co-designing, the researcher takes on the role of a facilitator. When we acknowledge that different levels of creativity exist, it becomes evident that we need to learn how to offer relevant experiences to facilitate people's expressions of creativity at all levels. This means leading, guiding and providing scaffolds, as well as clean slates to encourage people at all levels of creativity (Sanders and Stappers 2008). Co-creation approaches are moreover seen as crucial to address and cultivate the development of a sense of belonging among residents: "However, places by themselves have no identity, identity is a quality in the minds of people, and it is a collective attribution" (Nientied, Aliaj, and Stachowiak-Bongwa 2022). Establishing a stronger connection between individuals and their urban environment is essential to create healthier and more locally appropriate cities (Nientied, Aliaj, and Stachowiak-Bongwa 2022). How can this sense of belonging be effectively fostered?

Despite the acknowledged need and benefits of applying co-creation approaches, prior research also indicates the difficulties of integrating co-creation approaches effectively into urban planning procedures. The idea of wide inclusion of different stakeholders is seen as beneficial for the joint definition of intervention objectives by taking a "step away from pre-defined issues and solutions towards reframing problems that open up the view on what interventions are needed" (Hölscher and Reil 2019). It also allows for those stakeholders to be engaged who are often left out by expert-based, decision-making or conventional participatory approaches (Walker 2026), but whose input is highly needed, for the usability of the joint solutions (Brink et al. 2018) as well as to address the complexity and wickedness of environmental challenges by pooling and co-owning different kinds of knowledge (Schneider et al. 2019; Torfing et al. 2016; Wamsler 2017). However, in practice, co-creation can inadvertently privilege certain groups over others. Factors such as socioeconomic status, education, and access to resources can still influence who participates in co-creation activities (Leino and Puumala 2021). Often, marginalised groups – such as low-income residents, ethnic minorities, and individuals with disabilities – may be underrepresented in these processes, which is also related to the challenges of lacking accessible tools for design/policy

users involved in a study to express themselves and share their experiences (Sleeswijk Visser et al. 2005).

The inclusive ideal of co-creation processes are often challenged by power, knowledge and trust imbalances, difficulties of including different groups and keeping them engaged throughout the process, the resource-intensive investment in good relationships, the facilitation of group dynamics, as well the communication flow (Noppenberger et al. 2021). For NbS in particular, this entails also the question of balancing participatory knowledge and expert knowledge as well as suitable ways of gaining valuable insights into and being able to incorporate local situational knowledge (Brink et al. 2018; Nightingale 2017; van den Hove 2006). Among these difficulties are that the term "co-creation" is not clearly defined in EU policies (Broekema, Bulder, and Horlings 2023). Especially in the context of participatory planning for resilience, this might lead to situations where the expectations put upon co-creation processes might vary extensively. As Plüschke-Altof et al. (2024) have elaborated, participatory planning processes often generate expectations among participants to have significant influence over both the process and the outcomes of the co-creation process. Planning for ecological resilience is however fundamentally normative, as it seeks to establish a definitive trajectory for environmentally acceptable change, while participatory planning is characterised by its open-ended nature, which fosters expectations regarding the potential for significant influence over both the process and the outcomes to be achieved. With the design of Seedbed Interventions, the approach sought to address these common challenges to co-creative planning approaches.

In the field of urban ecology and urban greenery, participatory processes are seen as crucial to overcome a lack of environmental awareness and estrangement from nature (Dunn et al. 2006; Remme et al. 2021).

Finally, an important hurdle is the bureaucratization on different levels of governance including the municipal level (Røiseland and Vedeld 2024). When municipalities attempt to engage in co-creation, they may face bureaucratic obstacles like rigid procedures and protracted approval processes that hinder flexible interventions. Regulatory strictness can hinder agile, participatory decision-making (Kauark-Fontes, Marchett, and Salbitano 2023). Furthermore, the temporal aspect of co-creation processes can also pose challenges for municipalities. Co-creation initiatives often require significant time and effort to build relationships, establish trust, and cultivate a culture of collaboration (Bentzen, Sørensen, and Torfing 2020). As Calderon et al. (2024) show, planners are in this regard under double pressure – on the one hand, decisions should be quickly made due to rapidly evolving sustainable issues, but this might lead to reduction in inclusion and participation . On the other hand, the advocacy for participation and deliberation, for example, by the means of citizen dialogues, suggests the necessity for more extensive and time-intensive planning processes (Calderon et al. 2024).

Introduced by Gäckle et al. (2025), the Seedbed Interventions approach seeks to systematically integrate co-creation into urban resilience planning by serving as an experimental, co-creative strategy that lays the groundwork for subsequent NbS implementations. This includes understanding social independencies, adapted open spaces that respond to local conditions and needs, as well as elements that contribute to the identification and maintenance of the space by its users.

Seedbed Interventions aim to enhance tr52Qaditional co-creation processes by offering a structured, adaptable framework tailored to local contexts, integrating art-based methods and triangulation to address power imbalances and foster comprehensive stakeholder engagement. Art-based approaches like Photovoice and Canvas help to uncover hidden local knowledge, as art's ability to "make present and not just represent" reveals insights that conventional methods like surveys may miss (Berglund 2022). This facilitates locally adapted NbS interventions, enhancing acceptance and connection between public spaces and users. Planners take on a facilitative role, analyzing art-based data and user narratives to guide discussions (Fenge 2022; Thorpe 2017).

Triangulating art-based methods with survey data ensures a holistic understanding of local contexts (Turner, Cardinal and Burton 2015). Triangulation verifies that all voices are heard, addressing the critical need for equitable engagement in developing NbS (Delbaere et al. 2024). Stakeholder analysis and participatory processes increase local engagement, fostering innovation and new networks (Morello et al. 2018). Urban Morphology Analysis further refines location selection to align interventions with specific site conditions (Bruen et al. 2021).

The approach draws from Temporary Urbanism, promoting flexibility and experimentation to address urban issues with minimal risk and to design actor-focused, adaptable temporary interventions (Franz et al. 2015; Madanipour 2017).

Pilot projects allow iterative testing and input collection before permanent changes, aligning with strategies for resilient, high-quality urban spaces (Carr and Dionisio 2017). Flexible spaces, such as vacant areas, serve as platforms for participatory planning, where planners act as mediators, enabling citizens to share their knowledge and desires (Carr and Dionisio 2017). Seedbed Interventions integrate these principles into a cohesive framework, prioritizing stakeholder collaboration to develop locally adapted and equitable NbS from the outset (Timpe et al. 2022).

3. Methodology and research design

This study adopts a mixed-method case study design to examine the integration of co-creative approaches (Figure 1) into urban planning through the implementation of a Seedbed Intervention and a subsequent NbS intervention in Versailles, France. The research was conducted within the framework of the EU Horizon project GoGreenRoutes, in which Versailles participated as a partner city.

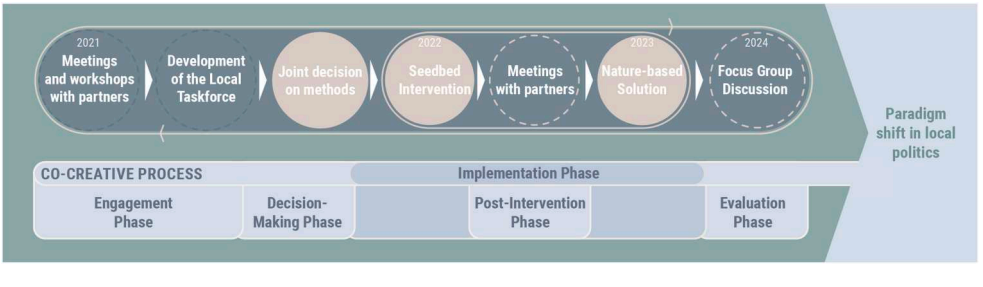


Figure 1. Graphic explaining the Co-Creative process of the case study. Source: Compiled by Jannis Meul, Julia Gäckle, Mariia Chebotareva, Bianka Plüschke-Altof.

The case study shows, that the NbS intervention was developed collaboratively between citizens and the municipality through a structured process:

(1) *Engagement Phase:* Multiple meetings and workshops were held to identify the community's needs and discuss ideas for the Seedbed Intervention and to shape the local taskforce
(2) *Decision-Making Phase:* Participants of the project decided how to implement the Seedbed Intervention and which art-based methods should be implemented
(3) *First Implementation Phase (temporary)*: The Seedbed Intervention was carried out
(4) *Post-Intervention Reflection*: The outcomes of the Seedbed Intervention were thoroughly discussed in follow-up meetings, which informed the planning of the NbS intervention;
(5) Second *Implementation Phase (permanent)*: The NbS intervention was implemented
(6) *Evaluation Phase:* After implementing the NbS intervention, Focus Group Discussions were conducted to assess the impact of the co-creative approach

Before implementation of the Seedbed Intervention, project partners initially conducted a stakeholder analysis, which later led to the establishment of the local taskforce – a group of voluntarily engaged stakeholder responsible for managing activities related to the interventions. In Versailles representatives of the departments: Sport; Urban planning and mobility; Associative life; Green area; Data; District life and youth and Social services met several times and chose based on conducting a stakeholder analysis, representatives of the following institutions to include into the local taskforce:

Public sector (municipal level):

- Mobility service
- Urban planning department
- Community life department
- Economic Development Department
- Urban ecology department
- Construction department
- Education department

Civil society

- Neighbourhood Council
- Mobility associations
- Environmental associations
- Sports associations
- Family associations

Private sector

- Sports physiotherapists

Academia

- UVSQ (public university in Versailles)

In the engagement phase prior to the implementations, various actions were organised mainly by the project manager from the city of Versailles working on the GoGreenRoutes project. In addition, once the local taskforce, was set up, they also contributed to prepare the Seedbed Intervention and finally the implementation of the NbS intervention.

To understand the potential area of interest for implementing the interventions and to select the final "local target area" an urban morphology analysis was conducted.

> "Urban morphology is the science that studies the physical form of cities, as well as the main agents and processes shaping it over time" (Oliveira 2018).

A subsequent SWOT analysis (Namugenyi, Nimmagadda, and Reiners 2019) showed strengths, weaknesses, opportunities and threats for the selected location for the interventions. After these first analysis procedures it was decided by the city of Versailles that Square Blaise Pascal (Figure 2) will be the site of the NbS intervention.

Square Blaise Pascal is a public space spanning approximately 9,900 m^2. The square was before divided into three distinct sections: (1) a 1,300 m^2 children's park featuring various play facilities, (2) a 1,730 m^2 intensively green area with cherry trees and recreational amenities such as ping-pong tables, and (3) a 6,900 m^2 multi-use sports area that includes a basketball court and a football field. This site has been designated for the NbS intervention aimed at enhancing urban green spaces and community engagement.

Over a period of approximately 1.5 years, several workshops with citizens, politicians, researchers and staff of the municipality were conducted with the aim of strengthening the cohesion of the local taskforce group and initially defining the intervention format for the Seedbed Intervention in collaboration with city representatives. To this end, a webinar



Figure 2. Square Blaise Pascal is the pilot area in Versailles, chosen to be redesigned within the project. Compiled by Julia Gäckle based on apple maps.

was held, in which project partners presented various art-based methods. Additionally, a Planning Intervention Workshop was organised, focusing on conducting the Seedbed Intervention as an event and also providing an initial preview of the NbS Intervention, which was scheduled to take place 1 year later.

The approach of implementing the Seedbed Intervention format before the NbS intervention, sets itself apart from other initiatives through its unwavering commitment to co-creation at every phase of the project. The activities in the cities emphasised that NbS can be significantly enhanced by involving local communities in the planning, design and implementation stages.

Properly integrated, intervention formats like Seedbed Interventions could positively contribute to making "slow" planning less protracted and more harmonised with "swift" planning.

> It`s (the co-creative process) longer, but its more efficient on the long term and usually the municipality is not really involving the citizens so that was a great opportunity to have this element (Participant A.2 of the second Focus Group Discussion in Versailles).

The participants of joining the Seedbed Intervention were visting guests on the day of the intervention. Participants were invited to engage in activities designed to capture their aspirations and emotions regarding the local environment: Canvas Method, Photovoice method and survey. Through the Canvas method about 30 visitors identified their top three wishes about the site on large white sheets. In applying the Photovoice method, about 20 participants out of 80 people in total joining the Seedbed Intervention that day, used instant cameras to document their experiences and emotions in the aforementioned site in consideration. The Photovoice method was led by the question: Take the camera, take a photo of a place in the public space here, and choose an emotion: active; in distress; interested; excited; upset; strong; guilty; frightened; hostile; inspired; proud; irritable; enthusiastic; ashamed; alert; nervous; determined; attentive; agitated. Twenty-four people aged 40–54 participated in the survey answering e.g. questions about their feelings about Nature or their level of climate anxiety (Figure 3).

The immediate sharing of results of the Seedbed Intervention with project partners catalyzed the refinement of the NbS intervention plans for implementation in 2023, with the local taskforce involved in further development. From Autumn 2023 to April 2024, the NbS intervention was constructed as a permanent implementation, featuring a



Figure 3. Square Blaise Pascal beforehand the NbS intervention, consisting primarily of a large soccer field.



Figure 4. Square Blaise Pascal after the NbS intervention, featuring different play elements, a new sports area, additional trees and a large meadow.

specialised area for sports activities integrated within a large meadow. This design enriched the natural landscape while providing a multifunctional space for physical activity and recreation. Square Blaise Pascal, previously a transit-dominated area (see Figure 3), was transformed into a vibrant, green space conducive to various outdoor activities (see Figure 4). Extensive greenery was added, creating a tranquil and inviting atmosphere that fostered relaxation and a deeper connection to nature.

The implementation of the NbS intervention were followed by a period of reflection and evaluation, including focus groups central to the analysis conveyed in this paper. The Focus Group Discussions were conducted, addressing key questions (Figure 5) on the added value of the NbS, the overall experience of the co-creation process, and visions for the site's future.

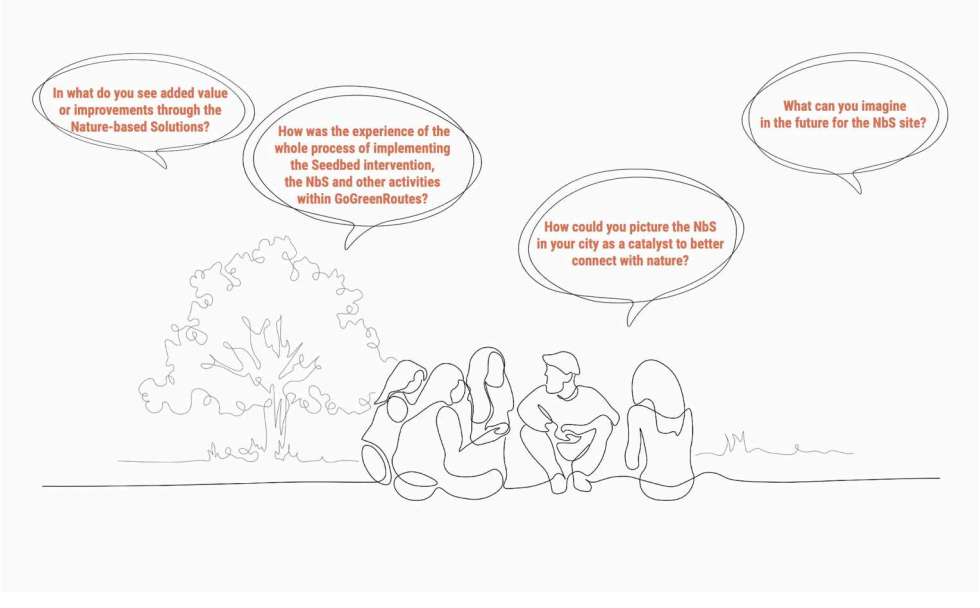


Figure 5. Graphic handed out the participants of the Focus Group Discussion. Source: Compiled by Jannis Meul, Julia Gäckle, Mariia Chebotareva, Bianka Plüschke-Altof.

The first Focus Group Discussion, conducted at Square Blaise Pascal, included members of the local taskforce, site visitors, and representatives of the City of Versailles. The session was guided by a set of structured questions (Figure 5). A second discussion was held later that day with additional task force members who were previously unavailable. Approximately six months later, following the first summer of use of the redesigned site, a third Focus Group Discussion was convened to evaluate longer-term adoption of the space and to gather policymakers' perspectives on the value of the co-creative process in urban planning.

In the context of the Focus Group Discussions, the previously established stakeholder analysis was utilised to ensure the inclusion of a diverse user group during the interviews with various stakeholders. Focus Group Discussions were conducted with representatives from the local taskforce, as well as with officials from the municipal government and political bodies. Sheets containing four questions about the overall process and outcome were distributed (Figure 4).

Their primary objective was to identify perceived added value, challenges, and future prospects of the interventions from the perspective of engaged stakeholders.

In Versailles three Focus Group Discussions were held at Square Blaise Pascal and involved several active participants from previous project activities. The session was facilitated by Project partners of the project GoGreenRoutes; Julia Gäckle (Project lead in the project GoGreeRoutes, RWTH Aachen University) who guided the discussion using a semi-structured set of thematic questions. Jannis Meul (Student assistant in the project GoGreeRoutes, RWTH Aachen University) documented the discussion and managed the audio recording, while Simon Racé (Assistant in the project GoGreenRoutes, ICLEI Europe) provided translation between English and French where necessary.

The Focus Group Discussions followed a structured thematic guide addressing four core questions: (1) perceived added value and improvements resulting from the NbS; (2) experiences throughout the overall process, including Seedbed and NbS implementation; (3) the potential of NbS as a catalyst for strengthening human–nature connections; and (4) future visions for the NbS sites. Due to time constraints and participant fatigue, not all questions were discussed in every session, three of the four guiding questions were addressed.

All discussions were audio-recorded with prior informed consent from participants. Consent forms were systematically collected in compliance with ethical and legal requirements concerning data protection. Recordings were encrypted and stored on secure devices. The data were analyzed using qualitative thematic analysis, focusing on recurring themes, perceived benefits, implementation challenges, and recommendations for future interventions.

In the following quotations of the participants will be used to showcase the findings, the names of the participants are anonymized replacing the name e.g. with "Participant B.2".

4. Findings: benefits and challenges of integrating co-creations approaches into urban planning for resilience

This inclusive engagement process enabled the early collection of ideas, fostering enthusiasm and anticipation among participants for the subsequent implementation of their

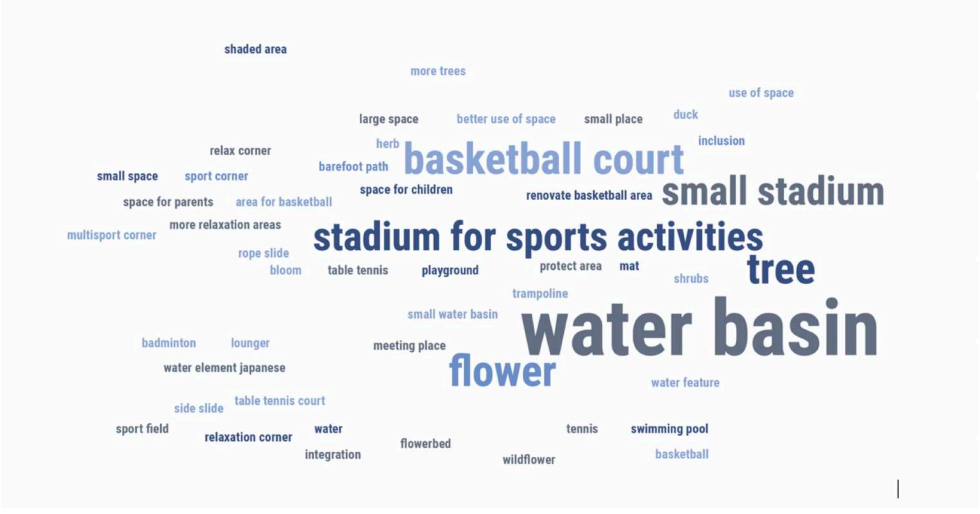


Figure 6. Wordcloud as result of the Canvas method. Compiled by Jannis Meul, Julia Gäckle.

suggestions. The intervention also encouraged reflection on the local natural environment, with some visitors returning to contribute additional ideas.

The results of the Canvas method were visualised using a word cloud. The frequency of each term mentioned by participants was systematically counted, and the size of each term in the visualization was scaled proportionally to its frequency of occurrence. Thus, terms cited more often were displayed in larger font sizes, whereas less frequently mentioned terms appeared in smaller fonts. This approach provides a proportional and intuitive representation of the relative thematic prominence of the identified ideas (Figure 6).

The results of the Photovoice method were not differentiated in detail. The Photovoice method primarily served as an activation tool, encouraging participants to reflect more deeply on the site and to notice aspects they might not otherwise have consciously articulated. Through the use of the Photovoice method, new modes of spatial perception were opened up for the participants. By engaging with the camera and undertaking the task of identifying and photographing a place that evoked a strong emotional response, they were able to approach and experience space in novel ways (Figure 7).

The survey was analyzed by using quantitative indicators to summarise key variables such as nature connectedness, perceived safety, access to green space and climate concern. The results are visualised through e.g. bar charts and proportional graphics, enabling a clear and accessible representation of response patterns within the sample.

A large majority believed Nature-based Solutions benefit biodiversity, and 83% are concerned about climate change. Notably, 87% reported access to at least 0.5 hectares of nearby greenery in Versailles, indicating strong local green infrastructure.

The results of the three methods are presented here only illustratively, as providing a detailed account would exceed the scope of this paper.

The implemented Seedbed Intervention, comprising three methodological components, was designed to inform and tailor the subsequent Nature-based Solutions (NbS) intervention. The findings generated through these three methods were primarily analyzed and synthesised by the GoGreenRoutes project lead, the City of Versailles project

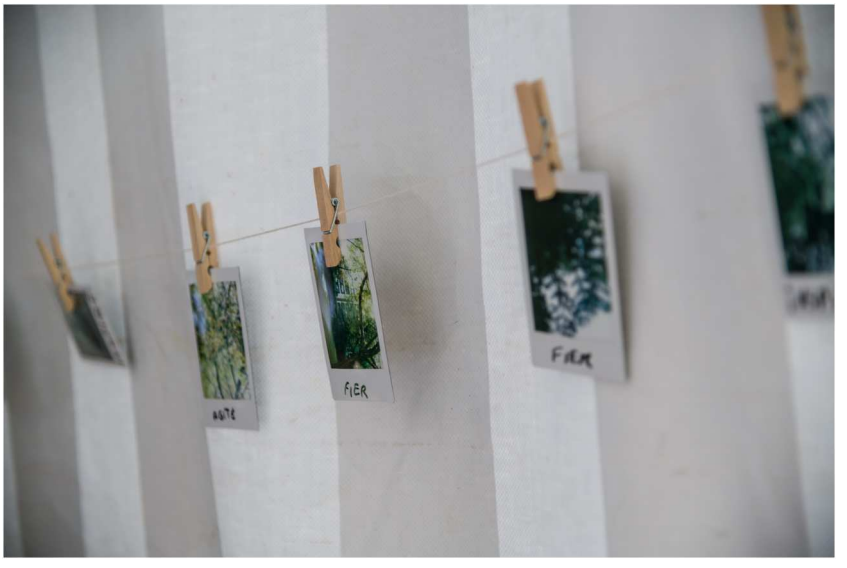


Figure 7. Pictures of the Photovoice method. Compiled by Julia Gäckle.

manager responsible for local implementation, and members of the local taskforce. This collaborative analysis formed the empirical and strategic basis for the development of the NbS intervention.

The seedbed intervention at Square Blaise Pascal in Versailles actively involved neighbourhood residents in shaping the Nature-based Solutions (NbS) plans. Using Canvas and Photovoice approaches, participants shared concrete suggestions – such as introducing a water feature and redesigning spaces that had previously felt unsafe to improve comfort and security.

Implemented between autumn 2023 and April 2024, the NbS intervention reflects the community input gathered throughout the Seedbed Intervention. It includes a basketball court, dedicated sports areas, an expansive meadow, enhanced planting and welcoming spaces designed to foster relaxation and intergenerational interaction. While the square continues to function as a passageway, it now more effectively accommodates outdoor recreation and social connection.

Overall, the outcomes highlight the importance of co-creation, improved safety, and meaningful engagement with nature as guiding principles of the final design. The NbS intervention in Versailles exemplified the transformative potential of co-creative planning. Participants highlighted the inclusive and intergenerational nature of the redesigned park, which now accommodates a diverse range of users, from young children to the elderly. Previously characterised as an underutilised, arid area, the park's transformation into a green oasis has enhanced community well-being by providing a calming and restorative environment.

The park's innovative design, significantly different from the original layout, foster social interactions and a strong sense of place.

> When it's hot, people come to the park much more often. We've had significantly more visitors since the park reopened (Interview with Local Taskforce member D.3).

The NbS intervention in Versailles overall successfully revitalised an underutilised space, fostering social cohesion and environmental benefits. The participatory approach was key to its success, demonstrating the importance of citizen engagement in urban planning. Moving forward, sustained community involvement will be crucial to maintaining and expanding these benefits.

The results of the focus group discussions are aligned with the themes presented in Figure 4. Within the first Focus Group Discussion key benefits of the redesign were highlighted:

- **Added Value of NbS:** The redesigned park now brings together people of all ages, offering a welcoming environment for families. The previously dry and sandy space has evolved into a green oasis, fostering well-being and social interaction.
- **Implementation Process:** The Seedbed Intervention and NbS efforts were highly collaborative. Engaging the community from the outset ensured local ownership and a sense of belonging.
- **NbS as a connection to the nature in the city:** The redesign included the planting of additional trees, which enhanced the availability of shaded resting areas, as well as the implementation of features such as a natural playground. These interventions are likely to strengthen nature connectedness by increasing both direct sensory contact with natural elements and opportunities for unstructured interaction within a green environment. Furthermore, the reported increase in perceived safety following the redesign represents a critical enabling condition: when individuals experience a space as safe, they are more able to attend to and meaningfully engage with natural surroundings, thereby deepening their affective and experiential connection to nature.
- **Future Vision:** While the space is currently well-used, participants expressed concerns about maintaining its vibrancy over time. Continuous engagement is necessary to sustain its success.

The second Focus Group Discussion included local taskforce members who reflected on the transformation of the space:

- **Added Value of NbS:** The intervention expanded the site's use beyond just sports fields. Participant B.2 emphasised, "*The new design encourages social interactions among different generations by integrating greenery and creating a more inviting atmosphere*" (Participant B.2 of the second Focus Group Discussion in Versailles).
- **Implementation Process:** Language barriers and lengthy commitments posed difficulties. However, early community involvement helped mitigate initial resistance.
- **Future Vision:** The vision includes integrating the district house area with green spaces and commemorating the area's horticultural history.

The third Focus Group Discussion held later in September 2024, after one summer of usage of the NbS intervention:

- **Impact on Urban Planning:** Participant A.3 reflected on how the project reshaped planning approaches: "*Here, we changed everything based on the usage, absolutely*."

He emphasised the shift from abstract design concepts to use-based planning, which transformed the perspectives of both city officials and citizens.

- **Implementation Process:** Participant B.3 highlighted the improved microclimate, stating, "*The play area is very well appreciated*." She acknowledged the park's role in cooling the urban environment and outlined upcoming initiatives, such as planting trees to honour the site's horticultural legacy.
- **Future Vision:** Plans include connecting the district house area with green spaces and commemorating the site's historical identity as a horticultural landmark.

According to the results of the Focus Group Discussions, the co-creation approach played a pivotal role in fostering community ownership of the project as participatory workshops and tools sought to ensure that residents were actively involved in the design process, thereby strengthening intergenerational connections and reinforcing the perceived value of the interventions.

> The fact that we conducted cooperative workshops – both the walks and the question boxes during the workshop – created significant community engagement around the project. And with the park opening today, people aren't just discovering a ready-made project out of nowhere. It's a project they were involved in, one where they made decisions, so they were expecting something perhaps even better than what they had imagined. But in any case, it's their project, their creation. I think everyone contributed their part, so it's truly a cooperative project that we managed to carry through from start to finish with the community (Participant A.1 of the first Focus Group Discussion in Versailles).

The participants of the Focus Group Discussions also felt that the intervention addressed prior concerns about the segregation of age groups, creating a unified and welcoming space that integrates environmental considerations such as urban heat island effect mitigation. Early and sustained community involvement for them seemed key to realizing a shared vision, resulting in a multifunctional public space aligned with the local identity.

> All the generations were split in the previous space and now we have gathered everyone so we have a space for kids very close to the space also for the teenagers as well and this was the purpose of this intervention (Participant B.2 of the second Focus Group Discussion in Versailles).

While participants expressed optimism about the park's continued evolution, aspiring to maintain its vibrancy and appeal over time, concerns were also raised about sustaining community interest as the novelty of the intervention fades. Efforts to adapt the space to evolving needs and to maintain engagement were identified as essential for the site's long-term dynamism.

> Engaging local people is absolutely good, and I would like to extend this to a general statement that we have more novels here. The mayor said that if we really want to have an enjoyable city, we need to involve the inhabitants from the beginning. And there is a lot of local initiative that we are not necessarily aware of, that we can include in our durable city. It's very important (Participant A.3 of the first Focus Group Discussion in Versailles).

The challenges associated with the resource intensity of co-creative methods, as well as the necessity of institutionalizing such approaches within municipal governance, were emphasised. These challenges, while significant, also highlight the unique opportunity

that co-creation offers: the potential to design and develop solutions that are more locally relevant and closer to the needs of the people. The information generated via applying different methods in these co-creation processes can indeed present a challenge, but it is precisely through these methods that we gain the chance to create solutions that are more attuned to local contexts and people. Furthermore, when these seemingly fuzzy and complex processes become institutionalised over time, they may give rise to routines and foster trust in the success of these approaches, ensuring their sustainability and long-term impact.

> It's something new; it has allowed us to push even further with this park and engage in co-construction with the local residents. (Participant B.4 of the third Focus Group Discussion).

Key insights from this research suggest that several elements should be integrated into municipal planning practice beyond the project's duration. First, the findings demonstrate both the necessity and the feasibility of systematically embedding co-creative planning within existing municipal structures. Second, the results highlight the critical role of individual actors, emphasizing that meaningful participation depends on their empowerment and capacity to contribute effectively. Third, the research underscores the importance of fostering pro-social and environmentally conscious behaviours among citizens, thereby enabling them to actively engage with urban development processes and to better understand their roles within the broader urban ecosystem.

5. Discussion and conclusion

The Versailles case illustrates the tangible benefits of integrating co-creative planning methods into urban planning. Implementing the Seedbed Intervention ahead of the main NbS intervention allowed planners to embed local knowledge early in the process, aligning with EU priorities such as the European Green Deal and the New European Bauhaus to promote inclusive and context-sensitive solutions. These participatory methods fostered place-based design, strengthened community ownership, and encouraged intergenerational interaction outcomes that contribute to more inclusive and resilient urban environments.

The case study also highlighted how local knowledge – gathered through methods like Photovoice and the Canvas technique – provides planners with valuable insights into residents' needs and aspirations. For example, participants' input on features like water elements or increased biodiversity directly influenced the design of the NbS intervention. By involving citizens as active contributors, the process bridged the gap between expert-driven design and lived experience, helping create spaces that align with local identity (Corburn 2003). The Versailles case emphasises the importance of early co-creative engagement in planning processes. Early involvement builds trust and ensures a diverse range of voices are heard, reducing the risk of marginalizing vulnerable groups. As noted by Lepori and Noukas (2023), this inclusion fosters a sense of ownership, which is critical for the long-term sustainability of NbS interventions. In Versailles, the initial Seedbed Intervention generated momentum for continued collaboration, showing how early co-creation can catalyze sustained community engagement. While the Seedbed Intervention provided valuable insights, it also revealed challenges inherent in co-creative planning. The coordination required for such events can strain municipal

resources, as planning often involves multiple departments and stakeholders. However, these challenges highlight the potential of co-creative methods to foster interdisciplinary collaboration and build a culture of cooperation within municipalities. Overcoming these barriers will help institutionalise co-creation as a standard component of sustainable urban development.

Involving urban residents early in the development of a NbS intervention significantly enhances social cohesion and fosters values such as fairness, inclusivity, and mutual respect, a pattern consistently highlighted by the focus group discussions. Additionally, it refines decision-making processes, facilitates social learning, and integrates local knowledge, improving the effectiveness of NbS. Researchers suggest that the collaborative creation of NbS could catalyze a shift in how society interacts with nature, promoting a more holistic approach to healthier urban environments (Nunes, Björner, and Hilding-Hamann 2021). However, for NbS intervention to succeed, it is essential to ensure they genuinely enhance nature-connectedness, rather than offering a superficial "green" image. In terms of citizen engagement, it is crucial to assess adherence to co-creation principles, identify effective strategies, and maintain consistent stakeholder involvement. Furthermore, inclusion and diversity should be integral to the co-creation of NbS.

The spectrum of art-based methods is inherently diverse and encompasses a wide range of participatory, performative, and material practices. In the present context, the selection of methods was not predetermined but emerged from a structured co-creative process conducted in close collaboration with project partners and representatives of the partner cities (Gäckle et al. 2022, 62ff). This iterative and dialogical approach ensured that the chosen methods were context-sensitive, locally embedded, and aligned with the practical and strategic objectives of the participating stakeholders. A central aspect guiding the selection process was the provision of maximum interpretative openness. The methods were intentionally designed to allow for multiple readings, subjective associations, and diverse forms of engagement, thereby fostering inclusivity and minimizing barriers to participation. This openness was considered essential in order to accommodate heterogeneous audiences and to support spontaneous, low-threshold forms of interaction. While alternative art-based methods are theoretically conceivable, their applicability would depend on their capacity to meet comparable accessibility requirements. Furthermore, practical implement ability under real-world conditions, as demonstrated in the reference project, constitutes a necessary criterion for methodological transferability and scalability.

For the City of Versailles, the adoption of a strongly co-creative approach represented a relatively unusual and initially met with some skepticism administrative practice. Participatory formats were not entirely new; however, the depth and intensity of co-creation envisaged in this project exceeded previously established procedures. The preparation and development of the co-creative format involved a broad range of municipal actors across political and administrative levels (Bah, Chapman, Gäckle 2021, pp.23ff). Representatives included e.g. an elected official responsible for environmental affairs, innovative projects, and ecological transition; members of the municipal and district councils; senior administrators from the department of green spaces; a landscape planner; and the director of a local neighbourhood community centre. This constellation illustrates that the project was not confined to a single department but required cross-departmental coordination and shared ownership.

The case of Versailles demonstrates that the successful implementation of co-creation depended not only on formal structures, but also on interdepartmental cooperation, administrative openness to new working modes, continuous capacity-building and the willingness of public employees and planners to assume reflexive, facilitative roles within a shared governance framework.

Future plans in Versailles include celebrating the area's horticultural history, expanding green spaces and continuing citizen involvement to create a vibrant, historically mindful urban area. The collaborative approach unified different age groups, fostered a strong sense of community ownership and addressed environmental concerns, emphasizing the importance of early resident involvement in urban projects. The NbS intervention has successfully revitalised a community space, making it more welcoming and inclusive. This process promoted intergenerational social interactions and accommodated diverse needs, thanks to close collaboration with local residents and effective participatory planning. Nonetheless, challenges remain. Some municipalities are hesitant to engage local stakeholders due to concerns about lengthy processes (Ferreira et al. 2020). However, awareness of the importance of such engagement is growing. Another challenge is sustaining citizens' voluntary participation over time. To maintain a long-term engagement, incentives beyond the co-design process itself must be created. Stakeholder engagement should be institutionalised, with experimental formats like Seedbed Interventions becoming permanent components of urban planning.

To ensure lasting impact, collaborative approaches must move beyond isolated trials and become institutionalised practices. This includes formalizing test phases to communicate benefits clearly to decision-makers and developing long-term engagement strategies, including incentives for sustained citizen involvement. The shift toward co-creation must also prioritise diversity and equity, avoiding tokenistic participation and ensuring participants have a meaningful influence on planning decisions and long-term urban outcomes.

The institutionalization of collaborative formats, such as Seedbed Interventions, would ensure their integration into the planning process, helping mitigate the uncertainties inherent in co-creation. A formalised test phase could help communicate the benefits to policymakers more effectively. Enhanced local identification can improve relationships between individuals and their city, leading to more sustainable and flexible urban spaces. Long-term, empowering urban residents as active city shapers contributes to vibrant, resilient urban environments that can adapt to the evolving needs of diverse social groups and address ecological, social, and political challenges. In conclusion, the Versailles case demonstrates how a co-creative experimental approach improves functional outcomes and fosters stronger connections with communities. However, challenges remain in institutionalizing these kinds of approaches within municipal governance.

Future research should critically examine the institutional, political and operational conditions that enable or hinder the systematic integration of co-creative experimental approaches, such as the Seedbed Intervention, into mainstream urban planning processes. Ultimately, only through the systematic institutionalization of co-creative experimental approaches such as the Seedbed Intervention can municipalities transition from *ad hoc* participation toward embedded, resilient, and inclusive planning paradigms capable of addressing the complex socio-ecological challenges of contemporary urban environments.

> We changed about everything and the fact that we have pushed [the] point that it has to be a multi-cultural, multi-age and everything, as it's the first time we do something, as I would say, as a signal. So the mayor is very often using Blaise Pascal as an example of what we mean by durability for a city […] (Interview with Local Taskforce member D.2 in Versailles).

The implementation of the NbS intervention transformed the park into a green, welcoming, and community-oriented space that brings together people of all ages, promotes well-being and through its inclusive and multifunctional design strengthens social interaction and a sense of belonging. The process was highly collaborative and characterised by intensive co-creation. Early engagement of local residents fostered intergenerational connectedness, shared ownership, and the development of a sustainable and climate-resilient urban environment.

> Force the system not to slow down, but to go step by step by step. And not try to imagine what could be, because in fact, you spend your time to imagine what has to be done. In fact, you just have to listen. And it will give you exactly a substance you are looking for. (Interview with Local Taskforce member D.2 in Versailles).

The Versailles case study demonstrates how this pilot initiative contributed to a constructive evolution of municipal planning practices. By reinforcing user-centered and participatory elements within existing planning frameworks, the project complemented established procedures and supported a more inclusive and context-sensitive model of urban development. The successful transformation of Square Blaise Pascal has since inspired follow-up initiatives, such as the "Oasis" programme, highlighting the potential of citizen participation to create sustainable, vibrant, and widely accepted urban spaces.

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