



Be Part of the Green Transition

N4C knowledge databases and NBS frameworks

Nature4Cities Event – Bruxelles – 2019 Dec. 10th

Presentation plan



1. Organise knowlegde
2. Databases
3. An overview of the tools to explore NBS knowledge





1. Organise knowlegde

NBS world is a multidisciplinary world, particularly when applied to cities
NBS are diverse and their perimeter is still not well defined



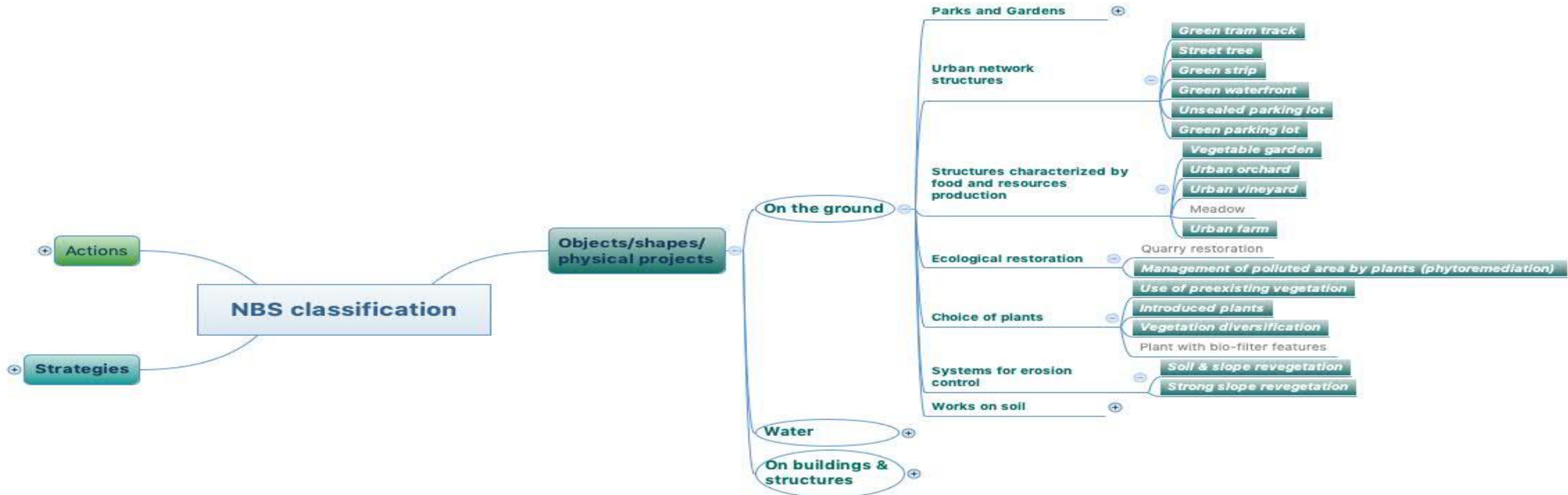
3 main kinds of knowledge



- **Urban NBS**
- **Models to implement NBS in cities**
- **Impacts of NBS**

How to characterize and organise urban NBS ?

N4C answer: a practical classification based on an inventory of urban NBS (integrated by ThinkNature)

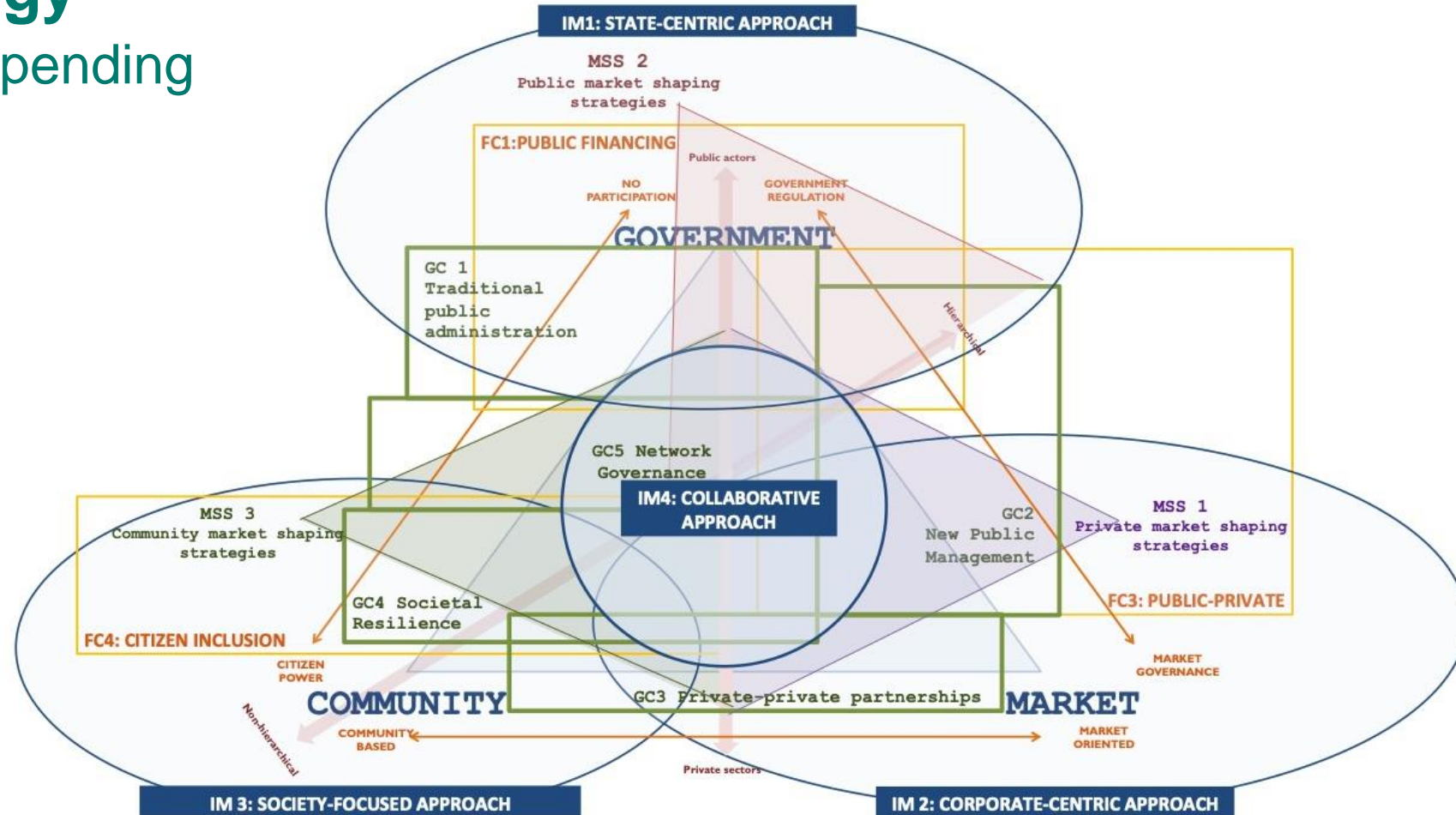


How to characterize and organise Implementation models?

N4C answer: IM typology

4 IM clusters mapped depending on their main actors

- Government
- Community
- Market



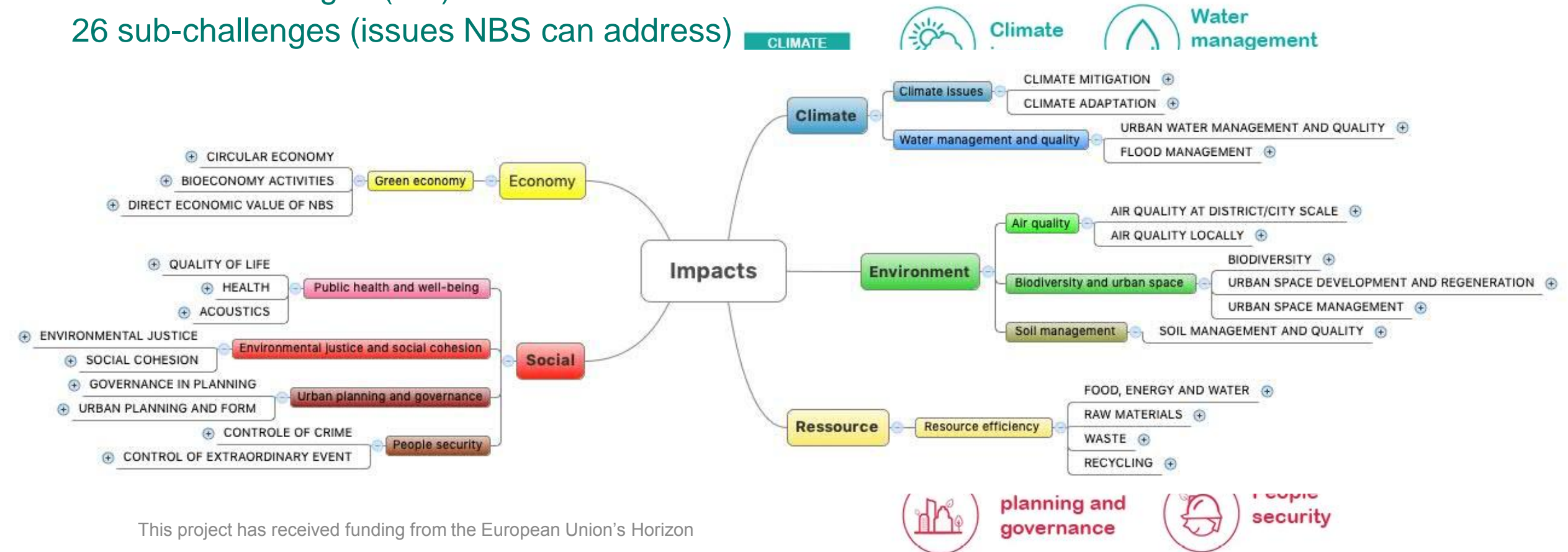
What are the impacts of urban NBS ?

N4C answer: Urban Challenges definition

5 Topics

11 Urban challenges (UC)

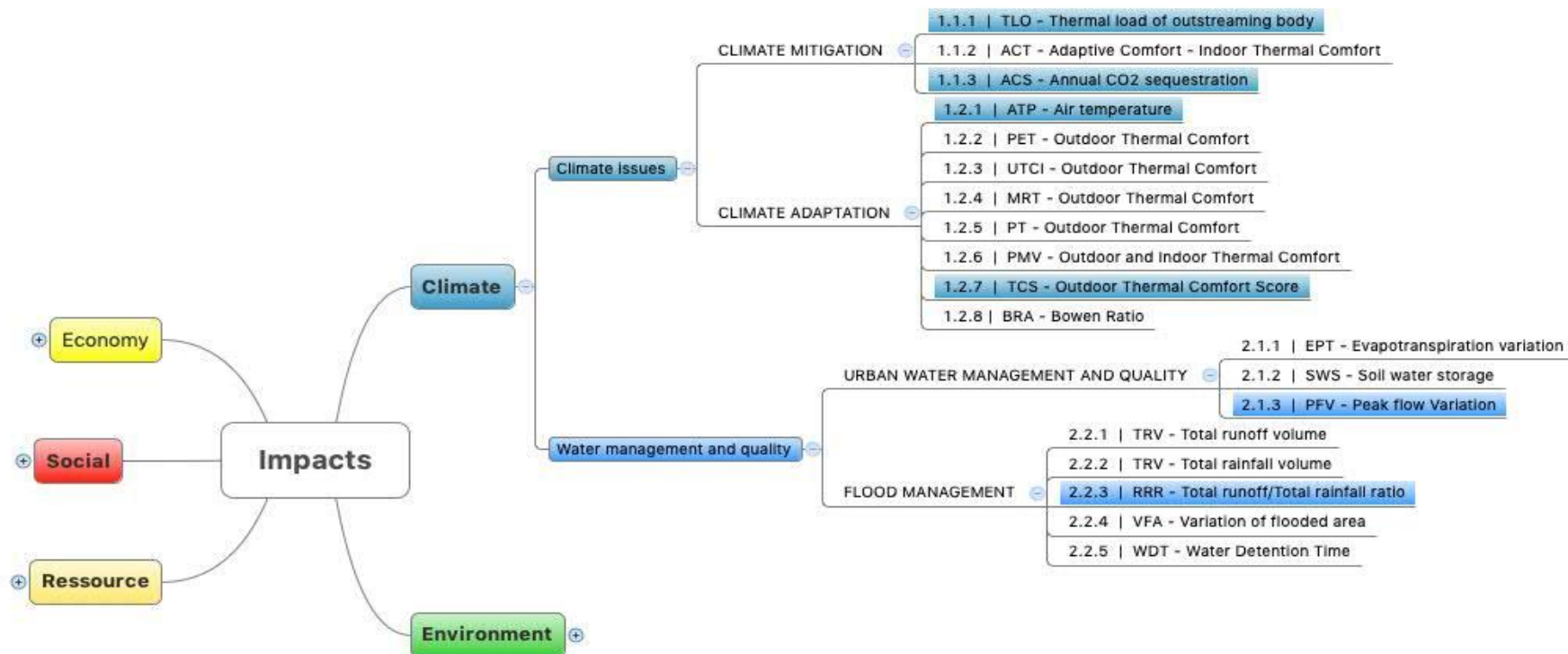
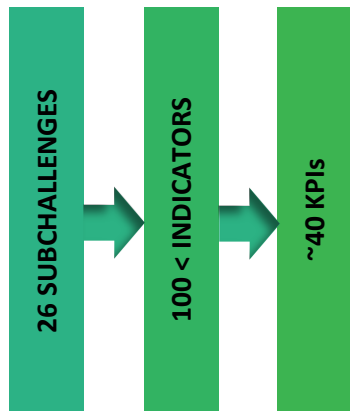
26 sub-challenges (issues NBS can address)



How to assess the impacts ?

N4C answer: Performance Indicators catalogue and KPI selection

More than 100 indicators documented and assessed (RACER method)





2. Databases

Databases built to

- document NBS entities & NBS projects
- store and share information



A urban NBS database

57 NBS documented with

- Description
- Urban challenges addressed
- Stakeholders
- Design
- Implementation
- Alternative solutions

Objects/shapes/physical projects/On the ground/Choice of plants
>USE OF PRE-EXISTING VEGETATION

I/ General description and characterization of the NBS entity

I.1 Definition and different variants existing


Definition

This NBS can preserve a part of pre-existing ecosystems and vegetation. The use of pre-existing vegetation (remnant vegetation) provides elements to integrate vegetation present on the site prior to NBS design and implementation. This approach has many advantages (Flørgård, 2000):

- Vegetation in parks, etc. is already mature when the first occupants move in. This is a great advantage especially in areas with low growth potential.
- Preserved areas will differ from 'traditional' gardens and parks and be of interest to everyone, particularly as an exciting playground for children.
- Costs for construction and maintenance of green areas are minimized
- Essential habitats for plants and animals can be preserved.

Different variants of pre-existing vegetation

The preserved remnant vegetation can be natural or semi-natural which has been developed with little or non-human intervention over time. It may be related to agricultural, forestry or other uses. It also comprises stable post-agricultural plant communities such as meadows and pastureland, or even pre-existing vegetation in urban areas.


Horticultural hedge
(Source: Thak Tachamdee, Pexels)



Semi-natural hedge
(Source: Adeline Bulot)

Illustration of horticultural hedge v/s Semi-natural hedge

1 / 5

4 CITIES


Remnant hedges preserved in urban areas
(Source: H. Daniele)



Suburban areas with horticultural hedges
(Source: Rambleren, Wikimedia commons)

Illustration of suburban areas with planted horticultural hedges v/s trees or preserved semi-natural hedges in a landscape planning


Semi-natural space (ex: urban park)
(Source: Mbit, Wikimedia commons)


Botanical garden
(Source: Creative commons)

Illustration of semi-natural space v/s botanical garden

I.2 Urban challenges and sub-challenges related + impacts

Main challenges and sub-challenges targeted by the NBS	04) Biodiversity and urban space > 04-1 Biodiversity 07) Public Health and well-being > 07-2 Quality of life	- Increase of biodiversity - Provide a habitat for birds and insects, and other animals - Aesthetic value - Contact with nature - Support for education
Co-benefits and challenges foreseen	01) Climate Issues > 01-1 Climate mitigation > 01-2 Climate adaptation 2) Water Management > 02-1 Urban water management 03) Air quality > 03-2 Air quality locally 04) Biodiversity and urban space > 04-1 Biodiversity > 04-2 Urban space development and regeneration > 04-3 Urban space management	- By already grown plant acts in favour of urban heat island reduction and helps filter air and water pollutants - Keeping vegetation is in favour of carbon sequestration
Possible negative effects	07) Public Health and well-being > 07-3 Health	- Presence of undesired insects - Presence of weeds - Allergies

2 / 5

4 CITIES

II/ More detailed information on the NBS entity

II.1 Description and implication at different spatial scales

Scale at which the NBS is implemented

The object: a green space.
The district: diversity of plants for example can be done at the quarter scale in order to diversify ecological habitats (forests, open herbaceous areas, ...)
The city: planning of green infrastructures

Impacted scales

The 3 scales impacted
Regional scale is also impacted when ecological connectivity is ensured

II.2 Temporal perspective (including management issues)

Expected time for the NBS to become fully effective after its implementation

Immediately when the pre-existent vegetation is conserved.

Life time

It depends on several factors:

- The protection measures implemented to preserve plants during the urban works.
- For rural plants integrated in a city
- Long term, it depends mainly on vegetation management

Sustainability and life cycle

This type of vegetation is often more resilient
This type of vegetation most often requires a continuation of previous management conditions, the most often of low intensity.

II.3 Stakeholders involved / social aspects

Stakeholders involved in the decision process

- Owners, co-owners (in case of a joint ownership property)
- Users of public areas
- Municipality

Technical stakeholder's networks

- Landscape architects
- Landscape planners at the city scale
- Specialized green spaces management firms, horticulturist and gardeners.
- Naturalists' NGO
- horticultural producers

Social aspects

Environmental education, Awareness campaign, training, participatory process, nature conservation

II.4 Design / techniques/ strategy

Knowledge and how-know involved

- Selection of plant adapted to: the traffic intensity (the level of perturbation)
- Vegetation management
- Botanical skills
- Landscape architecture and landscape planning skills

Materials involved

- Inventory of existing plants
- Maps of ecological habitat

3 / 5



Projects database



98 projects selected as pioneer or because of their implementation model, documented with

- Description
- Urban challenges addressed
- Stakeholders
- Design
- Implementation

41 Pioneer projects in the geocluster tool

31 Projects transferred to oppla platform

Analysis grid for the documentation of NBS pioneer cases

Reference of the case	IT 4			
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I. General description of the pioneer NBS

I.1 Identity – main elements

Title	Flood retention basins of Lura river – Milan			
A short description of the NBS	Milan's metropolitan region is affected by severe flooding during heavy rain events because of the high sealing rate of urban areas and increasing effects of climate change. Among several measures planned by the regional government there is a wide retention area that has been planned as flood control device, which also creates high quality natural areas and reconnects slow-mobility routes and recreational spaces inside the Lura Valley park. The project consists of the implementation of two rolling basins connected by an open air ditch and a pond filled with ground water. The basins will be temporarily flooded by Lura river during intense rainy periods through natural inlet from the river bed, whilst the pond will recharge constantly the ditch to maintain wetland vegetation all over the year to guarantee its phytodegradation functions. The balance of ground movements within the project is null as the volumes excavated are reused to create mounds and dikes. Wide areas of the river banks and plains have been upgraded through afforestation with native species.			
Ref. photos	IT 4.1	IT 4.2	IT 4.3	
NBS Types	Objects Shapes	Water	Constructed wetlands and built structures for water management	Constructed wetland for phytoremediation

Location	Country: Italy	City: Milan
Street or location	Lomazzo/Cadorago	
Geographic coordinates	Latitude: 45,6967	Longitude: 9,03427
State of progress of the project	Project delivered	
Dates (for project delivered)	2017	

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[COMMUNITY](#)
[CASE STUDIES](#)
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Green Roof of Aimé Césaire School Complex

Goal(s)

- Enhancing sustainable urbanization
- Developing climate change adaptation

NBS Actions:

- Nature-based solutions for improving wetland in urban areas
- Nature-based solutions for improving the sustainable use of water and energy

Client:
Nantes municipality (Contracting authority)

Design team:
B. Maier (Architect)
Main partners:
Mabre & Bach (Architecture)
Physalis (Landscape architecture)
Other stakeholders:

City green spaces services
The city green spaces services has been involved in the monitoring and the management of the green roof. Their objective was to adapt their practices to the specific employed vegetation. Natural spaces conservation of the Parc de la Loire.

Area characterisation:
The school is located at the west of the "Île de Nantes". The building is (R+1) is designed around courtyards and interior terraces.

Scale of the project object (building, etc.)
The secondary school has been involved in the monitoring of the vegetation. COFFRENE (MUSE).

Governance (cluster, traditional public administration)
The governance is controlled by Nantes Métropole.

Awards:
"Vision d'avenir" (Victory of the landscape) in 2014 (French national competition).

Publications and reports:
Media cover:
• Saint Pierre Raphaël, 2014, Une école-paysage en bord de Loire, Le Monde, N° 7188
• Bati Déléphante, 2014, École buissonnière - Groupe scolaire Aimé Césaire à Nantes, 01 ÉcoGlobe, N° 97, pages 62-71
• Architectural, 2015, École paysage - Schu

Slideshow:

Objective:
In 2013, an experimental and educational project, conceived as a garden home for a school, was built at the heart of the green district known as "Île de Nantes" on the Île de Nantes. The building's roof was covered by 2,700 square meters of natural dunes.

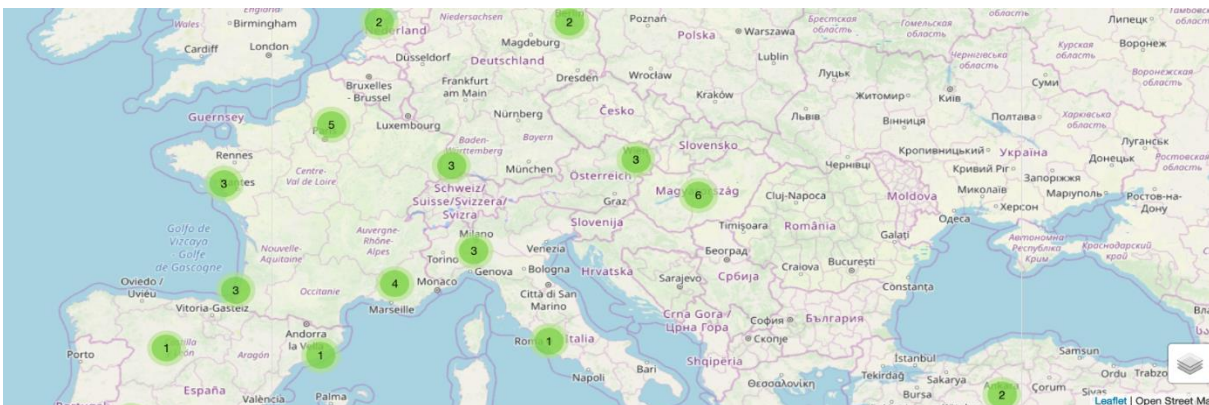
The objective is to create a green roof, relying heavily on a phytoclimatological approach to plant colonization and high biodiversity, but also a site that is easy to manage.

The originality of its green roof results from a co-construction between architects and landscape designer. Its qualities are undeniable, and this project has received several prizes. Two main original aspects characterize this green roof:

- The access: two ramps allow direct access to the roof from the ground floor courtyard.
- The vegetation: the project involves the establishment of dunes and moor vegetation. Its design is based on a technical work dealing with the treatment of slopes, the nature and thickness of the substrate, and the research of plants.

The project is also combined with other environmental friendly solutions: Bio-sourced materials

Urban Sub-challenges: Climate adaptation, Biodiversity, Flood, energy and water, Quality of life.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730468





3. Tools to explore knowledge

Make the knowledge accessible, easy and pleasant to explore, for different actors



Geocluster4NBS tool

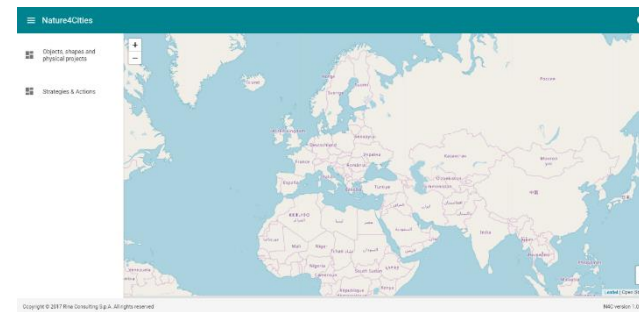
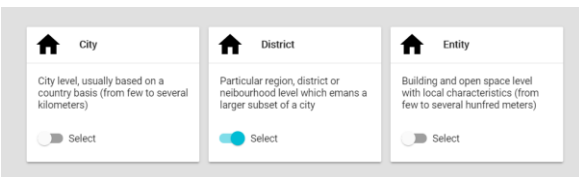
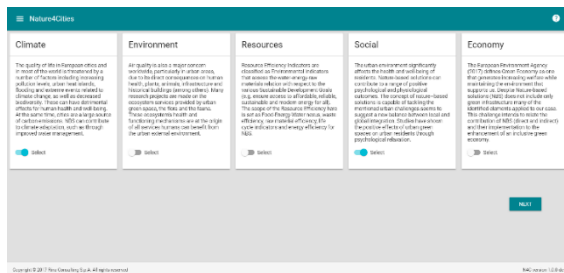
A way to explore NBS and projects databases, to find solutions & references, to check their replicability

Select UCs and USC -> Select Scale

->

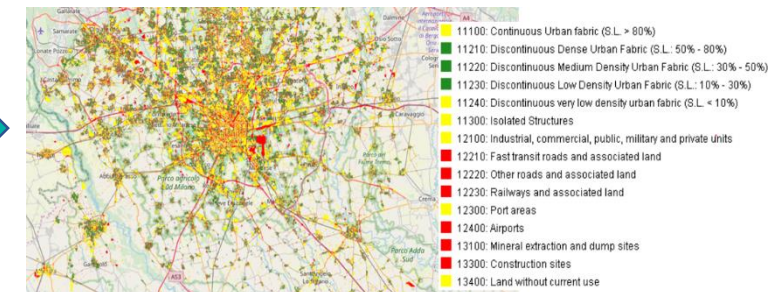
Visualize NBS and pioneer project on the map
Access to NBS factsheets

-> Check replicability



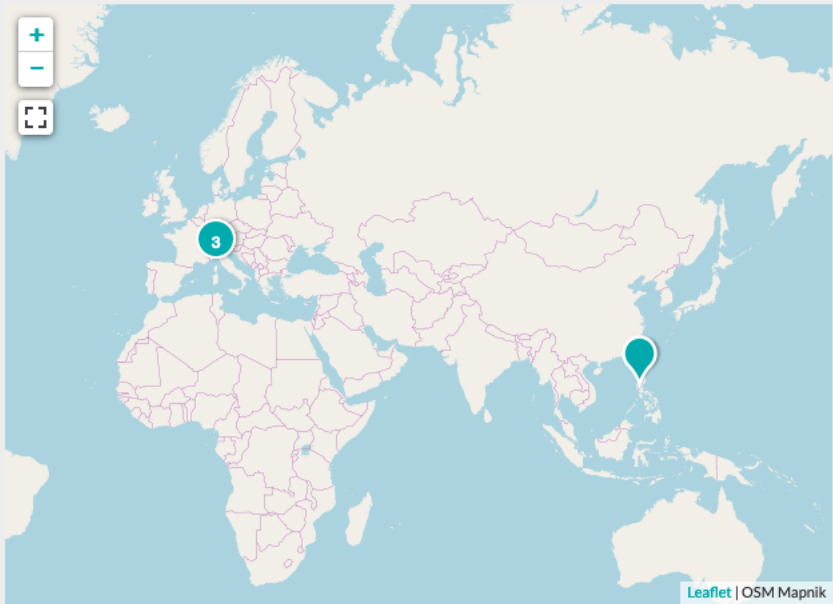
Can the project be duplicated to my site ?

Where can I implement this NBS ?



Case studies

Displaying 1 - 4 of 4



Water Retention Reservoir - Podutik

Increasing ecosystem service provision by creating multifunctional blue-green infrastructure.



MORE

SEARCH

enter search terms:

Scale

- ☐ Global
- ☐ Continental
- ☐ Sub-continental
- ☐ National
- ☐ Subnational
- ☒ Local

Type

- ☐ NC & ES Case Study
- ☒ NBS Case Study - project
- ☐ NBS City Overview Case Study

APPLY

RESET

NBS City Case Studies

Existing ecosystem-based initiatives



IM pre-selection tool



ELIGIBLE MODELS



GOVERNANCE	
Eligible governance models	Definition
Co-management	Bring together resource users in shared stakeholder management regimes. Such arrangements theoretically provide potentiality to democratise decision foster conflict-resolution, and encourage stakeholder participation and has been defined as a situation in which two or more social actors negotiate, defi guarantee amongst themselves a fair sharing of the management functions, entitlements, and responsibilities for a given territory or set of natural resou

FINANCING		
Eligible financing models	Definition	Tools
Public-private	Collaboration between a government agency and a private-sector company to finance a project.	Preferential loans, Guarantee funds, and Soft loans/Dedicated Credit Lines.
Financial institutions	Corporations that provide services as intermediaries of financial markets. They can provide long term finance which are not provided by commercial banks. The funds are made available even during periods of depression, when other sources of finance are not available.	European Fund for Strategic Investments (EFSI), Natural Capital Financing Facility (NCFF), European Development Financial Institution (EDFI), Municipal Green Bonds, and Revolving Funds.

Please, select the GM and FM that fit the best with your NBS project:



Governance model

Co-management

Financing model

Financial institutions Public financing Public-private

DELETE FILTERS



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Governance model

Co-management

Financing model

Financial institutions Public financing Public-private

DELETE FILTERS



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Conclusion

This detailed knowledge makes the originality of Nature4Cities project

It is available through the deliverables of the projet and differents tools helping to explore it

Databases and Typologies have been designed to be extended with new data, so that to integrate new products and projects: a possibility through the platform

You will also find this knowlege in other projects

- NBS typology has been integrated into ThinkNature typology

- Part of the IM typology has been adapted and used by Connecting Nature

- A first part of the projects database has been shared through Oppla platform

● ● ● ● Thank you for your attention!



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