



Convention on the Protection and Use of Transboundary Watercourses and International Lakes
Working Group on Integrated Water Resources Management
Fifteenth meeting

Geneva, 30 September – 2 October 2020

Item 7(b) of the provisional agenda

Water-food-energy-ecosystems nexus in transboundary basins.

Nexus solutions and investments in transboundary basins: draft report – the scope, approach and the analytical framework

Note by the secretariat

Summary

The Meeting of the Parties to the Water Convention at its eighth session (Astana, 10-12 October 2018) requested the Secretariat, as part of the Programme of Work 2019-2021 under the Water Convention, to undertake the preparation of a synthesis report of proposed solutions to nexus issues and experience from addressing the nexus. By building on an improved understanding about the water-food-energy-ecosystems nexus in transboundary basins and by considering intersectoral impacts from policies and other sectoral developments beyond water management, broad cooperation opportunities can be identified at the basin level. Such opportunities can provide benefits through reduced impacts and trade-offs as well as through synergies, including in terms of financing opportunities. Designing, planning, and implementing nexus solutions and investments is in the interest of all policy makers (notably from the nexus sectors of energy and agriculture) because these are associated to lower political risks (broader consensus), higher levels of coherence when it comes to cross-sectoral goals (e.g. climate goals) and broader benefits (multiple interests), than strictly sectorally developed solutions.

At the time of the IWRM meeting, the synthesis report is being developed, as a collaboration between the Water Convention and the International Union for Conservation of Nature (IUCN), in cooperation with Finnish Environment Institute, building on a literature review as well as on a stakeholder questionnaire. Among the key inputs are the transboundary nexus assessments carried out under the Convention since 2013 as well as IUCN's and other organizations' initiatives.

The report aims to provide clarity on the benefits and added value of implementing nexus solutions to solve the most typical problems affecting transboundary basins in terms of water quantity, quality, and environment. Furthermore, it seeks to provide a synthesis of real-world experiences accumulated so far in national and transboundary level, highlighting the factors of success. By providing an overview of nexus solutions and investments in terms of: common barriers, successful cases, and types of investment/funding used, the report is expected to help national authorities and basin organizations to better understand the potential of the nexus approach and how it can be applied to solve inter-sectoral challenges (or even to turn them into opportunities), and to improve transboundary water cooperation.

The preliminary findings from the analysis are to be presented to the sixth meeting of the Task Force on the Water-Food-Energy-Ecosystems Nexus (22-23 October 2020) for discussion, and to be further developed into a publication for presentation at the Meeting of the Parties in 2021.

The Working Group is invited to provide comments on this work, as outlined. Development of the synthesis would benefit from input from interested countries and organizations, in particular those that have participated in nexus assessments, through completion of the questionnaire on nexus solutions and investments and from active participation in the 6th meeting of the Task Force.

1. Background and rationale for the synthesis report

Transboundary water resources constitute more than 60% of global freshwater resources. Water, energy, food, and environmental security depend on these waters. Their sustainable management is crucial for development, peace and stability, as is the effective cooperation among riparian countries and the different sectors of the economy that rely on them.

The “nexus” concept is rooted in the idea that sectoral and national policies urgently need to become more coherent to reduce resource management trade-offs and reconcile multiple uses. Policy coherence can be achieved through inter-sectoral exchange of communication, active coordination and due consideration of different interests, negotiation of trade-offs, all the way to synergy and co-operation towards common objectives. Notably, policy coherence is necessary condition for effective climate action, which requires acting across sectors (energy, food, biodiversity, etc.) and across scales (global to local, and transboundary).

Policy coherence could bring economic benefits by facilitating the development of synergies and partnerships, which in turn motivates the co-financing of investments: public-private, multi-sector, and multi-countries. In transboundary settings, increased trust among riparian countries is essential to reduce the political risks for investors.

Multiplying benefits from a single project (e.g. multi-purpose infrastructure; combining innovative solutions to attain different resources’ efficiency) is the most practical way of contributing to different objectives at the same time. Energy access and production, energy efficiency, food production, agricultural sustainability, and environment protection are examples of sectoral objectives that can be combined into broader cross-sectoral objectives such as circular economy and climate action. However, without a coherent policy framework, consultative processes and planning frameworks that support integration, upscaling or replicating this type of investments is difficult.

Various Governments and institutions have been involved so far in nexus dialogues and/or assessments carried out by the Water Convention and partner organizations around the world.

Yet despite the need for cooperation, there is a persistent tendency for water dependent sector investments to be planned, financed and implemented in so-called policy silos. Hence the “nexus” concept, which is rooted in the idea that sectoral and national policies urgently need to become more coherent to reduce resource management competition and reconcile multiple uses. The nexus approach is emerging as an effective way to do this.

Different commentators define the approach in different ways but they all ultimately speak to an increasingly urgent need to break down the silo’s and catalyse policy coherence via inter-sectoral exchanges of communication; active coordination; reconciliation of competing interests; trans-sectoral planning paradigms and mutually appropriate metrics. For the specific study reported herein, it was decided to adopt a simple definition specific to transboundary benefits, hence:

“Nexus solutions and investments arise from silo breaking action and directly or indirectly produce sustainable transboundary benefits in multiple, diverse water using or water dependent sectors in the riparian states.”

The Task Force on the Water-Food-Energy-Ecosystem Nexus is providing a global platform for Parties and non-Parties to the Convention to share their knowledge and experience of multi-sector approaches to natural resources management and utilisation in shared basins. Despite this knowledge and experience and indeed similar knowledge and experience emerging elsewhere, various questions remain open. For instance:

- Who should develop nexus solutions, and how?
- What are the costs, benefits and added value associated with them?
- What institutional frameworks (particularly in transboundary basins) are needed to support their implementation?
- What financing sources are available, and what investment pathways and transaction models might apply.
- And, what can be learnt from the experience of governments and other key stakeholders who have taken part in nexus dialogues and assessments to date?

2. Nexus work under the Water Convention:

The Meeting of the Parties to the Water Convention at its eighth session (Astana, 10-12 October 2018) requested the Secretariat, as part of the Programme of Work 2019-2021 under the Water Convention, to undertake the preparation of a synthesis report of proposed solutions to nexus issues and experience from addressing the nexus.

In 2012, the Meeting of the Parties to the Water Convention decided to carry out an assessment of water-food-energy-ecosystems nexus in selected transboundary basins. The Transboundary Basin Nexus Assessment (TBNA) methodology was developed 2013-2015 to carry out participatory assessments of nexus issues in transboundary contexts and has since been applied in 6 river basins and on one aquifer. The assessments sought to jointly identify, firstly, intersectoral issues in the respective transboundary basins and, secondly, concrete policy and technical solutions to address them. The recent assessments in particular, notably, the North-Western Sahara Aquifer System, have resulted in integrated packages of multi-sectoral solutions. Supporting implementation of nexus solutions and highlighting related investment or financing opportunities is what the nexus assessment have logically progressed towards.

The Task Force on the Water-Food-Energy-Ecosystem Nexus, chaired by Finland as the Lead Party, was established in 2013 under the Water Convention to oversee the series of thematic “nexus” assessments in transboundary basins. This global platform allows Parties and non-Parties to the Convention to share their knowledge and experience of integrated management of natural resources in shared basins. The Task Force consists of government representatives (mainly water, energy, agriculture and environment protection authorities) especially from countries that have experience in nexus or integrated assessments; river basin organizations; specialized agencies; international, regional and non-governmental organizations as well as experts/academia, and is open to participation by representatives from these groups.

This document presenting the scope, approach and the analytical framework for the stock-taking of nexus solutions and investments, will be discussed at the sixth meeting of the Task Force (22-23 October 2020). The preliminary findings will also be presented. Possible conclusions and recommendations will be discussed. As needed, follow up steps for completing the stock-taking and for further developing of the synthesis report will be agreed upon at the Task Force meeting. The draft synthesis report will be completed for review by the next joint session of the Working Group on IWRM and Working Group on Monitoring and Assessment (Geneva, 26-28 April 2021), before finalization as a publication that will be presented at the Meeting of the Parties in 2021.

3. Aim and objectives

At the time of the fifteenth meeting of the Working Group on Integrated Water Resources Management, the report is being developed, as a collaboration between UNECE and IUCN, in cooperation with the Finnish Environment Institute (SYKE), building on a literature review as well as on a stakeholder questionnaire.

The first aim of the report is to clarify and demonstrate what is the added value of integrated approaches to natural resource management when it comes to concrete solutions to transboundary issues¹, and related investments, and why looking beyond the river basin or aquifer is necessary. Furthermore, considering the experience so far, the report will shed light on the implementation challenges faced by institutions including, notably, water authorities and River Basin Organizations, and how the challenges could potentially be overcome.

¹ “Transboundary impact” means any significant adverse effect on the environment resulting from a change in the conditions of transboundary waters caused by a human activity... Such effects on the environment include effects on human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures or the interaction among these factors; they also include effects on the cultural heritage or socio-economic conditions resulting from alterations to those factors;”

The general objective of the stocktaking report is to make a stronger case for the adoption of a nexus approach to natural resources management in transboundary contexts. The report will:

- Demonstrate the added value of “nexus solutions and investments” compared to traditional/silo ones.
- Indicate how to realize nexus solutions and investments through cooperation, consultation, and co-financing;
- Map the financing opportunities and some of the investment schemes available (across sectors and countries);
- Reflect the variety of experiences from different regions of the world; Highlight the value and potential of cooperation frameworks to promote nexus solutions and investments in transboundary contexts.

4. Approach to the development of the report, content and structure

The stocktaking report will be developed based on the following:

- 1) A desk review of *nexus/inter-sectoral dialogues and assessments*⁷ carried out so far around the world at regional and transboundary levels, with focus on response to the nexus issues, recommended solutions and their operationalization. Other levels may be appropriate to include when of transboundary relevance; and
- 2) A *questionnaire gathering experience from stakeholders* involved in the nexus assessments and dialogues in different regions. The respondents have been identified jointly by the Water Convention secretariat and the IUCN, including through initiatives such as the IUCN’s project Building River Dialogue and Governance (BRIDGE), the regional Nexus Dialogues supported by the European Commission and Gesellschaft für Internationale Zusammenarbeit (GIZ).
- 3) The analysis of the results of the desk review and questionnaire survey, and the synthesise of the lessons learned.

The report is planned to be structured as follows:

- Part 1 Detailed background review of the nexus approach, its importance for implementation of the Agenda 2030 for Sustainable Development and climate action, and common challenges in transboundary basins.
- Part 2 contains the literature review, framework style analyses and a stakeholder questionnaire.
- Part 3 describes the outcome of the questionnaire survey, i.e. provides a synthesis of experience about nexus solutions and investments
- Part 4: conclusions and recommendations (reflecting the outcome of the questionnaire survey).
- Annex 1: brief overview of frameworks
- Annex 2: Nexus Solutions from the assessment of the Northern Sahara Aquifer System² Annex 2: Derivation of the problems axis

5. The analytical framework

The stocktaking exercise required the development of an ad-hoc analytical framework that was developed to capture the common traits and differences in the experience so far of addressing typical problems faced in transboundary basins by means of nexus solutions (and, in turn, through nexus investments).

The typical problems that can be better addressed by taking cross-sectoral action were categorized as follows (considering the experience arising from Transboundary Diagnostic Analyses carried out by the Global Environment Facility):

- *Water quantity* (permanent or time based; too much water, insufficient water, or excessive variability; anthropogenic or natural)
- *Water quality* (permanent or time based; pollution, turbidity, or salinity; anthropogenic or natural)

² The NWSAS is the latest nexus assessment carried out under the Water Convention. The package of nexus solutions is one of the key elements used to derive the analytical framework for this study.

- *Environment* (biodiversity loss or compromise, habitat loss or compromise, sediment or erosion, morphological change, compromised human health)

These problems have their root causes, which can be of various nature, from climate change, to inadequate infrastructure, to land use or water management issues, poor planning, resistance to new ideas, etc. (For a full list, the Annex can be referred to).

According to the experience of nexus in transboundary basins, the potential solutions can be divided into five broad categories, or clusters: 5 I’s framework for nexus solutions – institutions, information, instruments, infrastructure and international cooperation and governance -- developed under the Water Convention³, (described in Table 1).

Table 1. The five categories of nexus solutions applied in nexus assessments of transboundary basins carried out under the Water Convention.

Categories of nexus solutions				
<i>institutions</i>	<i>information</i>	<i>instruments</i>	<i>infrastructure</i>	<i>International cooperation and governance</i>
Spanning from institutional reforms to improved institutional cooperation and governance culture.	Improving collection, accessibility and communication of data, information and knowledge related to basin resources and their dynamics (intersectoral assessments, guidelines)	Defining and implementing various instruments (policy, economic, regulatory) to address trade-offs and promote synergies in the management of natural resources and environmental protection	Planning (i.e. designing, siting, financing) and modernizing or modifying existing infrastructure (built or natural)	The most cross-cutting category: solutions of this type are aimed at broadening the scope of transboundary cooperation and identifying common priorities

For the purpose of this stocktaking exercise, which aims at clarifying the *process* of identification and implementation of nexus solutions, these categories were used to derive four “factors of success” that determine the success in the conceptualization, planning, and/implementation of a nexus solution:

- international/transboundary cooperation
- governance
- economic and policy instruments
- infrastructure and innovation

As a result, the scheme below (Table 2) illustrates the two-axis framework proposed (problems/factors of success). This served as a basis for the development of the stakeholder questionnaire survey (included as Annex to this document).

³ UNECE, 2018, Methodology for assessing the water-food-energy-ecosystems nexus in transboundary basins and experiences from its application: synthesis. Available at : <http://www.unece.org/environmental-policy/conventions/water/envwaterpublicationspub/water/envwaterpublicationspub74/2018/methodology-for-assessing-the-water-food-energy-ecosystems-nexus-in-transboundary-basins-and-experiences-from-its-application-synthesis/doc.html>

Table 2: The Proposed Analytical Framework (to be adjusted as needed upon elaboration of results from the survey)

FACTORS OF SUCCESS										
International Cooperation		governance			economic policy and instruments			Infrastructure and Innovation		
A1	A2	A3	B1	B2	C1	C2	D1	D2	D3	D4
Sustainable and productive natural resource management as a result of stronger transboundary cooperation	Increased awareness concerning the benefits of and options for cross-sectoral, transboundary trade-offs, compromise and synergies	New multi-purpose "basin" level infrastructure use of existing "basin" level infrastructure optimised as a result of trans-sector governance and international cooperation.	Sustainable and productive management and exploitation of natural resources as a result of shared planning and monitoring information and not least with respect to mandatory environmental and social impact assessment	New multi-purpose "basin" level infrastructure and multi-purpose use of existing "basin" level infrastructure optimised as a result of appropriate incentive structures and well enforced regulations	Water demand management improved by a combination of smart economic policies along with institutional and legal arrangements that increase the economic mobility of water	Transparent and equitable terms of transboundary trade within a river basin	New multi-purpose "basin" level infrastructure and multi-purpose use of existing "basin" level infrastructure	Water, energy, agriculture and environmental security enhanced, basin-wide as a result of innovations in infrastructure financing and operating rules, especially due to multi-purpose paradigms	Water, energy, agriculture and environmental security enhanced, basin-wide as a result of restored or transformed by investments in natural infrastructure or appropriate agribusiness operations	Water, energy, agriculture and environmental security enhanced, basin-wide as a result of increased use of decentralised service concepts and infrastructure.
PROBLEMS	secondary	quaternary								
primary		Natural Anthropogenic								
	Too much water	Natural								
	Insufficient water	Anthropogenic								
	Excessive variability	Natural								
	Too much water	Natural								
	Insufficient water	Anthropogenic								
	Excessive variability	Natural								
	Pollution	Anthropogenic								
	Salinity	Natural								
	Turbidity	Anthropogenic								
	Pollution	Natural								
	Salinity	Anthropogenic								
	Turbidity	Natural								
	biodiversity loss or compromise	Anthropogenic								
	habitat loss or compromise	Natural								
	sediment or erosion	Anthropogenic								
	morphological change	Natural								
	compromised human health	Anthropogenic								
Environment										

6. Expected results from the report, and their relevance

The report will provide clarity on the benefits and added value of implementing nexus solutions, taking coordinated action with economic sectors, notably energy and agriculture, to solve the most typical problems affecting transboundary basins in terms of water quantity, quality, and environment. Furthermore, it will provide a synthesis of real-world experiences accumulated so far in national and transboundary level, highlighting the factors of success. The reader will therefore find an overview of nexus solutions and investments in terms of: common barriers, illustrative cases, types of investment/funding used.

Despite the potential of nexus solutions, there are various challenges to implementing such solutions, including those put forward in the nexus assessments under the Water Convention. The report will help countries and river basin organizations in better understanding the nexus approach and how to apply it to solve common issues as well as, ultimately, how to use the nexus approach to inform and support transboundary water cooperation.

The report aims to inform government officials, basin authorities and practitioners in water management working at different levels (local, national, inter-governmental) of governance of shared rivers, lakes and aquifers, as well as policy-makers from economic sectors, environment protection, foreign policy and finance. The Water-Food-Energy-Ecosystem Nexus Task Force under the Water Convention, which brings together the relevant resource management sectors from Parties and non-Parties, is the primary audience of this report. Other nexus-focused knowledge platforms that can reach out to policy makers and practitioners around the world – e-g- the GEF-IWLEARN, the Sustainable Water and Energy Solutions Network, the Union for the Mediterranean Task Force on Water-Energy-Food-Ecosystems Nexus- are also among relevant readership identified.

At the same time, the report aims to provide a useful stock-taking exercise for the regional and global organizations that implemented the nexus dialogues and assessments reviewed in the publication.

The nexus approach can be used to improve inter-sectoral cooperation for different purposes that go beyond the resolution of transboundary trade-offs. The stocktaking of nexus solutions and investments can inspire and guide the implementation of coordinated cross-sectoral action in areas like climate action and sustainable finance.

In relation to the work of the Water Convention, the stocktaking of nexus solutions and investments will inform, in particular, the following areas of work:

Area 2: Supporting monitoring, assessment and information sharing in transboundary basins

Area 3: Promoting an integrated and intersectoral approach to water management at all levels (including water allocation)

Area 4: Adapting to climate change in transboundary basins

Area 5: Facilitating financing of transboundary water cooperation

Preliminary results will inform discussion about future work on the nexus issues for the Programme of Work 2022-2024 in the 6th meeting of the Task Force. This meeting provides also for discussion about future work related to water allocation. In developing a Handbook on Water Allocation in a Transboundary Context (on-going as part of the Programme of Work 2019-2021), the value of broader approaches such as the nexus approach are considered.

Annex: Questionnaire Survey

The questionnaire is available via this link:

<https://forms.office.com/Pages/ResponsePage.aspx?id=2zWeD09UYE-9zF6kFubccPWx9Lb8Ey1OjaF4ZP02MHZUQVhEVIZDMVMYwUlaNDZPMVhIT0NWOENESS4u>

The questionnaire has seven sections as follows:

- **Section 1** invites the interviewee to provide a very simple problem statement
- **Section 2** takes a deeper dive into the problem(s) faced. It provides a range of possibilities, most, but not all of which, emerged from the analysis of different GEF Transboundary Diagnostic Analyses and previous studies. With one exception, the interviewee is required to click on a button.
- Once again and with two exceptions, using simple buttons, **Section 3** examines the root causes.
- If the problem has been or is being solved by means of a nexus approach **Section 4** captures the factors of success in a manner consistent with the analytical framework.
- **Section 5** examines the financing architecture of the solution, while **Section 6** attempts to capture the added value accruable to a nexus solution. If the problem could be solved using a nexus approach but is not or was not, **Section 7** applies