Funded by the European Union

PART OF THE
EU MISSIONS
RESTORE OUR OCEAN & WATERS

Project acronym:	EcoDaLLi
Project title:	ECOsystem-based governance with DAnube lighthouse Living Lab for sustainable Innovation processes – EcoDaLLi
Call:	HORIZON-MISS-2021-OCEAN-02-04 – Danube river basin lighthouse – coordination activities
Programme:	HORIZON EUROPE
Start date of project:	01.01.2023
Duration:	42 Months

Deliverable 4.3

Report on participatory governance structure for the Danube river (including its delta) basin lighthouse

Grant Agreement No.: 101093908

Funded by the European Union

Deliverable Name	Report on participatory governance structure for the Danube River (including its delta) basin lighthouse
Deliverable Number	D4.3
Work Package	WP4
Associated Task	T4.4
Due Date	M36
Completion Date	
Submission Date	
Deliverable Lead Partner	MMAP

Dissemination Level		
PU	Public	X
SEN	Sensitive	

Change Control | Document History

Version	Date	Change History	Authors	Organization
1.1	17.09.	Outline	Delia Dimitru, Carmen Negu	SMS/MMAP
1.2	17.10.	First Draft	Delia Dimitru, Verena Höhn	SMS/SEZ
1.3	08.11.	Addition of MMAP	Carmen Neagu	MMAP
1.4	10.11.	Addition of BAW	Steffen Büchen	BAW
1.5	10.11.	Addition of BOKU	Lisa Waldenberger	BOKU
1.6		Addition of IP Tulcea	Daniela Petroschi	IP Tulcea
2.0	3.12.	Draft of Version 2	Verena Höhn	SEZ
2.1	08.12.	Addition of SMS	Delia Dimitru, Mihai Pondea	SMS
3.0	12.12.	Adaptation of all additions	Verena Höhn	SEZ
3.1	18.12.	Revision by FTN	Milan Martinov	FTN
3.2	18.12.	Revision by ICARTI	Givi Kochoradze	ICARTI
4.0	19.12.	Implementation of revision comments	Verena Höhn	SEZ

Funded by the European Union

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Table of Contents

Abbreviations and Acronyms

ADI ITI Integrated Territorial Instrument Association for Community Development
BSC Black Sea Commission
CSA Coordination and Support Action
CSO Civil Society Organizations
CSR Corporate Social Responsibility
DanubeGIS Danube Geographic Information System platform
DanubeHIS Danube Hydrological Information System
DDBRA Danube Delta Biosphere Reserve Administration
DRB Danube River Basin
DRBMP Danube River Basin Management Plan
DRPC Danube River Protection Convention
EUSDR EU Strategy for the Danube Region
FRMP Flood Risk Management Plan
GEF Global Environment Facility
GOOS Global Ocean Observing System
IA Innovation Action
IAP2 International Association for Public Participation
ICPDR International Commission for the Protection of the Danube River
JDS Joint Danube Survey
LL Living Lab
LNOB Leave No One Behind
MoEW Ministry of Environment and Water
MSFD Marine Strategy Framework Directive
NBS nature-based-solutions
NEPA National Agency for Environment & Protected Areas
NGO non-governmental organizations
PLLS Practice Living Lab System
SDG Sustainable Development Goals
TNMN TransNational Monitoring Network
UNECE United Nations Economic Commission for Europe
WFD Water Framework Directive

List of Figures

List of Tables

Funded by the European Union

Executive Summary

EcoDaLLi's WP4 focuses on mobilising an innovation community along the Danube Basin, including the Delta, to accelerate nature-positive solutions and governance practices. D4.3 consolidates lessons from WP4 activities (T4.1 community-building; T4.2 solution exploration; T4.3 PLLS design and testing; T4.4 assessment of governance potential) and frames a Lighthouse-specific, participatory governance structure that is implementable with project assets. The report complements earlier conceptual work in EcoDaLLi, most notably the LL concept set out in D1.2, by translating them into a governance architecture that public authorities, practitioners, and communities can work with.

In the first part the overall governance context and the lighthouse role in the Danube River Basin and the Delta are explained. This is followed by an introduction of participatory governance and the mechanisms thereof in the Danube region. The main part of this report summarises the activities done by the lighthouse related to participatory governance mechanisms, with the key elements being the Living Labs and the PLLS, explaining how they worked, and sharing the experiences and challenges to guide further use and uptake of these concepts. Based on the experience of the Lighthouse activities, overall challenges and gaps are defined as well as recommendations are presented.

The intended audience includes basin-level bodies, national/regional water and environmental authorities, Danube Delta institutions, municipalities, civil society, academia, private actors, and youth networks active in the Danube and Black Sea Lighthouse. It aims to guide near-term implementation and provide continuity beyond the project by articulating roles, interfaces, mechanisms, and digital enablers that can be maintained or scaled after the end of the EcoDaLLi Project.

1 Introduction

EcoDaLLi is a Coordination and Support Action (CSA) within the EU Mission "Restore our Ocean and Waters by 2030," contributing to the biodiversity objective through a systemic, nature-based-solutions (NBS) lens. The project's design references Green Deal targets and the Mission's lighthouse architecture. The governance design is aligned with the WFD, Floods Directive, EU Biodiversity Strategy, and the Mission Ocean & Waters governance principles.

Through establishing a Living Lab System and a connected Digital Portal it aims to provide structured spaces and tools for co-creation, experimentation, and learning across Upper, Middle, and Lower Danube sub-basins, the Danube Delta and the Black Sea. This approach, outlined in earlier project materials, positions EcoDaLLi to integrate local insights with macro-regional priorities and Mission objectives.

This deliverable "Report on participatory governance structure for the Danube river (including its delta) basin lighthouse" consolidates lessons from EcoDaLLi's Work Package 4 (WP4) activities (community building, solution exploration, PLLS design and testing, and the assessment of governance potential) and frames a Lighthouse-specific participatory governance structure that can be implemented with existing project assets. It complements the Living Lab concept set out in EcoDaLLi's D1.2 by translating it into a practical governance architecture that public authorities, practitioners, and communities can work with. It also builds on insights documented in D4.2 regarding Living Lab contributions to Mission objectives.

2 Governance Context

2.1 Institutional framework (basin, delta, transboundary)

The Danube & Black Sea basin governance architecture is building on established transnational frameworks: 1) The International Commission for the Protection of the Danube River (ICPDR) coordinates basin-wide policy and implementation under the Danube River Protection Convention. 2) The EU Strategy for the Danube Region (EUSDR) supported by the Danube Strategy Point. These provide a macro-regional platform connecting national, regional and local authorities. These frameworks are essential alignment points for any participatory governance structure spanning the Danube River and its Delta. The ICPDR functions as the core coordinating body under the Danube River Protection Convention (DRPC),[1] and is responsible for the Danube River Basin Management Plan (DRBMP) and Flood Risk Management Plan (FRMP). The DRPC forms the legal instrument for operation on transboundary water management in the Danube River Basin. Its main objective is to ensure that surface waters and groundwater within the Danube River Basin are managed and used sustainably and equitably.

Besides these transnational frameworks, national and sub-national authorities also play an important role along the Danube River basin. These include Ministries of Environment, Water, Agriculture, Transport in riparian countries, local water directorates and municipalities in the Delta. The following outlines national authority roles, with examples from Romania and Bulgaria.

[1] https://www.icpdr.org/about-icpdr/framework/convention

Funded by the European Union

Romania

At the national level, Romania employs an integrated approach to managing water resources, addressing both quantity and quality in accordance with national and European water legislation, including the Water Framework Directive. Currently, Romania is advancing the implementation of its updated National Management Plan.

These Plans and their associated programs of measures serve as the primary legal and technical tools for maintaining and improving the quality of both surface water and groundwater. They focus on reducing organic pollution, nutrient runoff, and contamination from hazardous substances originating from urban areas, industry, and agriculture. Additionally, a significant emphasis is placed on minimizing the impacts of hydro-morphological changes to water bodies. Importantly, these actions not only address point and diffuse sources of pollution but also advance progress toward several United Nations Sustainable Development Goals (SDGs)[2].

The Ministry of Environment, Waters and Forests plays a central role in ensuring that environmental protection requirements are effectively integrated into all sectoral policies, aligning with both European and international standards. In addition to implementing national policies related to environmental protection, green economy, biodiversity, protected natural areas, climate change, and the circular economy across all sectors and subsectors, the Ministry is responsible for developing strategies and specific regulations. These efforts are aimed at harmonizing and advancing these activities in line with the broader objectives of the Government's general policy framework.

Danube Delta – Local Level

At the local level, the governance structure of the Danube River is distinguished by the unique status of the Danube Delta as a UNESCO Biosphere Reserve. Two key entities operate directly under the Ministry: The National Agency for Environment & Protected Areas (NEPA) and the Danube Delta Biosphere Reserve Administration (DDBRA). These organizations serve as both executive and implementing authorities, with representation at regional and county levels. Both entities function as implementing bodies for environmental policies and regulatory acts, one for terrestrial areas and the other for wetlands. For communities in the Danube Delta, the Integrated Strategy for Sustainable Development of the Danube Delta (2030) was developed and funded through the Integrated Territorial Instrument Association for Community Development (ADI ITI) Danube Delta. This association plays a pivotal role in advancing projects aligned with the integrated strategy by supporting beneficiaries at the local level, through support of project preparation, as well as in ensuring early prevention of problems faced by projects.

Bulgaria – Municipalities

In institutional terms, municipalities operate within a multi-level governance system. They are the implementing level of water policy, working under the coordination of the Danube Region Basin Directorate and in partnership with regional and national institutions. While the Ministry of Environment and Water (MoEW) sets policy and approves basin management plans, and the Basin Directorate coordinates water use, monitoring, and planning within the Danube catchment, municipalities execute local measures, operate infrastructure, and ensure compliance within their territories.

[2] https://sdgs.un.org/goals

Funded by the European Union

At the local level, municipalities in Bulgaria play an important role in the implementation of water management and environmental policies within the Danube River Basin. Although overall coordination and strategic planning are carried out at the basin and national levels, through the MoEW and the Danube Region Basin Directorates, municipalities are key actors in applying these frameworks on the ground. Their responsibilities are defined primarily by the Water Act, the Environmental Protection Act, and related legislation, which align national governance with the requirements of the EU Water Framework Directive and the Floods Directive. A key document for identifying key pressures is the National Strategy for Management and Development of the Water Sector in Bulgaria, 2012. Its action plan contains long-term (2022-2037) measures concerning water infrastructure, services, and investment needs.

Despite their crucial implementation role, municipalities often face challenges such as limited technical and financial capacity, fragmented coordination with higher authorities, and insufficient data collection at the local level. Nevertheless, their proximity to communities and local ecosystems makes them indispensable for achieving the environmental objectives of the Danube River Basin.

2.2 EU policy alignment and Mission framing

The work under the ICPDR as well as the regional, national and local work is performed taking into account the several different EU policy frameworks into their RBMPs.

Additionally, the EU Mission “Restore our Ocean and Waters by 2030” acts as an accelerator for these frameworks as their objectives align. This Mission is set up to achieve the following goals:

I. protect and restore marine and freshwater ecosystems and biodiversity, in line with the EU Biodiversity Strategy 2030
II. prevent and eliminate pollution of our ocean, seas and waters, in line with the EU Action Plan Towards Zero Pollution for Air, Water and Soil
III. make the sustainable blue economy carbon-neutral and circular, in line with the proposed European Climate Law and the comprehensive vision outlined in the Sustainable Blue Economy Strategy

Under the EU “Restore our Ocean and Waters by 2030”, the Danube and Black Sea region became one of the four lighthouse regions, with the focus on the first phase of the Mission on Goal I. ecosystem protection and restoration. Through the Mission Ocean Green Deal Targets are referenced and its projects are aligned with the Water Framework Directive (WFD), Floods Directive, EU Biodiversity Strategy, and the Mission Ocean & Waters governance principles. Other EU policy alignments include the Marine Strategy Framework Directive (MSFD) (which is more relevant for the Black Sea but also the Danube Delta), as well as the Habitats and Birds Directives.

The Mission Ocean supports the work of the ICPDR through Danube Lighthouse activities, promoting innovation, citizen engagement, and digital tools and encourages participatory governance and citizen science, complementing ICPDR’s stakeholder engagement.

2.3 Addition on the connection to the Black Sea

Although not mentioned in the title of this deliverable, the governance context in respect of the Black Sea will be briefly introduced to draw a full picture of the Danube and Black Sea Lighthouse.

The governance architecture for the Danube River Basin and the Black Sea Basin is primarily shaped by international treaties, commissions, and cooperative frameworks focused on transboundary water management, pollution control, environmental protection, and sustainable development. The Danube River, which discharges into the Black Sea, creates natural linkages between the two basins, leading to collaborative efforts. Below there is a list of the primary organizations, established for the Black Sea region.

- **The Black Sea's governance** started in the 1992 Bucharest Convention for the Protection of the Black Sea Against Pollution, emphasizing marine environmental protection among six coastal states (Bulgaria, Georgia, Romania, Russia, Turkey, Ukraine).
- **Black Sea Commission (BSC)**: The primary intergovernmental body implementing the Bucharest Convention. It oversees pollution monitoring, biodiversity conservation, integrated coastal zone management, fisheries regulation, and shipping safety to protect the marine ecosystem from land- and sea-based threats.

Cross-Basin Collaborative Frameworks

Due to the Danube's direct influence on Black Sea eutrophication (e.g., nutrient pollution), several initiatives bridge the two basins:

- **GEF Strategic Partnership for the Danube River/Black Sea Basin**: A multi-donor program led by the Global Environment Facility (GEF), in cooperation with the World Bank, UNDP, and UNEP. It focuses on nutrient load reduction, watershed restoration, and capacity building to address transboundary pollution flows from the Danube to the Black Sea.
- **ICPDR-BSC Joint Efforts**: Formal collaboration between the ICPDR and BSC on water quality improvement, sustainable development, and data sharing to mitigate Danube nutrient discharges into the Black Sea.
- **Black Sea GOOS (Global Ocean Observing System)**: A regional alliance under UNESCO-IOC that supports oceanographic monitoring and data collection for environmental governance, governed by an Executive Committee of member states.

These organizations operate across the Black Sea Basin, where national authorities (e.g., river basin directorates in riparian countries) feed into the international bodies.

3 Lighthouse Role

The Danube & Black Sea Lighthouse is a model area for integrated restoration and governance across a highly international River basin. It comprises the CSA EcoDaLLi and multiple Innovation Actions (IAs) concentrating on restoration of water quality, wetlands, and delta ecosystems as well as sediment management and monitoring and sustainable fish farming, positioning the Lighthouse as a hub for learning and replication. Through these projects the Lighthouse can work as a model area for wetlands restoration, water quality improvement, and delta ecosystem resilience, ensuring that participatory inputs contribute to monitoring, programmatic planning, and adaptive management.

Figure 1 illustrates the overall structure of the Mission Ocean and the separation into four Lighthouse regions. Each Lighthouse is made up by an overarching CSA project, that coordinates and supports all the IA project that are funded under this Lighthouse. In the case of the Danube and Black Sea Lighthouse EcoDaLLi as the CSA is collaborating and supporting the 10 other IA projects.

Figure 1: Structure under the Mission Ocean and Waters**.** List of Innovation Actions (IA).

EcoDaLLi's governance approach explicitly connects basin-level bodies (e.g., ICPDR), macro-regional coordination (EUSDR), and national/sub-national authorities, so that bottom-up inputs from local actors in the Upper, Middle, Lower Danube and Danube Delta units can be considered alongside existing transboundary strategies. This is the intent of the living-lab-centred governance concept.

EcoDaLLi operationalises the Lighthouse's role by:

- Structuring a Danube Innovation Community via living labs and a digital portal to interconnect governance, research, business and civil society ("quadruple helix").
- Facilitating inter-project cooperation in the Danube and Black Sea Lighthouse
- Providing evidence-based inputs (NBS methodology and catalogues; innovative practices inventory) to inform governance choices across sub-basins and the delta.

Stakeholder participation can accelerate uptake of solutions across a large, heterogeneous basin. It showcases cross-basin linkages by connecting upstream interventions (e.g., retention, restoration) with downstream benefits (e.g., delta habitat quality, flood risk mitigation), using digital participation and collecting evidence to make these linkages visible to decision-makers and communities. The Lighthouse activities function as both process (participatory mechanisms) and infrastructure (LLs, and PLLS). They create a repeatable "engage–evidence–act" loop: engage stakeholders via LLs and forums; collect evidence through citizen science and open calls (by IA); analyse and visualise results; and feed consolidated insights into ICPDR and national/sub-national policy processes.

Cooperation with the other lighthouse basins is essential to successfully reach the goals of the Mission Ocean by 2030. Especially in areas of Mission Monitoring but also in common outreach campaigns regarding promoting the Mission charter the dialogue and joint efforts of the different basins is fundamental. Beyond that replication and sharing solutions of the different basins ensures the effective use of the efforts spent in each lighthouse. Connection of

lighthouses with overlapping regions as e.g. with the Mediterranean Lighthouse makes the need of collaboration and joint activities clear.

4 Participatory Governance Structure

The term "*Participatory Governance"* was introduced and began to be applied in the second half of the 20th century. At the very beginning it was mostly related to the engagement of citizens into politics and policy defining and decision-making processes. Over time the meaning of the term expanded and today it is related to many decision-making procedures, including those related to environmental protection measures, and the preservation of nature. The term is described in literature as follows:

"Participatory governance" widely refers to the democratic mechanisms which are intended to involve citizens in public policy-making processes. In other words, participatory governance is aimed at establishing a bridge between public institutions and ordinary people, in an attempt to increase the effectiveness and responsiveness of public policy-making activities. Either an interest-based, integrative, or functional logic may inspire participatory governance initiatives. Apart from the inner logic at the basis of these initiatives, the attempt to give a deliberative power to people distinguishes participatory governance." [1]

Cited from [1] : Palumbo, R. (2017). Participatory Governance. In: Farazmand, A. (eds) Global Encyclopedia of Public Administration, Public Policy, and Governance. Springer, Cham. Pp 1-6.

Although the term was initially used in relation to citizens, today it is applied across many decision-making contexts, involving diverse stakeholders and not exclusively citizens.[3]

The structure of stakeholders engaged in activities in the Danube Region is considered by Sielker [2]:

"EUSDR stakeholders came from different institutional backgrounds, including policy-makers, administrative units, EU programmes, civil society, non-governmental organizations (NGOs), private economy, public companies and science, at different levels: European, national, regional and local."

Cited from [2]: *Sielker, F. 2016. New approaches in European governance? Perspectives of stakeholders in the Danube macro-region, Regional Studies. Regional Science. 3(1), 88-95.*

4.1 Principles

The design of participatory governance is anchored in inclusiveness, transparency, and multi-level coordination. Inclusiveness ensures participation from policy makers, local communities, civil society/NGOs, research & academia, private sector, and youth. Transparency is achieved through open calls, accessible dashboards, and documented feedback loops. Multi-level coordination connects sub-basin deliberation with basin-wide planning.

Inclusiveness: All stakeholder groups must be included in the governance mechanism: public authorities, local communities, NGOs, scientists, businesses, and users (fisheries, navigation, agriculture).

[3] Despite "*participatory governance"* a related term "deliberative democracy" is also used though here not further discussed. For more information on this concept see: Parkinson, J. 2006. Deliberating in the real world: Problems of legitimacy in deliberative democracy. Oxford: Oxford University Press.

Transparency: Information about Governance activities should be easily accessible to everyone. Clear rules and procedures for decision-making should be established and communicated. Open data platforms and public consultations.

Multi-level coordination: Alignment and collaboration across different levels of government and society—from local (delta communities) to basin-wide (ICPDR) and European (EU Missions, EUSDR)

4.2 Stakeholder groups and roles

To correctly include all stakeholder groups in the participatory governance it is important to correctly identify the different groups as well as their roles. There are five different stakeholder groups to address: Policy (e.g public authorities), Science (Universities/research organisations), Industry/innovative businesses, Citizens and Civil Society Organizations (CSO).

Governance/Public authorities: National water agencies, ministries, regional councils

- Facilitate participatory processes and ensure policy alignment
- Provide regulatory support
- Coordinate between local actors and higher-level authorities
- Act as a bridge between grassroots initiatives and national strategies

Research/Academia: Danube Delta National Institute, universities in Austria, Romania, Serbia, etc.

- Offer evidence-based insights and technical expertise
- Monitor ecological outcomes and assess effectiveness
- Facilitate knowledge exchange

Innovators/Local business: Local communities of: Fishers, farmers, tourism operators, Indigenous or traditional users in the Delta. Private sector: Ports, shipping companies, hydropower operators, eco-tourism businesses.

- Invest in NBS through green infrastructure or sustainable land use
- Collaborate on public-private partnerships
- Adopt nature-positive business practices
- Brings financial resources and innovation
- Influences land-use decisions

Civil society/Communities: Citizens

- Provide local knowledge and lived experience
- Ensure solutions are culturally appropriate and socially accepted
- Build stewardship and long-term sustainability
- Can contribute to local monitoring

NGO/CSO: WWF, Wetlands International, local conservation groups

- Advocate for inclusive and equitable restoration practices
- Mobilize communities and support capacity building.
- Act as facilitators of transparency.
- Strengthens democratic accountability and social justice

4.3 Citizen engagement

Citizen engagement is one of the key elements of participatory or collaborative governance. This subchapter outlines the concept of citizen engagement and how it can be applied, especially in the context of the EU Mission “Restoring our Oceans and Waters by 2030”.

Furthermore, aspects to consider when selecting instruments for successful citizen engagement are presented, as well as potential general and specific challenges with regards to the EU Mission Ocean. For a more detailed breakdown on citizen engagement in the EU Mission Ocean see [3].

How is it defined?

Citizen engagement, also referred to as “civic involvement”, “public participation” or “citizen participation”, describes a variety of activities that aim to involve people in public processes. The term “citizen” emphasises that those involved are neither specialists nor part of an elite group, distinguishing them from other stakeholders such as organised interest groups, companies or authorities, even though the two terms often overlap [4].

The aim of citizen engagement in the EU Mission is to empower citizens to play an active role in designing and implementing solutions that will drive the systemic change required by the Mission.

Why is it important?

Taking citizen engagement into account is important in many areas, from gathering insights to informed decision-making. Some key elements of citizen engagement are:

Creating legitimacy and acceptance:
Citizen engagement is the democratic backbone of innovation activities and gives them public legitimacy. This is essential for ensuring broad public support for the necessary ecological and social transitions. Without open dialogue, guidelines and policies that trigger fundamental changes can encounter resistance.

Dealing with complex, uncontrollable problems:
Citizen engagement can be particularly helpful when it comes to tackling complex challenges such as climate change or environmental pollution. These are problems where facts are uncertain, values are controversial and decisions are urgent – they are often referred to as “wicked problems”. Scientific knowledge alone is often insufficient for such problems, as an expanded knowledge base is required. Involving citizens enables local, practical and first-hand knowledge to be integrated, improving the robustness and relevance of jointly developed solutions.

Promoting systemic change:
The transformation sought by the Mission Ocean will have an impact on those who use waterways for fishing, swimming, recreational activities or transport. Finding effective ways to help citizens understand their role and engaging them throughout the various stages and aspects of mission implementation is key. Working with them can strengthen the transformative power of Mission initiatives, create ownership within the communities and help shape their transitions.

How is it usually implemented?

Regardless of the form of engagement, a systematic approach should be adopted from the very beginning. It is also important to clarify the objectives, ethical considerations and evaluation methods early on to maximize success. Methods of citizen engagement can be categorized according to the desired level of engagement or the type of problem.

The level of engagement required is usually determined by the nature of the problem. Here, two categories can be distinguished:

- **Controllable problems** (low uncertainty) usually only require information to be shared (inform).
- **Uncontrollable problems** (high uncertainty) require active and deeper engagement, such as involvement, collaboration or empowerment, to incorporate lived experience and diverse perspectives.

The level of citizen engagement reflects how projects involve citizens in the process and the extent to which they are granted decision-making power. Citizen engagement is typically represented by a spectrum or "participation ladder". This ranges from minimal communication (information) to the transfer of genuine decision-making power (empowerment). The International Association for Public Participation (IAP2) provides the Spectrum of Public Participation, a globally recognized framework that clarifies the public's evolving role in citizen engagement processes. The extent of participation can be classified as shown in Table 1.

Table 1: List of citizen engagement methods by participation level [5].

Inform	**The one-way flow of communication for the purpose of awareness raising or educating.**	Stakeholder management**:** **Collect data on actors; people, partnerships, organizations, groups and communities closest to the mission.** Strategic communication**:** **Develop a strategy for how to influence the public sphere, stand out in public discourse and encourage behavioural change.**
Consult	Take account of the views and values of citizens. This two-way flow of communication is an opportunity to shape outcomes but not the objectives.	**Research**: Use polls to understand public opinion and gather insights related to the mission. **Formal consultations**: Surveys, interviews or via statutory governance mechanisms. **In-person events**. 'Have your say' events such as town halls, summits and facilitated workshops.
Involve	Work directly with communities to ensure that their input is consistently understood and considered.	**Digital and social media engagement**: Two-way communication – dialogue via digital channels. **Innovation events**: Hackathons, jams, design sprints – single or week-long events based on design methods to encourage rapid idea development. **Human-centered design**: Understand user needs through design research and empathy tools. **Citizen science**: The participation of citizens as data-gatherers and co-researchers
Collaborate	Collaborative and participatory practices that	**Participatory action research**: Shared inquiry processes shape R&I agendas and participation effectively defines action.

Funded by the European Union

	actively involve people in discovery, co-creation, community learning and monitoring and evaluation.	**Action learning networks**: Forming mixed learning communities with action learning pedagogy to maintain continuous learning from experiments and feedback loops to inform policy adaptation. **Participatory design methods**: Long-term codesign and co-production methods enable shared power. This can include participatory foresight methods and socio-technological imaginaries **Civic innovation labs or living labs**: Open innovation ecosystems in real-life/local environments using iterative feedback processes throughout a lifecycle approach of an innovation.
Empower	Place final decision-making in the hands of beneficiaries and other stakeholders.	**Deliberative methods**: These include citizen juries, consensus conferences, and citizen assemblies. **Participatory budgeting**: A participation mechanism in which citizens are involved in the process of deciding how public money is spent and given a role in the scrutiny and monitoring of the process following the allocation of budgets. **Data commons and digital democracy platforms:** A civic technology mechanism for facilitating experimentation with a data commons, gathering e-petitions and improving civic inclusion.

Further information on engagement methods and their application can be found in [4]. Developed and published by the PREP4BLUE project as part of the Mission Ocean initiative, this guide provides a comprehensive overview of how to implement citizen engagement. It also distinguishes between different project sizes with regard to the implementation of citizen participation. Different approaches to this topic are described and explained using case studies, depending on whether the project is small or large.

Another resource offering further methods suitable for citizen engagement is the online decision-making tool Engage2020.[4] The tool's catalogue comprises 57 methods, all of which focus on participatory and inclusive research. Users can filter the methods according to 32 different criteria and weight the importance of each one. The tool then lists the methods in order of priority. Each method is accompanied by detailed explanations, examples of use, and a list of advantages and disadvantages.

What are potential challenges?

[4] https://actioncatalogue.eu/search

Funded by the European Union

Several potential challenges to the effective implementation of citizen engagement should be considered during the planning and implementation stages. The most significant of these are likely to be:

Skills and resources:
In-depth citizen participation requires time, financial resources, and specially trained staff. Project managers must be able to navigate the political environment and build consensus among different stakeholders.

Costs and budgeting:
Costs associated with engagement are often considered an "add-on" and are not firmly anchored in budgets. This needs to be revised at the institutional level, as specialized training and tools are required.

Tokenism and "engagement washing":
There is a risk that participation will merely be symbolic ("lip service"). To prevent this, the goals of engagement must be made explicit and transparent from the outset.

Engagement fatigue:
If citizens or stakeholders are repeatedly asked for input without seeing the impact of their contributions, this can lead to fatigue and the perception that they have no power to influence, particularly if language barriers are present.

The following specific challenges to the implementation of citizen engagement have emerged for Mission Ocean:

Lack of awareness of the mission ("Mission literacy"):
In the early years of Mission Ocean, knowledge of the mission and its objectives was low, even among researchers and parts of the EU administration. To establish the mission as a joint European endeavour, it is necessary to increase both mission and ocean literacy (the emotional and knowledge-based connection to water).

Inclusion and representativeness:
Despite the goal of inclusion, participation can remain biased. There is an imbalance in that men often dominate political and leadership roles, whereas women are more likely to participate in events but less likely to hold decision-making positions. Additionally, many initiatives do not actively target the inclusion of marginalized groups, such as people with disabilities, refugees, and specific ethnic minorities. A stronger focus on the "Leave No One Behind" (LNOB) principle is needed to break down barriers specifically.

Fragmented structures in Member States:
EU countries have very different historical and cultural experiences of formal participation structures. Therefore, a one-size-fits-all approach is not practical. Projects must be culturally and historically sensitive, adapting their approaches to local conditions to ensure meaningful participation.

Shallow depth of participation in citizen science:
Although citizen science is growing rapidly, engagement often remains superficial. Most projects focus on simple data collection (crowdsourcing) and do not achieve the level of deep collaboration and co-creation that the mission aims for.

It is important to view citizen engagement as a strategic tool for managing complex, mission-oriented innovation processes, rather than a burden. Mission Ocean's success depends on its

ability to inform and involve citizens in co-creation and decision-making through appropriate methods.

4.4 Participatory mechanisms

Participatory mechanisms are structured methods or tools that enable stakeholders (especially citizens) to actively engage in governance processes. These mechanisms help ensure that decisions are inclusive, transparent and grounded on local realities. In the case of the Danube River Basin and its Delta the following structures can serve as such mechanisms to address cross-border issues, widen evidence collection, scout solutions and enable Transboundary Dialogues to tackle sensitive topics.

River Basin Committees & Sub-Basin Structures: Regular consultations and co-decision forums at national and sub-basin levels.

The Danube is one of the most international river basin in the world, covering 19 countries and 79 million people. Sub-basin councils make governance manageable and locally relevant while ensuring alignment with basin-wide goals. They operate at Part B level of the Danube River Basin Management Plan (DRBMP) coordination structure:

- Part A: Basin-wide (ICPDR)
- Part B: Internationally coordinated sub-basin level
- Part C: National/local sub-units.

Their role is to localize and implement the EU Water Framework Directive and the Danube River Protection Convention at a scale where local issues can be addressed effectively.

"The Danube River system consists of multiple sub-basins, such as the Danube Delta, the Drava Basin, the Sava Basin, the Tisza Basin, and the Prut sub-basin. Each of these sub-basins has its unique characteristics and plays a vital role in the overall functioning of the Danube River and its associated ecosystems."

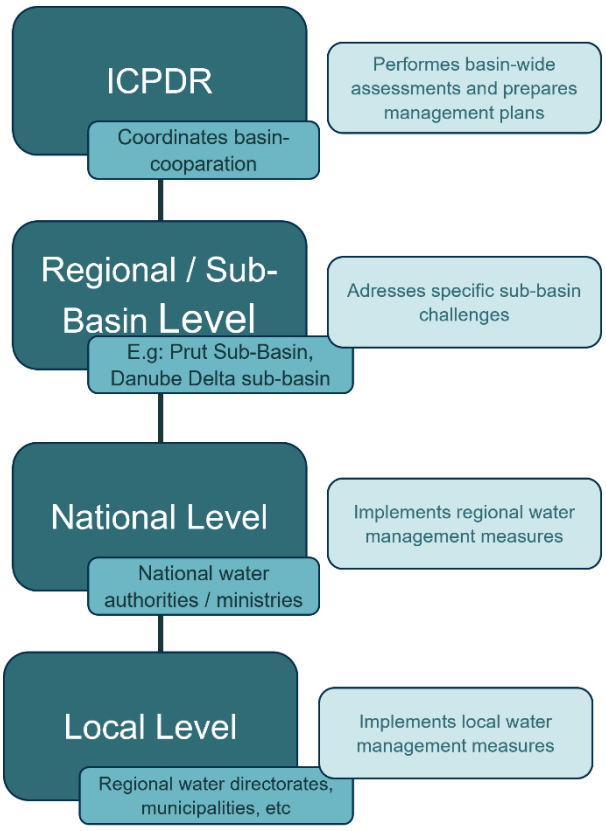

Figure 2: Governance Layers in the Danube Region by the ICPDR

Cited From [6]: https://www.icpdr.org/danube-basin/sub-basins

The DRBMP Part B sub-basins [7] with formal coordination include the:

- Tisza River Basin
- Sava River Basin
- Prut River Basin
- Danube Delta

These groups should reflect all key water-related interests spanning from national and regional water agencies and environmental ministries over water users such as agriculture and industry to environmental groups and community representatives. Their task is to review and approve sub-basin management plans aligned with the DRBMP, agree on measures for flood

protection, pollution control and ecological restoration, facilitate conflict resolution and foster cross-border cooperation.

Danube Delta Forums: Specific focus on Delta ecosystems, combining Ukrainian and Romanian delta governance.

The Danube Delta Forum represents a multi-level, multi-stakeholder governance approach that aligns knowledge with EU restoration goals, builds resilience through inclusive planning. It encourages innovation and collaboration across borders for the Danube Delta, gather local community priorities for restoration in the Danube Delta and reaches out to fishing and agricultural communities to highlight their challenges and needs post-conservation policies.

Citizen Science & Monitoring Networks:

Citizen Science activities can foster local participation as well as create awareness and knowledge in the civil society for the environmental challenges of the Danube River Basin as well as open possibilities to participate in protection and restoration activities.

Citizens can gather environmental data, e.g. water quality, species sightings or other biodiversity tracking, pollution levels, across wide geographic areas. Beyond that communities can contribute insights based on their lived experience. It empowers citizens, by giving them a voice in environmental governance, while building trust through transparency of the created open data ecosystem. Citizen-generated data can inform and shape policy decisions and strengthen community stewardship through a common environmental goal.

Examples in the Danube Region are the Joint Danube Surveys (JDS), where in the 5th version opportunities for citizens, students, and communities are created to participate in water protection efforts through citizen science and digital outreach initiatives.[5] Additionally, the Innovation Action projects funded under the Danube and Black Sea Lighthouse of the Mission Ocean & Waters are working towards developing different kinds of tools for citizen science, more on that will be listed later in this report.

Open Innovation Platforms: Co-design of solutions (e.g., sediment management, pollution reduction) with SMEs and research institutions

Open innovation platforms can serve as a tool to facilitate collaboration and knowledge-sharing between different organisations or individuals. It can support to break silos (e.g. between academia and business) to enhance inter-sectoral dialogue, enable solution scouting and knowledge exchange and fosters collaboration. Through these platforms new partnerships (e.g. between start-ups and established businesses / researchers and companies) can be formed and the dialogue with potential funders can be initiated. Open innovation can improve the performance of projects, provide synergies between innovators and enables the development of new business models [8].

Examples for open innovation hubs in the Danube Region are projects like CI-HUB[6] and DECIDE[7] funded under Interreg Danube Region providing support services to adopt circular economy and green technologies

[5] https://www.danubesurvey.org/jds5/about-jds5

[6] https://interreg-danube.eu/projects/ci-hub

[7] https://danube-region.eu/decide/

Transboundary Dialogues:

Transboundary dialogues in the Danube region are essential mechanisms for environment protection, especially in the context of ecosystem restoration and protection. These dialogues bring together multiple countries, sectors, and stakeholders to collaboratively manage shared resources and address environmental challenges.

These dialogues help to build a common knowledge base across countries, reduce tension over shared resources and aligns national policies with regional goals. Additionally, it enables joint funding, data sharing and infrastructure planning as well as supports a coordinated response to floods, droughts and pollution. It can take the form of scientific collaboration (joint surveys and data platforms), policy dialogues (exchange of ministries, experts and civil society), public engagement (events and online consultation) and creation of digital tools (interactive maps, feedback portals).

Transboundary Dialogues in the Danube Region are mainly located under the framework of the DRPC, the WFD and the UNECE Water Convention in the form of mostly bilateral and trilateral agreements. In the following some examples for such agreements are listed

- The Danube Delta Climate Change Adaptation Strategy between Romania, Ukraine and Moldova to address climate change impacts in the Danube Delta sub-basin under the ICPDS and WFD.[8]
- The collaboration under the UNECE Industrial Accidents Convention between Ukraine, Moldova and Romania on hazard and crisis management in the Danube Delta focused on reducing risks of accidental pollution in transboundary waters.[9]
- Bilateral cooperation between Romania and Ukraine to establish a Transboundary Biosphere Reserve under covering the Danube Delta and adjacent wetlands.[10]
- Lower Danube Green Corridor agreement under which the governments of Bulgaria, Moldova, Romania, and Ukraine pledged to work together to establish a green corridor along the entire length of the Lower Danube River in 2000.[11]

Beyond that, annual events such as the Danube Day[12] and the Danube Art Master are held across the Danube region to engage citizens, schools, and communities across borders. They foster environmental awareness and cultural exchange as well as promote bottom-up participation in river stewardship. Digital tools like the DanubeGIS[13] (Danube Geographic Information System platform), the DanubeHIS[14] (Danube Hydrological Information System) or the TransNational Monitoring Network[15] (TNMN) offer public access to spatial data and maps covering the Danube River Basin, combine basin wide dataset and build cooperation networks in the field of monitoring and assessment.

[8] https://www.icpdr.org/publications/preparing-climate-change-danube-delta
[9] https://unece.org/sites/default/files/2025-07/UNECE_DD_Project%20analysis_CA.pdf
[10] http://world-heritage-datasheets.unep-wcmc.org/datasheet/output/site/danube-delta/
[11] https://www.icpdr.org/publications/ten-years-green-corridor
[12] https://www.danubeday.org/
[13] https://www.danubegis.org/
[14] https://www.danubehis.org/
[15] https://www.icpdr.org/tasks-topics/topics/water-quality/transnational-monitoring-network

Funded by the European Union

5 Implementation within Lighthouse Activities:

In the following section the implementation of participatory governance mechanisms by the EcoDaLLi project but also other Danube Lighthouse Projects will be discussed. The focus thereby lies on EcoDaLLi's Living Labs.

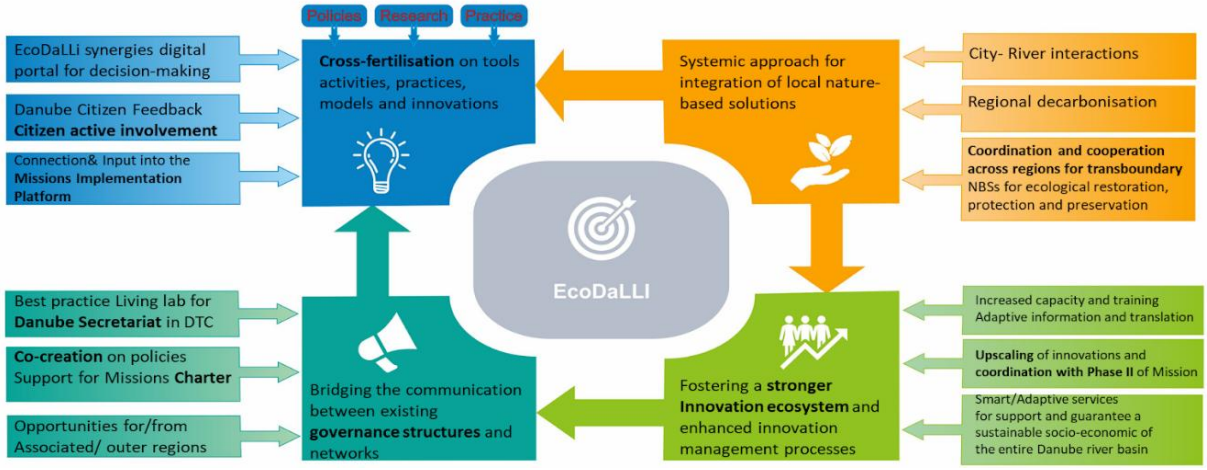

Figure 3: Graphic illustrating the work done by the EcoDaLLi project to foster a participatory governance system in the Danube and Black Sea Lighthouse.

EcoDaLLi's concept of work is depicted in Figure 3. It shows how the project's activities feed into the four main areas of the project: cross-fertilisation, integration of local NBS, a stronger innovation ecosystem and communication between existing Governance structures and networks.

5.1 Living Labs

The EcoDaLLi project establishes a participatory governance structure for the Danube River Basin through its Living Lab (LL) System, which provides a structured framework for connecting diverse stakeholders and governance levels in a bottom-up and co-creative manner. Rather than functioning as fixed physical spaces, the Living Labs operate as dynamic environments composed of tools, participants, and a temporal structure for ongoing collaboration, designed to enhance dialogue, knowledge exchange, and decision-making across the basin.

The Living Lab System is structured along four spatial scales—Upper Danube, Middle Danube, Lower Danube, and the Danube Delta—and four thematic scales: Biodiversity, Water Management, Climate Change, and the Danube Innovation Ecosystem. Through this structure, EcoDaLLi promotes participatory, adaptive governance, enabling stakeholders to collaboratively develop and test solutions that address both local and transboundary challenges in the Danube region.

5.1.1 Living Labs as Tools for Participatory Governance

The EcoDaLLi Living Labs are designed to serve as a **governance mechanism** that strengthens participatory structures and integrates local insights into policy-making. They provide a **bottom-up tool** for connecting governance levels and incorporating local needs and knowledge into higher-level decision processes. This approach enhances synergies between national, regional, and local initiatives, improving governance effectiveness and fostering

innovation. Living Labs bring innovation, co-creation and experimentation to river basin governance. They complement traditional governance structures by making the process interactive, localized and adaptive.

Central to the EcoDaLLi approach is the **Quadruple Helix model**, which ensures the participation of four key stakeholder groups—**Research, Governance, Business, and Civil Society**—across all Living Labs. This model facilitates structured dialogue and multi-level cooperation, giving equal voice to diverse actors and ensuring that local and regional communities are integral to shaping governance outcomes.

The concrete examples of stakeholders involved include:

- Local communities (affected by flooding or pollution)
- Agriculture & irrigation associations
- Hydropower providers
- Port authorities and navigation companies
- Environmental NGOs
- Local governments
- Research institutions

This connection and engagement reduces conflict and increases acceptance of river restoration or flood measures. That way the LL accelerate innovation uptake across countries, provide locally grounded evidence for basin-wide planning, improve trust between stakeholders, and help align EU policies with local priorities. LL also foster transboundary cooperation on shared water challenges, and these examples can be found in Upper and Middle Danube (cooperation between Slovakia, Hungary, Serbia and Croatia) as well as Lower Danube (transboundary cooperation between Bulgaria and Romania)

5.1.2 Co-Creation and Knowledge Exchange

Participatory governance within the Living Labs is achieved through **co-creation processes** that promote mutual learning and shared strategy development. By involving multiple stakeholders throughout the design and implementation phases, the LLs create a shared understanding of the Danube Basin as both a natural and socio-economic system. They bridge the gap between academia, policymakers, and citizens, transforming complex scientific insights into practical, user-friendly knowledge.

This co-creation process also underpins the development of a **common action plan** and the **EcoDaLLi Lighthouse Implementation Charter**, ensuring that locally generated knowledge and innovations inform basin-wide policy frameworks and strategic actions.

5.1.3 Participatory Governance in Practice

The implementation of the Living Labs across the Danube Basin demonstrates how participatory governance principles translate into practice through stakeholder engagement, joint planning, and co-design of solutions. Each Living Lab has applied the participatory approach within its specific geographical and thematic context, as summarized below.

Table 2: EcoDaLLi Living Labs with each theme and participatory governance action/outcome.

Living Lab	Theme	Participatory Governance Actions / Outcomes
Upper Danube LL	Danube Innovation Ecosystem	Focused on strengthening citizen and youth engagement, improving multi-sector communication, and promoting bottom-up strategies that amplify local stakeholder voices. Key actions included launching a **"Youth Connector" initiative** to engage young innovators and enhancing SME participation to improve competitiveness and innovation uptake.
Middle Danube LL	Climate Change	Highlighted the integration of local knowledge with scientific evidence to inform adaptation strategies. Emphasized community participation from the outset of decision-making and promoted knowledge exchange on sustainable agricultural and water management practices. Included a **field visit to Kopački Rit National Park** to observe real-world examples of nature-based solutions.
Lower Danube LL	Water Systems	Prioritized bottom-up, community-driven water management. Encouraged the creation of **Local Water Committees**, participatory decision-making structures, and the co-design and monitoring of water projects. Discussions also stressed open access to data, strategic funding planning, and stronger local involvement in governance.
Danube Delta LL	Biodiversity	Promoted community engagement, policy advocacy, and citizen science for biodiversity protection. Actions included educational initiatives, corporate responsibility campaigns, and public outreach programs. The Lab outlined a **three-phase approach to Nature-Based Solutions**: financial incentives, design development, and pilot implementation.

Each Living Lab contributes to participatory governance through targeted activities and collaborative frameworks.

- The **Upper Danube Living Lab** focused on building a strong, cross-border innovation ecosystem and roadmap for transferring and scaling innovations. It emphasized usability, social innovation, and sustainable development, while addressing challenges such as limited post-funding project sustainability and fragmented communication among sectors.
- The **Middle Danube Living Lab**, organized in **Osijek, Croatia (June 11–12, 2024)**, addressed the impact of climate change on agriculture and river basins. It encouraged joint approaches to adaptation, combining local experience with scientific research, and promoted nature-based solutions to improve soil and water resilience.
- The **Lower Danube Living Lab**, held in **Romania (May 14, 2024)** in collaboration with the **Ministry of Environment, Waters and Forests**, explored governance models for sustainable water management. Participants advocated for community-based approaches, open data access, and funding mechanisms that empower local stakeholders.

- The **Danube Delta Living Lab**, conducted on **May 16, 2024**, focused on biodiversity and nature-based solutions. It addressed fisheries management, educational initiatives, and economic instruments for conservation, emphasizing the need for cross-sector cooperation and local participation in biodiversity governance.

Through the Living Lab System, EcoDaLLi creates a **social infrastructure for participatory governance** in the Danube Basin. The Labs institutionalize collaboration between citizens, experts, businesses, and policymakers, ensuring that decisions are informed by local knowledge and real-world experience. This participatory model not only strengthens governance structures but also enhances innovation, resilience, and shared responsibility for the Danube's sustainable future.

By integrating bottom-up engagement, multi-stakeholder dialogue, and co-creation processes, EcoDaLLi demonstrates a replicable governance framework for transboundary river basins—one that aligns local actions with macro-regional strategies and contributes to the long-term sustainability of the Danube region.

Findings are being integrated into deliverables and disseminated early via LL-specific roadmaps to inform IA partners, authorities and other relevant stakeholders.

5.1.4 Gender dimension

Inclusive governance requires deliberate attention to gender dimensions, ensuring that women and youth are not only beneficiaries but active participants. Gender considerations have been central to environmental research since the 1980s, evolving from ecofeminist essentialist perspectives to frameworks that emphasize participation, decision-making, and empowerment, consistent with UN SDG 5 on gender equality.

Understanding the gender-environment nexus is critical for identifying inequities in both environmental degradation and restoration efforts. Impacts of environmental challenges and the benefits of Nature-Based Solutions (NBS) are not experienced equally: women and children are often disproportionately affected by climate change and may benefit more from mitigation and adaptation measures. Similarly, vulnerabilities related to water scarcity and energy access are gendered. Therefore, NBS initiatives that consider gender can generate more equitable and effective outcomes.

Gender mainstreaming in the Living Labs involves systematically integrating gender perspectives into legislation, policies, and practices. The first step is gender analysis, which examines roles, access to resources, beliefs, participation, legal instruments, and power relations [9]. Gender analysis frameworks, such as the EU model classifying engagement as gender-blind, neutral, sensitive, or positive, help structure inclusion and promote meaningful participation of women and youth in project design and governance processes.

5.1.5 Challenges and Experiences in Implementation

Implementing gender-sensitive participatory governance in the Living Labs has revealed several **practical challenges**:

- **Awareness and Capacity:** Some stakeholders lack the knowledge or awareness to implement gender-sensitive practices effectively.

- **Cultural and Social Norms:** Local traditions and social expectations may limit women's participation or influence in decision-making.
- **Representation vs. Influence:** Even when women participate, they may lack genuine influence due to power dynamics or dominant stakeholder voices.
- **Data Limitations:** Limited gender-disaggregated data on project impacts and participation hinders targeted interventions.
- **Resource Constraints:** Effective gender integration requires additional time, planning, and resources, which are sometimes constrained in project cycles.

Despite these challenges, several lessons have emerged: targeted outreach and facilitation, capacity-building initiatives, integration of gender considerations into governance tools, and adaptive engagement methods (e.g., hybrid participation or culturally sensitive approaches) significantly improve inclusivity.

Future Living Labs can benefit from these experiences by systematically conducting gender analyses, allocating dedicated resources for gender-sensitive engagement, integrating gender indicators into monitoring, and fostering continuous capacity-building for stakeholders and facilitators. Addressing these challenges enhances the legitimacy, effectiveness, and sustainability of participatory governance and environmental interventions in the Danube Basin.

5.2 Practice Living Lab System (PLLS)

The Practices Living Labs System[16] (PLLS) is a strategic tool of the EcoDaLLi project developed by SMS. It was conceived as a decision-support and assessment instrument aimed at filling an existing gap of tools available for evaluating and monitoring Living Labs (LLs) and their contribution to ecosystem-based governance and innovation.

PLLS functions as both an analytical and participatory mechanism within the broader EcoDaLLi information system, an integrated digital environment designed to connect, assess, and enhance collaboration among stakeholders across the Danube River Basin (DRB). By mapping stakeholders and visualising their interconnections, the tool encourages further participation, dialogue, and collaboration among actors in the Danube Basin. It directly supports the Mission "Restore Our Ocean and Waters by 2030", focusing on its three major objectives: **restoration of aquatic ecosystems, reduction of pollution and achieving carbon neutrality and circularity.**

5.2.1 Overview and Purpose

By assessing how various actors contribute to these objectives, the PLLS provides a structured governance intelligence layer to the EcoDaLLi framework.

The PLLS tool is built upon eight interrelated pillars, which together define the multidimensional structure through which Living Labs are analysed and assessed. Each pillar represents a critical component of sustainability-oriented innovation ecosystems:

[16] More information about PLLS at https://portal.ecodalli.eu/wp4

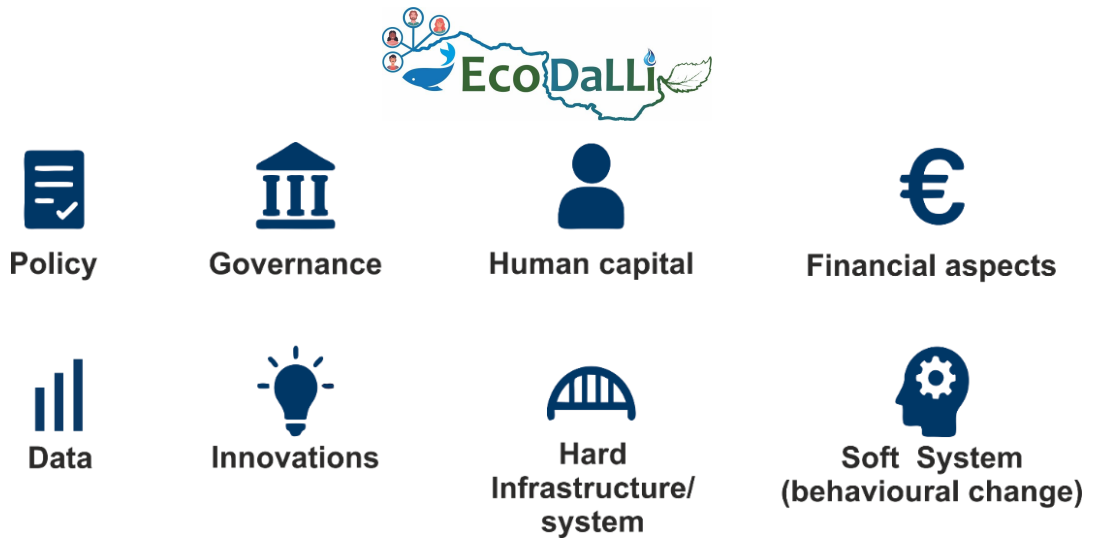

Figure 4: Visual list of the eight pillars of PLLS. More information on each Pillar in **Annex 1**.

Together, these eight pillars interact dynamically to generate a comprehensive understanding of Living Lab performance, stakeholder engagement, and governance evolution. The knowledge transfer component is a core part of the tool's philosophy. Through structured use of the eight pillars, the PLLS promotes mutual learning among stakeholders, guiding them to:

- Identify and share effective practices;
- Understand the type of information required for effective governance;
- Align local initiatives with broader Mission objectives;
- Co-design improved Living Lab strategies and policies.

The first version of the PLLS was designed as a questionnaire-based tool to collect structured information from stakeholders involved in Living Labs across the Danube Basin. The objectives of the initial questionnaire were to identify who holds relevant data and what type of information is available, map the relationships among key stakeholders involved in Living Lab activities, and evaluate the readiness level of these actors to engage in multi-level governance processes.

The initial pilot questionnaire was tested on a limited number of stakeholders, mainly to evaluate the functionality and logic of the data-gathering system. Feedback from this pilot informed subsequent improvements in questionnaire design, user guidance, and integration pathways with EcoDaLLi's central information system.

During the development process, it became evident that the PLLS required a complex analytical framework capable of processing, correlating, and visualising the diverse data collected through the tool. To address this, SMS designed an integrated data analysis component, which allows:

- Cross-pillar correlation analysis (e.g., linking governance structures with innovation performance).
- Identification of information gaps in stakeholder contributions.
- Generation of summary reports highlighting strengths, weaknesses, and opportunities for improvement in Living Lab operations.

This analytical layer ensures that data collected through the PLLS does not remain static but is actively transformed into actionable intelligence for policy learning and governance strengthening. To operationalise the PLLS and ensure consistent use across project partners, SMS initiated a training and knowledge transfer programme.

5.2.2 Implementation in EcoDaLLi

Following the successful development of the PLLS framework the tool was tested and validated to assess the applicability, usability, and stakeholder acceptance of the PLLS methodology across different geographical and socio-economic contexts of the Danube River Basin (DRB). The testing activities were designed to ensure that the PLLS can function as an effective mechanism to support ecosystem-based governance, foster multi-level cooperation, and enhance stakeholder engagement throughout the Danube region (for more information on the testing see **Annex 2**). The outcomes and insights directly inform the next stage of the development of the PLLS, which focuses on investigating the potential of PLLS across the Danube Basin to strengthen governance frameworks. Specifically:

- The analysis of testing results provided empirical evidence on how stakeholders and citizens perceive governance tools and participatory mechanisms,
- Identified challenges (e.g., fragmented communication, limited accessibility) will guide the design of improved governance models.
- The proposed digital platform concept for PLLS will be further explored to assess its feasibility as a long-term governance support tool, integrating stakeholder feedback loops, citizen engagement functions, and policy-learning resources.

This laid the analytical and methodological foundation, ensuring continuity and strategic coherence between testing, evaluation, and implementation phases. The testing confirmed its capacity to act as a bridge between scientific knowledge, policy frameworks, and citizen participation, while also identifying critical pathways for further development.

The final phase focuses on:

- Assessing the governance potential of the PLLS across different administrative and socio-ecological contexts in the Danube Basin;
- Exploring digitalisation options to enhance accessibility and user engagement;
- Integrating outcomes into policy-learning frameworks and governance recommendations for Mission Ocean and related EU initiatives.

5.2.3 Guide on how to use PLLS

Use the PLLS when you want to:

- Map existing Living Lab capacities
- Understand stakeholder roles and connections
- Assess readiness for green transition and governance innovation
- Identify gaps in data, funding, skills, policy alignment
- Capture citizen perceptions and regional differences
- Support planning for restoration, innovation, or cooperation initiatives
- Benchmark governance performance across Danube regions

The PLLS operates through two main instruments:

- Stakeholder Questionnaire:[17] Collects structured information from institutions, organisations, businesses, research groups, NGOs, and public authorities.
- Citizen Questionnaire:[18] Collects perceptions, level of awareness, values, and needs from local communities across the Danube Basin.

[17] https://portal.ecodalli.eu/polls/PLLs_stakeholders
[18] https://portal.ecodalli.eu/polls/PLLs_survey

Funded by the European Union

To use the PLLS effectively, the process can be described in nine steps:

I. Prepare and select respondents
II. Distribute questionnaires
III. Support questionnaire completion
IV. Collect and organise responses
V. Analyse with eight-pillar framework
VI. Interpret patterns and gaps
VII. Present findings and summaries
VIII. Integrate results into governance
IX. Conduct targeted follow-up (second engagement)

Find a detailed description of each step in **Annex 3**.

Together, these nine steps ensure that the PLLS functions as both an assessment tool and an engagement mechanism. Through structured analysis, targeted follow-ups, and continuous knowledge sharing, the PLLS supports EcoDaLLi's vision of building an inclusive, data-driven, and collaborative governance ecosystem for the Danube Basin. It enables stakeholders and citizens to contribute meaningfully to restoration and innovation initiatives while creating a shared evidence base that guides decision-making at local, regional, and transnational levels.

5.2.4 Key insights based on stakeholder and citizen feedback

By December 2025, including the responses from the testing period, a total of 45 citizens and 56 stakeholders (organisations) had responded to the questionnaires.

Key Insights from Citizen Questionnaires:

- **Awareness & Familiarity**: Many respondents report being moderately to very informed about conservation and biodiversity in the Danube Basin. Strong familiarity with the ecological importance of the Danube is consistent across age groups and regions.
- **Challenges Identified**: Water pollution, loss of biodiversity, habitat destruction, and climate change impacts are the most frequently cited threats.
- **Engagement Barriers**: The most common barriers are lack of time and lack of information or awareness.
- **Willingness to Act**: A majority are willing to change personal habits and support eco-tax or subsidies for eco-friendly practices. Citizens consistently call for transparency (public reporting, real-time data platforms) and participatory governance.

Figure 5: Visual representation of the key insights from the questionnaires.

Key insights from Stakeholders:

- Types of Stakeholders- Mix of academic institutions, NGOs, policy makers, businesses, and local governments.

Funded by the European Union

- Strategies & Priorities- Many organizations are “in progress” with sustainability strategies, focusing on environmental pillars, but often lack comprehensive ecological restoration approaches. Priorities include water system restoration, biodiversity conservation, and circular economy.
- Collaboration Patterns- Frequent collaboration with local businesses, educational institutions, and NGOs. Some highlight cross-border cooperation and digital monitoring as essential for basin-wide governance.
- Innovation & Literacy- Several institutions propose digital twins of the Danube Basin, nature-based solutions, and training programs for staff and citizens. Literacy programs on climate, water, and biodiversity are unevenly implemented.

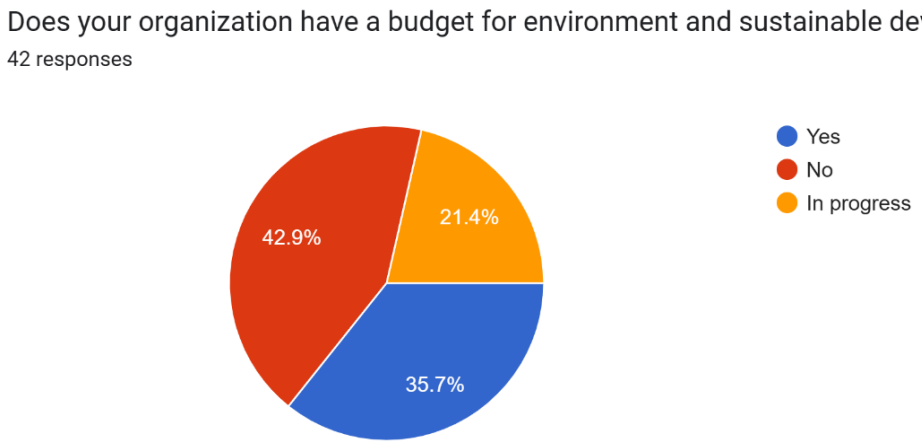

Figure 6: Example of results of the questionnaire.

5.2.5 Experiences and challenges

Overall, the experience with the PLLS demonstrated its strong potential as a governance assessment and engagement tool. However, challenges related to terminology, language, digital literacy, capacity differences, and data availability must be addressed to improve future versions. The feedback collected through testing provides a clear roadmap for enhancing the PLLS and supports its evolution toward a more accessible, standardized, and digitalized tool.

The implementation and testing of the Practices Living Labs System generated a wide range of experiences across the Danube Basin, reflecting the diversity of stakeholders, governance cultures, and socio-economic conditions in the region. As a new governance-intelligence tool in EcoDaLLi, the PLLS was generally well received, and many respondents appreciated its structured approach to understanding sustainability maturity and collaboration dynamics. However, these experiences also revealed several challenges—both expected and emerging—that should inform the next development phases, including the potential creation of a digital PLLS platform.

Many stakeholders expressed strong interest in participating, particularly those already involved in environmental governance, research, innovation, or cross-border cooperation. Respondents recognized that the PLLS addressed an existing gap by offering a structured assessment tool aligned with Mission Ocean objectives. In several regions, the tool also helped raise awareness about the importance of governance maturity, data management, and multi-sector collaboration.

Both citizens and stakeholders reported that answering the questionnaire made them reflect on their own practices, capacities, and connections. For some organisations, the PLLS experience highlighted previously overlooked issues — such as insufficient data sharing, limited collaboration networks, or the absence of a formal sustainability strategy — triggering internal discussions.

EcoDaLLi partners involved in data collection observed that the PLLS provided a structured way to engage stakeholders, making conversations more consistent across countries. This helped build a shared methodology within the consortium and strengthened coordination with other project activities.

Challenges Encountered During PLLS Use:

Fragmented or Missing Data
A recurring challenge was the inconsistent availability of environmental, biodiversity, or climate data across regions. Many stakeholders lacked internal monitoring systems or access to shared databases. This limited their ability to respond fully to data-related questions and reinforced the need for a unified future PLLS platform.

Need for Re-engagement (Second Engagement Step)
A significant number of respondents required follow-up clarification, especially regarding governance, collaboration networks, and innovation processes. While second engagement solutions were implemented successfully, this additional step increased time demands on both facilitators and participants.

Limited Representation in Some Sectors
Certain sectors—such as small businesses, private innovators, and local citizen groups—were harder to reach. Their underrepresentation in initial responses created analytical gaps and required further targeted outreach.

Expectations for an Integrated Digital Platform
Many respondents expressed that the lack of a centralised online system made the process more time-consuming and less intuitive. The need for a unified platform was a common experience, as respondents wanted a more seamless interface that automated submission, storage, and reporting.

5.3 Other digital tools:

The EcoDaLLi Projects provides the EcoDaLLi Portal[19] as a platform to make projects results available for the public. It provides a catalogue of NBS, a catalogue of Business Innovations, a content catalogue for stakeholder engagement, information on PLLS and still more to come. Deliverables such as Policy recommendations of NBS are provided and a discussion forum provides a platform for exchange of local actors. Until the end of the project a section will be developed to foster the dialogue between public authorities and citizens.

The EcoDaLLi portal aggregates LL outputs, innovation services and synergies and is being enhanced for governance participation (discussion forums, catalogues, cross-platform links).

Besides this, the Innovation Action projects in the Danube and Black Sea Lighthouse provide or develop a variety of Lighthouse-specific tool.

[19] https://portal.ecodalli.eu/

Table 3: List of digital tools provided by the IA projects in the Danube and Black Sea Lighthouse

Project	Name of tool	Short description	Category
Danube4all	Local Action Guide	This Guide provides information for citizens on how to monitor biodiversity yourself & restore the Danube river basin https://localactionguide.mykajabi.com/	Citizen Science, Monitoring
	Prototype GIS screening tool	For mapping river connectivity and floodplain restoration measures. Under development	Monitoring
Restore4Life	Wetland4Life App	An app for citizen science to provide support and guidance for wetland assessment. Still under development.	Citizen Science, Monitoring
	Solution4Life app	An app for stakeholders: learning about assessing wetland restoration potential. Still under development.	Innovators, Public authorities
	Restore4Life Platform	Under construction	Monitoring, Data sharing
DaWetRest	Community Engagement Toolkit	DaWetRest provides a Toolkit for community engagement as downloadable content: (https://dawetrest.eu/community-engagement-toolkit/). This toolkit includes a colouring book for children and Flyers specific for different Danube Regions.	Community engagement
	DaWetRest Platform	under development: Community engagement platforms for co-design of restoration actions.	Community engagement, Co-designing
DALIA	Knowledge & Monitoring System (KMS)	provides maps, demo site data, and policy recommendations. https://kms.dalia-danube.eu/	Monitoring, Data sharing
SUNDANSE	Sediment Prediction Tool	A digital tool for forecasting sediment transport and impacts using monitoring data and modelling Under development	Forecasting, Data sharing
DANSER	Digital Portal	Digital Portal for Monitoring & Decision Support. Under development	Monitoring, Decision support

Several of these tools are currently under development and will become available as the projects progress. Additionally, further tools are anticipated, particularly from recently launched initiatives such as DANUBElifelines, SWIM, and SoS2LearnDBS. If looked at European-wide infrastructure the monitoring service by the EU Copernicus and EMODnet and their collaboration the Digital Twin Ocean can be named.

5.4 Capacity building

To support the transfer of innovation and strengthen the capacity of relevant stakeholders within the Danube River Basin, as part of the Work Package 5 of the EcoDaLLi projects, several activities are conducted. This involves the development of a comprehensive catalogue of services, the creation of a guidebook to support innovation, and the organization of training sessions to enhance the skills and knowledge of innovation actors in the region.

As part of these activities, the project identified the necessary conditions for successfully upscaling innovations in the Danube Lighthouse by engaging stakeholders and facilitating collaboration through interviews, workshops, and strategic events. In addition, a blueprint for advancing river restoration and innovation transfer within the Danube Region, supporting the implementation of the Danube Region Action Agenda is created.

The Catalogue of Services provides a valuable resource for innovation actors, offering access to a wide range of services that support the transfer of innovation within the Danube River Basin.

A survey was developed and conducted to assess the guidance needs of innovation actors in the region. The results of this survey have been analysed and feed into the development of a guidebook to support innovation in the basin.

It reflects both the most frequently requested forms of support and those that respondents ranked highest in terms of importance. The most relevant areas for support include:

- **Financial support** (grants, venture capital, subsidies), which received the highest prioritization score and was cited by nearly all respondents (93%), confirming that access to funding remains the most critical barrier to scaling innovation.
- **Market intelligence** and networking opportunities, underlining the need for better access to market data, visibility, and collaboration platforms to foster connections and synergies within the regional innovation ecosystem.
- **Simplified regulatory procedures** reflecting strong concern over complex or unclear regulations that can hinder or delay innovation processes, particularly in areas related to ecosystem restoration and sustainability.
- **Infrastructure support** including access to laboratories, co-working spaces, and testbeds, which are essential to facilitate experimentation, prototyping, and collaboration.
- Access to **expert mentoring and coaching**, highlighting the importance of strategic guidance, experience-sharing, and individual support throughout different innovation stages.
- **Training on business models and commercialization** and tailored consulting on business model design and market analysis were recognized as valuable enablers.

To meet these needs EcoDaLLi is designing and providing targeted trainings for innovators and key stakeholders across the Danube region, helping them to develop innovation readiness, management skills, and access to market opportunities. To date, two training sessions were held: the webinars "Surfing the Innovation Stream" and “Financing & Scaling Wetland Restoration: Unlocking Innovation in the Danube Region.” More training sessions will follow.

The first webinar explored the objectives and collaborative opportunities of the EU Mission Ocean and EcoDaLLi Project, highlighting innovative governance approaches, the importance of data sharing for ecosystem restoration, practical examples of innovation in the Danube and Black Sea regions, and strategies for scaling research into market-ready solutions. This session provided valuable insights and practical knowledge to innovation actors, helping them navigate the complexities of innovation within the Danube River Basin. The second webinar was designed and facilitated as part of the DaWetRest Community of Practice: Innovation supporting services and financing for upscaling wetland restoration – Unlocking innovation in the Danube region.

These support services are seen as essential for helping innovators refine their strategies, improve market readiness, and successfully scale their solutions.

6 Challenges and Gaps

This section summarises the systemic barriers observed across WP4 activities, Living Labs, and PLLS testing that currently constrain participatory governance and ecosystem restoration in the Danube & Black Sea Lighthouse. The challenges are transboundary and multi-level in nature, spanning institutional fragmentation, limited resources for sustained engagement, geopolitical sensitivities in the Delta, upstream, downstream trade-offs, and the need for adaptive climate-risk governance.

1) Fragmentation of governance

The Danube River Basin spans 19 countries, each with its own water laws, environmental standards, and institutional arrangements. While the Danube River Protection Convention and ICPDR provide a coordination platform, implementation often differs at national and sub-national levels. For example, sediment management and hydropower licensing vary widely, making transboundary planning complex. Additionally, only 14 of the 19 countries located within the Danube River Basin are fully contracting parties to the ICPDR.[20] Policy misalignment slows integrated river basin management and restoration efforts.

2) Limited resources for sustained community engagement

Many Interreg and Horizon projects include citizen engagement, but funding is project-based and temporary. After project completion, local NGOs and municipalities struggle to maintain monitoring networks (e.g., citizen science for water quality). Rural areas and small towns along the Danube often lack technical capacity and financial incentives to keep communities involved long-term.

Furthermore, sustainable financing for citizen involvement has not been adequately addressed. Frequently, citizen participation is assumed to be voluntary; however, this expectation is often unrealistic, especially when it comes to ongoing monitoring and evaluation activities. Relying solely on volunteer efforts makes it challenging to ensure consistent engagement and data quality over time. Without long-term incentives or dedicated funding, citizen science networks are likely to face significant difficulties in maintaining active participation and meaningful contributions.

[20] https://www.icpdr.org/about-icpdr/framework/about-us

Funded by the European Union

3) Political sensitivities in Delta cross-border areas (Romania–Ukraine)

The Danube Delta is a UNESCO Biosphere Reserve shared by Romania and Ukraine, that faces several issues. Environmental measures (e.g., wetland restoration) are often delayed due to national interests and diplomatic friction, for instance navigation and dredging disputes (Ukraine's Bystroe Canal vs. Romania's ecological concerns).[21] On top of that security and geopolitical tensions since 2022 have made cross-border cooperation more fragile.

4) Need for better integration of upstream–downstream interests (hydropower vs. ecosystems, others)

Effective management of the Danube River Basin demands improved integration of upstream and downstream interests to address the interconnected impacts of hydropower, navigation, and ecosystem health throughout the region. Hydropower in Upper Danube (Austria, Germany) is in direct conflict with the ecosystem health in Lower Danube and Delta:[22] Dams interrupt the river flow, alter sediment transport, impacting delta stability and fisheries. Besides that, shipping and navigation priorities conflict with biodiversity conservation.[23] Current governance lacks mechanisms for balancing trade-offs between energy, transport, and ecological integrity across the entire basin.

5) Climate adaptation and disaster risk management (floods, droughts) requiring adaptive governance

The Danube Basin is increasingly affected by floods and droughts as a result of climate change, highlighting the need for adaptive governance. Flood protection efforts tend to prioritize hard infrastructure in upstream regions, whereas downstream areas depend more on the preservation of natural floodplains. At the same time, building resilience to drought requires the development of cross-sector water allocation agreements, but such agreements remain only weakly established in the region. Existing plans (e.g., ICPDR Flood Risk Management Plan) are not fully integrated with climate adaptation strategies at national levels.

7 Recommendations

This section builds on the lessons from WP4 activities into actionable guidance for strengthening participatory governance across the Danube & Black Sea Lighthouse. The recommendations framed with a concise "Why" and "How". Together, they translate Living Lab outcomes and PLLS insights into practical steps that authorities, practitioners, and communities can implement immediately, while ensuring continuity beyond EcoDaLLi.

1) Strengthen basin-wide participatory platforms.

Why	How
The Danube spans 19 countries (including 14 EU-countries), making transboundary coordination complex.	Instead of building new platforms, promote and improve existing platforms such as the different platforms of the ICPDR, to strengthen their

[21] https://www.worldports.org/romanian-govt-irked-by-ukrainian-dredging-on-danube-delta-canal/
[22] https://www.icpdr.org/tasks-topics/water-users/hydropower/power-danube-can-it-be-sustainable
[23] https://www.wwfmmi.org/?338711/The-Danube-River-and-its-Delta-well-known-but-threatened-by-multiple-pressures

Funded by the European Union

Participatory platforms ensure inclusive decision-making, reduce conflicts, and build trust among the different actors, including governments, NGOs, businesses, and citizens. They enable alignment with EU directives (Water Framework Directive, Floods Directive) by integrating local knowledge into basin-wide plans. Strong basin-wide platforms improve policy legitimacy and accelerate implementation of restoration measures through shared ownership.	outreach and the public awareness about their existence. Develop targeted strategies to engage stakeholders who are typically difficult to reach. Rather than simply increasing the quantity of communication, focus on enhancing its impact by amplifying the message and employing more effective methods. Utilise diverse communication channels, tailor content to the interests and needs of specific groups and collaborate with local organisations and community leaders to extend outreach. This approach will help ensure that all relevant stakeholders are informed, involved, and able to contribute meaningfully to participatory processes. Raise the profile and impact of the Danube Youth Council by making it more known by the young people in the DRB but also to officials.

2) Institutionalise citizen science.

Why	How
Citizen science data collection expands data coverage in areas where official monitoring is limited, improving water quality and biodiversity assessments. It fosters public engagement and environmental stewardship, turning citizens into active contributors rather than passive observers. Institutionalisation ensures data quality, continuity, and integration into official reporting (e.g., ICPDR's Joint Danube Surveys), making citizen contributions actionable. In addition to that, a general alignment in methods and outreach is helpful to prevent a decrease in participation through fatigue or confusion caused by too many different systems.	Provide and adopt unified data quality & ethics guidelines for all citizen science activities in the DRB. Leverage citizen science results and protocols from funded projects, for instance on litter pollution such as Plastic Cup initiative or the PlasticFreeDanube project to create basin-wide guidelines and ensure the sustainability of the efforts through setting up a financing and organisational structure. Create (sub-basin) pilots in monitoring and sampling where agency coverage is thin. Replicate them in other regions and create guidelines to set up these frameworks and on how to maintain them. Provide trainings for data collection or other citizen science activities (in person and online). Create a link to schools: micro-grants for kits, teacher training, annual or other reoccurring school events to engage people at a young age in nature protection and restoration. Provide hands-on activities to create a feeling of ownership.

	Create rewards for participating in continuous monitoring: certificates, or other form of appreciative incentives to keep people engaged. Gamification through streak bulidng could be another mechanism to keep people engaged.

3) Enhance cross-border delta governance.

Why	How
The Danube Delta is a shared ecosystem between Romania, Ukraine, and Moldova, with high biodiversity and vulnerability to pollution, floods, and climate change. Cross-border governance prevents fragmented management, which can lead to ecological degradation and socio-economic tensions. Coordinated governance supports joint risk management, biodiversity conservation (e.g., sturgeon recovery), and compliance with international agreements (Ramsar, UNESCO).	Use existing strategic frameworks: Romania's Danube Delta Integrated Sustainable Development Strategy (World Bank-supported)[24] as a planning reference; mirror on the Ukrainian/Moldovan side where feasible. Biodiversity & sturgeon focus via EUSDR PA4/PA6 flagships, connecting river continuity and fisheries measures across borders. Conflict-sensitive operations acknowledging war-related constraints on the Ukrainian side; maintain cross-border education and monitoring using mixed teams and satellite-based methods.

4) Use digital participation tools at scale.

Why	How
Digital tools (e.g., interactive maps, Digital Twin Ocean) make complex data accessible, enabling informed participation by stakeholders at all levels. They allow real-time feedback and scenario planning, improving transparency and responsiveness in decision-making. Scalable digital engagement ensures broad reach, overcoming geographic and language barriers across the basin.	Digital Tool for Citizen Science activities, to ease participation and send reminders to provide updates and sustain engagement. Gamify Engagement: Introduce apps for biodiversity reporting and restoration challenges to attract younger demographics.

[24] https://www.worldbank.org/content/dam/Worldbank/Feature%20Story/ECA/Romania/Webpage%20-%20Danube%20Delta%20Integrated%20Sustainable%20Development%20Strategy%20NOV-DEC14%20FOR%20PDF.pdf

Funded by the European Union

	Ensure Multilingual Access: Provide tools in all Danube languages to overcome participation barriers.

5) Align funding for co-created restoration.

Why	How
Restoration projects often fail to sustain due to fragmented funding streams and lack of coordination between EU, national, and local sources. Aligning funding ensures financial sustainability, enabling multi-year, basin-wide measures rather than isolated pilots. Co-created projects backed by aligned funding demonstrate shared responsibility, increasing chances of success and impact. Besides public funding, private funding is a needed source, to maintain impact and replication of restoration activities.	Linking macro-regional priorities to operational programmes to ensure restoration measures co-designed with communities receive multi-source financing. Progress tracking to prioritize co-created measures with clear basin benefit (nutrient reduction, flood resilience). Provide guidelines and success stories for public private partnerships and align these with funding mechanisms like Interreg or Horizon Europe, to create lasting impact by securing independent funding for scale ups or scale outs after the project ends. This will ensure the long-term impact of the projects. Leverage Corporate Social Responsibility (CSR) initiatives and green bonds for restoration financing.

8 Conclusions

This report demonstrates that participatory governance is not merely a theoretical ambition, but a practical necessity for the sustainable management and restoration of the Danube River Basin and its Delta. The project's approach—anchored in the principles of inclusiveness, transparency, and multi-level coordination—has shown that effective governance requires the active involvement of diverse stakeholder groups, from public authorities and researchers to local communities, businesses, and civil society. By leveraging existing frameworks such as the ICPDR and EUSDR and aligning with EU policy instruments like the Water Framework Directive and the Mission "Restore our Ocean and Waters by 2030," EcoDaLLi has established a robust foundation for integrated, cross-border cooperation.

A key achievement of the project is the operationalization of participatory mechanisms through Living Labs, digital platforms, and innovative stakeholder engagement tools. These mechanisms have fostered a culture of co-creation, enabling local knowledge and experience to inform decision-making at all levels. The Living Labs, in particular, have demonstrated the value of iterative, context-sensitive approaches that adapt to the unique ecological, social, and governance realities of each sub-basin and the Delta. By institutionalizing participatory practices, EcoDaLLi has helped bridge the gap between policy and practice, ensuring that governance structures are both resilient and adaptable to emerging challenges. The PLLS as a strategic tool to support the Living Lab process. Testing confirmed its ability to support LL to bridge science, policy, and citizen engagement while identifying gaps in data, participation, and digital access. In addition to participatory governance mechanisms, capacity-building materials such as trainings and workshops can equip stakeholders with the skills, resources, and networks needed to overcome barriers and scale innovations for ecosystem restoration in the Danube Basin.

The report also highlights critical challenges that must be addressed to sustain and scale these achievements. The project's recommendations offer actionable pathways to overcome these obstacles and ensure the long-term success of the Mission.

Ultimately, EcoDaLLi's work in the Danube & Black Sea Lighthouse serves as a replicable model for other transboundary basins. By embedding participatory governance in the core of its approach, the project has demonstrated that inclusive, transparent, and adaptive governance is not only possible, but essential for achieving the ambitious goals of the European Green Deal and the Mission "Restore our Ocean and Waters by 2030." The lessons learned and frameworks developed here provide a strong foundation for future efforts, ensuring that the voices of all stakeholders are heard, and that the Danube River Basin continues to thrive as a living, resilient, and shared resource.

Sources and References:

[1] Palumbo, R. (2017). Participatory Governance. In: Farazmand, A. (eds) Global Encyclopedia of Public Administration, Public Policy, and Governance. Springer, Cham. Pp 1-6, https://doi.org/10.1007/978-3-319-31816-5_1834-1

[2] Sielker, F. (2016). New approaches in European governance? Perspectives of stakeholders in the Danube macro-region, Regional Studies. Regional Science. 3(1), 88-95. DOI: 10.1080/21681376.2015.1116957.

[4] Bjørkan et al. (2025) Engaging Citizens with Mission Ocean & Waters: A toolbox of approaches. Deliverable 3.4. PREP4BLUE.

[3] Whyte, D., Debaveye, L., Bjørkan, M. et al. 2024. Planning for citizen participation in the EU mission to restore our ocean and waters by 2030. Maritime Studies. 23(44). https://doi.org/10.1007/s40152-024-00385-x.

[5] Wise, Emily, (2024) Moving forward on the implementation of national missions Mutual Learning Exercise on EU missions implementation at national level Final report Moving forward on the implementation of national missions, Final Report of Mutual Learning Exercise on EU missions implementation at national level, DOI: 10.2777/92126.

[6] https://www.icpdr.org/danube-basin/sub-basins (last accessed 28.11.2025)

[7] https://unece.org/fileadmin/DAM/env/water/meetings/Assessment/Kiev%20workshop/Presentations/basin%20presentations/Presentation_2ndAssessment_Kiev_Danube_Toader_RO.pdf (last accessed 28.11.2025)

[8] https://en.wikipedia.org/wiki/Open_innovation (last accessed 28.11.2025)

[9] de Siqueira, L.P., Tedesco, A.M., Meli, P., Diederichsen, A. and Brancalion, P.H.S. (2021), Gender inclusion in ecological restoration. Restor Ecol, 29: e13497, DOI: 10.1111/rec.13497.

ANNEX: Additional Information on PLLS

ANNEX1: The eight interrelated pillars of PLLS:

Pillar	Description	Purpose
Policy	Examines alignment of Living Lab activities with regional, national, and EU policies related to water, environment, and innovation.	To assess policy coherence and policy-learning potential.
Governance	Focuses on decision-making processes, stakeholder involvement, and coordination mechanisms within Living Labs.	To evaluate participatory governance maturity.
Human Capital	Looks at the competencies, skills, and engagement levels of individuals involved.	To understand capacity-building needs.
Financial Capital	Reviews the availability and sustainability of financial resources and funding models.	To assess financial viability and sustainability.
Data	Captures data generation, management, and sharing practices.	To identify interoperability gaps and data-driven decision potential.
Innovation	Evaluates the capacity to generate and scale innovative solutions.	To measure innovation performance and knowledge diffusion.
Hard System	Refers to the physical and technological infrastructure supporting Living Labs.	To map technical readiness and operational capability.
Soft System (Behavioural Change)	Focuses on social dynamics, behavioural shifts, and community acceptance.	To assess socio-cultural transformation potential.

ANNEX 2: Details on testing PLLS:

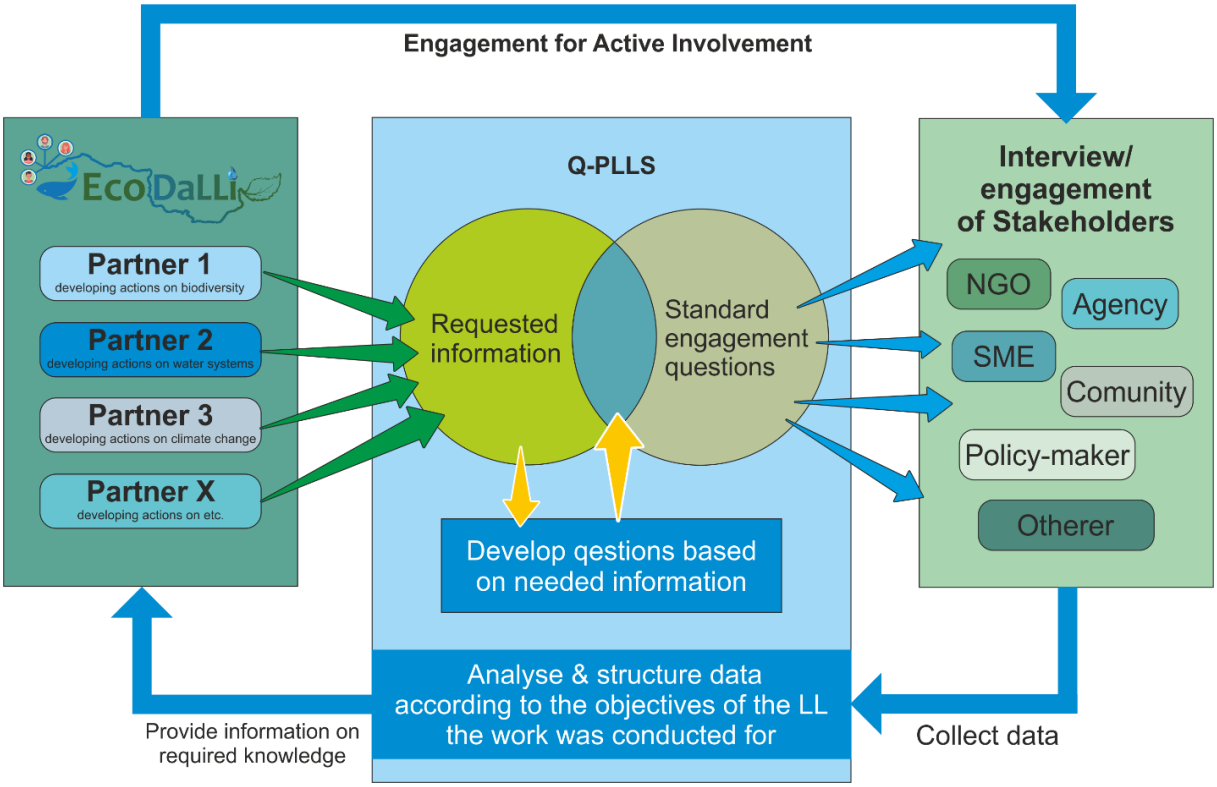

Figure 7: Input and feedback cycle of the PLLS.

To ensure representativeness across the Danube region, testing was organised around four major Danube units: Upper Danube, Middle Danube, Lower Danube and the Danube Delta

Within these geographic areas, testing groups were selected from existing Living Labs (LLs) and stakeholders with demonstrated interest or active involvement in environmental governance and innovation initiatives. The target groups included:

- Policy makers at local, regional, and national levels
- Technology owners and innovation developers from the private sector
- Academic and research institutions
- Civil society organisations and local communities impacted by climate change and wetland restoration

To establish a baseline for testing, 3–5 key contacts per target group were identified and invited to participate.

Recognising the need to capture perceptions and feedback from the local population, a second questionnaire was developed specifically targeting citizens in communities directly impacted by wetland restoration initiatives. This version aimed to assess levels of awareness, participation, and acceptance of ecological restoration processes. To ensure accessibility, the citizen questionnaire was translated into six languages -English, Romanian, German, Croatian, Bulgarian, and Serbian, reflecting the linguistic diversity of the DRB.

During this stage, several refinements were implemented:

- Clarifying definitions were inserted for less familiar terms to facilitate comprehension (e.g., “ecosystem services,” “participatory governance”).

- The term “overurbanization” was added as an explicit response option to the question regarding the main challenges facing the Danube Basin.
- Links to the EcoDaLLi portal and newsletter were embedded to strengthen dissemination and encourage broader participation.

Following the successful completion of testing, attention shifted towards evaluation and interpretation of the collected data. Preliminary results were internally reviewed, and recommendations were developed for the future use of the PLLS tool in strategic governance contexts, particularly regarding policy learning loops and multi-actor collaboration frameworks. These findings were also presented and discussed during major project events:

- Delta & Wetlands Symposium, which brought together scientists, policy-makers, and local stakeholders to discuss governance challenges and innovation opportunities in wetland management; and
- DaWetRest General Assembly Board 5 Meeting, where the EcoDaLLi consortium presented the PLLS progress and gathered expert feedback.

The discussions helped validate the testing outcomes and provided additional insights into how the PLLS can support adaptive governance and stakeholder co-creation processes across the Danube Basin.

ANNEX 3: Detailed steps on how to use PLLS

The first step is to prepare the target groups. This involves identifying suitable respondents for both the stakeholder and the citizen questionnaire. Stakeholder respondents may include public authorities, NGOs, businesses, research institutions, and community organisations, while citizen respondents are selected from communities located in the Upper, Middle, and Lower Danube, as well as the Danube Delta and the Black Sea region. Ensuring diversity is essential because it enables the PLLS to capture a representative picture across multiple socio-economic and geographic contexts.

The second step consists of distributing the questionnaires. These can be delivered digitally through online forms, the EcoDaLLi portal, email, SMS, or in paper form during workshops or field visits. Respondents must first read and agree to the privacy statement before completing the questionnaire. Because digital literacy varies across the region, distribution channels should be adapted to the accessibility needs of each community.

Once the questionnaires are distributed, the third step involves supporting respondents during completion. Some questions contain technical terms related to governance, circularity, innovation, or ecological restoration, and these may require clarification. Facilitators should be prepared to explain terms, offer examples, or provide translation support. This guidance is essential for ensuring that responses are accurate and comparable across regions and sectors.

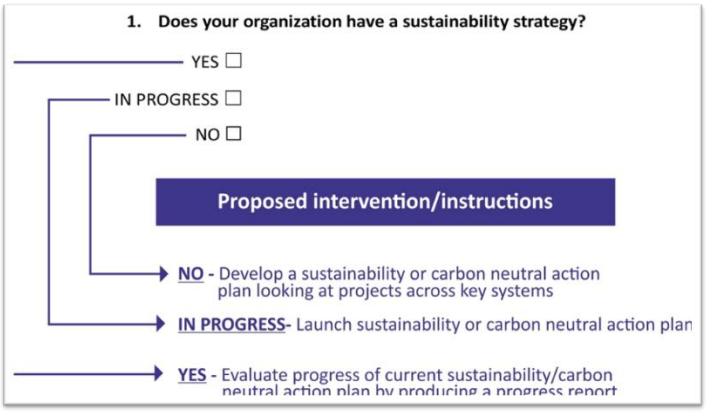

Figure 8: Example of a Question and its proposed intervention.

The fourth step focuses on collecting and organising the completed questionnaires. Responses should be stored in a structured database — either a spreadsheet or a managed platform — while keeping stakeholder and citizen data separate for analytical clarity. Each response should be coded by region, respondent type, and date of completion to make later comparison possible and to maintain data quality across the entire workflow.

Following data collection, the fifth step involves applying the eight-pillar framework to analyse the results. This analysis examines the degree to which respondents align with policies, participate in governance networks, invest in human and financial capacities, generate or use environmental data, engage in innovation, maintain or develop restoration infrastructures, and support behavioural change. Analysing these pillars together creates a detailed picture of organisational readiness, collaboration structures, local challenges, and community attitudes toward sustainability.

The sixth step requires interpreting the patterns revealed by the eight-pillar analysis. This includes identifying which regions or sectors demonstrate high readiness for collaboration, which groups lack resources or skills, and where gaps exist in data availability, innovation activity, or public engagement. It also includes evaluating how citizens perceive environmental challenges, whether they are willing to adopt sustainable behaviours, and what barriers prevent them from participating in restoration efforts. These interpretations lay the foundation for tailoring recommendations that respond to real conditions in the Danube Basin.

The seventh step involves presenting the results. Findings can be summarised through narrative reports, pillar-based overviews, regional comparisons, stakeholder maps, or citizen perception summaries. Presenting the findings ensures that stakeholders understand the outcomes and can use them for planning, decision-making, and cross-border collaboration.

The eighth step integrates the analysed results into governance processes and planning activities. PLLS insights are valuable for refining Living Lab strategies, supporting policy learning loops, designing capacity-building measures, improving regional cooperation, and guiding targeted interventions related to restoration, innovation, and behavioural change. Incorporating PLLS results helps align local practices with Mission Ocean targets and prepares the groundwork for the future digitalisation of the PLLS as a more interactive, long-term governance tool.

In some cases, a ninth step — called second engagement — may be necessary. Second engagement refers specifically to a focused follow-up with citizens or stakeholders who have already completed the questionnaire. It is used when additional clarification is needed, when an answer is ambiguous or incomplete, when a respondent's circumstances have changed,

or when an organisation plays a critical role and more detailed information is required for accurate interpretation. Unlike the initial survey process, this follow-up is short and highly targeted, typically conducted through a brief email, phone call, SMS message, or short meeting. During this follow-up, facilitators explain why additional information is needed and reassure respondents that the request is not a correction, but rather an opportunity to ensure that their contribution is fully understood. Any new information collected is added directly to the respondent's original record, annotated as second-engagement data, and then reintegrated into the eight-pillar analysis. This step significantly improves data reliability, strengthens interpretations, and deepens the collaboration and trust between respondents and the initiative.

ANNEX 4: PLLS Citizen Questionnaire used in the testing phase

EcoDaLLi (ECOsystem-based governance with DAnube lighthouse Living Lab for sustainable Innovation processes) is an EU project working on innovative solutions, to protect and restore the Danube River Basin and its delta. It brings together experts, communities, and innovative ideas to improve water quality, preserve nature, and ensure a healthier environment for people and wildlife by 2030.

Citizens` engagement with research projects will strengthen the expected outcome and will speed up the implementation of several solutions towards increasing the quality of life in the Danube region. Your valuable and will be included in these expectations.

By participating in this survey, you are helping improve the quality of life in your community. Your opinions will directly influence important decisions and contribute to a greater cause. It is a chance to raise awareness, access future opportunities, and feel more involved in shaping the future.

Date: Select the date

BASIC INFORMATION

NAME First Name Last Name GENDER:

EMAIL Contact email adress

OCCUPATION current occupation LOCATION Country City

Your Age: under 20 ☐ between 20 and 40☐ Between 41 and 60☐

Over 61 ☐

In which of the Danube River Basins do you live?

☐ Upper Danube ☐ Middle Danube ☐ Lower Danube ☐ Danube Delta & Black Sea

and your distance to the Danube River is

☐ less than 1km ☐ between 1 and 5 km ☐ between 5 and 50km ☐ over 50 km

Funded by the European Union

Knowledge, Awareness and Engagement

1. How informed are you about conservation, restoration, and biodiversity efforts in the Danube River Basin?
    - Very informed
    - Moderately informed
    - Not informed
2. Are you familiar with the ecological importance of the Danube Basin?
    - Yes, very familiar
    - Somewhat familiar
    - Not familiar

Perception and Challenges

3. How do you think human activities (e.g., farming, industry, urbanization) affect the Danube's ecosystems?
    - Significantly
    - Moderately
    - Negligibly
4. What do you think are the biggest challenges facing the Danube Basin you live near to? (Select all that apply)
    - Water pollution
    - Loss of biodiversity
    - Habitat destruction
    - Climate change impacts
    - Overexploitation of resources (fishing, agriculture, etc.)
    - Overurbanization
    - Other: _____

Behavior and Environmental Practices

5. Do you engage in activities that impact the Danube River Basin (e.g., fishing, farming, recreation)?
    - Yes, often
    - Occasionally
    - Rarely
    - Never

6. Do you actively reduce your environmental impact in your daily life (e.g., recycling, reducing water use)?

   - Yes, consistently
   - Sometimes
   - Rarely
   - Never

7. Would you be willing to change personal habits to support conservation efforts (e.g., reducing water usage, avoiding pollution)?

   - Yes
   - Maybe
   - No

Policy

8. What conservation measures do you think should be prioritized for the Danube River Basin? Rank in order of importance, from 1(highest priority) to 7 (lowest priority)

   - __ Reducing pollution
   - __ Protecting and restoring forests
   - __ Protecting and restoring wetlands
   - __ Enhancing biodiversity through species protection programs
   - __ Regulating industrial and agricultural practices
   - __ Raising public awareness and education
   - __ Other: _____

9. What restoration actions do you think would benefit Danube the most? (Select all that apply)

   - Reforestation of riverbanks
   - Wetland restoration
   - Removal of invasive species
   - Reintroduction of native species
   - Other: _____

10. How should biodiversity protection in the Danube River Basin be improved?

    - Strengthening legal protections for endangered species
    - Expanding natural reserves and protected areas
    - Promoting sustainable fishing and agriculture
    - Other: _____

11. What additional legislative measures do you think should be taken to protect the Danube River Basin and its biodiversity? Rank in order of importance, from 1(highest priority) to 7 (lowest priority)
    - __ Pass laws to safeguard critical habitats by introducing/enlarging mandatory buffer zones along the riverbanks
    - __ Introduce legal frameworks mandating sustainable farming and vegetative buffers or sediment traps on farms near waterways, to prevent the input of suspended matter and pollutants
    - __ Strengthen fines and penalties for wastewater and stormwater discharge
    - __ Mandatory fish-friendly designs for dams and barriers to ensure the connectivity of aquatic ecosystems
    - __ Mandatory regular public reporting on water quality, biodiversity status, and pollution
    - __ Ensure that citizens can access real-time data and create centralized digital platforms for public discussions
    - __ Pass Laws that empower citizens to play an active role in protecting and managing the Danube River Basin
12. Can you suggest additional legislative measures that should be taken?

    _____
    _____

Participation, Barriers and Support

13. Do you have experience with conservation activities?

    ☐ YES ☐ NO

14. What prevents you from participating in conservation activities?
    - Lack of time
    - Lack of information or awareness
    - Lack of interest
    - Other: _____
15. Would you support policies that include:
    - A small eco-tax for conservation funding?
        - Yes
        - No
    - Subsidies or incentives for eco-friendly practices?
        - Yes
        - No
16. What type of resources or support would help you contribute to conservation efforts?
    - Access to training or workshops

- Financial incentives or subsidies
- Recognition of contributions
- Other: _____

Feedback

Conservation aims at preserving ecological structures and services which still exist and restoration is re-building ecological structures and services that have been destroyed.

17. Do you have any suggestions to improve citizen engagement in conservation and restoration efforts?

- _____

_____

_____

I have read and accepted the data protection statement and agree ☐

I would like to receive the quarterly Danube & Black Sea Lighthouse newsletter ☐

Join the EcoDaLLi digital platform: https://portal.ecodalli.eu/

The EcoDaLLi Privacy Policy: https://ecodalli.eu/privacy-policy/

ANNEX 5: PLLS STAKEHOLDERS Questionnaire used in the testing phase

EcoDaLLi is the acronym for "ECOsystem-based governance with DAnube lighthouse Living Lab for sustainable Innovation processes". It is a Horizon Europe project within the EU Mission "Restore our Ocean and Waters by 2030".

The main objective of EcoDaLLi is to centralise Danube governance structures in terms of innovative solutions for improved ecological restoration, protection and preservation of the Danube basin and its delta by fostering a stronger innovation ecosystem within a well-connected Living Lab system.

BASIC INFORMATION

ORGANIZATION Enter organization name

LOCATION	Type your organization adress here		
NAME	First Name	Last Name	Role in Organisation
EMAIL	Contact email adress	TEL.	Contact tel. No.

STAKEHOLDER TYPE

ADMINISTRATION ☐	NGO ☐	ACADEMIC INSTITUTION ☐
BUSINESS ☐	RESEARCH ☐	COMMUNITY ☐
		Fill in -OTHER

1. **Does your organization have a sustainability strategy?**

YES ☐ **IN PROGRESS ☐** **NO ☐**

* A sustainability strategy is a comprehensive plan that outlines how an organization aims to conduct its operations in creating value while minimizing negative impacts on people and the planet.

2. **Which pillar of sustainability is your organization focusing on?**
    - ENVIRONMENT
    - SOCIAL
    - ECONOMIC
3. **Which of the following specific areas is your organization prioritizing?** (Check all that apply)
    - Water system restoration
    - Research and development
    - Social equity
    - Circular economy

- Smart growth
- Democratic participation
- Pollution
- Cost savings
- Education
- Biodiversity
- Long-range planning
- Social well-being

4. **Does your organization have an ecological restauration management approach?**

YES ☐ IN PROGRESS ☐ NO ☐

*An ecological preservation(restauration) management approach is focused on maintaining and protecting natural ecosystems to ensure biodiversity and the health of the environment. This strategy involves conserving habitats, protecting endangered species, and managing natural resources sustainably. Key practices include monitoring ecological changes, restoring degraded areas, preventing pollution, and promoting sustainable land use.

5. **Is your organization working/collaborating with:**

Local businesses ☐	Communities ☐	NGO`s ☐
Educational institutions ☐	Research institutions ☐	Public institutions ☐
Environmental specialists ☐	Health organizations ☐	Other

6. **Does your organization have a climate/ water/ biodiversity sustainability literacy program for staff members?**

CLIMATE	YES ☐	IN PROGRESS ☐	NO ☐
WATER	YES ☐	IN PROGRESS ☐	NO ☐
BIODIVERSITY	YES ☐	IN PROGRESS ☐	NO ☐

* A Sustainability Literacy Program for staff members is an educational initiative designed to increase awareness and understanding of environmental, social, and economic sustainability principles. It supports employees with the knowledge, skills, and tools to make informed decisions and adopt sustainable practices within the workplace and in their daily lives.

7. **Is your organization?**

Conducting training for the green transition and/or sustainable development☐

Providing opportunities to attend technical training relating to sustainability☐

Allocating sufficient staff members and time to deliver on its climate ambitions☐

Encouraging upskilling of its staff members in relation to sustainability ☐

8. **Does your organization have a budget for environment and/or sustainable development?**

YES ☐ IN PROGRESS ☐ NO ☐

9. **From the environmental point of view, does your organization:**

-use whole-life costing when assessing projects ☐

*Whole-life costing is a method used to assess a project's total cost over its entire lifespan, including initial capital investment, maintenance, operation, and eventual disposal or decommissioning.

-measure financial value of the of wider socio-economic benefits ☐

*The financial value of wider socio-economic benefits refers to the monetary estimation of positive impacts a project or initiative has on society and the economy, such as improved public health, job creation, and environmental sustainability

-officers have the expertise to make the business case for climate-related projects ☐

*This outlines the potential environmental, financial, and social benefits, demonstrating how the project aligns with organizational goals, reduces risks, and supports long-term sustainability.

10. **Does your organization report on the effects left on organisms and their environment due to actions made by human-activity using a systematic recognized methodology?**

YES ☐ IN PROGRESS ☐ NO ☐

11. **Your organization has accessible data on:**

biodiversity conservation ☐

water systems ☐

climate change ☐

12. **Does your organization have in place a clear and comprehensive process relating to innovation?**

YES ☐ IN PROGRESS ☐ NO ☐

*A comprehensive process for innovation involves a systematic approach to developing new ideas and solutions. It typically includes stages such as idea generation, research and development, prototyping, testing, and implementation.

13. **Your organization embraces the potential of:**

Nature-based Solutions ☐	**New technologies/ Man-made solutions ☐**

Ex. Rainwater Harvesting, Agroforestry, Riparian Buffers, ...	Ex. Electric and Hydrogen-Powered Vehicles, Vertical Farming, Energy Storage Systems, ...

and engages in

Collaborative innovation ☐ Demo. and pilot projects ☐ Open innovation ☐

14. Has your organization launched an environmental protection/restoration program?

YES ☐ IN PROGRESS ☐ NO ☐

*Ex. Renewable Energy Initiatives, Waste Segregation Campaigns, Plastic Ban Programs, ...

15. Has your organization invested in green/blue infrastructure?

GREEN Infrastructure **YES ☐** **IN PROGRESS ☐** **NO ☐**

*Natural or engineered systems that use vegetation, soil, and water management techniques to provide environmental, economic, and social benefits, such as reducing urban flooding, improving air quality, and enhancing biodiversity.

BLUE Infrastructure **YES ☐** **IN PROGRESS ☐** **NO ☐**

*Natural or engineered water-based systems, such as rivers, lakes, wetlands, and stormwater management features, designed to manage water resources sustainably while providing environmental and social benefits.

16. Does your organization actively support a transition to a circular blue economy in your area?

YES ☐ IN PROGRESS ☐ NO ☐

*A **circular blue economy** focuses on sustainable use of ocean and water resources by minimizing waste, recycling materials, and promoting renewable practices to support economic growth and ecosystem health

17. Please select if you are involved or interested in one or both of the following programs, related to sustainability.

Behavioral change program for local residents and businesses ☐

*A **behavioral change program** encourages individuals or groups to adopt sustainable habits or practices through education, incentives, and support to achieve specific environmental, social, or health goals.

Behavioral change program for staff members ☐

* A **behavioral change program for staff** helps employees adopt sustainable and productive workplace habits through training, awareness, and supportive initiatives.

18. **How do you think innovative collaboration across the Danube River Basin could help restore ecosystems while driving sustainable economic growth? Also please point out some keywords that are of interest to you.**

19. **Keywords of interest:**

○ **Ecosystem restoration** ○ **Sustainable economic growth** ○ **Innovative solutions** ○ **Collaboration** ○ **Biodiversity** ○ **Circular economy** ○ **Climate adaptation**	○ **Water management** ○ **Green infrastructure** ○ **Nature-based solutions** ○ **Community engagement** ○ **Stakeholder collaboration** ○ **Sustainable agriculture** ○ **Pollution reduction**	○ **Environmental monitoring** ○ **Sustainable tourism** ○ **Renewable energy** ○ **Green jobs** ○ **Smart growth** ○ **Policy integration** other …. …. …. …. …. ….. ….. …. ..

I have read and accepted the data protection statement and agree ☐

I would like to receive the quarterly Danube & Black Sea Lighthouse newsletter ☐

Join the EcoDaLLi digital platform: https://portal.ecodalli.eu/

The EcoDaLLi Privacy Policy: https://ecodalli.eu/privacy-policy/