

Advanced draft

**MAINSTREAMING WATER SUPPLY, SANITATION,
TRANSBOUNDARY WATER MANAGEMENT AND COOPERATION
INTO NATIONALLY DETERMINED CONTRIBUTIONS AND
NATIONAL ADAPTATION PLANS**

This document was prepared in the framework of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and the Protocol on Water and Health. Countries and organizations are invited to review and provide comments on this document by 15 December 2024 to hanna.plotnykova@un.org.

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1. Background: the linkages and the importance of integrating water and sanitation services, transboundary water management, cooperation and climate change

Climate change has a significant impact on water resources, influencing the availability, quality, and distribution of fresh water. Changes in precipitation patterns, increasing frequency of extreme weather events, and rising temperatures can lead to water scarcity or flooding.

The most recent IPCC reporting cycle¹ underscores the critical relationship between climate change adaptation and mitigation and the provision of basic services such as water supply and sanitation which require proper water management and cooperation on water within and between countries. When climate change exacerbates water scarcity, that affects water availability and its quality. Increased precipitation as a result of climate change may lead to flooding, affecting water infrastructures and water quality. Increases in the frequency of extreme weather events consequently lead to disruption of these essential services. Adaptation strategies are needed to enhance the resilience of water infrastructure and services, ensuring reliable access to clean water and sanitation. Mitigation efforts, such as reducing greenhouse gas emissions, can lessen the long-term impacts of climate change on water resources. At the same time, water management and the water supply and sanitation sector can also greatly contribute to lowering emissions, while water availability is central to many mitigation efforts. Integrated approaches embracing water management, climate adaptation and mitigation are vital for sustaining basic services in a changing climate. Only in this way will they be able to contribute jointly with other basic social services - such as health, food and education - to building community resilience and adaptive capacity.

Globally, significant progress has been made in access to water supply and sanitation, yet challenges remain. According to the latest estimates from the Joint Monitoring Programme (JMP), 2.2 billion people still lack safely managed drinking water, while 3.5 billion people lack safely managed sanitation services. Despite an increase in coverage since 2015 an acceleration in efforts is necessary to meet the Sustainable Development Goal (SDG) targets. Moreover, as new water supply and sanitation systems are planned for and put in place, it is crucial that they are designed and constructed to be climate-resilient, particularly in regions highly vulnerable to climate hazards. Existing systems also require urgent upgrading to enhance resilience against the impacts of climate change, ensuring that these essential services remain reliable and accessible for all communities in the face of increasing environmental challenges.

In all, 153 countries share transboundary rivers, lakes and aquifers, which account for approximately 60 per cent of the fresh water available globally and sustain around 40 per cent of the world's population. Transboundary water management and cooperation are therefore essential for effective climate change adaptation and mitigation, as highlighted by IPCC. Climate change exacerbates water-related challenges, such as droughts, floods and changing precipitation patterns beyond national boundaries, affecting all countries that share water resources. Effective cooperation between countries is therefore crucial for managing these shared water resources sustainably, ensuring water security, and reducing climate-related risks. In addition, cooperation helps countries to adapt to climate change more efficiently though

¹ V. Masson-Delmotte and others, eds., *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (United Kingdom of Great Britain and Northern Ireland and New York, Cambridge University Press, 2021)

reducing uncertainties by sharing data, enlarging the planning space, better prioritization of measures, as well as sharing costs and benefits. Thus, collaborative efforts in transboundary water management can enhance resilience and promote efficient water use, as well as support climate change mitigation strategies by maintaining healthy ecosystems, promoting regional stability and reducing conflict over water resources.

Integrating water supply, sanitation and transboundary water management and cooperation into national climate policy, such as Nationally Determined Contributions and National Adaptation Plans, is crucial for effective climate adaptation and mitigation. Such integration ensures a coordinated approach to managing shared water resources, enhancing resilience to climate impacts, and promoting sustainable development. It allows countries to address water security, improve public health, and reduce climate-related vulnerabilities comprehensively across water dependent sectors, including agriculture and energy production. By incorporating these elements into national climate policies, countries can leverage international cooperation to achieve their climate goals and ensure the provision of essential services.

At the same time, water supply and sanitation policies, strategies and plans, as well as transboundary water management, need to integrate climate adaptation and mitigation so that they are responsive to and contribute to mitigating the impacts of climate change. Therefore, bridging national climate policy with water management policies and strategies is crucial. Moreover, climate policy implementation through coordinated action with line ministries responsible for water management and sanitation is needed to enhance the ability to respond to climate impacts. Such alignment of climate and water policies and their implementation will foster regional cooperation (including across countries), support sustainable economic growth, and help meet national and global climate and water-sanitation commitments.

2. Introduction to the document

This action-oriented document aims to illustrate why and how to integrate water supply, sanitation and hygiene (WASH), and transboundary water management and cooperation into climate policies. While it has a global scope, the document addresses both the global relevance of transboundary water management, as framed by the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention), and the regional efforts within the pan-European region under the UNECE-WHO/Europe Protocol on Water and Health. It builds on concrete examples and case studies at the regional and country levels and illustrates why said integration is crucial and beneficial, highlighting the interconnectedness of water and sanitation services, transboundary water management and cooperation and climate resilience. The document also provides recommendations on how to achieve such integration.

The document presents the results of a global analysis on how water supply, sanitation-hygiene, transboundary water management, and cooperation are currently integrated into two key climate policy documents, the NAPs and the NDCs. This analysis included a manual review of all the NAPs submitted by developing countries to the UNFCCC, as well as the use of the NDC-SDG Connections tool, which helped identify connections between the NDCs submitted by high-income and low- to middle-income nations and relevant SDG targets. It includes illustrative boxes and case studies from countries that have achieved such integration as those can serve as inspiration for other countries.

Based on the results of the analysis, the document then provides suggestions and recommendations on strengthening the integration of water supply, sanitation-hygiene, and transboundary water management and cooperation, first into NAPs, and then into NDCs, by outlining step-by-step processes for policymakers and stakeholders to follow.

The document advocates for this integration by detailing the underlying reasons, such as the interconnected nature of water, socioeconomics and environment, and the compounded impacts of climate change on society and explains why water and sanitation services and transboundary water management and cooperation are essential for the development and implementation of cohesive climate policies and, consequently, the building of climate resilience.

By addressing these points, the document aims to foster a holistic approach to water and climate policy at the national, transboundary and regional levels, ensuring sustainable and resilient water services globally.

The primary audience for this document includes:

- **Climate stakeholders:** policymakers, government officials, experts, academia and organizations involved in climate adaptation and mitigation.
- **Water managers, water supply, sanitation, and hygiene stakeholders:** agencies and organizations responsible for providing water and sanitation services.
- **Transboundary water managers:** authorities and institutions managing shared water resources, transboundary basin and regional organizations.

The document has been prepared in the framework of the Water Convention and the UNECE-WHO/Europe Protocol on Water and Health. The content of the report that relates to transboundary water management and cooperation was submitted to and welcomed by the [tenth session of the Meeting of the Parties to the Water Convention \(23-25 October 2024, Ljubljana, Slovenia\)](#).

With regards to the Water Convention, since 2006, its work, in particular under the Task Force on Water and Climate, has supported the integration of climate and water consideration and has led to the development of guidance material (e.g., the *Guidance on Water and Adaptation to Climate Change*² or the *Words into Action Guidelines: Implementation Guide for Addressing Water-related Disasters and Transboundary Cooperation*)³ and collections of good practices,⁴ which are also relevant to the objectives of this action-oriented document.

As experience in mainstreaming transboundary water management and cooperation into NDCs and NAPs is currently limited, it is foreseen that the Task Force on Water and Climate will review the lessons learned from the implementation of the action-oriented document and, if needed, further refine its recommendations.

² United Nations publication, ECE/MP.WAT/30.

³ United Nations publication, ECE/MP.WAT/56.

⁴ *Water and Climate Change Adaptation in Transboundary Basins: Lessons Learned and Good Practices* (United Nations publication, ECE/MP.WAT/45).

Box 1. The Water Convention and its Protocol on Water and Health

Water Convention

The [Convention on the Protection and Use of Transboundary Watercourses and International Lakes](#) (Water Convention) is a unique international legal instrument and intergovernmental platform which aims to ensure the sustainable use of transboundary water resources by facilitating cooperation. Initially negotiated as a regional instrument, it has been opened up for accession to all UN Member States in 2016. As of November 2024, 55 countries are Parties, including 14 from outside the Pan-European region.

Water and Health Protocol

The [Protocol on Water and Health](#), jointly serviced by [UNECE](#) and [WHO/Europe](#), is a unique legally binding instrument aiming to protect human health by better water management and by reducing water-related diseases. The Protocol provides a practical framework to implement SDGs 6, 3 and other water and sanitation related SDG targets, including those related to climate resilience as well as to translate into practice the human rights to water and sanitation and.

3. How are water supply, sanitation-hygiene, and transboundary water management and cooperation currently reflected in National Adaptation Plans and Nationally Determined Contributions?

To inform this action-oriented document, an analysis was conducted of the integration of drinking water supply, sanitation and hygiene services, transboundary water management and cooperation within climate policy frameworks, specifically focusing on NAPs and NDCs submitted to the UNFCCC.

While the scope of the analysis is global, the document examines the particular situation in relation to WASH within the pan-European Region. This region, which includes European Union countries, Western Balkans, Eastern Europe, the Caucasus, Central Asia and other countries,⁵ faces unique challenges but also opportunities due to its diverse geographic, climatic, and socio-economic conditions.

To assess the inclusion of WASH and transboundary water related elements in NDCs, the NDC-SDG Connections tool⁶ and the UNFCCC NDC Registry⁷ were used. The NDC-SDG Connections tool is an analytical platform designed to evaluate and visualize the linkages between NDCs⁸ and the Sustainable Development Goals. It provides a comprehensive assessment of how countries' climate commitments align with the broader development agenda outlined in the Sustainable Development Goals. The tool categorizes the level of priority given in NDCs to SDG6 related targets, including targets 6.1, 6.2, and 6.3 on the achievement of universal and equitable access to water and sanitation, as well as various water related topics within NDC, including "transboundary water management". It assigns scores to each country, indicating whether an SDG target or topic is considered a "high priority", an "average priority"

⁵ See <https://unece.org/member-states>.

⁶ [SDG 6 – Clean Water and Sanitation | NDC-SDG Connections \(idos-research.de\)](#)

⁷ [Nationally Determined Contributions Registry | UNFCCC](#)

⁸ Those submitted to the United Nations Framework Convention on Climate Change (UNFCCC) up to December 2023.

or a “low priority”, or if it is “not mentioned” at all. This classification system helps to identify the integration of and emphasis placed on specific issues within national climate policies.

Unlike NDCs, no analogous tool exists for NAPs. Therefore, the 58 NAPs submitted (only by developing countries) to the UNFCCC NAP Registry up to October 2024 were all reviewed manually. Countries were classified based on the same priority scale used by the NDC-SDG Connections tool.

All information compiled from the analysis of NAPs and NDCs was consolidated into a database containing detailed insights into the integration of water supply, sanitation-hygiene, transboundary water management and cooperation across different national climate policies.

Box 2. Reporting obligations for Annex I and non-Annex I countries under the UNFCCC

Annex I Countries

Annex I countries, which include developed nations, are required to report on their adaptation efforts as part of their National Communications (NCs) and Biennial Reports (BRs). These reports must detail how they are addressing climate impacts, including the implementation of adaptation measures, assessment of vulnerabilities, and progress toward the global goal on adaptation. They are also expected to provide information on financial, technological, and capacity-building support provided to non-Annex I countries for adaptation purposes.

Non-Annex I Countries

Non-Annex I countries, primarily developing nations, are encouraged to include information on their adaptation efforts in their National Communications as well, but their reporting obligations are generally less stringent. Under the Cancun Adaptation Framework, adopted during COP16 in 2010, non-Annex I countries are encouraged to formulate and implement NAPs to enhance their adaptive capacity to climate change.

The NAP process is intended to assist these countries in identifying and addressing their vulnerabilities, setting adaptation priorities, and integrating adaptation strategies into national development plans. While the submission of NAPs is not legally binding, it reflects an expectation from the UNFCCC that non-Annex I countries will proactively engage in planning for adaptation in order to build resilience against climate impacts.

Moreover, the submission of NAPs provides a structured approach for countries to communicate their adaptation needs and priorities to the international community, facilitating access to financial and technical support for their adaptation initiatives. This process aligns with the overarching goal of the UNFCCC to promote sustainable development and climate resilience globally.

3.1. Analysing the integration of water supply, sanitation and hygiene into NAPs

In the analysis of the inclusion of water supply, and sanitation-hygiene in the 58 NAPs submitted to the UNFCCC NAP registry by September 2024, the methodology involved searching manually for key terminology related to the topics:

- For water supply: including terms such as "water supply," "drinking water," and "potable water,"

- For sanitation and hygiene: including the terms such as “sanitation/ sanitary,” “latrine / toilet,” “wastewater /water recovery / water reuse,” “sludge / excreta / sewage / sewerage,” “biogas,” “grey / yellow / brown / black water,” and “hygiene”.

Variations of these terms to ensure comprehensive coverage were included in the search. For NAPs submitted in Spanish and French, translated versions of the search terms were used in the analysis. Countries have been classified based on the same priority scale used by the NDC-SDG Connections tool.

Table 1 shows the set of countries where the analysis has found that the integration of water supply, and then, sanitation and hygiene in their NAP could be ranked as high priority.

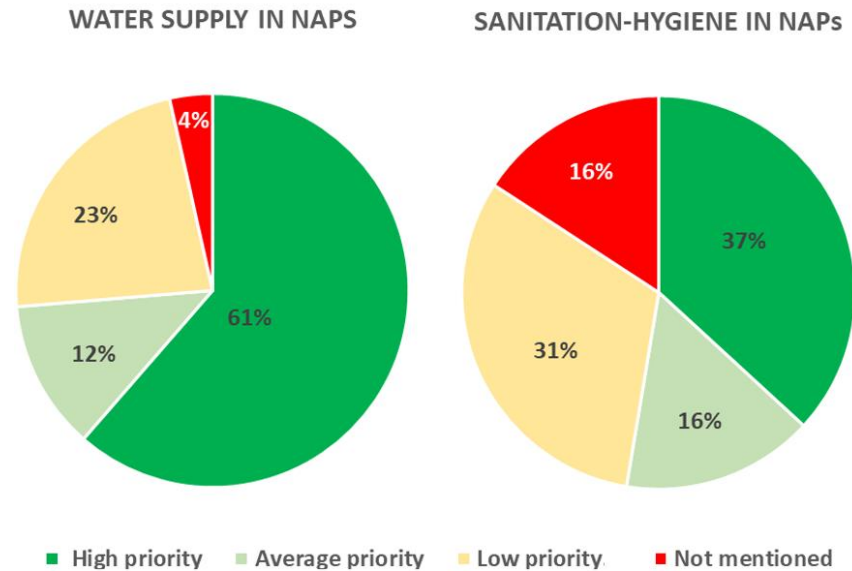
Table 1. Countries currently integrating water supply and sanitation-hygiene into their NAP as high priority

	Countries			
Water Supply	Argentina	Central African Republic	Madagascar	South Sudan
	Bangladesh	Chad	Morocco	Sri Lanka
	Benin	Chile	Mozambique	State of Palestine
	Bhutan	Colombia	Nepal	Suriname
	Bosnia Herzegovina	Costa Rica	Pakistan	Timor Leste
	Brazil	Fiji	Peru	Trinidad and Tobago
	Burkina Faso	Grenada	Philippines	Uruguay
	Cabo Verde	Guatemala	Saint Lucia	Zambia
	Bangladesh	Kiribati	Sierra Leone	
Sanitation-hygiene	Argentina	Fiji	Nepal	South Sudan
	Bangladesh	Kiribati	Pakistan	State of Palestine
	Bhutan	Madagascar	Peru	Suriname
	Brazil	Morocco	Philippines	Uruguay
	Burkina Faso	Mozambique	Saint Lucia	Zambia
	Costa Rica			

Figure 1 shows the classification of water supply and sanitation-hygiene integration into developing countries’ NAPs, including the percentage of countries that fall under each classification.

The result is that 61 per cent of the NAPs have been found to integrate water supply as a high priority, with three or more relevant adaptation actions, while 37 per cent have prioritized at the same level sanitation and hygiene. Another set of NAPs, corresponding to a 16 per cent for water supply, and 12 per cent for sanitation and hygiene, do include these thematic areas as an average priority. This means that those NAPs include for each thematic area two relevant adaptation priorities. A set of NAPs, corresponding to a 23 percent for water supply and 31 per cent for sanitation and hygiene have been found to only make one relevant adaptation priority in each of those themes. Finally, 4 percent of NAPs for water supply and 16 of NAPs for sanitation and hygiene do not include any adaptation priority related to the themes surveyed.

Figure 1. Integration of water supply and sanitation-hygiene among submitted NAPs



While the global analysis highlights varying degrees of integration of water, sanitation, and hygiene into NAPs, the situation within the pan-European Region merits closer examination. In this region, five countries have submitted NAPs to the UNFCCC up to October 2024:

1. Albania (submitted in 2021)
2. Armenia (submitted in 2021)
3. Bosnia and Herzegovina (submitted in 2022)
4. Republic of Moldova (submitted in 2024)
5. Serbia (submitted in 2024)

Among those five countries Bosnia and Herzegovina has been found as the only one to integrate water supply as high priority in its NAP, while none of them integrate sanitation/hygiene as a high priority. In this context is important to highlight that many Pan-European countries have developed national adaptation strategies and plans as part of their climate change response efforts. However, and based on the different reporting obligations for Annex I (developed countries) and Annex II (mostly developing nations) of the UNFCCC, several of these countries have not formally submitted them to the UNFCCC. Indeed, many countries in the Pan-European region have already established national adaptation strategies before the formal NAP process under the UNFCCC was introduced (See box above).

For EU member states, climate adaptation is addressed within the EU Adaptation Strategy, which encourages member states to implement and coordinate their adaptation efforts. In this context is important to note that while the European Union submits a single joint NDC on behalf of all member states, EU member states are responsible for formulating their own adaptation plans and submitting their adaptation communications to the UNFCCC if they choose to do so.

These factors indicate that while pan-European countries are actively engaged in climate adaptation planning, the formal submission of a NAP to the UNFCCC has so far been not be prioritized due to existing national or regional frameworks that address climate adaptation effectively.

Brief case studies, in the form of boxes below, show how water supply and sanitation/hygiene are included in the NAPs of Bosnia and Herzegovina, and Morocco. Those are two of the countries where the global analysis has concluded that these topics are included in their respective NAPs as a high priority.

Box 3. Integration of water supply in Bosnia and Herzegovina's NAP⁹

Bosnia and Herzegovina faces significant challenges from climate change, particularly concerning water resources. With increased variability in precipitation patterns, rising temperatures, and an expected rise in the frequency of extreme weather events, water security is a critical issue for the country. Addressing these risks through an integrated approach to water resource management is vital for maintaining resilience across key sectors, including agriculture, health, and urban planning. Recognizing these challenges, Bosnia and Herzegovina's NAP emphasizes the importance of safeguarding water supply and ensuring long-term sustainability in the face of these climatic threats.

In its National Adaptation Plan, Bosnia and Herzegovina has prioritized the following key measures to strengthen its water supply resilience:

1. **Feasibility study for retentions and reservoirs** – to assess water storage solutions that can help manage water supply during periods of drought or variable rainfall.
2. **Upgrading the hydrological forecasting system** – enhancing early warning capabilities to predict floods and droughts.
3. **Surface and groundwater quality monitoring** – ensuring water quality, particularly in areas vulnerable to contamination, through improved monitoring of both surface and groundwater bodies.
4. **Reduction of water losses in water supply systems** – addressing inefficiencies in water distribution systems, starting with the preparation of a study to reduce losses.
5. **Study on the impact of climate change on water resources** – analysing the long-term effects of climate change on the country's water supply, with particular attention to floods and water scarcity.
6. **Monitoring the quality of drinking water in rural areas** – ensuring that rural communities maintain access to safe drinking water, which is particularly vulnerable to climate-related impacts.

These initiatives underscore Bosnia and Herzegovina's commitment to ensuring a climate-resilient water supply system that can adapt to both immediate and long-term challenges posed by climate change.

Box 4. Integration of sanitation and hygiene in Morocco's NAP¹⁰

Morocco's National Adaptation Plan (NAP) highlights the critical importance of addressing water and sanitation challenges as the country faces increasing climate vulnerabilities, such as droughts, floods, and rising temperatures. Sanitation, in particular, is vital for ensuring public health, reducing pollution, and enhancing resilience in both rural and urban settings. The NAP acknowledges that improving sanitation services can help mitigate the impacts of climate change by reducing the exposure of vulnerable populations

⁹ Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina. (2021). *National Adaptation Plan of Bosnia and Herzegovina*.

¹⁰ Ministère de l'Équipement, du Transport, de la Logistique et de l'Eau du Maroc. (2021). *Plan National d'Adaptation au Changement Climatique du Maroc*.

to waterborne diseases and improving water quality, particularly in areas where water scarcity and contamination risks are heightened due to climate variability.

Key sanitation-related priorities in the NAP include:

1. **Adopting new technical standards for sanitation infrastructure** to improve functional capacity, particularly in regions vulnerable to floods and water flow changes. This measure ensures that sanitation systems are more resilient to extreme weather events, safeguarding both human health and environmental quality.
2. **Promoting ecological sanitation models** in rural areas, focusing on households, small farms, public institutions (e.g., schools, mosques), and collective solutions for small communities. These models aim to increase sanitation coverage while adapting to the specific needs and conditions of rural regions.
3. **Widespread adoption of autonomous collective sanitation systems in oases** – a region highly vulnerable to climate impacts. This initiative helps protect fragile ecosystems while maintaining sanitation services for local populations.
4. **Implementing stormwater and sanitation management plans** for all new housing developments, ensuring that climate risks are fully integrated into urban planning processes.
5. **Developing wastewater reuse projects** to mobilize 340 million m³ of treated water by 2050. This project reflects Morocco’s strategic focus on enhancing water reuse as part of its climate resilience and resource efficiency efforts.

This case study reflects Morocco’s efforts to build climate-resilient sanitation systems, ensuring that these services can withstand future climate-related challenges.

3.2. Analysing the integration of water supply, sanitation and hygiene into NDCs

In the analysis of the inclusion of water supply, and sanitation/hygiene in the NDCs submitted to the UNFCCC, the most recent datasets provided by the NDC-SDG Connections Tool¹¹ have been used and adapted. Those data bases comprise the updated NDCs from 144 countries as of May 31st 2024.

For water supply, the integration in NDCs has been assessed through the NDC-SDG connection to SDG6 target 6.1 to “achieve universal and equitable access to safe and affordable drinking water for all.”

For sanitation and hygiene, the integration in NDCs has been assessed through the NDC-SDG connection to SDG6 targets 6.2 to “achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations,” and also target 6.3 to “improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.”

The set of countries having water supply and sanitation-hygiene ranking as high priority are shown in Table 2. A broader analysis is shown in figure 2, including the percentage of countries that fall under each classification.

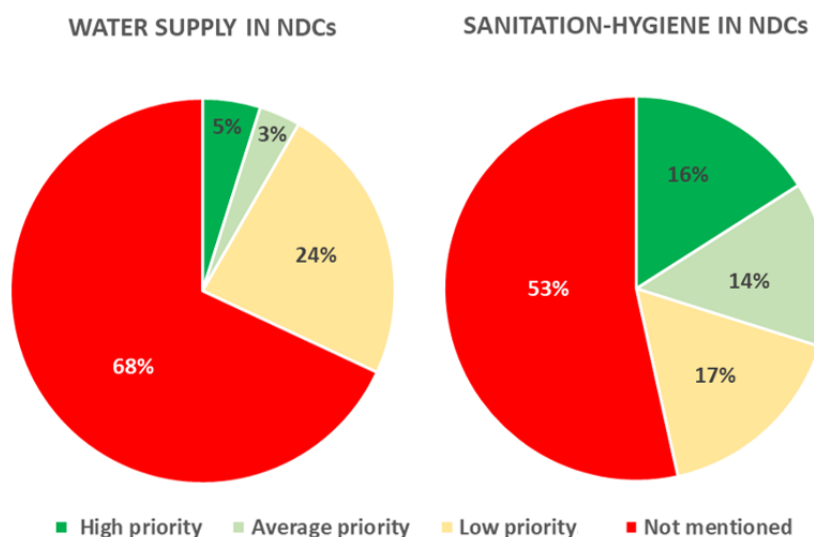
¹¹ Dzebo, A., Banerjee, A., Iacobuță, G., & Beaussart, R. (2024). NDC-SDG Connections: Data on updated NDC submissions (V2) (1.1.0) [Data set]. German Institute of Development and Sustainability (IDOS), Stockholm Environment Institute (SEI). <https://doi.org/10.5281/zenodo.11400384>

Table 2. Countries currently integrating water supply and sanitation-hygiene into their NDC as high priority

	Countries			
Water Supply (SDG6 Target 6.1)	Angola Bolivia	Congo Nicaragua	Paraguay Turkiye	Vanuatu
Sanitation-hygiene (SDG6 Targets 6.2 and 6.3)	Bolivia Cape Verde Central African Republic Chad Colombia	Costa Rica Eswatini Guinea Bissau Haiti Jordan Kazakhstan	Morocco Myanmar Nauru Niger Paraguay Republic of Moldova	Tanzania Turkiye Uganda Uruguay Venezuela Vietnam

The result is that 5 and 16 per cent of the updated NDCs up to May 2024 have integrated water supply and sanitation/hygiene respectively as a high priority (more than 3 activities prioritized in the NDC for each of the two thematic areas). Another set of NDCs, corresponding to a 3 and 14 percent respectively, do include as an average priority aspects of water supply and sanitation-hygiene (two activities prioritized in the NDC for each thematic area). Then, 24 and 17 per cent of NDCs only include one prioritized action for water supply and sanitation and hygiene respectively and therefore those are considered as including those themes as a low priority. Finally, 68 per cent of NDCs do not include any priority related to water supply and 53 per cent of them do not include any priority related to sanitation and hygiene.

Figure 2. Integration of water supply and sanitation-hygiene among updated NDCs (May 31st 2024)



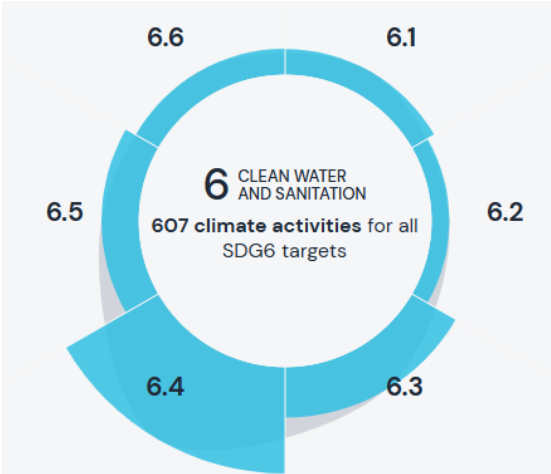
An immediate conclusion that can be extracted is that integration of water supply and sanitation-hygiene into NDCs is lower than in NAPs submitted to the UNFCCC. A plausible explanation might be that most of

the references to these thematic areas are related to adaptation options, and while those are reflected in NAPs, many countries have not transposed those as adaptation priorities in their respective NDCs. Another interesting finding is that in the case of NAPs more countries have included water supply (as opposed to sanitation/hygiene) as a high priority, while for NDCs is the opposite. A potential explanation is that the analysis of sanitation in NDCs, through the NDC-SDG connections tool has included the connections to SDG targets 6.2 and 6.3 and there might be elements of target 6.3 related to water quality or target 6.4 related to water scarcity that perhaps should be considered connected to water supply. Table 3 describes the number of activities prioritized in the updated NDCs in relation to water supply and sanitation/hygiene and in connection to SDG targets 6.1, 6.2, and 6.3. Figure 3 provides a wider perspective showing the weight of activities prioritized in updated NDCs corresponding to all SDG 6 targets. There, it can be seen that the highest number of activities prioritized correspond to SDG target 6.4 aiming to increase water use efficiency and sustainable withdrawal and to reduce water scarcity.

Table 3. Number of water supply, sanitation-hygiene activities prioritized in NDCs

Number of activities related to water supply in connection to SDG Target 6.1	Number of activities related to sanitation-hygiene in connection to SDG Target 6.2	Number of activities related to sanitation-hygiene in connection to SDG Target 6.3
67 activities	46 activities	132 activities

Figure 3. How do countries’ NDC activities connect with SDG 6?¹²



¹² Source: [SDG 6 – Clean Water and Sanitation | NDC-SDG Connections \(idos-research.de\)](https://www.idos-research.de/publications/SDG-6-Clean-Water-and-Sanitation-NDC-SDG-Connections)

A brief case study, in the form of a box below, shows how water supply is included as high priority in the NDC of Paraguay.

Box 5. Integration of water supply in Paraguay's NDC¹³

In Paraguay, access to safe drinking water and the efficient use of water resources is a critical component of the country's climate adaptation strategy, as reflected in its updated 2021 NDC. The country recognizes the challenges posed by climate change, particularly in terms of water resource availability and quality, which are essential for maintaining public health and supporting key economic activities such as agriculture.

The NDC emphasizes the importance of securing safe drinking water by promoting technologies for water collection, storage, and efficient usage, particularly in areas that are vulnerable to climate variability. Paraguay prioritizes:

- Access to safe water and the promotion of its efficient use through appropriate technologies for collection and storage, considering local vulnerabilities and climate variability.
- Promoting the use of appropriate technologies that ensure water availability, particularly for vulnerable groups and in different regions of the country.
- Empowering women as agents of change in accessing and using water efficiently, both for consumption and in productive processes.

By focusing on these areas, Paraguay aims to address existing gaps and ensure that its population, especially vulnerable communities, has access to reliable water supply systems that are resilient to the impacts of climate change

Within the pan-European region is important to note that the EU submits a single joint NDC representing all 27 EU Member States, meaning that individual EU countries do not submit separate NDCs.

The EU's updated NDC¹⁴ is primarily focused on mitigation, as the bulk of the document outlines efforts to reduce greenhouse gas emissions, especially through initiatives like the EU Emissions Trading System, renewable energy targets, and energy efficiency measures. There is minimal emphasis on adaptation strategies, with the document predominantly concerned with achieving the legally binding target of a 55% reduction in emissions by 2030 compared to 1990 levels. In this context, water is mentioned only twice, specifically in relation to maritime emissions (as part of transport regulation) and alternative fuels for ships. There is no mention of sanitation, highlighting the EU's greater focus on energy and industrial processes than on water or sanitation infrastructure in this context.

In relation to other countries within the pan-European region, an extended dataset, beyond the one used for the global analysis that comprises 144 countries, has been used. The result of the analysis is that only six countries: Albania, Kazakhstan, Republic of Moldova, Tajikistan, Turkiye and Uzbekistan include in their NDCs priorities that relate to water supply and sanitation-hygiene. Among them, only Turkiye and Kazakhstan, have been found to integrate them as a high priority as described in box 6 below. For the other five countries, Table 4 describes some of the most relevant water supply and sanitation-hygiene in their NDCs.

¹³ **Government of Paraguay. (2022).** *Actualización de la Contribución Nacionalmente Determinada (NDC).* Ministerio del Ambiente y Desarrollo Sostenible (MADES).

¹⁴ [Microsoft Word - ES-2023-10-17 EU submission NDC update.docx \(unfccc.int\)](#)

Table 4. Water supply and sanitation-hygiene priorities in four pan-Europe NDCs

Albania	<ul style="list-style-type: none"> • Increase of the rate of connection of the urban population to shallow anaerobic lagoons. • Wastewater treatment in industry: Increase of the total industry product evolution until 2030
Republic of Moldova	<ul style="list-style-type: none"> • Increase the level of water recycling for industrial and domestic needs. • Improve treatment of wastewater and domestic water. • Stimulate private sector investments in water resources development, water supply and sanitation
Tajikistan	<ul style="list-style-type: none"> • Stricter regulation of wastewater treatment and discharge, providing backup systems for storage water resources management
Uzbekistan	<ul style="list-style-type: none"> • Expand sectoral programs for domestic and industrial wastewater treatment

Box 6. Integration of water supply, sanitation and hygiene in Turkiye and Kazakhstan’s¹⁵ NDCs

Turkey's updated Nationally Determined Contribution (NDC) emphasizes the importance of water management in addressing climate challenges. The country aims to enhance its water management systems, focusing on increasing the efficiency of water use and addressing the impact of climate change on water resources.

Key priorities outlined in Turkey's NDC include:

- **Water allocation and basin management:** Turkey prioritizes the development of river basin management plans for all 25 river basins in the country. These plans will ensure that water resources are allocated efficiently across sectors, including agriculture, industry, energy production, and ecosystem maintenance, to ensure equitable and sustainable access to water.
- **Reduction of water losses in distribution networks:** One of the key targets is to reduce drinking water distribution network losses to 25% for metropolitan and provincial municipalities. This will help improve water security by addressing inefficiencies in water supply systems.
- **Expansion of wastewater reuse:** Turkey plans to increase the reuse of treated wastewater across various sectors, including agricultural irrigation, industrial use, and groundwater recharge. By 2030, the country aims to increase the reuse rate of treated wastewater to 15%, supporting sustainable water management practices.
- **Promotion of climate Resilience in Water and Sanitation:** To ensure the resilience of water supply and sanitation systems, Turkey will focus on rainwater harvesting and the reuse of greywater. The country also aims to implement drinking water safety plans and expand the use of treated wastewater for wetlands restoration, especially in areas facing degradation or drought.

These actions reflect Turkey's commitment to adapting its water supply and sanitation infrastructure to cope with the impacts of climate change while enhancing the sustainability and resilience of its water systems.

Kazakhstan’s 2021-2030 NDC emphasizes the critical need to protect water ecosystems and improve sanitation services as part of its climate resilience and adaptation strategy. Water pollution and industrial

¹⁵ **Government of Kazakhstan. (2023).** *Updated Nationally Determined Contribution (NDC).* Kazakhstan Government Decree No. 313.

contamination pose significant risks to the country’s water supply and public health, and Kazakhstan has identified several key actions related to wastewater management and sanitation in its NDC.

The prioritized sanitation-related activities include:

- Protection of water ecosystems from contamination, particularly by industrial activities, to ensure clean and safe water is available for consumption and use.
- Implementing projects to increase the coverage of the population with wastewater treatment in urban areas. This will enhance the efficiency of wastewater management and improve overall sanitation services across cities.
- Supporting the Central Asian regional programme on climate adaptation, which focuses on protecting water quality and promoting the joint management of transboundary rivers. This includes agreements on the protection and sustainable use of shared water resources, crucial for maintaining sanitation standards across borders.

By addressing these key areas, Kazakhstan aims to improve the sustainability of its water systems, ensuring that water resources remain safe for both consumption and sanitation, even as climate change increases the risk of water scarcity and contamination.

3.3. Analysing the integration of transboundary water management and cooperation into NAPs

In the analysis of the inclusion of transboundary water management and cooperation in the 57 NAPs submitted to the UNFCCC NAP Registry by September 2024, the methodology involved searching manually for key terminology related to transboundary water cooperation, including terms such as “transboundary”, “cross-border”, “regional and international cooperation”, “water basin”, “watershed” and “water management”. Variations of these terms to ensure comprehensive coverage were included in the search. For NAPs submitted in French and Spanish, translated versions of the search terms were used in the analysis. Countries were classified based on the same priority scale used by the NDC-SDG Connections tool.

Among the 57 submitted NAPs there are 11 countries for which transboundary water cooperation does not apply as they are island States. Table 5 shows the set of countries where the analysis found that the integration of transboundary water cooperation into their NAP could be ranked as “high priority” or “average priority”.

Table 5. Countries currently integrating transboundary water management and cooperation into their National Adaptation Plans as “average priority” or “high priority”

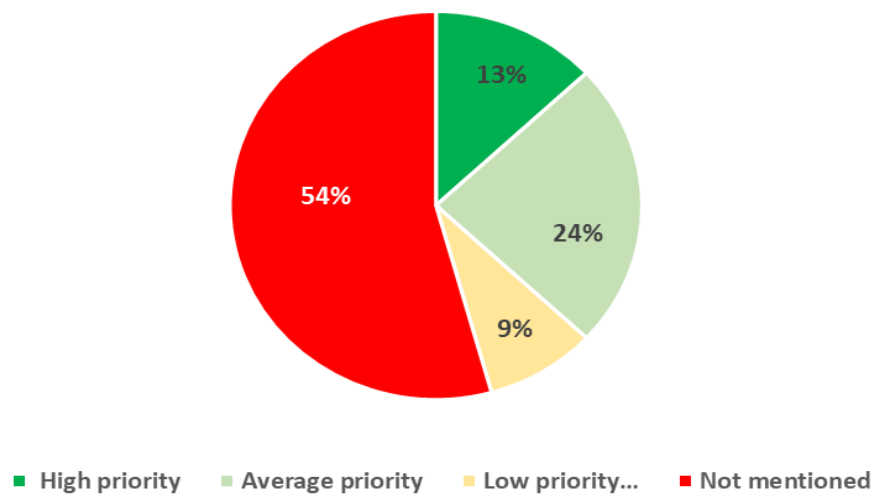
Priority level	Countries
High	Albania Argentina Bangladesh South Sudan State of Palestine Timor Leste

Average	Brazil Cambodia Central African Republic Chad Kenya Niger	Pakistan Sierra Leone Sudan Thailand Uruguay
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Figure 4 shows the classification of transboundary water management and cooperation integration into NAPs only for countries where this can apply (i.e. surface water or groundwater bodies can run across borders), including the percentage of countries that fall under each classification.

The result is that 13 per cent of the NAPs, for which cross-border and transboundary waters apply, were found to integrate transboundary water management or cooperation as a “high priority”. Another set of NAPs, corresponding to 24 per cent, do include aspects of transboundary water cooperation but this issue is normally either mentioned as a background issue or in the context of the water resources references made in the NAP, but without singling out the above-mentioned topics as priority for adaptation. A set of NAPs, corresponding to 9 per cent, have been classified as having integrated transboundary water management as “low priority”, meaning transboundary issues might have been reflected but for other sectors (e.g., transport, migration), or emphasis is placed on river basin management but with no specific references being made to transboundary waters.

Figure 4. Integration of transboundary water management and cooperation among submitted National Adaptation Plans with cross-border water bodies



Brief case studies, in the form of boxes 7 and 8 below, show how transboundary water management and cooperation are included in the NAPs of, respectively, Albania, and Bangladesh. Those are two of the countries where the analysis concluded that these topics are included in their respective NAPs as a “high priority”.

Box 7. Integration of transboundary water management and cooperation into the National Adaptation Plan of Albania¹⁶

Albania is highly dependent on its water resources for various sectors such as agriculture, energy and domestic use. While the country comprises seven river basins (Drin-Buna, Ishem, Erzen, Mat, Seman, Shkumbin, Vjosa), two of them are transboundary basins (Drin-Buna and Vjosa) shared with neighbouring countries such as Greece, Montenegro and North Macedonia.

The country has developed an Integrated Water Resources Management Strategy for the period 2018–2027 to promote the coordinated development and management of water, land and related resources, in order to maximize the resulting economic and social benefits in an equitable manner without compromising the sustainability of vital ecosystems. Climate change impacts were reflected in the Integrated Water Resources Management Strategy to enhance resilience of water resources against climate change. However, the NAP of Albania explains that, as such, the Strategy does not develop detailed action plans for the different sectors (i.e. agriculture, energy, water supply) but will include an overall action plan that will serve as an overall policy framework setting conditions for water sector-wide related strategies.

Following on from the Strategy, priority action 8 of the NAP of Albania outlined specific measures for concrete transboundary watersheds. First, two pilots were launched for the Drin-Buna River basins. These comprise the development of River Basin Management Plans aiming at considering climate change impacts, especially regarding drought and flood risks. Indeed, after the formulation of the NAP, the Drin-Buna River Basin Management Plan was approved and is currently being implemented. Said Management Plan is expected to be revised to further strengthen transboundary cooperation within the basins.

The NAP also reflects on the development of the River Basin Management Plan for the Vjosa transboundary basin. Currently a Flood Risk Management Plan for this basin is being prepared with the expertise of a project on Flood Risk Management Plans for the Erzen, Ishem, Shkumbin, Seman and Vjosa Rivers, through the Western Balkans Investment Framework.

NAP priority action 8 includes indicators to track whether the transboundary effect of climate change has been taken into account when developing River Basin Management Plans, and whether climate change is considered by the transboundary organizations for the related basins.

Annex 3 to the NAP provides detailed project descriptions, including some that have been already completed, such as project 1, which is dedicated to enhancing regional water cooperation and capacity in addressing risks posed by meteorological and hydrological hazards, as well as new risks posed by a changing climate, with a focus on:

- Enhancing regional networking and coordination in disaster risk reduction support to water resources management in the Drin-Buna River basin.
- Strengthening cross-border cooperation in disaster risk management.
- Enhancing regional capacity to supply/share/exchange data and information in the field of disaster risk reduction.

Box 8. Integration of transboundary water management and cooperation into the National Adaptation Plan of Bangladesh¹⁷

¹⁶ **Republic of Albania. (2024).** *National Adaptation Plan to Climate Change in Albania: Framework for the Country Process.* Ministry of Tourism and Environment, Republic of Albania.

¹⁷ **Government of the People's Republic of Bangladesh. (2023).** *National Adaptation Plan of Bangladesh (2023–2050).* Ministry of Environment, Forest and Climate Change.

Bangladesh, located in the delta region of the Ganges, Brahmaputra and Meghna Rivers, faces significant challenges in managing its transboundary water resources. The country's dependence on these rivers, which flow through multiple countries before reaching Bangladesh, necessitates robust transboundary water cooperation to ensure water security, mitigation of flood risks and adaptation to climate change impacts. Effective management of these shared water resources is crucial for the sustainable development and resilience of Bangladesh.

The NAP of Bangladesh explicitly addresses the importance of transboundary water cooperation. Several sections of the NAP highlight how this aspect is integrated into national climate adaptation strategies.

The NAP identifies the significant risks and vulnerabilities associated with the transboundary nature of the country's major rivers. It acknowledges that upstream activities and climate change impacts in neighbouring countries can exacerbate flooding, sedimentation and water scarcity in Bangladesh. The document stresses the need for regional cooperation to manage these risks effectively and enhance the resilience of water resources.

In a section of the NAP of Bangladesh on water resources interventions, high priority is assigned to transboundary river basin management and basin-level cooperation. The following activities are outlined:

- Strengthening bilateral and multilateral water diplomacy with transboundary countries for enhanced cooperation in basin-wide management.
- Knowledge and information exchange with similar transboundary basin countries.
- Development of negotiation skills among young water professionals.

Also under key water resources adaptation interventions, the NAP highlights the development of a basin-wide and participatory watershed management framework to restore, store and optimize the use of water resources. This includes a specific activity to develop an institution for effective basin-wide management within and among transboundary countries.

Under the NAP section on prioritized interventions for ecosystems, wetlands and biodiversity, the following activities are proposed:

- Development of a policy for water diplomacy and transboundary negotiation for the use of upstream water with equal rights.
- Participatory watershed management through step farming and terrace plantations for increasing stream water in hilly areas.
- Development of ecological hydrographs for all large flood plains.
- Intensive community consultation and involvement of local knowledge to enhance and maintain flood plain ecosystems.

3.4. Analysing the integration of transboundary water management and cooperation into Nationally Determined Contributions

For countries identified with the NDC-SDG Connections tool as having transboundary water management and cooperation integrated into their NDC as an “average priority” or higher, the respective NDCs were downloaded and analysed manually to examine how transboundary water management and cooperation are integrated. This led to very few readjustments to the ranking. For example, while the analytical tool classifies 15 countries as having transboundary water management and cooperation integrated into their NDC as an “average priority”, and no NDC is classified as having transboundary water management and cooperation as “high priority”, a detailed look at the NDCs suggests that 3 countries can be considered as having this thematic area as “high priority”. On the other hand, no

references to transboundary water management or cooperation were found in 5 of the 15 countries. The adjusted set of countries having transboundary water management and cooperation ranking as “high priority” or “average priority” are shown in table 6. A broader analysis is shown in figure 2, including the percentage of countries that fall under each classification.

Table 6. Countries currently integrating transboundary water management and cooperation into their Nationally Determined Contribution as “average priority” or “high priority”

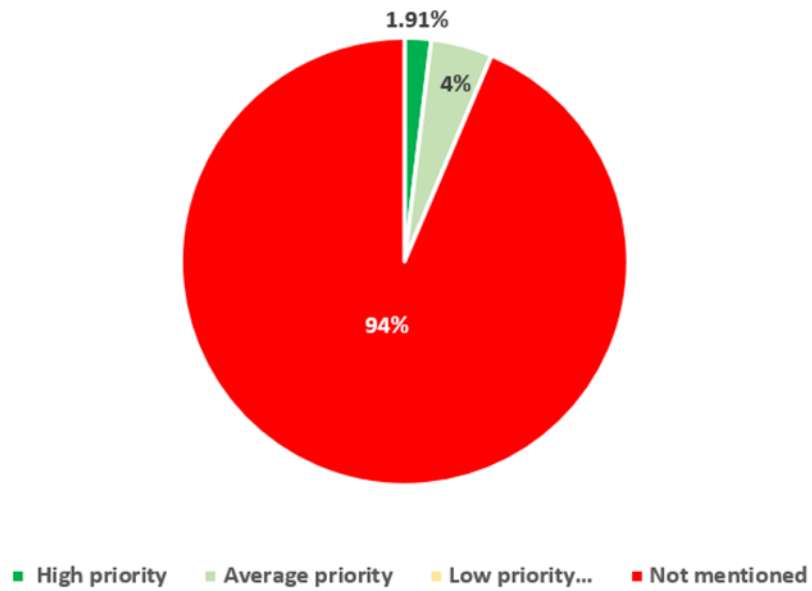
Priority level	Countries
High	Guinea Jordan Kazakhstan
Average	Egypt Nicaragua Paraguay Rep. of Moldova Bolivarian Rep. of Venezuela United Rep. of Tanzania Uruguay Uzbekistan

In total, 197 NDCs were presented up to December 2023. It must be noted, however, that for 40 of those NDCs, representing 20 per cent of the NDCs submitted, the topic of transboundary water management or cooperation does not apply. That is the case for NDCs submitted from island States (other exemptions apply, e.g., to the NDC submitted by the Holy See). Figure 5 shows the classification of transboundary water management or cooperation integration into NDCs only for the 157 NDCs where transboundary water management and cooperation can apply in principle (i.e. surface water or groundwater bodies can run across borders).

The result is that less than 2 per cent of the NDCs for which transboundary waters apply have integrated transboundary water management and cooperation as “high priority”. Another set of NDCs, corresponding to 4 per cent, do include aspects of transboundary water management and cooperation; however, it is normally either mentioned as a background issue or in the context of the water resources references made in the NDC, without it being translated into priority action lists or interventions for either climate mitigation or adaptation. No NDC was found to be classified as having integrated transboundary water management and cooperation as “low priority”, which could mean that very soft or indirect references are made to transboundary waters.

One immediate conclusion that can be drawn is that integration of transboundary water management and cooperation into NDCs is even much lower than in NAPs. A plausible explanation might be that most of the references to transboundary water management and cooperation are related to adaptation options, and while those are reflected in NAPs, countries have not transposed them as adaptation priorities to their respective NDCs.

Figure 5. Integration of transboundary water management and cooperation among Nationally Determined Contributions with cross-border water bodies



Brief case studies, in the form of boxes 9–11, show how transboundary water management and cooperation are included in the NDCs of, respectively, Guinea, Jordan and Kazakhstan. Those are the three countries where the analysis concluded that transboundary water management and cooperation are included in their respective NDCs as “high priority”.

Box 9. Integration of transboundary water management and cooperation into the Nationally Determined Contribution of Guinea¹⁸

Transboundary water management remains essential for Guinea, not because of a reliance on water inflows, but due to the country's critical role as the upstream source for several key river basins that support the region's water supply, agriculture and energy generation. The main river basins shared with other countries include the Niger, shared by Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Guinea, Mali, Niger and Nigeria; the Senegal, shared by Guinea, Mali, Mauritania and Senegal; and the Gambia River, shared by the Gambia, Guinea, Guinea-Bissau and Senegal. These rivers require cooperative management to address the risks of climate change, such as variability in water flow and increased frequency of extreme weather events.

The revised NDC of Guinea, submitted in July 2021, emphasizes the importance of transboundary water management, particularly concerning the country's major river basins. Specifically, under commitment 1 of the adaptation plan, Guinea prioritizes the following three interventions:

- Preservation and restoration of riparian forests, springheads, banks and riverbeds, particularly on transboundary rivers, through the development of integrated water resource management action plans.
- The search for alternatives to the financing of activities to preserve degraded transboundary river basins and the degradation of water quality (linked to brick factories, dredging of riverbeds for minerals mining).
- Integration of the climate change dimension into all institutional and legal frameworks and basin bodies responsible for the management and development of transboundary watersheds.

Box 10. Integration of transboundary water management and cooperation into the Nationally Determined Contribution of Jordan¹⁹

Jordan, one of the world's most water-scarce countries, faces significant challenges in managing its water resources. These challenges are exacerbated by its reliance on transboundary water sources such as the Jordan River and groundwater aquifers shared with neighbouring countries. Effective transboundary water management is essential for Jordan to ensure water security, mitigate conflicts, and enhance resilience to climate change impacts.

The updated NDC of Jordan, submitted in October 2021, emphasizes the importance of comprehensive watershed and basin-level management, which includes transboundary water resources. The NDC states that, since climate change impacts are witnessed at ecosystem levels, especially affecting the most vulnerable ecosystems, it is imperative that water adaptation plans in Jordan be based on a watershed or water basin management unit in order to integrate all elements of ecosystem management. Key measures to be taken, as outlined in the NDC, include:

- Identifying the vulnerability of surface water and groundwater basins to climate change and developing the required adaptation measures.
- Rehabilitating and restoring key watersheds in Jordan for enhanced retention of surface water and recharge to groundwater.
- Improving the quality of surface water and groundwater by enforcing laws to prevent dumping/pollution and/or offering incentives for clean-up and restoration of watersheds and basins.

¹⁸ **Government of the Republic of Guinea. (2021).** *Contribution Déterminée au niveau National (CDN) de la République de Guinée.* Ministry of Environment, Waters and Forests, Republic of Guinea.

¹⁹ **Government of the Hashemite Kingdom of Jordan. (2021).** *Updated Submission of Jordan's 1st Nationally Determined Contribution (NDC).* Ministry of Environment, Hashemite Kingdom of Jordan.

- Ensuring a reliable supply of water to protect and restore critical water-related ecosystems, including forests, wetlands, rivers, aquifers and lakes.
- Developing pragmatic management plans for transboundary watersheds that are shared with neighbouring countries and are not sustainably or effectively protected by political agreements.

The NDC of Jordan also includes provisions for a robust monitoring, reporting and verification system. This system is designed to track progress in various areas, including transboundary water management, and can facilitate transparency and accountability in how transboundary water resources are managed and how cooperation efforts are implemented. By incorporating transboundary water management and cooperation into the monitoring, reporting and verification system, Jordan can ensure that data and insights are shared with neighbouring countries, fostering a collaborative approach to addressing common water challenges.

Box 11. Integration of transboundary water management and cooperation into the Nationally Determined Contribution of Kazakhstan²⁰

Kazakhstan, the world’s largest landlocked country, faces significant challenges in managing its water resources due to its arid climate and the transboundary nature of many of its water bodies. Key rivers, including the Irtysh, Ural, Syr Darya and Ili, originate outside the country’s borders, making international cooperation critical for sustainable water management. Climate change exacerbates these challenges by increasing the variability of water availability and the frequency of extreme weather events.

The updated NDC of Kazakhstan, approved in April 2023, highlights the need for intersectoral and interregional cooperation, especially given the limited water resources and the strategic importance of the basin approach for managing these resources effectively.

The NDC of Kazakhstan outlines specific actions to improve water management through integrated water resources management principles and a basin approach. It includes projects aimed at enhancing the coverage of wastewater treatment, reducing water loss, and modernizing irrigation and water infrastructure.

The NDC explicitly mentions the implementation of agreements on the joint use and protection of transboundary rivers as part of the 2021–2030 Action Plan. This approach aims to ensure a stable water supply and enhance the resilience of water systems to climate variability and change.

4. Opportunities for further integration of water supply, sanitation-hygiene, transboundary water management and cooperation in climate policy

The first Global Stocktake of the Paris Agreement, concluded at the twenty-eighth session of the Conference of the Parties to UNFCCC, highlighted the need to transition from fossil fuels and called on countries to revise and raise the ambition of their NDCs. At the same time, based on the decisions of the twenty-eighth session, countries were encouraged to complete the formulation of their NAPs by 2025. The aim is for NAPs not only to be established but also for being implemented by 2030. This timeline aligns with the United Arab Emirates Framework for Global Climate Resilience (Box 10), also adopted at the twenty-eighth session of the Conference of the Parties to UNFCCC.

²⁰ **Government of the Republic of Kazakhstan. (2023).** *Updated Nationally Determined Contribution of the Republic of Kazakhstan to the Global Response to Climate Change.* Ministry of Ecology and Natural Resources, Republic of Kazakhstan. Approved by Government Decree No. 313, April 19, 2023.

Leveraging the decisions and frameworks established at COP28, countries can elevate both mitigation and adaptation ambitions by further integrating water supply, sanitation, and transboundary water management into their NDCs and NAPs. These areas offer substantial opportunities for climate resilient development, embracing both mitigation and adaptation: efficient water and sanitation systems can reduce greenhouse gas emissions through energy-efficient infrastructure and wastewater treatment that captures methane. These systems are at the same time at the core of building climate-resilient communities. Furthermore, coordinated transboundary water management fosters regional cooperation, enhances resource efficiency, and bolsters climate resilience against extreme weather events. By prioritizing these interconnected water-focused thematic areas, countries can address both immediate climate risks and long-term sustainability goals, reinforcing the commitments set out in the Paris Agreement.

Box 12. United Arab Emirates Framework for Global Climate Resilience: thematic targets and transboundary cooperation

The UAE Framework for Global Climate Resilience sets out seven thematic targets to strengthen global efforts in adapting to climate change impacts by 2030: the first thematic target is specifically focused on water and sanitation whereas attaining the others requires proper water management within and between countries. These targets encompass four complementary policy targets that consist of: comprehensive risk assessments to understand climate hazards, exposure and vulnerabilities; the development of gender-responsive and transparent NAPs; the mainstreaming of adaptation strategies into all relevant policies and planning processes; and the establishment of robust systems for monitoring, evaluation and learning to enhance continuous improvement in adaptation efforts. The Framework recognizes that “climate change impacts are often transboundary in nature and may involve complex, cascading risks that can benefit from collective consideration and knowledge-sharing, climate-informed transboundary management and cooperation on global adaptation solutions.”

The seven thematic targets to be achieved by 2030 and progressively beyond are:

- (a) Water-sanitation:** Significantly reducing climate-induced water scarcity and enhancing climate resilience to water-related hazards towards a climate-resilient water supply, climate-resilient sanitation and towards access to safe and affordable potable water for all;
- (b) Food-agriculture:** Attaining climate-resilient food and agricultural production and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all;
- (c) Health:** Attaining resilience against climate change related health impacts, promoting climate-resilient health services, and significantly reducing climate-related morbidity and mortality, particularly in the most vulnerable communities;
- (d) Ecosystems:** Reducing climate impacts on ecosystems and biodiversity, and accelerating the use of ecosystem-based adaptation and nature-based solutions, including through their management, enhancement, restoration and conservation and the protection of terrestrial, inland water, mountain, marine and coastal ecosystems;
- (e) Infrastructure and human settlements:** Increasing the resilience of infrastructure and human settlements to climate change impacts to ensure basic and continuous essential services for all, and minimizing climate-related impacts on infrastructure and human settlements;
- (f) Poverty eradication:** Substantially reducing the adverse effects of climate change on poverty eradication and livelihoods, in particular by promoting the use of adaptive social protection measures for all;

(g) Cultural heritage: Protecting cultural heritage from the impacts of climate-related risks by developing adaptive strategies for preserving cultural practices and heritage sites and by designing climate-resilient infrastructure, guided by traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems.

4.1. Opportunities for further integration of water supply, sanitation and hygiene in climate policy

Water supply and sanitation systems can help raise the mitigation ambition in revised NDCs. Prioritizing the most appropriate types of sanitation and wastewater treatment processes and management practices will provide countries with major new opportunities to cut greenhouse gases emissions, enable energy recovery while also increasing resilience of sanitation systems. There are also untapped opportunities for mitigation by improving water-sanitation services energy efficiency, the efficiency of the system itself, by ensuring where possible the use of renewable energy (e.g., solar and wind energy) for water and sanitation operations, and by considering the benefits of nature-based solutions.

Concrete actions that countries can include in revised NDCs, based on each national context, include:

- Limit the release of greenhouse gases (e.g., methane, nitrous oxide) from wastewater and excreta into the atmosphere by choosing the most appropriate types of treatment scales and technologies, and modifying operational parameters and management practices (e.g., biogas recovery in wastewater treatment plants). It must be noted that reducing emissions from onsite sanitation requires active management and treatment of faecal sludge.
- Achieve net zero (or even positive) wastewater plants through appropriate treatment and recuperation of biogas, and other byproducts.
- Ensure, where possible and appropriate, the use of renewable energy (e.g., solar and wind energy) for water and sanitation operations to reduce GHG emissions.
- Prioritize the improvement of the energy efficiency of water and sanitation operations and processes (e.g., pumps, generators, etc.).

Support to strong and ambitious adaptation targets, both in NDCs and NAPs, towards climate-resilient water supply, sanitation and hygiene services in communities and health facilities makes sense from a financial point of view, both for governments and users. It fosters community resilience by reducing human, social, environmental and physical vulnerability and enables safe healthcare. It also contributes to avoid or reduce conflict in areas affected by water scarcity. It provides an opportunity to policy makers and service providers to rethink access to basic services, adhere to a circular economy and green growth, and improve several pending aspects of service provision.

To enhance climate resilience, it is crucial to implement WASH services that are adaptive to changing environmental conditions. By prioritizing the development of climate-resilient water supply and sanitation systems, communities can significantly reduce their vulnerability to climate impacts such as floods, droughts, and water scarcity. For instance, integrating climate risk assessments into the planning and management of WASH infrastructure allows policymakers to identify potential vulnerabilities and proactively address them. This includes adopting innovative technologies, such as solar-powered water systems, and enhancing traditional practices, such as rainwater harvesting and groundwater recharge, which can provide reliable water sources during extreme weather events.

Moreover, fostering community engagement in WASH initiatives strengthens local capacities and enhances resilience. When communities are actively involved in decision-making processes, they can better identify their unique challenges and devise locally appropriate solutions. Educational programs focused on hygiene and water conservation can empower residents to adopt practices that mitigate climate risks, such as building flood-resistant latrines and maintaining water quality during heavy rains. Additionally, financial mechanisms, including micro-financing and targeted subsidies, can support vulnerable households in investing in resilient sanitation solutions.²¹ By prioritizing these adaptive measures, WASH programs can not only respond effectively to immediate climate challenges but also contribute to long-term sustainable development goals, ultimately fostering a more resilient future for all.

Box 13. Key water supply, sanitation and hygiene related conclusions by the Intergovernmental Panel on Climate Change Sixth Assessment Report (2022)²²

- Adaptation options that are feasible and effective to the 3.4 billion people living in rural areas around the world and who are especially vulnerable to climate change must include the provision of basic services, such as water and sanitation (high confidence).
- In urban settings, infrastructure, including transportation, water, sanitation and energy systems have been compromised by extreme and slow-onset events, with resulting economic losses, disruptions of services and impacts to well-being (high confidence).
- The burden of diseases could be reduced, and resilience increased, through strengthening access to water and sanitation (high confidence).
- Strengthened health, education and basic social services are vital for improving population well-being and supporting climate resilient development (high confidence).
- Weak governance, unequal access to safe water and sanitation services and a lack of infrastructure and financing all reduce adaptation capacity and deepen vulnerability (high confidence).
- The greatest gaps between policy and action are in failures to manage adaptation of social infrastructure (e.g., community facilities, services and networks) and failure to address complex interconnected risks for example in the food–energy–water–health nexus.

The UNECE-WHO/Europe Protocol on Water and Health, which is open for accession by countries within the pan-European Region, provides a critical framework for supporting the integration of water supply, sanitation, and hygiene NAPs and NDCs. The Protocol is particularly relevant in the context of the pan-European region, where the impacts of climate change on water resources and sanitation infrastructure are expected to increase vulnerability, particularly among the most at-risk populations, but its tools and approaches can be used and replicated globally. For the countries under the Protocol’s scope, the framework offers a robust platform for strengthening the climate resilience of WASH services by:

- Setting national targets for climate-resilient WASH services through the Protocol’s target-setting mechanism, which enables countries to use the existing Protocol framework and intersectoral

²¹ Adapted from GWP-UNICEF Policy Brief [Linking risk with response: options for climate resilient WASH \(2017\)](#)

²² IPCC. (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, et al. (eds.)]. Cambridge University Press. <https://www.ipcc.ch/report/ar6/wg2/>

institutional mechanisms to translate their water and sanitation related adaptation and mitigation commitments into practical goals that can be integrated into their NAPs and NDCs.

- Providing technical guidance to facilitate that water and sanitation systems are prepared for future climate risks. This includes tools like WHO-developed Water Safety Plans (WSPs) and Sanitation Safety Plans (SSPs), which incorporate climate scenarios to make WASH systems more resilient to the effects of climate change, including more frequent and intense droughts, floods, and heatwaves.
- Supporting cross-sectoral collaboration between health, environment, and water sectors, the Protocol promotes that national WASH systems not only address public health needs but are also resilient to climate impacts. This multi-sectoral approach fosters integration across NAPs and NDCs, ensuring that countries take a holistic view of climate adaptation.
- Monitoring and reporting frameworks offered by the Protocol can support countries in tracking their progress on WASH targets, which can be aligned with their climate policies and international commitments, such as those under the Paris Agreement.

The recently released report titled "[Strengthening climate resilience in the drinking water and sanitation sector through the Protocol on Water and Health](#)" outlines practical measures that stakeholders can implement to enhance climate resilience in water and sanitation services. It discusses actions such as improving supplier resilience, developing water safety and sanitation safety plans, enhancing efficiency in water use, implementing investment strategies, utilizing scenario-based planning, and establishing robust monitoring and assessment frameworks to evaluate resilience. The report emphasizes the need for coordinated efforts to address climate impacts while ensuring safe and efficient water management.

4.2. Opportunities for further integration of transboundary water management and cooperation in climate policy

Transboundary water management and cooperation is a critical component that, as shown by the analysis presented, is currently inadequately reflected in climate policy instruments such as NDCs and NAPs. Given that many of the world's most significant river basins are shared by multiple countries, the impacts of climate change on these water resources cannot be effectively managed within national borders alone. Moreover, transboundary water management and cooperation entail many benefits, for example, data exchange, larger planning scale, collective consideration, better prioritization of measures and sharing costs and benefits as, among other things, recognized in the United Arab Emirates Framework for Global Climate Resilience. Climate policies should therefore integrate transboundary considerations to ensure the equitable and sustainable management of shared water resources, which are vital for drinking water, agriculture, energy production and ecosystem health.

To enhance the integration of transboundary water management and cooperation into NDCs and NAPs, it would be beneficial for countries to explicitly include plans or commitments to cooperate with their neighbours on shared water resources, for example, referring to transboundary agreements, basin organizations and already agreed basin management plans and transboundary adaptation strategies, where they exist. This could involve setting joint objectives for reducing climate vulnerabilities, harmonizing water management strategies, establishing shared monitoring and early warning systems

for floods and droughts and coordinating and/or jointly implementing climate measures. Efforts to implement these transboundary commitments would be more effective and successful if there were robust transboundary legal and institutional frameworks and financing mechanisms in place, and all riparian countries were to participate actively.

Transboundary and regional bodies can also help to promote cooperation among countries to achieve common climate change mitigation and adaptation goals. Box 14 highlights some examples of transboundary river basins organizations where NDCs and NAPs from the respective riparian countries provide important input for the strategies and programmes of the respective basins.

Box 14. Mainstreaming Nationally Determined Contributions and National Adaptation Plans into regional river management strategies

Various river basin organizations and joint bodies align their strategies and programmes with the NDCs and NAPs. For instance, the projects and programmes of the Lake Victoria Basin Commission are consistent with national or subnational sustainable development strategies, including the NAPs and NDCs of the respective riparian countries.²³ The projects of the Niger Basin Authority are also consistent with the NDCs and NAPs of the respective riparian countries and contribute to the development and implementation of NDCs and NAPs in each of the Niger Basin Authority countries.²⁴ The Climate Change Adaptation Strategy for the Rhine Basin is based, among other things, on aspects included in the adaptation strategies and plans of the individual countries.²⁵ The Sahara and Sahel Observatory points out that NDCs and NAPs are important tools to help countries develop national adaptation strategies for concrete sectors.²⁶

The work of river basin organizations can also support development and improvement of NDCs and NAPs. Often, knowledge and expertise on water management is collected by river basin organizations or wider cooperation organizations that, in turn, can influence strategies and programmes at the national level. Boxes 15 and 16 give examples of how the Amazon and the Lower Mekong basin organizations, respectively, support development of national strategies and programmes.

Box 15. Amazon Cooperation Treaty Organization as a motor for national climate action

The Amazon Cooperation Treaty Organization is an intergovernmental organization formed by the eight Amazonian countries: Bolivia (Plurinational State of), Brazil, Colombia, Ecuador, Guyana, Peru,

²³ Lake Victoria Basin Commission (LVBC), “LVBC Prioritizes Media as Accelerators of Climate Change Adaptations”, 26 June 2022, available at www.lvbcom.org/lvbc-prioritizes-media-as-accelerators-of-climate-change-adaptations/

²⁴ Seventh meeting of the Global Network of Basins Working on Climate Change Adaptation 25–26 May 2023, Progress report of the Global Network of Basins Working on Climate Change Adaptation as of April 2023. Available at https://unece.org/sites/default/files/2023-07/Global_network_overview_pilot%20projects_progress_May2023_ENGL_Final.pdf

²⁵ Ibid

²⁶ Ibid

Suriname and Venezuela (Bolivarian Republic of), which signed the Amazon Cooperation Treaty. It is the only socio-environmental block in Latin America that works in different dimensions within the framework of the implementation of the Amazon Cooperation Treaty: political-diplomatic, strategic and technical, building synergies between various stakeholders.²⁷

The Strategic Action Programme - Regional Strategy for Integrated Water Resources Management in the Amazon Basin²⁸ of the Amazon Cooperation Treaty Organization integrates climate change as one of its strategic lines of actions and foresees the establishment of a national action plan in each of the eight Amazonian countries to ensure the effective implementation of the strategic actions at the national level. These national action plans are to be harmonized with national policies, regulations and legal frameworks on water management and climate change.²⁹

In addition, the Amazon Cooperation Treaty Organization, in collaboration with the CAF Development Bank of Latin America, has initiated activities to build a climate change module and strengthen other modules such as those on biodiversity and forests within the Amazon Regional Observatory. This includes the development of a benchmarking report document, with existing greenhouse gas emissions baselines, serving as a background for country NDCs for the Amazon and climate resilience and adaptation actions.³⁰

Box 16. Basin Development Strategy in support of climate action in the Mekong basin

All Mekong River Commission member countries have expressed a strong will to adapt to climate change. This has led to the development of the Mekong Adaptation Strategy and Action Plan³¹ in 2017, in close coordination between the Commission and its member countries. The Mekong Adaptation Strategy and Action Plan has been mainstreamed into the Basin Development Strategy 2021–2030 and the Mekong River Commission Strategic Plan 2021–2025.³²

Drought and flood management is an important issue for the Mekong River Commission member countries. Mekong Adaptation Strategy and Action Plan and Basin Development Strategy activities have contributed to the development and implementation of member countries' NDCs and NAPs, for example, through the development of national flood and drought policies, strategies and programmes for mainstreaming regional responses to climate change. In line with the seven strategic

²⁷ Amazon Cooperation Treaty Organization (ACTO), "Understand the importance of ACTO", available at <https://otca.org/en/about-us/>.

²⁸ ACTO, *Strategic Action Programme: Regional Strategy for Integrated Water Resources Management in the Amazon Basin* (Brasilia, 2018). Available at <https://otca.org/en/wp-content/uploads/2021/01/Strategic-Action-Program-SAP.pdf>.

²⁹ ACTO, "Regional Strategy for the Integrated Management of Water Resources in the Amazon Basin", available at <https://aguasamazonicas.otca.org/strategic-action-program/national-action-plans/?lang=en>.

³⁰ Amazon Regional Observatory, "ACTO and CAF sign an agreement to improve the living conditions of the population in the Amazon Region", available at <https://oraotca.org/en/news/acto-and-caf-sign-an-agreement-to-improve-the-living-conditions-of-the-population-in-the-amazon-region/>.

³¹ Mekong River Commission (MRC), *Mekong Climate Change Adaptation Strategy and Action Plan* (Vientiane, 2018).

³² MRC, *Basin Development Strategy for the Mekong River Basin 2021–2030 and MRC Strategic Plan 2021–2025*. (Vientiane, 2021).

priorities of the Mekong River Commission, monitoring, data collection and sharing have been enhanced and aligned with the member countries' NDCs.³³

The Water Convention serves as a critical platform for fostering transboundary water cooperation in climate change adaptation. Its Task Force on Water and Climate offers technical guidance and supports the development of joint adaptation strategies, plans and measures across borders. Additionally, the Global Network of Basins Working on Climate Change Adaptation, coordinated by the Convention together with the International Network of Basin Organizations, provides a collaborative platform for basins to share experiences in developing and implementing common adaptation strategies, plans and joint measures. These activities help to ensure that transboundary water cooperation is not only reflected in national climate policies but also effectively translated into action on the ground. For example, countries should as much as possible develop climate-proof transboundary agreements to ensure the long-term viability of cooperation in the face of climate change impacts, such as altered water availability and extreme weather events. In addition, countries should set up and develop joint bodies and task them with addressing climate change adaptation and mitigation. This may include developing transboundary vulnerability assessments and joint adaptation strategies and ideally integrating them into their NDCs and NAPs.

By leveraging platforms such as the Water Convention and its associated bodies, countries can enhance the implementation of transboundary water cooperation interventions outlined in their NDCs and NAPs. Indeed, when transboundary water cooperation is adequately reflected in NDCs and NAPs, they can be used as a reference for the development, financing and implementation of transboundary basin management strategies and projects developed by basin organizations. Transboundary basin and regional organizations can play a crucial role in this process by facilitating coordination between different countries, identifying common mitigation opportunities and adaptation needs, and contributing to their integration into national climate and sectoral policies and subsequently implementing them.

5. Recommendations for further integration of water supply, sanitation-hygiene, transboundary water management and cooperation into National Adaptation Plans

Given the recent actions taken by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement at its fifth session (Dubai, United Arab Emirates, 30 November–13 December 2023), the current moment presents a crucial opportunity to integrate water supply, sanitation, hygiene and transboundary water management and cooperation into NAPs. The outcome of the first Global Stocktake underlined significant gaps in adaptation planning and implementation, particularly highlighting the need for enhanced international cooperation to address climate change effectively. As climate impacts often transcend national boundaries, affecting shared water resources, the Global Stocktake's emphasis on international collaboration makes it imperative to incorporate transboundary water cooperation into NAPs.

³³ Progress report of the Global Network of Basins Working on Climate Change Adaptation as of April 2023.

Moreover, the Conference of the Parties recognized the importance of the global goal on adaptation by adopting the United Arab Emirates Framework for Global Climate Resilience. The decision³⁴ reaffirms the need for enhanced adaptive capacity, resilience and vulnerability reduction, which are inherently tied to effective water management, and recognizes that climate change impacts are often transboundary in nature and may involve complex, cascading risks that, in order to be addressed, require knowledge-sharing and climate-informed transboundary management.

Building on this momentum, and to further integrate water supply, sanitation, hygiene and transboundary water management and cooperation into the formulation of NAPs, stakeholders involved in supporting these initiatives should consider the following recommendations derived from the UNFCCC NAP Technical Guidelines (Part II, sects. 4 and 5).³⁵

(Step 1) Conducting comprehensive baseline assessments:

Water supply and sanitation assessments: Incorporate assessments that capture water availability, quality, and demand projections to understand climate vulnerability impacts on urban and rural water supply and sanitation services. Key data should cover water source reliability, treatment capacity, infrastructure conditions, and user access, especially for underserved populations.

Transboundary water assessments: Ensure that baseline assessments for NAPs explicitly include transboundary assessments of river basins and shared water resources. For example, for some transboundary basins, there are available climate impact and vulnerability assessments developed by transboundary basin organizations that should be promoted and used by climate policymakers during NAP development. Overall, preparing such assessments involves gathering data on the current status of water availability, quality and use across borders, as well as wide consultations among the relevant sectoral stakeholders from the riparian countries. Stakeholders should promote the inclusion of joint assessments and the development of new ones (if not available) with neighbouring countries to identify shared vulnerabilities and risks related to climate change.

(Step 2) Enhancing stakeholder engagement:

Inclusive participation: Engage health, urban planning, and sanitation departments alongside water authorities in the NAP process to ensure comprehensive water and sanitation adaptation strategies. Include marginalized and at-risk communities to reflect diverse needs, particularly around access to these basic services. In the context of transboundary waters, also ensure that all relevant stakeholders, including local communities, Indigenous Peoples, youth, women, private sector, expert community, Governments, and international organizations involved in transboundary water management and cooperation, are part of the dialogue.

Private Sector Involvement: Encourage public-private partnerships where possible to support innovations and financing in water and sanitation resilience projects.

³⁴Decision 2/CMA.5., para. 8 and 18.

³⁵United Nations Framework Convention on Climate Change (UNFCCC), *Least Developed Countries: National Adaptation Plans – Technical Guidelines for the National Adaptation Plan Process* (n.p., 2012); and Global Water Partnership, *Addressing Water in National Adaptation Plans: Water Supplement to the UNFCCC NAP Technical Guidelines – Second Edition* (n.p., 2019).

Involvement of transboundary institutions: Engage transboundary water management bodies, such as basin organizations, in the NAP process from the outset. Their expertise and data can help shape strategies and actions that are more reflective of the realities of shared water systems.

(Step 3) Developing a shared vision for water supply, sanitation and transboundary adaptation:

National visioning workshops: Organize workshops to define a shared vision for resilient water and sanitation systems that integrate climate adaptation at all levels. These workshops should bring together stakeholders from government, utilities, and communities to collaboratively define strategies that address both immediate and long-term challenges. Key topics for discussion can include:

- **Utility-Level Adaptation:** Emphasize the importance of adapting water utility operations to climate impacts, including upgrading infrastructure to withstand extreme weather events, enhancing maintenance practices, and ensuring the resilience of service delivery systems.
- **Water Safety Planning:** This includes identifying potential risks to water quality and supply, developing contingency plans, and implementing monitoring frameworks to ensure safe and reliable water provision.
- **Regulatory Changes:** Discuss necessary regulatory changes that can facilitate the integration of climate-smart practices into water and sanitation management. This may involve revising policies to encourage energy-efficient technologies, incentivize sustainable practices, and streamline emergency response protocols for service disruptions.
- **Climate-Smart Practices:** Explore climate-smart and energy-efficient practices in water treatment, conservation strategies, and emergency response preparedness for water service disruptions.

Aligning health, water quality and sanitation goals: Ensure harmonization between water resources and public health strategies to mitigate the impacts of inadequate sanitation and unsafe water, which are exacerbated by climate variability.

Joint transboundary visioning workshops: Organize workshops or meetings between neighbouring countries to develop a shared vision and adaptation strategy for adapting to climate impacts on shared water resources, for instance based on a joint vulnerability assessment, with the support of transboundary basin and regional organizations. This can help align national NAPs and foster cooperation in implementing shared adaptation measures.

Harmonizing transboundary objectives: Ensure the harmonization of transboundary adaptation objectives across NAPs of riparian countries. This can be done by finding synergies with regional or transboundary water management goals, ensuring that strategies complement rather than conflict with one another.

(Step 4) Creating cooperative National Adaptation Plan implementation frameworks:

Cross-sector coordination: Develop/use existing frameworks (e.g. those established under the Protocol on Water and Health in over 40 states of the pan-European region) that coordinate between health, sanitation, and water management bodies, ensuring that adaptation strategies prioritize resilient water

infrastructure and hygiene standards. This includes creating climate-adaptive sanitation systems capable of managing extreme weather and addressing wastewater safely.

Climate-proofed transboundary frameworks for cooperation: Develop, and where necessary and agreed by the riparian countries, revise transboundary agreements so that they account for addressing climate change and building climate resilience. Consider climate change while implementing transboundary agreements, for example, through developing and adopting additional protocols and decisions, creating dedicated working groups focusing on climate change and elaborating and implementing transboundary adaptation strategies, plans and measures.

Transboundary initiatives and projects: Support integrating transboundary dimensions and development of transboundary adaptation projects into NAPs. These projects/initiatives might focus on joint infrastructure development, ecosystem restoration, shared early warning systems, collaborative research initiatives or elaboration of joint transboundary/regional adaptation frameworks.

Resource mobilization and funding:

- **For WASH:** Include building climate-resilient water supply, sanitation, and hygiene infrastructure in vulnerable regions into funding proposals and climate finance mechanisms. Ensuring that NAPs highlight the need for climate-adaptive WASH systems—including resilient drinking water supply, safe sanitation, and effective hygiene management—can enhance their attractiveness to international climate finance mechanisms. This approach also aligns with health and environmental goals, making it easier to secure support from global funding initiatives focused on public health and water security.
- **For transboundary water cooperation:** Include transboundary water cooperation projects in funding proposals and climate finance mechanisms. Ensuring that NAPs include specific provisions for transboundary water cooperation can make these projects more attractive to international donors and financial institutions and can help in the mobilization of national funding.

(Step 5) Leveraging the role of international organizations, protocols and conventions:

Engagement with the UNECE-WHO/Europe Protocol on Water and Health: Make efforts to align water and sanitation/hygiene-related national adaptation priorities with climate-sensitive targets set under the Protocol on Water and Health. Such alignment promotes comprehensive planning that recognizes the interconnections between water resources, health outcomes, and climate resilience, leading to more effective and sustainable solutions.

The Protocol provides a platform for exchanging best practices, lessons learned, and innovative water supply and sanitation adaptation solutions, which can be particularly valuable for countries facing similar climate challenges.

Engagement with the Water Convention: Utilize the Water Convention as a platform to formalize and strengthen transboundary cooperation within NAPs. The Convention's Task Force on Water and Climate can provide expertise, facilitate dialogue and exchange of experience, and help in the design of transboundary adaptation measures.

Engagement with the Global Network of Basins: The Global Network of Basins can be a valuable resource for sharing best practices and lessons learned from other transboundary water basins. Seeking the participation of the Network and its member basin organizations during NAP formulation can help countries refine their NAPs with proven strategies for transboundary water management and cooperation.

6. Recommendations for further integration of water supply, sanitation-hygiene, transboundary water management and cooperation into Nationally Determined Contributions

As countries work on formulating their NAPs, it is essential to recognize the interconnectedness of adaptation and mitigation strategies within their broader climate goals. The NDCs, which are central to the Paris Agreement, encompass both mitigation and adaptation strategies. Therefore, countries currently developing their NAPs and integrating water supply, sanitation-hygiene, transboundary water management and cooperation should ensure that their adaptation priorities are also reflected in the revised versions of respective riparian countries' NDCs.

Indeed, the current moment is a pivotal time to integrate transboundary water cooperation into NDCs, especially in the light of the recent call by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement for all countries to raise the ambition of their NDCs and submit revised versions by February 2025.³⁶

To effectively integrate transboundary water management and cooperation into the revision of NDCs and to raise their ambition, stakeholders can consider the following recommendations, drawing on key insights from the NDC 3.0 Navigator.³⁷

(Step 1) Incorporate clear targets and indicators for water supply, sanitation and transboundary water cooperation

Set specific, measurable targets:

- **For WASH:** Establish quantifiable NDC targets for expanding climate-resilient water supply and sanitation infrastructure, such as goals for improving access to safe water, enhancing wastewater treatment, and minimizing contamination. In addition, it is crucial to align these efforts with the ongoing work by the Joint Monitoring Programme (JMP) and GLAAS to develop indicators for climate-resilient WASH. These initiatives are focused on creating indicators that complement the monitoring of SDG targets 6.1 and 6.2, which pertain to universal access to safe and affordable drinking water and adequate and equitable sanitation and hygiene, respectively. By incorporating climate resilience into these indicators, countries can better assess their vulnerabilities and adaptive capacities in the water and sanitation sectors. The integration of

³⁶Decision 1/CMA.5, paras. 166 and 167

³⁷See <https://ndcnavigator.org/>

climate-resilient WASH indicators will provide essential data to inform policy decisions, facilitate investment in infrastructure, and guide the implementation of effective adaptation strategies.

- **For transboundary water management and cooperation:** Clear, quantifiable targets related to transboundary water management and cooperation should be considered for inclusion in NDCs. This could involve plans for or commitments, for example, to joint wetlands conservation and restoration projects, transboundary early warning systems, or cooperative infrastructure developments in transboundary river basins. Specific indicators, such as the proportion of transboundary basin areas with an operational arrangement for water cooperation as reflected in indicator 6.5. of the Sustainable Development Goals can help identify gaps and measure progress for the 153 countries sharing transboundary water cooperation.

The global effort to produce and share data for the calculation of indicator 6.5.2 of the Sustainable Development Goals, in itself, has had a positive impact on transboundary water cooperation as it encouraged Governments to improve data quality and availability, and some countries have shared such data and cooperated at the transboundary level to prepare their national reports. The third and most recent report *Progress on Transboundary Water Cooperation: Mid-term Status of SDG Indicator 6.5.2, with a Special Focus on Climate Change has a special focus on climate change*. It (together with the previous progress reports)³⁸ can be used to inform the revision of NDCs by identifying gaps and opportunities for enhanced transboundary water cooperation in the context of climate change adaptation. It is therefore recommended to improve the coverage and quality of data for indicator 6.5.2 of the Sustainable Development Goals in order to inform decision-making on transboundary water cooperation at the national, basin, regional and global levels.

Where they exist, joint bodies can provide a platform for sharing and reviewing indicator 6.5.2 data, coordinating the efforts of countries sharing transboundary waters, and analysing data at the regional level. Lastly, climate stakeholders can refer to the national reports on indicator 6.5.2 for their countries to identify gaps and opportunities in transboundary water cooperation that can be incorporated into NDC development and implementation.

Use science-based indicators: Apply science-based indicators that measure the health and environmental impact of water and sanitation services, such as waterborne disease prevalence and levels of untreated wastewater discharge. This data can guide policy adjustments to better meet adaptation and mitigation goals. Similarly, use science-based indicators for water management that reflect the unique challenges of transboundary basins. These should be aligned with international best practices and support adaptive management approaches that can respond to changing climatic conditions (e.g., river flow variability, water quality parameters such as nutrient concentration or salinity, and ecosystem health indicators such as biodiversity indices).

(Step 2) Promote regional coordination

Coordinate NDCs across borders for shared basins: Countries should make efforts to coordinate their water supply and sanitation goals with regional climate and health priorities, particularly in

³⁸United Nations publications, ECE/MP.WAT/57 and ECE/MP.WAT/65.

transboundary regions. This can prevent actions in one country from negatively impacting water quality or sanitation access across borders, supporting integrated climate resilience.

Neighbouring countries should make efforts to coordinate their NDCs in relation to shared water resources. This can ensure that adaptation and mitigation strategies, including the role of water therein, are consistent and mutually reinforcing across borders, reducing the risk of conflicting actions that could undermine regional stability. Transboundary basin or regional organizations can support this process by serving as platforms for consultations and facilitating dialogue among riparian countries.

Leverage Existing international frameworks and agreements: Use established frameworks like the UNECE-WHO/Europe Protocol on Water and Health in the pan-European region to harmonize water and sanitation efforts within across borders.

Leverage existing transboundary and regional agreements: Build on existing transboundary water agreements, regional cooperation frameworks, basin plans and strategies. Countries should make efforts to reflect the commitments and objectives of these agreements and strategies within their NDCs, ensuring that regional and transboundary collaboration is embedded in national climate strategies.

(Step 3) Establish and strengthen institutional frameworks for water supply, sanitation and transboundary water governance

Develop climate-proof transboundary water agreements to ensure that cooperative frameworks can withstand and help mitigate the impacts of climate change, such as altered water availability and extreme weather events. Basin organizations should also be tasked with addressing climate change adaptation and mitigation, integrating these issues into their mandates to enhance resilience in transboundary water management.

Elaborate and adopt climate-resilient water supply and sanitation policies that account for future climate risks, such as increased droughts or floods, and that ensure the safe and sustainable management of sanitation and water resources under changing climatic conditions.

Strengthen existing transboundary basin and regional organizations to serve as platforms for discussing and coordinating water-related elements of NDCs at both the national and transboundary levels. These institutions should facilitate sectoral coordination among agriculture, energy and the environment to ensure that water management strategies align with broader national development goals and regional cooperation objectives. In cases where such joint bodies do not exist, efforts should be made to establish them, fostering cooperation in transboundary water management and supporting climate adaptation through integrated institutional mechanisms.

Integrate Water-Energy-Food-Ecosystems nexus approaches: Promote the integration of the water-energy-food-ecosystems nexus approach in the NDC revision process to account for interlinkages and dependencies across borders between water, energy, food and ecosystems. Countries should make efforts to ensure that policies and actions in one sector do not negatively impact other sectors, including across national boundaries, and that trade-off are reduced. By embedding the water-energy-food-ecosystems nexus in institutional frameworks, countries can develop more coherent and effective strategies that support both national and regional climate goals.

(Step 4) Integrate nature-based solutions and ecosystem-based approaches

Highlight the role of ecosystems: Include nature-based solutions and ecosystem-based approaches for water supply and sanitation and in managing transboundary waters. These approaches not only enhance water security but also contribute to biodiversity conservation, climate resilience and mitigation. Including such strategies in NDCs can raise ambition by addressing multiple climate and environmental goals simultaneously.

Promote joint ecosystem conservation and restoration projects: Countries should commit to joint and/or coordinate their ecosystem conservation and restoration projects in transboundary areas, such as wetland rehabilitation or reforestation of shared watersheds. These projects can be a cornerstone of enhanced NDCs, demonstrating a commitment to cooperative and sustainable water management.

(Step 5) Enhance stakeholder engagement and participation

Engage a broad range of stakeholders: Involve diverse stakeholders, including local communities, Indigenous groups, youth and civil society, in the revision of NDCs.

Facilitate knowledge-sharing platforms: Establish national platforms to exchange insights on successful climate-resilient water and sanitation approaches and methods.

Facilitate cross-border stakeholder dialogues: Organize and support dialogues that bring together stakeholders from different countries sharing a basin. These dialogues can help build trust, share knowledge, and co-develop strategies that are reflected in revised NDCs. Transboundary basin/regional organizations can play a crucial role in facilitating such cross-border dialogues and stakeholder engagement overall.

(Step 6) Secure and mobilize financing for transboundary projects

Identify and promote funding opportunities: Countries should consider including in their NDCs commitments to seek and secure financing for water and sanitation resilience projects, focused on public health and environmental sustainability as well as .for transboundary water management and cooperation projects This could become an opportunity to mobilize resources from national funding and/or from international climate funds, bilateral donors, and multilateral financial institutions that prioritize regional cooperation and shared water resource management.

Create joint financial mechanisms: Support the creation of joint financial mechanisms, such as pooled funds, that can be used to finance transboundary water initiatives. Including these mechanisms in NDCs can demonstrate a higher level of ambition and commitment to long-term regional cooperation.

The above opportunities and recommendations, if made use of, could support increased climate resilience of water and sanitation services and improve water management at national, transboundary and global level.