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ESPON-GILL

**Methodology for Quantifying the
Demand for Green Infrastructure at
Local Level**

**HO
GENT**

Rik De Vreese, European Forest Institute (EFI)

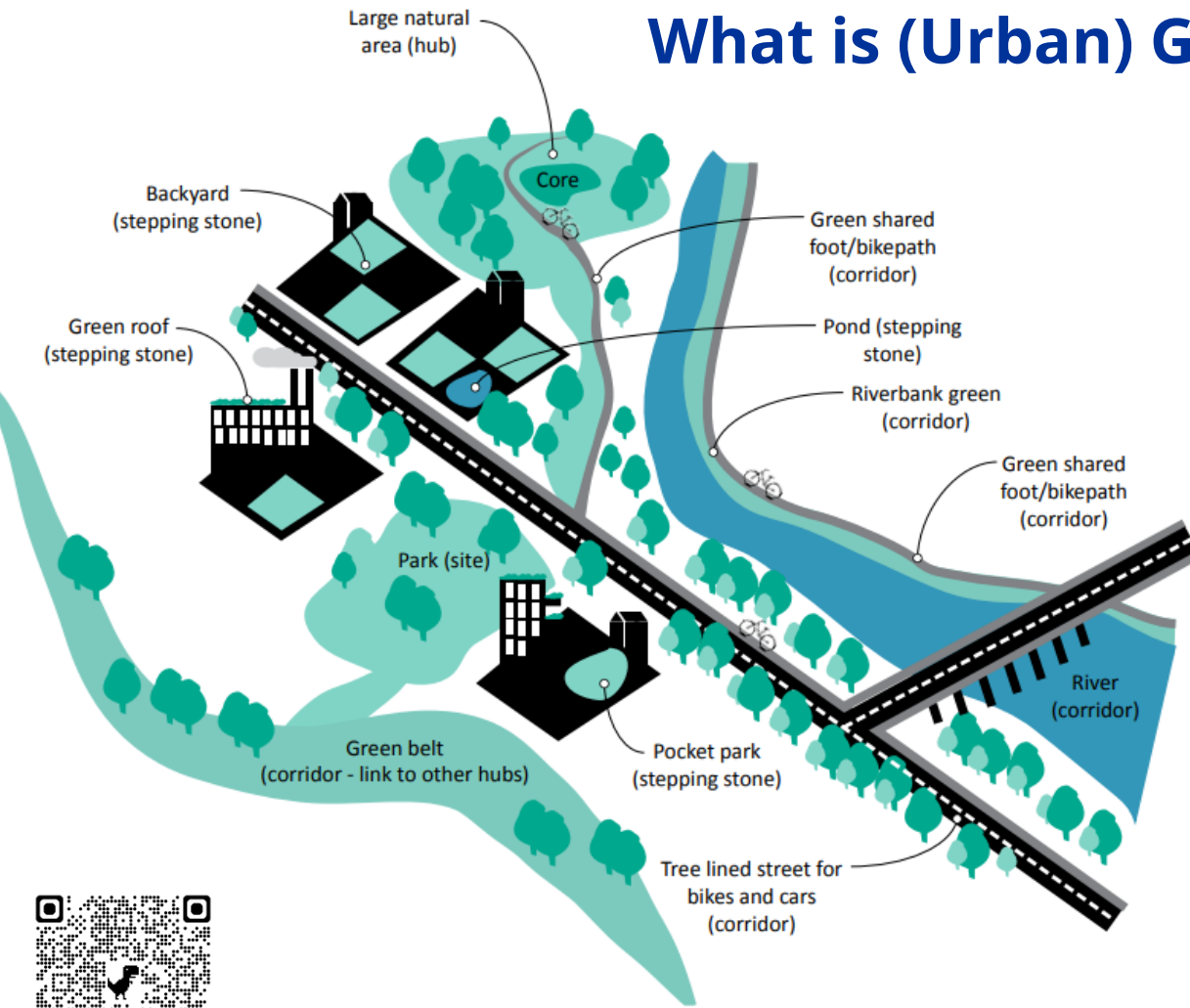
Urban Greening and NNLT, De Wijnaert, Gent (BE), 9.12.25

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What is (Urban) Green Infrastructure?



Green Infrastructure definition:

a strategically planned network of natural & semi-natural areas (...) designed and managed to deliver a wide range of ecosystem services.

It incorporates green spaces (or green & blue spaces) and other physical features in terrestrial and marine areas.

On land, GI is present in rural and urban settings."

EU Green Infrastructure Strategy (2013)

Hansen et al. (2017). Urban Green Infrastructure Planning: A Guide for Practitioners.



GREEN INFRASTRUCTURE (GI)

Nature-based Solutions (NbS)/Nature-based Climate Solutions

Natural Infrastructure (NI)

Low Impact Development (LID)

NATURAL ASSETS:*

- Wetlands
- Forests
- Parks
- Meadows
- Lawns and gardens
- Soil

ENHANCED ASSETS:*

- Rain gardens
- Green roofs and walls
- Bio-swales
- Urban trees
- Naturalised stormwater ponds

ENGINEERED ASSETS:*

- Permeable pavement
- SuDS Planters
- Cisterns
- Perforated pipes
- Infiltration trenches

GREY INFRASTRUCTURE:*

- Bridges
- Roads
- Parking lots
- Culverts
- Pipes

MERISTEM

DESIGN

Turning the grey green*



Why do we need Green Infrastructure?



Green walls



Green roofs



Urban green spaces, parks and vegetation



Street trees and SuDs-enabled street trees



Sustainable drainage systems (SUDS)



Benefits of urban green infrastructure



Reduces risk of **cardiovascular disease** and **cancer**



Reduces **air** and **noise pollution**



Promotes **physical activity**



Improves **mental health** and increases **life satisfaction**



Improves **memory** and **attention**



Decreases the **urban heat island** effect

Source: *Ljungman T., et al., The Lancet, 2023.*

<https://www.uforest.eu/news/insights/trees-can-help-reduce-deaths-attributed-to-the-urban-heat-island-effect/>

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(22\)02585-5/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)02585-5/abstract) Urban Greening and NNLT, De Wijnart, 9.12.25

Green Infrastructure vs Urban Nature Planning

- **EU Biodiversity Strategy 2030**

- in order to bring nature back to cities and reward community action - the Commission called on European towns and cities of at least 20,000 inhabitants to “...develop ambitious **Urban Urban Nature Plans** including “measures to create biodiverse and accessible urban forests, parks and gardens; urban farms; green roofs and walls; treelined streets; urban meadows; and urban hedges.”

- **Nature Restoration Regulation Article 8. Restoration of urban ecosystems**

- **No net loss of urban green space and urban tree canopy cover by 2030** in urban ecosystem areas
- **Beyond 2031, an increase in area of urban green space**, including through the integration of urban green space into buildings and infrastructure in urban ecosystem areas
- **Beyond 2031, an increase of urban tree canopy cover**, until a satisfactory level is reached
- (preamble 48). In order to ensure that urban green spaces continue to provide the necessary ecosystem services, their loss should be stopped and they should be restored and increased, **inter alia by integrating green infrastructure and nature-based solutions, such as green roofs and green walls, in the design of buildings.** Such integration can contribute to maintaining and increasing not only the area of urban green space but also, if trees are included, the area of urban tree canopy cover

Constellation of Actions

of the Urban Agenda for the EU Partnership Greening Cities



Greening Cities Partnership unites diverse partners to

- advance green infrastructure,
- foster transformative change in urban environments, and
- empower cities to lead on climate adaptation, biodiversity restoration, and improved quality of life.



ESPON GILL Project

OBJECTIVE ***Action No.1 of the Greening Cities Partnership:

- Deliver an evidence-based, scientifically robust, scalable, and user-friendly methodology to guide policymakers and practitioners in **quantifying the demand for green infrastructure at the local level.**
- At its core the ESPON GILL methodology aims to map the gap between ecosystem service supply and human / ecosystem needs.
- **The ESPON GILL methodology should tell where nature is “working” for the city, and where the city needs more nature to “work” for it.**

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Partners and stakeholders



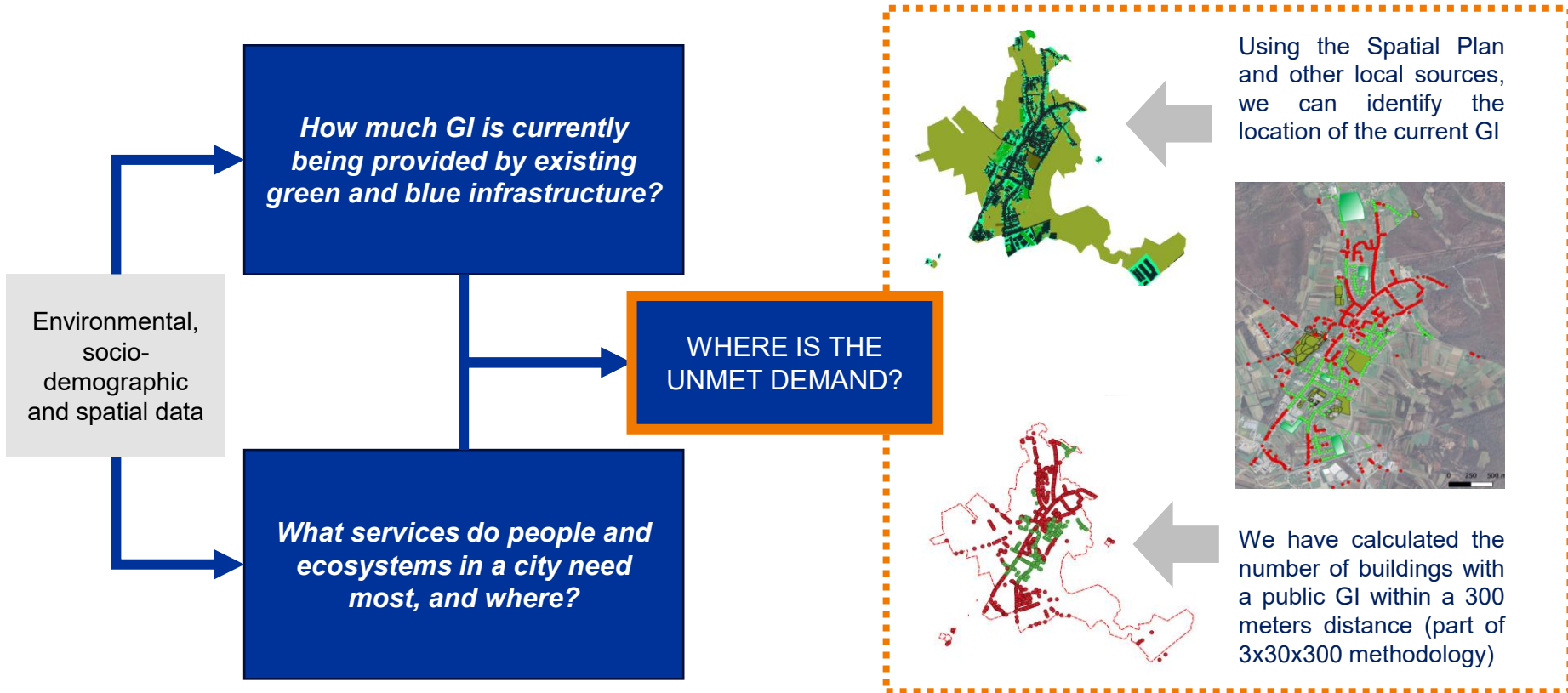
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Using data to quantify GI provision and demand



What constitutes Green Infrastructure at the local level?

What benefits does it provide?

How can the current and future demand be practically evaluated at the local level?

How can planning decisions, be better informed?

ESPON GILL

Evidence-based, robust, user-friendly, methodology for quantifying GI demand



Module 1: Local policy goals and ambition

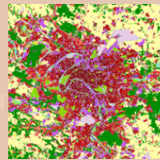
- Biodiversity
- Climate Change
- Health and well-being

Preliminary selection of ESS Analytic Hierarchy Process (AHP)



Module 2: Local baseline and current GI status

What do we have?

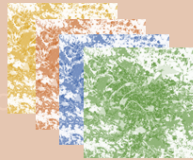


- GI characterization at the local level
- Mapping GI elements distribution



Module 3: Multifunctionality of GI: ESS assessment

What does it provide?

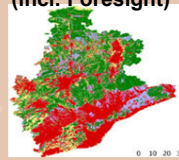


- Mapping of ESS provision by GI elements
- Quantit. and qualit. assessment of ESS



Module 4: Evaluation of GI demand and deficit (incl. Foresight)

What do we need?



- Mapping areas in deficit of GI to comply with policy goals under current and future scenarios with expert judgement



Module 5: Opportunity mapping for GI deployment



- GI carrying capacity
- Synergies and trade-offs of the new suggested GI and the potential ESS provided

- Enabling conditions: Governance, resources and financing.



Module 6: Inform Urban Planning- UNP

- Recommendations around organizational, procedural and normative mainstreaming
- Best Practice Examples

How to deliver?

Informs

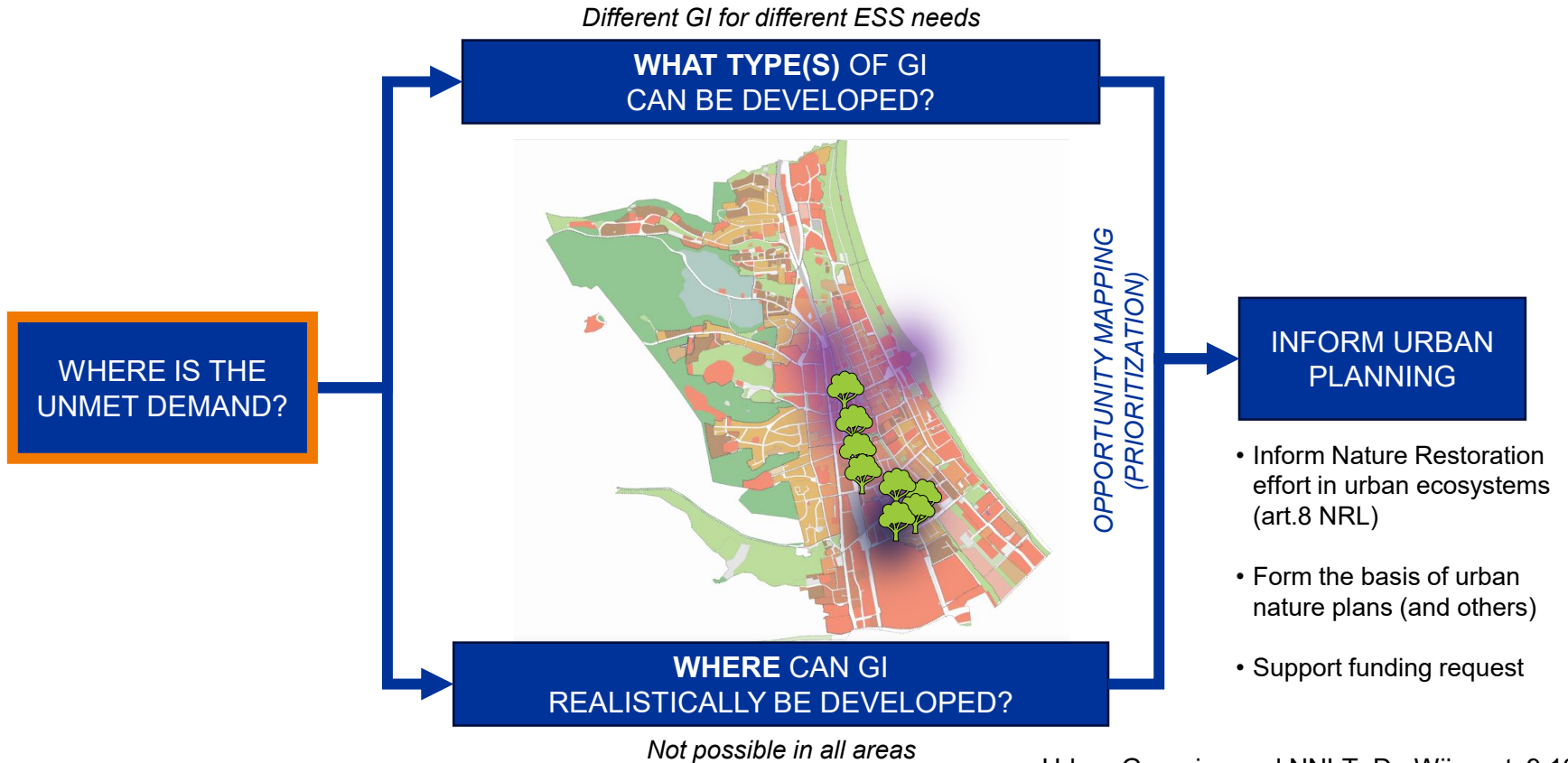
- Climate Plans
- Urban Planning
- Environm. Quality
- Urban Design
- Development Planning
- Urban Nature Plans

Data driven Spatial Analysis



ESPON GILL Dashboard

Integrating the demand into urban planning



Jastrebarsko, Croatia

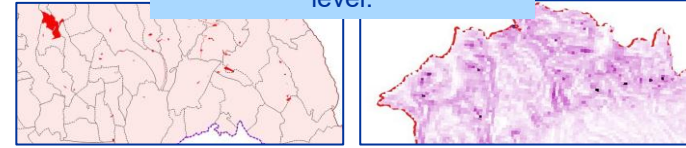
CONTEXT

- Small municipality: 14.562 inh./226.4 km²
- Policy and planning: Green Urban Renewal Strategy of the City of Jastrebarsko 2023-2033
- Data available at local level mostly
- Directorate for Property Law, Municipal Systems, Spatial Planning and Environmental Protection involved
- Two scales: urban and landscape

MAIN CHALLENGES IN TERMS OF GI

- Landslides
- Accessibility
- Economic activity related to GI
- Climate change resilience
- Conservation of biodiversity

Landslide were analysed, and overlap with other related available maps at EU level.

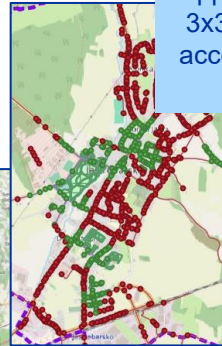


Map of the demand of GI at urban level, in relation to ESS needed.

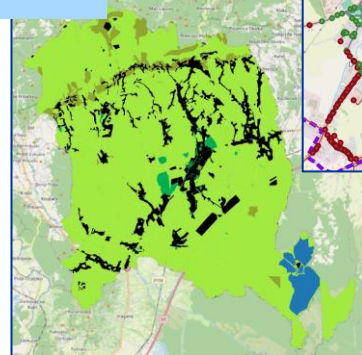
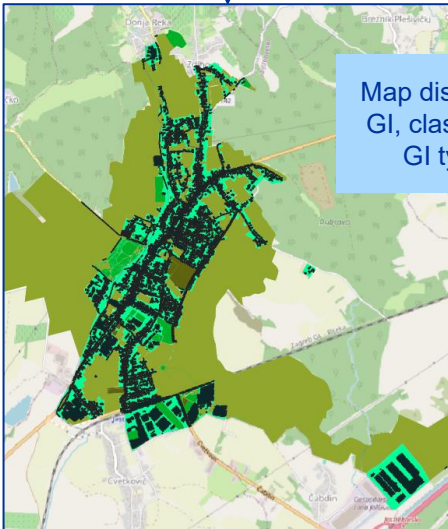


In-person meeting to discuss opportunities of implementation of GI

Application of method 3x30x300 to analyse accessibility and social impacts



Map distribution of GI, classified with GI typology



PRELIMINARY INSIGHTS

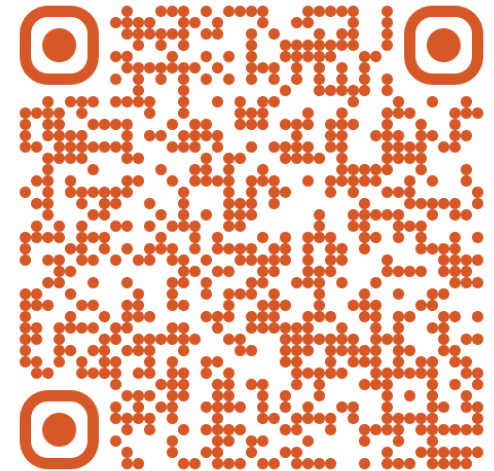
- Limited capacity in terms of available resources (people and financing)
- Current incorporation of new GI (native tree species, improvement of parks, strengthening public infrastructure in urban forests, others)
- Looking for funding to keep developing the municipality and make it more climate-resilient

How to inform urban planning? We are looking for Good Practices

We are collecting examples of planning documents by local authorities relevant to green infrastructure.

- Urban nature plan
- Green infrastructure plan
- Urban forestry plan
- Climate adaptation plan
- Urban biodiversity strategy
- Spatial development plans
- Etc.

SCAN THE QR CODE



https://ec.europa.eu/eusurvey/runner/ESPON-GILL_good_practices

Selected plans will be included in a repository of good practices, serving as inspiration and guidance for other cities and towns developing green infrastructure and urban nature plans.

Advances on some insights

Methodology Development

- How to consider **multiple needs, interests, contexts**
- **Data related issues** (lack of standard)
- Compile **data at EU level** that is useful

Case Studies Implementation

- **Data availability** (granularity, resolution, temporal consistency)
- **Data accessibility** (scale, fragmentation, scale, competences)
- **Capacity at the local level**



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NATURE
PLANS +

UNP+

*Enhanced Urban Nature Plans for
Biodiversity Mainstreaming in Society*

Horizon Europe Project, 2024-2026





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UNP+ Explained



UNP+ proposes a **next generation Urban Nature Plan framework for European Cities.**

This is a **forward-looking, systemic, integrated, and inclusive planning instrument** capable of realising meaningful and lasting impacts in **bending the curve of biodiversity loss.**



What are the 10 UNP Steps ?

UNP - 10 key steps are:

Phase 1. Preparation

- Step 1: Secure a long-term political commitment
- Step 2: Establish a working structure
- Step 3: Establish a co-creation process

Phase 2. Action Planning

- Step 4: Develop a long-term vision and goals
- Step 5: Analyse the current state of nature and biodiversity
- Step 6: Set indicators and targets
- Step 7: Agree on priorities, actions, responsibilities, timelines, and financing
- Step 8: Develop a communication, education, and public awareness strategy

Phase 3. Implementation and Monitoring

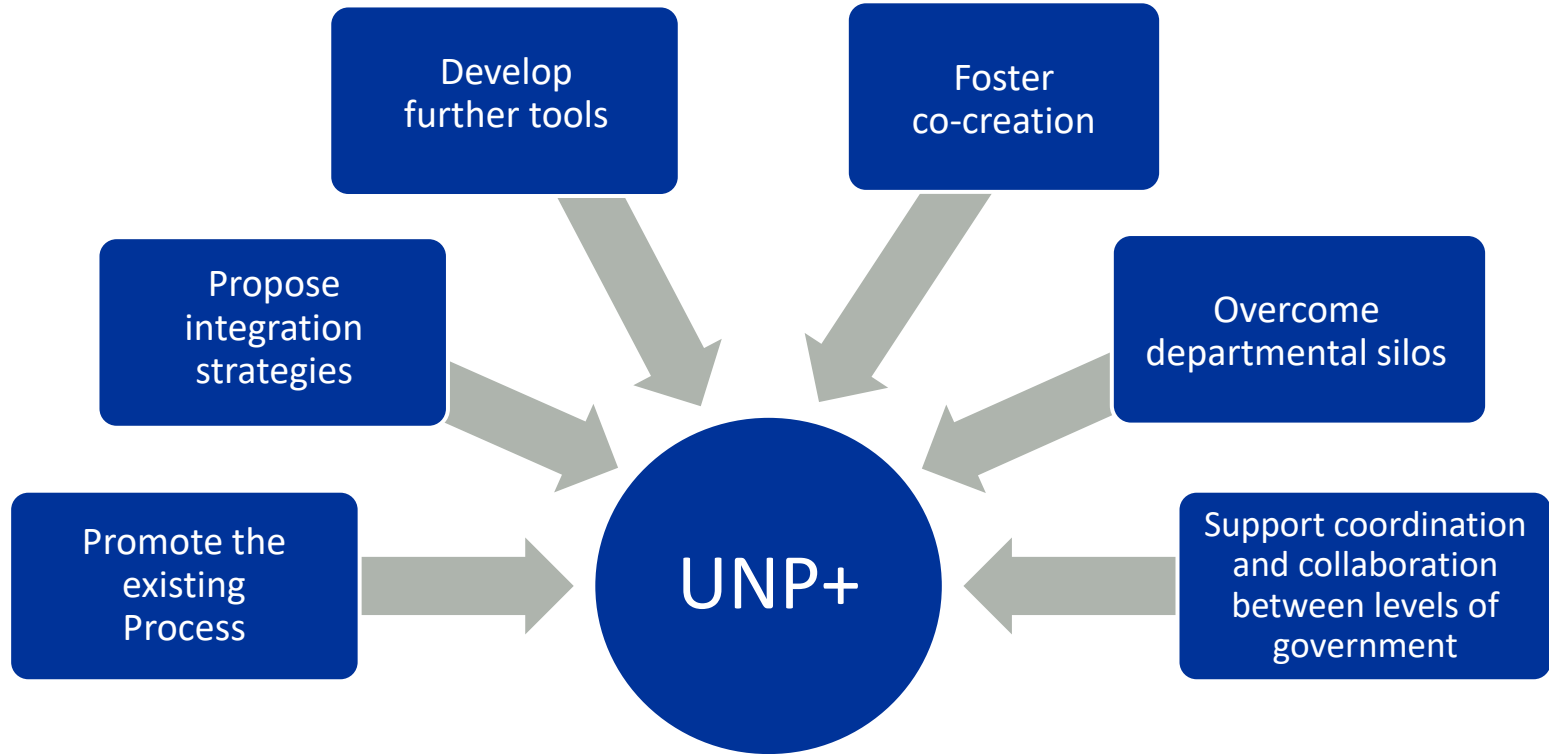
- Step 9: Establish a monitoring, reporting, and evaluation system
- Step 10: Adopt, publish and implement the plan



UNP Framework: European Commission and ICLEI Europe



What's the PLUS?



Thank You for Your Attention!



<https://urbannatureplans.eu/>

[UNPplus EU](#)



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Green and Grey Infrastructure in BaiYun District, GuangZhou, China © Rik De Vreese

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