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## Roadmap towards urban planning in Follower Cities

Deliverable 2.6

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## **Abbreviations**

- CH Chapter
- D Deliverable
- EU European Union



FRC	Front-Runner Cities
FC	Follower Cities
GCAP	Green Cities Action Plan
GI	Green Infrastructure
LL	Living Lab
NBS	Nature-Based Solutions
proGlreg	productive Green Infrastructure for post-industrial urban regeneration
RT	Replication Toolkit
SDG	Sustainable Development Goal
URA	Urban Regeneration Area

WP Work Package



## **Executive Summary**

The proGIreg project aims at promoting the replication of eight Nature-Based Solutions (NBS) that were implemented by four Front-runners cities (FRC) in the local contexts of four Follower Cities' (FC). The facilitation of knowledge exchange between FRC and FC supports the FC in the development of Urban Plans for the local integration of NBS. Task 2.3 – Urban planning in follower cities, as part of WP 2 - Planning, design and participation processes for NBS, represents a key milestone in testing and validating the replication potentials of co-creating nature-based solutions (NBS).

The purpose of this deliverable, D2.6 - Roadmap towards urban planning in FC, is providing a replication methodology to support FC throughout the process of developing Urban Plans. The Urban Plans will represent tailor-made strategies, co-created together with local stakeholders that will support and facilitate the implementation of NBS at local level. The tools presented in this deliverable are built on the activities conducted within WP3 – NBS implementation in Living Labs, WP4 – NBS benefit assessment and monitoring and WP5 – NBS market readiness, barriers and upscaling, and strongly rely on the knowledge generated during the FRC's implementation experiences. D2.6 represents a first indication of the replication potential of the proGIreg NBS and feeds into the wider replication strategy and process to be implemented within WP6 – Global networking, training, dissemination and impact, in particular Task 6.2 – Replication events. Using the proposed structure as a starting point, WP6 aims at boosting the proGIreg replication potential in its partner cities and by addressing a wider spectrum of cities beyond the project.

The developed replication methodology for FC is based on the principles of co-creation and co-implementation, representing core elements of the overall proGIreg's project approach to NBS. D2.6 incorporates these principles in the roadmap towards urban planning in FC. The roadmap is structured as a step-by-step journey, accompanying FC from the preparatory work phase (focused on the preliminary activities that should be consolidated before starting to plan the transformation of Urban Regeneration Areas (URA)) to the final design of strategies and action plans towards the integration of NBS into the local context. The roadmap is designed as an incremental and iterative process, allowing for throwbacks and changes of the proposed structure. It has been designed to fit the local needs and the different NBS' development statuses, taking into consideration different starting points and conditions of each FC. The roadmap has been built on the knowledge generated by the FRC during the past years of the proGIreg project's co-design and co-implementation experiences.

The retrospective characteristic of the roadmap is supported by an additional tool, referred to as the "replication toolkit" (RT), which provides a two-level structured summary of important findings and lessons learnt of co-designing and co-implementing NBS in FRC: the strategic level and the operational level. The RT also presents recommendations on how to deal with potential challenges and barriers throughout the proGIreg process, collected from discussions with FRC and previous deliverables. The strategic level RT supports the overall process of Urban Plan development with the help of the step-by-step roadmap. The



operational level RT is more NBS-focused, providing recommendations and examples on how FRC dealt with most common challenges and obstacles for each of the eight proGIreg NBS, such as the lack of a shared identity of places, difficulties encountered in engaging different stakeholders and public actors, and more technical issues related to the implementation of specific NBS.

The Roadmap shows FC how to build a coherent strategy towards the integration of NBS in the local context, gathering past knowledge created during the implementation phases and converting it into innovation while FC should use the RT as a constantly evolving atlas of proGIreg best practices and lessons learnt.

Furthermore, the deliverable establishes the participatory process to be followed in the FC within Task 2.3. The Roadmap integrates three workshops, marking key points of each of the three main phases of the Roadmap. Each workshop has the function of supporting the implementation of one phase, boosting co-design and co-creation:

- Phase 1 "Preparatory work" Workshop 1 "Analysis".
- Phase 4 "Planning the URA transformation" Workshops 2 "Scenario-Building".
- Phase 3 "From co-design to co-implementation" Workshop 3 "Design".

The deliverable will support the FC in developing urban plans and tailor-made-strategies to integrate the proGIreg NBS into their local urban contexts and urban planning frameworks for promoting productive green infrastructure in post-industrial urban regeneration.



## 1. Introduction

### 1.1. Introduction to the project

Productive Green Infrastructure for post-industrial urban regeneration (proGIreg) is developing and testing nature-based solutions (NBS) co-creatively with public authorities, civil society, researchers and businesses. Eight NBS, which will support the regeneration of urban areas affected by deindustrialization, have been implemented or are going to be deployed in four front-runner cities (FRC): Dortmund (Germany), Turin (Italy), Zagreb (Croatia) and Ningbo (China). The follower cities (FC) of Cascais (Portugal), Cluj-Napoca (Romania), Piraeus (Greece) and Zenica (Bosnia and Herzegovina), in the meantime, will receive support in developing their strategies for improving NBS at local level through co-design processes (see Figure 1 - The proGIreg partnership. Source: RWTH, proGIreg ).



Figure 1 - The proGlreg partnership. Source: RWTH, proGlreg proposal



ProGIreg will deploy the following NBS embedded into Living Labs (LL), working with the local stakeholder landscape to create ownership and locally rooted solutions:

- NBS 1 Renaturing landfill sites for leisure use and energy production.
- NBS 2 New regenerated soil thanks to biotic compounds for urban forestry and urban farming.
- NBS 3 Community-based urban farming and gardening on post-industrial sites.
- NBS 4 Aquaponics as soil-less agriculture for polluted sites.
- NBS 5 Capillary GI on walls and roofs.
- NBS 6 Making post-industrial sites and renatured river corridors accessible for residents.
- NBS 7 Establishing protocols and procedures for environmental compensation at local level.
- NBS 8 Pollinator biodiversity improvement activities and citizen science project.



Figure 2 - Spatial representation of proGIreg NBS, RWTH



### 1.2. Introduction to WP2 and Task 2.3

The activities conducted so far within WP2, are focused on building the methodology and framework for the optimal implementation of NBS in proGIreg cities. During the first phase, cities have been guided, on the basis of a common methodology (D2.1 - Methodology on spatial analysis in FRC and FC), in the elaboration of the initial spatial analysis (D2.2 - Spatial Analysis evaluation report) that has been used as a starting point for the NBS co-design and co-implementation in the FRC (D2.5 - Final report on co-design workshops in Front - Runner cities) and for the identification of the potential for the NBS transfer to the FC.

Task 2.3 - Urban planning in follower cities - represents both the conclusive phase of WP2 and the starting point of the project's second phase, focusing on the transferability of the proposed solutions. It aims at supporting proGIreg FC in embedding the project's NBS within their local contexts, towards the implementation of innovative GI solutions for sustainable development and renewal of communities from a physical, ecological, socio-cultural, and economic point of view.

Task 2.3 is an evolutionary task that builds upon the evidence and knowledge generated during the co-design and co-implementation phase of NBS in the FRC (WP3), the NBS benefit assessments in WP4, and the market readiness, barriers and upscaling potential assessed on the basis of both FRC implementation experience and preliminary studies on FC's territory and specific context (WP5). Task 2.3 works in close collaboration with WP6, which will provide training for FC's and other cities' administrative actors, civil society, relevant stakeholders and will follow the replication process, upscaling it to a wider public.

The aim of deliverable D2.6 is to provide a robust methodological base for replication in order to achieve the most efficient transfer of experience from FRC to FC. It seeks to answer the question: how is it possible to assure a smooth transferability process while, at the same time, also acknowledging the possible differences in legislations, regulations, culture?

Chapter 2 presents the applied methodology of developing the two important instruments for NBS replication: The Roadmap and the Replication Toolkit (RT), working in synergy with one another. A substantial part of the chapter is dedicated to the participatory co-creation approach, which stands at the core of the overall proGIreg process. The overall replication is based on the principles of co-design, co-implementation and co-maintaining, seeking a high level of stakeholder engagement. It has been developed in exchange with the partner cities.

Chapter 3 describes the current status of FC urban regeneration plans, already existing or planned NBS activities, and the integration of proGIreg NBS into urban plans and the respective urban planning frameworks.

In chapter 4, the roadmap describes easy-to-understand building block and subcomponents/steps that facilitates the process of developing Urban Plans. The roadmap guides the FC step-by-step towards the creation of urban plans from the preparatory work phase, through the planning of their Urban Regeneration Areas (URA)' transformation, to the final design of tailor-made strategies for the implementation of NBS.



In chapter 5, the results of challenges encountered by FRCs and lessons learnt (see Annex B and C) culminates in the replication toolkit (RT), which is developed on two different levels: (1) the strategic level RT and (2) the operational level RT. The strategic level RT can be used as general recommendations for the overall implementation path whilst the operational level RT provides details of specific aspects of implementing the eight proGIreg NBS. Furthermore, the kit contains useful tools already deployed in the FRC and references to FRC' best practices (a FRC state-of-play can be found in Annex A).

A structured summary of important findings and lessons learnt of co-designing and coimplementing NBS in FRC, on which the replication framework rests its foundations, can be found in Annex B. The Challenges and Lesson Learnt (annex B), together with the Tips and Tricks (annex C) have the role of ancillary instruments and knowledge repositories meant to feed and support the FC's in developing tailor-made strategies to use NBS in urban regeneration.



## 2. Methodology

The following chapter describes how the tools **The Roadmap** and the **Replication Toolkit** (RT) can support the participatory approach for creating Urban Plans in FC within the proGlreg project.

D2.6 proposes two main tools: (1) a Roadmap (replicable in all FC), structured as a step-bystep guide that allows developing tailor-made urban plans in order to embed NBS into the urban planning framework for each city, and (2) a replication toolkit (RT) gathering FRC knowledge and experiences, on which FC can make informed choices and adapt recommendations or tools to their local situation. The two tools address the core group of stakeholders actively involved in the future co-design and implementation process in the FC, as well as the wider stakeholder spectrum of interested cities in Europe.

D2.6 is based on the following fundamental approaches:

### 1. Retrospective approach

The role of FRC in the overall proGIreg landscape is to test and implement innovative solutions to solve concrete problems identified in the LL, using the same set of NBS adapted to local needs identified by each involved city. The FRC process of innovating, adapting, solving occurring problems serves as a source of valuable information.

FC benefit from experiences and encountered barriers in FRC, enabling to build on the knowledge of what steps are necessary to create and implement urban plans, and being more aware of possible obstacles along the way, thus FC can anticipate potential barriers and develop mitigation strategies early on.

### 2. Iterative approach

The iterative approach is at the basis of the general replication concept, and thus defines the underlying idea of the roadmap. The roadmap is a powerful instrument that can help FC to replicate the solutions and methodologies already tested and tried by FRC, guiding them throughout the overall replication process but at the same time giving them the possibility of having multiple throwbacks, iterations, and changes during the path in order to find a good match between the local needs and the proposed solutions.

### 3. Incremental approach

The tools developed within this document follow an incremental approach, built as a collection of already available information that, once added together, can provide cities with potential solutions to face local territorial issues.

The RT is based on the assessment of information already collected and how it can be structured into a comprehensive way to allow FC to use it as a consolidated knowledge basis on which to build their own path. The step-by-step roadmap starts with the spatial, socio-economic, and environmental assessment of the state-of-art of the FC towards finding a vision to develop a tailor-made strategy for Urban Plans.



### 2.1. Data collection

To contextualize the needs of the FCs and include these in the design of a robust but adaptable transfer programme, the following steps have been carried out by the T2.3 team:

- a round of interviews and discussions with both FRC and FC have been organized through online platforms such as Zoom and Microsoft Teams;
- where necessary, questionnaires were prepared and submitted to the cities;
- interviews were audio taped in most cases;
- the information collected was summarized in minutes.

All necessary and obligatory measures to ensure personal data protection and confidentiality were adopted according to GDPR as described in proGIreg Deliverable D7.2. Traceability to individual persons is not possible in this report, while all information will only be presented on an aggregated level or, in case of personal quotes or statements, personal information will not be provided. Upon request of the interviewee, their data, handwritten notes and audio tapes, will be deleted completely at any time. After carrying out all planned activities of Task 2.3, all data will be deleted.

### 2.2 Replication Methodology - main components

This deliverable provides an easy-to-follow replication methodology and tools to implement it. In order to enable and support the replication efforts in the four FC of Cascais (Portugal), Cluj-Napoca (Romania), Piraeus (Greece) and Zenica (Bosnia and Herzegovina), a solid replication framework is needed.

The replication methodology also builds on D3.1 - Methodology for implementation, in order to be coherent with the proGIreg piloting process in FRC. D3.1 proposes a series of building blocks representing a set of principles that help cities to transition to a more environmentally friendly and sustainable development where local communities are perceived as the key users and involved in decision-making processes:

- **Co-creation for social inclusiveness and equity** "the user communities have an active role as a source of creation from the beginning" (D3.1 Methodology for implementation). Empowerment is the key word, the communities being involved in a structured process of participatory activities, enhancing ownership through multi and transdisciplinary co-design (and co-implementation).
- Long-term perspective the NBS interventions has to outlive the project lifetime, creating long-lasting widespread impacts, not just at the URA level, through the process of upscaling initiatives that are proved to be successful for the regeneration areas' transformation.
- **Promoting innovation** "NBS can represent an effective innovation because they use natural systems with a smart perspective" (D3.1 Methodology for implementation). Innovation is important not just in terms of technological improvement, but also in the



process of promoting new sustainable solutions to the specific local problems. "In this context the use of innovation technologies can help in giving evidence-based proof of the property of ecosystem services produced from NBS" (D3.1 - Methodology for implementation).

The principles mentioned above are reflected also in the main components of the replication methodology for FC (see Figure 3), organized as follows:

- The Challenges and Lessons learnt (Annex B).
- The Roadmap (Ch.4).
- The Replication Toolkit (RT) (Ch.5)



Figure 3 - Main components of the Replication methodology. Source: URBASOFIA



### 2.2.1 Challenges and Lesson Learnt

In the pursuit of replicating good practices, FC should consider successes and/or setbacks of previous NBS interventions in FRC. The two replication instruments (Replication Toolkit and Roadmap) are partially built upon a set of challenges and lessons learnt (see Annex B) and tips and tricks (see Annex C).

Deliverables and reports of WP2, WP3 and WP5 provided insights in challenges and lessons learnt. By combining this information with results of discussions with proGIreg cities, it was possible to create a set of retrospective knowledge, focusing on (a) challenges, (b) lessons learnt, and (c) tips and tricks collected from the FRC cities (a structured table can be found in Annex B, providing additional information about the overall landscape of NBS implementation processes with the proGIreg project).

### 2.2.2 Roadmap

The Roadmap towards urban planning in FC has been constructed as a step-by-step guide to support FC in structuring their process of developing Urban Plans for integrating NBS within their framework. The roadmap is to be used together with the RT (see chapter 5) for finding creative ways of implementing NBS or useful recommendations that can help overcoming possible barriers and challenges that can be encountered in the implementation of each step.

The roadmap draws on experiences of other EU-funded projects that use an experimental process of knowledge transfer and replication of solutions. These projects, similarly to proGIreg, embarked on the process of transferring knowledge from a first round of cities concretely testing the solutions in the first place, and a second round of cities replicating tested solutions in their contexts:

- H2020 ROCK Cultural Heritage leading urban futures.
- H2020 SmartEnCity (SEC) -Towards Smart Zero CO2 Cities across Europe.
- H2020 NATURE4CITIES a Nature Based Solutions knowledge diffusion and assessment platform for re-naturing cities.

The roadmap represents a process with different characteristics:

- **Incremental**, it is structured in phases, blocks and activities, supported by innovative tools to facilitate the smooth and gradual development plan. Each step builds upon the results of the previous one, always getting the city to go forward in their development process with a consolidated wealth of knowledge.
- **Iterative and flexible**, because (1) the roadmap allows for throwbacks to re-think the process in order to intervene on elements that may risk the implementation, thus changing the development of plausible scenarios and providing flexibility and (2) because it can be adapted to each FC local framework.
- **Directional**, to provide necessary guidance for achieving the goal of developing the FC Final Urban Plans. The structure and information presented in the Roadmap are



sufficiently general to cover all the different proGIreg contexts but, at the same time, allow changes and updating if needed

- Adaptable, each city will be able to adjust the roadmap in order to respond to the local necessities, new conditions, and the current status of NBS activities in each FC (some FC may be more advanced on NBS planning and/or implementations than others).
- **Participatory and people centred**. It places local authorities and citizens at the driver seat of development. It stresses the dependence on multiple stakeholder collaboration when developing urban plans or implementing NBS. All critical planning steps should be understood and owned by stakeholders before further continuation.
- **Multidirectional**, to give the possibility of having multiple implementation directions based on the interaction between the stakeholders, the experts and the municipality. The scenario-building approach underlines this multidirectional character (see ch 2.2.4).
- **Comprehensive**, to collect all important information necessary to develop strategies including local information on state of art analysis (local policy framework, drivers/barriers, potentialities, synergies etc.), stakeholder mapping, possible scenarios, business models, sustainability of the actions proposed etc.

### 2.2.3 Replication Toolkit (RT)

The RT captures useful tools and lessons learnt and can be used by FC in supporting the development of tailor-made Urban Plans. The toolkit will serve as an inspirational and continuously updated toolbox that will help codify the project results and transform them into useful guidelines for replication, e.g., mistakes to avoid at the beginning of the process, or which methods to use in dealing with different types of stakeholders, and recommendations that can guide FC throughout the implementation process.

The toolkit incorporates information from the following proGIreg documents:

- Spatial analysis conducted for each city (D2.2), both FRC and FC, in order to identify local issues, potentials, drivers and to find commonalities and differences among all the cities that could help better structure the categories of tools.
- Implementation plans (D3.2) gathering the proGIreg FRC/LL Implementation Plan (IP) containing all relevant information about the co-realization of NBS.
- Co-design reports D2.3 Report on Workshops Round 1, D2.4 Report on Workshops Round 2 and D2.5 Final report co-design workshops, collecting the local workshops results held in FRC.
- The work conducted in WP5 on the assessment of limits and barriers (D5.2 Report on technological barriers and D5.3 Report on non-technological barriers).

It is divided into two levels: the strategic level RT, which provides recommendations that accompany the overall implementation process, and the operational level RT, providing useful information on the physical construction of each NBS and co-creation processes (see Figure 4). The RT is to be used complementary to the roadmap, providing useful tools and recommendations that can help cities overcome possible barriers more easily.





Figure 4 - The Replication Toolkit's structure. Source: URBASOFIA

### 2.2.4 Scenario-building approach

Scenarios have been defined by Herman Kahn, one of the founders of scenario planning, as a "set of hypothetical events set in the future constructed to clarify a possible chain of causal events as well as their decision points" (Ljubenovic et.al., 2014). The development of scenarios is usually used to address the complexity of local systems and the uncertainty of the future. Scenarios seek to capture the range of future conditions, opportunities, threats and obstacles, guiding actors' strategic thinking towards different ways of reaching identified goals. The identification of potential alternative future urban developments can reduce uncertainty by dismantling the system's complexity into more comprehensible and manageable possible futures.

This subchapter presents the methodology that will be followed for the scenario-building approach within the proGIreg FC implementation process, representing an important part of delivering Urban plans. The scenario building approach is tackled by two processes, which are strongly interrelated: (1) a thematic workshop (the second workshop "Scenario-Building"), (2) a set of steps embedded in the roadmap, defining the scenarios' development.

The round of thematic Workshops "Scenario-Building" (preceded by the "Analysis workshop" and followed by the "Co-Design workshop") and related outcomes represent core steps of the second phase of the Roadmap. The steps of the "Planning the URA transformation" phase aim at:



- Delivering a set of plausible scenarios on different NBS options<sup>1</sup> and implementation paths
- Finding out what resources are needed for the concrete design and further implementation of the NBS interventions, setting the basis for phase 4 "From co-design to co-implementation" (see Ch.4, figure 15).

Scenario planning refers to a variety of approaches that are able to capture and assess "different perspectives on the past, the present and the future" (van Notten, Rotmans, van Asselt, & Rothman, 2003). In the case of urban planning in FC, the scenario building will be a collaborative exercise that will focus on future perspectives, finding common agreements between the different stakeholders on the proGlreg desired outcomes, together with the suitable implementation methodologies. It will serve as a tool to assist the FC in the definition of clear and suitable long-term strategies towards the integration of NBS into their local context (see Figure 5 – Scenario-building approach). More specifically, scenarios will be used as a "prioritization and conversational tool" (Hopkins and Zapata, 2007), allowing for negotiations and collaboration on the solutions among the different stakeholders.



Figure 5 - Scenario-building approach – Source: URBASOFIA

<sup>&</sup>lt;sup>1</sup> This deliverable refers to NBS option as the different forms that the NBS can take (e.g., NBS3 in different FRC can be community gardens, school gardens or therapeutic gardens).



The proGIreg scenario-building process will encourage visionary thinking. Having all relevant stakeholders involved in the project, a high level of decisional transparency will be established. The stakeholders will contribute to the vision (developed in step 17, see Ch.4, figure 15) creating the basis for efficient NBS integration. By collaboratively developing possible scenarios, stakeholders also explore a) their responsibilities in the project framework; b) their specific advantages and opportunities; c) the potential and necessary relationships between actors.

### 2.3 Co-creation approach

The process of urban regeneration through NBS promoted by proGIreg strongly relies on the participatory and co-creation approach, considering the benefits for both the community and the successful implementation of the project. In fact, "the opportunity to participate in civic life has been identified as a core human need, essential to the psychological health of individuals and communities (...). Meaningful participation in the decisions that affect people's lives is an integral component of their sense of being sufficiently empowered to have some influence over the course of events that shape their lives" (see "Participatory approaches". Barreteau et al., 2013).

### 2.3.1 Co-design principles

Co-design is a core component in the planning and implementation process of proGlreg initiative. FRC proved in many ways how important the application of this approach is, and especially how it can impact the result.

For the three Workshop Rounds in FRC, six specific and easy-to-use co-design principles (developed in Task 2.2, see Figure 6) to guide planning and decision-making processes in the LL were formulated. FC can benefit from the knowledge developed and built upon these co-design principles when planning and implementing their own workshops and related activities.



#### **BE OPEN, INCLUSIVE & DIVERSE**

Be aware that jointly producing solutions to real-world problems relevant for society, policy and practice requires the collaboration of all relevant stakeholders holding different types of knowledge (i.e. scientific, experiencebased, tacit). Look to inclusive & early-on engagement of all relevant stakeholders in decision-making processes and equal consideration of their needs and preferences. These are prerequisites for building trust, legitimacy and ownership for solutions.

# Co-design for urban regeneration



#### SHARE GOALS & VISION

Explore possibly differing perspectives and expectations, find common ground and develop a jointly agreed, common vision and goal to foster effective, mutually valued outcomes with high acceptance among different stakeholders.



### BE TRANSPARENT

Be transparent, honest and realistic about the rules of the game, the desired outcome, as well as extent and limits to stakeholder engagement at all times. This will help manage expectations, enhance acceptance and commitment to the NBS, and promote the uptake of solutions.

#### THINK LONG-TERM

Look to a long-term planning horizon for all services and solutions to be produced. Good anticipatory, initial design and planning regarding monitoring, maintenance and governance can tackle arising barriers to the long-term success of an NBS.



**BE EXPERIMENTAL & REFLECTIVE** 

Actively foster iterative learning and trial and error. Learning environments should allow stakeholders to create and test new technologies, services and products in safe, real-life environments. A continuous feedback cycle of evaluating results and adjusting actions helps get to the best results. Accceptance of unfinished products and states is crucial.



#### **BE FLEXIBLE**

Allow for flexibility in processes and plans. Give room for adjusting strategies in response to changing actors' needs, insights and circumstances, and for changing the ways and rules of collaboration.

#### Figure 6 - The co-design for urban regeneration principles. Source: ICLEI

Citizen and stakeholder engagement is a necessary transversal aspect of the planning process. The developed steps in the roadmap (Ch.4) are based on the co-design, coimplementation and co-management principles, inviting actors to partake in the overall process from the very beginning to the realization of the Final Urban Plans, output of task 2.3, to the further potential implementation and use of the regeneration areas' interventions.



### 2.3.2 Quadruple helix partnerships approach

Within proGIreg, NBS and Regeneration Plans are cocreated in multi-stakeholder partnerships. The quadruple helix approach represents the core team in each LL or FC partnership, consisting of four key stakeholder groups: academia (universities and research institutions), governmental institutions (local governments and other public authorities), the private sector and civil society (NGOs and individual citizens) (see Figure 7).

The quadruple helix approach enables proGIreg to foster and sustain NBS innovations, in order to ensure the sound scientific grounding of the solutions implemented, the adaptation and fit within the legal frameworks of the FRC and the wider governmental actions, as well as the public acceptance and uptake, economic viability and sustainability.

For all co-designing activities within FRC LL, the quadruple helix approach was adopted, creating local partnerships. The approach for urban planning in FC will follow the same methodology.



Figure 7 - proGlreg quadruple helix approach. Source: RWTH, ICLEI

### 2.3.3 Gradients of participation approach

The level of participation of all parties to a NBS or a set of NBS may differ, due to objective factors such as:

- technological expertise;
- number of people involved;
- specific target group and/or typology of the intervention (for example, the co-creation process is quite challenging in the case of NBS2 - New regenerated soils or NBS4 -Aquaponics, from the perspective of civil society, the reason being that these NBS are mainly technical intervention).

Given the limits to participation (in either co-design, or co-creation, or both) a set of levels of participatory approaches are proposed (see Figure 8). The suggestion of using so called "gradients (of participation)", presented below, have been taken from D2.3:

- 1. Inform keep all parties up to date regarding the project ambition and progress.
- 2. Consult gather ideas on the necessities, issues, and possible solutions.
- 3. Involve include the local communities as contributors.
- 4. Collaborate partner with the public in each aspect of the decision making.
- 5. **Empower** place the final decision making in the hands of the public.



INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public
We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide

Figure 8 - Public Participation Spectrum. Source: International Organization for Public Participation, 2014

The level of participation is determined by the nature of the intervention, the specific phase of the planning/implementation process and the typology of the stakeholder. For devising a suitable replication strategy of applying participation gradient principles on specific NBS, the four FRC of Dortmund (D), Turin (T), Zagreb (Z) and Ningbo (N) have been asked to evaluate their participatory process experience within proGIreg through the submission of an online questionnaire. Based on their NBS implementation experience, FRC had to choose a maximum of three most important levels of participation for each implemented NBS to assess what kind of participation may be needed for each NBS.

Figure 9 presents a summary of the questionnaire's results. Overall, we observe that the gradient of participation - *Involve*, has the overall highest score (of 13 votes), and *Empower*, the lowest of 6.





Figure 9 - Synthesis of the questionnaire answers on gradient of participation from FRC. Source: URBASOFIA

The FC should consider the gradients of participation when planning the co-creation process for a specific NBS or set of NBS. For example, NBS3 proved to be the one with the highest potential in "collaboration" and "empower" participation gradients.

The gradients of participation apply to both the implementation process of specific NBS as well as to certain phases of the Roadmap (see Ch.4). On the basis of the FRC questionnaire results, suggestions were made for each stage (block) of the Roadmap, indicating the most suitable approach to be applied for its development. The adaptation of the roadmap to each FC's specific context can lead to the adoption of other gradients of participation, different from the one proposed by FRC.



## 3. FC Current status

This chapter provides an understanding of the current local context state-of-play in each of proGIreg's FC (representing an update to the initial research conducted during the spatial analysis in Task 2.1), focusing on general territorial information, framing the preliminary URA areas, and on the set of NBS planned to be implemented. This overview across FC is also intended to facilitate knowledge transfer between FC in case of tackling similar issues.

### **FC Cascais**

### The local context

"Cascais is a coastal municipality in the Lisbon Metropolitan Area. With an area of 97 km<sup>2</sup> and over 30 km of coastline, a third (33%) of which is protected as the Sintra Cascais Natural Park, a UNESCO Reserve" (D2.2 Spatial Analysis).

The FC has experienced high growth in the last years, both in terms of population and urban environment, which resulted in an inappropriate use of key ecological areas. Cascais is not facing post-industrial transformation, but the necessity of increasing the presence of GI within the city's urban fabric to ease the high urban pressure.

The proGIreg vision is coherent with the direction followed by the Master Plan developed in 2015 in Cascais, promoting initiatives such as GI and their protection functions, leisure and public equipment areas, and interventions meant to promote new landscapes and connect pre-existing urbanized areas. Supporting the re-use and recovery of abandoned areas is a key topic for this specific URA transformation process. Other strategic documents such as (1) Municipal Regulation for Green-Areas and Tree protection and (2) PEDU – Urban Development Strategic Plan have also elaborated development directions, sustaining urban agriculture, urban and social regeneration and participatory processes on community gardens.

Previous urban agriculture projects in FC Cascais proved to have an important impact, in regard to regeneration of land with agricultural potential. In particular, the dedicated programme for urban agriculture of the "Terras de Cascais" initiative raised high interest among the local population. The programme establishes urban, school, associative and community gardens, orchards, and vineyards, along with training and capacity building for citizens.

### The Regeneration area

The Cascais' Regeneration Area includes parts of the localities Tires and Zambujal in São Domingos de Rana (see Figure 10). The Regeneration Area delineated is characterized by a dense morphology of the built environment, crossed by a major road, part of an important system of road-infrastructure. The lack of valorisation of these spaces results in increased pressure for urbanization (D2.2 Spatial Analysis).





Figure 10 - Proposal for the Cascais Regeneration Area

### The NBS set (updated based on discussions with FC)

- NBS3: community-based urban gardening and farming on post-industrial sites.
- NBS6: making post-industrial sites and renatured river corridors accessible for residents.
- NBS8: Pollinator biodiversity improvement activities and citizen science project.

The selected set of three NBS have great implementation local potential. In particular, an associative garden of NBS3 provides the possibility of creating a local value chain where the community grows vegetables on public land to sell the products in a local market. Key challenges in implementing NBS 3 include the plot's private ownership that requires continuous dialogue and negotiation with private owners.

Great synergies might be created between the two selected NBS6 and NBS8: it is planned to regenerate green areas along Mariana's stream corridor that are going to host some pollinator friendly plant species (NBS8).



### **Synergies with FRC**

FRC Dortmund and Turin have implemented (or started to implement) the same NBS set thus being able to guide FC Cascais in its preliminary NBS options, especially in the case of community gardens and participatory approach by providing valuable experience and information.

### FC Cluj-Napoca

### The local context

"The Municipality of Cluj-Napoca (322,572 inhabitants) is the second-largest city in Romania. Built upon the success of its university tradition and its strong urban development ambitions, the city has seen a continuous transformation process towards the development of a new urban identity in the past decade, at the regional and national level, as a city of innovation, business development, youth, and culture." (D2.2 Spatial Analysis).

The necessity of regenerating post-industrial site in FC Cluj-Napoca is presented through the identification of three significant issues:

- 1. The industrial and rail axis, due to large areas of brownfields and highly degraded areas (most of which are privately owned).
- 2. The intersection of the industrial and rail axis with the blue-green corridor of the Someş River, having as impact poor state of the local landscape, low quality of the waterfronts, and difficulties to have the spaces accessible by the local communities.
- 3. The relation with the Făget Forest threatened by the sprawl-like development.

FC Cluj has several strategic and planning documents tackling GI issues, notably the 2014-2020 Integrated Development Strategy, which developed the concept of "Green Cluj" as a strategic priority.

The FC has an ambitious vision for the 2030 horizon, aiming to increase its green spaces by 100 ha, improve air- water- and soil quality management systems and introduce green corridors for urban mobility along the streams and rivers of the Metropolitan area.

### The Regeneration area

The Regeneration Area includes the above-mentioned axes: (1) the two industrial and rail axes, and (2) the blue-green corridor Someş River, that will serve as. "the backbone for testing new models of urban regeneration using NBS" (D2.2 Spatial Analysis). The planned URA site including 2.5 hectares of undeveloped land along the Someş river, is currently used for powerplants upstream (see Figure 11).





Figure 11 - The three potential Regeneration Areas (marked in red) in the Cluj-Napoca Municipality.

The NBS set (updated based on discussions with FC)

- NBS3: community-based urban gardening and farming on post-industrial sites.
- NBS5: capillary GI on walls and roofs.
- NBS6: making post-industrial sites and renatured river corridors accessible for residents.
- NBS7: Establishing protocols and procedures for environmental compensation at local level.

The preliminary objective of Cluj-Napoca in relation to the riverbank regeneration is to create a green, accessible area that could benefit the citizens offering leisure areas. The canal has



plenty of potential with bountiful natural resources on site - topographically it requires minimal interventions and would be connected to a nearby park (Cluj-Napoca municipality, 2020).

Cluj-Napoca expressed great interest in NBS3. Also, due to low resources, FC Cluj is considering excluding NBS5 from their set of interventions. The regeneration of the area will highly focus on the blue-green corridor and the related green spaces, that have community gardens potential. The FC is also considering implementing NBS7.

### **Synergies with FRC**

The NBS set and the regeneration area's characteristics of FC Cluj-Napoca are similar to FRC Zagreb, potentially replicating the Therapeutic Garden initiative (NBS3) and taking inspiration from the activities carried out with disadvantaged groups and the implementation of NBS6.

### **FC Piraeus**

### The local context

FC Piraeus, with a population of 163,688 and surface area of about 11 km2 (Hellenic Statistical Authority, 2011a), constitutes the third largest city and municipality of Greece located 12 km southwest from the capital city Athens, hosting the most significant port in Greece as well one of the most significant in the east Mediterranean region (Municipality of Piraeus, 2018).

The economic activity of the city shows strong recessional tendencies, with negative impacts on the social cohesion. The urbanisation process of the last decades in Piraeus shaped the conditions for the environmental degradation of the city. The lack of open green spaces and parks, the presence of a high density of buildings, the lack of infrastructure and air pollution (due to the emissions of ships) are the major environmental challenges for Piraeus today.

The municipality of Piraeus has a robust urban planning framework that allows for the integration of NBS into the local context, leveraging on the concepts of "blue city", "green city", sustainability and accessibility (Piraeus strategic plan, 2020), coherently with the proGIreg's objectives. It also presents a vast previous experience in coordinating transnational cooperation actions which relate to blue growth, energy efficiency, mobility and public space regeneration, thus demonstrating the availability of local capacity that will facilitate the production of an Urban Plan to embed the selected NBS into the local context.

### The Regeneration area

The areas identified as potential sites for the Urban Plans, represented also in Figure 12, are mainly two, selected among the five city's districts:

1. District City C', which is mainly residential and is surrounded by the Kifissos river and the highway connecting Athens and Thessaloniki at east.



2. District City E', located on the mainland and hosting the passenger port on the south. The district is mainly residential with small local neighbourhood commercial areas, containing, also, post-industrial areas waiting for regeneration initiatives. The regeneration areas are mainly restricted at the Marias Kouris street, representing the tram line, light rail track (Piraeus - Perama) discontinued since 1977.

The priority for the Piraeus FC is the integration of the proGIreg NBS into the local context in order to address the problems identified in the two districts.



Figure 12 - City Plan of Piraeus and its 5 districts; delineation of the potential regeneration areas. Source: Municipality of Piraeus, Urbasofia.



### The NBS set (updated based on discussions with FC)

- NBS5: capillary GI on walls and roofs
- NBS6: making post-industrial sites and renatured river corridors accessible for local residents
- NBS8: Pollinator Biodiversity

NBS5 and NBS6 are going to be used in relation to the river Kifissos currently running by and under the national highway connecting Athens and Thessaloniki. The preliminary plan foresees their implementation to introduce green walls with climbing plants to diffuse pollution and to create green corridors. Whilst on the riverside walkways and recreational areas would be introduced to improve accessibility to locals.

The pandemic had severely disrupted plans to implement NBS3, therefore, inspired by Turin's implementation process, the municipality of Piraeus decided to replace NBS3 with NBS8. The NBS8 and NBS6 will be developed on a stretch of 1km on the Marias Kiouri Road, that has been abandoned and reclaimed by nature and it is currently explored as a potential URA site to create a flourishing habitat for pollinators. The idea is that of transforming, in collaboration with locals, the derelict railway into a "linear park" hosting vertical walls and plant species for inducing pollinator biodiversity.

### **Synergies with FRC**

The selected set of NBS for FC Piraeus present similarities with LL Zagreb and Turin. Piraeus can draw inspiration from the experience of FRC, especially for technical solutions for the implementation of green walls and roofs (where the location and involvement of target groups are key components of a successful intervention, maximizing the potential impact with punctual interventions). The synergetic implementation of NBS5 and NBS6 can have a major impact on the urban landscape of the Piraeus' Regeneration Area, having predominant impervious surfaces with low degree of green areas.

### FC Zenica

### The local context

The FC Zenica, the fourth largest city in Bosnia and Herzegovina, is located in the River Bosna valley at 70 km north from Sarajevo. The configuration of the surrounding land does not go into the favour of the city expansion which suffers for very limited land resources for any major makeovers.

Zenica is still very much an industrial city, struggling with poor air quality and high amount of concomitant respiratory illnesses. The presence of heavy industry, which continuously



pollutes the city, limited availability of the land, lack of resources and local capacity building represent major urban regeneration challenges.

The city has a 'Green Cities Action Plan' (GCAP) as a part of the European Bank for Reconstruction and Development Green Cities Programme to address the various problems the city is facing. The focus is on reducing industrial pollution, improving air and water quality and the city's heating systems, preserving biodiversity and supporting the local economic growth through measures which will increase land values and will boost local tourism. To tackle the challenges, Zenica is planning to collaborate with energy companies in using alternative energy sources to coal and to introduce greenery to cope with heatwaves. Furthermore, the city plans to increase the green spaces in the city, which have been found beneficial for people during the pandemic, through small-scale projects and initiatives.

FC Zenica's main spatial planning documentation is the Master Plan for the city (2036), with both regulatory / land use and strategic components, which supports the redevelopment of the Kamberovića Regeneration Area.

### The Regeneration area

The area of intervention is focusing on the river Bosna banks (see Figure 13). Kamberovica field, representing the largest and most central of Zenica's green infrastructures and strictly regulated protected area has been identified as a potential focus area for the regeneration plan. The area is landscaped as a park and sport area, providing facilities for jogging and cycling paths that partly follow the river line. However, one side of the river bank is neither protected nor renatured or accessible for local residents.

Beside the Kamberovica field, Zenica is considering expanding the regeneration area, by including the Blatuša – Banlozi area, a residential/ industry area.



Figure 13 - Delineation of the Regeneration Area of Zenica. Source: Zenica Municipality, on orthophotoplan.



### The NBS set (updated based on discussions with FC)

- NBS3: Community based urban farms and gardens.
- NBS5: capillary GI on walls and roofs.
- NBS6: making post-industrial sites and renatured river corridors accessible for local residents.

The municipality of Zenica has decided to give up on the implementation of NBS4 aquaponics as soil-less agriculture for polluted sites because of the high level of investments required. Instead, it has recently started to consider the implementation of NBS3 with the aim of collaborating with local kindergartens to improve local greenery and the related health benefits for kids.

NBS5 is still under evaluation, the city has potentially identified private investors with whom to collaborate for the construction of residential business buildings on which it would be possible to install green walls and roofs.

Finally, NBS6 will be applied for the renaturing and the improvement of accessibility to the riverbank, flowing near the Kamberovica field and further down the river near the Blatuša – Banlozi areas.

### **Synergies**

The main challenge Zenica is facing is the lack of resources, both in terms of financial resources and local capacities to implement NBS at local level. However, the development of an Urban Plan can help the city in creating a strategy towards a greener and more liveable environment, and the capacity-building process embedded in proGlreg initiative can support the FC acquiring the required knowledge for implementing NBS. Harnessing the knowledge gathered in FRC Zagreb can be useful.



## 4. The Roadmap

### 4.1. Steps of the ROADMAP

The roadmap describes a step-by-step process to guide FC in the development and further implementation of Urban Plans.

Urban planning processes are complex and dynamic, requiring a "back-and-forth" approach to continuously review and validate the different stages of the process, since urban planning is a process framework (see "Participatory Incremental Urban Planning", UNHABITAT, 2020). Therefore, the following roadmap is conceived as an iterative and flexible process, allowing for changes and adaptation of the steps to the local needs in order to support the creation of a tailor-made strategy for each FC. Various steps can be conducted independently or simultaneously, depending on the expertise of the technical team and the availability of time and resources. The process steps are not compulsory, nor is their order, but are structured to offer a coherent path to be followed for the elaboration of Urban Plans (see Figure 14).

The roadmap presented in figure 10 is composed of four phases, 11 blocks, 35 steps and 3 milestones. The steps intend to support the creation of a framework for dialogue, negotiation and learning, considering and recognising diverse perspectives and knowledge.









Each block is broken down into different steps to facilitate the FC proGIreg process and enhance the adoption of participatory, inclusive approaches.

Moreover, the implementation is supported by tools and recommendations (see Strategic RT described in the next chapter), collected per each of the 10 implementation blocks based on past FRC experiences.

The steps are accompanied by symbols describing their characteristics and further guiding FC in their implementation path; in particular, re-routing points, challenging points and milestones blocks of the proGlreg replication process are clearly identified.

Table 1 – Explanation of symbols of the roadmap

07 20	The re-routing points are steps/block in which the FC can stop and reconsider the path in order to understand if something needs to be changed or further discussed to be improved.
	The "challenging" points are blocks that need particular attention and are usually accompanied by the suggestion to consult the RT for support to deal with problems that may be encountered in these phases.
	Finally, the milestones are key steppingstones within the process, fundamental for tailoring the integration process of NBS at local level.

References are made to the possibility of finding useful information, recommendations and tools related to specific blocks in the Replication Toolkit (RT). These symbols indicate to consult the strategic RT (S) or the operational RT (O).

Table 2 - Symbols in the roadmap pointing towards relevant Replication Toolkit elements

S.	Strategic Level Replication Toolkit
0.	Operational Level Replication Toolkit


Furthermore, the following symbols indicate three different levels of replicability of the FRC experience, establishing as a guide the potential level of adaptability of the solutions / information presented in RT.

#### Table 3 - Symbols of the level of replicability - roadmap

0	maximum level of replicability is accorded to the Roadmap's blocks in which it is possible to find concrete tools and solutions in the RT.
0	The medium level is accorded to the Roadmap's blocks in which solutions are present but need a strong adaptation work at local level.
0	The minimum level is dedicated to those Roadmap's blocks that require custom-made solutions for each situation. FRC can provide inspiration.

Relation to *Gradients of participation* (see ch.2.3.3) is made inside the Roadmap for each block. The level of participation suggested is just a starting point proposal that can be adapted to fit each local context.

#### Table 4 - Symbols representing the Gradients of Participation in the roadmap

ni	Inform
C	Consult
ni	Involve
со	Collaborate
е	Empower



## 4.1.1 Phase A – Preparatory Phase

## **UPDATING (SPATIAL ANALYSIS)**



Update the spatial analysis provided in D2.2 where necessary. Focusing on the positioning of NBS within governmental framework, drivers and potentials at local level for the regeneration area's transformation and potential barriers to implementation and aligning with the current policy framework and multistakeholder context; a quantitative assessment of conditions is not required. Disruptive developments at local level such as the Covid-19 pandemic may have had a strong impact on the local context, requiring an update of the spatial analysis to take into consideration new situations.

## **Outputs:**

Updated state-of-play on which to build the tailor-made-strategy for the integration of the NBS into the local framework.

The Local Group activated and the Kick-off Meeting organized.

#### Steps:

#### 1. Plans and Policy frameworks

A successful implementation of the eight NBS requires a strong integration with existing governance practices, institutional and regulatory frameworks. The analysis will look at the local enforced normative plans, strategies, programmes and policies, both horizontal and vertical (see D2.2.).FC should take a close look at the local policy framework, and assess how NBS activities can fit with the local strategies, development initiatives, regulatory requirements.

#### 2. Drivers/ Barriers - SWOT analysis

Summarize findings of the contextual analysis conducted at local level with the purpose of identifying potential local drivers that could boost the implementation and integration of NBS into the local planning and policy framework, as well as barriers that may hinder the process. It is suggested to re-visit the SWOT analysis to check for possible changes of strengths, weaknesses, opportunities and threats at local level when planning the transformation of the URA.

#### 3. Stakeholder mapping (updated) and stakeholder involvement plan

The first step towards co-creation process is identifying relevant stakeholders from each of the quadruple helix domains. At an early stage, define stakeholders to allow for a wide cooperation (vertical, horizontal and transversal), and a more transparent



and sustainable process. Extend and adapt the initial list of stakeholders in D2.1 to each NBS within the FC for the replication process. In order to boost the co-design process of the preliminary phase and for achieving buy-in and interest for the project from the relevant stakeholders, develop a first stage stakeholders involvement plan. It should contain a detailed list of the stakeholders at the current project phase, a brief analysis on their potential influence on the project's implementation and of their level of interest and possible involvement and the engagement approach for each of the categories.

## 4. Local Group Activation

Steps 1,2,3 are needed in order to activate the Local Group. At the local level, the process can happen in parallel, but it has to be in close relation: updating the stakeholder map and creating the related involvement plan is an activity that can be done in parallel to steps 1 and 2, but important findings in the first two steps have to be confirmed by step 3 and adapted accordingly. After the Local Group is activated, the Kick-off Meeting can be organized.

#### **PRELIMINARY VISION**



Developing a vision of the desired state of the URA based on local context and current requirements and expectations is critical for devising specific strategies, plans and projects together with stakeholders. Striving for a common vision and shared goals boosts collaboration among different stakeholder groups. Exploring common grounds, confrontation and negotiations are part of the process, therefore the vision will be further discussed and confirmed by the core group of stakeholders. The following four steps may guide developing a vision and shared goals.

#### **Outputs:**

Preliminary vision guiding the development of FC's tailor-made strategies and further steps.

#### Steps:

#### 5. Long-term/ short-term vision

Setting a time horizon for achieving the vision is useful, ranging from long-term vision, covering a couple of decades (usually 30), to short-term ramifications covering a shorter period of time (the time of a governate mandate for example).



## 6. Objectives

A vision is made of different objectives that could be related to socio-cultural, economic, environmental domains and need to be systemized in a comprehensive vision. They represent quantifiable components (as in indicators and measurable targets) that are going to be described in the vision.

## 7. Mission/directions

The Vision is a set of strategic directions helping to achieve the strategic objectives expressed in the vision. It will be the basis for identifying the most suitable actions at local level.

## 8. Political approval

Political approval is a primary factor for successfully achieving the vision, and for further implementing actions, interventions. It is fundamental that the vision proposed is in line with the governmental framework. This emphasizes the importance of having a clear planning and policy framework for the URA transformation.

\* The first workshop – ANALYSIS (see sub-chapter 4.2.5), will introduce the main components and guidelines to be followed for the completion of this preparatory phase that will lead to developing a vision, the guide spot for more implementation-oriented specific steps.

## **CONSOLIDATION OF THE URA**



A first definition of the FC regeneration areas has already been prepared for D2.2 - Spatial Analysis in Front Runner and Follower Cities. Revisit the initially planned proGIreg NBS interventions, areas with transformation potential and possible risks related to development. The three steps below are highly interdependent.

## Outputs:

A clear idea of the areas of interest and NBS to be implemented.



## Steps:

#### 9. Identification of transformation areas

At this stage, clearly define suitable areas for NBS interventions within regeneration areas on the basis of urban planning documents regulating the local spatial dynamics and plot ownership analysis.

## 10. Identification of possible transformation barriers/risks

Once the transformation areas are identified, consider possible implementation obstacles (i.e., land ownership issues, soil conditions, key users' involvement, etc.) and risks, especially in relation to potential conflicts arising from the proximity to other planned uses of the territory (see Annex B).

## 11. NBS selection

FC, together with stakeholders will reupdate the set of NBS interventions to be locally implemented, in coherence with urban planning frameworks.

## CONSOLIDATED STAKEHOLDER MAP



It is possible that the consolidation of the areas of interest and NBS to be implemented highlight the necessity of involving a wider group of stakeholders in the co-design and co-implementation process. Therefore, an updated and more detailed stakeholder engagement plan is needed, together with the definition of a management structure, roles and responsibilities.

#### **Outputs:**

A consolidated stakeholder group that will follow the project's development throughout the process.

#### Steps:

## 12. Second stage stakeholder engagement plan



The plan should contain the following components: an updated stakeholder list, a stakeholder classification on the basis of their interest/ influence on the project, an engagement strategy for each of the categories identified.

## 13. Definition of roles and responsibilities

It is important to establish a management structure and define roles and responsibilities for each of the identified stakeholders to facilitate the workflows.

## 14. Setting-up of the core group of key stakeholders

Following the example of FRC, it may be useful to identify a so-called core group of key stakeholders that will take a leading role in the co-design and coimplementation of solutions at local level.

## 4.1.2 Phase B - Planning the URA transformation

## LOCAL ACTOR ACTIVATION



In parallel to activating stakeholders, start a process of raising awareness on the project and on the NBS and their benefits on a wider scale. It is important to inform locals about the planned transformations to be implemented at local level in order to achieve a public consensus and to boost participation not only among principal stakeholders but also among marginalized communities.

#### **Outputs:**

Awareness raising and public consensus.

#### Steps:

## 15. Dissemination campaign

The most efficient tool to reach a wider public is the launch of a public dissemination campaign at local level that can be conducted through social-media channels, official networks (institutional networks but also local newspapers etc.) or



the organization of events which introduce the main objectives of the project and the planned changes but also to collect ideas for the concrete implementation of the NBS.

### 16. Marginalized communities' involvement plan

Elaborate a participation plan for marginalized communities to the proGIreg activities per FC in order to assure a wide level of involvement.

## 17. VALIDATION OF THE VISION



Validating the vision is the first output of the proGlreg participatory process in FC. The preliminary vision, its objectives and mission, should be re-considered on the basis of the new inputs received through the interactions conducted in the previous steps

\*The second round of workshops aims at steering the co-design of developing scenarios for the most promising proGIreg NBS identified in the first phase, in order to direct the FC toward strategic options for action plans.

#### **DEVELOPMENT OF POSSIBLE SCENARIOS**





Having consolidated the vision, the scenario approach will support cities in their decisionmaking process for selecting the most fitting NBS options for FC and finding the most suitable implementation paths. Developing scenarios should have a strong co-design character. This block is assessing the different options a NBS can take form and the different paths that can lead to their physical implementation depending on the local context.

#### **Outputs:**

Definition of NBS implementation's alternatives.

## Steps:

## 18. Co-designing NBS options and paths

The different NBS options, methodologies and paths for their implementation at local level will be co-designed together with the core group of stakeholders (composed based on the quadruple-helix approach) considering long-term and short-term visions, objectives, strategic directions, possible future risks and barriers related to their implementation and stakeholders' requirements and roles.

#### 19. Evaluating alternatives on the basis of different criteria

The options selected will be evaluated considering the before-mentioned factors, their ability to respond to the local needs but also the feasibility criteria expressed by the local urban planning framework analysed in the first steps.

## 20. Projects, policies and initiatives for scenarios

To realistically evaluate the implementation potential of each step, it is important to build a framework of events, projects and policies that could be activated in synergy with the set of NBS selected, the options and the paths. This framework helps also the preliminary assessment of the potential impacts, and related risks, obstacles and challenges.

#### 21. Assessment of the scenarios and final choice

To choose the suitable scenario, an assessment framework of each of the developed scenario's likelihood to occur should be created in order to facilitate the decision-making process. This assessment framework should be created on the basis of (1) the ability of the scenario to meet the local needs and (2) the financial and human resources needed for its implementation.



### SCENARIO CONSOLIDATION



Choose the most suitable scenario for the FC's local context on the basis of the assessment framework developed in the last step of the Scenario Building process. At this stage, FC should have selected a set of NBS adapted to the local level. This block represents the transition from the codesigning of solutions to their coimplementation. This is also an occasion to start thinking about the business model adaptation, according to the last proGIreg's desired output.

## **Outputs:**

A solid scenario and set of NBS options to be implemented.

## Steps:

## 22. Renegotiations with private actors

The final solutions should be approved by all the actors and stakeholders involved in the participatory process and, in case of major discrepancies/conflicts of interests, the solutions should be renegotiated in order to find the best compromises between the different interests.

### 23. Business model adaptation

To adapt to the economic environment, develop business models, also by consulting FRC on their experiences.

## 24. Final NBS mapping

The map showing the final NBS options' distribution should be elaborated and considered the starting point for the structuring of the action plans. The output is a Regeneration Area vision map similar with what FRC have done for the Implementation Plan (D3.2. – FRC Implementation Plan).

\*The third workshop - DESIGN, will conduct the city from the final decision on the scenario to be implemented to the concrete design of the action plan and the Urban Plan, smoothing the transition from the co-design to the co-implementation phase.



## 4.1.3 Phase C – From co-design to co-implementation

#### **DESIGN OF ACTION PLANS**



The action plan is an essential part of the strategic planning process to achieve the goal of developing strategic plans towards the integration of the NBS into the local framework. At this stage, taking all components consolidated in the previous phases to elaborate action plans, start designing the action plan for the future implementation of the NBS.

#### Outputs:

Action plans towards planning NBS implementation.

#### Steps:

#### 25. Work and time-plan for the implementation of NBS

The work- and time-plan are fundamental components of the action plans, guiding decisions concerning budget assignment, defining tasks for implementing the solutions, the roles and responsibilities, and estimated time needed to carry out the development works.

#### 26. Establishing a management structure

Together with the work and time plan, developing a management structure for the NBS options to be integrated into the action plans, defining the management methods, stakeholders' roles, capacities and responsibilities, etc.

#### 27. Resources' availability

A preliminary assessment of available resources for the implementation of the NBS at local level and identification of alternative sources is fundamental at this stage.



#### 28. PRELIMINARY URBAN PLANS' DESIGN



A first outline of the urban plan can serve as a starting point of collaborative discussions to achieve an understanding of necessary elements of the implementation framework and of the Final Urban Plans and of how to better calibrate these elements.

#### **IMPLEMENTATION FRAMEWORK**



Developing Urban Plans need to be supported by a locally contextualized implementation framework that can ensure sustainability beyond the project's implementation. Plan for synergies with other initiatives and for a long-term involvement and commitment of the actors active in the implementation stage, together with the maintenance structure of the proposed solutions.

#### **Outputs:**

Solid framework supporting the implementation and the continuity of the solutions beyond the project.

#### Steps:

#### 29. Synergies with other projects and local initiatives

Harnessing synergies with other ongoing or planned projects/ initiatives at local level supports better integration into the local context. Synergies help also extending the local group of stakeholders whilst incrementing the possibilities of knowledge sharing and the dissemination of the project and its results at local level and beyond.

### 30. Ensuring long-term commitment of stakeholders

Long-term commitment of local stakeholders should come naturally. However, to boost commitment, organise intense and regular co-creation activities in order to involve all relevant members of the local community in the decision-making



process. Good communication on the potential of solutions that address local needs and provide benefits for the environment can support this process.

**31.** Long-term general public involvement and marginalized communities Ensure the involvement of the general public and marginalized groups in NBS initiatives, also in the post-implementation phase. Update first phase plans of involving marginalized communities to ensure long-term involvement.

#### 32. Maintenance of the NBS beyond the project

Develop a "post-project" phase management structure for the NBS implementations, and find actors willing to make this commitment and funding solutions. One possible solution is to hand-over the responsibility to key users, thus boosting local commitment and the sense of belonging to the local community.

## 33. FINAL FC URBAN PLANS



The FC final Urban Plans are to facilitate the integration of the NBS into the local urban planning framework, not as a formal urban planning document, but more as a strategic guideline to demonstrate the feasibility of the interventions.

It creates the suitable local framework in which NBS intervention can be implemented

## 4.1.4 Phase D – The implementation

27 O		proGlreg objective accomplished	The implementation of the urban plans by the FC is not part of the proGIreg project's objectives. The replication of the NBS and the assessment of the impacts are just two of the main building
Replicating and adapting NBS	Assessment of the impacts	е	blocks that would form the path towards the accomplishment of the local proGlreg vision. The RT still offers valuable information that can be capitalized by FC also in the implementation process.



## **PROGIREG** objective accomplished

The final result of this step-by-step process is the creation of a local framework and a strategy that can support FC in their process of urban regeneration through the implementation of GI, creating self-sustaining business models for NBS.

## 4.2. Co-design activities

#### 4.2.1. Participatory process in FRC

The co-designing approach aims at facilitating the implementation process and allowing a "*smooth transition*" from co-design to co-implementation of NBS. FRC co-design workshops aimed at finding a vision of clear goals and target groups and most relevant stakeholders engaging them in the co-design process, while understanding roles and assuming responsibilities through the different co-creation stages (see Figure 16 for the main outputs of each of the three workshops).



Figure 16 - Structure of workshops in FRC. Source: URBASOFIA

Some important conclusions can be extracted from D2.5 Final report on three co-design workshops in FRC:

 Co-design process is dependent on the nature of each NBS or set of NBS. For example, the co-design process for NBS3 - Community-based urban farms and gardens may differ from the co-design process for NBS4-Aquaponics. The level of technicality, the target groups and the size and function of the NBS dictates a certain



approach in: involving communities and/or local institutions, involvement of experts, workshops topics, potential training for the local users, etc.

- "Co-design and co-implementation cannot be neatly cut or separated by time phases" (D2.5 - Final report on co-design). Transitioning from co-design to co-implementation represents a challenge. Co-creation processes need to be flexible and reflective, meaning that an interleaving of co-design and co-implementation activities may be required. At the same time, certain NBS may require more focus on co-design (see NBS3) or a more accentuated focus on co-implementation, due to planning procedures and administrative protocols (see NBS1, NBS6).
- "As the LL enters the implementation phase, it is important to ensure that the processes and implemented activities allow for flexibility and adaptability, in relation to potential changes as in partners, stakeholders etc." (D2.5 - Final report on co-design). In order to avoid blockages and ensure achieving the main objectives for URA transformation, it is important to adapt to unexpected challenges, requiring a flexible implementation framework.

## 4.2.2 Participatory process in FC

Task 2.3 foresees the participatory process in FC to be supported by three rounds of local workshops, specifically dedicated to their implementation process. Each one focusing on a specific phase of the path towards the elaboration of Urban Plans: Analysis, Scenario-building and Co-design. These three workshops are fundamental parts of the roadmap, in fact they mark the transition from a phase to another.

The structure of the workshops in FC (see Figure 17) builds on the participatory processes tested in the four proGIreg FRC including: developing a common vision, strong co-design and co-implementation approach and the process of engaging with stakeholders, defining roles and responsibilities, and planning the involvement of marginalized communities. However, FC should emphasise more on the sustainability of the NBS interventions, testing efficient methods for the involvement of the general public and the marginalized groups to assure a robust potential implementation framework for the interventions that they selected.

The parallel process of stakeholder group consolidation will be paramount to ensuring sustainability of the urban plans, for creating buy-in for implementation and for sharing responsibilities of monitoring progress in applying the action plans contained in the final urban plans.

The following workshops will be conducted in synergy to the WP6 replication workshops in the proGIreg FRC, which will be more focused on the replication beyond the proGIreg's cities. The WP6 workshops will represent ancillary instruments for FC, supporting the capacity-building and providing useful methods that FC will have the possibility to use in their local contexts.





Figure 17 - The workshops in FC. Source: URBASOFIA

#### 1. Kick-off Meeting

The kick-off meeting marks the official start of the implementation process of the proGlreg project in FC. It will be organized at the end of the first block. In order to have an efficient start of the process, steps 1-3 are to be updated internally by the proGlreg local team. The kick-off meeting can benefit:

- → from having relevant stakeholders at the table,
- $\rightarrow$  validating the results of steps 1-3,
- → collaborating for starting the delineation of steps 5 and 6 (block 2 "Preliminary vision").

#### 2. First Round of Workshops - ANALYSIS

The first workshops will help FC consolidating their URA by updating the spatial analysis developed within Task 2.1 (D2.2); choosing NBS to be implemented and further discuss with local stakeholders by defining a stakeholder engagement plan; roles and responsibilities of each stakeholder, and a local dissemination campaign to co-define a vision for the city that will become the objective of the overall process conducted at regeneration area level. "A "vision" is understood as a longer-term view reflecting what is both desirable and realistic. It can point towards climate-adaptive goals of a NBS, address social challenges such as bringing diverse groups in contact with each other...or generate local employment opportunities" (see "Step-by-step guide for co-production and cocreation of Nature-based Solutions". Nature4Cities. Breukers & Jeuken, 2017).

This First Workshop is a follow-up of the kick-off meeting. The Analysis Workshop aims at achieving the completion of steps from 9 – Identification of transformation areas, to 14 – Setting-up of the core group of key stakeholders, through a series of collaborative exercises. The workshop will be structured as a set of intertwined activities of open discussions, brainstorming sessions, debating, consulting, and collaborating.



- → The main outcomes of the first workshop are: the mapping of the local needs, barriers, and opportunities,
- → Detailing and validation of the co-developed vision,
- $\rightarrow$  Final selection of NBS in relation to the development vision.

### 3. Second Round of Workshops - SCENARIO-BUILDING

During the second round of workshops, cities will engage in the process of building their own scenarios in order to select the suitable path for NBS implementation. The process will involve the Local Core Group of Stakeholders, and relevant actors (members of the community and private sector stakeholders, representatives of the relevant departments of the municipality etc.), with the aim of finding solutions for the proper integration of the NBS interventions into the local framework. The development of different scenarios "offers a way to bring together technical approaches and participatory planning in a systematic way to think creatively about the future" (see "Scenario Planning for Urban Planners Toward a Practitioner's Guide", Chakraborty & McMillan, 2015). Through the process of conceiving, developing, and evaluating scenarios and their possible outcomes, it will be possible to obtain different feasible courses of action among which to choose the most suitable one, considering the local needs, context and actors. The process will aim at "reducing the large amount of uncertainty to several plausible alternative paths, which together contain the most relevant uncertainty dimensions" (Stojanović, M., Mitković, P., & Mitković, M., 2014).

The "Scenario-building" workshop help completing steps from 18 – Co-designing the NBS options and paths, to 22 – Renegotiations with private actors. The scenario-building approach focus on prioritizing needs, understanding the impact of the intervention, elaborating ways of allocating resources, understanding each actor's role and responsibilities, and their contribution.

The main outcomes of the second workshops are:

- $\rightarrow$  A common agreement between all actors on the desired outcomes of the project,
- → A set of options for NBS implementation, a set of requirements for the final Urban Plans.

#### 4. Final Round of Workshops – DESIGN

The "Design" round of workshops will focus on elaborating and detailing the chosen scenario. The final round of workshops is also facilitating the transition from co-design to co-implementation. It will focus on guiding the design of first drafts of the Urban Plans and correlated Action Plans, helping cities plan the post-project-implementation phase including appropriate tools that assure the sustainability of the initiatives, a robust management and impact-assessment structure.

This model, while robust and detailed, can be easily adapted to the needs of each FC. A comprehensive and detailed description of workshops' structure and agendas will be codeveloped with the FC in the next deliverable D2.7 - Report on the FCs' stakeholder set-up. The agenda of the workshops will be elaborated together with each city, in order to focus on local context specific aspects.



# 5. Replication Toolkit – good practices

The Replication Toolkit (RT) provides important tools/ recommendations/ solutions /ideas that FC can adapt to their own context for developing urban plans for urban regeneration in post-industrial sites through the use of NBS.

The RT complements the Roadmap (Ch. 4), providing useful recommendations and tools that can be applied in each of the proposed steps.

The RT presents the re-elaborated information in the form of two tables: (1) The Strategic Level RT (Table 7) and (2) The Operational Level RT (Table 8). The strategic level refers to a more general landscape of proGlreg planning and implementation processes, regardless of the NBS set, whilst the operational level provides a more concrete set of recommendations that applies to each specific NBS.



Figure 18 - FRC and FC relationship. Source: URBASOFIA



# 5.1. The Strategic Level Replication Toolkit

The Strategic Level RT provides an overview of potential solutions, principles, ideas to be integrated by FC into their general framework of implementation, and helps the FC to develop their urban plans, on different levels/stages in relation to the Roadmap. The Strategic Level RT is mainly focused on planning work and procedures but encompasses also recommendations for the implementation process (without overlapping with Operational Level RT).

The Strategic Level is divided into three main sections according to the three main blocks composing the Roadmap. It focuses on how to set up a LL/ regeneration area and organise NBS co-creation processes:

- **Preparatory work** phase focuses on the first steps to be taken when starting to plan the implementation of proGIreg's vision and the identification of the NBS, having as milestones the Consolidation of the regeneration area and a Consolidated Stakeholders map.
- Planning the LL/ URA transformation phase focuses on the co-designing of the regeneration area future development through the scenario building approach. The milestone of this stage is the Scenario Consolidation.
- From co-design to co-implementation phase focuses on capitalizing on the codesign output, and further elaborating the action plans, and the implementation framework for the final FC urban plans. Synergies with other local initiatives and community's commitment are key components.



Preparatory work phase				
Topic/block	Recommendations	Method and tools	FRC concrete recommendations	
Updating the spatial analysis	<ul> <li>Pay close attention to potential barriers and drivers.</li> <li>Analyze the local policy framework in order to maximize the impact of the interventions through the creation of possible synergies between the proGIreg initiatives and projects/ policies/ plans both ongoing and planned to be developed at the local level. This can help also raising awareness of the benefits of the project and its sustainability.</li> <li>Create an interdisciplinary local group composed of experts from different domains, members of the local community, members of the relevant local institutions, municipality representatives, etc.</li> <li>Make sure that the interventions are feasible and easy to implement - avoid administrative blockages and conflicts regarding landownership.</li> </ul>	<ul> <li>Analysis of plot ownerships and existing GI in the LL</li> <li>Analysis of the local plans and strategies</li> <li>Preliminary meetings - consult and also assess all possibilities of collaboration (in close relation to the location requirements of NBS)</li> <li>List of the minimum required expertise</li> <li>Public consultation</li> <li>Local workshops</li> <li>SWOT analysis – assessing the challenges, barriers, drivers, and potentialities.</li> </ul>	Dortmund - Involved other city departments in the planning process. Turin - A core team had been created to guarantee a shared planning process among local partners and three main working groups have been created with the purpose of managing all the planning activities within proGIreg properly - for each group a specific partner has been put in charge of the activities. (1) new soil (Turin LL main intervention) (2) widespread green (3) cross-sectional activities.	
Preliminary Vision	<ul> <li>Involve all relevant city administrative and technical departments in collaborative work on the preliminary vision and related set of objectives.</li> </ul>	→ Early concept - Start working on follow-up concepts early on in order to know how to approach different entities and actors.	<b>Zagreb</b> paid close attention to the local needs - NBS6 is a strategic intervention at the regeneration level, connecting a peripheral neighborhood with the city center.	



	<ul> <li>Pay close attention to local NGOs and the local communities' past and present requirements, to see what necessities can be addressed through the proGIreg initiative.</li> <li>Involve local institutions early on. It is easier to collaborate with local institutions, and they also have the potential of becoming the NBS 'hosts', having a better exposure and direct link with potential key users.</li> <li>Get political approval in the first stages of the project, so that the proGIreg team can better coordinate with other municipality departments.</li> <li>The initiative has to have exposure - the project must be promoted through a comprehensive set of dissemination activities.</li> </ul>	<ul> <li>→ A preliminary set of objectives - in order to engage needed actors and to get political approval.</li> <li>→ Vision/scenario - Have a preliminary vision (collaboratively developed) on the transformation of the LL, that will be further debated and constructed within the participatory process.</li> </ul>	Turin - If empty industrial spaces usually cause further degradation, they can also potentially become social spaces that provide services to the community, especially throughout NBS4 (Aquaponics as soil-less agriculture for polluted sites) and NBS5 (Capillary GI on walls and roofs).
Consolidation of the LL	<ul> <li>Keep in mind the identity of the LL when delineating the limits. The NBS character (and spatial distribution logic) have to improve the local urban landscape and strengthen the local identity.</li> <li>Create a coherent distribution of interventions in the LL, in relation to the urban context, local level stakeholder's location, existing GI, existing or future projects, and most important in relation to the available site plots.</li> <li>Cluster interventions - NBS can be clustered together based on compatibility.</li> </ul>	<ul> <li>→ Local group consultation – when choosing NBS location, involve different target groups that will potentially represent 1) the users; 2) the maintenance entity; 3) the facilitators.</li> <li>→ Correlation and agreements with the local development plans and projects, in order to maximize the resources and the potential impact.</li> <li>→ Negotiations with private owners of plots and/or local institutions, in order to provide space for NBS.</li> </ul>	<ul> <li>Dortmund - LL has a dispersed distribution of intervention, connected by NBS6.</li> <li>Turin - LL has a high variety of NBS interventions and locations, in order to mitigate the local urban landscape dysfunctions.</li> <li>Zagreb - LL has most of the NBS clustered in the same area – superior synergy between interventions.</li> </ul>



Consolidated stakeholders' map	<ul> <li>Anticipate and grasp any opportunities. Contact relevant stakeholders for preliminary discussions regarding plot sites, target groups, maintenance, key users.</li> <li>Decide on the role and responsibilities of each group of actors.</li> </ul>	$\rightarrow$ $\rightarrow$	Stakeholder mapping - have a collaborative exercise with the local group in which stakeholders are mapped accordingly to NBS, necessity, location, target group. Awareness-raising - Have questionnaires and focus group discussions in order to validate the necessity of the interventions and to gather preliminary ideas.	Each one of the FRC's at the beginning of their implementation and testing phase elaborated a map of stakeholders (check D2.2 and D3.2).
	Planning the LL/ U	JRA	transformation	
Local actor activation	<ul> <li>Connect with the local community through all media and channels available - web, social networks, local press, local meetings, etc.</li> <li>Creating a sense of empowerment and ownership (from the local communities) is key. In order to achieve this, a step-by-step approach is needed. The local communities have to be part of the decision-making process, which also means taking responsibilities.</li> <li>Educate through involvement. Activating youth groups is important. Young people represent a powerful resource of creative ideas. Involving them in educational activities regarding the NBS will result in improved environmental behavior and more engaged and knowledgeable users of the NBS.</li> </ul>	$\rightarrow$ $\rightarrow$	<ul> <li>The link - Use key stakeholders as the main link between the project and the community.</li> <li>Citizen reward system - in order to activate and engage community in a long-lasting urban regeneration, it is important to have a rewarding system, which will facilitate the community involvement in a good environmental process.</li> <li>A local Consortium - similar to the Local Group from the 1)</li> <li>Preparatory work phase. Having a local "entity" to help make decisions, engage in networking,</li> </ul>	<b>Dortmund</b> – In the process of involvement of the marginalized groups, a mapping of specific target groups must be elaborated in the planning phase (the level of participation might differ according to different NBS. See ch. 2.3.3).



		and ensure that every party's interests are met.	
Development of possible scenarios & Co-design activities (applicable to all community involvement activities)	<ul> <li>Keep it relevant - activities must be focused on certain topics, issues, ideas, and each activity should build upon the last one (this works better when the activities are conducted with the same group).</li> <li>Keep it open - from the co-creation process, new ideas may emerge that will potentially change the initial framework but improve the intervention.</li> <li>Keep it constant and intense - having a constant framework of activities will result in a high number of participants, which will help in ensuring the success of the intervention (mind that this approach works if results are visible).</li> <li>Keep everyone up to date - in the case of more technical NBS co-design will be hard to implement, but nevertheless is important to have everybody aware of the progress that is being made.</li> </ul>	<ul> <li>→ Focused events - involve community actively within events focused on a problem, idea, project, place.</li> <li>→ Co-design - in short, joint decision- making. Co-design also implies all consulting activities, such as analysis of the present state of the LL, public questionnaires, etc.</li> <li>→ Online activities in the case of a pandemic - given the potential constraints, online activities are in many cases the solution. There are advantages and disadvantages to this approach, which is why the activities must be carefully planned given the environment/media used.</li> </ul>	<b>Turin</b> - online activities - remote cultivation support, called tele- cultivation/ UNITO's colleagues working NBS8 have produced multimedia contents made by mental disables/the City of Turin by joining the initiative Skype in Classroom is offering to schools the emotion of a field trip using online platforms. The framework had to adapt due to the pandemic conditions. In the current context, these types of interactions must be planned in advance. Turin is a good example of swift adaptation and innovative solutions.
Scenario consolidation	<ul> <li>In order to have a sustainable intervention, "handing-over" is needed, in order to ensure maintenance and management to be taken over by the main user. Training sessions may be needed.</li> </ul>	<ul> <li>Negotiations - can take many forms. Negotiations are most important when plot ownership issues occur.</li> <li>Flexibility within the LL interventions and flexibility of the NBS design (technical components and structures shall be done in</li> </ul>	<b>Turin</b> – Educational institutions were engaged as the location for interventions, also having the potential of becoming the target users of NBS;



	From co-design to	<ul> <li>regards with easy disassembly and movability).</li> <li>Adaptability - Allow for further development and possible changes, after the proGIreg project ends in 2023.</li> <li>Sustainable value chain - Create a local value chain in order to have an ecological intervention, maximizing resources, minimizing energy losses. Secondary products and energy must be upcycled within the LL as much as possible.</li> <li>co-implementation</li> </ul>
	r toin co-design te	
Design of Action plans	<ul> <li>Have a comprehensive calendar of activities and constantly monitor the progress.</li> <li>Maximize the available resources at the local level, to ease the implementation process of the NBS and also to facilitate the maintenance and management of the intervention.</li> <li>Regular exchange of information within the projects and within the LL area - important during the entire phase of the project.</li> <li>Prevention is better than cure - make sure that the intervention is feasible to be implemented.</li> <li>Take all the measures needed to have the sites safe to intervene and to be used after the intervention.</li> </ul>	<ul> <li>→ Comprehensive planning - Construct the business models so that the interventions may outlive the proGIreg project lifetime, also assessing the possibilities for upscaling and evolving.</li> <li>→ Long-term planning - Construct the business model so that the interventions may outlive the proGIreg project lifetime, also assessing the possibilities for upscaling and evolving.</li> <li>→ List of financial requirements – It is important to assess all costs</li> </ul>



		→	before starting the implementation. Use the local resources in a creative way (create potential value chains). <b>Work-plan &amp; Time-plan –</b> management of resources and the related actors in charge of the transformation process is crucial.	
Implementation framework	<ul> <li>Have constant monitoring of the resources, progress, impact. Assess if the intervention process is successful (from the point of view of users, environment, expenses) and see how it can be improved.</li> <li>Try to lower the expenses through creative solutions, co-designed with the local stakeholders and local communities.</li> <li>Create synergies with other local projects to maximize the impact.</li> </ul>	$\rightarrow$ $\rightarrow$ $\rightarrow$	Evidence Database of the project's progress - store data decentral and regularly update the project calculations. <b>Right people for the right job -</b> (1) hire experts for more technical aspects of the interventions, (2) engage the fit target group as key users of the NBS but keep it as inclusive as possible. Lower the expenses through creative solutions.	<b>Dortmund</b> - created a harmonization with other local development plans and events in order to maximize the reach and exposure of proGlreg vision.



## 5.2. The Operational Level Replication Toolkit

The Operational Level RT collects good practices for the LL and regeneration area transformation at local level and replicable NBSspecific information.

The Operational Level RT focuses mainly on how to approach each NBS and what kind of different forms/manifestations of each NBS can be implemented. It encompasses valuable principles recommended to be followed. The overall set of information has the purpose of facilitating FC implementation of NBS, by providing the tools to avoid or overcome the most occurring blockages, thanks to the knowledge acquired from FRC's experiences.

Similar to the Strategic Level RT, the Operational Level RT is divided into three sections:

- **Preliminary activities and strategic settings** focusing on tasks that are recommended to be done prior to implementation and physical construction. These recommendations have the purpose of facilitating the efficient development of the implementation process.
- Local community engagement and involvement of stakeholders focusing on specific activities or recommendations that apply to specific NBS, in relation to the co-design and co-implementation process.
- **Design of the NBS** In this section, the most valuable and innovative approaches of FRC is showcased, in regard to different stages of a specific NBS implementation.

NBS	Preliminary activities and strategic settings	Local community engagement and involvement of stakeholders	Design of the NBS
NBS1	Assess the characteristics of the site - in some cases, the morphology of the territory can result in attractive solutions. According to	<b>Present the expected results</b> - the lack of incentives for citizens is an obstacle to involving them in the design and implementation activities	<b>Dortmund's initial idea - Keep it creative:</b> transforming the former landfill into a solar energy production area combined with sports

#### Table 6 - The operational level replication toolkit



	the range of opportunities regarding the morphology, location, proximities of the site, a set of options can be constructed. Avoid the need for relocation - the situation with former landfills may be sensible - for example, Dortmund municipality had included the respective site within other priority, in another project, with the horizon of 2027 (The International Garden Exhibition).	– to boost appreciation of benefits, it is important to present the expected results, for example in the case of NBS1 the benefits are movement, socialization, and time in the natural environment.	activities (mind that unforeseen challenges occurred, and sports infrastructure is going to be made in a neighborhood park). <b>Potential linking with other NBS -</b> in the case of Dortmund NBS1 linkages were possible in the case of the NBS1.2 Exercise Park, with NBS3 and NBS8. Generally, former landfills' transformations are also recommended to be linked with NBS6.
NBS2	Identification of the need - the soil may present poor qualities (scarcity of soil to farm). Stakeholders' engagement – in order to increase awareness, identify the sites' requirements and potentially collaborate for the needed transformation	In the case of <b>Turin</b> , a social involvement of the local population has been done in order to increase awareness about the experimental site developments and aims.	<b>Turin LL innovative approach</b> - new regenerated soil thanks to biotic compounds for urban forestry and urban farming.
NBS3	Check first - Where edible plants are to be grown, soil contamination tests must be carried out. In case of slight contamination, the soil can be cleaned at a reasonable cost or covered with a layer of uncontaminated soil. In the case of high contamination level, other alternative solutions can be adopted - for example, high raised soil-beds. Never alone - NBS3 works best when is addressing a specific target group and location - best examples are educational institutions	Collaborative means creative - The local community must be consulted regarding the needed functions of NBS3, helping also with the collection of new, creative ideas - in the case of Zagreb the idea for a therapeutic garden was born from the interaction with the local community. Taking ownership - Local institutions (especially schools and administrative buildings) can become the main stakeholders in the	<ul> <li>Dortmund: self-irrigating raised beds are being constructed on a section of the Gustav-Heinemann park. The park is built on an old brickwork factory, so it is not possible to grow edible plants in the ground. The nearby school would like to establish a school garden.</li> <li>Zagreb: NBS3 continued a former successful intervention of community garden, where an instrument of using the plots was created - an application for the use of a garden plot can be submitted by only one member of the joint</li> </ul>



	and community centers - it is important to assess all options when constructing the strategy of implementation.	intervention - being the main users and the maintenance team. <b>Gradually involvement</b> - Turin interventions within school premises involved direct contact with the teachers. The families of the pupils involved in the co-design have been reached through teachers - in this way the maintenance of the gardens will transfer gradually from the staff to teachers - non-teaching staff - families.	household - each applicant has a specific set of responsibilities regarding the use of the plot. <b>Dortmund - Think BIG!</b> - Dortmund LL is not addressing a garden, but a food forest. Assess if the spaces are available and if the intervention is feasible – a critical mass of users is crucial. <b>Potential linking with other NBS -</b> NBS4, NBS8.
NBS4	<ul> <li>Location is key- Dortmund chose to use a former industrial historical monument. For NBS4, being mainly a technical solution, it is important to opt for maximum exposure.</li> <li>Design - Create partnerships from an early stage to work on concepts. Zagreb team worked with the Faculty of Architecture for the design of the HUB, which includes green walls and roofs, and aquaponic.</li> <li>Think of a business model - the intervention is expensive, and it has to be proved sustainable - see Zagreb and Turin adopted solutions.</li> </ul>	<ul> <li>Ensuring maintenance is crucial -In the case of Dortmund, the intervention is managed by the University of Applied Science. Given the difficulties in managing such an infrastructure, the sustainable partner must be found.</li> <li>The Labour Market - Aquaponics represents a great resource for the labor market. Turin developed the idea of supplies for the most vulnerable part of the population - through a borough house that help those citizens in need by offering a free canteen.</li> </ul>	<ul> <li>Dortmund Business models: Farm-to-table (producing products for a restaurant that is located on the same sit) and Rent a Field (rent rafts to citizens rather than producing and marketing products).</li> <li>Zagreb innovative idea of linking NBS - Seedling factory with aquaponics installations and green roof - GOOD idea to combine two NBS into one infrastructure (NBS4 and NBS6) Linking with other NBS - NBS3, NBS5, NBS6</li> </ul>
NBS5	Link the solution to an existing building on which you might have a certain level of control - linking the NBS to an institutional	<b>Ownership -</b> in the case of NBS5, a certain level of ownership may be hard to achieve, given the nature of the intervention (in the case	<b>Turin</b> - one of the NBS5 interventions focuses on making an existing green roof accessible to the community, especially the disabled and



	building can ease the implementation process. Negotiations can be held with private actors, but then the results are dependent on the progress of the investor.	of green roofs, not as easy to access as regular green spaces) - see Turin case. Management can be taken over by a local association - depending on the level of needed maintenance (dictated by the nature of the intervention), different stakeholders may be fit for the job. In the case of specialized intervention, as is the case with Turin WOW green roof, the maintenance is taken over by Associazione Parco del Nobile (beekeepers) through OrtiAlti resources.	elderly. The other intervention is creating a green wall indoor within the local school - in this case, the intervention has a high chance of success, as concerns taking ownership and education, but the environmental impact at the green infrastructure level is low (since it is an indoor intervention, not related/connected with the other NBS interventions). Potential linking with other NBS - NBS3, NBS8, NBS6. In the case of Turin, the WOW green roof intervention is strictly connected with the other NBS expected in the same area: The Pollinator-friendly garden and the apiary.
NBS6	Synergies with other NBS can be planned very easily - the most important element being the land ownerships and the overall distribution of NBS in the LL. Assess the opportunities - besides connecting NBS at the level of the LL, NBS6 has first to satisfy the local community needs as in mobility/accessibility. Thorough site analysis at the Regeneration Area Level or more - also pay close attention to the local plans/projects of development regarding the road infrastructure and the green system.	Pay close attention to citizens' needs as concerns accessibility and mobility - for example, citizens of Dortmund LL have been asking for long time for a connection between the settlement and the Duesenberg leisure area. If the community has not expressed these kinds of needs, then it is important to collaborate and co-design with the community in order to deliver meaningful interventions. Include the local community as much as possible - given the nature of the intervention, local level participation might differ. In some cases, can be at the level of actual co-design and in other cases the participatory level may	<ul> <li>Turin LL case - making post-industrial sites and renatured river corridors accessible for residents is a good approach to be replicated to FC cities where possible - this approach initiates the first steps in local urban landscape regeneration.</li> <li>Zagreb LL case - creating a green corridor that also has the function of a bicycle track, connecting a peripheral neighborhood to the center of Sesvete.</li> </ul>



	Maximize the impact - a green corridor can take many forms. In the case of some FRC, the corridor has the purpose of a connector.	stop at consulting (see the gradients levels of participatory approach ch.2.3.3).	
NBS7	<b>Careful documentation of the local</b> <b>regulations and legislation</b> is the first activity for this specific NBS.	Local citizens will help monitor numbers and species variety.	<b>Turin</b> - tools for environmental compensation processes.
NBS8	<b>Collaborative planning with specialized</b> <b>institutions (preferably local)</b> - NBS8 is a high environmental technical intervention, efficient collaboration with specialized stakeholders is crucial.	<ul> <li>Knowledge, education, empowerment - in Turin, disabled groups were key stakeholders at the local level, a major achievement being training 8 disabled persons in becoming "butterfly experts".</li> <li>Keeping the community engaged through various online/offline events and activities - see the case of Turin LL (implementing a series of educational material, including a contest open to all citizens).</li> </ul>	Business model - in the case of Turin LL, in order to convince the other associations that will participate in the project to keep the commitment, a membership fee is required, for each applicant will receive training workshops. Potential linking with NBS3



# 6. Conclusions

This deliverable focuses on building a methodology that can support FC in their process of developing Urban Plans for the integration of NBS at local level. The methodology strongly relies on the outcomes of the FRC implementation processes, acquiring and incorporating the knowledge created in the first years of proGlreg implementation and providing solutions and recommendations for their adaptation to new EU contexts, dealing with similar post-industrial regeneration challenges.

The replication methodology provides different valuable instruments that emphasize the potential of the proGIreg knowledge-exchange process between FRC and FC and help boost local level capacity-building. Discussions with FRC of the most occurring challenges and lessons learnt (tables in annex B) and previous deliverables (WP2, WP3 and WP5) show various similarities despite the different FRC context. The two tables can be used by FC assessing their local situation, allowing for mitigation and prevention of the possible issues/ obstacles related to the transformation of respective URA.

The two main outputs of the document, the Roadmap and the Replication Toolkit, work in synergy, delineating a step-by-step process towards the creation of Urban Plans. At the same time, facilitating relevant knowledge transfer with the help of an open repository of both general and NBS-specific recommendations related to the different aspects of the URA transformation process. FC should be able to select the locally adaptable recommendations on the basis of local needs, urban planning frameworks and local stakeholder requirements. Offering simple and manageable building blocks reduces the complexity of designing a tailor-made strategy for integrating NBS in FC's context. This simplification allows for adaptability to different local contexts, being specific enough in its delineation of each step for developing Urban plans, but general enough to make it adaptable to local frameworks and socio-economic conditions. It also offers flexibility by giving to cities the chance to trigger a series of throwbacks without losing the thread of the process.

The proposed tools intend to support the creation of a framework for dialogue, negotiation, and learning, in which diverse perspectives and knowledge are considered and recognised. The co-design component stands at the core of the overall FC process, investing every aspect of planning: from the updating of the initial state-of-play, to the elaboration of visions and different scenarios and the choice of the most suitable NBS options and implementation paths, to the creation of the final Urban Plans and the further physical realization and management. The co-design and co-implementation will be supported by principles and techniques that will guide the organization of local level stakeholder workshops, as well as the overall implementation process.

In conclusion, D2.6 - Roadmap towards urban planning in FC is conceived as a guide for FC and other cities looking for an open, updatable and adaptable replication methodology (WP6). The more this replication process is repeated, monitored, evaluated and (re)readjusted, urban regeneration processes through NBS become easier and more



economical (in terms of time, planning, administrative, expertise resources) to implement for cities around the world.

Enabling urban regeneration through GI is challenging, but the proGIreg project contributes to developing an important milestone for green transformations in cities all over Europe.



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# Annexes - Resources for roadmap and toolkit

## Annex A: FRC state-of-play

This annex summarises the state of play in FRC, for the purpose of giving context to Annex B – Challenges and lessons learned. The D2.3 Roadmap to urban planning, is a retrospective document on the FRC experience, but is not a FRC oriented document. The following information is synthetised from the information presented in D2.2 Spatial Analysis and from the information provided by FRC through online meetings and questionnaires.

## A. Dortmund LL state-of-play

#### Short description of the LL

The Dortmund LL is a peripheral area of the city, covering approximately 22.8 km2, a complex and vast territory of the city in which NBS are being implemented. Considering the vast area of the LL, the decision for the distribution of NBS was to not cluster them together, but to spread them across the whole area, connecting most of them by 2 thematic routes, Emscher Route and proGIreg route. Important and relevant clustering exists in the case of NBS3 and NBS8 – creating synergies between these NBS is optimal. Most of the work planned for Dortmund LL is still in the planning phase, the only activity that can be considered completely finalised is the one related to the NBS1, the integration of solar energy production on Duesenberg landfill. COVID-19 had an impact on many of the planned activities, especially those that foresaw the involvement of the community: 3.1 Food forest and permaculture orchard in Huckarde, 3.2 Improving and monitoring pollinator biodiversity in Huckarde. Delays and rescheduling occurred, also, due to certain changes in the city's strategic framework and related projects. For example, according to the D3.3 Implementation Monitoring Report, NBS1.2 had to be reframed due to changes in construction times of the IGA (International Garden Exhibition 2027).

#### **NBS in the Dortmund LL**

#### Table 7 - Dortmund's NBS

NBS	Title of the intervention	Status	<b>Comment/ Conclusions</b> (cell completed by each FRC)
1	Integrating solar energy in Deusenberg landfill and Huckarde district	implemented	Was finished before proGIreg



	Sports infrastructure in an existing park in Huckarde	In planning	Conceptual phase, with Department of Green Spaces
	Food forest and permaculture orchard in Huckarde	In progress	Will be finished after planting trees/ shrubs
3	Community gardening in Huckarde	In planning	Contacts to Kindergarden and School; Delays in realization due to Corona
4	Aquaponics	In planning	Current status: Building permission handed in, but not approved yet.
6	Connection of Huckarde borough with the renatured Emscher river and Deusenberg sites	In planning	Call for bids for path planning will start in April 2021.
8	Improving and monitoring pollinator biodiversity in Huckarde	In progress	Naturfelder group has formed and is planning first actions, among others seeding activities in public parks

## B. Ningbo LL state-of-play

## Short description of the LL

The LL in Ningbo is focused on Moon Lake Park, having a total area of 28ha, included in a larger analysis area of 2.07 km2, represented by the entire Moon Lake Street.

The central element of the LL is the small shallow lake, divided in a southern part and a north-ern part. The lake has a total nutritional level between medium eutrophication and extreme eutrophication. The living quarters, restaurants and hotels are concentrated around Moon Lake, and rainwater and sewage pipelines are leaking. The high level of pollution of the lake is given by...At the same time, the water area of Moon Lake is small, and the water flow is so slow that pollutants cannot be diluted and degraded quickly.

The interventions are located around the lake shore. One of the interventions planned with the aim of improving the local landscape and re-naturing a 5 km green corridor is the plantation of aquatic plants along the lake.

#### Ningbo NBS specific interventions



#### Table 8 - Ningbo's NBS

NBS	Title of the intervention	Status	Comment /conclusions
2	New regenerated soil thanks to biotic compounds for urban forestry and urban farming	cancelled	The heavy metal content of lake sediments is too high to be converted into new soil
3	Community-based urban farms and gardening on post-industrial sites	in progress	Aquatic plants have been planted and maintenance work continues.
7	Local environmental compensation processes	in planning	Ongoing water quality monitoring is the basis of the environmental compensation process.

#### C. Turin LL state-of-play

#### Short description of the LL

In Turin, the LL coincides with the Regeneration area, the Mirafiori Sud district, with a population of 34,659 inhabitants, living in a 11.5km2 area. The LL will test and develop models for participatory urban regeneration whilst implementing the new municipal regulation on common goods. This results in a high-end synergy between different development axis/directions at local level.

In Turin's LL, the distribution of NBS interventions is in close relationship with the densely populated areas where terrain resources were available. The poor environmental and landscape quality led to the idea of using the NBS as means to mitigate against the grey urban landscape.

Turin LL has implemented 7 out of 8 NBS. The general calendar of implementation was heavily affected by COVID-19 – especially the interventions that were in the implementation process when the pandemic started. The pandemic as an external factor (or threat) led to a change of the Turin LL overall vision, highlighting the need for adaptation. For example, responsible NBS3 stakeholders began to think about responding to food emergency issues raised by the pandemic. (see D3.3 Implementation Monitoring Report).

#### **NBS in the Turin LL**

Table 9 - Turin's NBS

NBS	Title of the intervention	Status	Comment/conclusion
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2	New Soil production by Sangone Park	implemented	Monitoring activities are running	
	Mirafiori Castle's ruins recovery and new planting	in progress	Green maintenance is running	
	Gardens in Cascina Piemonte (Orti Generali)	implemented	Works finalized in 2019 - Accompanying activities halted by COVID19 restrictions	
	Pollinator friendly garden at WOW	implemented	Works finalized in 2020	
3	Gardens around the houses	in progress	Activities halted by COVID19 restrictions	
	School garden in box in progress		Activities halted by COVID19 restrictions	
	Micro vegetable garden in schools	in progress	Activities halted by COVID19 restrictions	
	Community school garden	in progress	Activities halted by COVID19 restrictions	
4	Aquaponic test system	In planning	The City is working for the tender	
	New green roof at Casa nel Parco	implemented	Works finalized in 2019	
-	Green wall in a school	implemented	Works finalized in dec. 2020	
5	Green wall on a homeless dormitory	implemented	Works finalized in dec. 2020	
	New green roof at WOW	implemented	Works finalized in July. 2020	
6	Green corridor	In planning	The City is working for the tender	



	Local natural heritage enhancement in green corridor	in progress	Activities halted by COVID19 restrictions
7	Tools for environmental compensation processes	In planning	The City is collecting local procedures and experiences within the Administration
8	Butterfly gardens in school and for disadvantaged people	In progress	Accompanying activities halted by COVID19 restrictions

### D. Zagreb LL state-of-play

### Short description of the LL

Zagreb LL is situated in a heavily fragmented urban area that is still developing, located in the eastern neighbourhood of Sesvete. The LL is approximately 128 000 m2, located on a former industrial site (Sljeme meat factory) – note that the brownfield are in the process of transferring ownership to the City of Zagreb. The NBS punctual interventions are clustered in the northern part of the LL. The LL has an important green corridor – NBS6 New bicycle lane, connecting the southern part (mainly a collective living area) with the other NBS interventions. The bicycle green corridor represents an important step in transforming the former industrial site and integrating it into the day-to-day life of residents, in a sustainable way.

An important element of the Zagreb LL is the local consortium, consisting of the local government body, municipal planning bureau, Faculty of Architecture, and local NGO representing a direct link with the local community, ensuring that their needs and expectations are taken into consideration during the overall implementation process.

The Zagreb LL was heavily affected by two events: the pandemic and the earthquake occurred in March 2020 – that resulted in relevant cuts to the municipal budgets and will potentially affect the implementation of some of the planned activities (D3.3 Implementation Monitoring Report).

### **NBS in Zagreb LL**

Table 10 - Zagreb's NBS

NBS	Title of the intervention	Status	Comment/conclusion
3	Modernization of existing urban garden	In planning	Public procurement procedure in progress



	New therapy garden in Sesvete	in progress	Construction has begun
	Info point	implemented	Operating since 2018
4	Aquaponic installation	/	Integrated with No 5
5	Seedling factory with aquaponics installations and green roof	In planning	Public procurement procedure in progress
6	New cycling track	In planning	Property issues are being solved before issuing of construction permit
7	New protocols	in progress	Partners working on several levels (Change of Regulation on Simple Structures, implementation of NBS and green principles into regulations and planning documents



# **Annex B: Challenges and Lesson Learnt**

This annex summarises the knowledge acquired during the proGIreg local regeneration and NBS implementation process in the FRC LL.

The first part of the annex focuses on the Challenges identified, whilst the second part summarizes updates on the level of NBS progress and "lessons learnt" in each FRC. The challenges component represents an important first step in constructing the Roadmap and the Replication Toolkit. The challenges identification was an analytic process of the information provided by FRC and FC (within the preliminary discussions), and synchronizing with D5.2 Report on technological barriers and D5.3 Report on non-technological barriers.

The second part of the annex, the *Lessons learnt* component is a collection of conclusions (based on previous discussions with FC and objective analysis of the work completed and reported mainly in D3.2 Implementation Plan, D3.3 Implementation monitoring report, and lastly a comparison with the information presented in D2.2 Spatial Analysis).

In conclusion, the *Challenges & Lessons Learnt* annex provides an overview of challenges based on the first two years of implementation in the FRC LL. The information contained in this chapter served as a first step for developing the RT and the Roadmap.

Since the implementation process in the FRC is on-going, continued regular exchange and close interaction between FRC and FC will ensure that adopted solutions are communicated. FRC act as mentors for the FC, offering inspiration and guidance.

# Challenges

Building on previous experience and learning from previous encountered challenges is key for an effective transformation of the URA. The interface between FRC and FC is a key opportunity for peer-to-peer learning of FRC transformation process.

The following table represents a synthetic set of challenges, occurred for FRC, and potentially valid also for FC. Is a database of common, most occurring challenges (and barriers), that applies to: (a) all the components of the planning/implementation process - General level challenges; or (b) it applies only to a specific NBS or set of NBS - Specific level challenges.

Key occurring challenges are presented in the following table, structured in phases: Preparatory work phase, Planning the LL/ URA transformation phase, From co-design to coimplementation phase, and lastly Implementation phase. These categories are the same as the phases of the Roadmap - the identification of the challenges being a process accomplished before the creation of the Roadmap.



#### Table 11 - FRC's most occurring challenges

Category	Challenges	Description	Level of impact
Preparatory work	Distribution of interventions within the LL	The distribution of the NBS interventions within the LL represents a major initial challenge because these decisions will heavily impact all the implementation procedures and further activities.	General
	Choice of the target group	The choice of the target group within the co-creation process is dependent on the LL transformation objectives.	General
	Creating the optimal local team to work/manage/maintain the intervention	In the absence of a local group (which is familiar with the project and its objectives), the planning process, the transformation of the LL and the implementation of NBS may be difficult to accomplish.	General
	Synergies with other planning initiatives and local projects	Projects starting from scratch are more difficult to be realized within a short time frame, this is why it is important to try to create linkages between local initiatives or existing infrastructure. Nevertheless, linkages could create also difficult interdependence situations that could lead to delays and complications.	General
	Environmental concerns	The environmental priorities for the LL must be identified and the solutions have to be planned accordingly - select the most suitable set of NBS in order to increase the quality of the environment.	General
	Integration into the local planning framework	Outdated city planning and regulatory documents represent a challenge towards the integration of innovative NBS.	General



Working on early In concepts re au pi du In cl st		In order to have early concepts, relevant experts and working groups are needed. Early concepts have the purpose of sparking discussions during the co-design process. Inevitably, the initial concept will change - have an open and inclusive structure.	NBS1, NBS3, NBS4, NBS5.
	Landowners' negotiation	Dealing with private landowners could be a major barrier in the preparatory phase, especially in the first steps of the process when clear objectives have not been defined yet.	General
Planning the LL/ URA transformation	Land ownership	Land ownership is a critical aspect when choosing the location of interventions within the LL and can be a great impediment.	General
	Timeframe	During a short timeframe, it is difficult to conduct negotiations (ownerships, target groups, users), generate secondary strategies, business models, and then actually build the NBS.	General
	Interdisciplinary & Intersectoral process	Having an interdisciplinary process, as well as a good collaboration between the different municipal sectors could result in valuable and creative solutions, but in many cases these collaborations result to be difficult due to local internal bottlenecks.	General
	Co-design in the case of technical interventions	In the case of more technical NBS, organizing community activities, such as co-design and co-implementation can be hard. Locals have to be at least up-to-date with the initiative.	General
	Citizen engagement	Lack of interest on the project of citizens, partly due to a lack of a rewarding system.	General



	Stakeholders' engagement	Lack of interest of major stakeholders (mainly private).	General
	Collaboration between different entities	Finding an agreement between different actors could be hard due to different interests. The level of collaboration is different according to the intervention proposed.	General
	Lack of knowledge (also applies to the following next two phases)	The lack of knowledge, expertise and/or experience regarding specific interventions could lead to the necessity of hiring external experts, thus incrementing the budget lines.	General
From co- design to co- implementation	Transition from co- design to co- implementation	It's important to keep a coherent approach when working with the local communities and local stakeholders. Actors who participated in co-design, also have to be involved in the co- implementation stage. At the same time co-implementation can be more inclusive to all actors.	General
	Synergies between NBS and timeline management.	The NBS selected must work well together and in relation to the urban context. At the same time, the implementation can benefit from NBS being implemented in the same area, although bringing timeline management complicacies.	General
	Sustainability over time	Ensuring sustainability to the implemented solutions requires a clear post-implementation plan addressing, in particular, the problems of roles in managing and maintaining the solutions and of funds.	General
Implementation	Contaminated land	The level of contamination must be analyzed and assessed if the remediation is feasible, from the point of view of costs and time.	NBS1, NBS2, NBS3, NBS6, NBS8



	Construction problems	Unforeseen construction problems can cause delays and increase the budget lines.	General
	Administrative procedures	Potential delays may occur due to the long periods of time needed for solving administrative procedures.	General
	Expensive technology	The design or implementation of the NBS may require the acquisition of expensive components, or the use of certain infrastructures and equipment that increase the expenses.	NBS1, NBS2, NBS4, NBS5.
	Immaterial resources	As concerns technical and specialized interventions, knowledge and proper training, represents the main challenge, possibly affecting the sustainability of the intervention.	NBS4, NBS5.
	Maintenance of the interventions	The maintenance could be challenging not only from the point of view of expenses but also from the point of view of human resources.	General
	Technical infrastructure	The construction of the technical infrastructure can be expensive, technical, and complex. Special expertise may be needed, and after that a comprehensive training for the local user, in order to fully take ownership of the intervention.	NBS4
	Technical operation	Most of the time a trained group of people is needed to ensure the intervention functionality, thus increasing the effort.	NBS4
	Local restrictions	Environmental restrictions or local challenges that impact the NBS' implementation, by restricting the construction conditions or by increasing cost unsustainably.	General



The table gives FC a general overview of potential obstacles of the URA transformation that FRC encountered in order to better manage the available resources and create a better synergy between the intervention and local context in view of maximizing the potential impact of the regeneration process.

# **Lessons Learnt**

This section presents recommendations directly presented by each FRC LL or extracted as a conclusion from previous deliverables.

The following Lessons learnt table is structured on two main categories:

- A Lessons learnt from preliminary stages of the planning and implementation process implementation process;
- B Lessons learnt from advanced stages of the planning and implementation process;



#### Table 12 - Lessons Learnt table

Lessons learnt					
Dortmund	Ningbo	Turin	Zagreb		
A - Lessons learnt from prelimi	nary stages of the planning and imp	blementation process			
<ul> <li>Prevention is better than cure – in order to enhance the NBS opportunities and reduce implementation threats, the project team developed a series of risk mitigation measures, for example: test soil where edible plants are grown / additional revenue streams or new business models have to be detected to allow higher budgets/ regular exchange of information within the project LL/ involve other city departments in the planning process/ careful documentation of work progress/ carefully select the locations of the NBS – to prevent vandalism/ start working on follow-up concepts early in the implementation process and encourage partners to integrate similar activities into future projects;</li> </ul>	<ul> <li>The Ningbo LL proved how important it is to have preliminary analysis and check-ups. NBS2 "Regenerated soil, transforming lake sediment into soil fertilizer" failed due to high concentration of heavy metals. The pre- implementation activities encompassed also in-depth analysis of contaminants. The measures taken will clean the lake from the polluted soil, but without transforming it into new regenerated soil.</li> <li>In the case of NBS3, local residents did not participate in the maintenance and management of the vegetation, but education activities are planned with the local school. When the nature of a NBS makes it hard to actively involve the local community in the decision-making process, transparency must be ensured,</li> </ul>	<ul> <li>The LL must assess external threats according to priorities and adapt. For example, the pandemic had a powerful impact – making the municipality realize how important food production is at local level. Thus, community gardens can have a bigger impact on the quality of life for local users than prior to the pandemic.</li> <li>LL Turin has established three main groups for the purpose of managing all the planning activities, each having a partner in charge of specific NBS activities such as new soil, widespread green, and crosssectional activities. In contrast to Dortmund LL, which has one group/team responsible for managing one NBS intervention, the Turin LL approach has the added value of a partner in charge of cross-sectional</li> </ul>	<ul> <li>Zagreb LL developed an efficient methodology of engaging the local residents to use the community garden (proposed before the proGIreg project). The methodology consists in giving the land only to one member of the joint household and is addressed only to people who do not own, co-own, lease or use any other arable land.</li> <li>The municipality planned to foster social inclusiveness through a cycling track connecting a peripheral, isolated neighborhood to the Sesvete center and to the main green infrastructure.</li> <li>The co-design workshops were guided to strategically involve potential stakeholders to participate in the planning phase as local users.</li> <li>Ownership status represents a significant challenge - In the case of Zagreb, one of the city's companies managed to acquire a property for the implementation.</li> </ul>		





Identifying suitable locations is difficult when the municipality added value, but it can only lacks land/buildings in the LL, encompass awareness-raising • e.g., NBS4: Aquaponics. in this activities. Nevertheless, the case FC must negotiate with community must be constantly updated and consulted regarding various stakeholders to find a all interventions – transparency suitable option. is a must. It is important to harmonize as • In the process of working with much as possible with other • local development plans, schools in implementing dedicated interventions (to be events, local activities - it is mainly used and capitalized by important to maximize the the educational institution), dissemination. teachers must act as the link Dortmund LL adopted an between the project, students, approach to NBS sustainability and parents (involving parents over time - each NBS widens the overall environmental intervention is managed and `owned` by a local group of education impact). NBS3 – Community-based urban people (from local schools, farms and gardens, are well scouts. NGO and certain university departments). developed in the LL Turin, with a total of 7 specific interventions, The Business-Model (BM) each one having its own adopted must ensure the character and target group. This intervention outlives the results in a high-level impact on proGlreg project – for example Dortmund's green corridor/path the community environmental behavior. If the intervention is will be maintained by the local relatively small and addressed to waste disposal company. a single target group, the key towards success is to scale it up and diversify the typologies of interventions as much as

collaborative approach is an

possible.

point has been assigned to a local NGO.

- Zagreb LL NBS3 started from an already successful intervention of a community garden and has planned to upgrade the existing infrastructure with solar purifying water pumps.
- Zagreb LL has clustered two NBS into one single structure: a green roof (seedling factory) and aquaponics. Furthermore, the building chosen for the installation of the solutions will serve as a community hub, also hosting a green technology center.

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# Annex C: Tips and tricks

The *Tip and tricks* provided in this annex which resulted only from discussions and questionnaires with the FRC. The following topics were addressed: stakeholders' engagement, issues regarding the private ownership of plots in the LL, collaborative working and co-design processes, the evolution of the implemented NBS, and how the community has taken ownership over the LL. All the information provided in this annex are extracted from FRC's response to the question *"what kind of tips would you give to FC in order to facilitate their implementation process of NBS?"*.

## Dortmund

- Starting with a good campaign to attract a critical mass of the local community attending the first co-design meeting can ensure success and acceptance of the project's initiative
- Get political approval in the first stage of implementation – in this way the proGIreg project team can better coordinate with other municipality departments
- Hire experts if there is a lack of knowledge in the team/work-group
- Make the project interdisciplinary to be successful
- Tailor each NBS to its specific local context and avoid a copy-paste process



Figure 19 - Deusenberg path, Source: www.progireg.eu

## Ningbo

- Find common interests. Each stakeholder has its own concerns and expectations, which may result in conflict of interests. Communication is key, common interests have to be found and maximized, having the potential of overcoming conflicts.
- Personnel responsibilities must be clear, and internal communication must be strengthened to prevent inefficiency.
- The Private-Public-Partnership model for funding could be a useful potential source of funding for municipalities in need.



Figure 20 - Ningbo LL, Source: www.progireg.eu



### Turin

- Apply a systemic/integrated strategy even given a disconnected territory the diffused green development approach.
- Industrial buildings spread all over the city represent an implementation barrier in the case of Turin LL, the approach used to overcome the issue was to have punctual interventions, with the purpose of germinating other (potentially bigger) ideas, in the sense of social and environmental regeneration.
- Roof gardens, even if not accessible by all residents, are still an added-value to proGIreg vision – cluster similar interventions with other compatible ones can increase the impact.
- Engaging private entities and citizens in the participatory process can be a challenge. Turin LL used an innovative instrument called Urban Common – it gives the possibility to find possible forms of collaboration, allowing groups of citizens to be actively directly engaged in (greening) activities within public buildings or areas.
- In the case of strict pandemic regulations, it becomes very difficult to start new interventions and engage people with whom the municipality has not created a connection yet – it is important to engage on a certain level from the beginning of the project.
- Find creative ways of engaging with marginalized groups (e.g., disabled people/ children).



Figure 21 - Community gardens in Turin, Source www.progireg.eu



## Zagreb

- At city-level it is important to preliminary analyse the green spaces' system, and then plan the next layer which is the GI and NBS.
- Working with the local NGOs (preferably already involved in similar initiatives) can really help in the organization of co-creation workshops.
- As concerns Zagreb's co-creation process, it started after the NBS solutions framework was completed.



Figure 22 - Community gardens in Zagreb, Source www.progireg.eu

As a general recommendation, the co-creation process can start before and/or alongside the NBS framework - promoting the process at local level is very important.

- Having a proper co-creation process can result in innovative and creative ideas: for example, in the case of Zagreb LL, the idea for a therapeutic garden was born during a community collaborative workshop.
- It is essential to promote this kind of initiative and raise awareness on the benefits related to their implementation.
- People need to see implementation happening starting with one small area in order to showcase actual results could be a good initial approach.