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GreenInCities Living Labs Governance (Initial Report)

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Statement of Originality

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Project Executive Summary

GreenInCities: Demonstrating Holistic Data-driven Co-Creative Approaches in Nature-based Solutions towards climate Adaptation and Mitigation

In recent decades, new planning paradigms have reshaped cities. Urban regeneration has renovated public spaces, redeveloped city centres, and established innovation districts. Smart cities have implemented technological systems, such as transport management, water and contamination monitoring, and energy-efficient buildings. A new sustainable approach, including recycling, renaturalisation, and recovery, has emerged in response to the demand for environmental sensitivity in urban planning. These strategies have mainly been applied to wealthy areas to attract tourism and companies, repositioning cities in the global economic framework. However, applying these regeneration strategies, smart systems, and renaturalisation processes to deprived areas is crucial. These areas tend to face multiple urban problems, such as pollution, social and cultural issues, lack of services and low-quality built environments, and public spaces, leading to issues related to liveability, functionality, quality of life, social cohesiveness, and physical and mental health. Moreover, there is a growing need for climate change adaptation strategies, which has led to the implementation of Nature-based Solutions (NbS). However, a new pattern is emerging, which considers nature as a stakeholder in itself, beyond the ecosystem services it provides. Innovative technologies such as AI, machine learning, and immersive realities are also emerging, which can enhance the accuracy of information delivery and people engagement.

GreenInCities aims to develop methodologies and tools for collaborative climate mitigation and adaptation urban planning approaches, specifically for deprived areas, addressing three main challenges: improving societal readiness level and awareness of vulnerable groups, going beyond classical greening and renaturing interventions, and leveraging cutting-edge technologies to enhance co-creation and maximise urban regeneration impacts.

Deliverable Executive Summary

GreenInCities Living Labs Governance (Initial Report)

This deliverable is associated with Task T3.3, *Multi-stakeholder governance in Living Labs (LLs): principles and mechanisms*. The task aims to develop a framework for implementing multi-stakeholder governance within GreenInCities LLs, which are located in five Leader cities and six Follower cities in Europe. As described in the task, the focus is on defining principles—fundamental truths or assumptions that guide beliefs, behaviours, or reasoning—and mechanisms—methods or processes—that enable effective collaboration among various stakeholders, ensuring that their diverse perspectives and needs are incorporated into interventions.

To support identifying governance principles and mechanisms, *D3.3 GreenInCities Living Labs Governance (Initial Report)* provides an overview of LLs and their governance challenges. It discusses the innovation paradigms of open innovation and user innovation and theoretical frameworks related to organisational and project governance in LL settings. The document emphasises the importance of governance in facilitating collaboration among diverse stakeholders, which is crucial for the success of innovative urban solutions aimed at addressing climate change and enhancing sustainability in cities, particularly in deprived areas.

Building on this, the deliverable proposes a governance framework customised for GreenInCities LLs. It is designed to guide project practitioners in aligning various stakeholders and promoting the effectiveness of LL projects. By establishing clear governance principles, the framework aims to enhance collaboration and decision-making processes, ensuring that all participants' diverse needs and perspectives are considered, including those from more vulnerable social groups.

Additionally, D3.3 introduces a method for planning and evaluating governance in LLs. This method assesses stakeholder engagement levels and improves user participation and project outcomes. This governance method allows project teams to continuously monitor and adjust their governance approaches, fostering a more balanced and effective co-creation process.

Finally, in the follow-up to this deliverable, the next deliverable—*D3.5 GreenInCities Living Labs Governance (Final Report)*—will also incorporate empirical data collected through stakeholder interviews, providing practical examples of governance in LLs and enabling refined adjustments to the governance framework presented in this document.

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1. Introduction

1.1 Deliverable Structure

The deliverable is organised into four main sections and one annex:

- **Section 1 – Introduction** includes brief sections on the deliverable's structure, such as the purpose, target audience, reference documents, and a list of abbreviations and acronyms.
- **Section 2 – Living Labs** provides an overview of the scientific literature on LLs, highlighting their characteristics, innovation paradigms, and challenges. It emphasises the role of co-creation and stakeholder involvement, especially user engagement, in developing innovative and sustainable solutions for urban environments.
- **Section 3 – Governance in Living Labs** explores the literature on governance at organisational and project levels within LLs. It proposes a customised governance framework, detailing organisational and project governance principles while considering the specific characteristics of GreenInCities. The section also introduces a governance matrix to evaluate and adjust stakeholder engagement throughout LL projects, improving user participation and balanced decision-making.
- **Section 4 – Conclusions** summarises the key findings on the importance of applying governance principles in LLs, emphasising the need to clarify roles and responsibilities, motivate and facilitate user engagement, and utilise practical methods to support effective governance in LL projects.
- **Annex.** The annex details the workshop *Planning Stakeholder Governance in Living Labs*, held during an internal project meeting in Cork in October 2024. The workshop provided an opportunity for participants to plan and reflect on stakeholder engagement throughout the co-creation process within their respective LLs.

1.2 Deliverable Purpose

D3.3 GreenInCities Living Labs Governance (Initial Report) focuses on the following purposes:

- to provide a theoretical perspective on LLs, emphasising governance challenges.
- to present an overview of organisational and project governance frameworks relevant to LL settings.
- To propose a governance framework for GreenInCities LLs, supporting stakeholder alignment and improving project effectiveness.
- To introduce a method for planning and evaluating governance in LLs, focusing on assessing engagement and enhancing user participation in co-creation.

1.3 Target Audience

Deliverable *D3.3 GreenInCities Living Labs Governance (Initial Report)* is a public document that introduces a guiding governance framework to support GreenInCities LLs. It is primarily intended for project managers and practitioners involved in LL projects. Additionally, the document targets stakeholders by clarifying the governance context within LLs and offering insights into how these stakeholders can be more effectively organised throughout LL projects. Lastly, as this deliverable is based on LL literature and best practices in project management, it may also be useful for LL initiatives beyond GreenInCities.

1.4 Reference Documents

This deliverable was developed using the following data sources:

- The GreenInCities Grant Agreement.
- Literature on LLs, governance, and project management.
- ISO 37000:2021 – Governance of Organizations.

- Project management frameworks: PMBOK, PRINCE2, and PM².
- Insights from the “Workshop on Stakeholder Governance in Living Labs,” involving representatives from Leader and Follower cities and project partners, held during an internal project meeting in Cork in October 2024 (see Annex).

1.5 List of Abbreviations and Acronyms

Alphabetical list of project-related acronyms specific to this deliverable:

D	deliverable
ENoLL	European Network of Living Labs
GRA	Grant Agreement
ISO	International Organization for Standardization
LL	living lab
PM²	Project Management Methodology
PMBOK	Project Management Body of Knowledge
PRINCE2	PRojects IN Controlled Environments
SDG	Sustainable Development Goals
T	task

2. Living Labs

Living labs (LLs) have been interpreted from various perspectives by scholars and practitioners, leading to diverse views of LLs as an approach, a project, a particular location (Chron  er et al., 2019), and even as a network (Leminen et al., 2012).

To clarify this concept and establish a foundation for further exploration of governance, the following sections present a brief overview of LLs, covering their definitions, key characteristics, innovation paradigms, and main challenges they face.

2.1 What Does ‘Living Lab’ Mean?

The European Network of Living Labs (ENoLL)¹ offers a broad definition for LLs as *“open innovation ecosystems in real-life environments based on a systematic user co-creation approach that integrates research and innovation activities in communities and/or multi-stakeholder environments, placing citizens and/or end-users at the centre of the innovation process.”* This general definition can be applied to different sectors such as education, healthcare, technology, and urban development.

In the specific context of urban development, LLs are often referred to as *urban living labs*. These labs have a clear focus on developing local sustainable solutions to address wicked problems or societal grand challenges, such as climate change, aimed at enhancing the overall sustainability of cities (Steen & Van Bueren, 2017). From a city-centric perspective, Chron  er et al. (2019, p. 60) define an *urban living lab* as:

“a local place for innovative solutions that aims to solve urban challenges and contribute to long-term sustainability by actively and openly co-constructing solutions with citizens and other stakeholders.”

According to this definition, the GreenInCities project can be seen as an example of such an urban living lab initiative. It promotes urban living labs in five Leader cities and six Follower cities across Europe, aiming to co-create innovative solutions for urban greening and re-naturalisation plans in deprived areas.

The key characteristics of general LLs, such as operating in real-life environments, involving multiple stakeholders, and facilitating co-creation, also apply to the specific context of urban living labs. These characteristics are then further detailed in the

¹ <https://enoll.org/living-labs/#living-labs>

following section. For simplicity, the term *living lab* and its acronym *LL* will be used throughout this text when referring to *urban living labs*.

2.1 Key Characteristics

- Real-life Environment

In contrast to typical laboratory environments, where experiments are conducted in controlled spaces, LLs operate within real-world settings, allowing for interactions with users and communities. This approach allows for evaluating experiments and user experiences within a familiar local area. Such environments then serve as platforms for engaging a variety of stakeholders, including government entities, companies, researchers, and citizens (Hakkarainen & Hyysalo, 2013). Accordingly, the real-life context of LLs helps identify user needs, preferences, and expectations for innovative products and services.

- Multiple Stakeholders

The literature emphasises the involvement of multiple stakeholders in LLs. Key participants typically include the public sector, universities, companies, and citizens, who are often regarded as users or customers (Tukiainen et al., 2015). This multi-stakeholder approach aligns with the quadruple helix model of innovation ecosystems, which brings together government, academia, industry, and civil society to shape innovation (Carayannis & Campbell, 2009). Additionally, the GreenInCities project incorporates the environment as a fifth element of the helix, thus adopting the quintuple helix model (Carayannis & Campbell, 2010) to highlight the importance of sustainability in urban solutions².

The participation of multiple stakeholders brings together a range of perspectives aimed at fostering innovation in LLs. However, this diversity also creates challenges in aligning the various interests and expectations of participants, making it difficult to keep everyone focused on the core objectives of the LL (Hossain et al., 2019). Particularly critical is the participation of users. LL project managers often face challenges in engaging users in activities due to the lack of formal authority over them and low trust between participants (Sørensen & Torfing, 2017). For these reasons, project managers should focus on building relationships of trust (Mora et al., 2023) and creating and maintaining user motivation to ensure active participation in LLs (Westerlund & Leminen, 2011). As Juujärvi and Pessa (2013) emphasise, the engagement of users is key for a successful LL.

² The GreenInCities project recognizes both humans (including citizens of various groups) and non-human species as users. Participation of non-human species is facilitated through representatives from organizations that can speak on their behalf. For further details, refer to *D7.4 Inclusion Plan*.

- Co-Creation

Co-creation is one of the most distinguished characteristics of LLs (Steen & Van Bueren, 2017). With a co-creation approach, solutions are developed with the user from the start rather than creating a solution independently and involving the user only in the later stages of testing and implementation. Moreover, users should not only be consulted about their input but also empowered to actively participate in decision-making throughout the process. This becomes a continuous cycle, as co-creation is an iterative process, implying that once the solution is designed, it is tested and evaluated by users and stakeholders, providing feedback for further refinement and development.

In the GreenInCities project, co-creation is structured across the stages of co-analysis, co-design and implementation, and co-monitoring, ensuring that interventions address the specific needs of vulnerable groups. By involving community members and representatives advocating for non-human entities throughout these co-creation stages, the project aims to develop greening and re-naturing solutions that are closely aligned with the real needs and expectations of users and stakeholders.

2.2 Innovation Paradigms

Regardless of the context in which LLs are applied—such as education, healthcare, technology, or urban development—they are mainly associated with the innovation paradigms of open innovation and user innovation (Hossain et al., 2019). While this connection highlights the importance of collaboration among stakeholders and users, it also creates significant challenges for the governance of LLs. The following topics explore these key innovation paradigms.

- Open Innovation

Open innovation is a paradigm that promotes the use of both external and internal ideas to market and drive innovation within organisations (Chesbrough, 2003). This approach contrasts with the traditional model of innovation, where companies rely solely on their internal resources and capabilities (Dahlander & Gann, 2010). Open innovation leverages the collective knowledge and expertise of a broader community, including users, customers, partners, and even competitors, to drive innovation. Such a collaborative process can lead to more diverse and creative solutions, faster development times, and reduced costs, but also implies new managerial considerations as multiple actors become involved (Giannopoulou et al., 2011). By opening up the innovation process, organisations can tap into a wider pool of ideas and technologies, enhancing their ability to innovate and stay competitive in rapidly changing markets.

In the context of LLs, open innovation plays a foundational role in fostering collaboration and co-creation among various stakeholders (Abi Saad & Agogu , 2024; Almirall & Wareham, 2008). Such a real-world setting allows for continuous feedback and iteration throughout the innovation process. The integration of open innovation within LLs has been particularly effective in addressing complex societal challenges, such as healthcare and urban development (Gasc , 2017; McGahan et al., 2021). By involving multiple actors throughout the innovation process, LLs help ensure that the resulting solutions become more practical, sustainable, and widely adopted. This collaborative approach thus has the potential to not only accelerate the innovation cycle but also enhance the overall impact and relevance of the innovations developed.

- User Innovation

Similar to open innovation in terms of breaking with traditional ways of doing innovation, the notion of user innovation refers to a process where end-users actively contribute to the development and improvement of products and services (von Hippel, 2005). Initially, this mainly involved “lead users” (von Hippel, 1986) when targeting radical innovation, but lately it has become more inclusive and engaging also “regular” users in participatory and co-creation processes (Sanders & Stappers, 2008). The value of such an approach is the possibility of leveraging the unique insights and needs of users to drive innovation, bringing a diverse range of perspectives and experiences (Bogers & West, 2012). This can lead to more practical and user-friendly solutions, as well as more robust and effective innovations, as users are often best positioned to identify the challenges and opportunities within their own contexts.

In the context of LLs, user innovation is pivotal, as the continuous involvement of users in the process ensures that innovations are closely aligned with user needs and preferences (Compagnucci et al., 2021). For example, in healthcare, LLs have been used to develop patient-centred technologies and services that improve care delivery and patient outcomes (Kim et al., 2020). In smart cities, LLs have facilitated the development of smart mobility solutions, energy-efficient buildings, and community-driven public services (Schaffers et al., 2011). Studies have shown that involving users in the innovation process within LLs can lead to higher adoption rates and more sustainable solutions (Huang & Thomas, 2021; Liedtke et al., 2012). By integrating user feedback and fostering collaboration among diverse stakeholders, LLs help create urban spaces that are more adaptive, resilient, and aligned with visions of a smart, sustainable future. This is particularly relevant in the context of GreenInCities, where including more vulnerable groups in the co-creation process can significantly improve social impact and foster long-term benefits, which are key objectives of the project.

2.3 Challenges

The literature identifies several significant challenges faced by LLs across a variety of contexts, including those designed to support urban development, such as the GreenInCities LLs. These challenges include temporality, the involvement of users, unforeseen outcomes, and governance. The following topics offer a detailed examination of these obstacles, which can hinder the success of LL initiatives.

- Temporality

Sustaining long-term operations remains a significant challenge for LLs, as they typically depend on short-term public funding (Gualandi & Romme, 2019) and lack a sustainable business model (Schaffers & Turkama, 2012). Additionally, stakeholders in LLs may also prioritise short-term goals that align with their immediate organisational needs (Leminen et al., 2012). For example, the project-based nature of many LLs tends to emphasise short-term benefits, particularly focusing on financial gains for supplier organisations (Fuentes, 2020). In this sense, building long-term partnerships is essential to support sustainable activities and ensure the longevity of LLs (Compagnucci et al., 2021).

- Involvement of Users

The appealing concept of co-creating innovative solutions in LLs may generate initial attraction among users. They are typically interested in participating in projects that may benefit their well-being and communities. However, transitioning this initial interest into engaged participation is more challenging (Compagnucci et al., 2021). This difficulty arises because users are often outside the formal organisational boundaries of LLs (Leminen & Westerlund, 2012) and due to a lack of trust among participants (Sørensen & Torfing, 2017). Unlike stakeholders directly tied to an organisation, users are not obligated to participate consistently in LL activities and are free to choose their level of engagement.

- Unforeseen Outcomes

During the co-creation stages, users and stakeholders play an exciting role in shaping the development process, providing rich inputs that foster the creation of innovative and disruptive solutions. This ongoing feedback can substantially change initial requirements, often resulting in outcomes that differ significantly from the original plans. Indeed, Hossain et al. (2019) argue that activities in LLs frequently lead to unpredictable outcomes due to the diverse inputs from users and multiple stakeholders, reflecting the dynamic, emergent, and often surprising nature of the co-creation process.

- Governance

Scholars have suggested that the governance of stakeholders does not always succeed in generating value (Sørensen & Torfing, 2017). Several challenges can hinder its effectiveness: the inclusion of all key relevant stakeholders, the alignment of diverse interests and expectations, tasks that are too vaguely defined, internal conflicts, disputes leading to a lack of trust, and difficulties in communicating goals and methods utilised in LL activities (Hossain et al., 2019; Sørensen & Torfing, 2017; Voytenko et al., 2016). These challenges highlight the need for effective governance to ensure participation and value creation in LLs.

The following section explores the governance of users and stakeholders in LLs and presents a guiding framework to address the challenges mentioned previously. The focus is on aligning participants, clarifying roles and responsibilities, and effectively guiding the outcomes of LL initiatives.

3. Governance in Living Labs

To understand governance in LLs, we must first clarify that LLs can encompass activities on multiple levels (Schoorman, 2015), which also has implications for how to think about governance. At the macro level, the focus is on multi-stakeholder partnerships that enable and legitimise collaboration throughout the co-creation process, centring on the LL organisational level. At the meso and micro levels, attention shifts to LL projects, focusing on the operational activities, methods, and tools needed to successfully deliver innovative solutions.

The following sections explore and combine the role of governance at both the organisational and project levels, resulting in a guiding multi-stakeholder governance framework for GreenInCities, along with strategies for the operationalisation and scaling up of LL projects.

3.1 Governance of Organisations

Studying governance at the organisational level provides initial insights for exploring governance in LLs. The international standard ISO 37000 (2021, p. 1) defines *governance of organisations* as a

“Human-based system by which an organisation is directed, overseen, and held accountable for achieving its defined purpose.”

According to this standard, governance is essential for organisations to achieve their goals effectively, responsibly, and ethically. It facilitates effective performance by keeping the organisation connected to its purpose and delivering value to stakeholders. Governance supports responsible stewardship by guiding the organisation to use resources judiciously, contribute to sustainable development, and build trust among stakeholders. Additionally, it promotes ethical behaviour³ by ensuring transparency and demonstrating integrity in decision-making.

³ Ethical behaviour is also addressed in the deliverables *D1.7 Values and Ethics Handbook* and *D7.4 Inclusion Plan*.

ISO 37000 (2021) presents governance through categories of principles, providing a structured framework that helps organisations understand the different aspects of governance. The standard defines a principle as a “fundamental truth, proposition or assumption that serves as foundation for a set of beliefs or behaviours or for a chain of reasoning” (ISO 37000, 2021, p. 3). It further classifies governance principles into three categories: primary, foundational, and enabling.

- The **primary principle** is the organisational purpose. It is the primary consideration for governance and outlines the reasons for the organisation’s existence, articulating its intentions toward the natural environment, society, and stakeholders. It serves as a central point to align all other principles.
- The **foundational principles** are essential for effective governance. They involve determining the approach for value generation and directing strategies to achieve those values.
- The **enabling principles** focus on governance responsibilities. They help organisations meet evolving stakeholder expectations and adapt to the changing social, economic, and natural environments.

Establishing these principles also facilitates organisational decision-making (ISO 37000, 2021). For instance, when the primary principle—the organisational purpose—is clearly defined and understood, stakeholders can assess and prioritise options based on their contribution to this purpose, ensuring that choices, decisions, and actions remain closely aligned with the purpose. Similarly, these principles can also be applied at the organisational level of LLs. Since LLs rely on co-creation as their innovation method, aligning stakeholders with the LL’s purpose and including them in decision-making becomes crucial for their success.

3.2 Governance of Projects

LLs are environments that host a wide range of diverse projects (Steen & Van Bueren, 2017). They primarily operate based on national or regional funding linked to universities or urban development agencies, with most funding being project-based (Hossain et al., 2019). In this context, project management frameworks provide another valuable perspective for examining governance within LLs.

According to the Project Management Institute (2021, p. 2), a project is “a temporary endeavour undertaken to create a unique product, service, or result.” This description emphasises some key attributes of projects:

- **Temporality:** a project has a defined start and end.
- **Uniqueness:** each project creates outputs with a certain degree of uniqueness.
- **Progressive elaboration:** projects usually evolve as they progress, with additional details and adjustments being made over time.

Recognised project management frameworks, such as PMBOK⁴, PRINCE2⁵, and PM² ⁶, provide structured approaches and best practices to ensure that projects are planned, executed, controlled, and delivered efficiently and successfully. To achieve this, these frameworks recommend several management principles, such as clear objectives and scope, business alignment, supportive governance, change management, risk management, stakeholder involvement, and effective communication.

However, when executed in LLs, projects are also exposed to a particular context of co-creation, where the paradigms of open innovation and user innovation are utilised as methodologies to develop innovative solutions. In this context, LL projects encounter more specific challenges compared to conventional projects (Hakkarainen & Hyysalo, 2013):

- **Diverse competence and interests:** this diversity among users and stakeholders may result in misunderstandings and misalignments in expectations, hindering the collaborative process.
- **Power issues between actors:** differing interests and levels of influence may lead to conflicts over decision-making and project direction.
- **End-user reluctance:** users may hesitate to engage with new technologies or participate in the development process.
- **Communication barriers:** differences in terminology, priorities, and understanding of the proposed solution can create obstacles to participation in LLs.
- **Need for governance structures:** without clear structures, the collaboration between users and stakeholders may lack direction and accountability, leading to inefficiencies in the co-creation process.

These challenges highlight the complexities involved in LL projects and the importance of addressing them to enable stakeholder collaboration and promote successful

⁴ <https://www.pmi.org/>

⁵ <https://prince2.wiki/>

⁶ https://pm2.europa.eu/index_en

innovation. In this context, governance in LLs plays a crucial role by organising users and stakeholders throughout the co-creation process while facilitating decision-making across diverse interests. The following section introduces a guiding governance framework designed to assist LLs in navigating these challenges and achieving their goals.

3.3 Towards a Multi-stakeholder Governance Framework

Building on the presented insights from governance in organisations and projects, a framework to support the development of governance in GreenInCities LLs can be proposed. This framework is based on the three categories of principles recommended by ISO 37000 (2021) for the governance of organisations: primary, foundational, and enabling principles.

Additionally, as GreenInCities LLs are designed around projects, both organisational and project levels must be taken into account for their governance (ENoLL, 2024). In this context, LLs can be regarded as a form of project-based organisation (cf. Hobday, 2000), emphasising the importance of project management frameworks in supporting LL governance models.

Following this rationale, the primary principle—rooted in the organisational purpose—and the foundational principles—based on strategies and value generation—are informed by the GreenInCities initiative. Further elaborated in the next section, these principles offer overarching guidance to GreenInCities LLs at the strategic level. In turn, the enabling principles, which focus on governance responsibilities, are derived from best practices in project management, supporting the development of solutions and deliverables at the operational level.

The following sections outline the proposed framework and explain the principles within the three proposed categories.

3.3.1 Primary Governance Principle

- GreenInCities' Purpose: Co-creation of innovative solutions for urban greening and re-naturalisation plans in deprived areas.

In line with ISO 37000 (2021), the proposed framework adopts the GreenInCities' purpose as the primary principle, highlighting it as the central point that guides all other

principles. In this sense, plans, activities, decisions, and actions in the LLs should be steered and prioritised around this primary principle.

3.3.2 Foundational Governance Principles

Value Generation

- Good Health and Well-being (SDG 3)
- Gender Equality (SDG 5)
- Sustainable Cities and Communities (SDG 11)
- Climate Action (SDG 13)
- Life on Land (SDG 15)

The GreenInCities project centres on advancing the United Nations Sustainable Development Goals (SDG) 3, 5, 11, 13, and 15. These goals focus on enhancing health and well-being, achieving equal rights and opportunities for all genders, building resilient and sustainable urban environments, combating climate change and its impacts, and restoring terrestrial ecosystems.

Strategies

- Co-creation
- Innovation

The project builds on deploying co-creation approaches in LLs to develop innovative solutions by bringing together users and stakeholders in collaborative efforts. These solutions aim to benefit all citizens, with a particular emphasis on inclusivity and equity.

3.3.3 Enabling Governance Principles

- Leadership

Having a clear leader is crucial for LLs (Voytenko et al., 2016). Effective leadership aligns the diverse interests of users and stakeholders, fostering a collective commitment to the goals of LL projects. Leadership also plays a critical role in facilitating the involvement of external users that are beyond the LLs' organisational boundaries, ensuring that developed solutions deliver substantial value to all participants, with particular attention to the needs of more vulnerable groups.

- Stakeholder and User Engagement

LLs foster innovation by bringing together users and stakeholders to collaboratively create solutions. This co-creation process integrates their diverse perspectives, making the outcomes more relevant and effective for all participants. Users, contributing as co-creators, offer their insights, which are essential for developing products and

services that align with real-world needs. Accordingly, user engagement is recognised as a key element for innovation and sustainability (Compagnucci et al., 2021). GreenInCities further reinforces this principle by emphasising inclusivity and equity in participatory processes.

- **Defining Roles and Responsibilities**

Defining roles and responsibilities is a core task for project managers (Alie, 2015). It creates a clear structure for accountability, decision-making, and communication, which are essential for effective project management. This principle aims to ensure that all LL participants understand their responsibilities and the expectations of their roles, fostering alignment throughout the project.

- **Managing and Facilitating by Co-creation Stages**

Breaking LL projects into stages allows for more effective management and control, with stages serving as distinct checkpoints. This approach also provides the flexibility to adapt to evolving requirements, stakeholder needs, or user feedback. Additionally, in the context of LLs, project managers must also facilitate user participation in the co-creation stages, focusing on fostering a collaborative environment rather than exercising authority over individual participants (Westerlund & Leminen, 2011). In summary, project managers should plan and execute projects in a stage-by-stage manner to keep control and facilitate user participation at each stage.

- **Quality and Risk Management**

Quality and risk management are critical to project success, helping to ensure that deliverables align with stakeholder expectations while proactively identifying and mitigating potential risks. These components are essential in LL projects, where ongoing user feedback often results in unforeseen outcomes (Hossain et al., 2019).

- **Learning**

Learning from experience is also a core principle in project frameworks. Learning enables continuous improvement and reduces the likelihood of past mistakes, contributing to project effectiveness. In the context of LLs, successful projects depend on shared learning among users, developers, and stakeholders to support the co-creation process (Hakkarainen & Hyysalo, 2013).

- **Tailoring**

To ensure that the governance framework can effectively support LLs in different places, some customisation may be necessary at both the organisational and project levels. Tailoring allows the framework to be adapted to meet the specific needs, complexities, context, and objectives of individual LLs. For instance, when replicating LL projects from Leader cities to Follower cities, project managers should account for economic, social, cultural, and political differences between the cities and adjust their approaches accordingly.

Finally, Figure 1 illustrates the principles of the proposed multi-stakeholder governance framework, organised into three categories. In short, the enabling principles, based on best practices of project management, support the foundational principles of strategies and value generation, which ultimately contribute to achieving the primary principle: the organisational purpose of GreenInCities.

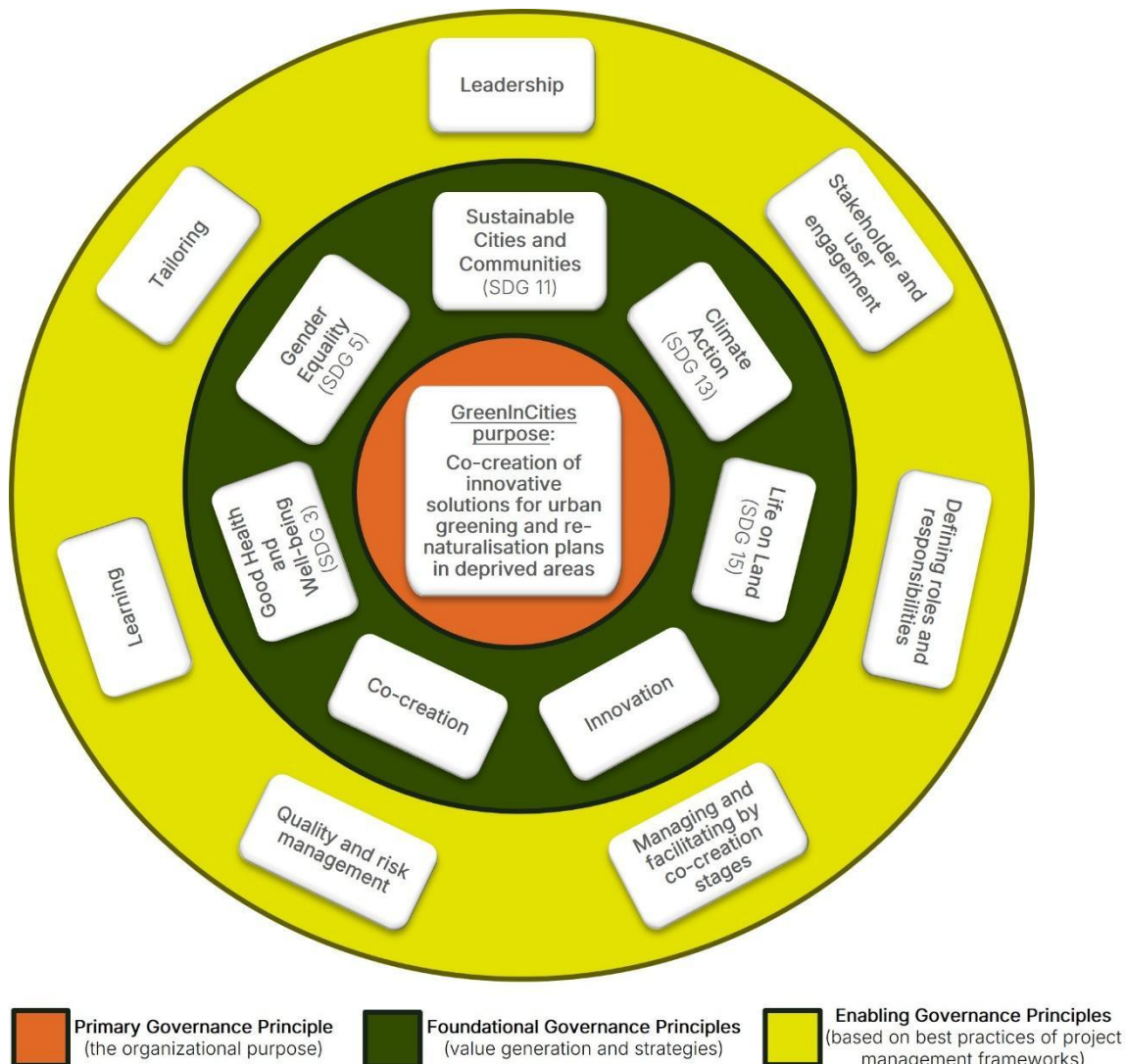


Fig. 1 The proposed multi-stakeholder governance framework for GreenInCities LLs

3.4 Operationalising Multi-stakeholder Governance in LLs

Following the introduction of the governance framework, this section presents a method for implementing governance in LLs. The approach is based on the principles outlined in the proposed framework and involves a few steps as illustrated in Figure 2: first, developing a governance matrix; second, mapping users and stakeholders; third, organising their participation throughout the co-creation process; and finally, evaluating their engagement to ensure a balanced governance approach. These steps are described in detail below.

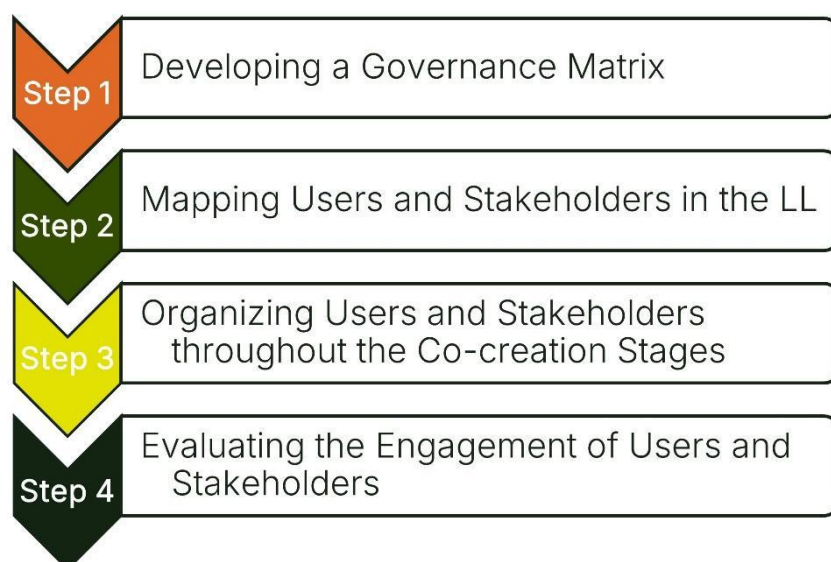


Fig. 2 Steps to operationalise multi-stakeholder governance in LLs

3.4.1 Step 1: Developing a Governance Matrix

Based on the principle of *managing and facilitating by co-creation stages* introduced in the previous section, the governance matrix incorporates the stages of co-analysis, co-design, implementation, and co-monitoring. These stages can be adapted—for example, by introducing co-evaluation as the last stage—or even broken into smaller parts if necessary, depending on the project's complexity. At this initial step, it is also important to recognise that the engagement of stakeholders and users can occur at

different levels. To assist in this categorisation, the method utilises the IAP2 Spectrum of Public Participation⁷ as follows:

Table 1: Level of engagement (adapted from IAP2 Spectrum of Public Participation)

Level of engagement	Description
Empowered	To hold power for final decision-making.
Collaborative	To share responsibilities and decisions regarding the analysis of needs, the design of alternatives, and the implementation of solutions.
Involved	To ensure that concerns and aspirations are consistently understood and considered.
Consulted	To provide feedback on analysis, alternatives and/or decisions.
Informed	To receive information regarding problems, alternatives, opportunities and/or solutions.

Building on the co-creation stages and levels of engagement, each LL project team can create a matrix to position its stakeholders at a specific stage and engagement level (see Figure 3). At the lowest level of engagement—Informed—stakeholders simply receive information about the LL activities. At the Consulted level, stakeholders are asked to provide feedback on specific matters. Moving to the Involved level, stakeholders engage more actively and establish a dialogue with the LL to ensure that their concerns are consistently considered. At the Collaborative level, stakeholders share responsibilities and decisions regarding the LL project activities. Finally, at the Empowered level, stakeholders hold decision-making power, having the authority to make final choices⁸.

This matrix also categorises different types of stakeholders—including government entities, academia, industry partners, and users (human/non-human)—to facilitate further stakeholder mapping and governance planning⁹. It's important to note that participants and engagement levels indicated in the matrix can be further tailored to suit the needs of different LLs.

⁷ IAP2 stands for the International Association for Public Participation. For more information, visit iap2.org.au.

⁸ D2.2 *GreenInCities Sustainable Renaturing Toolbox* presents the tool *Decision Support System* as an evaluation method that combines various criteria, such as sustainability, resilience, cost, and replicability, to support decisions on small projects for short- and medium-term implementation.

⁹ D2.4 *GreenInCities Catalogue of Solutions, Practices and Support Systems (Initial Version)* offers various methods and tools to facilitate user engagement. It also describes horizontal governance and support systems to empower communities and decision-makers in urban greening. Key systems include *Co-Mapping* for participatory mapping and *Participatory Decision-Making* for bottom-up decision-making.

Engagement Level ¹	Co-creation stages															
	Co-analysis				Co-design				Implementation				Co-monitoring			
	Government	Academia	Industry	Human/ Non-human	Government	Academia	Industry	Human/ Non-human	Government	Academia	Industry	Human/ Non-human	Government	Academia	Industry	Human/ Non-human
5. Empowered To hold power for final decision-making.																
4. Collaborative To share responsibilities and decisions regarding the analysis of needs, the design of alternatives, and the implementation of solutions.																
3. Involved To ensure that concerns and aspirations are consistently understood and considered.																
2. Consulted To provide feedback on analysis, alternatives and/or decisions.																
1. Informed To receive information regarding problems, alternatives, opportunities and/or solutions.																

Fig. 3 Stakeholder governance matrix

3.4.2 Step 2: Mapping Users and Stakeholders in LLs

After the LL project team has prepared its governance matrix, the next step is to identify all participants who may either influence or be impacted by the LL project¹⁰. This identification is crucial to fostering the co-creation process and developing innovative solutions. Initially, the project team may consider potential scenarios of interventions in the LL, assessing user needs, local challenges, and key stakeholders that could be part of the project. For underrepresented or vulnerable groups—including non-human entities recognised in the GreenInCities project—engagement strategies may involve community leaders or representatives who can advocate for these groups¹¹. Participant lists should also remain flexible to allow continuous adjustments and ensure continued relevance throughout the co-creation process.

3.4.3 Step 3: Organising Users and Stakeholders throughout the Co-creation Stages

Once the governance matrix is in place, the next step is to create a structure for organising the users and stakeholders within the project. This involves planning the

¹⁰ Deliverable D3.1 *Initial Toolbox and Methodologies for LLs towards Implementation and Twinning* provides specific tools and activities to guide stakeholder mapping and facilitate user engagement.

¹¹ Deliverable D7.4 *Inclusion Plan* proposes strategies to ensure social inclusion at all stages of the project and guidelines to secure the involvement of all key stakeholders (see Table 4).

co-creation stages in more detail by identifying the tasks for which participants will be responsible and determining their level of engagement in those tasks. This activity can initially be set up on a large canvas, allowing the LL project team to jointly reflect, discuss, and adjust the allocation—and reallocation—of participants within the governance matrix as needed. Using colour-coded post-it notes for each type of participant (see Figure 4) helps visualise their levels of engagement, which brings important insights related to governance analysis while planning the co-creation stages.

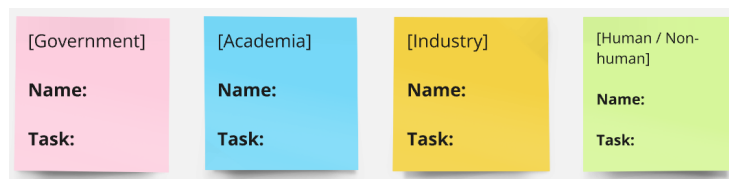


Fig. 4 Examples of colour-coded post-it notes by participant category

Figure 5 illustrates a hypothetical example of the governance matrix after the LL project team has organised users and stakeholders across the co-creation stages. The distribution of colours throughout the project lifecycle offers insights into how stakeholders and users are engaged and participate in decision-making at each co-creation stage.

Engagement Level ¹	Co-creation stages															
	Co-analysis				Co-design				Implementation				Co-monitoring			
	Government	Academia	Industry	Human/ Non-human	Government	Academia	Industry	Human/ Non-human	Government	Academia	Industry	Human/ Non-human	Government	Academia	Industry	Human/ Non-human
5. Empowered To hold power for final decision-making.																
4. Collaborative To share responsibilities and decisions regarding the analysis of needs, the design of alternatives, and the implementation of solutions.																
3. Involved To ensure that concerns and aspirations are consistently understood and considered.																
2. Consulted To provide feedback on analysis, alternatives and/or decisions.																
1. Informed To receive information regarding problems, alternatives, opportunities and/or solutions.																

Fig. 5 Users and stakeholders organised within the governance matrix

As the LL project progresses, the LL project team can revisit the canvas at the start of each new stage, updating initial plans to reflect evolving requirements, stakeholder needs, and user feedback, ensuring that the governance approach reflects what is

needed at that moment. This iterative approach aligns with the principle of *managing and facilitating by co-creation stages*, enabling more precise planning before each stage begins. It is also worth noting that both participants and their respective engagement levels may vary across project stages.

Project managers should also pay special attention to the facilitation aspect of the principle of *managing and facilitating by co-creation stages* and the principle of *leadership*. As highlighted by Westerlund and Leminen (2011), project managers should act as facilitators, leading a collaborative environment that supports the participation of all key stakeholders and users, particularly those from more vulnerable social groups. This is especially important given that project managers do not have direct authority over users outside the organisational boundaries of the LL.

3.4.4 Step 4: Evaluating the Engagement of Users and Stakeholders

As users and stakeholders are positioned within the governance matrix with varying engagement levels, the colour-coded post-it notes allow for a visualisation of the distribution of decision-making power across different stages of the LL project. For instance, if government representatives (in pink in the example), such as municipal authorities, occupy primarily higher engagement levels while users (in green)—both human and non-human—are positioned at lower levels, this indicates a top-down approach to governance. In such a scenario, the project team can reassess their initial plans and consider reallocating users to strengthen their level of engagement within the project.

This evaluation and adjustment can be repeated for each stage of the project. The ultimate objective is to achieve a balanced power distribution, aligning with the meet-in-the-middle approach recommended by the GreenInCities initiative. This approach views the city as a collaborative space where the public sector, private businesses, and citizens come together to co-create and drive innovation. This strategy avoids the limitation of top-down interventions, which often lack sufficient citizen input, and bottom-up initiatives, which may struggle with a lack of long-term vision and resources (Breuer et al., 2014).

3.5 Scaling up LLs

Scaling up LLs involves replicating and expanding activities from one setting to another (Leminen et al., 2020). However, LLs face distinct challenges in this process. Firstly, many LLs depend on sustained public funding to support and scale their innovation activities, which can limit their long-term growth (Hossain et al., 2019). Secondly, the LL

method usually relies on tacit knowledge based on local practices, making it difficult to scale beyond a specific region (Yasuoka, 2021). Finally, although LLs serve as a valuable context for experiments with sustainable practices, scaling these practices to the dominant regime often proves challenging due to their specific contexts and conditions (Florez Ayala et al., 2022).

To facilitate scaling up, scholars suggest that stakeholders should actively disseminate the knowledge co-produced in their LLs to broader networks (Dóci et al., 2022). Additionally, building urban innovation ecosystems—where, for instance, start-ups and large corporations collaborate to develop services—can combine stakeholders' strengths and enhance the scalability and sustainability of innovations. (Mora et al., 2023). In summary, fostering collaboration among diverse stakeholders and encouraging knowledge diffusion across their networks present potential strategies for expanding LL activities beyond the initial LL site.

4. Conclusions

This document provides an overview of LLs, covering their definitions, key characteristics, innovation paradigms, and main challenges. In urban development, LLs can be seen as local hubs for co-creating innovative solutions to address urban challenges in collaboration with citizens and stakeholders. Central to LLs is the process of co-creation, where multiple stakeholders collaborate in real-life environments to identify user needs, design potential solutions, and implement them. However, several challenges can hinder this process, including the participation of all relevant stakeholders, alignment of diverse interests, poorly defined tasks, internal conflicts, trust issues, and difficulties in communicating goals and methods. These challenges highlight the importance of effective governance to support the participation of all key stakeholders and users, including human and non-human species, and promote value creation in the implemented solutions, particularly for those from more vulnerable social groups.

To support LL project teams in navigating these challenges, this report introduces a multistakeholder governance framework. The framework consists of several principles that provide a basis for guiding project teams in planning and organising stakeholder participation throughout the co-creation process. For example, adopting the GreenInCities purpose as a primary principle aligns stakeholders and facilitates decision-making. Additionally, clearly defining roles and responsibilities fosters accountability and promotes collaboration among participants. The framework also recommends managing and facilitating projects by stages, allowing for ongoing assessment and adjustments of stakeholder engagement. In this regard, project managers are crucial in motivating users and encouraging their active participation. In turn, the principle of tailoring emphasises that the governance framework can be adapted to the specific context of each LL.

Finally, this deliverable offers a method for governance planning and evaluation: the governance matrix. It is designed to assess engagement levels and adapt strategies to enhance user participation. The governance matrix is an effective mechanism for organising users and stakeholders throughout the LL project stages, enabling project teams to evaluate stakeholders' participation consistently. This approach allows for the reallocation of stakeholder engagement, promoting a balanced "meet-in-the-middle" governance strategy that enhances the effectiveness of LL initiatives. By implementing the proposed principles and methods, GreenInCities LLs can more effectively handle the complexities of their projects and support the co-creation of innovative solutions for urban climate regeneration in deprived areas.

Annex

Report on the workshop *Planning Stakeholder Governance in Living Labs*

Place: Plenary meeting in Cork

Date: October 8th, 2024

Participants: representatives from Leader and Follower cities and project partners

The workshop was based on Deliverable D3.3 *GreenInCities Living Labs Governance (Initial Report)*. It began with an overview of governance in LLs, introducing key concepts to establish a common understanding among participants. This was followed by practical discussions on applying governance approaches using the stakeholder governance matrix described in Section 3.4 of D3.3.

The session highlighted examples of common organisational challenges, such as the “wall syndrome,” where departments or experts operate in silos, hindering communication and collaboration. These issues are also common in projects and can lead to inefficiencies and communication breakdowns between team members and stakeholders.

In this context, governance is defined as a system that directs and holds organisations accountable to achieve their objectives. It promotes not only performance but also ethical behaviour and responsible management. In projects, governance includes key elements such as governance approaches, roles and responsibilities, stakeholder engagement, and communication, which are essential for project success.

Projects face additional challenges when executed in LLs, which are characterised by multi-stakeholder environments often extending beyond traditional organisational boundaries. As a result, project managers must shift from a managerial role to a facilitator role, leading the collaboration and building trust among participants. This complexity also requires tailored governance approaches to effectively engage diverse stakeholders in different contexts.

During the workshop, representatives from cities and project partners worked in groups based on their respective LLs. They applied the governance matrix and discussed how each stakeholder could be engaged at different stages of the co-creation process in their LL projects. Participants recognised that the level of engagement does not need to remain the same throughout the project lifecycle. Another insight was the extent to which citizens can be engaged, highlighting different governance approaches, whether top-down, bottom-up, or a balanced ‘meet-in-the-middle’.

Finally, some participants expressed their appreciation for the workshop, noting that it helped them better understand how to plan and organise stakeholder involvement, communicate more effectively, and determine the appropriate level of engagement for each stakeholder at different stages. They also shared their intention to continue refining their governance matrix in collaboration with colleagues in their respective cities. Below are some pictures from the workshop. One image shows participants working on their canvases, while the others showcase some of the governance matrix at the end of the workshop.



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