



*Forum Loire & affluents
Au cœur de l'Europe des fleuves
Adaptation aux impacts du changement climatique*

Nature-Based Solutions to address societal challenges

Towards a new EU R&I policy framework

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Societal challenges to be addressed

- Society faces multiple **challenges** (e.g. climate change, food security, degradation of ecosystems and biodiversity loss, air and water quality, droughts, heat island effects, risks of floods and hazards etc.)
- These challenges have serious **impacts** on the **economy**, **natural capital**, **human health** and **well-being**
- They are likely to be **further exacerbated in the future** due to climate and global changes, demographic changes and increasing urbanization

Floods



- Between **1998 and 2009**, floods in Europe have caused some **1126 deaths**, the displacement of about half a million people and **at least €52 billion** in insured economic losses (Source: EEA)
- Despite huge investments, **built/grey infrastructures by themselves**, though essential in many cases, **cannot provide sustainable solutions**
- Need for **more systemic and sustainable solutions** that can be found by looking to nature for "**proof-of-concept**" and to R&I for **demonstration, innovative design and optimal implementation**

Grey infrastructure: Inherent weaknesses

- **Built** or '**grey**' **infrastructures** have been traditionally used to address these challenges
- They are **costly, single-purpose** solutions, usually **hostile to biodiversity**, they **degrade ecosystems and ES**, create “**lock-in**” situations, **depreciate with time**, lack internal **resilience** and **flexibility** to adapt to projected environmental **changes** (e.g. climate change, sea level rise, higher precipitation and temperature etc.);
 - **Dykes in rivers**: fragment riparian habitats, prevent interactions between water body and ecosystems, degrade freshwater ecology etc.
 - **Dams**: prevent sediment/organic matter transport, cause ecosystem degradation, beach erosion
 - **Coastal protection structures**: protect one stretch of the coast, cause erosion of adjacent beaches

Need for a new paradigm

- Foster **mindset shift** of **authorities, relevant stakeholders** and **societal actors** to consider deployment of Nature-based solutions as **sustainable and cost-effective** solutions to improve society's **economic, social and environmental resilience**, particularly in **urban areas**;
- Examples
 - **flooding**: consider restoring **wetlands** and/or reconnecting rivers with **floodplains** instead of **dikes** OR optimal **hybrid** solutions
 - coast protection against erosion: **conserve sand dunes, coral reefs, beach nourishment** instead of **sea walls**, OR optimal **hybrid** solutions

Defining Nature-Based Solutions

Solutions inspired from and **supported** by nature.

They:

- provide **simultaneously benefits** for **environment, society and economy** and **increase resilience**;
- are **cost effective** and **resource efficient**;
- are **multi-purpose, systemic** and **locally attuned**;
- are **replicable** and **communicable**;
- are **resilient** and **adaptable** to environmental changes;
- **appreciate with time**;
- are "**engineered**" solutions, based on **proactively introduced new ecosystems**

What has prevented NBS wide deployment?

- Evidence about their **cost-effectiveness** and **economic viability** exist but **fragmented**
- Robust EU-wide **evidence** and solid **knowledge base** is needed
- **Methodologies** are needed to value and factor-in **all their benefits and co-benefits** in cost-benefit analysis to enable a more **transparent** and **fair comparison** against grey infrastructure and assess their **competitive advantages**
 - Ex.** natural **flood plains** along river-banks for **flood protection**;
 - Co-benefits:** filtering of water, stabilizing of water table, nutrients retention, storage of CO₂, timber provision and linking up natural habitats

A new R&I policy initiative on NBS

- A new and ambitious **two-fold EU R&I policy framework** to promote Nature-Based solutions and turn **challenges** into **innovation opportunities** generating new local **jobs** and **growth**, stimulate new **investments** and **markets** by fostering both **demand** and **supply**:
 - **"Innovating Cities with Nature"**: foster **systemic deployment** through **social innovation** (e.g. participatory approaches and community-based initiatives) and **integration** of Nature-Based Solutions into the overall **urban planning** to resolve **trade-offs** between nature, society and the economy;
 - **"Enhance resilience in rural and natural areas"**: NBS to build territorial, socio-economic and ecological **resilience and coherence** to cope with climate change, natural hazards and ecosystem degradation;
- **Relevant Juncker's Political Guidelines**: 'A new boost for Jobs, Growth and Investment', 'A resilient Energy Union with a forward looking climate change policy' and 'A Stronger Global Actor'

"Re-naturing cities" in "Smart cities and communities with NBS"



- Cities **ideal "hubs" of innovation** and **"stewards" of multiple value creation**
- Nature-Based Solutions can make cities more **sustainable, liveable and attractive for investments and businesses**
- Foster **systemic and trans-disciplinary** approaches allowing for **co-designing, co-creating, co-implementing** and **co-assessing** of Nature-Based Solutions with all relevant stakeholders

Nature-Based Solutions for urban flooding



New York City to prevent **sewage overflow** from **stormwater**:

- For **pipe and tank improvements** in sewage system would cost **US\$6.8 billion**;

Investing in **nature-based solutions** (e.g. green roofs, streets and sidewalks) as **surface water retention** to reduce stormwater runoff would cost **US\$5.3 billion**

(+ **co-benefits** in air quality, water quality, recreation, health, well being, recreation ...)

City of Arnsberg, Germany

Challenge: Flooding by the small streams in the city (2007)

Solution: Renaturing of rivers and streams



Co-benefits

- Increased **biodiversity**
- Improvement of the **city landscape**
- Enhanced **recreational value** (and revenue from tourism) for the city
- Underpinning implementation and achievement of **WFD objectives**

Room for the River, the Netherlands

Challenge: High cost of expanding grey infrastructure for flood protection

Solution: Integrated spatial plan with **restoration of floodplains & introduction of green elements**



Co-benefits

- Master landscaping
- Improvement of overall environmental conditions

R&I can make a difference (ii)



- **Universities** acting beyond the traditional role and becoming "**civic/ entrepreneurial universities**" providing a knowledge base, developing the R&I profile and helping to shape the **smart specialisation strategies** of the city/region
- **Private sector** leveraging funding, performing R&I, providing products and services – and jobs
- Engagement of **end-users, public authorities, planners and service providers**

= the "**quadruple helix**" of universities, private sector, policy makers, civil society.

Implementation under Horizon 2020

- **Consolidation of an EU R&I policy framework, agenda and roadmap** for Nature-based solutions and re-naturing cities underway;
- **Establishment of multiple stakeholders dialogue platform** as "**networks of good practices**";
- **Mapping and networking of existing initiatives** on Nature-Based Solutions in Europe and beyond;
- **Set-up of large scale demonstration** projects as '**living labs**' to provide EU-wide evidence on **cost-effectiveness**, enabling **scaled-up, systemic, European-wide deployment** nature-based solutions and stimulate market development (both demand and supply)
- **Test new means of collaboration, financing and governance** (**public private** partnerships, innovative **financing, business** and **governance** models, innovative **public procurement**, inducement **prices, social innovation** etc.)
- **Communication** to Council and EP in 2016;

Major priorities identified by the EG

- **Sustainable urbanisation**
- **Restoration of degraded ecosystems**
- **Climate change adaptation & mitigation**
- **Improved risk management & resilience**

Stakeholder consultation and engagement



- **Dedicated Expert Group** to assist us in defining **policy agenda** and **roadmap** for Nature-based solutions and re-naturing cities;
- Several **awareness raising events**, including with **EP Inter-group** on "Climate Action, Biodiversity and Sustainable development"; Two **conferences** on re-naturing cities under GR and IT presidency;
- **Stakeholder e-consultation** on 12 November 2014 on all four priorities;
- **Stakeholders Workshop** 'Nature Based Solutions and Renaturing Cities', Brussels, 8 December 2014;
- **Engagement and consultation of citizens on re-naturing cities** (qualitative & quantitative studies by Eurobarometer);
- **Call for expressions of interest;**



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