EU policy initiatives and actions to support nature-based solutions for Disaster Risk Reduction and Climate Change Adaptation

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Expert Meeting Paris, Wednesday 27 February 2019
Natural disasters in the EU

- Hydro-meteorological events account for 64% of the reported damages (in euros) due to natural disasters
- High-impact Low-probability events (3%) cause 70% of the damages

Source: European Environmental Agency
Outline

• Nature-Based Solutions... to what?
  • EU R&I agenda for NBS
• Focus on Hydro-Meteorological risk
  • Relevant EU actions and initiatives
• Conclusion
Eco-DRR & EbA: policy context & priorities

- The Urban agenda for the EU (2016)
- The EU Adaptation Strategy (2013)

- NBS
  - Towards better environmental options and flood management (2009)
  - Water blueprint & natural water retention measures (2012)
  - Towards a research agenda for Nature-based solutions (2014)

- Eco-DRR
- NWRM
  - Climate Adaptation
- GI

- The EU Green Infrastructure Strategy (2013)
Nature-based solutions are understood as living solutions that are inspired and supported by nature, which are efficient and cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience.

Examples: green and blue infrastructure, green roofs and vertical walls, natural water retention measures, salt marshes and dunes, floodplains...
Nature-Based Solutions... to what exactly?

**CHALLENGE: MANAGING URBAN SURFACE WATER FLOWS**
Planners in VITORIA–GASTEIZ, SPAIN restored a river ecosystem along one of the city’s main urban arteries, improving the city’s sewage system and enhancing the city’s ecological resilience. The Avenida Gasteiz project, whose implementation began in 2014, redirected a portion of the Avendaño River such that it now flows at the surface along a central promenade. This river restoration will both slow storm water flows and prevent clean rainwater from entering the sewage system. The new green corridor will promote urban biodiversity by increasing habitat and its connectivity within the city and its surrounding areas.

**CHALLENGE: MATERIAL AND ENERGY EFFICIENCY**
The municipality of TRNAVA, SLOVAKIA approved a “Climate adaptation strategy” in January 2015, including establishing small grants for local inhabitants and NGOs. Municipal planners are actively promoting green urbanism and green architecture that decreases land use, raw material consumption and energy requirements of urban buildings while simultaneously providing additional benefits from natural surroundings. These concepts consider local terrain conditions and local materials in design and construction, energy efficiency of buildings, green roof gardens, vertical gardens (green walls), interior and exterior greenery and water management measures (water retention and irrigation components).

**CHALLENGE: LOCAL FOOD, HEALTH CARE AND EMPLOYMENT**
Developers and planners for a proposed extension to the Helsinki metro area in SIBBESBORG, FINLAND will employ “Green Care” to provide unique place identity and local livelihoods for the new area. Green care is the use of agricultural farms and nature for interventions promoting mental and physical health. The Majvik biodynamic farm in Sipoo, near Helsinki, already offers green care opportunities, and provides an example for future facilities. Planners will attract further green care entrepreneurship by allocating land to local food production adjacent to dense urban development and establishing a logistics centre for supplying the local food market.
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R&I agenda for Nature-Based Solutions

Environmental Research
Volume 159, November 2017, Pages 509-518

Nature-Based Solutions in the EU: Innovating with nature to address social, economic and environmental challenges

Nicolas Faivre, Marco Fritz, Tiago Freitas, Birgit de Boissezon, Sofie Vandewoestijne
R&I Actions initiated by DG Research and Innovation

Horizon 2020 calls on Nature-Based Solutions

- *New governance, business, financing models and economic impact assessment tools for sustainable cities with nature-based solutions (urban re-naturing)* (SCC-03-2016)
- *Operationalising insurance value of ecosystems* (SC5-09-2016)
- *Multi-stakeholder dialogue platform to promote innovation with nature to address societal challenges* (SC5-10-2016)
- *Large-scale demonstrators on nature-based solutions for hydro-meteorological risk reduction* (SC5-08-2017)
Portfolio of projects covering NBS

**Call Topic SCC-02-2016-2017**
Demonstrating innovative nature-based solutions in cities

<table>
<thead>
<tr>
<th>Project name</th>
<th>EU contribution (in EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting Nature</td>
<td>11 394 282</td>
</tr>
<tr>
<td>GrowGreen</td>
<td>11 224 058</td>
</tr>
<tr>
<td>UNaLab</td>
<td>12 768 932</td>
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<td>URBAN GreenUP</td>
<td>13 970 642</td>
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2018-2023

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<thead>
<tr>
<th>Project name</th>
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<tr>
<td>CLEVER Cities</td>
<td>14 214 661</td>
</tr>
<tr>
<td>EdiCitNet</td>
<td>11 254 913</td>
</tr>
<tr>
<td>proGlreg</td>
<td>10 432 512</td>
</tr>
<tr>
<td>URBiNAT</td>
<td>13 019 300</td>
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</table>

Total EUR 98 279 300

**Call Topic SC5-08–2017**
Large-scale demonstrators on nature-based solutions for hydro-meteorological risk reduction

<table>
<thead>
<tr>
<th>Project name</th>
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<tr>
<td>PHUSICOS</td>
<td>9 472 200</td>
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<tr>
<td>RECONECT</td>
<td>13 520 690</td>
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<tr>
<td>OPERANDUM</td>
<td>12 257 343</td>
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</table>

Total EUR 35 250 233

**Call Topic SC5-09–2016**
Operationalising insurance value of ecosystems

<table>
<thead>
<tr>
<th>Project name</th>
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<tbody>
<tr>
<td>NAIAD</td>
<td>4 994 370</td>
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</table>

**Call Topic SCC-03-2016**
New governance, business, financing models and economic impact assessment tools for sustainable cities with nature-based solutions (urban re-naturing)

<table>
<thead>
<tr>
<th>Project name</th>
<th>EU contribution (in EUR)</th>
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</thead>
<tbody>
<tr>
<td>NATURVATION</td>
<td>7 797 878</td>
</tr>
<tr>
<td>Nature4Cities</td>
<td>7 499 981</td>
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</tbody>
</table>

Total EUR 15 297 859

Other research projects funded by other calls

- **ThinkNature, 2016-2019**
  - EU contribution: EUR 2 974 164
- **BiodiVERsA3, 2015-2020**
  - EU contribution: EUR 11 988 018
- **EKLPSE, 2016-2020**
  - EU contribution: EUR 2 997 271
- **ESMERALDA, 2015-2018**
  - EU contribution: EUR 3 002 166
- **INSPIRATION, 2015-2018**
  - EU contribution: EUR 2 598 761
## A community of practice on NBS

<table>
<thead>
<tr>
<th>Project</th>
<th>Type</th>
<th>Start Date</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>ThinkNature</td>
<td>CSA</td>
<td>SC5-10-2016</td>
<td>Establish science-policy-business-society interfaces to allow for continuous dialogue and interaction</td>
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<tr>
<td>NAIAD</td>
<td>RIA</td>
<td>SC5-9-2016</td>
<td>Promote the uptake of ecosystem-based approaches for disaster risk reduction and climate change and the exploration of the concept of the insurance value of ecosystems</td>
</tr>
<tr>
<td>Nature4Cities Naturvitation</td>
<td>RIA</td>
<td>SCC-03-2016</td>
<td>Enable the systemic integration of NBS into a sustainable urban planning, new governance, business, financing models and partnerships</td>
</tr>
<tr>
<td>CONNECTING Nature Urban GreenUp UNALAB GrowGreen</td>
<td>IA</td>
<td>SCC-02a-2016</td>
<td>To provide a robust, EU-wide evidence base and develop a European reference framework for nature-based solutions in cities (water and climate resilience)</td>
</tr>
<tr>
<td>CLEVER Cities EdiCitNet URBiNAT proGIreg</td>
<td>IA</td>
<td>SCC-02b-2017</td>
<td>To provide a robust, EU-wide evidence base and develop a European reference framework for nature-based solutions in cities (inclusive urban regeneration)</td>
</tr>
<tr>
<td>OPERANDUM RECONECT Phusicos</td>
<td>IA</td>
<td>SC5-08-2017</td>
<td>To provide evidence that NBS are flexible, multi-beneficial alternatives to traditional engineering to cope with extreme hydro meteorological events</td>
</tr>
</tbody>
</table>
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Main EU legislation embedding water-related risks...

- Flood Directive (2007/60/EC)
- Water Scarcity and Drought Communication
Learning from FP7 projects on floods and drought

**CORFU**
Collaborative research on flood resilience in urban areas

**IMPRINTS**
Preparedness and risk management for flash floods

**RISC-KIT**
Resilience-Increasing strategies for coasts

**PEARL**
Preparing for extreme and rare events in coastal regions

**STARFLOOD**
Towards resilient flood risk governance

**XEROCHORE**
Policy-Science interface in drought issues

**DEWFORA**
Early warning and preparedness

**DROUGHT-R&SPI**
Drought science-policy interfacing
NBS for hydro-meteorological risk at large scale: 4 H2020 projects working together in a new TASKFORCE

[Logos for NAIAD, RECONECT, PHUSICOS, and OPERANDUM]
Objectives of the taskforce

- To learn from each other
- To widen networks
- To enable synergies and complementarities
- To save/optimize use of resources in the projects
- To increase impacts of communication and dissemination activities,
- To ensure the EU added value of the Horizon 2020 projects in the area by:
  - providing consolidated evidence base on NBS
  - supporting mainstreaming of NBS (guidance/tools/methods)
34 case studies

- OPERANDUM green
- RECONECT purple
- PHUSICOS orange
- NAIAD yellow
Development and demonstration of NBS...

**RECONECT:** different type of demo sites
- 4 demonstrators Type A (new NBS)
- 6 demonstrators Type B (existing NBS)
- 17 collaborators (4 EU + 11 intl.)

**NAIAD:** multi-hazard and multiscale approach
- 3 micro scale (in cities) + 3 meso scale + 3 large scale

**OPERANDUM:**
- Open Air Laboratories (OALs)
  - 7 OALs in EU
  - 2 OALs in China
  - 1 OAL in Australia

**PHUSICOS:**
- The mountain focus
  - 3 large-scale demonstrators
  - 2 small-scale concept cases
Individual and common work on indicators and assessment frameworks

- Looking at co-benefits
- Cost-effectiveness analysis (life cycle costs)
- Comparison with grey solutions
- Multiple risks assessed (synergies and complementarities exploited!): flooding, droughts, storm surges, coastal erosion, landslides...

Collaboration with NBS projects working in urban areas !!

Supporting each other in monitoring activities and field campaigns

Interoperability of data platforms

Common dissemination and communication activities
Support to mainstreaming NBS

- Identifying barriers and opportunities for NBS
  - Cultural, social, governance and regulatory frameworks...

- Supporting stakeholder engagement and co-creation

- Multiple tools, methods and guidelines to support NBS planning, design, implementation, up-scaling, monitoring and assessment...
  - PHUSICOS: Complex Social- Ecological Simulation game on NBS, with facilitation instructions and materials. Assessment framework of NBSs effectiveness in comparison with grey solutions. Training Programmes for local practitioners...
  - OPERANDUM: Protocols for the co-design and co-development of NBS as well as for their integrated design, taking into account land management and planning strategic focus. Guidelines for assessment of the effectiveness of NBS in wider lands. Guidelines for replication and up-scaling...
  - RECONECT: Guidelines for design, construction and maintenance of large scale NBS. Selection and enhancement of Complex Adaptive Systems (CAS) tools to support governance and policy formulation. Services platform...
  - NAIAD: Web-based spatial tool (Eco-Actuary) to understand the insurance value of existing and planned NBS to assets at risk of flood. Apps for citizen observatories. Innovative financial frameworks and incentives...
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<tr>
<th>Policy</th>
<th>Ecosystem-based initiative</th>
<th>Information mechanism</th>
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<tbody>
<tr>
<td>Climate adaptation</td>
<td>Ecosystem-based adaptation</td>
<td>ClimateAdapt, CoM</td>
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<td>Biodiversity</td>
<td>Green Infrastructure</td>
<td>BISE</td>
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<td>Water retention</td>
<td>Natural water retention measures</td>
<td>NWRM platform</td>
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<tr>
<td>Disaster risk</td>
<td>Eco-DRR</td>
<td>DRMKC</td>
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<tr>
<td>Research and innovation</td>
<td>Nature-Based Solutions</td>
<td>Opplla, ThinkNature</td>
</tr>
</tbody>
</table>
Open-access wherever possible

The development of a multi-stakeholder communication platform that will support the understanding and the promotion of nature based solutions in local, regional, EU and International levels.

https://www.think-nature.eu/

The latest thinking on natural capital, ecosystem services and nature-based solutions

www.oppla.eu
H2020 EKLIPSE is the European Mechanism to answer requests from policy makers and other societal actors on biodiversity related issues (replies to in-depth questions/analyses/knowledge).

http://www.eklipse-mechanism.eu/

Find more about H2020 research
Improving the use and uptake of research and operational knowledge
Advancing technologies and capacities in disaster risk and crisis management
Improving science-based advice through networks and partnerships
Improving the use and uptake of research and operational knowledge
Advancing technologies and capacities in disaster risk and crisis management
Specific networks

Global Flood Partnership

cooperation framework between scientific organisations and flood disaster managers worldwide

European Innovation Partnership on Water

ESE - Ecosystem Services for Europe (AG052)

The Action Group aims to develop a consensual and agreed methodology to assess the tangible and intangible benefits from natural and constructed ecosystems in environment and monetary terms. This methodology will be tested, adapted and implemented in a range of European and non-European demo sites as European, national and local (RTD) projects. Expected is the development of a unique set of economic indicators (in monetary values), allowing economic comparisons among diverse areas and different scenarios.
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Expected impact

- **Develop, demonstrate and deploy** innovative systemic and locally attuned NBS in rural and natural areas for hydro-meteorological risk reduction at watershed/landscape scale.
  - RECONECT: Report describing technical specifications and procurement processes
  - Phusicos: Starter Toolbox for Stakeholder knowledge mapping to co-design NBS solutions at case study sites

- **Develop a framework for the comparison of green and blue/grey/hybrid solutions** for hydro-meteorological risk prevention and reduction.
  - OPERANDUM: Guidelines for assessment of the effectiveness of NBS in wider lands (replication and scalability) as a measure of adaptation to the effects of climate change
  - PHUSICOS: Assessment framework of NBSs effectiveness in comparison with grey solutions

- **Identify, assess, and propose ways to overcome barriers** related to their social and cultural acceptance and policy regulatory frameworks
  - OPERANDUM: Protocols for the co-design and co-development of NBS as well as for their integrated design, taking into account land management and planning using OALs as strategic focus
  - RECONECT: Catalogue of regulatory, economic and social barriers for upscaling of NBS.

Source: www.nwrm.eu
Expected impact

- PHUSICOS: Governance innovations for the design, financing and implementation of NBS, and their applications to the concept and demonstration projects; accompanied by a Policy Brief

- Develop methodologies, tools and best practices for the replication and up-scaling of NBS in different contexts
  
  OPERANDUM: Strategies for replication and upscaling of NBS.

- Provide consolidated evidence-base on co-development processes, performance standards, cost-effectiveness, operational requirements, life cycle costs and the multiple benefits of NBS as viable alternatives
  
  RECONECT: Monitoring and evaluation of effectiveness over the period of 2 years (Demos A) and 5 years (Demos B);

  OPERANDUM: Data record on evolution of OAL-s in response to interventions

Other deliverables:

- RECONECT: Report on the selection and enhancement of Complex Adaptive Systems (CAS) tools to support governance and policy formulation

- PHUSICOS: The PHUSICOS game – A Complex Social- Ecological Simulation on NBS, with facilitation instructions and materials