

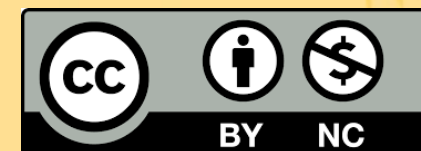
Understanding Nature Based Solutions

An Introduction

Lecture (online)

Trinity College Dublin

Content created in 2024



Funded by
the European Union

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NBS are “Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience.”

Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions.

NBS Definition – EU

Reference: European Commission

What are NBS?

(video 2 min)



- [Reference: NetworkNature](#)

Elements of NBS:

1. Biodiversity
2. Resilience and mitigation of climate change effects
3. Environmental, societal and economic benefits
4. Cost-efficiency
5. Co-creation

*Beyond **technical solutions** for climate change, consider **nature solutions***

Benefits of NBS

Environmental, Social, and Economic Impacts

1. Environmental Benefits:

- Climate change mitigation and adaptation.
- **Biodiversity restoration** through green infrastructure.
- **Flood reduction** and water quality improvement.

2. Social Benefits:

- Healthier communities with improved access to green spaces.
- Social cohesion and community engagement in NbS projects.

3. Economic Benefits:

- **Cost savings** in stormwater management, flood prevention, and energy use.
- Job creation in green sectors, such as urban gardening and landscape design.



Summary of the Benefits of NBS: *tackling the climate and biodiversity crisis*



How to recognise an NBS?

- 1 • Does it use nature/natural processes?
- 2 • Does it provide/improve **social** benefits?
- 3 • Does it provide/improve **economic** benefits?
- 4 • Does it provide/improve **environmental** benefits?
- 5 • Does it have a net-benefit on biodiversity?

■ Connop, S. "Nature-Based Solutions Explained." [Connecting Nature](#).

In-Class Exercise 1:

Objective: Apply NBS concepts to design a solution for a specific urban challenge.

- **Instructions:**

- Choose an urban challenge (e.g., **flooding, heat islands, or pollution**).
- Propose an **NBS solution** (e.g., **green roofs, rain gardens, or urban forests**).
- Discuss potential **policy** and **community involvement** strategies.



**TAKE
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NBS and the SDGs



NBS are contributing to Sustainable Development Goals (SDGs)

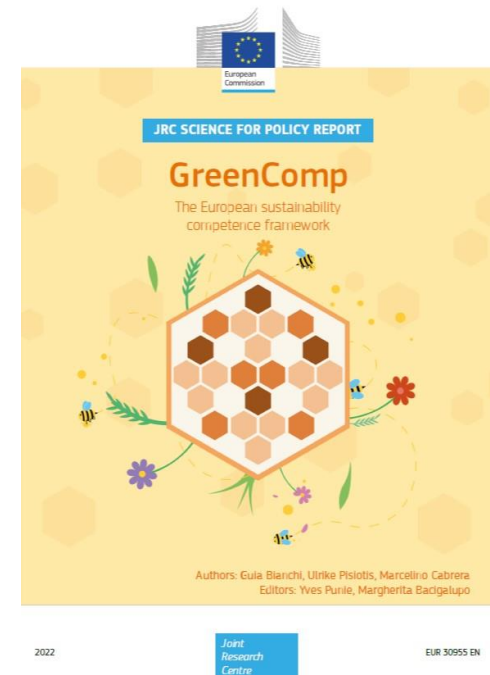
- Key SDGs Linked to NBS:
 - **SDG 6:** Clean Water and Sanitation (e.g., **SUDS** for water management).
 - **SDG 11:** Sustainable Cities and Communities (e.g., **urban green spaces**).
 - **SDG 13:** Climate Action (e.g., **forest restoration** for carbon sequestration).
 - **SDG 15:** Life on Land (e.g., **biodiversity conservation** through NBS).
 - **SDG 3:** Good Health and Well-being (e.g., **green spaces** for public health).

GreenComp:

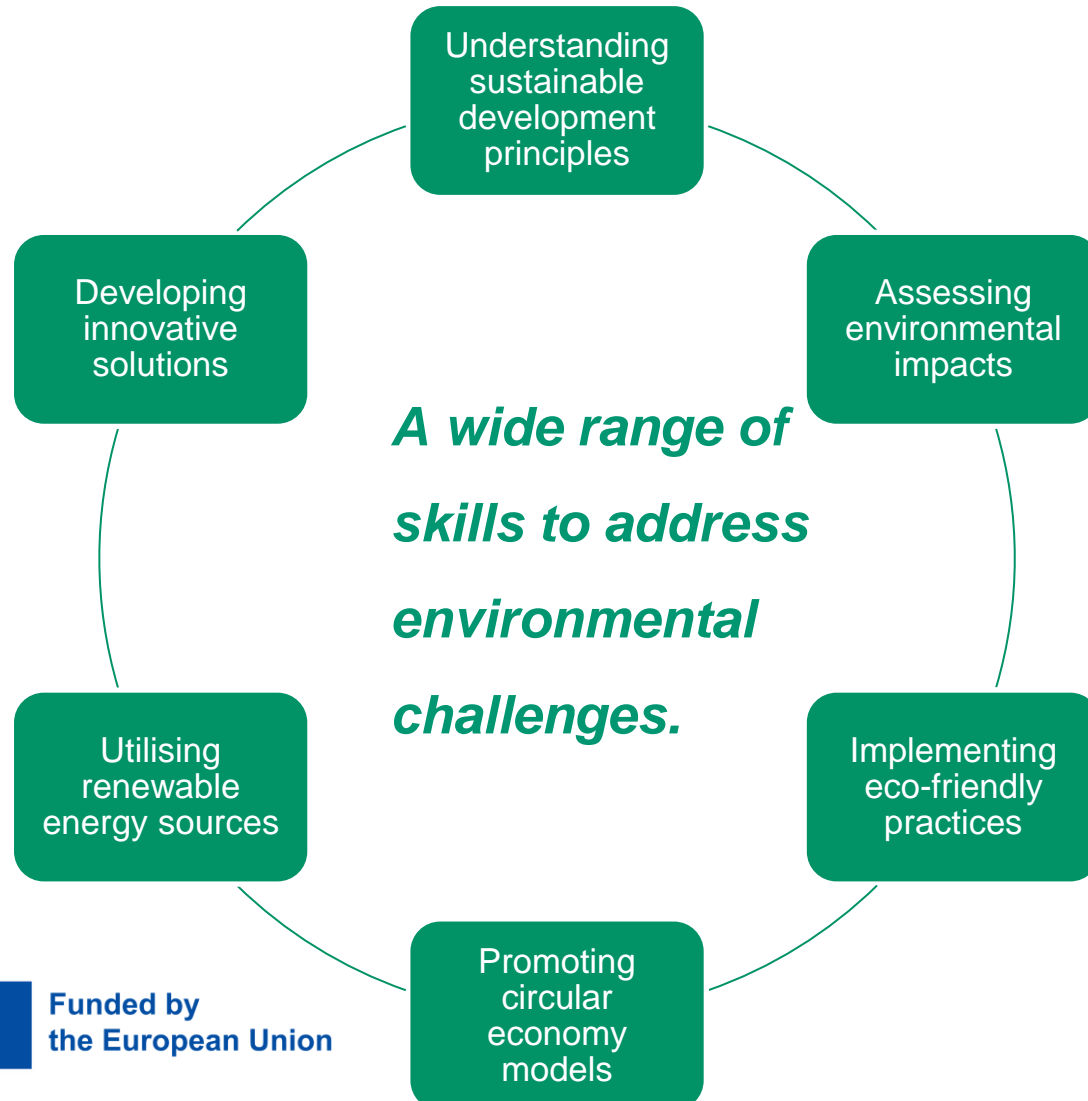
The European Sustainability Competence Framework

- Promoting sustainability concepts via lifelong education and training exercises
- Four competence areas:
 - 1- **Embodying values:** a) valuing sustainability, b) supporting fairness, c) promoting nature;
 - 2- **Embracing complexity in sustainability:** a) systems thinking, b) critical thinking, c) problem framing
 - 3- **Envisioning sustainable futures:** a) futures literacy, b) adaptability, c) exploratory thinking
 - 4- **Acting for sustainability:** a) political agency, b) collective action, and c) individual initiatives (Bianchi et al, 2022)

[Reference: GreenComp 2022](#)



GreenComp: Skills to address environmental challenges



The framework aims to ensure that individuals and businesses have the necessary competences to actively participate in and support the transition towards a greener and more sustainable future.

Source: Utkarsh et al 2023 [Learning from NBS EduSystems inspiring initiatives](#)

Components of GreenComp



Reference:
GreenComp 2022

Nature Based Entrepreneurship

- **Opportunities for Businesses to Implement NBS**
- **Eco-Entrepreneurship:** New business models in **green construction, urban farming, and green infrastructure** solutions.
- **Corporate Responsibility:** Companies investing in NBS projects to reduce their **environmental footprint** and contribute to **SDGs**.
- **Example: Private developers** partnering with local authorities to implement **green infrastructure** in new housing projects.
- For a list of Nature Based Enterprises check out the **‘Connecting Nature Enterprise Platform’**



Local Government & NBS

The Role of Public Administration in Implementing NBS

- **Policy Development:** Creating policies and incentives to promote NBS
- **Zoning and Urban Planning:** Integrating **green infrastructure** and **permeable surfaces** into development codes.
- **Community Engagement:** Involving local groups in planning and implementation through public consultations and workshops.



Comhairle Chontae Uíbh Fhailí
Offaly County Council



CMA
CÂMARA
MUNICIPAL
DE ALMADA

Two local government partners from NBS EduWORLD who are promoting NBS in Ireland and Portugal

Local Government & NBS

How Local Communities Can Engage in NBS Projects

- **Co-designing** NBS solutions with the community.
- **Volunteer Programs:** Local groups can participate in **tree planting, maintenance** of green spaces, and **monitoring** NBS projects.
- **Community-Led Monitoring:** Using **citizen science** to track the effectiveness of NBS in urban environments.



Potential of NBS and ‘Green Gentrification’



- Greening efforts NBS integration may result in **exacerbated social exclusion**:
 - increased rents
 - inflated property taxes
 - displacement of residents
- **Building trust, ownership, and support** among all those directly or indirectly affected by these solutions - regardless of income, gender, and race - and benefitting society at large.

In-Class Exercise 2:

Objective: Understand the role of **public-private partnerships** in implementing NBS.

- **Instructions:**

- Design a model for a **public-private partnership** that involves local governments, private companies, and local communities.
- Discuss potential funding sources, roles, and responsibilities.



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Monitoring & Evaluating Impacts

Tracking the Success of NBS Projects

- **Monitoring Tools:** Use of **smart sensors, IoT devices, and data analytics** to track NBS performance (e.g., water quality, temperature, and biodiversity).
- **Evaluation Metrics:** Assess environmental, social, and economic outcomes, including **carbon sequestration, flood risk reduction, and public health** improvements.
- **Example:** The **Green4CITIES** project uses **smart technology** to monitor the impact of **green infrastructure in urban settings**.

Conclusion

NBS as a Pathway to Sustainable, Resilient Cities

- **Nature-Based Solutions (NBS)** are crucial for creating sustainable, resilient, and healthy urban environments.
- **Local governments** play a pivotal role in enabling the integration of NBS into urban planning, policymaking, and community engagement.
- Collaboration between **governments**, local **community groups**, and **private sectors** is essential for ensuring the success and long-term impact of NBS.





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