URBAN GreenUP

D1.10: Evaluation and scaling up plan

(Follow up D1.18)

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0 Abstract

URBAN GreenUP introduces the concept of Renaturing Urban Planning, which incorporates NBS alongside the traditional urban planning aspects to generate a more sustainable approach to Urban Planning. In parallel to traditional planning processes, the methodology supports cities in the direct implementation of one or more NBS in a specific area or across the city to address specific societal challenges in a more effective and ecologically sustainable way.

Selecting the right NBS for a city is a very important part of a RUP. Guarantying the proper maintenance of them, and continues replication and/or scaling up, will contribute to the final positive impact even more. The main goal of this action is to prepare the up-scale action plan in accordance with the assessment of the Risk and potential Impact for selected NBS.

As same as there are big differences between cities in Europe, and around the world, there are certain differences between different areas of the same city. An NBS that is very successful in one city/ or city area may completely fail in another.

The key criteria influencing the final replication and scaling-up process, across different cities and different areas, have been conceptualized:

- The different organizational strengths and weaknesses and different NBS place different demands on those NBS. Important factors like political support, legislation, and organizational integration are vital determinants of what NBS is suitable for.
- The different challenges that they are facing. A city facing heat island effects and flooding may require a very different NBS to a city that is seeking to deliver urban renewal and improve the health and well-being its residents.
- Finally, different abilities to pay for the construction and maintenance of new NBS.

Understanding how a city may replicate NBS that have been successful in other cities, or/and scale them up to the different city's areas, requires a good grasp of the factors that make NBS suitable for different contexts.

This holistic approach to the methodology builds in part on the experience of the cities involved in Urban GreenUP. This includes both successes and problems encountered in the 'real world', and lessons learned through the process of implementing NBS in the 'leading' cities of Liverpool (UK), Izmir (Turkey), and Valladolid (Spain), and simultaneously validated in 'follower cities of Mantova (Italy), Ludwigsburg (Germany), Medellin (Colombia), Chengdu (China), and Quy Nhon (Vietnam).

The characterization reports from each participating city (front runners and followers) validated the mapping of the common driving pressure and social and natural conditions that entail the implementation of NBS to address the driving pressures with the RUP process and certain key indicators for the proper replication and scaling up of the demonstrated NBS or NBS catalog developed under this project.

1 Definition of concepts

Re-naturing City Methodology – methodology for supporting the Re-naturing of the cities and/or areas, that will include new concepts as Re-naturing Urban Plans RUPs that will let embrace the climate change challenges.

NBS – Nature-Based Solutions - can provide a multitude of benefits that influence human health, lifestyle, and well-being, can improve air quality, reduce local temperatures on a small scale, act as carbon stores, help on mitigation of climate change, reduce flooding disasters overcoming the adaptation to climate change and be an important habitat for wildlife.

RUP – Re-naturing Urban Plans – which incorporates the urban planning aspects directly related with nature-based solutions as major strategy to fight against climate change. It will be part of the Sustainable Urban Planning and totally integrated with the urban strategy for dealing with the main city challenges.

Methodology Component – All components needed for methodology developments, those could be activities, but also, catalogues, guides, decisions.

Methodology Processes – methodology activities that analyse/ define/ evaluate the methodology concept, and create corresponding outputs, in many cases, basing also on inputs from different activities.

Methodology Procedure – methodology output related to the systemized step-by-step activity for Re-naturing Methodology Implementation.

Input – Information coming from other project processes, or external, not developed in the project but needed for methodology definition.

Output – Information created in a project process, could be an input to other project process.

Workflow – relation among different project processes and components. It also indicates the correct direction to implement the methodology.

Zoning – The term “zoning” has several meanings and can often be used to identify areas that have statutory policy in place for their development and management. In other cases, zoning can be a generic term for identifying “areas of focus” or interest that have no statutory implications. In this document the term zoning is used to refer to targeting areas for NBS.

Co-creation - an advanced, modern form of community engagement.

Scaling up – The term “scaling up” in its pure definition it is to make something larger in size, amount, etc. In this document, the term “scaling up” refers, to the set of processes, methodology based, providing a larger scale of implementation of NBS strategies. The viability of the scaling up will be identified according to how, “Credible, Relevant, Relative advantage over existing practices have, Easy to adopt, Compatible and Able to be tested” the methodology is.

2 Background

The aim of this report is to provide cities with a useful guide to the re-naturing process of cities and/or areas. It explains one of its main actions on scaling up. It develops the procedures of evaluation of economic, technical, social and environment maters. It defines the way in which a successful scaling up will be done, to get a methodology that will be able to embrace all the scale of challenges, in different parts of the world, with different cultures, different environments and in different scales of cities and complexities, generating a relevant impact that improves the city and the wellbeing of the citizens.

The scaling up procedures is strictly dependent from the methodology outline proposition, its different phases and step-by step action plan, as well as the final definition of the rest of the URBAN GreenUP methodology components to be updated the current month.

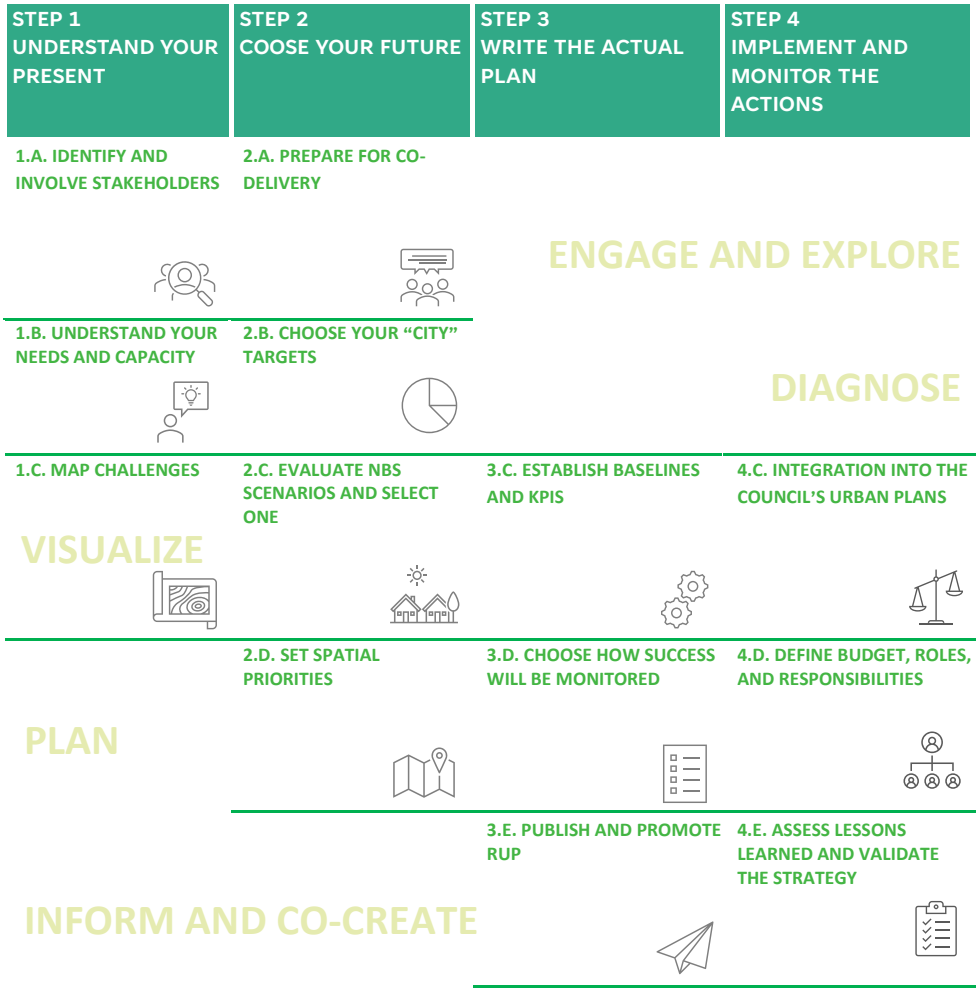
- Diagnosis procedure Guide *(URBAN GreenUP D1.3), Source: URBAN GreenUP, December 2020*
- Baseline Calculation Guide *(URBAN GreenUP D1.4), Source: URBAN GreenUP, December 2020*
- NBS scenarios generation Tool *(URBAN GreenUP D1.7) with KPIs prioritization criteria Guide (URBAN GreenUP D1.8), Source: URBAN GreenUP, December 2020*
- Methodology Guide *(URBAN GreenUP D1.14 RUP Methodology and D1.17 Methodology Validation), Source: URBAN GreenUP, December 2022/ and February 2023 recently available,* https://www.urbangreenup.eu/resources/deliverables/Introduction to scaling up process

3 Methodology to RUP on behind

The methodology proposed by URBAN GreenUP project provides a way to implement Nature-Based Solutions (NBS) in urban areas, which are defined by the European Commission as *"solutions that are inspired and supported by nature (Cohen-Shacham et al., 2016), which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. (Maes J et al., 2015)" (Source: Sustainability 2020).*

To support re-naturing journey of the cities, URBAN GreenUP developed a systematic strategy, to reach high level of impacts using NBS. It aims to provide an integrated methodology to support the Urban Planning of NBS at the local city level, as a powerful strategy to contribute to increase sustainability, addressing a range of societal challenges.

Table 3.1: Graph to the methodology main components by phases, steps, actions and RUP chapters (Source: URBAN GreenUP).



URBAN GreenUP introduces the concept of Renaturing Urban Planning, which incorporates NBS alongside the traditional urban planning aspects to generate a more sustainable approach to Urban Planning. In parallel to traditional planning processes, the methodology supports cities in the direct implementation of one or more NBS in a specific area or across the city to address specific societal challenges in a more effective and ecologically sustainable way.

This step-by-step methodology is not conceived as only a linear process, but as circular one. The outputs coming from Action (4.E.) related the assessment of the lessons learnt and validation, is considered the last action of the Step4. "Implement and Monitor the Actions", but also as a key input to Step 1. "Understand your Present". The lessons learned gathered from the RUP process executed as a first in your city, will give valuable information for an improvement of the process during the replication and/or scaling up of the RUP Action Plan to another city zone, as same as the City Green Goal maintenance in time.

The social aspects are also considered one of the main key elements, and the economic issues complementing the environmental one, fostering the creation of good business cases to solve the general lack of budget of the public administration. To achieve good outcomes, a co-creation approach is adopted in the definition of the methodology, from the definition and design of the technical solutions to the final assessment. This ensures that NBS are adapted to the local context, that they address local priorities and needs of stakeholders, and work within the opportunities and constraints of the local context.

3.1 The successful projects

Smart City projects seem to remain in the planning or pilot testing phases, as concluded by EU studies (Source: EC, Industry, Research, and Energy), where the representative sample of 50 Smart City initiatives across 37 cities, taking account of city size, geographic location, initiative characteristics, objectives, stakeholders and governance, funding, and achievements. The analysis shows that successful projects are those with clear objectives, goals, targets, and baseline measurement systems in place from the outset. Successful projects also tend to be embedded in a comprehensive city vision.

3.2 Scaling the RUP objective

The principal aim is to contribute to sustainable urbanization and the application of sustainable urban and energy policies for development in the context of Climate change. This has clear scope and possibilities for cooperation in areas of transport (particularly public transport), solid waste management, sewerage & sanitation, energy, and others. Cross-cutting topics such as project development, technology integration and sourcing, and project financing need specific attention.

The objective proposed for the scaling-up step is to develop the procedures of evaluation of economic, technical, social, and environmental matters in different city scales and the way in which a successful scaling-up will be done.

URBAN GreenUP the same applies the term "scaling up" the set of processes, methodology based, providing a larger scale of implementation of NBS strategies. Its viability of the scaling up will be identified according to how, "Credible, Relevant, Relative advantage over existing practices have, Easy to adopt, Compatible and Able to be tested" the methodology is.

The information generated will allow the calculation for the KPI´S corresponding city baselines (NBS based) and the level reached with respect to the targets defined. Thanks to monitoring procedures integrated to the City Urban Plans RUP, the scaling up to the city zones, districts, cities will be continuously improved.

4 Scaling up principles for cities

4.1 Scaling up definition

Scaling up strategies in fact following the Smart City objectives in sense of their replication or empowering. URBAN GreenUP methodology seeking to address re-naturing issues via NBS-based solution on the basis of a multi-stakeholder, municipally based partnership.

Scaling up of that concepts treats issues like an increase in the territorial scale of NBS offer, dialogue with higher order plans, periodic revision and adaptations, internal improvement of the plan parameters.

Should we distinguish a range of scaling strategies? *(Source: EU, IR&E)*

- **Replication** repeating initiatives and Smart City Strategies in other locales
- **Scaling** increasing of number of participants, resource allocation, geographic footprint or offering services more widely
- **Ecosystem seeding** using Smart City initiatives as the basis for an adaptive network of interacting initiatives

However, to come to larger scale implementation of Smart cities and Communities strategies and exploitation of the pilot project results, the following definition has be given to upscaling:

- Upscaling ≠ growing Labs/ diffusion (i.e. the experiment continues with more actors /stuff)
- Upscaling ≠ replication of Labs (i.e. similar Labs on other location(s))
- **Upscaling = the emergence of a set of novel practices (such as new governance practices or mobility practices), learned from practical experiments, with corresponding new structure and culture elements** *(Source: European Innovation Partnership on Smart Cities and Communities)*

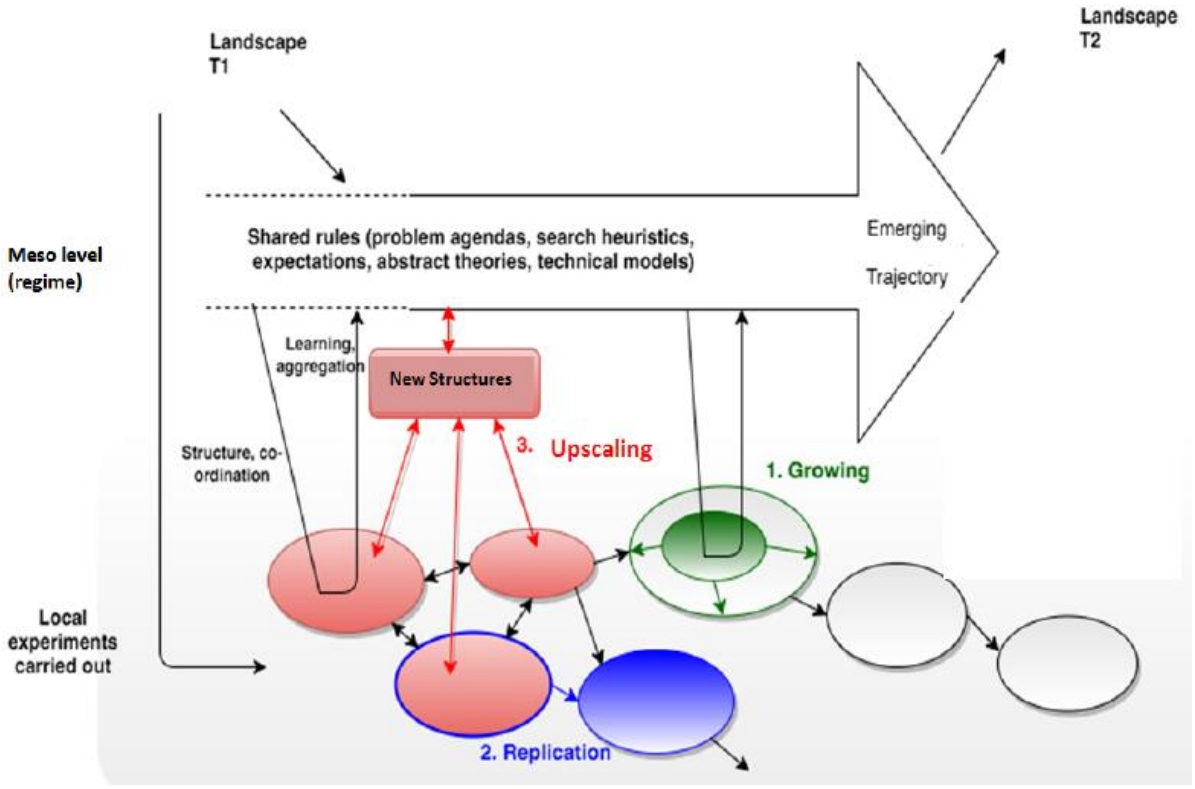


Figure 4.1: Scaling up vs replication concept by Marc Dijk of Naber (2016) and Geels and Raven (2006), (Source: European Innovation Partnership on Smart Cities and Communities).

4.2 Cities factors across EU

The potential to scale up the city initiatives, and RUP re-naturing process, should follow the same factors that are indicated to smart cities in general. The process should be crossed with different city grow strategies proposed and the baseline referenced.

"Three important factors for successful Smart Cities and the deployment of solutions: a clear vision; the involvement of citizens, representatives and local businesses; and efficient processes" (Source: Mapping Smart Cities in the EU, European Parliament's Committee on Industry, Research and Energy, 2014). Where, the **successful initiatives** are defines as: observable indicators through the life cycle of the initiative: attracting wide support, having clear objectives aligned to policy goals and current problems, producing concrete outcomes and impacts, being imitated or scaled. The **successful cities** concluded as: having meaningful objectives (aligned with Europe 2020 and actual outcomes) covering a mix of policy targets and characteristics; having a balanced portfolio of initiatives; attaining maturity (on our scale); actively joining in Smart City networks.

Table 4.1: Factors for successful Smart Cities adopted in URBANGreenUP methodology

Factors for success	Description
Vision	*"The study makes clear that inclusion and participation are important targets for successful Smart City programs to avoid the polarization between the urban elite and low income areas." (Source: Mapping Smart Cities in the EU, IR&E)* The objective of URBAN GreenUP is to deliver trans-disciplinary and community-based stakeholder engagement strategy including the social sciences and humanities best practices in the co-design, co-development and co-implementation of the city´s NBS projects. The engagement-oriented program focuses on the social benefits of engaging with nature, biodiversity and green spaces in cities.
People	*"The case studies highlight the inspiring leaders ('city champions') behind many successful initiatives. Citizens should be empowered through active participation to create a sense of ownership and commitment, and it is important to foster participative environments that facilitate and stimulate business, the public sector and citizens to contribute." (Source: Mapping Smart Cities in the EU, IR&E)* Local people and experts can hold highly relevant knowledge for the management of NBS, ranging from cultural history to geomorphology. Involving a range of stakeholders can offer much needed trans-disciplinary approaches to tackle complex modern problems. Collaboration of diverse stakeholders such as governments, NGOs, scientists, interest-groups, philanthropists and charities are likely to enhance the social and environmental outcomes of NBS. Once identified, this list of stakeholders becomes a central part of your project, as many of these groups will be involved in the development and implementation of the RUP at some level. It is important to identify these parties early and plan to involve them appropriately in your project.
Process	"*The creation of a central office that acts as go-between for Smart City ideas and initiatives, drawing in diverse stakeholders, is of vital importance and allows coordination of ideas, projects, stakeholders and beneficiaries. Local level coordination can also be important for uptake, to ensure the integration of solutions across the portfolio of initiatives." (Source: Mapping Smart Cities in the EU, IR&E)* The URBAN GreenUP guide to the methodology helps in definition of all the outputs needed, following the step by step action process to city re-naturing plan. The RUP informing channels for the RUP promoting initiative at the municipality level and from the early beginning developed. In addition, the information and discussion channels will be performed, to gather the feedback and propositions from different stakeholder groups, and to assess the NBS scenario adopted. The currently identified legal aspects, tendering process, but also the technical constrains, specified with the roles and responsibilities, and articulated the different stakeholders that will take part in it, allowing the correct implementation and maintenance of the RUP.

4.3 Scaling up drivers

The supporting actions to the scaling-up process are listed below:

- **European and regional politics NBS based, supporting the local growth,** promoting sustainable city growth, energy efficiency, and air quality, and guiding the environmental, social, and economic aspects of the city
- **NBS as a driver to overcome the city emergent problems, in reference to the city barriers associated to zones** Political barriers; Technical barriers; Legal / Organizational barriers/ Administrative; Social / Cultural barriers; Financial/ Economical barriers (conflictive zones, bleak, deserted, low-economic, low air quality…between the others more specific).
- **Local NBS initiatives lunched by the local network in link to the challenges adopted by city** URBAN GreenUP approach contains 10 challenges (Source: based on classification created by the EKLIPSE initiative): Climate mitigation and adaptation; Water management; Coastal resilience; Urban green space management (including enhancing/conserving urban biodiversity); Air/ambient quality; Urban regeneration; Participatory planning and governance; Social justice and social cohesion; Public health and well - being and Potential for new economic opportunities and green jobs.

4.4 Scaling up local targets

Selecting the right NBS for a city is a very important part of a RUP. There are big differences between cities in Europe, and around the world. An NBS that is very successful in one city may completely fail into another.

The analysis should start with identification of the objective depending on the specific city character, targets proposed, and it's scaling up dimensions. It is not the same to treat with the Smart City neighbourhood units, or rather, testbed micro infrastructures, we are focusing on Intelligent traffic systems, or potential the resource management systems and participation platforms.

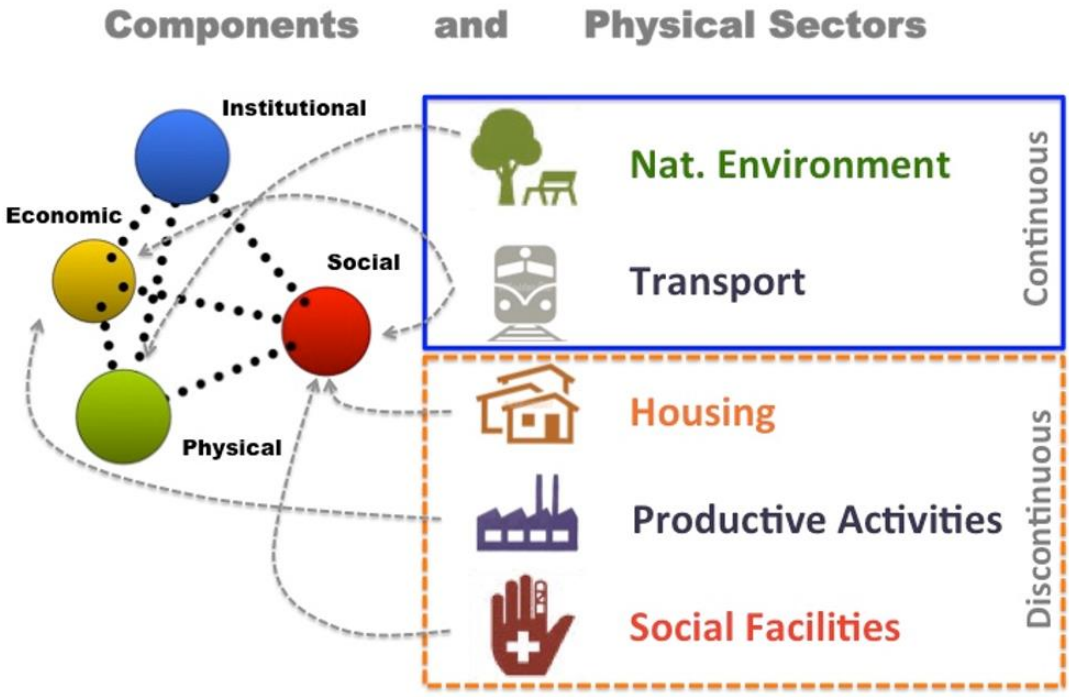


Figure 4.2: Metropolitan strategic components (Sources: Guide to the Metropolitan Plans: Pedro Ortiz, 2018).

NBS as part of the continuous system (natural environment) is attached as a Green network (waterways, green integration) and Green-Grey integrated system in interaction to other components like:

- **Transport** - has to be an INTER-MODAL connection
- **Places of work** – you need the people that are working there (industrial activity)
- **Residential spaces**
- **Institutional buildings**
- **Social facilities** (schools, etc.)
- **Public spaces** with identity of the place.

Understanding how a city may replicate NBS that have been successful in other cities requires a good grasp of the factors that make NBS suitable for different contexts. We have conceptualised key suitability criteria for replication, as conceptualised below:

- **Cities have different organisational strengths and weaknesses**, and different NBS place different demands on those NBS. Important factors like political support, legislation and organisational integration are vital determinants of what NBS are suitable.
- **Cities also have different challenges that they are facing**. A city facing heat island effects and flooding may require very different NBS to a city that is seeking to deliver urban renewal and improve the health and wellbeing of its residents.
- **Finally, each city will have different abilities** to pay for the construction and maintenance of new NBS.

You have two plans:

1. Strategic
2. Structural.

Plans with words - taking all stakeholders expectations including Mayors, Banks, etc. That are large views.

Plans with figures – this is when the main players come – the CEOs of the biggest banks, and the main airway company, etc. This is in detail and determines success. Here you extrapolate the words of metropolis into figures and see tendencies. See which are working and are good. See which are not working and remove them. But plan for what is needed. This is much more expensive. Fully cooperative state is very dangerous. Organic democracy is not a democracy. You cannot keep listening. If the planning is made only by the decision makers – it is not what the planning should be.

The same we can differentiate the types of planning according to the existing city structures:

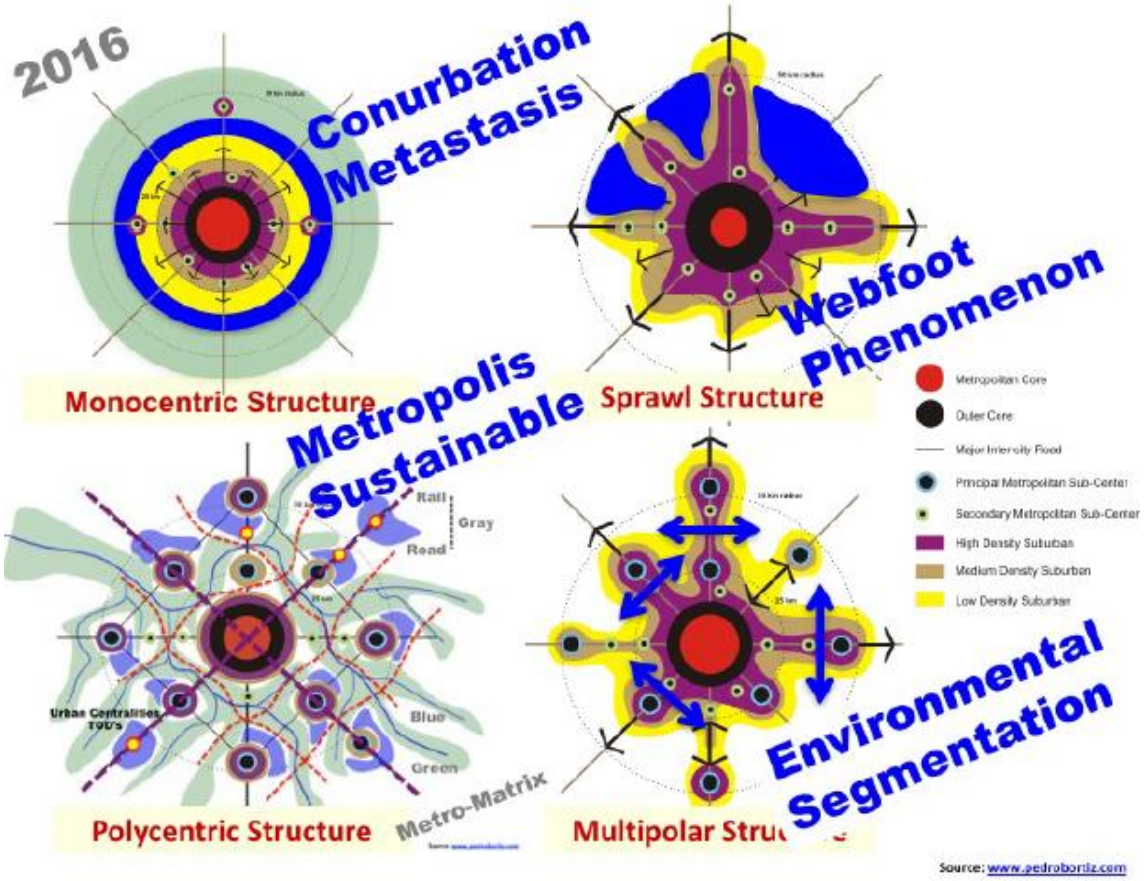


Figure 4.3: Metropolitan models: Monocentric, Sprawl structure, Multipolar, Polycentric Structure (Sources: Guide to the Metropolitan Plans: Pedro Ortiz, 2018).

- **Monocentric structure** (does not work = Conurbation: English invented the green belts but it did not work);
- **Sprawl structure** (does not work – Webfoot phenomenon, and it is very tough to control and environment gets cut),
- **Multipolar structure** (Environmental – you should not cut and put barriers to the environment). The only type that works is the poly-centric structure.

An adequate planning for upscaling: could be a reticular organization (grid), geography adapted (coast, rivers, pass, and valleys) and history: planning governors.

4.5 Scaling up diagnosis factors

- Environment (Zone)
  - Green network (waterways, green integration).
  - Green-Grey integrated system.
- Culture and heritage
- Challenges: creative cities, define and give social behaviour, urban health (COVID19), social equity (NBS for all).
- Cities growth expectation.
- City Scale (Region, Satellite City, District, Street): **sustainable time**
  - Interaction and integration with suburban villages and proximate cities.
  - Synergies with other cities around the world.
  - Permeability with other systems.
- City specific barriers
- Impact results gathered (experienced)
- Risk associated
- Economic and funding capability
- Social acceptance and initiatives
- Municipality capability and connection

4.6 Scaling up plan components

The scaling up Action Plan and the timeframe associated are the key point of the upscaling implementation success and important point of the RUP re-naturing process in the City.

The Goals and Objectives in form of long term strategic vision: What is the city future scenario, what the city wants to be?

The same, the scaling up plan influences the sectors, and requires its involvement from the early beginning. The municipal sectors like:

- Urban Planning (Public Spaces)
- Public Building and Spaces
- Social Facilities
- Urban Mobility
- Energy efficiency

- Environment
- Health (Air Quality)
- ICT infrastructure and services
- Citizen engagement

Scaling up Scenario the result scenario coming from the scaling up diagnosis process. It includes different visions according to the city goals compliance, with focus to NBS, but also to the city risk in case of the incompliance.

Helping Tools: like workshops, weblogs (webinars + dialogues with experts: urban developers, economists, environment experts, doctors-healthy cities). **Workshops** pass to practical study cases through co-creation actions. Similar to the RUP re-naturing process, its diagnosis and scenarios definition, the tool (activity) may be applied in continuation to the scaling up objectives.

- Description: address local needs.
- Engineering (infrastructures needed, timing, phasing, and costs).
- Finance: cost-benefit analysis, involved institutions, social benefits.
- Governance: structure of the city and possible evolution.

Master Scenario is selected after setting up of the different scenarios definition, crossing re-naturing decision (yes/no) with the city vision concerning the key challenge selected (yes/no). Once selected the most promising one, the strategic objectives of the plan are to be created. Following its objectives, several main axes and strategic lines will propose sectorial groups of actions, to fulfil the city vision chosen (indicating the timeframe), which is intended to be achieved by the identification of the specific NBS projects under each of those strategic lines. Each of those projects will present an estimation of budget, a description, and key responsible of development.

The establishment of the baseline condition in the locations where the interventions will be implemented, e.g. within a region, city, or neighbourhood is a base action. This action must therefore include the development of key performance indicators (KPIs) for monitoring this baseline condition, to allow for direct comparison before and after the interventions. It must also link to the diagnosis process and provides clear links between the identification of key needs, opportunities and barriers to investment in NBS.

Scaling up impact assessment. KPIs adapted to each scale. A characterisation report template has been prepared to enable cities to characterise their specific contexts, in terms of important variables like climate, organisational traits and built form. The replication methodology is developed from the analysis framework drawing from cluster analysis of the best suitable NBS for certain characterizations of urban pressures and its indicators. The characterization reports from participating cities (front runners and followers) will be cluster with common driving pressure, social and natural conditions that entail the implementation of NBS to address the driving pressures. Together with the situational institutional conditions of each cluster, the analysis framework will produce recommendations for the proper NBS implementation and replication in other cities with similar conditions. An analysis framework for the cluster of driving pressures mapping with corresponding NBS under the enabling conditions will be produced and

documented with certain key indicators for the proper replication of the demonstrated NBS or NBS catalog developed under this project.

NBS Challenge*	Indicators	Current Impact	Expected Impact
Ch1-…	KPIs LIST	Base level	Proposed level

Figure 4.4: Logic to the scaling up of KPIs proposal (Sources: URBANGreenUP).

Monitoring Process Assessment. Procedures definition to the evaluation and in the way of data collection. One or more analytical tools to be prepared to facilitate testing of capabilities and matching of NBS to desired impacts. The tool(s) may help cities to understand their strengths and weaknesses, and recommend NBS that align with their needs and organizational capabilities. The viability of the scaling up will be identified according to how, "Credible, Relevant, with relative advantage over existing practices, Easy to adopt, Compatible and Able to be tested" the methodology is.

Lessons learned from cities of reference: The guideline to the scaling up plan is alimented with URBAN GreenUP learns from lighthouse cities initiatives, and the results of the implementation process for city of Valladolid (Spain), Izmir (Turkey), Liverpool (UK) and continuously networking with the follower cities according their specific needs, barriers, objectives and difficulties found in RUP plan definition process.

5 RUP approach scaled upped

The scaling up process follows the actions proposed to the RUP re-naturing process, however focus to specific scaling up factors indicated, empowering the same the impact of the previously considered interventions.

1. **Recapitulate the process until the generation of the vision** (Diagnosis, workshops, Master Scenario, Vision) – RUP re-naturing process presented *(SourceURBANGREENUP D1.13)*
2. **Strategic up-scaling planning** (Strategic Objectives, Strategic Areas, Strategic Lines, Identification of Actions) – Scaling UP process
3. **Development of actions** (action cards by strategic line and project)
4. **Next steps** (development of actions, follow-up, monitoring and evaluation)

The integration of the contents of the scaling up plan, into the municipal land-use planning and strategies, may decide on final success or failure of the RUP re-naturnig plan.

The establishment of the the logic chain and/or decision-making framework needed to define a coherent set of KPIs and targets for improvement, which need to link to both a city's priority challenges and the specific types of NBS that are being planned.

This action should include development of a user-friendly monitoring protocol, which describes the rationale behind each KPI and will be built upon in step 2E with the development of methodologies, based on best practices in the natural, physical, and social sciences. The baseline and KPIs must also be context-driven and developed in light of any legal, technical, and social considerations within the city (e.g. staffing, expertise, physical conditions of the site).

5.1.1 Scaling up guideline

The methodology is divided into steps, and each step contains the actions, that lead to the creation of the "Renaturing Urban Plan" (RUP) Action Plan of the city. The link between the different actions, the key outputs across different steps, and all the supporting tools to be used during the RUP upscaling process are explained in the continuation of this report.

The actions directly or indirectly connected to scaling up, with the objective to increase the success of the initiative:

- STEP I. Understand Your Present
  - **Understand your needs & capacity** (1.B.) detailing the city scaled upped profile and preparing the NBS implementation at new area/zone.
  - **Map challenges** (1.C.) according new areas.

- STEP II. Choose Your Future Aspirations
  - **Prepare for co-delivery** (2.A.) preparing a clear engagement Plan which outlines clearly how your stakeholders will be involved in preparing and delivering the RUP.
  - **Choose your "city" targets** (2.B.) identifying the "city" extended NBS target and translating it into new challenges and sub-challenges (if any)
  - **Evaluate NBS scenarios and select one** (2C)
  - **Set spatial priorities** (2.D.) identifying the priority precincts for actions – where will the NBS go.

- STEP III. Write the Actual Plan
  - **Establish Baselines and KPIs** (3.C.) establishing the scaled upped baseline condition and its measurement system in the locations where the interventions will be implemented e.g. within a new region, city area, or neighbourhoods.

- STEP IV. Implement and monitor the actions
  - **Assess lessons learnt and validate the strategy** (4.E.) preparing the assessment of the new or/and scaled upped risks and potential Impact for selected NBS.

Once the city vision and the NBS scenario of the city has been concluded, the assessment of risk of NBS implementation established, the evaluation aspects can be concluded, the budget estimated, and the roles and responsibilities concluded.

- STEP III. Write the Actual Plan
  - **Choose how success will be monitored** (3.D.) helping cities to choose and prioritize KPIs. In addition, with this action, a framework will be drawn on monitoring the results of NBSs to be implemented, taking into account the challenges and needs of the cities.

- STEP IV. Implement and monitor the actions
  - **Define budget, roles, and responsibilities** (4.D.) carrying out an implementation of an upscaled plan for the RUP designed for initial areas, to integrate it into the municipality, defining roles and responsibilities, and designing a financial plan.

5.1.2 Understand your needs & capacity

Understand the city needs

Organize a city workshop to create a common picture of the future city and develop scenarios in detail. With this process, you will be able to identify the city goal and character of grow. These local scenarios are created with different NBS solutions proposed in "NBS Catalogue". Use deliverable D1.3.

The works can be supported by the specific city workshop with the group of interest will be useful in the development of:

- Key city areas to reform
- List the challenges
- Prioritization of challenges
- NBS main groups and examples
- Prepare the current re-naturing initiatives
- Prepare previous lessons learnt
- The Stakeholder consensus should be reached in accordance with the listed aspects above, and the list of the challenges and its prioritization should be proposed.

Understand the city capacity

Analyze the different factors of the city and surrounding the potential NBS implementation. Obtain city information covering aspects such as:

- Site analysis (geomorphology, water, subsoil, vegetation, but also and for specific climate definition, solar impact, average temperatures, wind direction)
- Zoning analysis (construction and public spaces balance, and equipment's, build environment character, use of soil, construction elements available for NBS)
- Legal regulations NBS related
- Other specific city data related with the city
- SWOT chart, that compilates and classifies the Strengths, Weaknesses, Opportunities, and Treads.

Depending on the specific city context (including political, technical, legal, social, and financial implications), as well as different NBS characteristic and needs, we will have to consider some influential advantages and disadvantages of their potential integration. Some NBS strategies will work better in some situations, being unnecessary until damaging the functioning in others.

Classify the Strengths, Weaknesses, Opportunities, and Threats (SWOT) prioritizing the most urgent and important, and those improbable, for NBS implementation in the local city context. Use D1.3

Create a SWOT chart for diagnosis process and selection of the best strategies supporting RUP. This methodology allows cities to analyze the problem from the point of view of the different factors:

- **Offensive.** To eliminate all Weaknesses and Threats
- **Orientation**. To take advantage of Opportunities, and improve the Weaknesses
- **Defensive.** To protect the Strengths and minimize the Threats, or avoid them
- **Of survival.** To avoid Threats and to reduce the Weaknesses

TIPS FOR MUNICIPALITIES REGARDING THIS ACTION:
• Organize the first meeting between the Stakeholders • Try to wonder on what if we do not have actions to "re-naturing" • Try to consider the period of at least of 10 years • Try to recuperate the previous lessons learnt (if exists)

5.1.3 Map challenges

Identify the focus areas for NBS

The main goal of this action is to define the green infrastructure picture, identifying the key areas of focus for each challenge and NBS. This step is crucial in the development of the RUP. Understanding the range, scale and complexity of the challenges facing a city is essential if arguments for NBS are to be made and resources found to implement NBS.

Data is often available from local or national government for many of the challenges that may need to be addressed in a city. This data has the advantage of being linked to statutory plans and strategies and therefore, it has already been accepted as a robust dataset.

A basic RUP may simply look at national/regional strategy and policy and assess how these are being addressed locally.

TIPS FOR MUNICIPALITIES REGARDING THIS ACTION:
• The use of Geographic Information Systems is, in almost all cases, essential. There are several commercial and free to use systems available, but if special data is not available, it may be possible to use the information to provide context for the RUP, but this is always going to be less useful and less robust than mapped data. • Ensure that you a clear scope is provided for gathering data. There is a vast array of data available, and it is easy to gather more and more date sometimes more does not mean better. Gather fewer, high quality data sets that clearly show the scale and distribution of the challenge. • If possible, ensure that your project budget allows for a GIS specialist to manage data and produce the challenge maps. • Catalogue the data gathered and describe how it is used to produce the challenge maps

Recommended tools: GvSIG QGIS GeoServer

5.1.4 Prepare for co-delivery

Prepare a clear engagement plan which outlines clearly how your stakeholders will be involved with the preparation and delivery of the RUP.

Main output:

Co-creation plan

5.1.5 Choose your "city" targets

Identify the targets of your city and translate them into the language of challenges and sub-challenges. Select specific targets for each challenge, along with the reason why the challenge has been prioritized. More information in "NBA Catalogue" in D1.1.

Main output:

NBS Scenario tool

5.1.6 Evaluate NBS scenarios and select one

Find the best NBS for the needs, targets, and capacities of the city. You can do so by checking Deliverable D1.7 and by using the NBS selection tool developed by URBAN GreenUP and publicly available here:

Main output:

List of city challenges and sub-challenges

5.1.7 Set spatial priorities

The main goal of this action is to identify the priority precincts for action – where will the NBS go. The mapping of the challenges had allowed the identification of the areas in "need", while the mapping of the existing green infrastructure and its functionality indicated which NBS are already in place across the city. More information in "Zoning for NBS"

Main output

List of green assets and pinch points

5.1.8 Establish Baselines and KPIs

Develop a baseline

Stablish the baseline conditions in the locations where the interventions will be implemented,

This action must therefore include the development of Key Performance Indicators (KPIs) for monitoring this baseline condition, to allow for direct comparison before and after the interventions.

This action focuses on developing a baseline understanding of the current conditions in the city, in order to monitor the impact of the interventions. It builds on the diagnosis, focusing on the defined list of NBS project and actions to understand whether the NBS interventions are successful. The baseline will need to consider the capacity of the city and the type of NBS that are planned, in order to develop a clear list of KPIs that need to be monitored, including a clear description and motive for their selection. Cities should consider what their priority challenges are and where these are located, based on an analysis of assets and "pinch points", to identify the monitoring locations.

This action should include development of a user-friendly monitoring protocol. The baseline and KPIs must be context-driven, and developed in light of any legal, technical, and social considerations within the city

TIPS FOR MUNICIPALITIES REGARDING THIS ACTION:
• Identify a coherent, meaningful and appropriate set of KPIs that are responsive to city/local context • Seek advice from experts on whether your KPI and methodology will establish the baseline conditions • The baseline may reveal new issues that you did not identify in the diagnosis, so there is a need to be flexible and allow for changes based on what you find • Focus on the most relevant KPIs in relation to your project • The creation of a baseline position for the calculation of benefits requires a clear definition of the current state of the location, the objectives for the project, and the proposed outcomes, to assess what 'success' means (and looks like)

5.1.9 Choose how success will be monitored

Determine the priority of the KPIS

Through the design monitoring program to track indicators to confirm progress and definition of the processes for review and adaptive management as milestones are met/missed and learnings are derived.

The cities will select the challenges as defined by the EKLIPSE methodology (and as re-adapted in deliverable **D1.2.** This should also be based on previous studies of the cities for the project, from the drop-down list. From each challenge selected from the list, the KPIs previously determined in WP5 monitoring studies will automatically appear as a drop-down list in the next column. List of questions:

- Q1 - Is the methodology/KPI credible? Who uses this method? Is it recognized as best practice or widely accepted/used in decision making or compliance monitoring?

- Q2 - Is it practical, reliable and replicable? Can one/two people do this quickly and accurately?
- Q3 - Does other similar data exist for comparison and benchmarking? Here or in other comparable cities or partner cities. Are there accepted thresholds?
- Q4 - Does it offer good value for time/money invested? Can we get results quite quickly? Are consumables and parts affordable? Is it resource efficient?
- Q5 - Will it further our understanding / add value to the NBS solutions? How much does it tell the story of the NBS solutions? Is it meaningful? Is it appropriate? Is it understandable? Is it convincing?
- Q6 - Do we have the expertise/software/time to make the analysis? Can this be done in-house? Is there a training need?

The average value will be determined as a result of the scoring of these pre-determined questions. Scoring will be made by project teams of each city by internal discussions. Based on these averages, the city's KPI prioritization will be visualized via the spider diagram. The average score can be interpreted as follows:

- Between 1.00 and 2.50; minor priority
- Between 2.50 and 3.75 medium priority
- Between 3.75 and 5.00 high priority

TIPS FOR MUNICIPALITIES REGARDING THIS ACTION:
• Try to focus on at least two KPIs for each challenge for a better understandable benchmark between challenges. • Do not try to select every challenge described in EKLIPSE methodology. For example, you might not have any opinion for the challenge, coastal resilience, if there are no coastal areas within your project. • If exists, please consider previous experience about each KPI during scoring

5.1.10 Assess lessons learned and validate the strategy

Collect feedback on the implementation of the RUP and insights concerning the early adoption of NBS. This will help improve RUP implementation for future applications, and help other cities develop successfully.

Learn from the RUP delivery

This action serves as a check to fine-tune your RUP. Delivering new NBS is difficult and will usually require a few iterations for the organization to become truly effective and efficient.

In this step you will work with your stakeholders to understand lesson learnt from the RUP delivery to transfer the best experience to the cities would like to develop a successful RUP by itself. We also provide a tool to help you reflect on your capabilities within your municipality.

Success factors:

- Stable executive and political support
- Suitable internal processes, standards, regulations and policy
- Adequate and empowered staffing
- Advanced community engagement skills
- Alignment of internal departments
- Culture of innovation and risk tolerance
- Supportive departments in other level of government
- Access to suitable technical skills

TIPS FOR MUNICIPALITIES REGARDING THIS ACTION:
• Try to involve the same stakeholders that were identified at the beginning of the RUP and identification step. • Inform the stakeholder clearly on the purpose of this action as a validation step for the methodology. • Document during any variations and changes needed to make to deliver the RUP during implementation. • Document any difficulty in the RUP development step for the final assessment, document any administrative and local legal that impacted by the implementation of RUP.

Main output:

Collection of lessons learned and strategy validation through continues monitoring of KPIs.

5.1.11 Define budget, roles, and responsibilities

Create a team within the city council

Create a human resources scheme within the municipal organization that will be the RUP implementation team.

In this executive step the organization chart of relevant positions is formally defined and documented by the Human Resources Department. Roles and responsibilities are also clearly defined on the Position description sheet.

The financial plan should set a schedule for funding in accordance with the implementation timetable.

It is recommended to create a Working Committee that meets periodically. This Commission will be made up of members from all areas with competence in the strategic implementation of renaturation.

The creation of this multidisciplinary Committee must be approved through some element of local regulations, such as a rule or standard, approved by the Local Government Board.

City council departments

NBS are cross-sectional interventions. The work team must be multidisciplinary and integrate team members from various areas of the City Council. There had been identified the following City Council Departments:

- Urban planning
- Urbanism
- Environment
- Parks and gardens
- Mobility
- Civil protection
- Heritage
- Lighting
- Public participation
- Innovation

6 Expected Impacts at European Level

The final impact may be influenced by different targets, but especially, the different local technical and socio-economic dimension we have:

- **The potential for expanding the scale of existing projects** or creating the duplicate projects in other areas can be reinforced by strong governance, sustained sponsorships and the right stakeholder is. The larger the scale, the more the benefits, also thanks to the wider catalogue of solutions is available. Think at regional level. The cooperation among cities to create common Smart City Platforms for large –scale development and testing.
- **The different disciplines to deal with, depending on every scale.** Different project types benefit from different scaling strategies, the same, face different obstacles, and diffident risk of failure to sustain progress or adverse side-effects such as market failure or displacement of alternative strategies.
- **The long-term strategic vision with citizens as important stakeholder** to create a sense of ownership and commitment and to maintain the initiatives in time. The participation of the private company as a key player alongside the city authorities and local firms provides the institutional base for scaling.
- **The periodic assessment capability**, assessment of scalability potential and identification of instruments and activities, availability of guidelines, compromise of smart city platforms, local authority participants.
- **The availability of the economic resources for cities transformation**, compromise of EC and member states. Linking scaling up to the local government and land politics. Smart cities specific new intellectual property ownership rights and contract forms.

The way in which a successful scaling up will be done, in order to get a methodology that will able to embrace all the scale of challenges, in different parts of the world, with different cultures, different environments and in different scales of cities and complexities, generating a relevant impact that improves the city and the wellbeing of the citizens.

Viability according to how, “Credible, Relevant, relative advantage over existing practices have, Easy to adopt, Compatible and Able to be tested”.

- Credibility: involvement of citizens and stakeholders from the very beginning.
- Relevance: propose new NBS projects and integration with other continuous systems.
- Advantages over existing practices (qualitative and quantitative).
- Easy to adopt: detect barriers and define roadmaps.
- Compatible: with other systems and current situations.
- Able to be tested: define adequate KPIs (upscaling).

Grow with reticular organization complemented with another diagonal.

Expand centralities.

Figure 6.1: Key factors determining NBS replication potential

By using URBAN GreenUP tools created, cities can determine which NBS may be most suitable to be scaled up (locally replicated). They may also wish to note opportunities to improve their capabilities or identify new ways to fund greening.

7 Bibliography

All references are included into the text.

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