

Alternet Day - 12 June, 2024

Sustainability Research + Innovation Congress 2024 - Sustainability Science Days



The role of (nature restoration as) Nature-based Solution in coastal communities' empowerment

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Eclipse Request

“Building resilient coastal communities through nature-based solutions and empowerment tools”

2023 – Request formulation

2023-05 Formation of Expert Working Group

2023-09 EmpowerUS Project Meeting Belfast

Knowledge Synthesis

2024 – 03 Draft Report for Review

2024 – 06 Report Launch



THE REQUESTER



EmpowerUs

Socio-Economic Empowerment of Coastal Communities

Transition Coastal Labs (TCLs) are open innovation ecosystems in real-life environments using iterative feedback processes throughout a lifecycle approach of an innovation to create sustainable impact

Christian Buschmann Ekeland

AT A GLANCE

NAME: Socio-economic Empowerment of coastal communities as users of the sea to ensure sustainable coastal development

PROGRAMME: Horizon Europe

CALL TOPIC: HORIZON-CL6-2021-COMMUNITIES-01-04

TYPE OF ACTION: Research and Innovation Action (RIA)

DURATION: October 2022 – September 2025 (36 Months)

COORDINATOR: Nordland Research Institute, Norway

CONSORTIUM: 16 partners from 9 countries

TOTAL BUDGET: €6 million
(Contributions: EU – €5.2 million; UKRI – €785,000)



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Development of TCLs across Europe to empower coastal communities in:

- Connemara, Ireland
- Cap de Creus, Spain
- Træna, Norway
- Åland Islands, Finland
- Burgas, Bulgaria
- Eastern Limassol, Cyprus



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empowerus-project.eu

The Expert Working Group

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Cecilia Gañán de Molina³, Mia Prall⁴,
Ananya Tiwari⁵, Spyridoula Ntemiri⁶,
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1 Kassel Institute for Sustainability, Kassel University, Germany (Co-chair)

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Research 4

Group, University of Córdoba, Spain

4 Aalborg University & Danish Coastal Authority, Denmark

5 Atlantic Technological University, Ireland

6 Green Fund, Greece

7 University of Stirling, UK

8 Ghent University, Belgium & Universidad de las Américas, Ecuador (Co-chair)



Objectives

“How can community empowerment tools and nature-based solutions contribute to addressing coastal challenges and building resilient communities?”

-  **1** *Specific Objective 1: What is the nexus between NbS and coastal challenges and resilience*
-  **2** *Specific Objective 2: What is the nexus between empowerment (including ET) and coastal challenges and resilience*
-  **3** *Specific Objective 3: What is the nexus between NbS and ET and their impact on empowerment (as a dimension of resilience)*

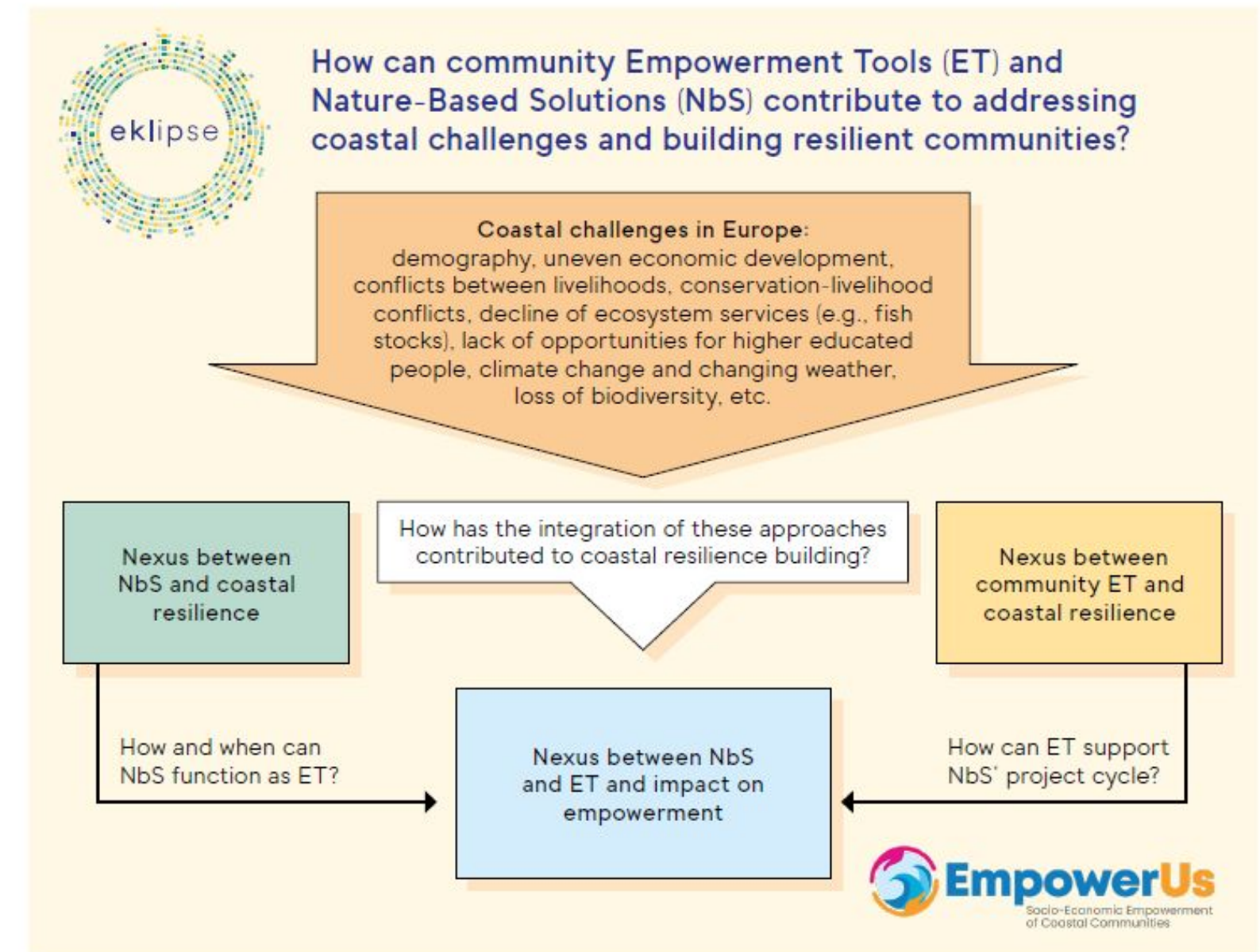


Figure 5. Conceptual framework linking Nature-based Solutions (NbS) and Empowerment Tools (ET) for coastal resilience in relation to the objectives of this report.

Methodology

Rapid Evidence Assessment

- PRISMA
- >1000 publications screened
- 218 publications for full text review

Table 2. List of keywords used for structured searches in the two academic databases (Web of Science and Scopus) and Google.

NATURE-BASED SOLUTIONS	EMPOWERMENT TOOLS	RESILIENCE	COASTAL
"nature-based solution*" OR "nature based solution*" OR "nature-based approach*" OR "nature-based intervention*" OR "ecosystem-based solution*" OR "ecosystem-based adaptation" OR "ecosystem-based mitigation" OR "ecological restoration" OR "ecosystem-based management" OR "green infrastructure*" OR "blue infrastructure*"	"community empowerment" OR "empowerment" OR "social empowerment" OR "social innovation*" OR "community action*" OR "empowering" OR "empowerment tool*"	"resilience" OR "coastal resilience" OR "coastal adaptation" OR "community resilience" OR "social-ecological resilience"	coast* OR marine

Scientific

& grey literature

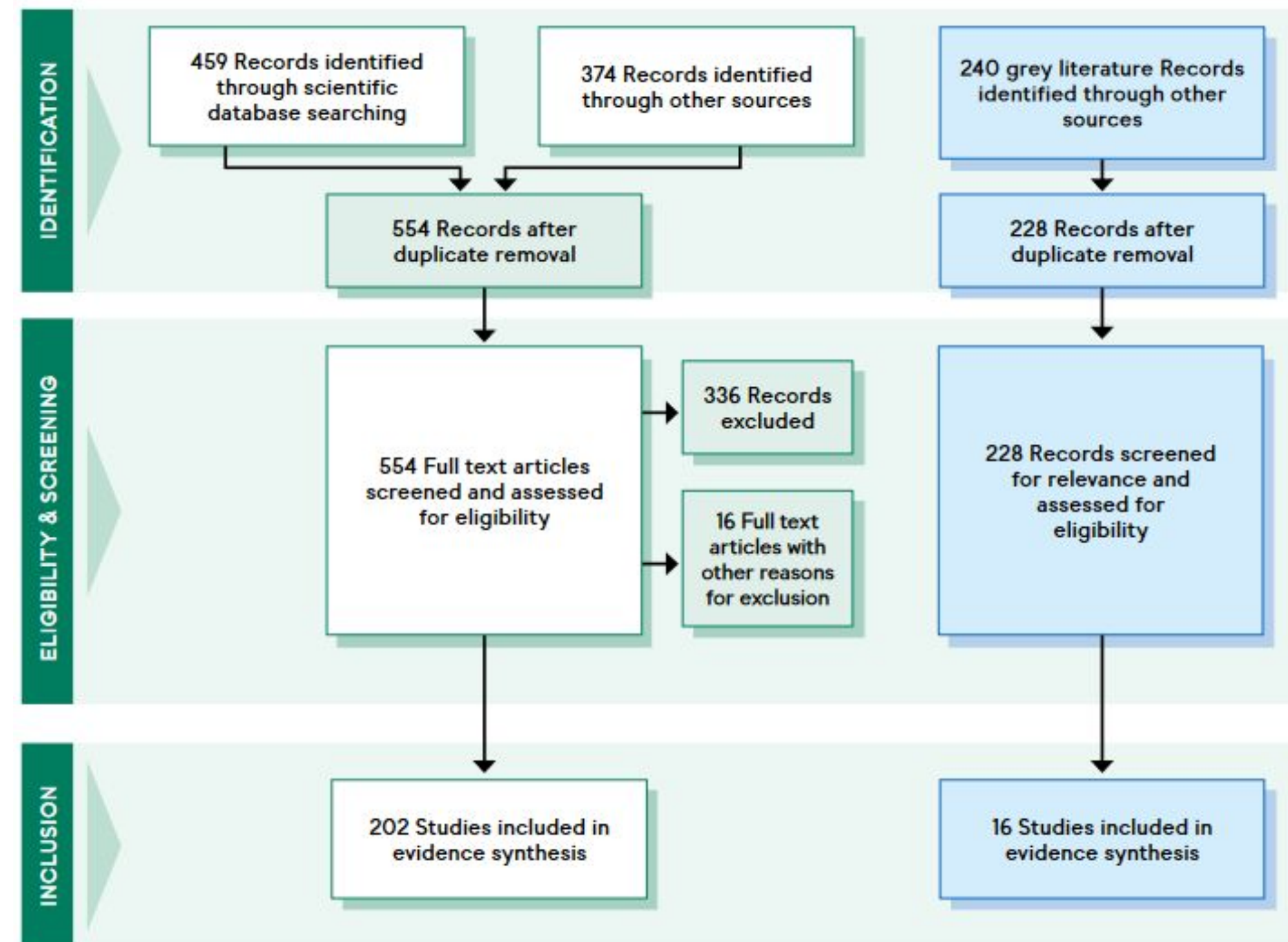
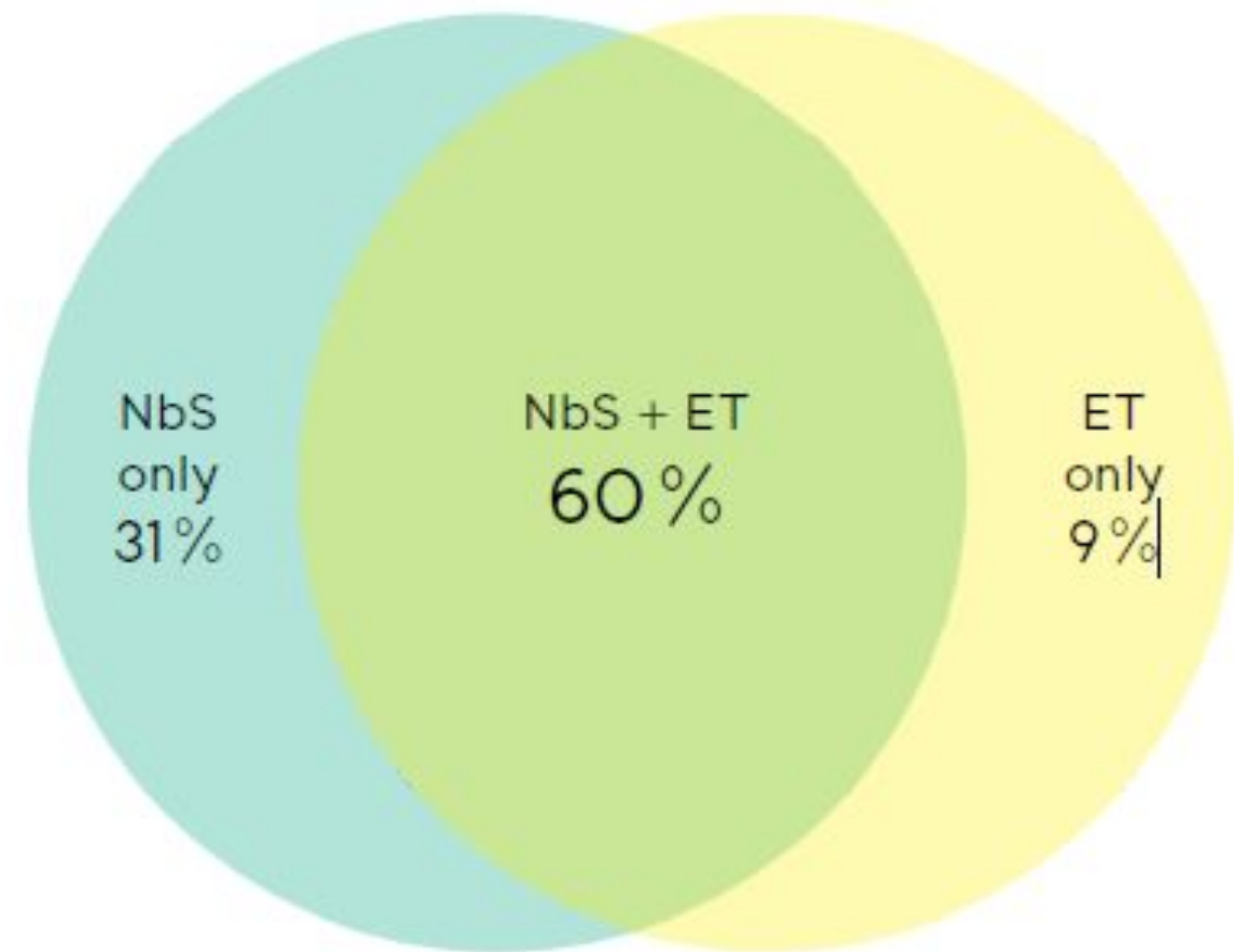


Figure 6. Flow schemes depicting an overview of the screening process (from 6/2023 - 12/2023) of the literature, following the PRISMA protocol (Liberati et al., 2009).

Results

The database

- 132 studies (60%) at the interface between NbS and ET.
- 67 publications (31%) solely on NbS,
- 19 publications (9%) address Empowerment



Nature-based Solutions

NbS

- 218 studies apply different Nature-based approaches
- Coastal NbS related to EbA, EbM, DRR and Green/Blue infrastructure

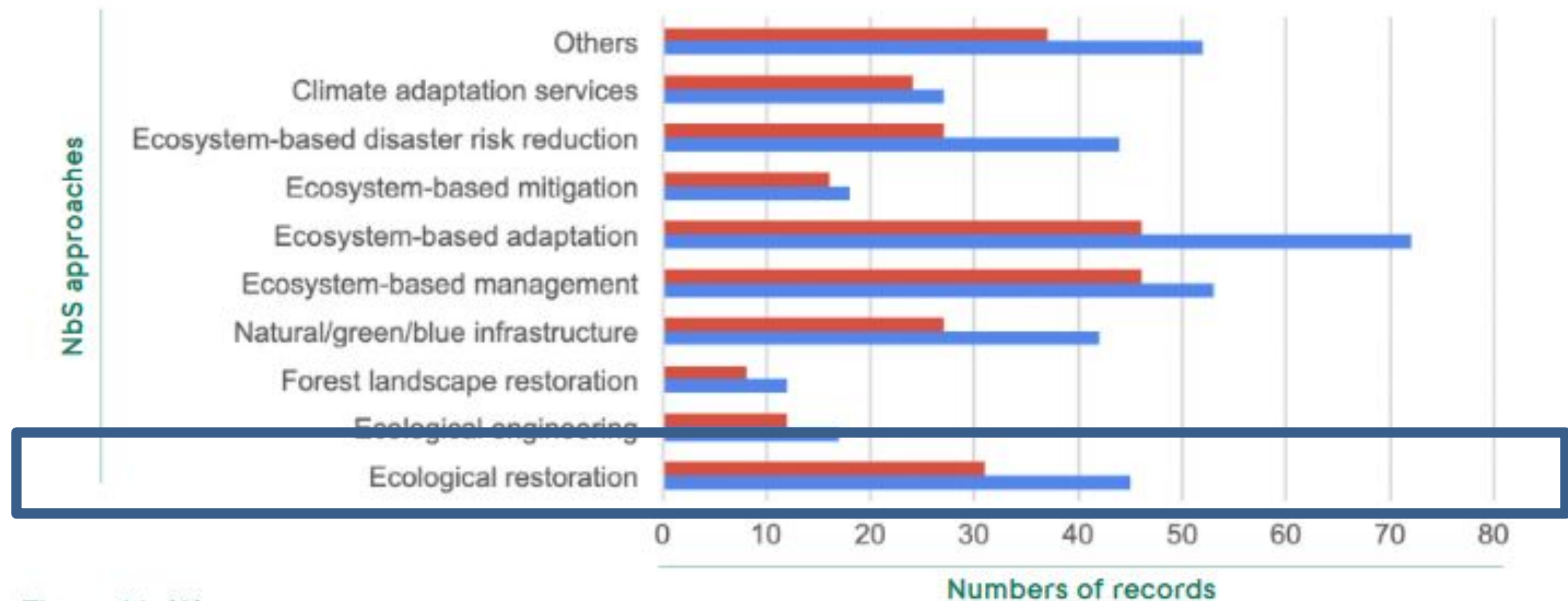


Figure 14. (A)

Nature-based Solutions

NbS and Empowerment

- Participation in 54% of NbS studies (106)
- Empowerment only in 12%; (24 studies)

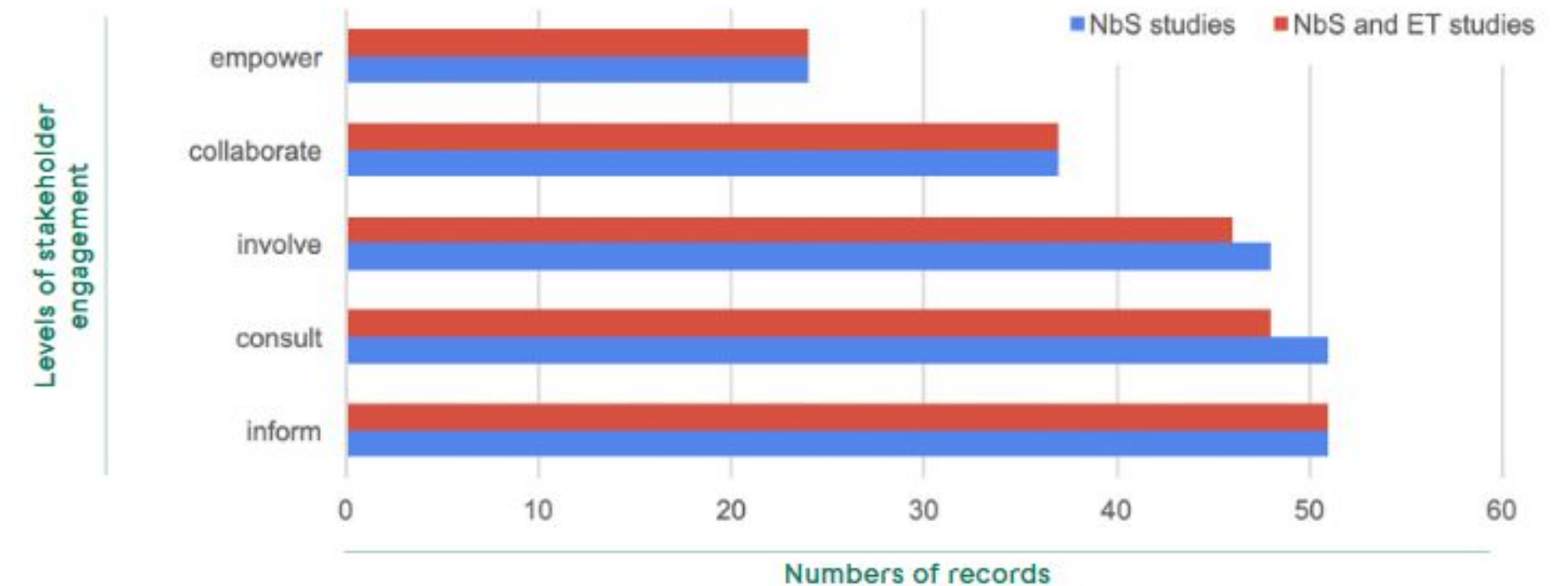
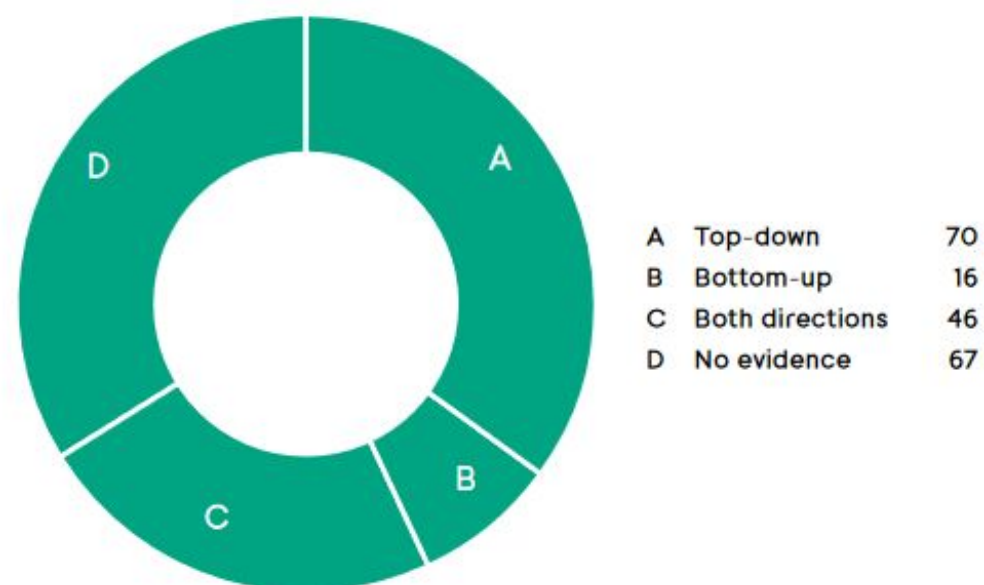
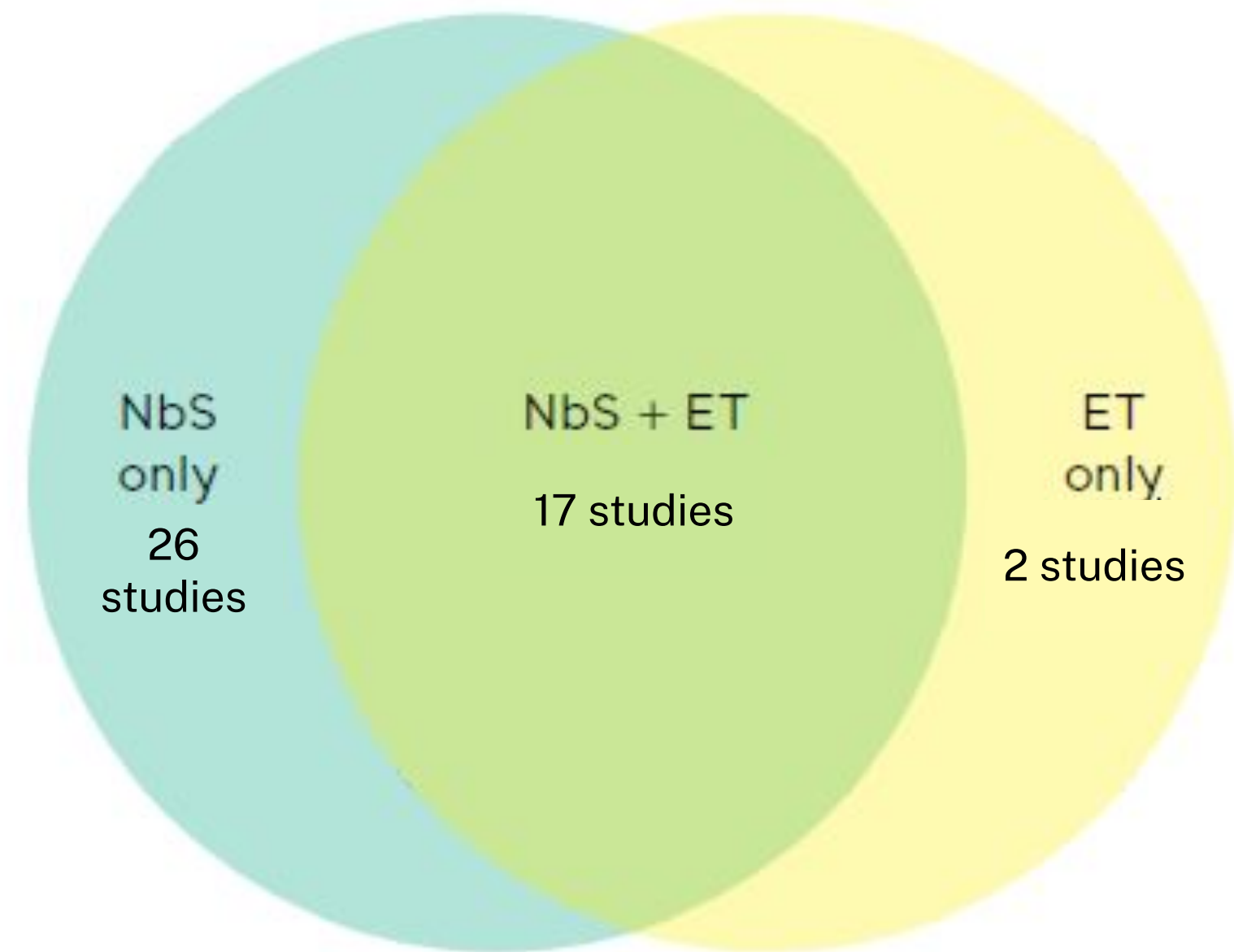
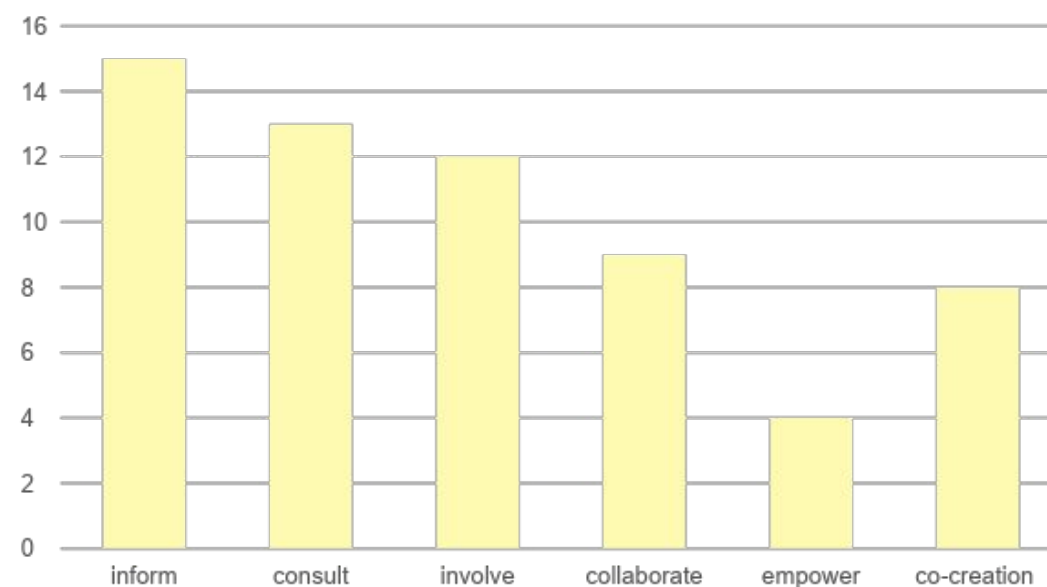


Figure 16. Levels of stakeholder engagement achieved in the reviewed NbS (N=199) and NbS+ET literature (N=132).

Nature Restoration

Coastal NbS examples from the review

- **45 examples found in coastal literature**
- Dominantly design and planning phase
- >50% local in scale
- Stakeholder involvement in 35% of these studies



Coastal nature restoration studies and their thematic focus
(n=45)

Nature Restoration

Coastal NbS examples from the review

Broad topics

- Benefits of coastal habitat restoration

(Guerry et al. 2022)

- Habitat restoration for aquaculture

(Foley et al., 2013; McClenachan et al., 2015; Lithgow et al., 2019; Wells, 2020;

- Ecosystem services

(Rivillas-Ospina et al., 2020; van Well et al., 2023)

- Community-led habitat restoration
(e.g. for iconic species)

(Thomson et al., 2022, Bakker et al., 2019; Stewart et al., 2020

- Social-ecological Systems

(Brattland et al., 2019)

- Resilience

(Bakker et al., 2019)



Wintery quayside on the EmpowerUs Transition Coastal Lab Træna, Norway



The lagoon system of the Ria Formosa (south Portugal) offering protection to the main cities



Sand dunes in Sligo Coastal City Living Lab with marram grass, as an example of Nature-based Solutions to fight against erosion.

How to make NbS empowering?

A catalogue

- 36 Tools to foster Empowerment
- Sorted according to possible stakeholder involvement in decision-making

- ▢ Actions, tools and approaches to foster empowerment in NbS planning, design and implementation

Table 4. List of selected tools, encompassing frameworks and approaches, and related actions.

TOOLS/ APPROACHES	Description
Education tools	■ Actions to create awareness and information ■ Actions to communicate science to diverse audiences ■ Actions to equip citizens with basic understanding needed to make decisions
Knowledge tools	■ Actions to co-produce knowledge ■ Tools to answer specific questions and needs ■ Participatory approaches and modes of knowledge production
Platform/Dialogue tools	■ Actions to generate new platforms and modes of communication and interaction ■ Networking and group formation
Governance tools	■ Actions to support a new governance structure that enables community empowerment ■ Actions for enhancing democracy, environmental justice and targeted policy decisions ■ Actions encouraging grassroots initiatives, bottom-up approaches and new organisational structures including polycentric governance.
Co-Creation tools	■ Actions to create novel, transformative modes of collaboration and decision-making ■ New, integrative forms of research support guiding community-based interests
Community-led Nature-based Solutions	■ Environmental actions for enhanced resilience with co-benefits for communities ■ Actions changing or preserving aspects of physical environment that increase community resilience and benefits for environment

How to make NbS empowering?

A catalogue

- 36 Tools to foster Empowerment
- Sorted according to possible stakeholders and decision-making

Community Gardens,

Nature-based food production,

Community-led Habitat Restoration

- Actions, tools and approaches to foster empowerment in NbS planning, design and implementation

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Empowerment tools

Actions, tools and methodological approaches

- Community empowerment and NbS can be combined to foster coastal community resilience
 - participation, ownership and democratization of planning processes
- ☐ strong communities
 - ☐ awareness on the importance of ecosystems and their services

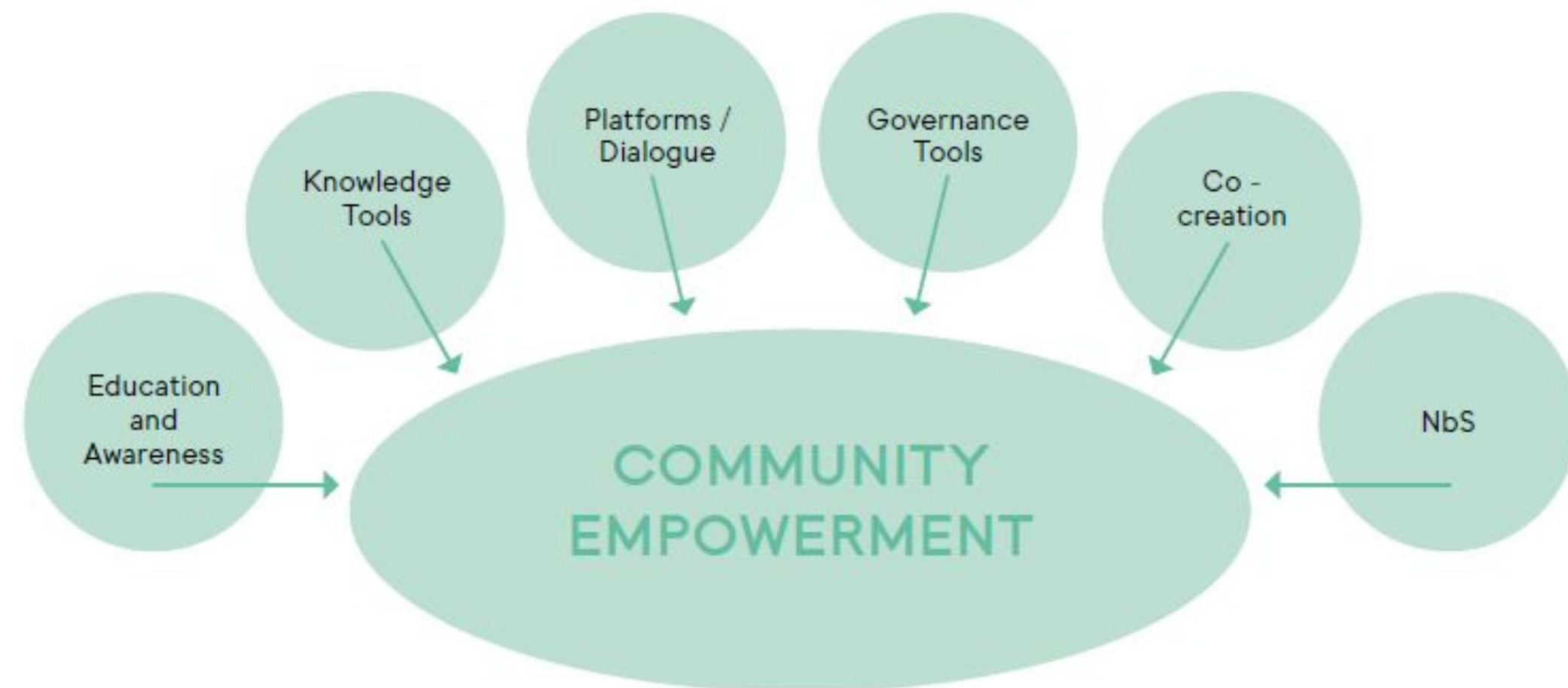


Figure 29. Different tools and approaches can add to community empowerment

Resilience

Nexus between NbS and ET and social-ecological resilience

Catalysts for resilience

- A systemic approach
- A shared vision and an involved community
- An integrated and multi-level governance
- Managing resilience both as a social process and an ecological exercise
- Diversity

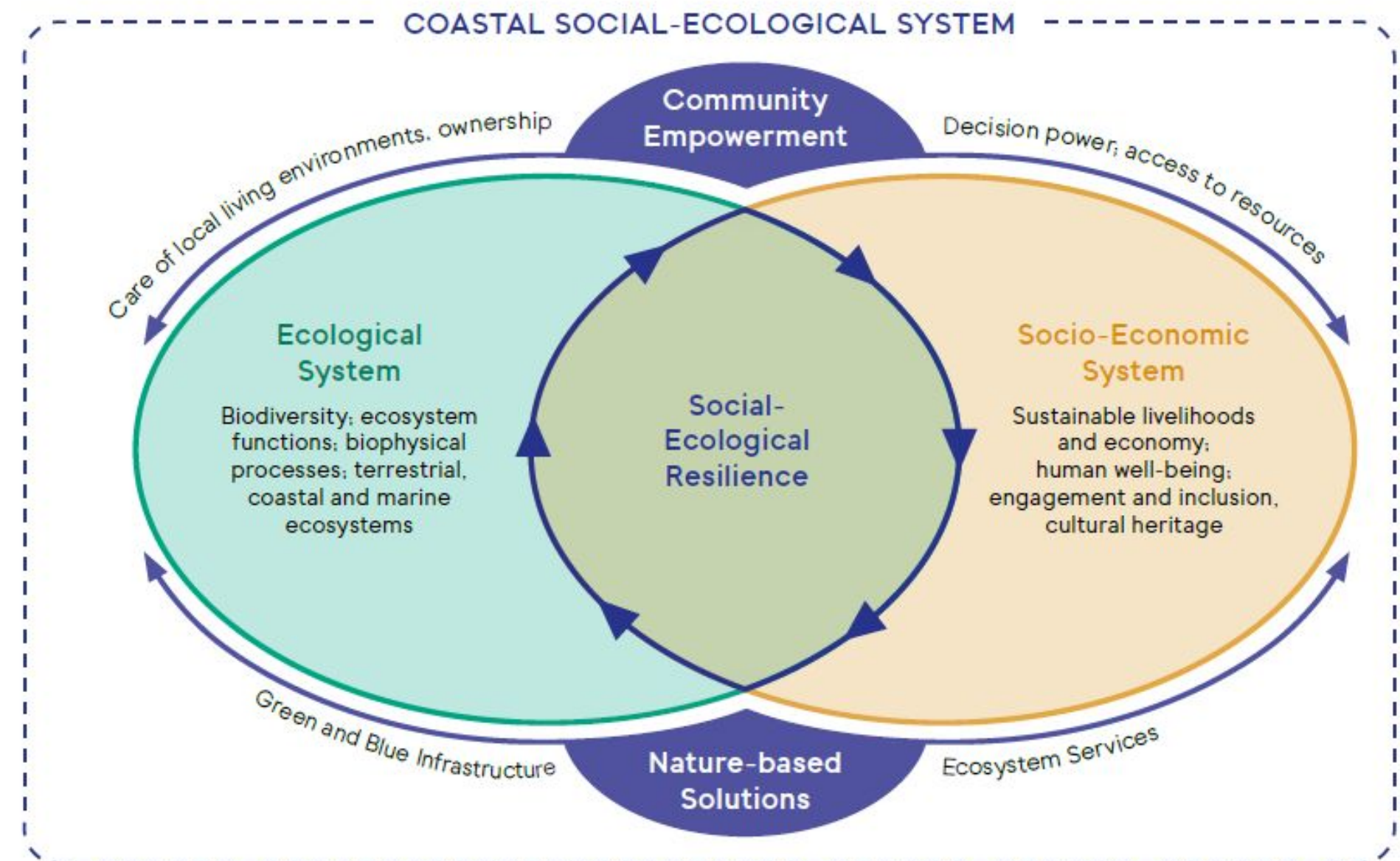


Figure 30. Linkages between ecological and social systems via ET and NbS through social-ecological resilience.

Recommendations

Research and Policy

- urgent need for measuring NbS, Empowerment and Resilience across scales
- Community empowerment and NbS can be combined to foster coastal community resilience
- Empowerment tools

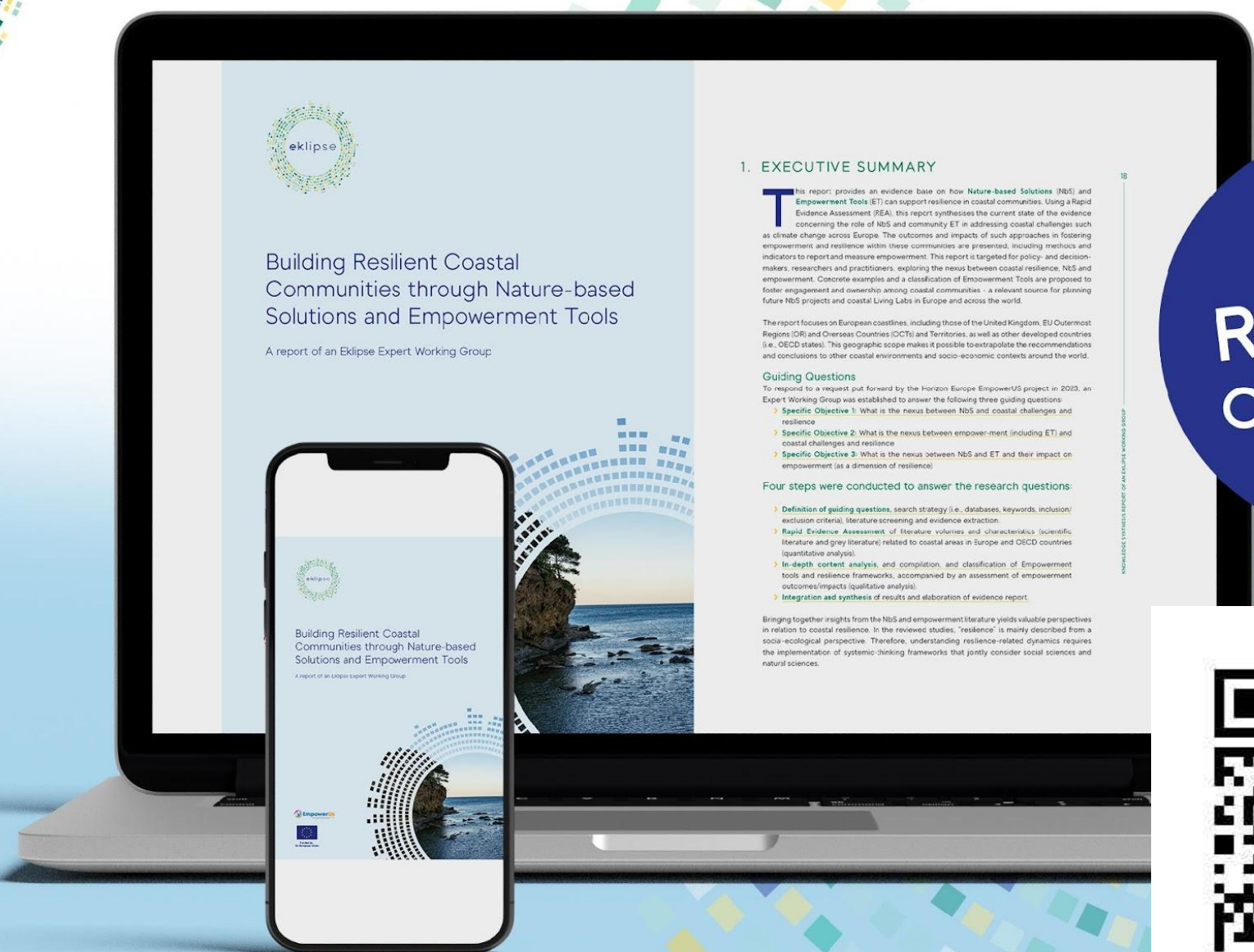


Report Launch

Available today!

Sieber I.M., Carrasco A.R., Gañán de Molina C., Prall M., Tiwari A., Ntemiri S., Bunnefeld N., Pontón-Cevallos J. (2024). “Building Resilient Coastal Communities through Nature-based Solutions and Empowerment Tools”. Eklipse Evidence Report 01/2024.

<https://eklipse.eu/request-empowerus/>



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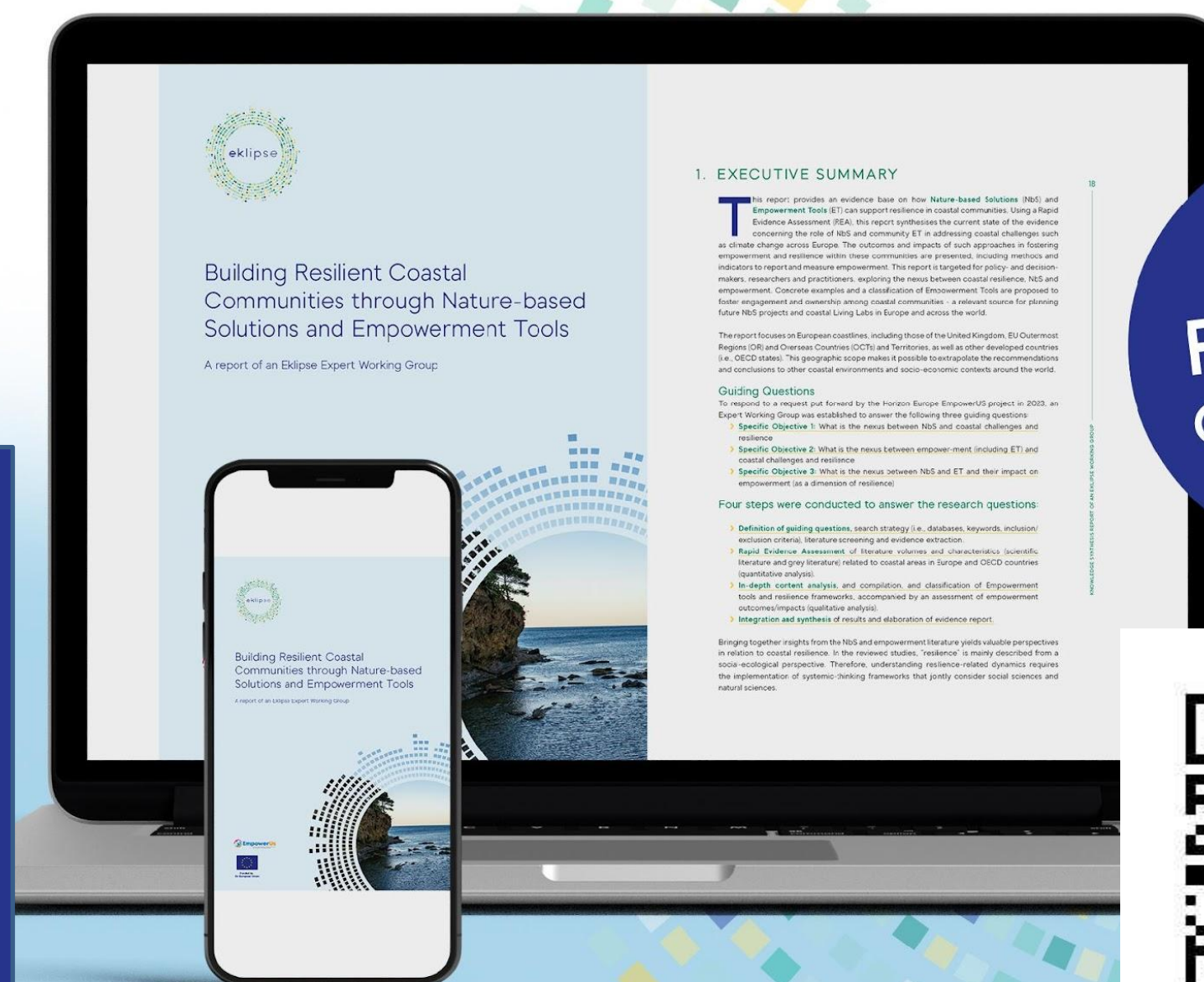
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Thanks to:
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Stella Apostolaki,

European Environment Agency (EEA)
The numerous reviewers
The requester EmpowerUS



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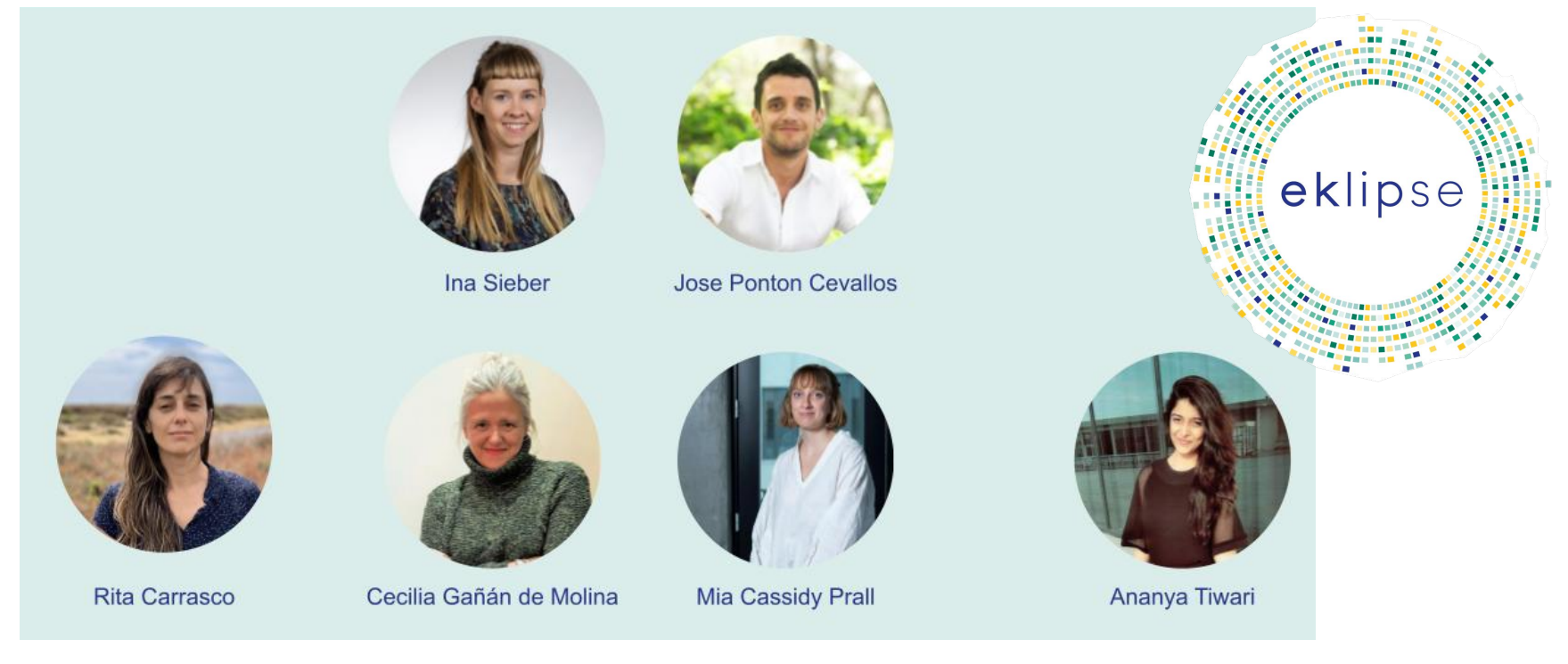
Thank you!

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(on behalf of the Eklipse EWG

“Building resilient coastal communities”)



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Building Resilient Coastal
Communities through Nature-based
Solutions and Empowerment Tools
A report of an Eklipse Expert Working Group

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in ina-m-sieber



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