NATURE 4 CITIES

Be Part of the Green Transition

«Nature-based Solutions» Workshop Sustainable Place 2018

Aix-les-Bains, 27-29 Juin

esentation plan

. The concept of « Nature-based Solutions »

    Definition & classification

    Quiz

. Implementing of NBS

    Expected impacts and co-benefits

    Pioneer experiences

    IM typology & IM database

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1. Definition & classification

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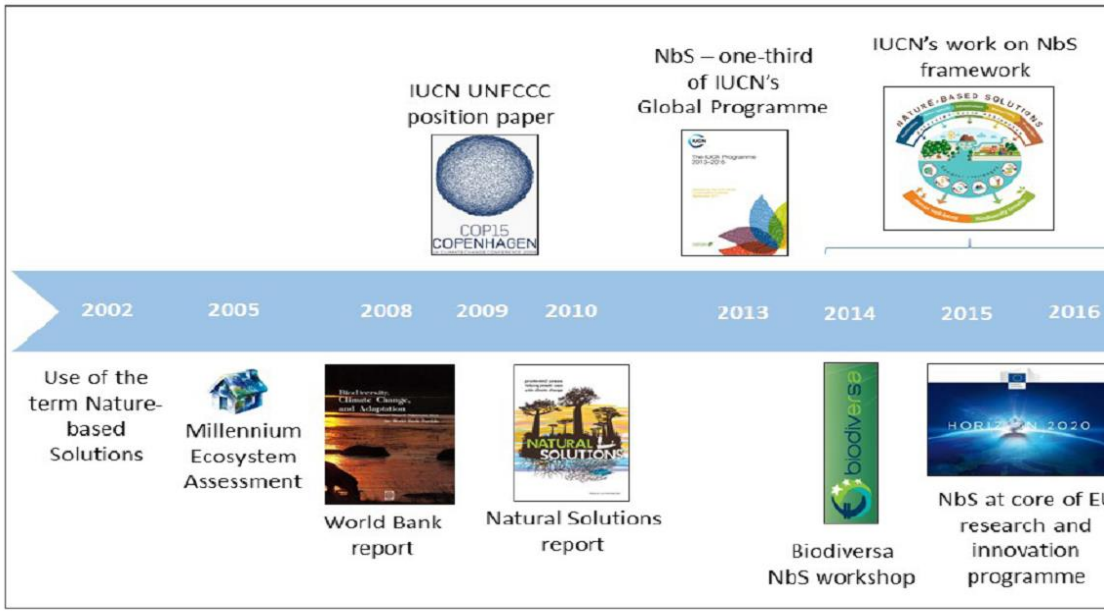
S concept

n emerging concept:

- Multiple definitions are coexisting (IUCN, EU).
- They are closed in many ways, but they can not be merged
- The concept of NBS is recent, its components are still much debated
- A very large frame (the concept is not specific to urban issues)



(Cohen-Shachan

Timeline of the NBS concept

concept that must be clarified

Two ongoing Eu funded projects (2016-2020)

NATURVATION
cities – nature – innovation

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European Commission

erview of N4C framework regarding the NBS concept

loration of the conceptual framework ne NBS

lain principles of the concept

elation with neighbour concepts (ES, GI and ustainable urban development)

omparison of the different definitions and heir variants

4C's NBS definition

Exploration of the analytical framewo of the NBS

- **Urban challenge addressed**
- **Urban spatial scales**
- **Temporal scales**
- **Gradient of level of human intervention**
- **Land cover/environment of the implementation**

=> NBS definition, typology & associated database

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y points of the concept

ystemic proach

- Multiple and simultaneously addressed challenges : environment, social and economy

Especially adapted to new and complex purposes : biodiversity loss, climate change, more frequent natural disasters and rapid urbanisation

- Multiple and interconnected scales (space and time)

Solution are thought at a general level and adapted to the local context

Solutions are though a temporal dimension and, they are ideally resilient to change

- A shared concept -from its origin- between scientists, politicians and practitioners

operational ncept

- A necessary positive response
- Compatible with technology and human intervention

“NBS are actions” : protection – restoration – management (IUCN) + design of new ecosystems (EU)

- Cost-effective
- NBS imply political choices (trade-off) => at the opposite of the idea of a calculated optimum
- NBS concept is compatible and complete existing concepts such as ES, GI

ural and ng features he core of solution

- NBS are based on ecosystems (or/ and) are “living solutions”
- NBS use physical features and processes of nature.

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finition proposal

roposal rewriting version of the EU definition (2015) rewriting in N4C:

S are **positive responses** to societal challenges, and can have the potential **to simultaneously meet environmental, ial and economic objectives**. They recognize the importance to develop a systemic approach and at the same time t pt interventions to the local context. They also integrate the temporal factor to meet the challenge of durability.

y are **actions inspired by, supported by or copied from nature**. Such solutions bring more, and more diverse, nature natural features and processes into cities. **They are living solutions**, and as much as possible they take part in nplex and functional ecosystems.

S use the features and complex system processes of nature. By using the natural flows of matters and energy, these low-input solutions. If these solutions are conceived and implemented in a good way, low-maintenance, cost saving rgy and resources efficiency are expected. NBS also benefit from the malleability of nature (capacity to evolve and t pt) and are thus more resilient to changes.

y both use and enhance existing solutions to challenges, as well as explore more novel solutions.

MO, and other solutions that artificially alter nature are excluded

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S classification

ies	Sub-Categories	Classes	Types
hapes/physical onstruction	On the ground	Parks and gardens	Large urban public park
nd	Water	Structures associated with urban networks	Wood
	on the buildings	Structures characterized by food and resources production	Urban orchard
	Urban management	Ecological restoration	Soil and slope revegetation
	Waste management	Choice of plants	Structural soil
	Protection and conservation strategies	Systems for erosion control	Reopened stream
	Urban planning strategies		Etc.

The 4 levels of the NBS classification

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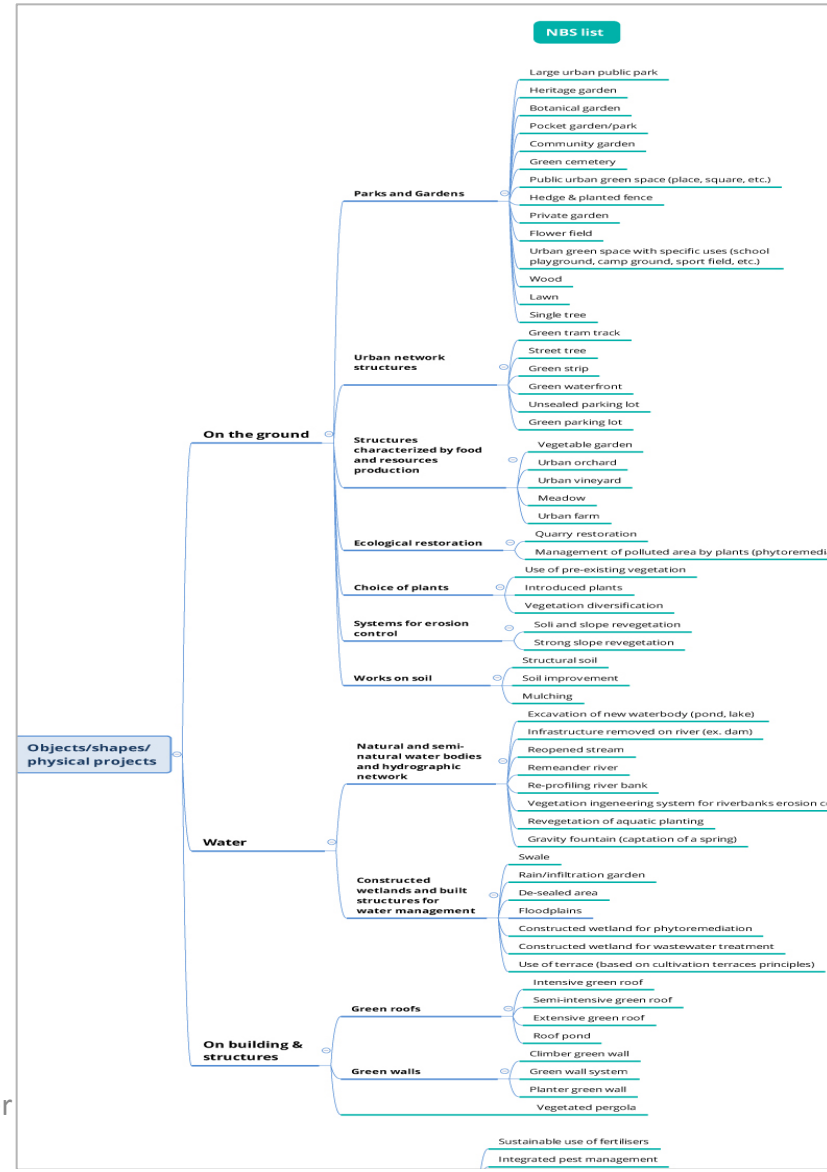

Quiz

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BS or not NBS?

. Vegetated parking lot

2. Sheeps used for green space managemen

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BS or not NBS?

Urban farm and social reinsertion

4. Wild animal passages based on heavy civil engineering structures

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BS or not NBS?

. Bio-sourced materials

6. A defensive hedge

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BS or not NBS?

. Combination of a green wall and solar panels

8. Intensive green roof

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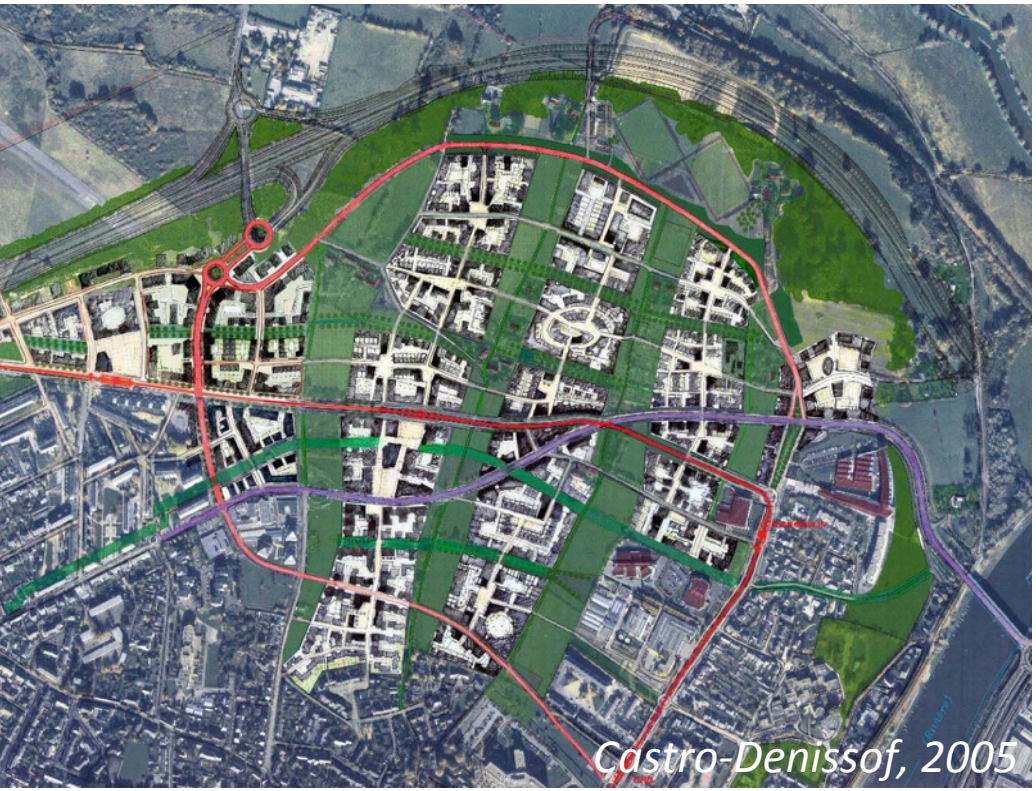
BS or not NBS?



. A urban master plan implementing
egetation

10.

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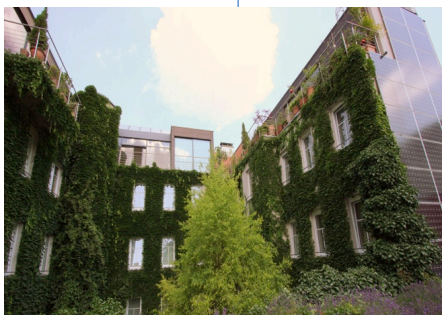
uiz solutions






Not NBS





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3. Implementing NBS

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xpected impacts and co-benefits

Urban challenges and sub-challenges

URBAN CHALLENGES (UC)	URBAN SUB-CHALLENGES (USC)
1 | Climate Issues	1.1 | Climate mitigation
	1.2 | Climate adaption
2 | Water Management	2.1 | Urban water management and quality
	2.2 | Flood management
3 | Air Quality	3.1 | Air quality at district/city scale
	3.2 | Air quality locally
4 | Green Space and Biodiversity	4.1 | Biodiversity
	4.2 | Urban space development and regeneration
5 | Urban Regeneration and Soil	5.1 | Soil management and quality
6 | Resource Efficiency	6.1 | Food, energy and water
	6.2 | Raw Material
	6.3 | Waste
	6.4 | Recycling

SOCIAL	7 | Public Health and Well-being	7.1 | Acoustics
		7.2 | Quality of Life
		7.3 | Health
	8 | Environmental Justice and Social Cohesion	8.1 | Environmental justice
		8.2 | Social cohesion
	9 | Urban Planning and Governance	9.1 | Urban planning and form
		9.2 | Governance in planning
	10 | People Security	10.1 | Control of crime
		10.2 | Control of extraordinary eve
ECONOMY	11 | Green Economy	11.1 | Circular economy
		11.2 | Bioeconomy activities
		11.3 | Direct economic value of NE

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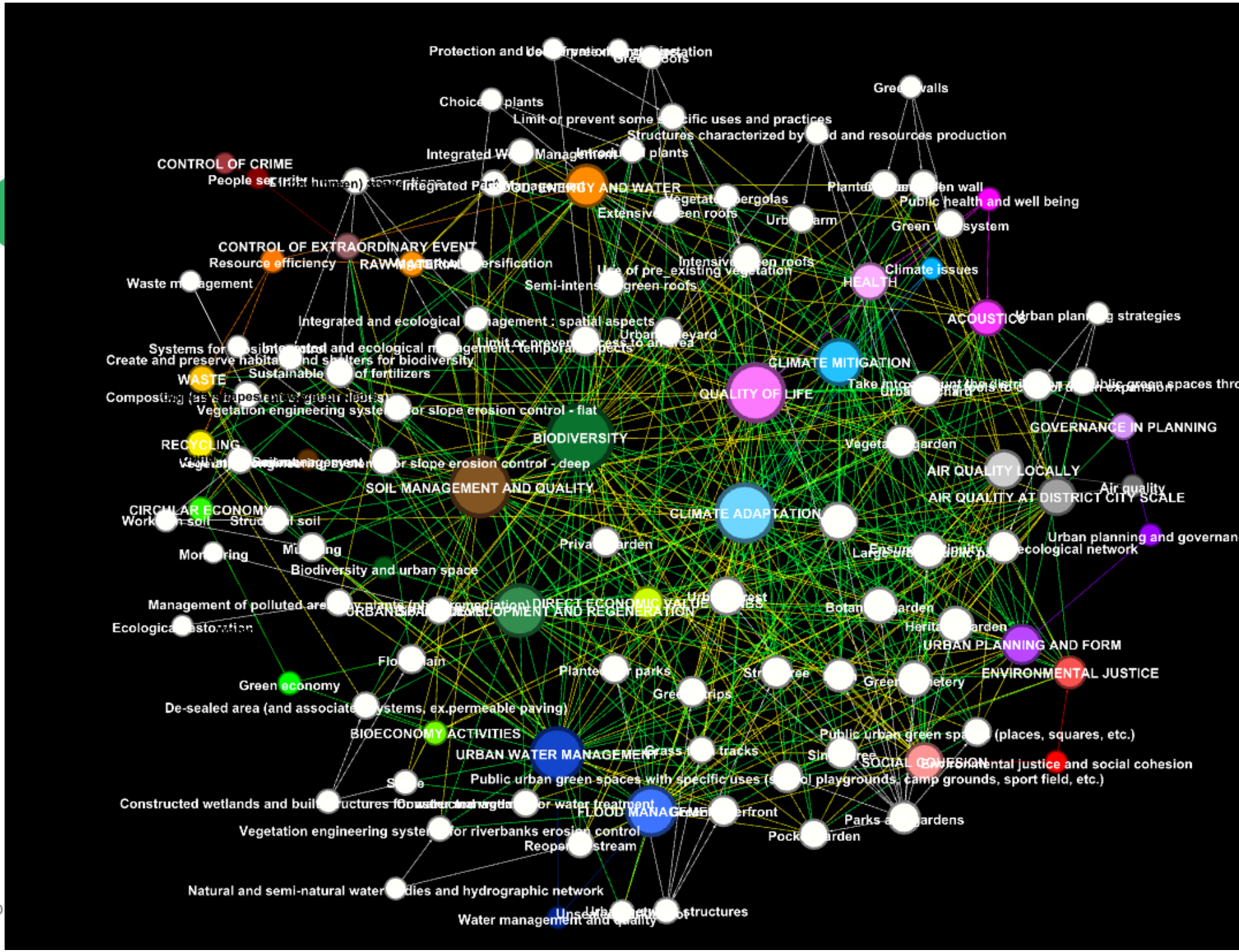
apping
BS –
SC links



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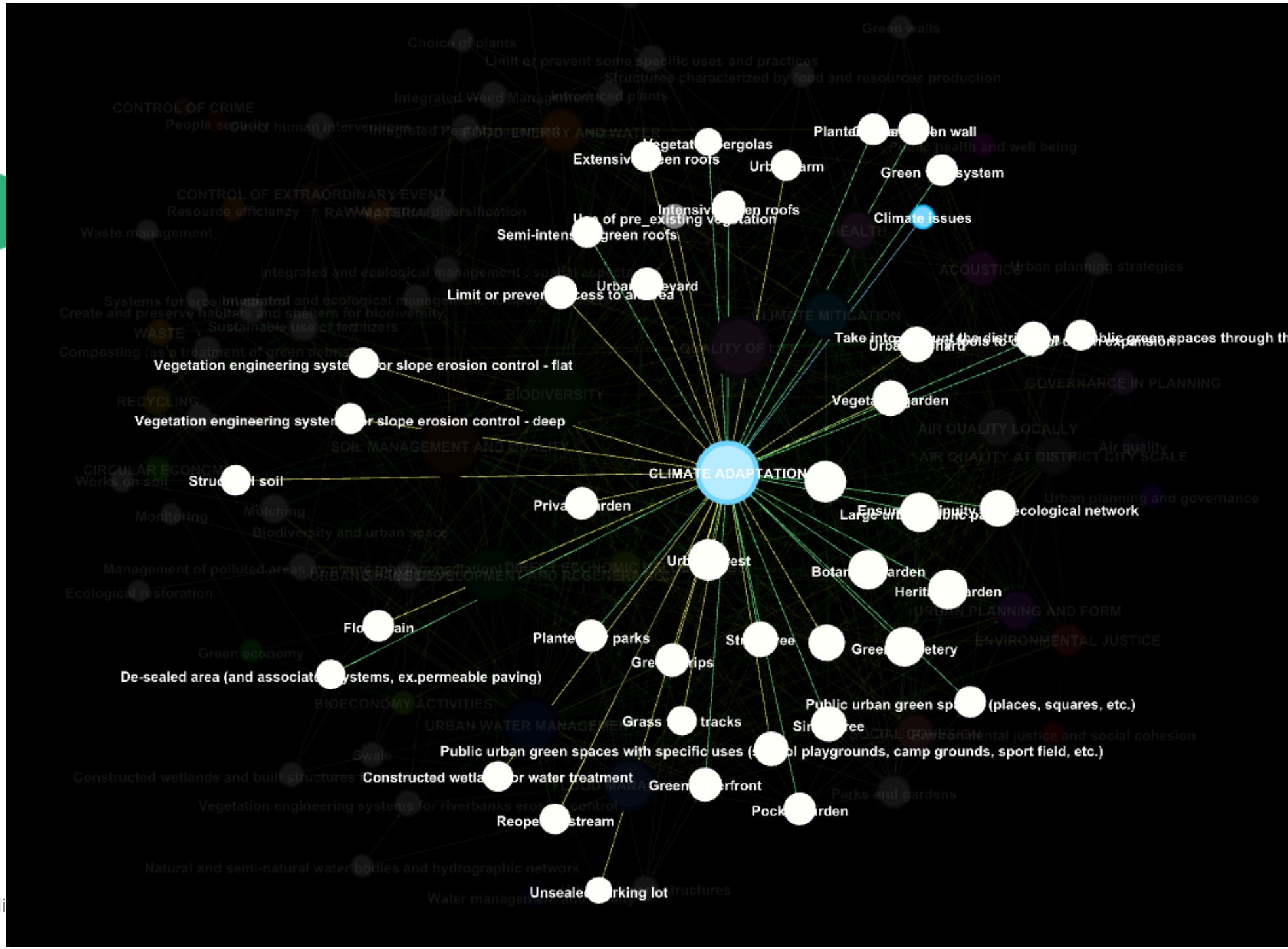

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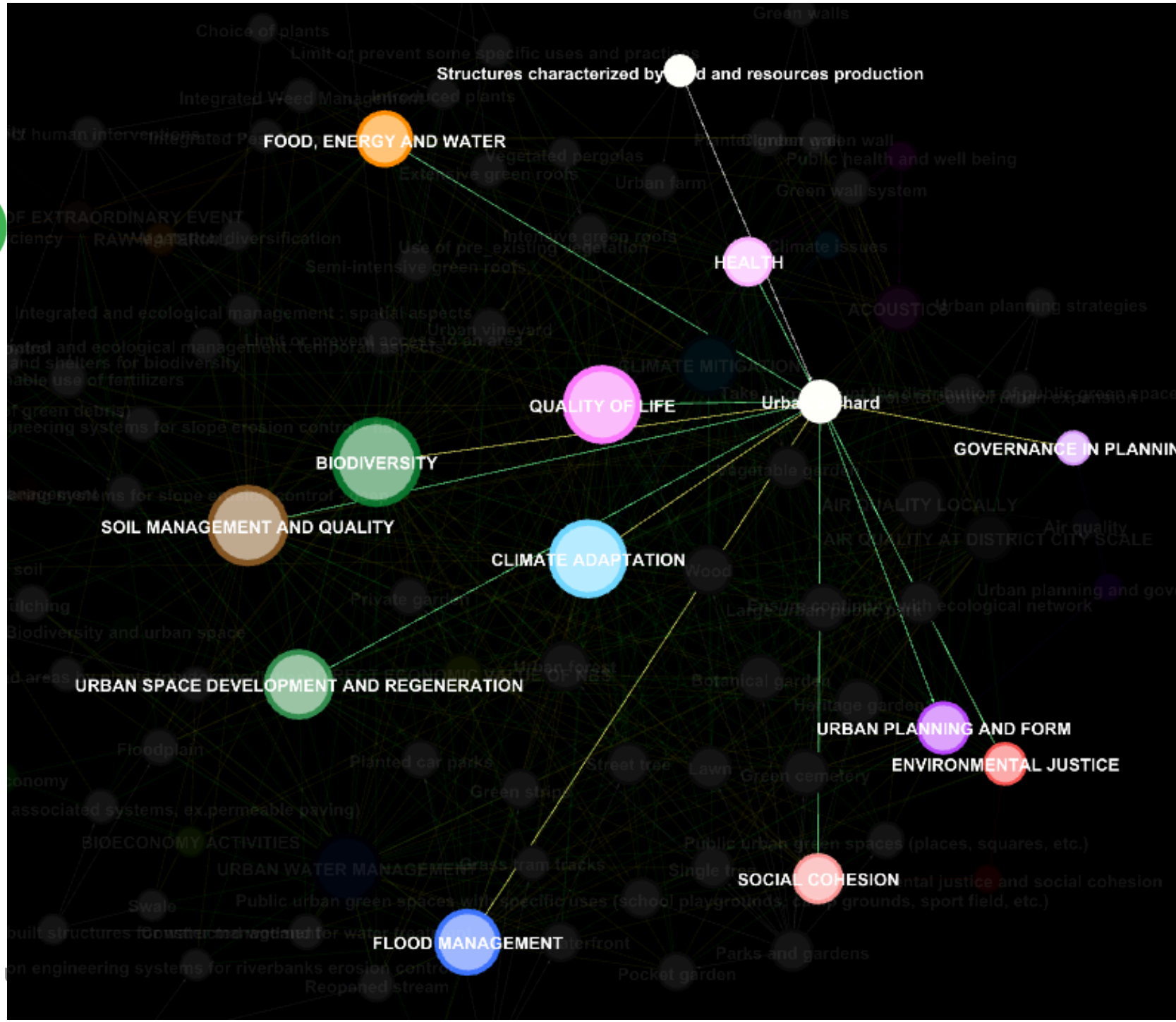

ject has received funding from the European

ioneers database

	Saida school			
	A school refurbishment in an ecological and participatory approach. Implementation of an ecological building (low-energy building) favorable for biodiversity, partial impervious pavement release, green spaces and vegetable gardens creation. This project is also notable for children and educational community consultation in its conception, making them as full stakeholders. The design reinforce the ecological networks at the district scale.			
	FR 14 1  Photo: Paris municipality			
	Objects Shapes	On the ground	Parks and gardens	Urban green spaces with specific uses (school playgrounds, camp grounds, sport fields, etc.)
	Objects Shapes	On the ground	Structures characterized by food and resource production	Vegetable gardens

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ioneers database

	Urban Public Space Refurbishment, Szeged
	Szeged is a mid-size historic city in the south of Hungary, the temperature is usually higher than in other similar -sized cities in the coutry. The goal of this project was to reduce the effects of the urban heat island in a very busy street with a lot of cars and shops. The idea was to increase the green area, plant trees, creating a more pleasant space for the pedestrians. The project has a significant effect which stimulated the economy as well.
	HU 6 1  HU 6 2  HU 6 3 

Objects Shapes	On the ground	Structures associated with urban networks	Street trees
Objects Shapes	On the ground	Structures associated with urban networks	Planted car parks

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ioneers database

Adlershof Berlin			
The building of the Institute of physics of the Humboldt university in Berlin is the result of combining decentralised rainwater management, building greening and elements for cooling and ventilation. All necessary factors, like water and energy consumption, temperature, radiation, etc., are monitored, evaluated, optimised and documented to gain information about basic conditions for the longterm implementation and further development of innovative and economic technologies. This project gives needed information about benefits of façade greening. The results and experiences of the concept model were integrated into the "Rainwater Management Concepts – Greening building, cooling buildings – Planning, Construction, Operation and Maintance Guidelines" developed by the Senate for Urban development of the City Berlin.			
DE 2 1 			
Objects Shapes	On building structures	Vertical structures Green walls facades	Climber green walls
Objects Shapes	On building structures	Vertical structures Green walls facades	Build or attached planter systems (including green balconies)

arch and innovation programme under grant agreement No 730468

ioneers database

LEAFSKIN® Green shady structure			
SINGULAR GREEN is a Spanish company specializing in landscape architecture. They integrate nature and architecture using vertical gardens, green roofs or other tools. They have relevant projects like a vertical garden in London: a garden located in the interior of a famous Nando's restaurant. The green wall, of approximately 30m2 , is located in the dining area. Because of their work, they are involved in the H2020 project URBAN GreenUP, where they study, design, budget and construction of NBS like green noise barriers, green covering shelters with vertical gardens, green roof and vegetable structures. LEAFSKIN® is a green shady structure with several benefits designed by SINGULAR GREEN. This green infrastructure consists in an ultralight vertical garden system with a pitch between 30º and 90º, it is destined for the planting and growth of plants, including irrigation and water drainage system. LEAFSKIN® allows to place advertising on the bottom of the infrastructure as an additional financial support. This NBS is something like a green roof but over the streets, it is an horizontal solution to create shadow areas in urban spaces as pedestrian streets or squares.			
ES 4 1 	ES 4 2 	ES 4 3 	
Objects Shapes	On building structures	Green roofs	Extensive green roofs

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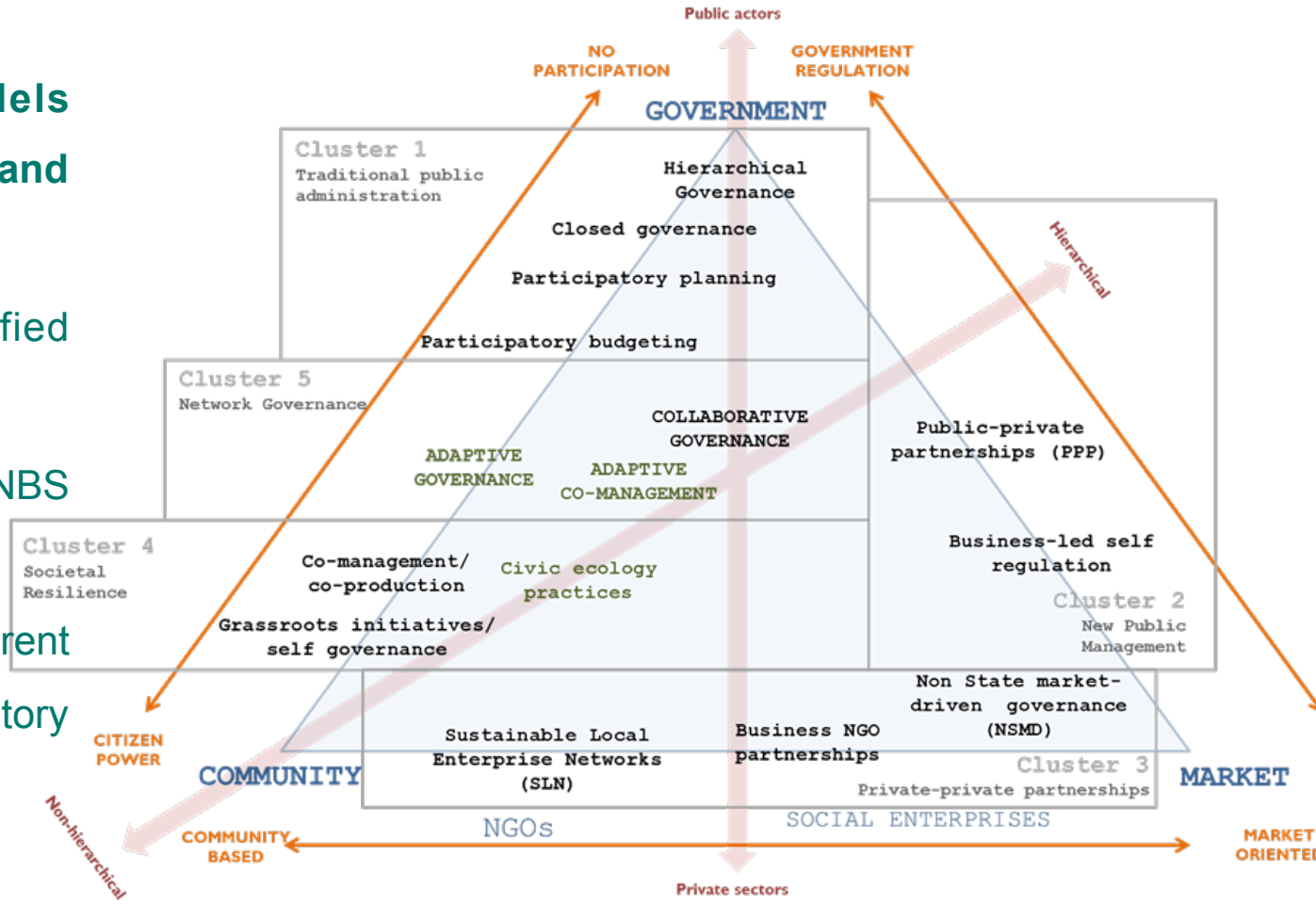
BS Implementation Models

A typology of Implementation Models (governance models, financing schemes and business models) according to:

- their capacity to overcome identified barriers
- their capacity to become drivers of NBS implementation
- their capacity to be adapted to different social, economic, cultural and regulatory contexts



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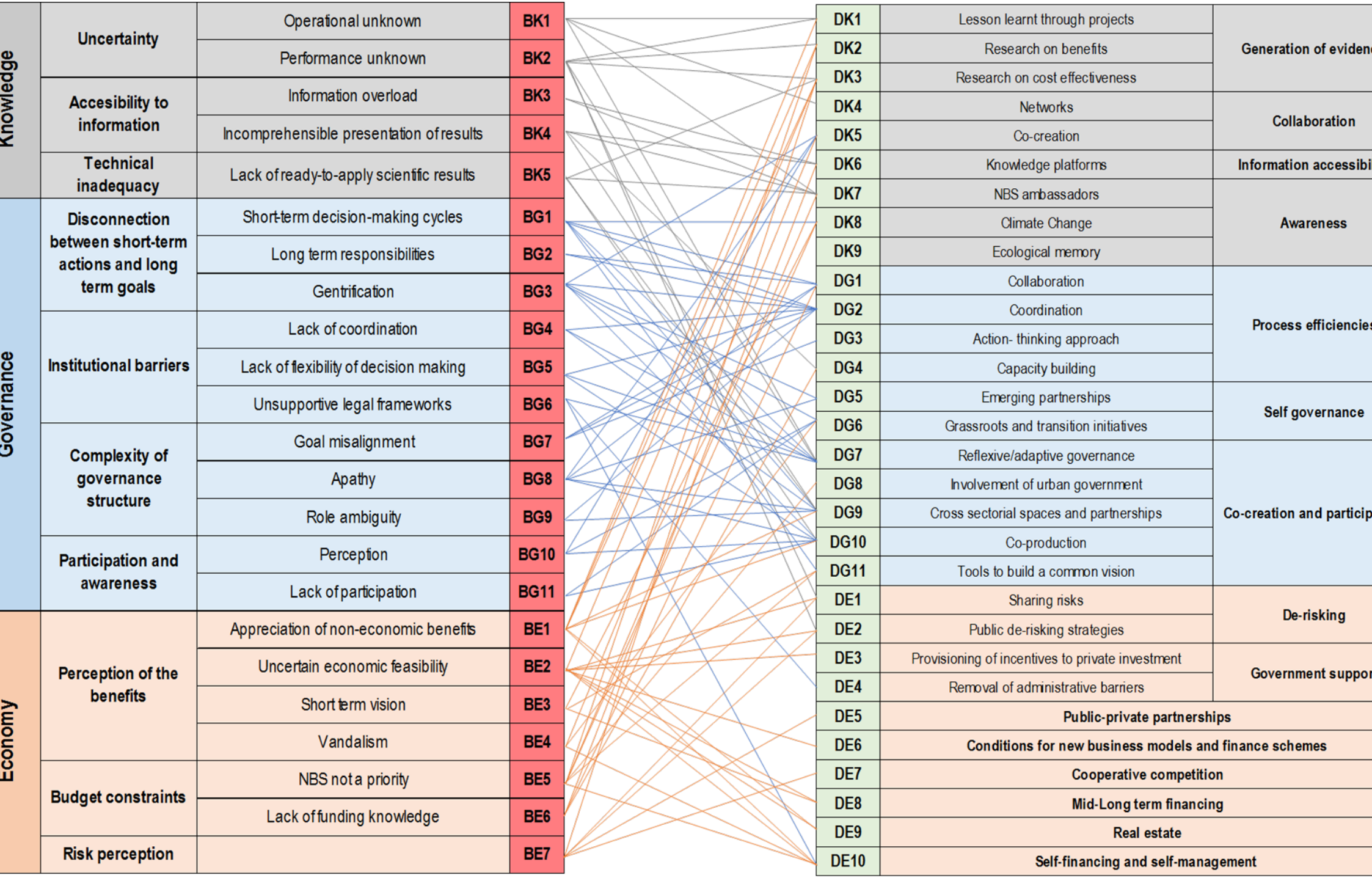
Knowledge
Uncertainty
Operational unknown
BK1
Performance unknown
BK2
Accesibility to information
Information overload
BK3
Incomprehensible presentation of results
BK4
Technical inadequacy
Lack of ready-to-apply scientific results
BK5
Governance
Disconnection between short-term actions and long term goals
Short-term decision-making cycles
BG1
Long term responsibilities
BG2
Gentrification
BG3
Institutional barriers
Lack of coordination
BG4
Lack of flexibility of decision making
BG5
Unsupportive legal frameworks
BG6
Complexity of governance structure
Goal misalignment
BG7
Apathy
BG8
Role ambiguity
BG9
Participation and awareness
Perception
BG10
Lack of participation
BG11
Economy
Perception of the benefits
Appreciation of non-economic benefits
BE1
Uncertain economic feasibility
BE2
Short term vision
BE3
Vandalism
BE4
Budget constraints
NBS not a priority
BE5
Lack of funding knowledge
BE6
Risk perception
BE7
DK1
Lesson learnt through projects
Generation of eviden
DK2
Research on benefits
DK3
Research on cost effectiveness
DK4
Networks
Collaboration
DK5
Co-creation
DK6
Knowledge platforms
Information accessibi
DK7
NBS ambassadors
Awareness
DK8
Climate Change
DK9
Ecological memory
DG1
Collaboration
Process efficiencies
DG2
Coordination
DG3
Action- thinking approach
DG4
Capacity building
DG5
Emerging partnerships
Self governance
DG6
Grassroots and transition initiatives
DG7
Reflexive/adaptive governance
Co-creation and particip
DG8
Involvement of urban government
DG9
Cross sectorial spaces and partnerships
DG10
Co-production
DG11
Tools to build a common vision
DE1
Sharing risks
De-risking
DE2
Public de-risking strategies
DE3
Provisioning of incentives to private investment
Government suppor
DE4
Removal of administrative barriers
DE5
Public-private partnerships
DE6
Conditions for new business models and finance schemes
DE7
Cooperative competition
DE8
Mid-Long term financing
DE9
Real estate
DE10
Self-financing and self-management

Thank you for your attention!

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