

### **TOWARDS AN IMPACTFUL NEXUS PROJECT**

a pilot survey & recommendations for practitioners



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The authors of this report are participants in the **European Junior Water Programme (EJWP)**.

The European Junior Water Programme (EJWP) is H2OPeople's flagship programme. Through an integrated two-year part-time programme, the EJWP provides young European professionals from water and other related sectors (2 - 10 years of experience / < 40 years old) with the necessary skills to address new water and climate challenges.

The EJWP enables the development of key competencies for the future by using the three pillars of EJWP development:

#### - Knowledge creation and transfer:

• Master classes on European policies, water technology and innovations, and primary water challenges - including local water projects of participating organisations

#### - European networking opportunities through building an EJWP community:

• Integration in Water Europe, EJWP ambassadors and participation in events

#### - Development of personal and professional skills in international teams:

Emphasis on cultural awareness and diversity in project tasks

EJWP specialists provide training on the following topics:

- Personal and communication development
- Co-design strategies and evaluation
- Project and self-management
- Leadership and pro-active strategies
- Skills of the future century for sustainability

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#### Cite this report as:

European Junior Water Programme (EJWP) (2023) Towards an IMPACTful Nexus project – a pilot survey & recommendations for practitioners. Online report.



This report contains the results of a pilot survey conducted by EJWP participants over a three-month period; it does not claim to provide a complete overview of recommendations for implementing impactful/successful NEXUS projects. In addition, it is important to emphasize that the EJWP survey was conducted on a small sample of workshop participants and respondents, so the recommendations can be expanded through additional surveys using the methodology developed in this pilot survey. The results presented in this report are intended to enrich the discussion in the field of NEXUS project ideation and management. In addition, they serve to formulate recommendations that may be useful to international cooperation stakeholders. Opinions and views of the authors of this report do not necessarily state or reflect those of the NEXUSNET COST Action (CA20138) members.

#### **Summary**



The European Junior Water Programme (EJWP) provides young European water professionals with professional and technical skills (e.g., network building, communication and diversity, technical advancement) to address water and climate challenges. The goal of the EJWP project, linked to NEXUSNET COST Action CA20138, was to assess the impact of NEXUS activities, i.e., to gather the opinions of the NEXUSNET community members on the question, "What makes a NEXUS project impactful?" To achieve this goal, EJWP participants conducted: (i) a workshop (consisting of Dialogue 1, 2, 3) during the NEXUSNET Annual Meeting in September 2022 in Athens, Greece; and (ii) interviews with available members of the NEXUSNET community to get their perspectives on the needs, gaps, criteria, and key performance indicators of NEXUS projects. The Dialogue 1 of the workshop resulted in a Mentimeter word cloud, which was further analysed using the MIRO application to create a mind map of the complex relationships among the various factors that workshop participants believe influence the impact of NEXUS projects. The Dialogue 2 resulted in the coding of workshop participants' responses in the form of a sentiment scale, i.e., a scale of participants' (dis)agreement with the statement that NEXUS projects strongly influence certain SDG categories. The dynamics of Dialogue 3 (i.e., deep democracy game) were presented in the form of an animation showing the changing opinions of workshop participants regarding key aspects of an impactful NEXUS project. Interviews with members of the NEXUSNET community revealed that NEXUS projects are characterised by a multidisciplinary approach that enables the connection of different stakeholders and sectors, as well as synergies between them. Interviewees mainly agreed that bio-physical assessment, stakeholder engagement and policy analysis are very important (key components) of NEXUS projects. In particular, they share the view that water, food, and energy topics have been well covered by NEXUS projects to date, but point to the growing need to consider biodiversity, ecosystems, climate, and/or land use in future NEXUS initiatives. In addition, respondents believe that culture, cultural heritage, and traditional knowledge, as well as more effective cross-sector linkages and socio-economic assessments, are also critical to NEXUS projects, but have not been emphasised as much in NEXUS projects to date. It was also noted that an impactful NEXUS project must (i) reflect extensive stakeholder engagement, including local communities and traditional knowledge, (ii) follow a common framework for data generation and analysis, and (iii) ensure project sustainability. Based on the conclusions derived from the EJWP workshop and interviews, recommendations for practitioners involved in the planning and implementation of NEXUS projects are also derived. The goal of these recommendations is to more successfully integrate the NEXUS concept into existing and future NEXUS initiatives so that these initiatives are truly successful, i.e., have a positive impact on the human, socio-cultural, economic, and environmental pillars of sustainability.



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### 01 INTRODUCTION

Water, energy, and food are inextricably linked, meaning that actions in one of these areas have synergistic or often negative effects on the others at different levels and scales (Simpson et al., 2022). Increasing resource demand due to global population growth, not only in numbers but also in consumption patterns, is expected to increase dramatically in the coming decades (FAO, 2014). The initiation of the water-energy-food (WEF) NEXUS represents the largest step toward ensuring integrated resource management and resource security in the global context of climate crisis and resource scarcity (Taguta et al., 2022). It has gained undivided attention in academia, policy dialogue, industrial innovation, and development as it focuses on developing valuable tools for quantifying and assessing cross-sectoral relationships and interactions (Fig. 1), and for integrative sectoral planning and growth perspectives (Eftelioglu et al., 2017; Simpson et al., 2022). Currently, more extended NEXUS schemes are introduced by different research teams, adding components, such as the Ecosystems (WEFE) (Bidoglio et al., 2019; Malago et al., 2021), Climate and Land (WEFCL) (Ramos et al., 2022), and Health (WEFH) (Slorach et al., 2020).

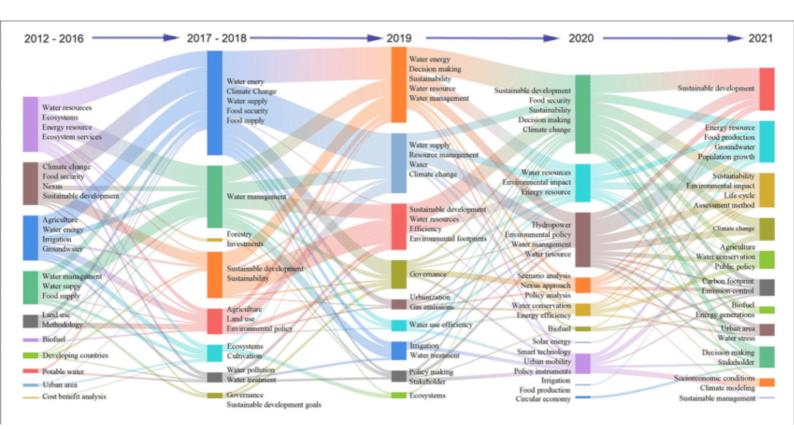


Fig. 1 Sankey diagram of the thematic evolution on the WEF nexus research (2012–2021) (Lazaro et al., 2022)



### 01 INTRODUCTION

**NEXUSNET** (https://nexusnet-cost.com/) is an international network of researchers, policy makers, and practitioners that takes a transdisciplinary approach to better understand how the WEF NEXUS promotes policy coherence and advances nexus thinking. NEXUSNET network participants are also part of the **EU-funded COST action (CA20138)** (https://nexusnet-cost.com/), which aims to bring the academic community together with policy makers and the business sector to better understand how the water-energy-food nexus promotes policy coherence and supports the transition to a low-carbon circular economy in Europe. In doing so, NEXUSNET integrates modeling, transdisciplinary decision-making, and systematic analysis of the NEXUS, taking into account bio-physical and socio-economic considerations, and supports multi-faceted exploration of existing water-energy-food challenges and effective solutions for natural and human resource sustainability.

Within the NEXUSNET working groups, the NEXUS concept is tested at different levels (i.e., local, regional, national, European), while the international dimension is explored through the involvement of international stakeholders. By applying transdisciplinary approaches, NEXUSNET also provides examples of NEXUS-compliant decision-making and recommendations aimed at achieving good practices in Europe based on the NEXUS concept. The NEXUSNET COST action envisions a series of intensive knowledge transfer and dissemination activities to ensure that the network has a significant impact on nexus thinking and frameworks in Europe and beyond.



### 02 PROBLEM BACKGROUND



Despite the growing literature on WEF NEXUS and the increasing number of NEXUS projects and case studies, there are still many gaps in applying NEXUS frameworks to policy recommendations (Olawuyi, 2020). One of these gaps is the lack of standard procedures, methods, and models capable of adequately identifying and assessing the impacts of NEXUS (Ramos et al., 2022). To address this gap and better understand the impacts of NEXUS frameworks in achieving and implementing sustainable resource (WEF) solutions, the **SIM4NEXUS** approach was applied (**Fig. 2**), based on the development and testing of twelve case studies in different spatial, socioeconomic, and biophysical contexts. This approach has demonstrated the need for a transdisciplinary approach and regular monitoring of qualitative and quantitative indicators of the success and impact of NEXUS initiatives to evaluate the success of the NEXUS framework and to support policy decisions regarding the adoption of sustainable NEXUS approaches. However, it is not yet sufficiently clear which qualitative and quantitative indicators apply to the success and positive impact of NEXUS initiatives.

Therefore, the **objective of this pilot survey** (EJWP project) was to assess the impact of NEXUS activities, i.e., to collect the opinion of NEXUSNET community members on the question, **"What makes a Nexus project impactful?"** To achieve this goal, EJWP participants conducted a workshop and interviews with NEXUSNET members to obtain their perspectives on the needs, gaps, criteria, and key performance indicators of NEXUS initiatives.

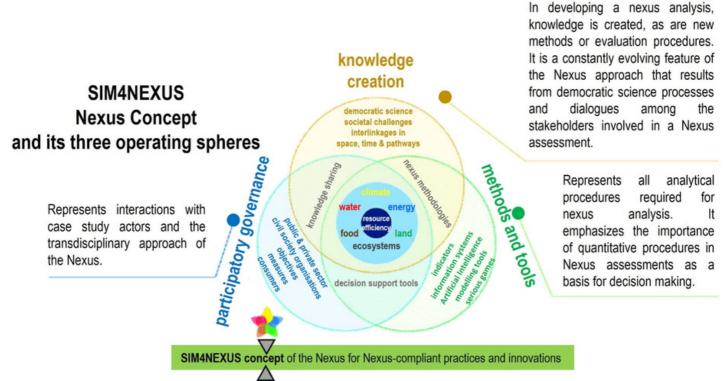


Fig. 2 The NEXUS concept as defined by the Sim4Nexus project (modified from Ramos et al., 2022)



# O3 PILOT SURVEY - METHODS



To achieve their project goals, EJWP participants conducted: **(01.)** a workshop during the NEXUSNET Annual Meeting in September 2022 in Athens, Greece; and **(02.)** interviews with available members of the NEXUSNET community to get their perspectives on the needs, gaps, criteria, and key performance indicators of NEXUS projects. The two-hour workshop was divided into three sessions: Dialogue 1) Mental Map focus group to clarify what makes a NEXUS project impactful; Dialogue 2) World Café to clarify the impact of NEXUS operationalization on the SDGs; and Dialogue 3) Deep Democracy by foot exercise for resolving conflicts (i.e., a lively discussion prompted by a conflicting/provocative statement based on the conclusions of the Dialogue 1).

#### 01. Workshop

during the September 2022 NEXUSNET Annual Meeting in Athens, Greece

#### 02. Interviews

with members of the NEXUSNET community to get their perspectives on NEXUS project needs, gaps, criteria, and key performance indicators Recommendation on how the NEXUS community should move forward

# O3 PILOT SURVEY - METHODS



Target group:

**NEXUSNET** 

annual meeting

participants

#### 03.1 Workshop

TEGRALSTALENUPROFESSIONA LAND
RESPONSBILITY PROFESSIONA LAND
R

#### 03.1.1 Mental map

#### **Answer to question:**

How would you describe an impactful Nexus project?



#### 03.1.2 World Café

Responses on the impacts of NEXUS operationalization on the SDGs



#### 03.1.3 Deep Democracy Game

A lively discussion prompted by a conflicting/provocative statement based on the conclusions of the Mental map

#### **03.2 Interviews**



Initially, 25 potential interviewees were contacted, but only 8 agreed to be interviewed for the purposes of this pilot survey

#### Target group:

NEXUS project officers, reviewers, implementers



### 04.1.1 Mental map

- each participant (24 respondents) indicated 5 keywords describing an impactful NEXUS project
- keywords were visualised in a Word Cloud (**Fig. 3**) using the Mentimeter application

How would you describe an impactful Nexus project? Answer in a way to list 5 words you would attribute to an impactful Nexus project.

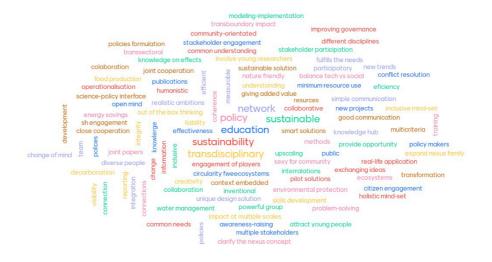


Fig. 3 Word Cloud resulting from respondents' answers to the question posed



### 04.1.1 Mental map

 keywords from the Word Cloud were further grouped using the MIRO application and translated into a Mental map (Fig. 4) to better understand potential relationships between key indicators of impactful NEXUS projects

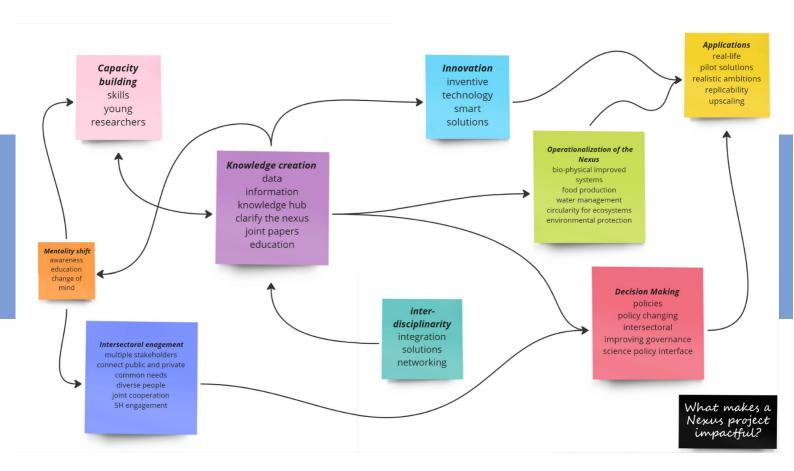


Fig. 4 Mental map as a result of grouping the Word Cloud keywords using MIRO application



### 04.1.2 World Café

- the World Café was designed as a lively discussion session that allowed participants, divided into 6 groups (round tables), to engage in an informal discussion about the impact of NEXUS projects on specific SDG categories
- the discussion led to the coding of participants' responses and the translation of their opinions in the form of a **sentiment scale**, i.e., a scale of participants' (dis)agreement with the statement that NEXUS projects have a strong impact on specific SDG categories (**Figs. 5, 6**)

Analysis

Education, gender and inequality: 24

Health, well-being and demography: 26

Energy, decarbonization and sustainable industry: 22

Sustainable food, land, water and oceans: 19

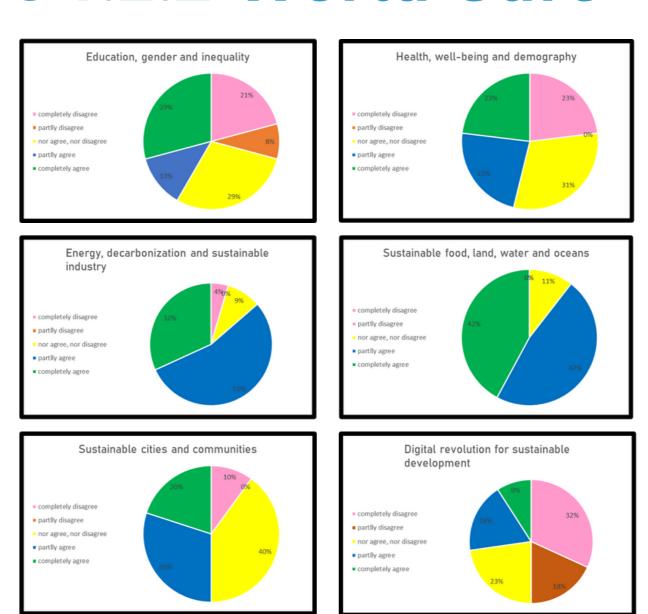
Sustainable cities and communities: 20

Digital revolution for sustainable development: 22

Fig. 5 Sentiment scale resulting from coding participants' opinions emerging from the World Café session



### 04.1.2 World Café



**Fig. 6** Pie charts depicting participants' (dis)agreement with the statement that NEXUS projects have a strong impact on the 6 SDG categories



### 04.1.3 Deep Democracy Game

Deep Democracy Game results were presented in the form of an animation showing the changing opinions of workshop participants
 regarding key aspects of an impactful NEXUS project







### 04.1.3 Deep Democracy Game

What is needed for an impactful Nexus project (based on the Deep Democracy Game results)?



#### **AGREEMENT**

a compromise must be established where all levels (supranational to people) agree with each other



#### **CO-CREATION**

co-creation occurs between representatives of all relevant sectors involved



#### **ENGAGEMENT**

all stakeholders are actively engaged



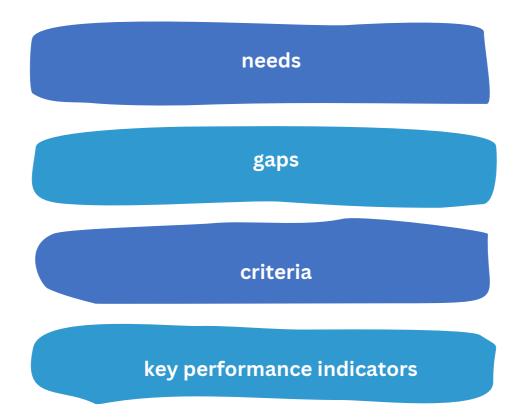
#### **INCLUSIVENESS**

stakeholder groups are inclusive and balanced



## 04.2 Interviews

 interviews with available members of the NEXUSNET community to get their perspectives on:



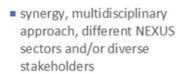
of impactful NEXUS projects



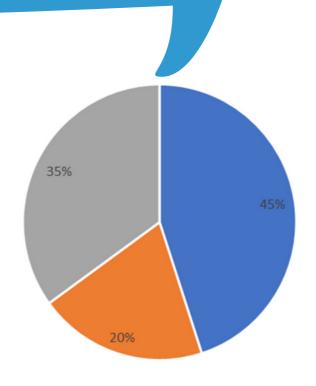
## 04.2 Interviews

45% of respondents agreed that NEXUS projects are characterized by a multidisciplinary approach which enables connection of various stakeholders and sectors, and also synergies between them

35% of respondents stated that NEXUS projects are focused on challenging integrated approach focused on policies and/or sustainable development and/or co-creation of innovative solutions



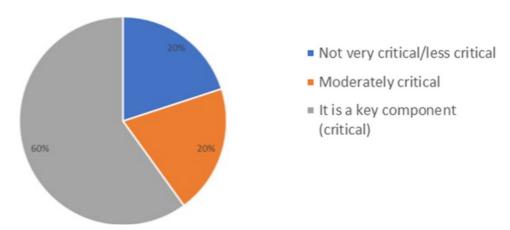
- common framework, sharing methodology/data
- challenging integrated approach focusing on diplomacy/policy and/or sustainable development issues, and/or co-creation





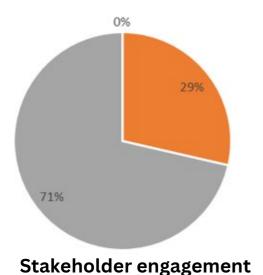
## 04.2 Interviews

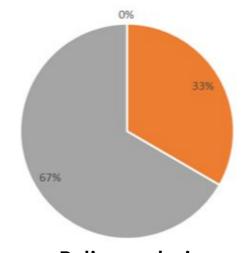
• the interviewee opinions on how critical the **bio-physical** assessment, stakeholder engagement, policy analysis are in NEXUS projects:



**Bio-physical assessment** 

(modeling, simulation, other quantification approaches)





**Policy analysis** 



## 04.2 Interviews

The general opinion is that culture, heritage and tradition are important aspects of NEXUS projects, but they are often neglected. To meet the needs of the NEXUS framework, NEXUS initiatives would need to overcome various challenges, such as cultural and socioeconomic barriers, cross-generational and cross-sectoral differences, and increase citizen awareness and engagement within the NEXUS.

- Respect cultural heritage
- □ Shift towards **NEEDS**intersectoral
  integrated way
- Socio-economic assessment
- Raising awareness
- Generation gap
- Culture-dependent focus and/or mentality

CHALLENGES



## - RESULTS

## 04.2 Interviews

According to interviewees, issues of **injustice** and **inequality** are often neglected in NEXUS initiatives/projects. NEXUS initiatives should involve indigenous and local people, residents of small villages, and refugees. This requires working on the ground in diverse communities and among different stakeholders. In addition, **Living Labs** are known as a paradigm of inclusion in relation to poverty and gender inequalities, which could serve as examples of best practices for implementing the NEXUS framework in addressing complex resource-related and societal challenges.

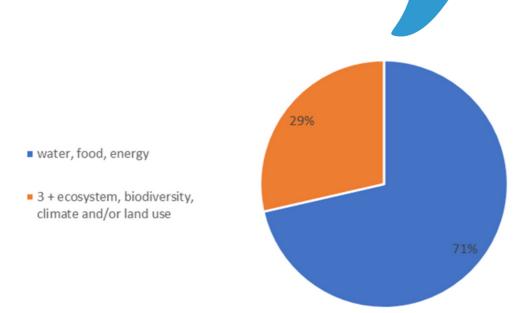




## 04.2 Interviews

71% of respondents agreed that water, food and energy play an important role in NEXUS projects

29% of respondents indicated that biodiversity, ecosystem, climate and/or land use are increasingly important and should be given greater consideration in future NEXUS initiatives



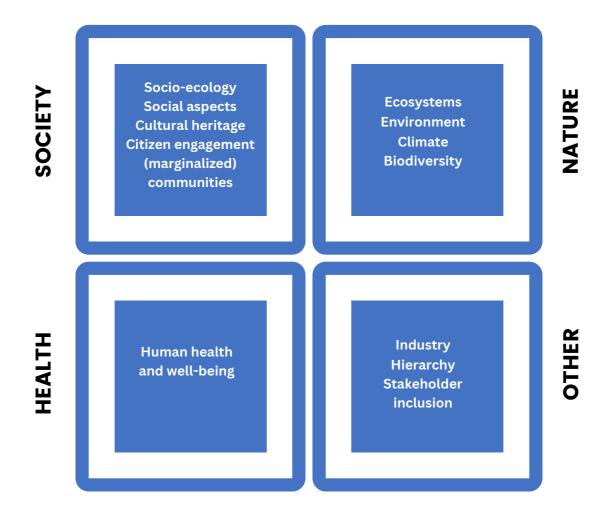


## 04.2 Interviews

Respondents were asked for their opinions on **components that are missing** from the NEXUS projects initiated so far.

From these, 15 keywords were selected and grouped into four categories: society, nature, health, and other.

The social aspects and cultural heritage were mentioned as most underrepresented in NEXUS projects, followed by human health/well-being and nature-related dimensions.

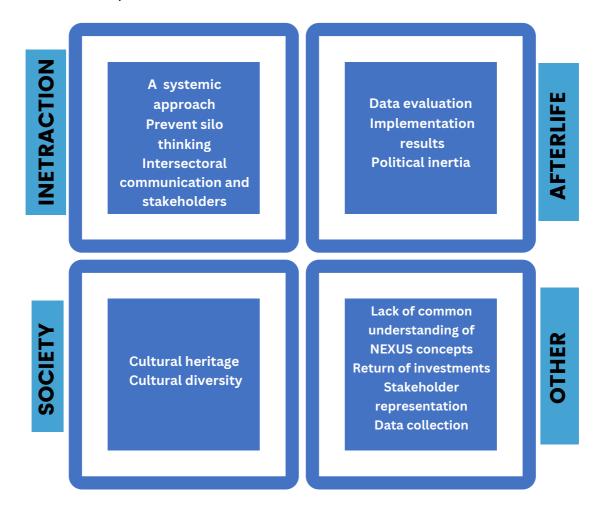




## 04.2 Interviews

From the responses on barriers to the impact of the NEXUS projects, fourteen keywords were grouped into four categories: interaction, afterlife, society, and other.

The most frequently highlighted barrier to the success of NEXUS initiatives was silo-thinking and communication between different stakeholders (e.g., science vs. policy/academia vs. policymakers), which can encounter difficulties when working together. Another obstacle preventing NEXUS from moving from mere success to real impact is the lack of afterlife of NEXUS initiatives.





## 04.2 Interviews

When asked about the **gaps in NEXUS projects** that respondents have encountered so far, two main categories were identified: **Framework and Data.** The gaps mainly relate to the concept of NEXUS and understanding the framework, which is an ongoing line of research. NEXUS is a young concept, so this aspect may improve over time. The other gaps mentioned relate to **cross-project collaboration** and again the **lack of a project afterlife.** 

#### A common understanding of NEXUS concepts with standardized methods

Proper representation of NEXUS Size of NEXUS community and nexus maturity

1. FRAMEWORK

Development of data-driven techniques Data integration

2. DATA

Interproject cooperation
Afterlife implementation by the EU
commissions

OTHER



## 04.2 Interviews

Interviewees were also asked what is needed to improve the NEXUS project afterlife. Responses emphasised the need to ensure:

- implementation of NEXUS project results
- awareness of project results
- integration of project results and conclusions into policy
- project visibility (and dissemination activities)
- adequate presentation of NEXUS data
- funding for project afterlife activities





## 04.2 Interviews

When asked about the **difference between** successful and impactful NEXUS projects (Fig. 7), more than 60% of interviewees described a successful NEXUS project as one that delivers results. A successful project also needs to provide a new methodological approach to addressing climate change and benefit society, but it does not *die* when it ends.

Successful NEXUS project provides the deliverables

Impactful NEXUS project benefits society, policies, inspire the next generations

On the other hand, an **impactful NEXUS project**, according to the interviewees, is the one that leaves a legacy of networking and change for the better even after the official end of the project. It also means that project findings and conclusions have informed policy decisions and contributed to education and people. As interviewees stated, impactful means inspiring the next generations, benefiting society, improving lifestyles, and supporting local economies.



## 04.2 Interviews









Benefit society

Deliverables provided

Has the afterlife

new methodological approach in tackling climate change issues

#### SUCCESFUL

V S

#### IMPACTFUL

















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impact on policies

benefit to policy makers or regional authorities Implement
-ation and
operationa
-lization
matter

change for the better, made a difference (policy) contribute to education, to people Inspiration for next generation

Benefit society

Promote the local economy Improve the way of life

Fig. 7 Summary of the differences between successful and impactful NEXUS projects according to interviewees



## 04.2 Interviews

The main **conclusion from the interviews** is that for impactful NEXUS project, the social aspect should be further developed, while at the same time improving communication between the different stakeholders and pursuing a common framework for data generation and analysis.

	Health	Interaction	Society	Nature	Framework	Afterlife	Data
Missing in projects so far	+	+/-	++	+	-	-	-
Obstacles towards impact	-	++	+	-	+/-	+	+/-
Gaps projects so far	-	+/-	-	-	++	+/-	+
Lacks related to afterlife	-	+/-	-	-	+/-	++	+/-

## 05 RECOMMENDATIONS FOR PRACTITIONERS



Considering the results of the EJWP pilot survey, we can state the following. Unlike projects that are not based on NEXUS and are often narrow and focused, NEXUS projects are by default **inter-, multi-, and/or transdisciplinary**, i.e., they combine different disciplines and multiple partners working together to find new solutions to the **water-food-energy-biodiversity-climate challenges**. The real added value of the NEXUS projects is to find a new method/approach to address the **interlinkages** between water, food, energy, land availability, biodiversity and climate, and to **link the project with the Sustainable Development Goals**.

While water, food, and energy are well covered and reasonably well understood in NEXUS projects because they are very important resources, future NEXUS projects would need to pay more attention to land use, biodiversity, ecosystems, climate awareness, and human and nature health, which are related to water, food, and energy but are often very neglected because they are hidden resources that people take for granted and/or are not considered important for maintaining sustainable use of the Earth's resources.

It is also necessary to link the bio-physical with the socio-ecological aspects of NEXUS issues, but also to take into account the cultural heritage, local mentality and social structure/hierarchy. It is very important to involve citizens in creating win-win solutions to solve NEXUS challenges, especially marginalised communities that suffer most from lack of resources, including NEXUS resources (food, water, energy,...). The NEXUS project should focus not only on specific biophysical and intersectoral differences, but also on cultural, geopolitical, socioeconomic, and intergenerational differences. Therefore, it is necessary to facilitate not only communication between different NEXUS sectors, but also a dialogue between different cultures, economies, and social backgrounds. In this way, the NEXUS project would also reflect its focus on all domains of sustainable development.

Achieving strategies is also very important for NEXUS projects, especially if we want to achieve an impactful project. 'Impactful' is often described as something that has a strong effect on a situation or a person. It would be of great benefit if NEXUS projects identified conflicts and hotspots that are not making progress or changes in nature and society because of political inertia. It is often the case that policies are coherent at the EU level but are not implemented coherently at the national level. Therefore, policy is not a guarantee of its implementation, and it would be beneficial for NEXUS projects to go a step further and work towards implementing and/or reviewing the implementation of relevant policies.

## 05 RECOMMENDATIONS FOR PRACTITIONERS



For us to consider NEXUS projects as influential/impactful, they should leave a mark and ensure their effect across multiple affected sectors, governments and policies, across multiple stakeholders and over a longer period of time. There is a need for NEXUS-related projects to achieve an afterlife through their deliverables, conceptual solutions, and designed activities, i.e., the products of these projects should be usable after the official end of the project.

To achieve a successful and influential NEXUS project, it is first necessary to achieve an understanding of the NEXUS concept and a proper interpretation of NEXUS that includes social aspects of NEXUS. Thus, a strong interdisciplinary team of experts and good communicators is required. In order to achieve a successful communication, it is important to familiarise all relevant stakeholders with the NEXUS concept, and then achieve a dialogue between the different stakeholders. It is beneficial to include stakeholders with conflicting issues, because through an inclusive dialogue of all stakeholders and opposing positions, more durable solutions can be achieved for the benefit and mutual advantage of all. Cocreation is effective communication in which documents are presented in a non-technical language and translated into the native language of local communities. Building trust and co-creating solutions, taking into account all stakeholders, guarantee the sustainability of implementation and the durability of projects created in this way. Imposed solutions usually affect current benefits and are not readily accepted by local communities.

Furthermore, a NEXUS project should include **integrative activities between many different stakeholders to achieve co-design, co-creation and/or living labs**. However, co-creation is not possible without relevant local stakeholders and active engagement, following the motto "from NEXUS thinking to NEXUS doing".

Therefore, to achieve impact, the NEXUS project should be **highly inclusive** and incorporate elements of **social justice and sustainability**. In solving the NEXUS challenges, it is important to listen to all people – from members of underrepresented communities to influential people who are in a position to advance the needs of underrepresented people and the rest of the community – and to take into account all knowledge – from indigenous and local knowledge to major scientific, social, and political insights and discoveries. Thus, to avoid inert problem solving and stimulate rapid changes in society, science, and policy, NEXUS projects should **avoid hierarchical and siloed thinking and instead promote systemic, inclusive, and integrative thinking and approaches**.

To extend the life of NEXUS projects, they should focus on raising awareness, disseminating project results, and incorporating them into policy and education at all possible levels. There is also a need to secure funding for project follow-up, which is often lacking and a major barrier to greater impact of NEXUS projects. NEXUS projects should result in simple and coherent messages that are clear to all stakeholders.

### 05 RECOMMENDATIONS FOR PRACTITIONERS



### Checklist of key performance indicators of impactful NEXUS projects

Interdisciplinary and multi-stakeholder approach				
Interlinkages of resources:				
water-food-energy land use, biodiversity climate health social structure culture/cultural heritage/traditional knowledge				
Policies implementation and review				
Afterlife as:				
effect across sectors, governments, policies, stakeholders dissemination of results implementation in policies and education				
Co-creation of:				
interdisciplinary experts good communicators policy makers local communities				
Thinking vs. Doing as incorporating systemic, inclusive and integrative approaches to co-create and co-design				

**Addressing SDGs** 

### **06 NEXT STEPS**





...conduct an **online survey** of NEXUS project experts to gain a broader perspective on NEXUS project needs, gaps, criteria, and performance indicators, and to learn more about how to increase NEXUS project impact



...the online survey should be conducted **globally** to capture differences in responses based on respondents' country, role in the NEXUS project, etc.



...create a **list of indicators, recommendations, and/or a checklist** for planning and implementing impactful NEXUS projects based on the online survey responses



...several **recommendations/checklists** should be drafted for **policymakers**, **businesses**, **and academic practitioners** implementing the NEXUS concept in different countries/regions



...conduct a **review of literature sources** relevant to evaluating NEXUS implementation to more clearly define what is critical to the impact/success of NEXUS concept/thinking implementation



...the review of literature sources should include **examples of best practices** (high quality NEXUS projects), but also examples of **projects that do not have impact** 



...systematically track the scientific progress of NEXUS global community



...evaluate whether NEXUS projects have led to **behavioral**, **social**, **and policy changes** to date



...develop strategies to increase the impact of NEXUS projects



...develop **strategies based on new innovative transdisciplinary approaches** that enable breakthroughs, rather than being guided by the limitations of individual frameworks

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### **07 ACKNOWLEDGEMENTS**





# H20people

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