

► **GREEN INFRASTRUCTURE AND ECOSYSTEM-BASED APPROACHES: NATURE-BASED TOOLS FOR URBAN ADAPTATION AND IMPROVED HUMAN WELL-BEING**

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Overview

- ▶ Nature-based solutions: context and definitions
- ▶ European policy framework
- ▶ Overview of European (urban) nature-based projects
- ▶ Potential barriers to implementation
- ▶ Fostering GI integration in urban planning
- ▶ Summary - key GI planning principles

Assessment of the potential of ecosystem-based approaches to climate change adaptation and mitigation in Europe



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Design, implementation and cost elements of Green Infrastructure projects



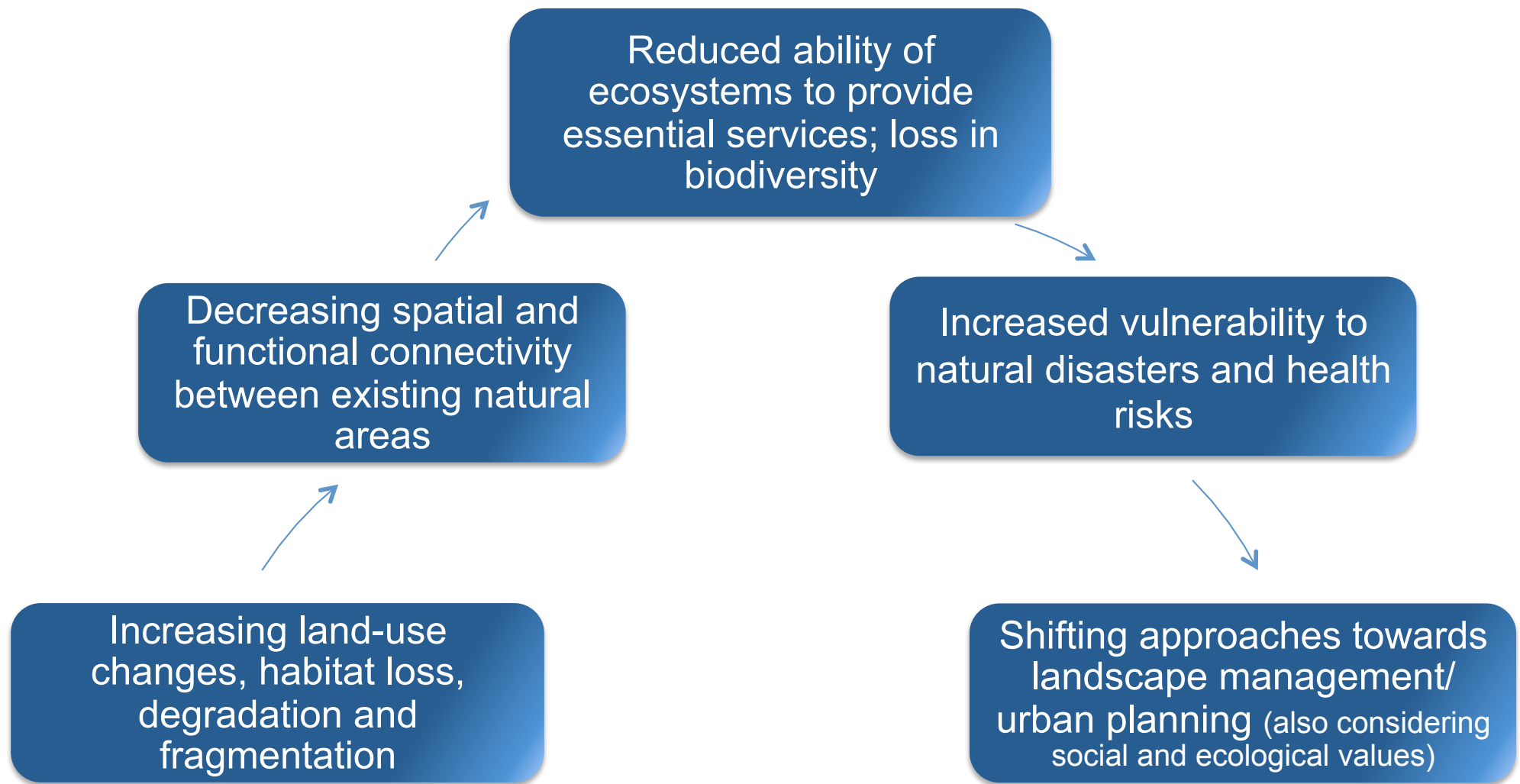
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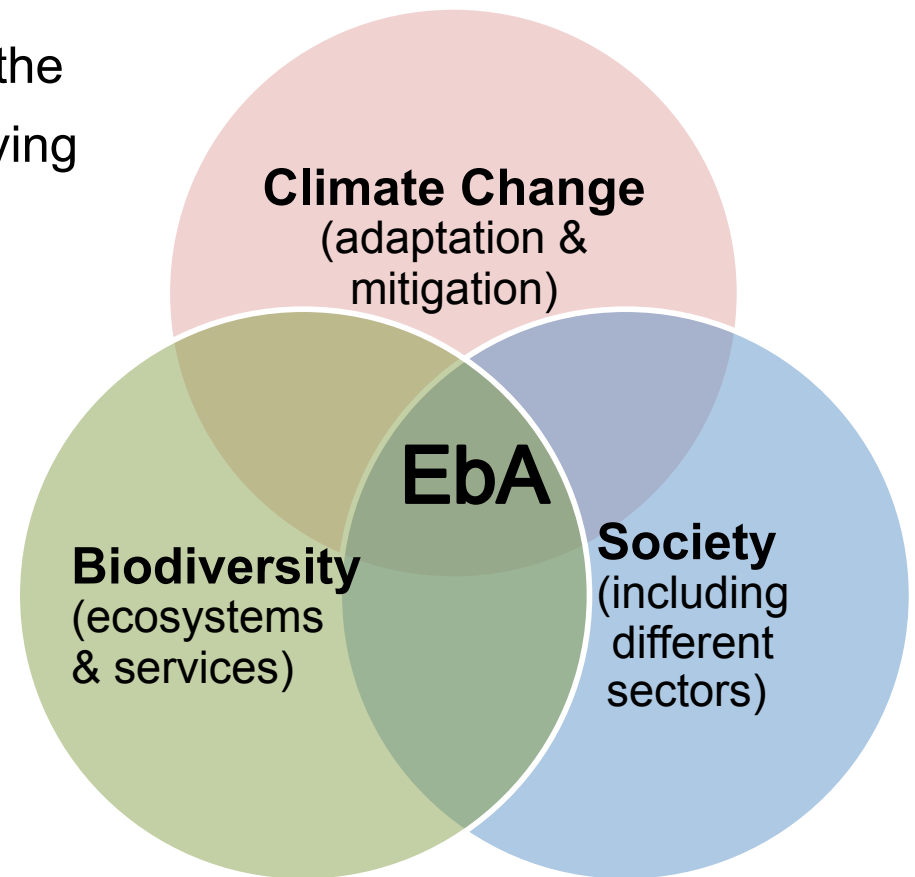
European context



Ecosystem-based approaches

“The **ecosystem approach** is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way”
(CBD decision V/6 2000)

- ▶ **Ecosystem-based Adaptation**
- ▶ **Ecosystem-based Mitigation**



@ Naumann (2013)

Green infrastructure

“A **strategically planned network** of natural and semi-natural areas with other environmental features designed and managed to **deliver a wide range of ecosystem services**. It incorporates green spaces (or blue if aquatic ecosystems are concerned) and other physical features in terrestrial (including coastal) and marine areas. On land, GI is present in rural and urban settings” (COM(2013) 249 final; May 2013)

- ▶ Strengthened through **strategic and coordinated initiatives** that focus on maintaining, restoring, improving and connecting existing areas and features and creating new areas and features
- ▶ Through the maintenance and enhancement of ecosystem services, GI can:
 - **enhance ecosystem health and resilience,**
 - **contribute to biodiversity conservation and**
 - **benefit human populations.**

Potential benefits of nature-based solutions

Support tool for adaptation to climate change:

- ▶ Disaster prevention (e.g. storms, floods, forest fires)
- ▶ Strengthening ecosystem resilience
- ▶ Reduce vulnerability by supporting local livelihoods and economies
- ▶ Connect spaces and habitats for wildlife (increased landscape permeability)

Contribution to human health and well-being:

- ▶ Increased life expectancy and improved health from e.g:
 - Improved air quality, reduced urban heat island effect, more physical activity opportunities, increased contact with nature
- ▶ Increased physical attractiveness of the area
- ▶ Diversification of local economy and job opportunities
- ▶ Higher property values and attractiveness to investors ('urban rehabilitation projects')

EbA & GI in EU Policies

- ▶ **EU Biodiversity Strategy to 2020 (2012)**
 - ▶ **Target 2** focuses on maintaining and enhancing ecosystem services and restoring degraded ecosystems by incorporating GI in spatial planning
 - ▶ EbA can offer cost-effective alternatives to technological solutions, while delivering multiple benefits beyond biodiversity conservation
- ▶ **European Adaptation Strategy (2013)**
 - ▶ acknowledges EbA as usually being “cost- effective, easily accessible and providing multiple benefits “
 - ▶ Accompanying document: “Adapting infrastructure to climate change”
- ▶ **Strategy for Green Infrastructure (2013)**
 - ▶ EbA “are among the most widely applicable, economically viable and effective tools to combat the impacts of climate change”
- ▶ **A Water Blueprint for Europe (2013)**
 - ▶ GI and **natural retention measures** (urban include e.g. Sustainable Drainage Systems, Green Roofs, etc)

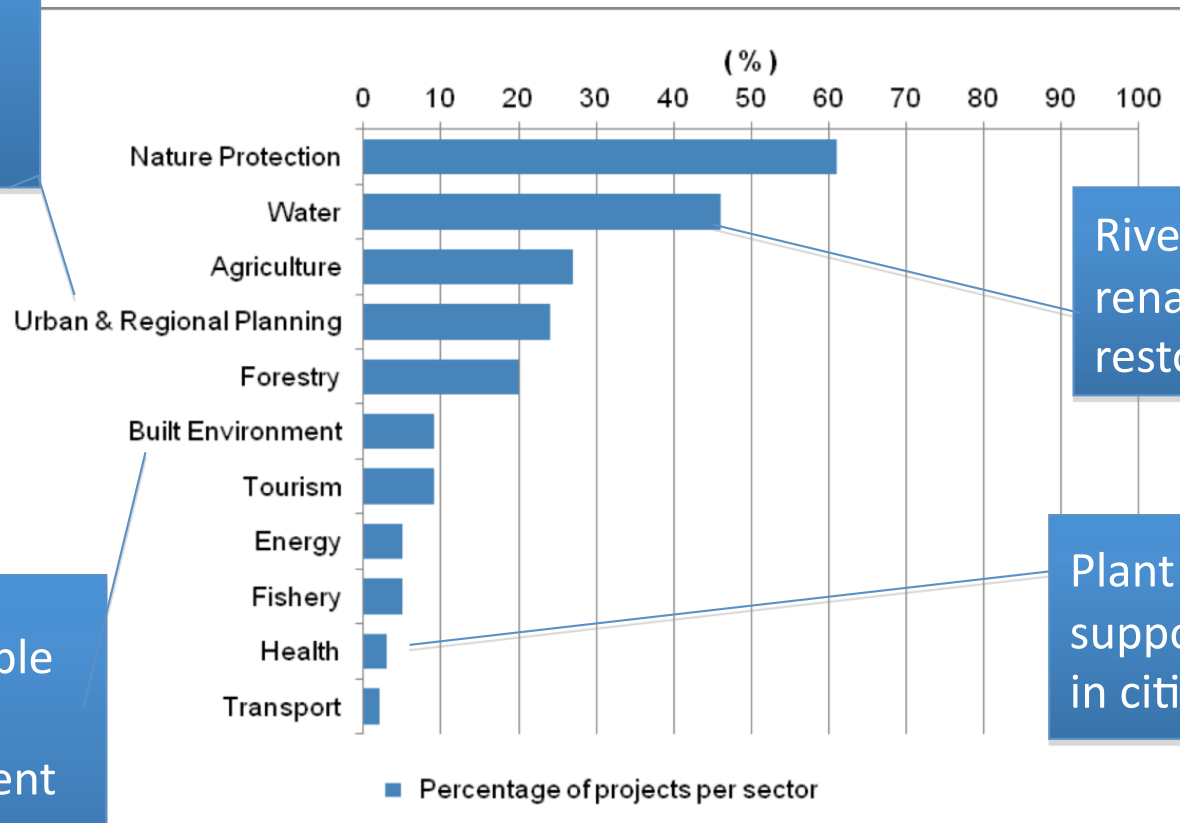
Overview of European nature-based projects

- ▶ **Project databases** (EbA - 161 projects; GI – 127 projects) – include parameters on project identification, scope and operation
- ▶ **In-depth case studies** – provide detailed assessment of projects' initiation and implementation, costs and benefits, barriers and success factors
- ▶ **Additional input:**
 - **EbA: screening** and assessment of EU strategies/ policies and selected NAS and **interviews with EC officials**
 - **GI: expert workshop**



Sectoral coverage (EbA)

Increase green and blue infrastructure and spaces



River and floodplain renaturation/restoration

Plant urban trees; support green spaces in cities

Reduce impermeable surfaces; use of ecosystem-consistent materials

Urban & regional planning project examples



Combating heat island and poor air quality with green aeration corridors (Stuttgart, DE)



Urban regeneration initiative - retrofitting SUDS (Augustenborg, SE)

Development of open space standards (SK)



Greater Lyon green network - Develop and increase the urban tree canopy (Lyon, FR)



Extra cubature for developers in return for green spaces (Faenza, IT)



Potential barriers to implementation

- ▶ Barriers at project level:
 - Lack of **financial sufficiency** and predictability
 - Lack of **quantitative data** on benefits
 - Limits to **technical expertise**
 - Organizational and institutional **complexity** arising out of the diversity and number of **partners**
 - Antecedent **regulatory conditions** inhibit landscape-scale, strategic decision-making and the creative provision of funds, materials, and expertise
 - Limited **public awareness** about the multiple benefits

- ▶ Barriers to integrating GI into policy:
 - Lack of **political will**
 - **Competing land uses** and increasing value of and demand for land
 - **Cross-sectoral and multi-scale** nature of strategic GI network

Recommendations to foster GI integration in urban planning

- ▶ Creation of overarching and **supporting national framework** and **clear national vision**
- ▶ Promote identification of **multifunctional, multipurpose zones** and incorporation of **new GI elements and restoration actions** into urban planning and policy
- ▶ GI as tool to support **integrative spatial planning** approaches in urban areas (Laforteza et al, 2013) → collaboration of local planning authorities
- ▶ **High level of consultation** and **diversity of stakeholders** involved in urban planning early on in the process
- ▶ **Objectives are understood** and appreciated by all participants
- ▶ **Incorporate GI principles** into other strategies, master plans and local development frameworks (embed project in larger policy, project or strategy)
- ▶ **Time and place suitability** (project concept is coherent with local visions and ambitions)
- ▶ Highlight **provided benefits and case studies** of locally accessible GI

Summary – key GI planning principles

- ▶ Approaches addressing the green structure:
 - Integration
 - Multifunctionality
 - Connectivity
 - Multi-scale approach
 - Multi-object approach

- ▶ Approaches addressing the governance process
 - Strategic approach
 - Social inclusion
 - Transdisciplinary

(Hansen and Pauleit, 2014)

THANK YOU!

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