

BOOK OF ABSTRACTS



Session 30: Beyond Implementation: Stewardship and Governance of Nature-based Solutions for Long-Term Urban Transformation

symposium

BACK TO THE PROGRAM

This Book of Abstracts provides a comprehensive overview of the session content and is structured into two main sections:
I. Session Description: an introduction to the session
II. List of Abstracts - Orals & Posters: a complete compilation of all selected contributions showcasing relevant and impactful research related to the session theme

I. SESSION DESCRIPTION

Hosts:

	Name	Organization
Host	Hai-Ying Liu	NILU
Co-hosts	Raimund Kemper	IFSAR Institute for Social Work and Social Spaces – OST
	Barbara Sowińska-Świerkosz	University of Life Sciences in Lublin

Description:

Friday, 6 November 2026 | **2:00 PM - 4:00 PM** | Aubépine 6+7

Despite rapid advances in the planning and implementation of Nature-based Solutions (NbS) over the past decade, their long-term performance often declines due to fragmented governance, insufficient maintenance, and weak institutional embedding. This session focuses on a critical yet underexplored phase: the post-implementation stewardship and governance of NBS as dynamic socio-ecological systems.

Building on insights from the Biodiversa+ NatureScape project and related research, the session highlights that NbS outcomes depend less on initial design than on how knowledge, responsibility, and care are organized and sustained over time. Urban NbS commonly face persistent challenges after implementation, including unclear responsibilities, limited monitoring, and declining stakeholder engagement. At the same time, stewardship is often reduced to technical maintenance, overlooking its broader social-ecological dimensions and implications for equity and long-term effectiveness.

The session invites interdisciplinary contributions that: (1) conceptualize NbS as evolving socioecological systems requiring adaptive and collaborative governance; (2) examine stewardship as a key but undervalued governance function; (3) analyze governance fragmentation, epistemic injustice, and stakeholder dynamics; (4) present empirical insights from urban contexts; and (5) explore mechanisms to support long-term stewardship and scaling.

The session is open to abstract and poster submissions. We welcome contributions from researchers, practitioners, and policymakers, including empirical studies, conceptual advances, and case-based insights aligned with these themes.

The 2-hour symposium will combine invited and selected presentations, followed by a moderated discussion to foster exchange across disciplines and sectors. It aims to advance the state of the art by strengthening the focus on stewardship, institutional embedding, and long-term sustainability of NbS.



II. LIST OF ABSTRACTS - ORALS

01. Beyond environmental silos: stakeholder perspectives on barriers and enabling conditions for biodiversity–climate–health integrated actions

Speaker: Sara F Camilleri
Authors: Sara F Camilleri, Alice Chonavel and Mario V Balzan
Affiliation: Ecostack Innovations – Malta

Nature-based solutions (NbS) are increasingly promoted as responses to interconnected biodiversity, climate and health challenges. Despite growing recognition of these interdependencies, decision-making remains largely organised around sectoral priorities, funding mechanisms and governance structures. Biodiversity-Climate-Health (BCH)-integrated actions, which explicitly seek outcomes across biodiversity, climate and health domains, provide a useful lens through which to examine how NbS can become embedded across a wider range of policy and practice contexts.

This study examines barriers, enabling conditions and capacity needs associated with BCHintegrated actions. The analysis combines evidence from a systematic review of BCHintegrated actions with a multi-sector stakeholder survey conducted as part of the Horizon Europe GoGreenNext project. The survey targets public authorities, researchers, practitioners, civil society organisations and private-sector actors involved in biodiversity, climate, health, planning and related policy domains. It explores perceived barriers and enablers, examples of successful practice, lessons learned, and training needs for advancing BCH integration in policy and practice.

The presentation will focus on survey findings and examine the extent to which stakeholder experiences align with barriers and enabling conditions identified in the literature. Particular attention will be given to areas of convergence and divergence between academic evidence and implementation practice, including challenges that may be underrepresented in the current literature. By comparing evidence from research and practice, the study identifies practical conditions for advancing BCH-integrated action across sectors and governance contexts.

The findings contribute to ongoing discussions on how NbS can be more effectively integrated into decision-making systems that are not primarily focused on nature, while providing empirical insights into the governance, capacity-building and knowledge requirements needed to support more integrated biodiversity, climate and health outcomes.

Keywords: *Biodiversity* *Climate* *Health* *Nexus* *Governance*

02. From Co-Design to Long-Term Care: the SPICE Approach fo Embedding Stewardship in NbS Participatory Masterplanning

Speaker: Anacleto Rizzo[1]
Authors: Sarine Agopian[1], Ilaria Principi[1], Alice Donferri[2], Marco Berni[2], Rita Duina[2] and Anacleto Rizzo[1]
Affiliations: [1]Iridra S.r.l – Italy
[2]Codesign Toscana ETS – Italy

Nature-based Solutions (NbS) and New European Bauhaus (NEB) principles are increasingly recognised as complementary strategies for urban climate resilience and quality of life. Yet a persistent gap exists between the participatory processes that generate NbS masterplans and the long-term stewardship commitments needed to sustain them after implementation. Co-design processes rarely embed maintenance responsibilities, institutional anchoring, or community ownership as explicit outcomes - leaving NbS vulnerable to degradation once project funding ends.

SPICE (Sustainable Planning for Integrated Climate-resilient Environments, GA 101215492) is a Horizon Europe project developing a participatory toolkit - combining digital and analog tools - to co-design integrated NbS and NEB masterplans across four European cities: Rovaniemi (Finland), Thessaloniki (Greece), Bielsko-Biala (Poland), and Cuba (Portugal). These pilot cities represent contrasting urban contexts, climatic conditions, and governance traditions across Europe, offering a rich comparative basis for testing participatory approaches across diverse socio-ecological and institutional settings.

The SPICE toolkit builds on established participatory methodologies and approaches, intending to explicitly align spatial intervention planning with governance and stewardship frameworks from the outset of the co-design process. This contribution opens a structured debate around two connected questions: how can participatory masterplanning tools be designed to embed stewardship commitments - maintenance responsibilities, institutional roles, community engagement - during co-design rather than as a post-implementation afterthought? And how can such tools identify, integrate, and build on existing local stewardship models rather than replacing them?

We argue that stewardship must be treated as a design parameter, not a downstream governance problem, and that connecting to existing stewardship practices is key to long-term NbS sustainability.

Keywords: *Codesign* *Governance* *Public spaces* *Participatory approach* *Design Thinking*

03. From stewardship of NbS to stewardship of co-productive citizenship for long-term urban regeneration

Speakers and authors: Nunes Nathalie and Ferreira Isabel
Affiliation: Centre for Social Studies of the University of Coimbra – Portugal

Growing attention has been paid to the economic, social, political, moral and cultural conditions that shape the design, implementation and long-term trajectories of Nature-Based Solutions (NbS). This expanding research agenda raises new questions regarding how transformative change is enabled, negotiated and sustained over time.

Drawing on two complementary doctoral investigations connected through joint research conducted within the projects URBiNAT and TRANS-lighthouses, this contribution explores co-productive governance and the social construction of citizenship to examine what sustains the transformative potential of NbS beyond implementation.

The first emerges from a comparative qualitative study of participatory governance practices in Portuguese and Canadian municipalities. It examines how participation cultures, governance arrangements and institutionalisation processes influence the quality of citizenship generated through participatory practices in cultural and sustainability projects, identifying governance archetypes that frame co-governance and transformative outcomes. The second draws on socio-legal action research conducted within an NbS-based urban regeneration project. It examines transformative potential through the lens of latencies, emergences and resistances, identifying emancipatory possibilities and risks that underpin twelve guidelines for inclusive urban regeneration.

Bringing these perspectives into dialogue, the notion of co-productive citizenship emerges as the capacity of participatory urban processes to mobilise active citizenship, strengthen agency, recognise situated knowledges, needs and aspirations, and foster infrastructures of human relations. It is enacted through co-creation as participation in sustainable transitions, co-governance as innovation in institutional arrangements, and mediation and interculturality as practices of inclusion in the construction of the social fabric.

This notion highlights what remains at stake after implementation: the continuity of the processes through which transformative capacities are cultivated over time. From this perspective, stewardship involves sustaining the conditions through which co-productive citizenship can endure beyond implementation, including the expansion of the public sphere and intermediary spaces for living and acting together.

Keywords: *Coproductive citizenship* *Cogovernance* *Inclusive urban regeneration* *Cocreation* *Sociolegal research* *Transformative change*

04. Governing NbS beyond the project cycle: participatory assessment of social learning and long-term stewardship in the Lelantine plain, Greece

Speaker: Beatriz Medina[1]
Authors: Beatriz Medina[1] and Georgia Tseva[2], Giannis Alexiou[3], Thanos Giannakakis[3], Joana Diaz[4] and Chrysi Laspidou[2]
Affiliations: [1]Water, Environment Beyond (WEB) – Spain
[2]University of Thessaly – Greece
[3]WWF Greece – Greece
[4]Eurecat - Centro Tecnológico de Catalunya – Spain

Long-term stewardship of nature-based solutions (NbS) depends on whether co-creation is experienced by local actors as a process in which their knowledge is recognised, concrete problems are addressed, and the conditions for continuity beyond the project cycle begin to emerge. This contribution presents the transversal participatory assessment process developed within the Horizon Europe NATALIE project. The assessment examines how social transformation toward climate adaptation unfolds through open innovation and how this process can generate practice-oriented insights for the long-term governance of NbS.

Continuity is often discussed in relation to technical performance, funding, or maintenance. However, it is also shaped by how actors understand NbS, how alliances are formed around them, and how responsibility and ownership are negotiated over time. The assessment collects qualitative evidence through reflective meetings used as an observational method, in-depth interviews with key informants, and questionnaires. It is based on a literaturegrounded analytical framework (Nunes et al., 2021; Meister Broekema et al., 2022) organised around five dimensions: organisational process quality, stakeholder inclusion and representativeness, convergence around shared perspectives, individual gains, and social learning. Analysis of stakeholder discourse is central to identifying the narratives, coalitions, and governance conditions that may support or constrain long-term implementation.

The Lelantine Plain on Evia Island, Greece, provides the empirical setting. The case is analysed through collaborative and institutional processes emerging around NbS-related action. Governance arrangements are structurally complex, while NbS remain weakly embedded in Greek legislation. In this context, prioritised co-creation actions connect relevant actors and open a governance pathway for exploring stewardship beyond the project cycle.

These actions include support for the operational readiness of the local volunteer firefighter registry in relation to fire-risk-related NbS interventions, and the establishment of a multi-stakeholder committee for disaster risk reduction linked to water-management-related NbS. The findings identify narratives, actor relations, and social learning processes.

Keywords: *NbS stewardship* *Long-term governance* *Participatory assessment* *Social learning* *Open innovation* *Stakeholder discourse* *Climate adaptation* *Institutional embedding*

05. More Nature, More Health? Governance and Stewardship as Determinants of Long-term Health Outcomes in Nature-based Solutions

Speakers and authors: Ribal Aman Eddine[1] and Barbara Sowińska-Świerkosz[2]
Affiliations: [1]University of Coimbra, Department of Architecture – Portugal
[2]University of Life Sciences in Lublin, Department of Hydrobiology and Ecosystems Protection – Poland

The rapid mainstreaming of Nature-based Solutions (NbS) within European policy and research agendas has consolidated an increasingly normative assumption: that more nature equals more health. This conflation – productive in mobilising investment – obscures more complex socio-ecological processes through which co-benefits and unintended consequences are generated and distributed. Grounded in a socio-ecological systems understanding of NbS, this contribution examines health implications of NbS, with particular attention how governance and stewardship shape NbS health outcomes and underlying pathways. The study synthesises insights from 30 European NbS case studies from COST Action CA23133 LILY (Large-scale Interdisciplinary Alliance on Nature-based SoLutions and Health: Indicators, InequalitY and Innovation), illustrating how different intervention types generate distinct constellations of health benefits and risks across physical, mental, environmental, and socio-economic domains. Drawing on interdisciplinary evidence, the study identifies four key determinants shaping NbS–health implications: (i) environmental and geographic context, (ii) socio-cultural conditions, (iii) governance and management practices, and (iv) design, type, and scale of interventions. Among these, governance and stewardship emerge as critical yet underexplored dimensions. Issues such as fragmented governance structures, unequal participation, and epistemic injustice can significantly mediate how benefits and risks are distributed across urban populations. Conversely, adaptive and collaborative stewardship can enhance inclusivity, long-term effectiveness, and health equity outcomes. These findings underline the importance of moving beyond benefit-centric evaluations towards more balanced assessments that include unintended consequences and distributional effects.

Acknowledgements: This work is based upon work from COST Action LILY, supported by COST (European Cooperation in Science and Technology). The authors gratefully acknowledge the contributions of Ioanna Kyprianou, Steven Savic, Maria Carmen Garcia-Mateo, Roc´ıo Pineda-Martos, Gon¸calo Canto-Moniz and Infigeneia Kagkalou for their expert input in the development and validation of the NbS-health-impact matrix. We also extend our gratitude to all LILY members who contributed case studies data that made the comparative analysis possible.

Keywords: *Nature–based Solutions indicator–based evaluation* *NbS–health–impact matrix* *Health equity* *Ecosystem services and disservices* *Urban health* *Climate change action* *Governance and stewardship*

06. Pacts and stewardship agreements for pollinators adaptation in urban areas

Speaker: Stefano Magaudda[1]
Authors: Stefano Magaudda[1], Carolina Pozzi[1] and Giuseppe Dodaro[2]
Affiliations: [1]Università degli Studi Roma Tre = Roma Tre University – Italy
[2]Sustainable Development Foundation – Italy

This contribution presents LIFE BEEadapt – A Pact for Pollinator Adaptation to Climate Change (01/09/2022-30/09/2026), co-financed by the European Commission through the LIFE climate adaptation sub-programme, as a governance-oriented NbS experiment linking urban, peri-urban, and rural landscapes.

The project supports wild pollinators' adaptive capacity by enhancing ecological connectivity and habitat heterogeneity in five target areas and activating collaborative governance for long-term land stewardship.

Pollinator-friendly NbS tested by the project includes flower-rich meadows, hedgerows, native shrub and tree planting, differentiated mowing and grazing, delayed ploughing or mowing, reduced pesticide exposure, ecological corridors, pollinator shelters, nesting sites, and microhabitats. These interventions form managed habitat networks that increase food resources, refuge availability, and microclimatic diversity across urban, peri-urban, and agricultural mosaics.

The LIFE BEEadapt model combines climate-risk assessment, NbS implementation, ecological and socio-economic monitoring, and a multi-level governance system. At the strategic level, local Pollinator Adaptation Pacts define shared agendas and align existing plans, policies, and funding opportunities. At the operational level, Land Stewardship Agreements translate these agendas into voluntary, place-based, and monitorable commitments for the management and maintenance of NbS. The paper argues that stewardship should not be reduced to technical maintenance, but understood as an adaptive governance function that builds trust, clarifies responsibilities, recognizes local knowledge, and supports continuity over time.

Focusing on two project case studies – Rome and the Agro Pontino –, the contribution explores how pollinator-friendly NbS can be embedded in wider socio-ecological systems addressing habitat continuity within fragmented urban landscapes and intensive agriculture, and promoting stewardship mechanisms connecting farmers, authorities, associations, and communities.

By bridging urban and peri-urban territories, LIFE BEEadapt offers a replicable pathway for transforming pollinator-friendly NbS into durable infrastructures of ecological connectivity and collaborative care.

Keywords: *Stewardship* *Climate adaptation* *Biodiversity* *Collaborative governance*

07. Supporting Nature-based Solutions' asset management with long-term performance modeling

Speaker: Emma Girot[1,2]
Authors: Emma Girot[1,2], Corinne Curt[2], Franck Taillandier[2], Sylvie Vanpeene[2] and Frédéric Cherqui[3,1]
Affiliations: [1]Laboratoire DEEP - Déchets Eaux Environnement Pollutions – Institut National des Sciences Appliquées de Lyon – France
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Nature-based stormwater solutions (NBSS) are increasingly recognized as essential components of urban stormwater management due to the hydrological and ecosystem services they provide. However, the sustainable management of these systems remains challenging because data on their long-term performance, operation, and maintenance are often incomplete, limited, and fragmented. This work develops an agent-based model (ABM) to address these knowledge gaps by integrating the hydrological and ecological dimensions that characterize NBSS and govern their evolution over time, alongside the socio-technical system composed of managers and users. The conceptual ABM framework includes agents representing NBSS components, failure events affecting them, maintenance practices, and the utilities responsible for implementing these practices, while simulating their interactions over time.

The model is informed by data from three complementary sources: (i) scientific literature, including fault tree analyses; (ii) grey literature, through a review of operational guidelines; and (iii) expert knowledge collected via semi-structured interviews and an international survey targeting managers. These sources help identify common failures in NBSS stormwater management systems and provide insights into current maintenance practices and their frequency. The model is explored under a range of long-term failure and maintenance scenarios. In addition, a user interface enables practitioners and other stakeholders to adapt the model to the specific characteristics and environmental context of their NBSS. By capturing emergent behaviours and simulating alternative management strategies, ABM provides a promising approach for optimizing NBSS performance.

Overall, this study contributes to a better understanding of NBSS deterioration processes and supports the development of proactive, data-driven management frameworks aimed at sustaining the long-term benefits of these critical infrastructures.

Keywords: *Blue-green infrastructure* *Urban stormwater* *Operation and maintenance* *Decision aid* *Complex system*

08. From Waterfront Regeneration to Stewardship: Governing the long-term Future of Rimini's Parco del Mare

Speaker: Alice Jelmini[1]
Authors: Alice Jelmini[1], Daniela De Rubeis[2], Alberto Dellavalle[2] and Ania Porucznik[1]
Affiliations: [1]Global Infrastructure Basel – Switzerland
[2]Comune di Rimini – Italy

With great attention being dedicated to planning and implementation of urban regeneration and Nature-based Solutions (NbS) projects, far less focus is often placed on their long-term governance, financing and institutional embedding.
Rimini's Parco del Mare offers a compelling case study. This ongoing large-scale coastal regeneration project on Italy's adriatic coast is transforming 15 kilometres of waterfront through public space redesign, sustainable mobility measures, and NbS, including urban greening, permeable surfaces, dune systems, and blue-green infrastructure. Beyond improving environmental quality and coastal resilience, the project aims to redefine the relationship between the city, tourism, and public space for a more liveable and year-round waterfront.

Yet, as the transformation progresses, new questions emerge around long-term stewardship, operational responsibility, and the distribution of costs and benefits among public and private actors.

Building on work developed within the Horizon Europe Re-Value project, this contribution explores how the Municipality of Rimini is currently reflecting on governance and financing mechanisms to support the long-term stewardship of Parco del Mare and its associated socio-ecological functions. Particularly, the focus is on the development of a partnershipbased stewardship approach involving the municipality, maintenance actors, tourism-related businesses, and local stakeholders benefiting from the regenerated waterfront.

In this regard, the contribution discusses several mechanisms, including:

- The establishment of an external coordinating entity responsible for maintenance, partnerships and activation activities;
- The progressive engagement of private-sector actors through incentive-based and shared ownership arrangements;
- A tiered financing framework linking stakeholder contributions to different levels of benefits derived from the regenerated waterfront;
- The use of a Social Return on Investment (SROI) assessment quantifying impacts generated by Parco del Mare, to support legitimacy and political alignment.

Drawing on the Rimini experience, the contribution provides practical insights into how collaborative stewardship approaches can support the long-term governance, financing and maintenance of NbS and large-scale waterfront transformations.

Keywords: *Waterfront regeneration* *Nature-based Solutions* *Stewardship* *Long-term maintenance* *Coastal resilience* *Financial sustainability* *Partnership model* *Climate adaptation* *Socio-ecological systems*

II. LIST OF ABSTRACTS - POSTERS

01. Sustaining Nature-based Solutions Beyond Implementation: Governance Insights from Wetland Stewardship and Collaborative Platforms in Japan

Speaker: Shiori Takahashi
Authors: Shiori Takahashi, Maki Osaka and Jun Nishihiro
Affiliation: National Institute for Environmental Studies – Japan

Long-term performance of Nature-based Solutions (NbS) depends not only on initial planning and implementation, but also on the governance arrangements that sustain stewardship, maintenance, and learning across actors and scales. This is particularly important in urban and peri-urban landscapes, where fragmented responsibilities, changing land use, and declining local management capacity can undermine the ecological and social benefits of NbS.
In Japan, cultural landscapes such as satoyama woodlands, rice paddies, semi-natural grasslands, and wetlands have historically been maintained through the continued use and management of natural resources by local communities. These landscapes provide multiple ecosystem services, including biodiversity conservation, food production, disaster risk reduction, cultural heritage, and landscape values. However, many are now declining due to changes in lifestyles, land use, and demographic conditions. Sustaining these landscapes therefore requires governance systems that organize knowledge, responsibilities, and longterm stewardship across actors.

This presentation examines the traditional wetland management through controlled burning near the Tokyo metropolitan area. We analyzed stakeholder roles and collaboration structures involving land managers, local governments, citizen groups, fire departments, and researchers, and identified factors supporting the continuity of management. The analysis shows that sustained stewardship depends on the participation of diverse actors, multiple sources of external support rather than reliance on a single resource, and continuous relationship-building between local communities and other stakeholders.
Building on these insights, we have established a Landscape Management Center (LMC) in two municipalities in Chiba Prefecture, near Tokyo, as a collaborative platform linking researchers, governments, and citizens. The LMC aims to support evidence-based NbS by integrating local practices with scientific knowledge and catchment scale landscape management. We discuss the potential of such intermediary organizations to reduce governance fragmentation, integrate NbS stewardship into local governance and planning systems, and support the long-term stewardship of NbS as evolving socio-ecological systems.

Keywords: *Nature-based Solutions* *Long term stewardship* *Collaborative governance* *Social ecological systems* *Traditional ecological knowledge* *Intermediary organization*