

D6.11: Policy Impact Strategy

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Date: 28.02.2023





This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003881

Project Deliverable

Project Acronym	Project Title
NEXOGENESIS	Facilitating the next generation of effective and intelligent water-related policies, utilizing artificial intelligence and reinforcement learning to assess the water-energy-food-ecosystem (WEFE) nexus
	Thematic Priority
20RIA	LC-CLA-14-2020
	NEXOGENESIS

Title

Policy Impact Strategy

Contractual Delivery Date	Actual Delivery Date	
M18: March 2023	16 February 2023	

Start Date of the project	Duration
01 September 2021	48 months

Organisation name of lead contractor for this	Document version
deliverable	
AVA	V1.2

Dissemination level	Deliverable Type
Public	Report

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Abstract

This strategy intends to help making the projects' research agenda and research findings relevant to policymaking in a way that has an impact on how policy is formed, implemented and understood.

Keywords

Science-policy interface, wider impact, research for policymaking

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Table of Content

Pro	ject [Deliverable	. 2
Dis	claim	ier	. 3
1	Exe	cutive Summary	. 6
2	Proj	ject Information	. 6
2	2.1	Project Summary	. 6
2	2.2	The Case Studies	. 7
3	The	need for a policy impact strategy	. 8
4	Dev	eloping a policy impact strategy	10
5	Арр	lying the policy impact strategy	11
5	5.1	Stakeholders that could influence policymaking identified in NXG	11
5	5.2	Defining policy impact	13
5	5.3 Tracking policy impact		14
5	5.4	Suggested benchmarks	16
6	Mor	nitoring impact and measuring success	17
6	5.1	Tactics to be used by consortium members on their own contributions	18
6	5.2	Tactics to be used by case study leads to evaluate the local impact	19
6	5.3	Tactics to be used by the NXG consortium to evaluate the overall impact	21
7	Cor	nclusion	25
8	Ref	erences	25
9	Ann	ex	27
9).1	Annex 1: Template for Impact Logs	27
9	.2	Annex 2: Summary results of initial Impact Logs	29
9	.3	Annex 3: Summary overview of initial case study policy impact histories	34







List of Abbreviations and Acronyms				
AGU	American Geosciences Union			
САР	Common Agricultural Policy of the European Union			
CS	Case Study			
EC	European Commission			
EGU	European Geosciences Union			
EU	European Union			
DGs	Directorate General of the European Commission			
HSE	Health and Safety Executive in the United Kingdom (Britain's national regulator for workplace health and safety. It prevents work-related death, injury and ill health.)			
JRC	Joint Research Commission			
M&E	Monitoring and Evaluation			
MOOC	Massive Online Open Course			
MS	Milestone			
MSC	Most Significant Change approach			
NGO	Non-Governmental Organization			
ODI	Oversees Development Institute			
RBM	Results-Based Management			
REF	Research Excellence Framework in the United Kingdom			
RTZ	U.Kregistered mining company with important assets in natural resources and related industries			
SH	Stakeholder			
SLNAE	Self-Learning Nexus Assessment Engine			
UK	United Kingdom			
UN	United Nations			
UN COP	United Nations Conference of Parties			
WEFE Nexus	Water-Energy-Food-Ecosystems Nexus			
WFD	Water Framework Directive			
WP	Work Package			





1 Executive Summary

This strategy presents the overall approach to be taken in NXG to strive for policy impact at three levels: (1) by each consortium member, (2) in and through the case studies, and (3) at the overarching project levels. The Joint Research Commission has pointed out that capacities at both the side of research and policy makers needs to be enhanced for effective policy impact of evidence. Therefore, consortium members' intent to achieve policy impact will be monitored in the beginning, middle and end of the project through standardized policy impact logs. Impacts at the case study level are linked to the information collected in WP5 milestones and deliverables on advances in the cases. And lastly, policy impact at the overarching project level is assessed through the qualitative analysis of activities undertaken in the project (such as publishing of scientific findings in research and other outlets as per D6.5) in relation to three identified policy impacts that the project strives for as well as their influence on different stakeholders.

The deliverable first outlines some general information about the project (section 2), then describes the needs and the development of this strategy (section 3 and 4), to lastly explain how this strategy will be applied and its progress monitored (sections 5 and 6). Section 7, 8 and 9 are the conclusion, references and annexes respectively.

2 Project Information

2.1 Project Summary

Water, energy, food, and ecosystems (WEFE) are interconnected and comprise a coherent system (nexus), which is characterised by complexity and modulated by climatic and socioeconomic drivers. In the nexus, economic development (including optimal trade, market, and policy solutions) is hampered by resource constraints and their interconnectedness. In addition, the adoption of a sectoral approach in developing and implementing policies may affect nexus characteristics, which in turn can affect decision-making and policy formulation. NEXOGENESIS (NXG) will develop and validate:

- a coherent cross-sectoral policy-making framework at different scales addressing climate and socio-economic change, as well as stakeholder (SH) behaviour and transboundary (diplomacy) issues, developed for and validated by SHs, policymakers, and academics;
- b) a Self-Learning Nexus Assessment Engine (SLNAE) exploiting reinforcement learning, and supporting streamlining water-related policies into the WEFE nexus;
- c) a WEFE Nexus Footprint, accompanying the SLNAE.

NXG will apply its approach to *five case studies (CS): four European and one in Southern Africa*. Through these CSs, strong SH engagement and validation of output, the project will improve policies and policymaking processes to enhance cooperation and help the EU achieve targets related to the Water Framework Directive, the greener CAP, Green Deal ambitions, as well as ambitions on water diplomacy.





2.2 The Case Studies

NXG applies its approach to five CSs (Figure 1) with a variety of nexus policy issues to be explored (Table 1). Application of coherent approaches throughout the project ensure a common connection between the cases and foster the exchange of ideas and experiences among CSs, as well as allows for broader comparative conclusions and recommendations to be drawn. The five CSs cover diverse spatial, social, cultural characteristics and development challenges backgrounds. They also feature strong WEFE nexus relations, with the potential for disruption from policy implementation, and allow for an assessment of how water-related policy can be streamlined into the nexus. They allow for out-scaling to broader regions and, due to the diversity of cases, and the coherent framework, wider-scale out-scaling to other regions globally will be possible. Dedicated CS partners offer access to SH consultation at different tiers, ensuring maximum engagement and project impact.



Case Study Name	Countries	Project Category
Nestos/ Mesta	Greece (EL), trans- boundary with Bul- garia (BG)	frontrun- ner
Lielupe	Lithuania (LT), trans- boundary with Latvia (LV)	frontrun- ner
Lower Danube (Jiu)	Romania (RO)	follower
Adige	Italy (IT)	follower
Inkomati- Usuthu	South Africa (RSA)	follower

Table	1.	Overview	of	the	5	case	studies
abie	1.		UI.	uie	J	Case	Sludies

Figure 1: Location of all case studies. CS3 and CS5 are overall transboundary (striped area) but the focus in NXG is on the Romanian and South African regions, respectively (solid-filled area).

A detailed description of each CS including a list of main nexus challenges is provided in milestone (MS) 2: *Roadmap for Case Study Work/Activities in NEXOGENESIS*, which also presents deadline/timing of different activities for the CS, i.e., deadlines when all CS should have completed the activities to ensure a timely progress of the project.

Two of the Case Studies, Nestos/Mesta and Lielupe, have been selected to be "frontrunner" CS (Table 1), which means that they will conduct CS activities slightly earlier (ca. 2 months) than others (so called "followers") to identify potential problems, redundancy, or shortcuts in the applied methodology.





3 The need for a policy impact strategy

This strategy intends to help making the projects' research agenda and research findings relevant to policymaking in a way that has an impact¹ on how policy² is formed, implemented and understood. Whether and how this happens is something that the consortium can influence and manage:

"Non-academic research impact is about identifying the influences of research findings on policy, managerial and professional practices, social behaviour or public discourse. Such impact may be instrumental, influencing changes in policy, practices and behaviour, or conceptual, changing people's knowledge, understanding and attitudes towards social issues."

Davies, Nutley and Walter, 2005

Policy can be formed by various actors and be influenced through different means. Exemplary representation can be found in Figure 2 which also extend beyond the EU.



² A set of rules or norms governing behaviour in a particular area of activity - established by an organisation (the "policy-maker") accepted as having authority to set such rules or norms. The basis of this authority is usually, but not universally, statutory in nature. It may also include authority to enforce the rules. (from: The University of Cambridge (2017))





¹ Results-Based Management (RBM) uses the model *Inputs > Activities > Outputs > Outcomes > Impact*, where 'outcomes' refers to mid-term accomplishments, and 'impacts' refers to long-term results.

c)	
Types of	Indicators and tools
influence	
Expanding	Developing new talent for research and analysis
policy	Improving data quantity and quality
capacities	Enhancing knowledge of all actors to a level where decision-making can occur
	Improving capabilities of communication and understanding
	Creating an environment for actions whose impact is measured beyond the current
	policy cycle
Broadening	Providing opportunities for inter-, multi-, and transdisciplinary knowledge generation
policy	Introducing new concepts to frame multi-actor interaction (e.g. debates, putting ideas
horizons	on the agenda, stimulating public debate)
	Stimulating dialogue and interactions between decision-makers
	Fostering holistic views in researchers involved in policy-relevant research
Affecting	Modifying existing policies or programmes
policy	Fundamentally re-designing policies or programmes
regimes	Creating an environment where radical change is possible and feasible

Figure 2: Aspects of policy to consider in research projects (a) from: The University of Cambridge (2017)., (b) own representation, and (c) adapted from Weyrauch et al. 2010

This strategy is intended to be a guidance document for the project as a whole and is in addition/in contrast to the policy work to be done in WP1 and WP4. While those WPs focus on specific Nexus policies to be assessed, understood and ideally influenced at the CS levels, this strategy here intends to be on a broader, overarching scale.

Policy impact can be achieved through various means but is generally difficult to prove or track. NXG is a Research and Innovation Action funded by the European Commission. It is therefore strongly rooted in evidence and science, but intends to produce marketable products and services, thus also representing interests. As an advisory body or as part of an advisory body NXG could also contribute to policies by cooperating with the European Commission or national governments, working directly on inside tracks drafting policy recommendations. The various cooperations at international level that are being fostered through Task 6.3 in WP6 provide multiple entry points for policy impact.

The Joint Research Commission (JRC) has defined five areas of competencies for researchers to effectively engage in policy deliberations, namely (see also Figure 3):

- (a) understanding policy such as evidence needs and policy relationships and networks,
- (b) participating in policy making through a number of activities like knowledge brokering, briefings and writings for policymakers, and working with values,
- (c) communicating through clear writings, storytelling, and various media, but also clarifying misand disinformation and communicating uncertainties,
- (d) engaging with citizens and SHs via SH consultations and citizen engagement activities, and
- (e) collaborating and therefore foster system thinking, intercultural sensitivity and understanding of group dynamics.







Figure 3: Clusters and competences that researchers need to have to be able to effectively engage in 'science for policy' from the JRC <u>https://knowledge4policy.ec.europa.eu/visualisation/competence-framework-%E2%80%98science-policy%E2%80%99-researchers_en</u>

4 Developing a policy impact strategy

This strategy document bases its work on the following definitions by Hovland (2017):

- 1) <u>Strategy and direction:</u> The basic plan that the research project/programme/institution is following in order to reach its intended goals.
- <u>Management</u>: The systems and processes that the project/programme/institution has in place in order to ensure that the overall strategy is carried out and that high-quality policy research is produced (e.g., systems of peer/user review, quality assurance and planning cycles).
- 3) <u>Outputs:</u> The tangible goods and services that a research project/programme/ institution produces (e.g., Working Papers, journal articles, policy briefs, website, meetings, events and networks, tested and verified technologies and services; best practices).
- 4) <u>Uptake:</u> Direct responses to the research project/programme/institution (e.g., its research is mentioned in a government policy paper, on a range of websites and referred to in a newspaper article).
- 5) <u>Outcomes and impacts:</u> Changes in behaviour, knowledge, policies, capacities and/or practices that the research has contributed to, directly or indirectly (e.g., a change in government policy implementation, a change in working practices among NGO practitioners, a reduction of poverty in a certain area, strengthened livelihoods and strengthened civil society input into policy processes).





The NXG Policy Impact Strategy is based on the following process:

- 1) Rough literature review of different policy impact strategy handbooks and tools (see documents in reference list);
- Presentation of the rough structure of the plan and its evaluation elements at the 1st General Assembly in Riga, September 2022;
- Agreement on collecting consortium member based information for policy impact through policy impact logs at the 1st General Assembly in Riga, September 2022;
- 4) Agreement on overarching impacts that the project may achieve through the discussions at the WP1 co-creation meeting in November 2022;
- 5) Collecting and summarizing the initial consortium information on potential policy impact at the members and CS levels;
- 6) Development of a final strategy.

5 Applying the policy impact strategy

This section sets forth the policies that the strategy intends to influence through the project, as well as SHs that could help doing so. It also describes a set of activities and benchmarks to achieve the following target:

NXG's goal is to support a shift in EU-wide and EU-country-specific governance frameworks towards holistic WEFE Nexus resource management. It intends to do so by providing evidencebased co-created WEFE nexus policy packages in five case examples (4 in Europe, 1 abroad), and when and where possible, to secure a "river contract" for committed policy change.

It needs to be noted that all ideas put forward in the following sections are based on the current knowledge of the consortium at the time of the writing of this strategy (July 2022 – Feb. 2023). We are conscious of the fact that unknown factors are and can strongly influence shifts in the policy directions at international, EU and national levels. Regular updates of this strategy and in particular of the activities will ensure that the strategy remains relevant throughout the course of the project and achieves impact beyond the project's lifetime.

5.1 Stakeholders that could influence policymaking identified in NXG

An initial SH register was set up to support SH engagement within and across the project (see also Milestone 6: Stakeholder Register). SHs are defined here as "*individuals, groups and organisations who are affected by or can affect those parts of the phenomenon (this may include nonhuman and non-living entities and future generations*)" (Reed et al. 2009, p.1933)³. In NXG, a first categorisation of SHs includes these three broad tiers (Figure 4):

³ Reed, Mark S., Anil Graves, Norman Dandy, Helena Posthumus, Klaus Hubacek, Joe Morris, Christina Prell, Claire H. Quinn, and Lindsay C. Stringer. 2009. 'Who's in and Why? A Typology of Stakeholder Analysis Methods for Natural Resource Management'. Journal of Environmental Management 90 (5): 1933–49. https://doi.org/10.1016/j.jenvman.2009.01.001.





- <u>Tier 1</u>: This tier includes SHs that will be **directly engaged in the project implemen**tation and/or outcomes and are strongly case-specific (e.g., representatives of the local municipality, civil society organisations -CSOs-). SHs will potentially collaborate (they might be informed or consulted only) in the processes of development of the models and self-learning nexus assessment engine, and analysis and validation of policy suggestions.
- <u>Tier 2</u>: This tier includes SHs with an interest in the application of project results and products. A wider constellation of interested SHs (e.g., local government, European policy departments -EC DGs-, SHs in different basins) who wish to utilise the NXG engine may be engaged.
- <u>Tier 3</u>: This tier includes SHs with a **general interest in the project**. This is a wide group of SHs for the dissemination of outcomes which could include neighbouring basin or country authorities, business or private enterprises, and national planning agencies.



Figure 4 Overview of stakeholder tiers and categories

The initial overview of all SHs per CSs that were registered in the different WEFE sectors showed a strong imbalance favouring SHs from the water and ecosystems sectors and lacking SHs from the energy and food sectors (Figure 5).







Figure 5 Overview of SH distribution across WEFE sector in all case studies (as per SH register status of September 2022)

While activities of the project mostly focus on CS level impact and thus target largely Tier 1 SHs, this strategy looks to influence, work with and through Tier 2 and Tier 3 SHs. Most of these SHs will predominantly be communicated with at an information level (to learn more *about the different levels of engagement employed in NXG see MS6) or at best be consulted* with. Therefore, the strategies set out in D6.5 Strategy for the dissemination and exploitation of project results shall be used and applied for policy impact also.

Scientific evidence and findings needs to be tailored to different audiences to be understandable, useful and amplified (Hajdu and Simoneau 2020). WP6 has outlined a number of communication strategies to transmit scientific findings to various audiences such as videos, newsletters, social media outlets and policy briefs. And while researchers may be proud of their evidence and findings, single pieces of research may not penetrate the policy arena at the time they may be needed or through the right channels (e.g. mis- and disinformation). Building networks beyond scientific circles is therefore crucial to get research into policy, i.e. through policy influencers (while being mindful of lobbyists and other interest-minded groups) (Sienkiewicz, van Nes, and Deleglise 2020). Horizon scanning, media monitoring, and following policy influencers can help researchers, research projects and research institutions find the right timing for placing their findings to the right people.

5.2 Defining policy impact

To define overarching policy impact for the project, the Grant Agreement was consulted, and the following impacts were found and judged to be of relevance for the policy impact:

From the proposal's Expected Impacts section:

Project Expected Impacts: Impact on understanding how streamlining (water) policy into the nexus alters biophysical and human behaviour **How NXG delivers the impact:** Complexity science modelling, and simulation via the SLNAE. **Tied to Objective#:** O#1; **Relevant Key Performance Indicators:** 1, 2, 3, 4.

Project Expected Impacts: Reduce uncertainty of how new policy will impact across the nexus. **How NXG delivers the impact:** The SLNAE will analyse and assess the impacts of policies across the nexus using RL, complexity science, and reporting via the WEFE footprint. **Tied to Objective#:** O#2, 3; **Relevant Key Performance Indica-tors:** 3, 4, 15.





At CS scale:

Short term (within the project): (i) Facilitate collaboration among conflicting SHs in transboundary scale; (ii) Wiliness to use learning tools; (iii) Validation of trade-offs and win-win solutions within the WEFE nexus; (iv) Validation of water policy plans upstream affecting water flow/quality, ecosystem sustainability and energy production capacity downstream; (v) Enhanced knowledge and understanding of WEFE nexus behaviour, including trade-offs to avoid.

Medium/long term (after the completion of the project): (i) Establishing a crossboundary, cross-sectoral water governance accounting for WEFE nexus trade-offs and synergies; (ii) Transferability to EU transboundary river basin in Baltic Sea, Balkan & elsewhere; (iii) Improve water transboundary governance via "river contracts"; (iv) Improve restoration of aquatic biodiversity; (v) Policy recommendation based on practices to EU scale within a nexus context; (vi) Via the SLNAE, to provide autonomy to SHs for the assessment of the level of efficiency of the WEFE nexus in their territory.

Based on this wording the project members formulated three main overarching policy impacts at the co-creation meeting on 15 November 2022, which were further refined in the sub-sequent email communications. These impacts are as follows:

Impact 1: Improved decision-making under uncertainty in complex-socioenvironmental settings through dedicated nexus tools.

Impact 2: Mainstreamed use of "ecosystems" in nexus thinking and associated policymaking.

Impact 3: Improved understanding of the effect of streamlined nexus policies on (transboundary) resource governance and resource management.

5.3 Tracking policy impact

Following the principles of results-based management, we suggest here to track impact by the chain of activities-outputs-outcomes-impact (UNDG, 2011). Certain activities obtain a desired output (e.g. good quality research can be published as an article in a peer-reviewed journal). Multiple outputs can cause a desired outcome (e.g. articles and presentations in recognized outlets can cause the recognition of the respective scientists as experts in their fields). Collectively those outcomes can lead to impact (e.g. once scientists agree on 'ecosystems' within the nexus and how it affects policy-making and have provided evidence to this in science-policy interface platforms this concept can be mainstreamed). Table 2 provides an overview of the NXG logframe for policy impact.

Activities and outputs are in line with D6.5, which outlines the following dissemination channels and respective expected results from these in its table 6:

Dissemination type	Dissemination channels	Resp. part- ner(s)	Results/outcomes disseminated
	Website	GAC	Newsletters, press releases, deliverables,
	Social media (Twit-		project communications, flyer, poster, fact-
Online dissemi-	ter, LinkedIn and	WE	sheets, scientific publications, policy briefs,
nation	YouTube)		videos
	Newsletters	WE	Including articles about the results of the project activities which will be disseminated





			via the contact database of newsletter sub- scribers, via the website, social media and partners' network
	Online events	All partners	Project results in the form of presentations
	Open Research Europe platform and scientific jour- nals	All partners	Scientific publications and articles
	Flyers		Drecentation of the project and its regults
	Posters	CAC	Presentation of the project and its results
Non-electronic	Banners	GAC	Overtexpised context for the different events
dissemination	Roll-ups		Customised content for the different events
	Scientific posters	All partners	Scientific research and findings
	Scientific articles	All partners	In scientific journals
Physical inter-	Events	KWR & All partners	Procentation of the project and its results
nation	Final dissemination event	IHE	Presentation of the project and its results

Table 2: Logframe defining activities, outputs, outcomes and expected policy impacts of NXG

Activity	Output	Outcome	Impact
High-quality scientific writing	Peer-reviewed journal articles in high impact journals	Expertise of consortium scientists and project	
High-quality scientific work	Presentation or posters (oral/keynote) at international scientific conferences (EGU, AGU, etc.)	results validated amongst scientific peers	
Written summaries of high-quality scientific work	Findings are provided to global report outlets such as the World Water Development Report, UN Environment Frontiers Report, the Institute for Sustainable Development's Knowledge Hub (www.sdg.iisd.org) and others		Impact 1: Improved decision-making under uncertainty in complex- socio-environmental settings through dedicated nexus tools. Impact 2: Mainstreamed use of "ecosystems" in nexus thinking and associated policymaking.
Oral summaries of high-quality scientific work	Presentation (oral/keynote) at global science-policy conferences and events (Stockholm Water Week, UN COPs, etc.)	Expertise of consortium scientists and project results validated with practitioners and policy-	Impact 3: Improved understanding of the effect of streamlined nexus policies on (transboundary) resource
Oral summaries of combined scientific work Oral and written recommendations	Presentation of and consultation on overarching findings to local SHs of case studies including local practitioners and policy- makers Use of easily digestible formats to disseminate	makers	governance and resource
	knowledge on technical,		





guidelines and best practices	political and managerial aspects for WEFE nexus	
Written statements on Policies	Position papers on international, EU-level, national and local policies as appropriate	
Written statements on the (potential) policy relevance of project results	Policy briefs ⁴	
Easily digestible versions of the scientific content	Articles in popular press, blog posts, newsletters, vlogs, social media platforms, flyers, posters, banners, roll-ups, etc.	Expertise of consortium scientists and project results presented to all actors including the general public

5.4 Suggested benchmarks

While not all activities of the 48 months of the lifetime of the project can be anticipated, this strategy presents below an initial idea of activities that are foreseen by the NXG partners at the point of writing this document (Table 3). The activities, their timing and responsibilities are in line with the information provided in D6.5. Care will be taken to attend meetings physically or virtually depending on future COVID-19 hygiene and safety measures.

Activity	Name of outlet (Tentative name of article/talk, journal, conference, etc.)	Delivered by whom (partner)	When	Output
High-quality scientific writing	50 + peer- reviewed journals	All partners	M1 – 48	Peer-reviewed journal articles in high impact journals
High-quality scientific work	30+ Number of events in which the project partners participate in	All partners	M1 – 48	Presentation (oral/keynote) at international scientific conferences (EGU, AGU, etc.)
Written summaries of high-quality scientific work	30+ Number of events in which the project partners participate in	All partners	M 1 – 48	Findings are provided to global report outlets such as the World Water Development Report, UN Environment Frontiers Report, the Institute for Sustainable Development's Knowledge Hub (www.sdg.iisd.org) and others

Table 3: Suggested benchmarks for the delivery of the activities to achieve the desired output





⁴ Policy and briefing papers should be assessed against different criteria than academic journal articles. Policy papers are written specifically for the purpose of using evidence to shed light on a policy area. Briefing papers are produced with the same purpose but may be much shorter (perhaps 1-6 pages). Young and Quinn (2002) argue that good-quality policy and briefing papers have three core components: (i) they say what the *problem* is; (ii) what the possible *solutions* are, including the author's preferred solution; and (iii) what policy *recommendations* follow from this.

Oral summaries of high-quality scientific work	30+ Number of events in which the project partners participate in	All partners	M 1 – 48	Presentation (oral/keynote) at global science-policy conferences and events (Stockholm Water Week, UN COPs, etc.)
Oral summaries of combined scientific work	10+ number of organized events	KWR, IHE, partners	M1 – 48	Presentation of and consultation on overarching findings to local SHs of case studies including (local) practitioners and policymakers
Oral and written recommendations, guidelines and best practices	20+ project publications/press releases	GAC	Before/after major events and milestones	Use of easily digestible formats to disseminate knowledge on technical, political and managerial aspects for WEFE nexus
Written statements on Policies	20+ project publications/press releases	GAC & AVA	When appropriate	Position papers on international, EU-level, national and local policies as appropriate
Written statements on the (potential) policy relevance of project results	3 policy briefs	WE	M24-48	Policy briefs
Easily digestible versions of the scientific content	24+ articles on the website 8 newsletters 1+ flyer, and 1+ poster created	GAC	Videos and factsheets every 2 months; newsletter every 6 months; First version of poster, banners and roll-ups at M5	Articles in popular press, blog posts, newsletters, vlogs, etc.

6 Monitoring impact and measuring success

Monitoring the impact and measuring the success of the activities is a major challenge as it does usually not belong to the standard repertoire of academic evidence tracking. NXG operates on several levels from local, through national towards the supra-national. Advances to influence policies in the field of the WEFE Nexus may be at different levels of maturity in the different cases and countries. At the same time consortium members may be more or less aware of the influencers and lobby groups as well as advances in policy impacts within their countries and cases. We are therefore conscious of the fact that the monitored impact is a subjective reflection of the change felt by and through the consortium and the project. It may not be an objective reflection of policy advances in general.

Having highlighted the subjective bias, we suggest monitoring the impact of the project at three levels:





- 1) In consortium members own contributions;
- 2) At the local case study level;
- 3) At the overarching project level.

It is our hope and expectation that these varying viewpoints may diminish subjective biases without lessening the need to highlight individual successes.

6.1 Tactics to be used by consortium members on their own contributions

To track the individual contribution of each consortium member to the policy impact, impact logs shall be used. Impact logs are used to keep track of some of the direct responses that the research outputs trigger, and this in turn informs evaluation. An impact log is a list of the informal feedback, comments, and anecdotes received from people who have encountered or used its research outputs. It is not a systematic way of assessing user perceptions; rather, it is a way of capturing the qualitative and non-systematic feedback on research outputs that would otherwise get lost. A template on how to capture those experiences can be found in

Annex 1. As the Impact Log grows longer, the cumulative effect can be valuable in assessing where and how the project is triggering the most direct responses, and in informing future project/programme choices. Each consortium partner is encouraged to fill in the Impact log at three points throughout the lifetime of the project (M12, M26, M44) to be able to assess changes over time. Impact logs are stored in the internal shared data management tool (surfdrive) for ease of access. The results will be shared with consortium members to be able to better align strategies across partners and also with case studies. The co-creation meetings in WP1 can also help synergize strategies.

From the initial collection of impact logs (between M12 and M18) the following general direction can be obtained (see word clouds in Figure 6, and the full list in Annex 2):

- The initial policy influence objectives of the consortium are to show the value of integrated thinking and the management of resources, and to identify processes and activities towards nexus governance.
- 2) The main policies being targeted by the partners focus on water, climate change, biodiversity and ecosystems at the national, regional and European level.
- 3) The main audience in this effort are policymakers at various levels (local, regional, national), government authorities and NGOs with a focus on water.
- 4) The strategies to be used focus largely on participatory workshops, scientific conferences and articles, and the provision of data, information and outcomes.







Figure 6 : Word clouds of the collective information from the initial policy impact logs of all consortium members on the **initial objectives** (upper left), the **targeted policies** (upper right), the **intended audience** (lower left), and the **suggested strategies** to be used to reach the audiences (lower right).

6.2 Tactics to be used by case study leads to evaluate the local impact

To evaluate the policy impact at the local CS level much work is being done both in WP1 and WP5 as the main aim of NXG is to impact policy at the local level. To streamline processes and avoid double work, CS leads are asked to record Most Significant Change (MSC), which is the collection of significant change stories, and the systematic selection of the most significant of these stories. This focused attention encourages a form of ongoing and indirect monitoring of the work carried out. MSC also gives a project, programme or institution a better





understanding of whether and how it is achieving its purposes. In addition, it provides the project, programme or institution with a set of valuable public relations materials. These stories will be recorded as part of the WP5 Milestones on CS implementation (MS15 and MS23). The findings of the first round from month 18 indicated that it was generally too early to record any change (see full texts in Annex 3). However, from the information contained in MS15 some general conclusions and recommendations from this early stage across the CS in relation to competencies for effective science-policy interaction as per the JRC, are:

- The analysis of the SH landscape reveals an imbalance across WEFE sectors (with the energy sector being the hardest to reach in most cases) as well as unequal power distributions across SH groups (i.e. SHs such as fishermen appear as marginalized in decision making situations). Researchers and CS leads need to continue untangling the relationship between policy relation-ships and networks. (→ Refer A. Understanding policy of the JRC 'Science for Policy' Competence framework)
- 2) CS leads highlight that the interaction between SHs must go beyond the project level to result in meaningful impact beyond the lifetime of the project. Finding existing platforms at national or transboundary level that sustain SH interaction and cooperation in the nexus sphere is deemed as critical for the ultimate project success (i.e. its larger impact). CS leads may need to strategically assess potential platforms for SH sustainment. (→ Refer B. Participate in policymaking)
- 3) CS have focused largely on information campaigns about the expected project results in their specific cases and disseminating information about the project in their respective local languages (own translation work) through leaflets, flyers and posters, and social media, as well as at the project's workshops (Workshop 1 in early 2022, and Workshop 2 in late 2022). *CS leads are encouraged to maintain this level of information sharing through different outlets.* (→ Refer *C. Communicate*)
- 4) CS leads also emphasised the need to provide SHs with (intermediate) results of the research to keep them engaged and interested. The early phase of the project was perceived as challenging since SHs were mostly asked to provide data and information without a full understanding of the use and usefulness of their input. Providing intermediate results run the risk of being used for mis- and disinformation, and for some SHs' agendas. *Researchers and case study leads must therefore take care to put the results into perspective and clarify the uncertainties attached to these findings so that they are not misused for SHs' agendas.* (\rightarrow Refer C. Communicate)
- 5) The interaction with SHs also reveals their diverging degrees of capacities to interact in (highly) participatory settings due to a lack of (a) prior knowledge of how to engage, b) time because of multiple other commitments (for instance in other research projects), and (c) ability to implement changes either due to the lack of technical knowledge or the lack of institutional power or the individual's power within the institution. *CS leads and researchers may need to invest time in increasing SHs' capacities to engage in participatory settings in particular in the cases of the front-runners, that expect their SHs to co-decide on future policies. CS leads may need to carefully think about which SHs to engage for which purpose to avoid SH fatigue on the one hand and maximize project impact at the right institutional level on the other hand. (\rightarrow Refer D. Engage with citizens & SHs)*
- 6) The interactions and the co-creation mindset are deemed as helpful to better understand the challenges of nexus resource management and governance and in finding the policy gaps





between the respective sectoral legislations. SHs acknowledge and value the role of researchers in helping to understand those gaps and in co-creating viable and sustainable future scenarios. The project, but also the interaction with other research projects in the same catchment and thematic context is seen as helpful to enhance cooperation across SH groups that would not necessarily cooperate in their usual settings. *CS leads may want to strategically think about how to best maximize interaction with other projects and across SHs.* (\rightarrow Refer *E. Collaborate*)

6.3 Tactics to be used by the NXG consortium to evaluate the overall impact

The overall impact of the project will be achieved by monitoring the logframe benchmarks through modular matrices. This approach is designed to help describe the internal linkages of a project or programme (Davies, 2005). The approach focuses on exploring how the components of a project or programme relate to one another; e.g., how the project's outputs relate to its desired impacts, how its outputs relate to its SHs, or how its outputs relate to key future events. The matrix approach that he proposes is primarily descriptive. It can therefore be a useful tool for a mid-term review when a research project wishes to describe and assess its current status and think about how to move forward. Examples and templates of (1) an Outputs × Impacts matrix (gives the desired contribution of each project output to one or more of the project's outputs is reaching one or more of the project's SHs or target audiences) are given below (Figure 7, Table 4).

We suggest doing an internal review by the project consortium members and an external review through the members of the Enablers Advisory Board at the project's midpoint (M28) and a final assessment at the end of the project (M46). GAC tracks the publication record of consortium members and the organization of and participation at events. Consortium members are encouraged to provide this information on a regular basis to the respective site in the shared project management system (surfdrive) to be able to keep track of the outputs. This database will be used to assess the outputs that have been achieved with respect to the three impacts and the three levels of SHs (Table 4). This will be complemented with collecting the individual impact logs of the consortium members and the results of stories and histories of change from the local level so that proper emphasis is put on stories of change. The midpoint review will help find gaps in the outputs for specific SH groups and/or impacts; the final assessment will check on the overarching results of the strategy.





Impacts	Strengthen local	Increase	Build	Influence change
	research capacity	awareness about	relationships	towards more pro-
	on topic	topic among	between research	poor policy
		policymakers and	partners and civil	
Outputs		in media	society	
			organisations	
Project launch		XXX		Х
Website	Х	X		Х
One-on-one		XXX		XX
meetings with				
policymakers				
Public meeting	X	Х	XXX	Х
series				
Network building	XX	X	XXX	Х
Research reports	XXX		Х	
Policy briefs	XX	XXX	Х	XX

Figure 9. Example of an Outputs x Impacts matrix

Figure 10. Example of an Outputs x Stakeholder matrix

202		N	A		
Stakeholders	Research	National	Bilateral and	Civil Society	Media
	partners	policymakers	multilateral	Organisations	
Outputs			donors		
Project launch	Х	XX	Х	XX	XXX
Website	XX	X	XX	XX	XX
One-on-one meetings with policymakers	Х	XXX			
Public meeting series	XX	Х	X	XX	Х
Network building	XXX		X	XXX	
Research reports	XX		Х	X	
Policy briefs	Х	XXX	XX	Х	XX

Figure 7: Examples of how these modular matrices can look like from Hovland 2017

Table 4: Templates for the Output x Impact and the Output x SF	CH Matrix for the case of the NXG p	roject
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Outputs/Impacts	Impact 1: Improved decision-making under uncertainty in complex-socio- environmental settings through dedicated nexus tools.	Impact 2: Mainstreamed use of "ecosystems" in nexus thinking and associated policymaking.	Impact 3: Improved understanding of the effect of streamlined nexus policies on (transboundary) resource governance and resource management.
Peer-reviewed journal			
articles in high impact			
journals			
Presentation or posters			
(oral/keynote) at			
international scientific			
conferences (EGU, AGU,			
etc.)			
Findings are provided to			
global report outlets such as			
the World Water			
Development Report, UN			
Environment Frontiers			
Report, the Institute for			
Sustainable Development's			
Knowledge Hub			





(www.sdg.iisd.org) and		
others		
Presentation (oral/keynote)		
at global science-policy		
conferences and events		
(Stockholm Water Week, UN		
COPs, etc.)		
Presentation of and		
consultation on overarching		
findings to local SHs of case		
studies including local		
practitioners and policy-		
makers		
Use of easily digestible		
formats to disseminate		
knowledge on technical,		
political and managerial		
aspects for WEFE nexus		
Position papers on		
international, EU-level,		
national and local policies as		
appropriate		
Policy briefs		
Articles in popular press.		
blog posts, newsletters.		
vlogs, social media		
platforms flyers posters		
bannors roll-ups oto		
banners, roll-ups, etc.		

Outputs/SHs	Tier 1	Tier 2	Tier 3
Peer-reviewed journal articles in high			
impact journals			
Presentation or posters (oral/keynote)			
at international scientific conferences			
(EGU, AGU, etc.)			
Findings are provided to global report			
outlets such as the World Water			
Development Report, UN Environment			
Frontiers Report, the Institute for			
Sustainable Development's Knowledge			
Hub (www.sdg.iisd.org) and others			
Presentation (oral/keynote) at global			
science-policy conferences and events			
(Stockholm Water Week, UN COPs,			
etc.)			
Presentation of and consultation on			
overarching findings to local SHs of			
case studies including local			
practitioners and policy-makers			
Use of easily digestible formats to			
disseminate knowledge on technical,			
political and managerial aspects for			
WEFE nexus			
Position papers on international, EU-			
level, national and local policies as			
appropriate			





Policy briefs
Articles in popular press, blog posts,
newsletters, vlogs, social media
platforms, flyers, posters, banners, roll-
ups, etc.







7 Conclusion

In this strategy we presented the need for a policy impact strategy, the process of its development and tangible tactics for monitoring it at the level of individual consortium members, the case studies, and the overall project. From the initial assessment at the beginning of the project, consortium members intend to broadly tackle policies that are relevant to the WEFE Nexus by working through the participatory means of the project and thus reaching policy- and decision-makers at all levels. The case studies are more explicit and precise and have shown initial work in all capacity dimensions that were highlighted by the JRC to be of relevance for policy impact (understanding policy, participate in policymaking, communicate, engage with stakeholder sand citizens, and collaborate). This is laudable and as the project progresses care will be taken to continue addressing all those dimensions to pave the way for sustained policy influence. For the overall project three main impacts were co-developed by the consortium, namely:

Impact 1: Improved decision-making under uncertainty in complex-socioenvironmental settings through dedicated nexus tools.

Impact 2: Mainstreamed use of "ecosystems" in nexus thinking and associated policymaking.

Impact 3: Improved understanding of the effect of streamlined nexus policies on (transboundary) resource governance and resource management.

Progress towards these impacts will be assessed qualitatively against outreach and dissemination activities on the one hand and actors reached on the other. Advances at all three levels will be monitored in the middle (M23-M28) and towards the end (M44 -M46) of the project. With this strategy, we also hope to foster awareness amongst and raise capacities of consortium members to view the value of their scientific work towards policy impact.

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9 Annex

9.1 Annex 1: Template for Impact Logs

Date:			
Name of consortium partner:			
Name(s) and position(s) of involved consortium members:			
Name(s) and position(s) of involved consolition members.			
Relation to NXG case study (if any):			
To be filled in at the beginning of the project			
Initial policy influence objectives:			
What policy will be targeted?			
Which entity/policy maker/stakeholder will be influenced?			
What strategy/ies is/are to be used?			
To be filled in in the middle and at the end of the project			
Describe the level of policy influence achieved:			





Used strategies:	
Footowe that footilitated influence and why	Footowe that a betweeted influence and when
Factors that facilitated influence and why:	Factors that obstructed influence and why:
Lessons learned:	





9.2 Annex 2: Summary results of initial Impact Logs

Initial policy impact logs collected between September 2022 and January 2023.

Consortium partner	Initial policy influence objectives	What policy will be targeted?	Which entity/policy maker/stake- holder will be influenced?	What strategy/ies is/are to be used?
AVA	Show value of a structured and organized SH identification and engagement process for nexus projects Help show value of NXG research outcomes to non-scientific audience	Global level process outcomes such as SDGs, UN resolutions or outcomes of other global science-policy dialogues	Scientific community Global SHs in the science-policy in- terface	Scientific outcomes Policy briefs Participation in global scientific con- ferences Participation in science-policy inter- face events Public press articles
BDG	Assess relevant policies for the CS context and identify those that could sustain the change towards WEFE nexus approach Investigate SH awareness on potential con- necting points between relevant sector poli- cies and their capacity to participate in/influ- ence processes stimulating nexus thinking Identify potential policy gaps for promoting WEFE nexus actions	Water and flood risk management, climate adaptation, sustainable development	Policy makers in water, environment and sustainable development Implementing bodies and agents of change at regional and local level NGO's influencing social and eco- nomic restructuring processes at lo- cal level	Continued communication and feed- back (esp. with tier 1 SH) Participation in bilateral and group policy dialogues (within and outside project frame) Policy briefs and follow-up for their further uptake in the policy making processes Visibility of project results and shar- ing best practices
BEF	To improve governance and management of WEFE nexus To design integrated policies governing WEFE nexus taking the advantage of co- creation with SHs	EU policies concerning water manage- ment, renewable energy, common agricul- ture, ecosystems and biodiversity, climate change mitigation in Latvia and Lithuania	Policy makers at local level (munici- palities) and national level (minis- tries) Regional administration (planning regions) Developers of River Basin manage- ment plans (centres, agencies) Researchers (universities, insti- tutes) Professional associations (water management, farmers, energy) Environmental NGOs Business (food, etc)	Co-creation in a core group of SHs Participatory approach for SH en- gagement at national and interna- tional workshops Proposals for policy updates in WEFE nexus Proposals for improvements in WEFE governance (cross-sectoral, cross-border)

CAF	 Provide a long-run socio-economic data projection for each case studies to aid policy assessment through artificial intelligence and reinforcement learning Provide clear indication of future demands for water, food, energy, and ecosystem to drive better policy recommendations 	Achieving the European Green Deal through improved technologies, innova- tion, digital transformation, and addressing the utility of ecosystems Implementation of the new policy objec- tives such as SDGs, CAP, RED and Paris agreements.	 Policy makers at local and national level. Scientific -research community Institutions within the WEFE nexus 	 Implementation of G-RDEM CGE and DEMETRA model for data gen- eration Scaling down data and data map- ping Participation in national / interna- tional conferences
CMCC	Initial primary objective through WP2 is to highlight whether and which Interlinkages arise from and between multiple uses, water resources and the ecosystem, and how sen- sitive the biophysical system may be to driv- ers of changes which can be affected by management options and policies. Furthermore, such understanding of inter- linkages throughout the nexus system and the driving effect of management and poli- cies may be particularly informative to the wide scientific community, SHs and ulti- mately policy management.	Specific policy frameworks related to WP2 activities: Climate Change - National and Regional Adaptation strategies to Climate Change, National Adaptation Planning to climate change) Water Management - Water Strategy for the Mediterranean (WSM); Blue Plan Agriculture - National strategic plans of the new CAP 2023-2027 Ecosystem and Biodiversity - Biodiversity strategy for 2030	Researchers, student NGOs, SME EU authorities (CLIMATE ADPAT)	Exchange of dataset through EU data portal and other data nodes. Scientific outcomes and knowledge related to nexus domain will be dis- seminated via: - Webinars - Participation in scientific confer- ences - Public press articles - Scientific articles - Social media
EURAC	Explore the level of policy integration follow- ing the WEFE nexus approach Identify possible policy gaps and entry points to develop improved and integrated policies for the WEFE nexus Foster a more effective and integrated man- agement of WEFE nexus	National, regional and provincial policies regarding the WEFE sectors (incl. those implementing European Directives) National, regional, provincial plans and strategies for climate change adaptation	Policy makers at regional and pro- vincial level Provincial and regional authorities responsible for the WEFE sectors NGOs and associations (e.g. farmer and fishermen associations) Scientific community	Scientific outcomes (e.g. Journal publications) SH workshops, interviews and bilat- eral meetings Participation in national / interna- tional conferences Public press articles and blog posts
Eurecat	Identify policy combinations to implement nexus-efficient policy packages Foster the understanding of nexus sectors interlinkages and policies impact	water management, renewable energy, agriculture, ecosystems and biodiversity, climate change	Authorities, policy makers, re- searchers, students, SMEs, associ- ations, NGOs	Knowledge, technologies, and meth- odologies transmission from the data science research area to the nexus domain
GAC	Maximise the project's impact in terms of policy influence through T6.5 Facilitate writing of policy briefs, through our exploitation and dissemination activities (writing by relevant partners) – the policy brief partner please suggest how you wish it to be facilitated Participate in policy related workshops and events to disseminate the policy briefs and main outcomes of the project Communicate and disseminate largely and in a targeted way the policy related out- comes of the project	All the ones targeted by the policy briefs and outcomes of the project	Depending on the content and out- comes of the project.	Policy briefs' dissemination Intensive dissemination and commu- nication Develop the right tools/materials/for- mats to share the conclusions of the project





GotseD	Show value of a structured and organized SH identification and engagement process for nexus projects Help show value of NXG research outcomes to non-scientific audience	Water management Energy management Environmental conservation and long-term sustainability	Municipalities National and regional authorities Private entrepreneurs Environmental institutions Scientific community Water and sewerage operators Local private SHs	Assessment of existing national poli- cies within NXG sectors Evaluation of local conditions and hot topics through extensive SH en- gagement Organization of a series of work- shops for data collection, identifica- tion of local priorities, and develop- ment of a toolbox for supporting de- cision-making
IHE	Aim for more holistic policy making, with de- cisions and policies recognising and ac- counting for connections within and across resource sectors and ecosystems. Seek out trade-offs to avoid, and cross sectoral bene- fits to leverage. To promote cross-sectoral and transboundary resources policy cooper- ation in the case studies, and to facilitate up- and out-scaling of results and recommenda- tions.	WFD River basin plans Green deal CAP	Drinking water utilities National government Regional government Local governments River Basin Organisations NGOs	Dissemination of scientific outcomes via: - Webinars - Participation in global scientific conferences - Public press articles - Scientific articles - Professional articles - Social media - One-on-one conversations - SH workshops
JAW	Connect SHs to each other (link different sectors) Show value of the outcomes to policy mak- ers / influencers	Policies impacting on the WEFE sectors as identified in the SH engagement ses- sions will be targeted	National level government in WEFE Sectors Regional level government in WEFE Sectors Catchment management agencies Researchers Power producers Irrigation Boards River basin management	Workshops Focus sessions Project outcome
KWR	The initial policy influence objective is to transform the way of thinking of strategist and managers of water authorities from silo thinking towards more integrated, nexus-ori- ented thinking. In their new way of thinking they would acknowledge the interdependen- cies and interactions between the WEFE do- mains and the need to address it. It is about influencing the way of thinking and writing in policies and designing policy goals and in- struments. The impact of such new way of thinking in practice is not a project objective given the timeline of the project.	The business/ strategy plans and spatial planning plans of the following organisa- tions are targeted to become more inter- connected to WEFE domains	Dutch drinking water utilities Dutch water authorities RIWA Maas International Commission for the Protection of the Rhine (ICPR) In- ternational Meuse Commission International Scheldt River Commit- tee International Ems river commission Rijkswaterstaat (national govern- ment) Provinces (regional government) Municipalities (local governments)	Dissemination of scientific outcomes via: Webinars Participation in global scientific con- ferences Public press articles Scientific articles Professional articles Social media One-on-one conversations





NESTOS	Analysis of the current situation of the nexus (water, energy, food, ecosystems and recent human activity) in NESTOS, capitalization of implemented research activities in NESTOS, developing, creating a product or process to achieve a productive dialogue with the re- sponsible government authorities, creating and providing a service, or using them in standardization activities. Dissemination activities including water, en- ergy, food and ecosystems needed for hu- man activity, non-scientific publications available to the general public during the 1st (04 March 2022) and the 2nd Co-workshop (18 Nov 2022) organized in NESTOS to- gether with NTUA, UTH and NESTOS.	An interconnected WEFE relevant with re- sources and services needed to sustain human activity in NESTOS are presented to the SHs during the Co-workshops (04 March 2022, 18 Nov 2022). The dialogues (NTUA, UTH, NESTOS, SHs) are focused on the nexus which is affected by changes in climate (e.g. floods), precipitation and land cover as well as economic develop- ment, agriculture and urban growth. Cur- rently, citizens of NESTOS and 3 neigh- boring municipalities (Xanthi, Topeiros, Drama) are extracting resources at a faster rate than they are replaced, thereby deepening resource and ecological defi- cits.	University of Thrace (Komotini, Xan- thi), Municipalities (Xanthi, Drama, Nestos, Topeiros), Prefectures (Re- gion of Eastern Macedonia and Thrace including Xanthi, Drama, Komotini, Evros), 1 Decentralized Administration (Kavala), Local Wa- ter Agency Company, Local agricul- tural associations (Nestos)	 Press release (project start 01 Sep 2021): https://dimos-nestou.gov.gr/deltio-typoy-NXG-9-9-2021/ Presentation 1st Co-workshop (04 March 2022): https://www.youtube.com/watch?v= OkQTiStmgPc Presentation 2nd Co-workshop (Press Release): https://www.youtube.com/watch?v= NWptwuLJ1C8 2nd Co-workshop (18 Nov 2022): https://dimosnestou.gov.gr/prosklisisti-2i-synantisi-workshop-emplek-omenon-foreon-sto-plaisio-toy-er-qoy-i2020-nexogenesis/
NTUA	Explore which policies are more influential Explore the level of policy integration under a WEFE nexus rationale Identify possible policy gaps Design of improved and integrated policies governing WEFE nexus Better and more effective management of WEFE nexus	Implementation of relevant SDGs (e.g. SDG6) and Green Deal's objectives in Greece and Bulgaria Implementation of European Directives concerning water resources management, renewables, ecosystems and climate change	Policy makers at national, local and regional level Local and Regional authorities Energy authorities Environmental protection authorities Farmer associations NGOs	Scientific outcomes / produced knowledge Results from SHs' workshops Participation in national / interna- tional conferences Journal publications Press-releases Short videos
UFZ	Pave the way towards effective WEFE nexus governance in the case studies (WEFE nexus governance is the goal, the NXG SHs' co-creation approach towards WEFE nexus governance is the means) Achieve SH agreement on and commitment to policy packages + implementation of a SH's agreement built around the concept of voluntary river contracts	Policies that currently address WEFE nexus management in a siloed way (i.e. water resource management, renewable energy development, food and agricultural production policies, ecosystem manage- ment) + closely related fields, such as sus- tainable development, biodiversity protec- tion, climate adaptation, land manage- ment, waste management etc.	Scientific community Any organisation at all scales in the WEFE nexus domains that would like to initiate a bottom-up SHs' co- creation process for improving pol- icy integration and foster transition towards WEFE nexus governance, with a particular focus on water management organisations such as river basin organisations, including transboundary ones, water and en- vironment ministries and water utili- ties.	NXG SHs' co-creation approach to- wards WEFE nexus governance Scientific outcomes Field visits to interview local SHs of the WEFE domains SH workshops Participation in global scientific con- ferences Participation in science-policy inter- face events





UNT	 Assess the level of inter-sectorality in the management of WEFE nexus domains Identify leverages and blocages due to the policies of WEFE domains Support SHs with the design of solutions to urge to more WEFE nexus governance at national or transboundary level 	- local, regional or national policies de- pending on the gaps identified	- All possible SHs identified in the SH map and who registered in the SH engagement strategy of NXG	 Performing interviews for the NXGAT implementation Presentation of outputs during workshops Participation to international conferences
UTH	Demonstrate the co-creation bottom-up ap- proach with the SH engagement through participatory Workshops/Living Labs to- wards the WEFE nexus context Investigate the relative polices to the Water- Energy-Food-Ecosystem Nexus Explore possible policy gaps Introduce a new policy or modify an existing policy in relation to a river contract	Protection and management of water re- sources Preservation of Biodiversity Synergies among policies aiming at the protection of biodiversity Implementation of European Directives concerning water resources management, renewables, ecosystems and climate change Waste management	Policy makers at local, regional and national level Water authorities Energy authorities Environmental protection authorities Farmer associations NGOs in relation with the biodiver- sity and the protected areas	Participatory Living Labs/Workshops Co-creation with the SH of the scien- tific questions/objectives Dissemination of both, the WS re- sults and the scientific results with the local, regional and national au- thorities, all the involved SHs as well as the scientific community Videos of the CS Interviews of the involved SHs Press releases
UU	show value of SH engagement process (les- sons learnt and good practices) identify and highlight the (mis)alignment of SHs' and researchers' expectations showcase the SHs' response to the NXG ap- proach	Any policies and processes that involve engaging SHs, particularly in the multi- sector/nexus context	Scientific community Researchers and SHs involved in and/or organising SH involvement processes	Scientific outcomes (published sci- entific article) Participation in scientific conferences Policy brief Popular science summary
WE	Help show value of NXG research outcomes to non-scientific audience particularly to pol- icy makers and SHs at the EU level (Euro- pean Parliament, European Commission and representations of Member States, other EU SHs).	EU Water policies under revision (follow the EU agenda and the initiatives of the European Commission)	EU Water community EU policy makers (eg. members states representatives, EU parlia- ment)	Participate in the 3 policy briefs: PB #1: NXG: an integrating model- ling into the WEFE nexus created by and for local SHs PB #2: NXG integrating modelling: a tool for smart and inclusive govern- ance of river basins to preserve eco- systems PB #3: NXG: Lessons from 5 case studies to scale-up Smart WEFE Nexus policies for a green and digital world Participation in EU events related to R&D and water policies relevant for NXG. Newsletters and other communica- tion tools to reach the EU Water community via WE's channels
WR	Prepare more optimal policies for the water- energy -food nexus	Water policy mainly, agricultural policy (land use)	Policy makers at river basin level and national level	





9.3 Annex 3: Summary overview of initial case study policy impact histories

The summary below is from the early draft of MS15. At this early stage, CS felt that they could mostly not provide histories of change. However, much information about the general directions and challenges faced in targeting the right SHs within the policy cycle can be drawn from this.

CS 1 NESTOS/MESTA

From policy recommendations to impact maximization

So far, WP6 has provided to the Nestos/Mesta CS dissemination material including a flyer, already translated, printed and shared to our SHs, the project banner and the project poster. This material supports dissemination of the project's goals and expected outcomes as well as information of the 5 Case Studies. We have also received video transcripts about Nestos/Mesta CS which have been translated in Greek. Content for the NXG website, i.e. a brief description of the Nestos/Mesta CS was sent to WP6 at an early stage of the project, while we have also received all the relevant communication guidelines. Communication material like NXG social networks, NXG webpage, CS leaders' e-mails as well as flyers are shared with our SHs during and after every workshop.

Lessons learned and experiences

So far, the main nexus challenges having been identified in the Nestos/Mesta river basin concern the preservation of the significant ecosystem around the river but also in its delta area, the protection of endemic flora and fauna, the confrontation of coastal erosion, the removal of carried material, the support of agricultural income through the sustainable development of agriculture, the confrontation of flood risk, the compromise of conflicts between the energy and agricultural sectors as to water use and the protection of water quality.

Regarding lessons learned until now, it should be mentioned that co-creation with local SHs significantly contributes to deepen into existing problems and pressures; while it brings an added value to the designed solutions as such solutions will reflect on local needs and perspectives. Exploring WEFE policy framework and assessing policy coherence is a critical factor that also needs to be explored as it sheds light on gaps that should be addressed. This process goes hand-in-hand with the investigation of physical interlinkages among the different nexus sectors as physical interactions should be taken into account during decision making in order to achieve the integrated management of the WEFE nexus sectors.



CS 2 Lielupe

From policy recommendations to impact maximization (WP6)

In this NXG project reporting period within WP6 the Lielupe CS Lead has elaborated a Policy Impact Log to strive to achieve during the project implementation:

The initial policy influence objectives for the Lielupe CS are focusing on improving the governance and management of WEFE nexus and designing integrated policies governing WEFE nexus taking the advantage of co-creation with SHs. The EU policies on water management, renewable energy, common agriculture, ecosystems and biodiversity, climate change mitigation in Latvia and Lithuania are targeted. Policy makers at local level (municipalities) and national level (ministries), regional administration (planning regions), developers of River Basin management plans (centres, agencies), researchers (universities, institutes), professional associations (water management, farmers, energy), environmental NGOs as well as business (food, etc) are targeted.

Impact maximisation

In Lielupe CS various SH groups i.e., municipalities, planning regions, water management entities, farmers, business are related to governance and management of WEFE nexus within the Lielupe River Basin district for filling their daily business and duties. National policy makers and agencies are setting the legal frame thus regulating activities at regional and local level. Environmental NGOs and local initiatives are largely involved in activities within the river basin. Researchers are having a role in developing and providing science-based solutions for efficient resource management. NXG project aims to improve governance and management of WEFE nexus in Lielupe CS taking into consideration diverse landscape of involved players utilising common resources and facing similar issues:

- Capacity problem is often accounted by all SH groups involved. Municipalities point out that personnel capacity is not sufficient in regions and there is noticeable uneven distribution of resources between cities and rural municipalities. Insufficient capacity is sometimes noticed e.g., of water resource management operators to understand the treatment requirements, and farmers to understand requirements for environmentally friendly agricultural practices. Tools for capacity building are crucial to be developed and utilised.
- 2. Cooperation between various SH groups in governance and management of resources in Lielupe CS is implemented to a limit extent for targeting specific requirements or particular problems. Cross-sectoral cooperation could be enhanced by creating awareness of WEFE interlinkages. Trans-boundary cooperation for information and data exchange at national level is implemented to an extent. Cooperation of Latvia-Lithuania border municipalities at Lielupe CS is implemented at project level and thus it is important to sustain these practices beyond the project scope.

Lessons learned and experiences

This section comprises some initial thoughts and experiences from implementation of the Lielupe CS at the current stage of the project (December 2022):





- The main Nexus challenges for the Lielupe CS are related to: (i) water quality impacted by nutrient load from diffuse and point sources, (ii) energy production from renewable energy sources creating additional pressure on other Nexus sectors, (iii) intensive agriculture by applying fertilisers, (iv) pressure on terrestrial ecosystems due to homogenisation of land and growing of monocultures and on aquatic ecosystems due to fluctuations in hydrological regime, (v) exploitation of natural resources creating pressure on ecosystems due to intensive use of wood biomass. These challenges are reflected in the Conceptual model of the Lielupe CS.
- Work in NXG project is active and demanding by tackling WEFE issues comprehensively and addressing governance, policy, Nexus interlinkages and SH involvement simultaneously. This approach requires careful planning of resource attribution towards work packages and task implementation.
- Involvement of SHs from WEFE sectors at various levels (national, regional, local) is of crucial importance in implementation of Lielupe CS. Up to now the SH engagement activities were related to providing information, and involving in consultation. Collaboration and empowerment of SH in CS implementation will be achieved in further reporting periods. CS Lead acknowledges that closer cooperation (at national and transboundary level) between SHs should be established during elaboration and implementation of river basin management plans. Bringing up the issue on cooperation beyond the project implementation at local and regional level will favour to facilitating process towards the design and adoption of a (transboundary) SH agreement for integrated management of the Lielupe River Basin resources.

<u>CS 3 Jiu</u>

From policy recommendations to impact maximization (WP6)

Providing input on activities in the CS, input to promo materials (flyer, poster, video, interview) and supplying information for promotion on different social media platforms.

Lessons learned and experiences

The activities carried out during this period in CS#3 Jiu were focused on supplying information for the different WPs needs while at the same time raising SH awareness on WEFE nexus approach and identification and validation of interlinkages, relevant policies and specific indicators in the CS context. Further project activities should build up on the activated interest by providing elements to reflect the incorporation of SH input into different NXG deliverables and tools, contributing to SHs sense of ownership and their activation for using the planned results.

From the two WSs and the interviews performed so far, it is clear that the incentive for the SHs that adhered to the NXG objectives the project provides a step forward for operationalization of integrated water management principles for better water resources management in Romania. The dialogue with SHs in the CS that took place in 2022 included important aspects such as the wide variety of indicators used by each of the WEFE sectors that in practice result in fragmentation of polices not only across different scales but also within the sectors themselves. The NXG objective for the learning tool to embed the cross-sector dialogue and a decision support instrument is perceived by SHs as an opportunity for operationalization of different strategic targets in water management, climate adaptation and sustainable





development sectors. At the same time there is a direct experience of various projects with good results not implemented due to the lack of political engagement.

Consequently the development of the NXG tools and solutions need to keep a pragmatic approach. Thus their development in CS#3 will continue in close collaboration with connected authorities at catchment and national level.

The SHs perceive the tools proposed by the project and the possibility to incorporate CS specifics in their design as an opportunity for improved public policies development in the WEFE sectors and for reaching sustainable development goals in Romania. The national authorities are interested to make use of the results in the CS for upscaling at national level in connection with sustainable development and adaptation to climate change strategies and action plans. The registered participants that signed the consent forms (25) expressed interest in further engagement in project activities for reaching the objectives of their activity. The SHs should be kept interested and engaged between workshops not only by requesting information from them but also sharing with them the progress on the development of the different planned instruments and the incorporation of the input they provided along the process to raise their trust.

Applying the integrated water resources management principles are also a recognized as strategic goal at Danube basin level. The CS#3 research focus area is complementary with CSs in REXUS (Lower Danube) and GoNEXUS (Danube River Basin). Cooperation with both sister projects was initiated during this period and will be strengthened in the next stages including joint activities on the ground. Also a potential connection with the Nestos CS sharing similar challenges in the regional context is explored. These lines of work will contribute additionally to strengthening SHs engagement and building on the impact and sustainability of NXG planned results.

CS 4 Adige

From policy recommendations to impact maximization (WP6)

We contributed to WP6 through the following activities:

- Support to the website development and social media posts, in particular regarding the Adige CS
- Translation of communication material into Italian (e.g. NXG poster and flyer)
- Participation to the exploitation workshop during the Riga Partner Meeting
- Development of the Policy Impact Strategy specific for Eurac, responsible for the Adige CS.

In particular, in the latter, we identified the following policy influence objectives:

• Exploring the level of policy integration following the WEFE nexus approach

- Identifying possible policy gaps and entry points to develop improved and integrated policies for the WEFE nexus
- Fostering a more effective and integrated management of WEFE nexus





Impact maximisation

Initial policy influence objectives:

The main objective is to improve the complex and diverse water use situation that leads to disputes, tensions, and lack of trust for a multi-sector and geographically equitable water management and governance. To address this goal, current conflicting policies on sectorial water allocation and management at the territorial level needs to be identified; moreover, there's the aim of investigating and mapping the power relations among different groups of users in order to build and enhance trust and collaboration among SHs to jointly address trade-offs and win-win solutions. The improvement of water management and future assessments of sectorial water demands to changing socio-economic conditions is also addressed by testing beneficial practices in agriculture, under the objectives of greening the CAP, to enhance sustainable and efficient water use, reduce pressure on water resources, and facilitate ecosystem services provision.

Lessons learned and experiences

The main identified Nexus challenges which we are addressing within the Adige CS are the following:

- Hydropower production strongly influences the amount and timing of the Adige River flow for downstream users.
- At the same time lowland users strongly rely on water resources for agriculture (e.g., apple orchards, vineyards, crops) for drinking purposes
- Additionally, tourism affects the total water demands, especially for snow production and accommodation facilities.
- The above-mentioned intensive water uses as well as water scarcity can lead to not guaranteeing the minimum ecological flow. Moreover, river ecosystems are threatened by saltwater intrusion from the delta.
- Future climate-change induced shifts in the river flow regime can further affect seasonal water availability.

Here some initial lessons learned are reported:

- Although the Permanent Observatory on Water Uses was established by the Eastern Alps River Basin Authority, a lack of an overarching authority with executive power was identified by the SHs. During drought events, the Observatory can only act as an advisor and decisions are taken by underlying bodies such as the two Autonomous Provinces and the Veneto region. Moreover, although drought can be foreseen months in advance, decisions are usually taken under emergency situations.
- Environmental associations are regularly not deeply involved in decision making; for instance, they do not sit at the Observatory table. The environmental sector is therefore not represented in decision-making, underlining the importance of including the Ecosystems in the nexus thinking.
- The diverse and opposed interests in water in the upstream and downstream areas are characterised by different cultural, linguistic, economic, and legislative autonomy levels.
- Consequently, a basin logic is usually not adopted: each sector is aiming at securing the necessary amount of water to their needs.





The part played by local SHs from diverse sectors in the overall process of CS development and the outcomes of the case studies are:

- The Province of Trento proved to be particularly interested in the project and would like to use the knowledge emerging from project activities as a basis to update local water-related policies. They consequently offered to be co-organisers of the second workshop.
- Environmental and fishermen associations were particularly interested in joining project activities mainly to make their voices heard to more powerful actors. This underlines the importance of the project in empowering marginalised actors.

Regarding the use of tools (models, SDM and SLNAE) to support the overall process bridge the gaps and help understanding the Nexus:

- The conceptual model discussion during the second workshop helped the involved SHs to reason with a Nexus lens.
- The development of the conceptual model supported exploratory literature and data analysis to be coupled with information collected during the participatory activities with local SHs.

<u>CS 5 Inkomati</u>

Impact maximisation

A lot of studies and research has been performed in the IUWMA. Implementation and action is required. One of the top-tier SHs has warned of SH fatigue due to the many requests for his (and other SH's) inputs. There is definite interest in the NXG project, but enthusiasm is guarded. The project will need to make some insightful and beneficial recommendations, especially in terms of policy selection, in the coming years for the project to be fully 'accepted'. It is too early in the project to present 'stories of change' for this CS.

Lessons learned and experiences

Key nexus challenges relate to the overallocation of water, the rapid development of mines (especially coal mines), the poor management of wastewater treatment plants, illegal sand mining, and land conversions to grow crops for the export market.

Initial trade-offs identified are:

- The need for foreign exchange, which can be generated through growing crops for the export market, but this can compromise domestic food security. Significant land conversions are occurring for crops such as macadamia nuts.
- Eskom needs both good quality water and coal. Eskom has had to intervene in the development of coal mines in the catchments of some dams in the IUWMA due to the negative impact that their stormwater runoff, effluent, and seepage have on water quality. The high price of coal in the global market is driving increased prospecting and mining for the both the domestic and export markets. This has a positive impact on jobs and the earning of foreign revenue, but a negative impact on water quality, biodiversity, food security and human health. The loadshedding and the medium-term lead time for the implementation of renewables place South Africa in a coal-trap in the medium term. A key challenge going forward will be





energy storage and security, and the securing of a baseload supply to the national grid.

The SHs have expressed both interest and excitement in the outcomes associated with the CS and tools such as the models, SDM and SLNAE. The SHs have however stressed that in order for the tools to bridge the gaps and help with understanding the Nexus, the tools need to be intuitive, simple to use and relevant. The use of visualisations such as a composite indicator "Footprint" with the WEFE nexus as its guiding framework will assist in ease of use and understanding the Nexus. The tools have not been discussed in detail with the SHs at this stage but are expected to be discussed further in the following workshop. However, it is important to be aware of potential SH fatigue due to the numerous requests for SH engagement (e.g., workshops, focus sessions, WP interviews etc.).

Further to this, the SHs reiterated the importance of the tools and policy recommendations reaching the competent authorities with the ability to interpret and implement the policy packages required.

SH engagement has been instrumental in understanding the constraints, challenges and general nature of the IUWMA. A key reason for selecting this CS is that it has a well-developed Catchment Management Agency (CMA), i.e. the IUCMA. This assumption has been proved to be correct, and the adoption of competent CMAs across South Africa would be hugely advantageous for all citizens.



