



Progress on Transboundary Water Cooperation

Mid-term status of SDG Indicator 6.5.2, with a special focus on Climate Change

2024



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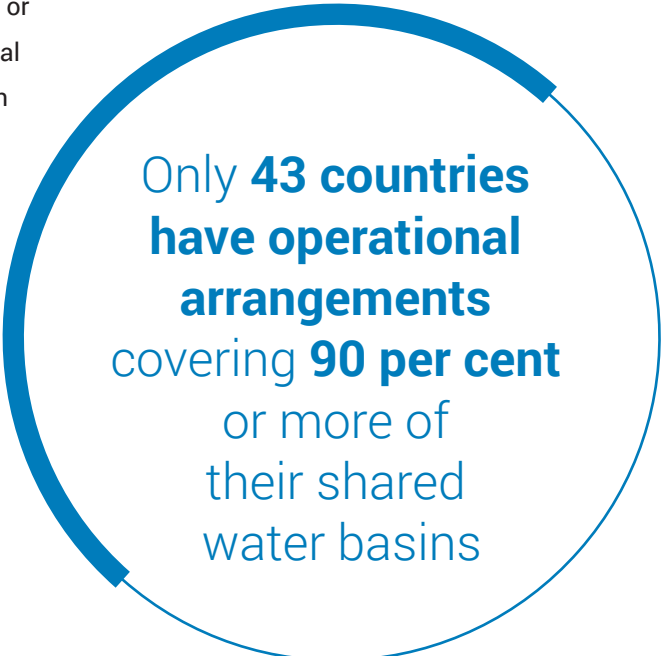
Transboundary water cooperation holds huge potential in supporting sustainable development and climate action

While transboundary water cooperation is essential for advancing sustainable development and addressing climate change, only 43 out of 153 UN Member States sharing transboundary waters have 90 per cent or more of these waters covered by cooperative arrangements that are operational, and over 20 countries lack any such arrangements.

Europe, North America and sub-Saharan Africa show the highest levels of cooperation – with 39 out of 84 countries having 90 per cent or more of their transboundary basin area covered by operational arrangements; whereas across Asia, Latin America and North Africa only 4 out of 69 countries have 90 per cent or more of their basin area covered.

On climate change and disaster risk reduction, some progress can be seen, but the number of transboundary basins with joint climate change adaptation strategies, and joint disaster risk reduction strategies remains low. Moreover, where operational arrangements and joint bodies are absent, countries lack the foundations upon which common responses to climate change can be developed.

Ensuring that all transboundary rivers, lakes and aquifers are covered by operational arrangements by 2030 will require an unprecedented effort.



Only **43 countries** have operational arrangements covering **90 per cent** or more of their shared water basins

Presenting the UN-Water Integrated Monitoring Initiative for SDG 6

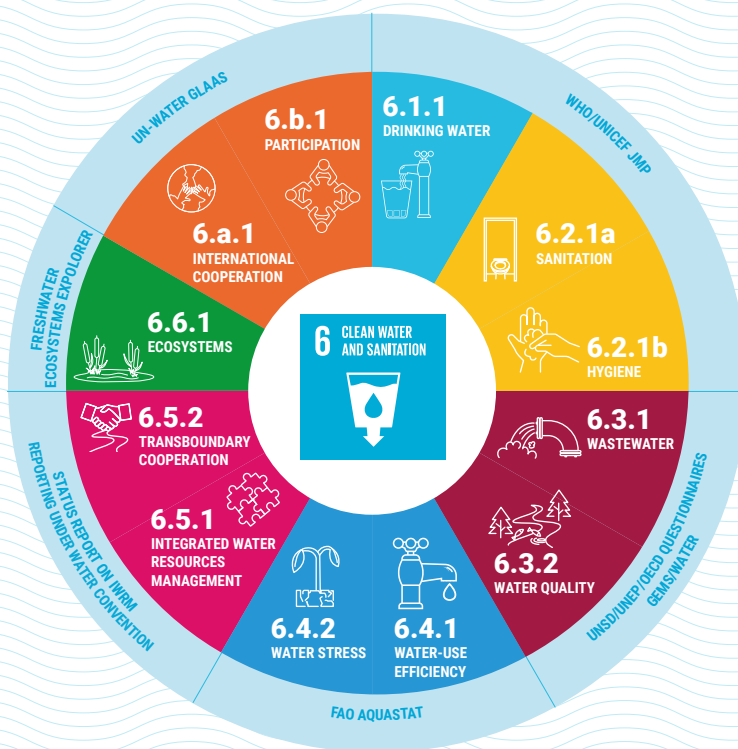
Through the UN-Water Integrated Monitoring Initiative for SDG 6 (IMI-SDG6), the United Nations seeks to support countries in monitoring water- and sanitation-related issues within the framework of the 2030 Agenda for Sustainable Development, and in compiling country data to report on global progress towards SDG 6.

IMI-SDG6 brings together the United Nations organizations that are formally mandated to compile country data on the SDG 6 global indicators, and builds on ongoing efforts such as the World Health Organization (WHO)/United Nations Children's Fund (UNICEF) Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), the Global Environment Monitoring System for Freshwater (GEMS/Water), the Food and Agriculture Organization of the United Nations (FAO) Global Information System on Water and Agriculture (AQUASTAT) and the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS).

This joint effort enables synergies to be created across United Nations organizations and methodologies and requests for data to be harmonized, leading to more efficient outreach and a reduced reporting burden. At the national level, IMI-SDG6 also promotes intersectoral collaboration and consolidation of existing capacities and data across organizations.

The overarching goal of IMI-SDG6 is to accelerate the achievement of SDG 6 by increasing the availability of high-quality data for evidence-based policymaking, regulations, planning and investments at all levels. More specifically, IMI-SDG6 aims to support countries to collect, analyse and report SDG 6 data, and to support policymakers and decision makers at all levels to use these data.

- Learn more about SDG 6 monitoring and reporting and the support available: www.sdg6monitoring.org
- Read the latest SDG 6 progress reports, for the whole goal and by indicator: https://www.unwater.org/publication_categories/sdg6-progress-reports/
- Explore the latest SDG 6 data at the global, regional and national levels: www.sdg6data.org



INDICATORS	CUSTODIANS
6.1.1 Proportion of population using safely managed drinking water services	WHO, UNICEF
6.2.1 Proportion of population using (a) safely managed sanitation services, and (b) a handwashing facility with soap and water	WHO, UNICEF
6.3.1 Proportion of domestic and industrial wastewater flows safely treated	WHO, UN-Habitat, UNSD
6.3.2 Proportion of bodies of water with good ambient water quality	UNEP
6.4.1 Change in water-use efficiency over time	FAO
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	FAO
6.5.1 Degree of integrated water resources management	UNEP
6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	UNECE, UNESCO
6.6.1 Change in the extent of water-related ecosystems over time	UNEP, Ramsar
6.a.1 Amount of water and sanitation-related official development assistance that is part of a government-coordinated spending plan	WHO, OECD
6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	WHO, OECD

Foreword by the Chair of UN-Water

We stand at a critical juncture. At the midpoint of the United Nations 2030 Agenda for Sustainable Development, we risk failing to meet the promise of SDG 6 – to ensure the availability and sustainable management of water and sanitation for all.

The 2024 series of indicator reports, published by the UN-Water Integrated Monitoring Initiative for SDG 6 (IMI-SDG6), depict a crisis with profound repercussions for many other SDGs, particularly those related to poverty, food, health, education, gender equality, sustainability and environmental integrity.

Billions of people worldwide are still living without access to safely managed drinking water and sanitation services. Water pollution levels are alarmingly high. Inefficient water use practices are common. Water scarcity is a growing problem. Degradation of water-related ecosystems continues unabated. Governance and transboundary cooperation on water resources are too weak, and every continent suffers the impacts of inadequate investment in water and sanitation infrastructure.

Despite concerted efforts and global commitments, we are compelled to acknowledge that progress so far has been insufficient to meet all eight targets of SDG 6. In some regions and countries, for some indicators, progress is even reversing.

However, over the past year, the UN-Water family has come together to develop a response that aims to accelerate progress through a more holistic and integrated approach.

After the UN 2023 Water Conference, in response to the high ambitions set by Member States, UN-Water released the *Blueprint for Acceleration: SDG 6 Synthesis Report on Water and Sanitation 2023*, which identifies two crucial needs: for Member States to develop a UN political process for water and for the UN system to better unify its water-related efforts to support Member States.

On the first, Member States adopted a resolution that, among other things, established two future UN water conferences – one in 2026 and one in 2028.

On the second, the resolution requested of the UN Secretary-General to present a United Nations system-wide water and sanitation strategy in consultation with Member States. The Secretary-General looked to UN-Water, under my leadership, to assist with this.

The strategy will be presented in July 2024: the middle of a year that marks a pivotal moment in our collective journey towards achieving SDG 6. It is time to redouble our efforts, recalibrate our strategies, and mobilize resources to make good on our commitments to global society and the future of our planet.

We face unprecedented challenges, but we now have unprecedented tools and political momentum. The data and insight gathered by the IMI-SDG6 must guide our prioritization of efforts and investments to the areas of greatest need, ensuring no one is left behind.

Thank you for your unwavering dedication to this vital cause.



Alvaro Lario,
President of the International
Fund for Agricultural
Development (IFAD)
and Chair of UN-Water

Joint Foreword by UNECE and UNESCO

Water is one of the most important challenges of our time. Two statistics are particularly revealing. First, 60% of the world's freshwater flows across international borders. Second, water-related extreme events account for 70% of all deaths related to natural disasters. As these figures show, water is truly a global issue, and one that calls for global solutions.

For this reason, the international community made water and sanitation for all one of the 17 Sustainable Development Goals—SDG6. This Goal not only underlines the role of water in advancing development worldwide, but it also highlights the crucial importance of transboundary cooperation in managing this shared resource, through its target 6.5. In particular, our joint UNESCO-UNECE collaboration on SDG indicator 6.5.2 aims to ensure that all transboundary rivers, lakes and aquifers, located in more than 150 countries, are covered by operational cooperation arrangements by 2030.

To monitor progress towards this objective, SDG indicator 6.5.2 reports are published every three years. This report, which covers the 2023 monitoring exercise, presents data and information provided by 129 countries—with seven countries submitting data for the first time. It also sheds light on the ways in which transboundary water cooperation can support climate action and disaster risk reduction—a focus that is particularly relevant given the recognition of transboundary cooperation within the decisions of COP28.

The Third Progress Report shows that the number of countries reporting their operational arrangements for 90% or more of their transboundary waters is slowly growing: it increased from 30 in 2020 to 43 in 2023, although significant regional variations remain. Regarding climate disruption and water related disasters, the report acknowledges efforts to cooperate on floods, while underlining the need for better transboundary action on droughts.

The monitoring exercise itself is also yielding positive outcomes. In addition to enhancing knowledge, it has fostered cooperation between riparian



Tatiana Molcean
Executive Secretary
United Nations Economic
Commission for Europe



Audrey Azoulay
Director-General
United Nations Educational,
Scientific and Cultural Organization

countries, facilitated the exchange of experience, and highlighted the importance of transboundary aquifers. Insights from these reports have informed the global water agenda, including at the United Nations 2023 Water Conference, as well as policymaking for advancing the Sustainable Development Goals.

Promising as these results are, much remains to be done. At this rate, just over a third of countries with shared basins will have most of their basin area covered by operational arrangements by 2030. We need to accelerate efforts to adopt arrangements and joint bodies for transboundary water cooperation. UNESCO and UNECE are committed to achieving this goal, hand in hand with governments, international organizations, civil society, and other stakeholders. Together, we can support better transboundary water cooperation for the benefit of current and future generations.

Acknowledgements

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Explanatory note on use of data in the report

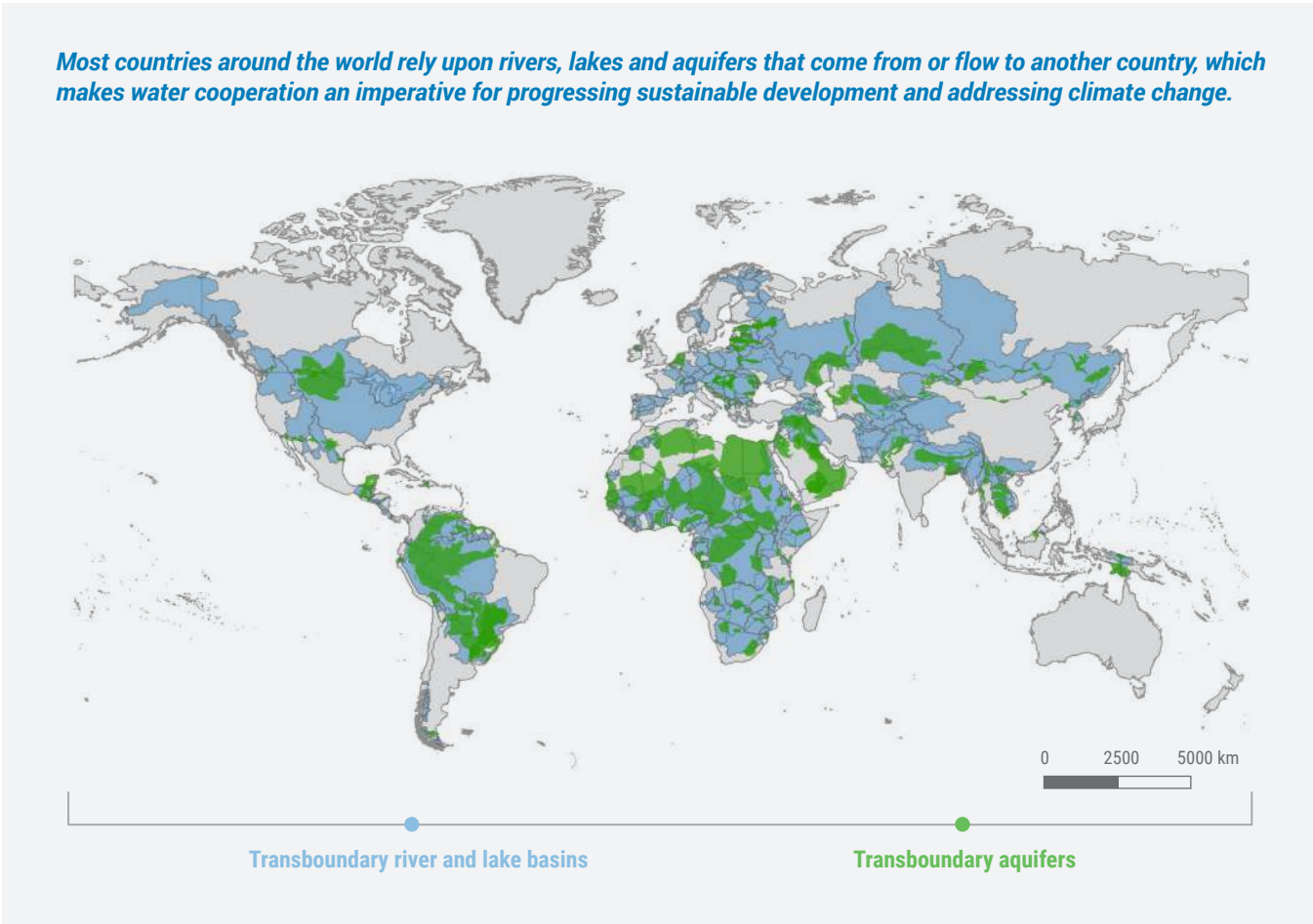
Data used throughout the report is primarily based on the national reports submitted by countries during the 2023 monitoring exercise. Data from 15 countries that responded in 2020, but either did not update that data in 2023, or the data that was submitted required further clarification, is also included.

The basin analysis data, which is primarily used in chapter four, box 3 and annex II, is based on a total number of 291 river and lake basins listed in section II of the national reports submitted. As not all countries sharing transboundary waters provided a national report, the number is lower than the total number of transboundary river basins shared by countries, that is 313. Where a country submitted multiple responses for the same basin, for example they submitted data for a basin arrangement and sub-basin arrangement, the highest-level arrangement was used, that is the basin arrangement. Percentages are based on at least one country within a basin responding affirmatively to the relevant question in section II of their SDG indicator 6.5.2 national report, for example ticking the relevant box.

Executive Summary

Transboundary waters are of great significance globally. An estimated 313 rivers and lakes, and 468 aquifers, are shared by two or more countries, and a total of 153 UN Member States are reliant on waters that either flow from or flow to another country (see figure i). Transboundary rivers alone account for 60 per cent of the world’s freshwater flows, and river and lake basins are home to more than three billion people. While cooperation between countries over their transboundary waters has long proven challenging, climate change poses an additional threat to the equitable and sustainable management of transboundary rivers, lakes and aquifers due to changing patterns of water availability, and the increased likelihood and magnitude of extreme events. At the same time, through joint and coordinated action at the basin scale, transboundary water cooperation offers an opportunity for countries to progress sustainable development whilst also maximizing the effectiveness of measures adopted to combat climate change.

Figure i: Transboundary river and lake basins, transboundary aquifers and international borders (2024).



(Source: UNESCO-IGRAC. 2015. Map of Transboundary Aquifers of the World. Scale 1:50 000 000. Paris, France (aquifers); UNEP and GEF, TWAP River Basins Data Portal (river and lake basins)).

SDG target 6.5 calls for the implementation of integrated water resources management at all levels, including through transboundary water cooperation, as appropriate, by 2030. Water management at national levels and through transboundary cooperation is essential for achieving shared water resilience. Transboundary water cooperation, and the establishment of operational arrangements to foster that cooperation, is central to achieving the target. Moreover, transboundary water cooperation has proven to be an important catalyst for wider cooperation in support of not only SDG 6, but other SDGs, such as those relating to poverty alleviation, food security, health and well-being, gender equality, clean energy, climate change, ecosystem protection, peace and security, and partnerships.

SDG indicator 6.5.2 assesses progress towards SDG target 6.5 achievement at the transboundary level.¹ This is done by monitoring the coverage of operational arrangements for water cooperation within transboundary river and lake basins, and aquifers. Arrangements are considered 'operational' where a joint body, such as a river basin organisation or bilateral commission, is in place, meetings between countries take place at least once per year, data or information is exchanged at least once per year, and joint objectives, strategies or plans have been agreed. With guidance from the custodian agencies (UNECE and UNESCO), countries submit national reports on the proportion of their transboundary basin area (rivers, lakes and aquifers) covered by an operational arrangement for transboundary water cooperation every three years. SDG indicator 6.5.2's approach of directly sourcing data from countries has produced a unique set of global data on transboundary water cooperation.

A total of 129 countries submitted responses to the 2023 monitoring exercise – which represents 84 per cent of all countries sharing transboundary waters and is the same total as in 2020. Seven countries submitted a national report for the first time in 2023.² While it has not been possible to calculate the SDG indicator value for all 129 responses, the quality of data submitted by countries has improved through each monitoring exercise, with the SDG indicator value now available for 117 countries.

The SDG indicator 6.5.2 monitoring exercise has provided the impetus for countries to initiate or strengthen their cooperation. It has also inspired several countries to work together to accelerate progress on the adoption of arrangements and the establishment of joint bodies for transboundary water cooperation or make existing arrangements operational. In particular, the efforts of countries to deepen their knowledge and understanding of transboundary aquifers has both triggered stronger cooperation with their neighbours and enhanced their ability to provide data for the SDG indicator 6.5.2 monitoring exercise. To ensure full coverage of the SDG indicator 6.5.2 value, all countries are encouraged to engage in the 2026 monitoring exercise, and, with the support of the custodian agencies and partners, address any data gaps that might be precluding the calculation of their SDG indicator 6.5.2 value.

The global average of the SDG indicator 6.5.2 value is 59 per cent (see figure ii). This means that, for the 117 countries where the SDG indicator can be calculated, on average, a country has 59 per cent of its transboundary basin area covered by operational arrangements. This figure has not changed significantly between exercises – in 2020 it was 58 per cent and in 2017 it was 59 per cent. A significant portion of transboundary basin area therefore remains uncovered by cooperative arrangements.

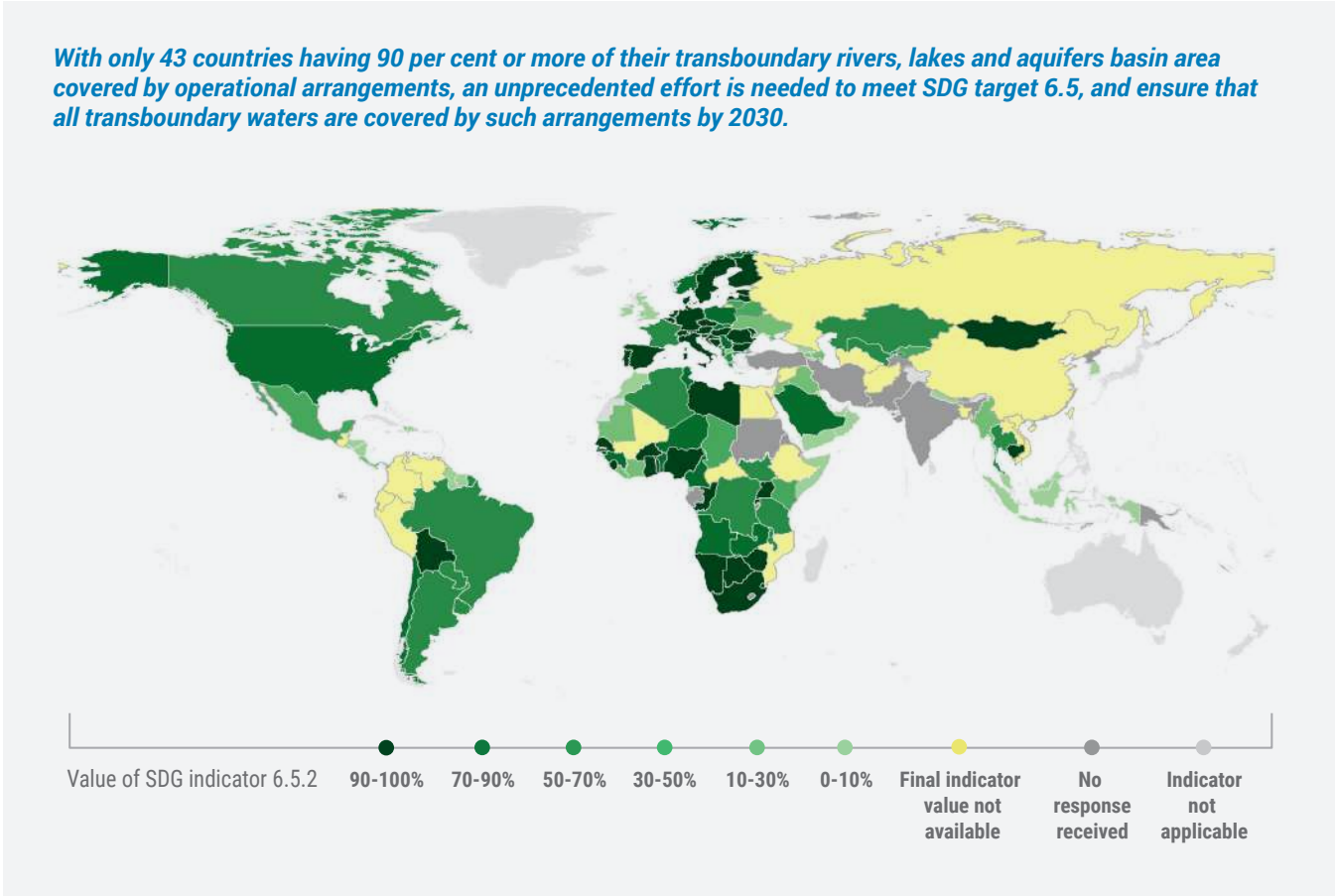
A positive change is that 43 countries sharing transboundary waters now report having 90 per cent or more of their transboundary basin area covered by operational arrangements (see figure iii). While this represents less than a third of countries sharing transboundary waters, it is an increase of 13 countries compared to 2020 and 20 countries more than in 2017. The majority of changes in SDG indicator 6.5.2 values are due to improvements in data availability,

1 SDG indicator 6.5.1 assesses the implementation of integrated water resources management at national and other levels.

2 The number of responses in 2020 and 2023 is the same because 11 countries that responded in 2020 did not respond in 2023, whereas seven new countries submitted a response in 2023, and an additional four countries responded in 2017 and 2023, but not in 2020.

which is testament to the effort and engagement of countries in enhancing their SDG indicator 6.5.2 data through successive exercises.³ Only eight countries have increased their indicator value from 2020 to 2023 by improving cooperation, and in two countries, due to reduced cooperation, the indicator value has even decreased. At such a rate of progress, barely more than a third of countries sharing transboundary rivers, lakes and aquifers would have 90 per cent or more of their basin area covered by operational arrangements by 2030. An unprecedented effort is therefore needed to ensure that all transboundary waters are covered by operational arrangements by 2030.

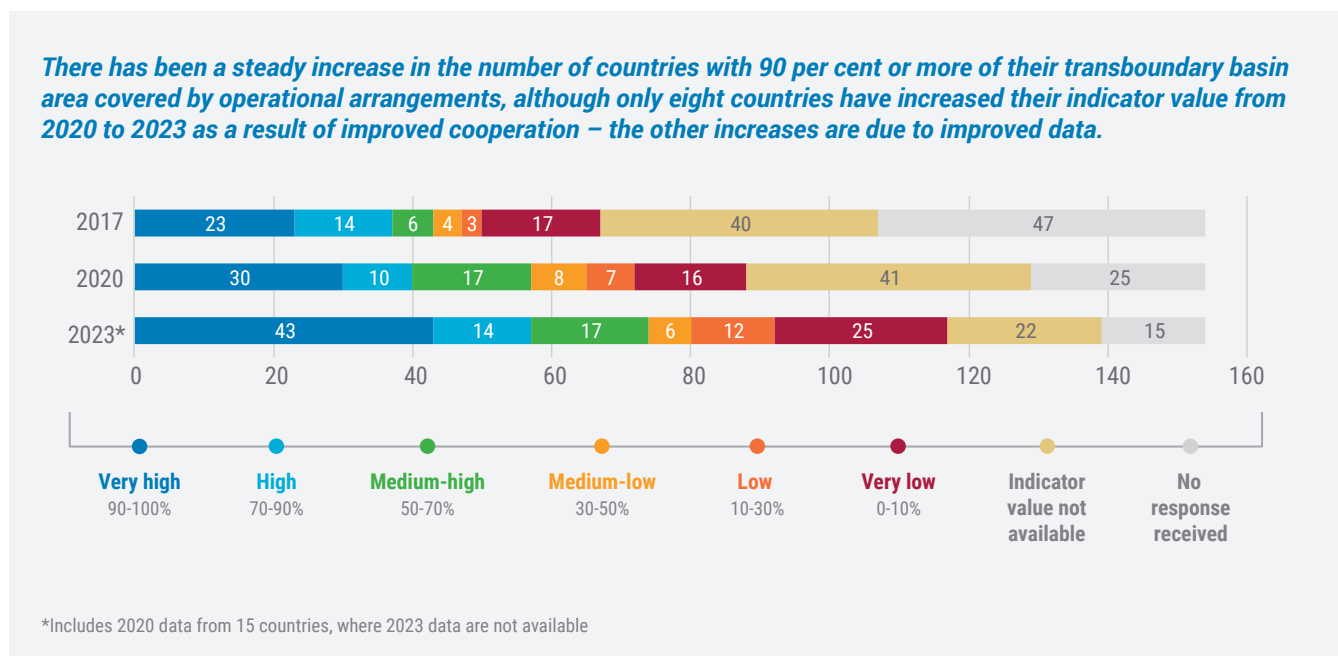
Figure ii: Global map of SDG indicator 6.5.2 value per country (2024).



(Source: developed by UNESCO and UNECE).

3 The improvements in both the number of countries reporting data for the aquifer component and the global average of the aquifer component are closely tied to an increased consideration of transboundary aquifers covered by non-aquifer specific arrangements, that is river basin arrangements that cover both surface water and groundwater. Another significant factor is the simplification of aquifer delineation for calculating the indicator value, which was allowed in 2023 in line with a trend initiated in 2020 (see section 3.1.3 for further details).

Figure iii: Number of countries sharing transboundary waters and breakdown of SDG indicator 6.5.2 values (comparison between 2017, 2020, and 2023 data).



Global averages also mask significant regional variation. Relatively greater coverage of operational arrangements can be found in Europe and North America, where 23 out of 42 countries sharing transboundary waters have 90 per cent or more of their transboundary basin area covered by operational arrangements; and in Sub-Saharan Africa, where 16 out of 42 countries sharing transboundary waters have 90 per cent or more of their transboundary basin area covered by operational arrangements. However, only two out of 41 countries sharing transboundary waters in Asia, one out of 22 countries in Latin America and one out of six countries in North Africa have 90 per cent or more of their transboundary basin area covered by operational arrangements.

Given the link between climate change and transboundary water cooperation, this third SDG indicator 6.5.2 progress report has a special focus on climate change. The SDG indicator 6.5.2 operability criteria, that are joint bodies, regular meetings and data exchange, joint or coordinated plans or strategies provide an important foundation upon which countries can jointly build resilience to climate change within transboundary rivers, lakes and aquifers. Data from the SDG indicator 6.5.2 national reports provide insights into countries' efforts to tackle the impacts of climate change and disaster risk reduction at the transboundary level. For instance, 50 per cent of basins have implemented coordinated or joint alarm systems for floods, and 45 per cent of basins have included preparedness for extreme events among the tasks of a joint body or mechanism.⁴ However, much more action is needed for countries to jointly address climate change and disasters. For instance, only 14 per cent of basins have so far adopted a joint climate change adaptation strategy, only 20 per cent of basins have adopted a joint disaster risk reduction strategy, and only 30 per cent of basins have implemented coordinated or joint alarm systems for droughts.⁵ Countries are therefore encouraged to mainstream transboundary water cooperation into climate change adaptation and mitigation. Opportunities for such mainstreaming can be achieved through the incorporation and coordination of climate adaptation plans at the basin level, and by ensuring that transboundary cooperation is reflected in National

4 Basin analysis based on a total number of 291 river and lake basins listed in section II of the national reports.

5 Ibid.

Adaptation Plans and Nationally Determined Contributions under the Paris Agreement to the UN Framework Convention on Climate Change (UNFCCC). Transboundary water cooperation should also be mainstreamed into the overall process with a global goal on adaptation, and its associated targets and indicators.

SDG indicator 6.5.2 has generated unique insights into progress on transboundary water cooperation. These insights have provided an evidence base to inform decision-making related to the SDGs, such as via the High-Level Political Forums on the SDGs and the UN 2023 Water Conference. Countries should continue to use the SDG indicator 6.5.2 monitoring exercise to identify and address data gaps, particularly in relation to groundwater, and accelerate efforts to adopt operational arrangements for transboundary water cooperation where they are lacking. At both national and basin levels, countries should use their SDG indicator 6.5.2 national reports to take stock of progress and develop action plans to address any gaps or strategic priorities.

Where operational arrangements are lacking, countries should take advantage of the legal frameworks that support transboundary water cooperation at the global level, including the 1992 Water Convention, the 1997 Watercourses Convention and 2008 ILC Draft Articles on the Law of Transboundary Aquifers, as a basis for the negotiation and implementation of their transboundary water arrangements. The intergovernmental institutional framework and the programme of work of the 1992 Water Convention, UNESCO's Internationally Shared Aquifer Resources Management (ISARM) initiative, GEF International Waters and similar programmes can be utilised by countries to provide practical support in the development of arrangements and the establishment of joint bodies. Accession to the Water Convention and the Watercourses Convention also offers an opportunity to mobilise political will in support of transboundary water cooperation.

Key messages

Transboundary water cooperation holds huge potential in supporting progress on sustainable development at multiple levels and advancing coordinated and joint responses to climate change amongst countries. However, while some countries have demonstrated the significant benefits that transboundary water cooperation helps deliver there is an urgent need to learn from experience and enhance cooperation in rivers, lakes and aquifers where co-operative arrangements are lacking or not operational.

An unprecedented effort is needed to meet SDG target 6.5 by 2030, and ensure that all transboundary rivers, lakes and aquifers worldwide are covered by operational arrangements for cooperation. Currently, only 43 out of 153 UN Member States sharing transboundary rivers, lakes and aquifers have operational arrangements in place for 90 per cent or more of their transboundary basin area, and only 26 countries have all their transboundary waters covered by operational arrangements. Unfortunately, the current rate of progress is severely behind where it needs to be. Only eight countries have increased their indicator value from 2020 to 2023 by improving cooperation, and in two countries, as a result of reduced cooperation, the indicator value has even decreased. At such a rate of progress, barely more than a third of countries sharing transboundary rivers, lakes and aquifers would have 90 per cent or more of their basin area covered by operational arrangements by 2030.

There are significant regional variations in transboundary water cooperation. Europe, North America and sub-Saharan Africa show the highest levels of cooperation (39 out of 84 countries have more than 90 per cent of their transboundary basin area covered by operational arrangements). There have been notable developments in Sub-Saharan Africa, where 16 countries were able to report having 90 per cent or more of their transboundary basin area covered by operational arrangements in 2023 compared to five countries in 2020. However, across **Asia, Latin America and North Africa** transboundary water cooperation is low: only four out of 68 countries sharing transboundary waters have 90 per cent or more of their transboundary basin area covered by operational arrangements.

Transboundary water cooperation is indispensable to addressing transboundary risks associated with climate change and to supporting climate-informed transboundary basin management. While transboundary waters are often vulnerable to the impact of climate change, cooperation over these waters helps enhance resilience and address climate change impacts in a coordinated and effective way. It is often not appreciated enough that transboundary water cooperation offers great potential in helping countries to collaboratively and coherently accelerate the global transition towards adaptation and mitigation. Operational arrangements and joint bodies, such as river basin organizations or bilateral commissions, offer a solid foundation upon which countries can exchange data, deepen their collective knowledge of climate change scenarios, develop joint or coordinated adaptation plans and strategies, establish early warning systems, and leverage finance, including for their national adaptation needs.

SDG indicator 6.5.2 data shows that countries have made important efforts to tackle climate change and reduce disaster risk at the basin level, but more work is needed. Coordinated or joint alarm systems for floods are in place for 50 per cent of basins, and almost two-thirds of basins include climate change adaptation as a task for their joint body.* However, only 14 per cent of basins have adopted a joint climate change adaptation strategy, only 20 per cent of basins have adopted a joint disaster risk reduction strategy, and only 30 per cent of basins developed coordinated or joint alarm systems for droughts.* **Moreover, where operational arrangements and joint bodies are absent, countries lack the foundations upon which tailored responses to climate change can be developed.**

SDG indicator 6.5.2 is having a positive impact on transboundary water cooperation. The 2017, 2020 and 2023 SDG indicator 6.5.2 monitoring exercises have helped address data gaps, especially in relation to transboundary aquifers.

Despite the politically sensitive nature of transboundary waters, over 84 per cent of countries sharing transboundary waters have engaged with the exercise. SDG indicator 6.5.2 monitoring has inspired countries, such as those sharing the Senegalo-Mauritanian aquifer system, to work together to accelerate progress on the adoption of arrangements and joint bodies for transboundary water cooperation or make existing arrangements operational. While SDG indicator 6.5.2 has therefore positively influenced transboundary water cooperation, there is a need for countries to accelerate progress, and also to ensure that the 36 countries where data was unavailable in 2023 provide data in the 2026 monitoring exercise.

Countries should continue to use the SDG indicator 6.5.2 monitoring exercise to identify and address data gaps, particularly in relation to groundwater, and accelerate efforts to adopt operational arrangements for transboundary water cooperation where they are lacking. Global legal frameworks, such as the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention), the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses (Watercourse Convention), and the 2008 Draft Articles on the Law of Transboundary Aquifers provide a sound basis upon which countries can develop and strengthen the implementation of arrangements for transboundary water cooperation. Upscaling capacity development initiatives, including the exchange of experiences, improved and innovative financing models, and mobilising political will for transboundary water cooperation through inter alia accession to the 1992 Water Convention and the 1997 Watercourses Convention are important ways in which transboundary progress towards SDG target 6.5 achievement can be accelerated.

Progress towards SDG target 6.5 can be enhanced by coordinated efforts on integrated water resources management (IWRM, SDG indicator 6.5.1), and transboundary cooperation (SDG indicator 6.5.2). Initiatives on both topics are mutually supportive, have the potential to enhance climate resilience of shared waters, directly benefit numerous socioeconomic development objectives, and consequently support progress towards corresponding SDGs.

* Basin analysis based on a total number of 291 river and lake basins listed in section II of the national reports.



Limpopo River shared by Botswana, Mozambique, South Africa and Zimbabwe. © Vhembe Biosphere Reserve



Confluence of the Iguazú and Paraná Rivers at the borders of Argentina, Brazil and Paraguay. © Adobe Stock*

1. Introduction

“Water has the capacity to unite and act as a driver of peace, sustainable development, climate action and regional integration. Even in times of severe water scarcity, cooperation on surface waters and groundwaters has been a game changer and countries have demonstrated an ability to collaborate based on international water law principles in order to find and implement mutually beneficial solutions.”¹

¹ UN, *Report of the United Nations Conference on the Midterm Comprehensive Review of the Implementation of the Objectives of the International Decade for Action, “Water for Sustainable Development”, 2018-2028*, UN Doc. A/CONF.240/2023/10, 22-24 March 2023, <https://documents.un.org/doc/undoc/gen/n23/315/00/pdf/n2331500.pdf>, accessed 6 May 2024, para 148.

1.1 Setting the context

The 2030 Agenda for Sustainable Development sets out a transformative plan of action for people, planet and prosperity. The Sustainable Development Goals (SDGs) are central to this plan of action, as are the system of targets and indicators that monitor progress. SDG 6, which is supported by eight targets and 11 indicators, seeks to ensure water and sanitation for all. Central to SDG 6, and the sustainable management of water resources in particular, is SDG target 6.5, which calls for the implementation of integrated water resources management (IWRM) at all levels, including through transboundary water cooperation as appropriate, by 2030. IWRM, in turn, stresses the importance of coordination, including between sectors, across land and water, and amongst countries sharing rivers, lakes and aquifers in order to promote sustainable development.² Progress in implementing IWRM is measured by two indicators. SDG indicator 6.5.1 measures the implementation of IWRM through an assessment of four key components (enabling environment, institutions and participation, management instruments, and financing).³ SDG indicator 6.5.2 complements SDG indicator 6.5.1 by focusing on the transboundary level and assessing the proportion of transboundary basin area (river, lake or aquifer) within a country covered by an operational arrangement for water cooperation. SDG indicator 6.5.2 is unique in being the only SDG indicator exclusively dedicated to monitoring transboundary cooperation. Cooperation at the transboundary level is not only vital for ensuring water for all, but also for supporting progress across other SDGs (see table 1).

Where operational arrangements are in place, countries have highlighted a range of achievements that cooperation delivers (see figure 1). The top three, that is better knowledge and understanding, adoption of joint plans and programmes and improved water management, are similar to the responses in 2020, where better knowledge and understanding was top, followed by the adoption of joint plans and programmes, and then the adoption of cooperative arrangements, with improved water management fourth.⁴

However, transboundary water cooperation is also not without its challenges. As figure 2 highlights, countries often face different types of difficulties in progressing transboundary water cooperation, with the top three being a lack of relevant data and information, resource constraints, and difficulties in the exchange of data and information. Along similar lines, resource constraints, lack of relevant data and information, and differences between national administrative and legal frameworks were highlighted as the top three challenges in 2020, closely followed by difficulties in data and information exchange.⁵







2 See UNEP (2024), *Progress on implementation of Integrated Water Resources Management – Mid-term status of SDG indicator 6.5.1 and acceleration needs, with a special focus on climate change 2024*, <https://iwrmdataportal.unepdhi.org/publications/global>, accessed 30 August 2024.

3 Ibid.





4 UNECE and UNESCO, *Progress on Transboundary Water Cooperation – Global Status of SDG indicator 6.5.2 and Acceleration Needs 2021*, UN Doc. ECE/MPWAT/65, <https://unece.org/environment-policy/publications/progress-transboundary-water-cooperation-global-status-sdg>, accessed 10 June 2024, at p. 52.

5 Ibid, at p. 53.

Table 1: Transboundary water cooperation supports multiple development objectives across the SDGs.

GLOBAL CHALLENGE	SDG	EXAMPLE OF OPERATIONAL ARRANGEMENTS FOR TRANSBOUNDARY WATER COOPERATION CONTRIBUTING TO SDGS
Poverty alleviation	 <p>1 NO POVERTY</p>	Cooperation between El Salvador, Guatemala and Honduras through the Trinational Commission of the Trifinio Plan demonstrates how basin-wide development programmes support actions to fight poverty and improve the living conditions of local communities. ^[i]
Food security	 <p>2 ZERO HUNGER</p>	Cooperation between Portugal and Spain in the framework of the Albufeira Convention has facilitated sustainable agricultural and energy production through the existence of a well-defined flow regime and coordination of actions to control situations of drought and water scarcity. ^[ii]
Health and well-being	 <p>3 GOOD HEALTH AND WELL-BEING</p>	Cooperation between Czechia and Germany in the International Commission for the Protection of the Elbe River enabled a marked improvement in the water quality of the Elbe, for example a decrease in the concentration of mercury in the sediments from more than 8 mg/kg in 1996 to less than 0.5 mg/kg in 2013. ^[iii]
Gender equality	 <p>5 GENDER EQUALITY</p>	The Volta Basin Water Charter commits Volta riparians (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali and Togo) and the Volta Basin Authority to give special consideration to the interests and contributions of women, men and vulnerable people in decision-making about water and the environment, the right to water and sanitation, capacity-building, and investment operations in the water sector. ^[iii]
Clean energy	 <p>7 AFFORDABLE AND CLEAN ENERGY</p>	Implementation of jointly-owned and managed projects, such as the Manantali and Diama dams, has been recognized among the major cooperation achievements within the framework of the Organization for the Development of the Senegal River. ^[iv]
Climate change	 <p>13 CLIMATE ACTION</p>	Countries of the Amazon, with the help of the Amazon Cooperation Treaty Organization, have implemented climate change adaptation activities under the Amazon Basin Strategic Action Programme. The Amazon Regional Observatory was recently expanded to include a climate change module, and climate change scenarios have been integrated in the Regional Hydrological Platform. ^[v]

GLOBAL CHALLENGE	SDG	EXAMPLE OF OPERATIONAL ARRANGEMENTS FOR TRANSBOUNDARY WATER COOPERATION CONTRIBUTING TO SDGS
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Ecosystem protection		<p>In the Dniester Commission, the Republic of Moldova and Ukraine cooperate in implementing ecosystem-based adaptation activities (reforestation, fish conservation, restoration of floodplains, etc.), as identified in the Strategic Framework for Adaptation to Climate Change in the Dniester River Basin.^[vi]</p>
		
Peace and security		<p>The Lake Chad Basin Commission promotes regional integration, peace and security in the basin. A dedicated Multinational Joint Task Force was mandated to deal with cross-border security issues and facilitate humanitarian operations and the delivery of assistance to the affected populations in the Lake Chad region.^[vii]</p>
Partnerships		<p>In the Organization for the Development of the Gambia River, the national and local coordination and monitoring committees have ensured that the voices of national and local stakeholders, civil society, rural communities, and youth and women’s associations are taken into account in the development of measures in the basin.^[viii]</p>

[i] Plan Trifinio “Agua sin fronteras”, <https://www.plantrifinio.int>, accessed 27 April 2024. Among others, activities included establishing cross-border and inter-agency arrangements between national governments and local governments with participation of key stakeholders, resulting in investment and employment opportunities through programmes for the protection of natural resources and protected area management.

[ii] UNECE, *The Water Convention: 30 Years of Impact and Achievements on the Ground*, UN Doc. ECE/MP.WAT/69/Corr.1, <https://unece.org/environment-policy/publications/water-convention-30-years-impact-and-achievements-ground>, accessed 27 April 2024.

[iii] Volta Basin Water Charter (2018), arts. 4(g), 6(3), 131 and 139.

[iv] National Reports of Guinea, Mauritania and Senegal on the SDG indicator 6.5.2, 2023.

[v] UNECE, *Progress report of the Global network of basins working on climate change adaptation as of April 2023*, https://unece.org/sites/default/files/2023-07/Global_network_overview_pilot%20projects_progress_May2023_ENGL_Final_0.pdf, accessed 27 April 2024.

[vi] Strategic Framework for Adaptation to Climate Change in the Dniester River Basin (2021).

[vii] The Multinational Joint Task Force, <https://mnjtfmm.org/about>, accessed 27 April 2024.

[viii] UNECE, *Progress on transboundary water cooperation under the Water Convention: Second report on implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 2017–2020*, UN Doc. ECE/MP.WAT/67, September 2021, <https://unece.org/info/Environment-Policy/pub/360105>, accessed 27 April 2024.

Figure 1: What have been the main achievements in cooperating on transboundary waters? (SDG indicator 6.5.2 reporting template, section IV, question 2).

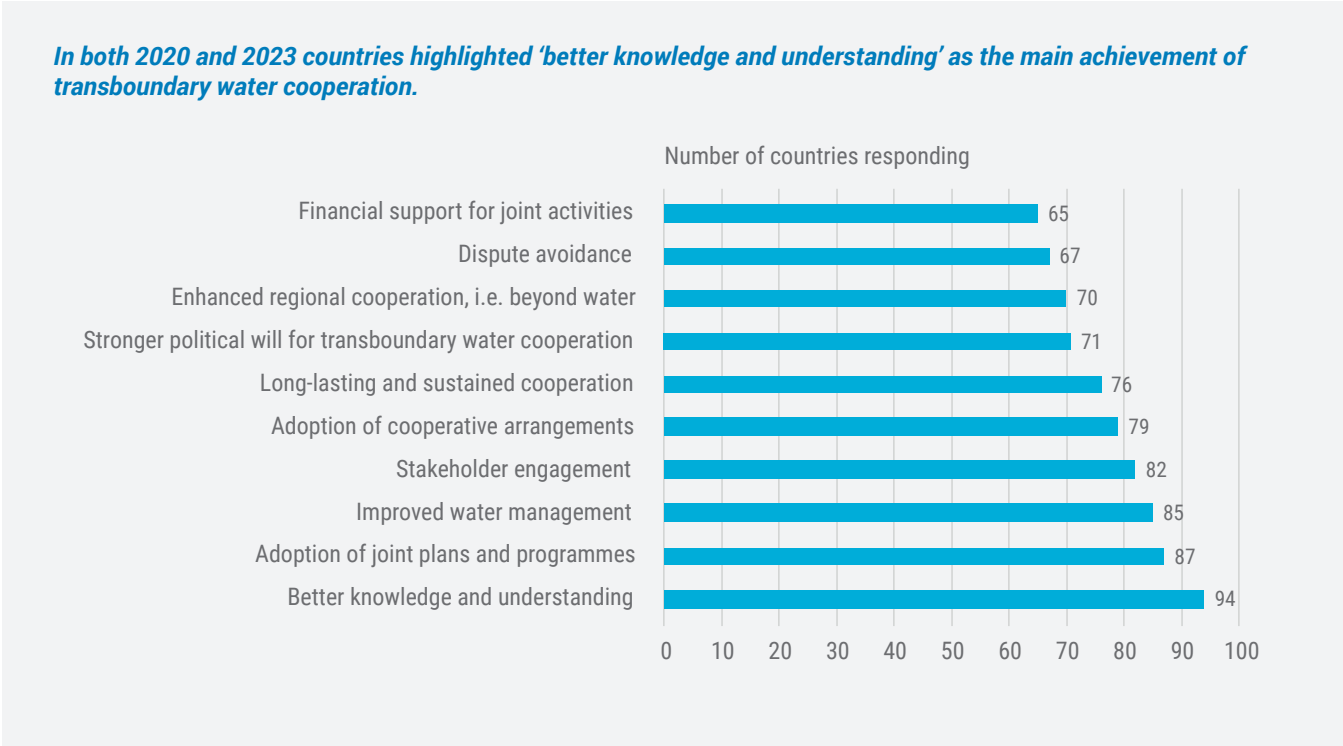
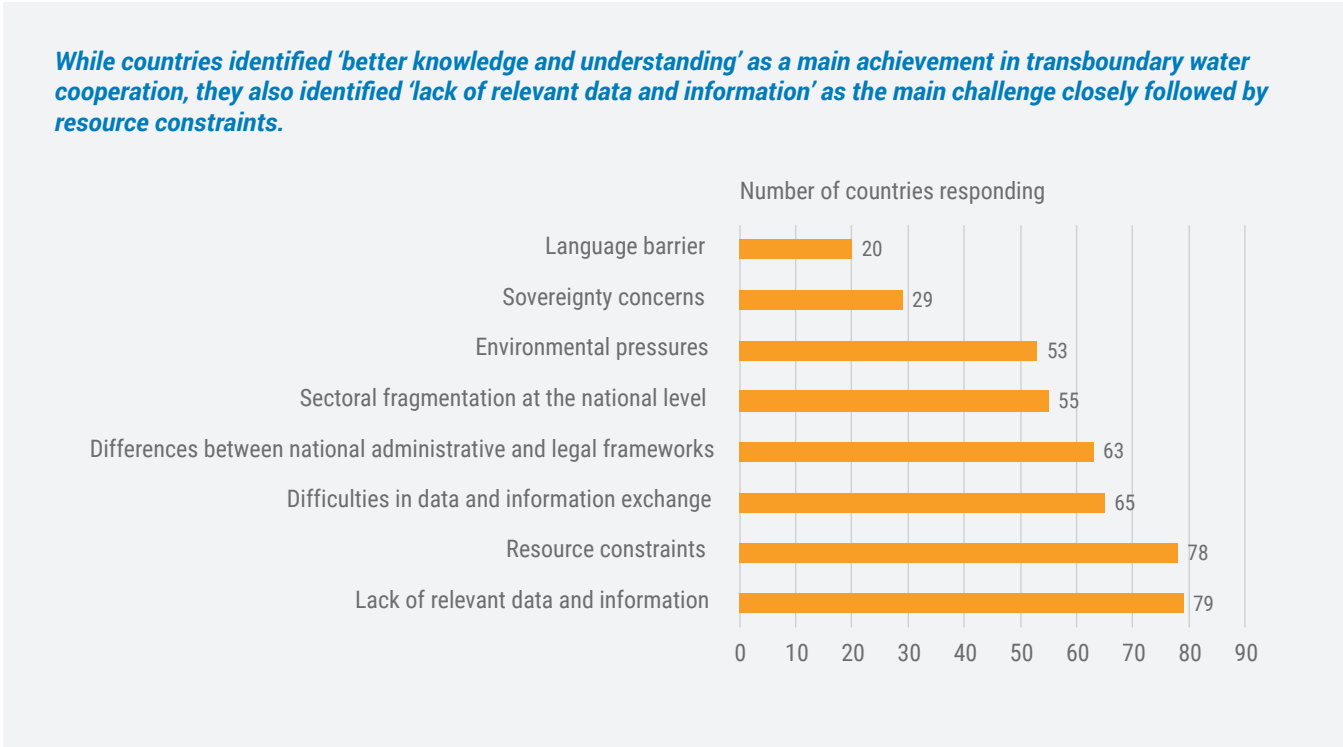


Figure 2: What are the main challenges your country faces in cooperating on transboundary waters? (SDG indicator 6.5.2 reporting template, section IV, question 1).



1.2 Aims and objectives of this report

The first SDG indicator 6.5.2 progress report in 2018 established a global baseline for assessing the extent to which transboundary rivers, lakes and aquifers are covered by operational arrangements. The second report in 2021 reflected on improvements both in the coverage and quality of data, and identified actions that could be taken through the SDG 6 Global Acceleration Framework. This third report presents the findings of the third SDG 6.5.2 monitoring exercise, which took place in 2023, and places special emphasis on climate change.

The report is made up of five sections. Following this introduction, section II discusses the reporting process. Section III then presents the latest data from the 2023 monitoring exercise at both global and regional levels, as well as disaggregating the data to river and lake basins, and aquifers. Section IV analyses SDG indicator 6.5.2 data within the context of climate change. The conclusion summarises key findings and highlights critical steps that should be taken to accelerate progress on transboundary water cooperation, climate change and the SDGs.

1.3 Why the special emphasis on climate change within a transboundary water context?

Transboundary waters are of great significance globally (see figure 3). An estimated 313 river basins⁶ and 468 aquifers,⁷ are shared by two or more countries. In total,

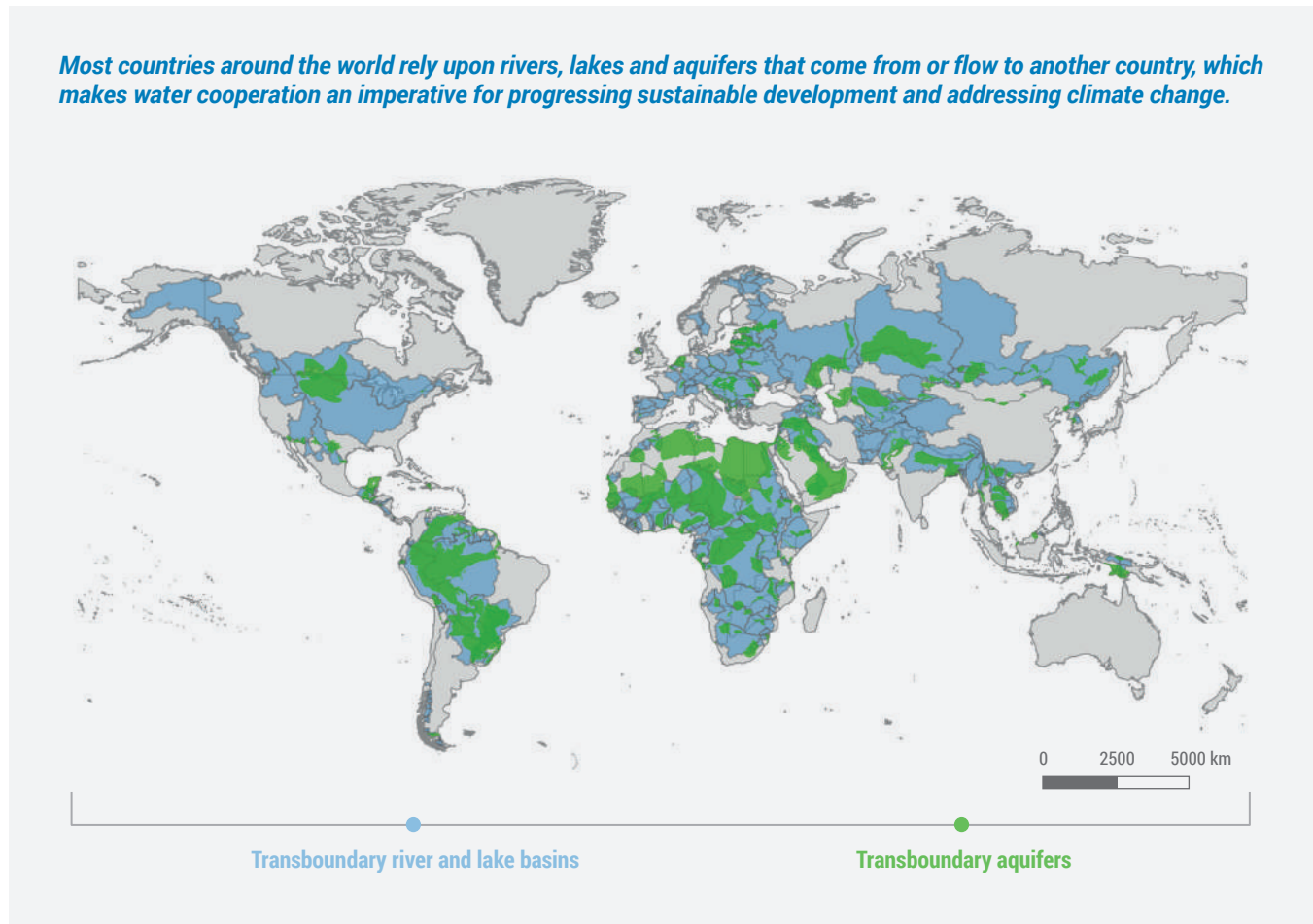
153 UN Member States are reliant upon these waters. Transboundary rivers alone account for 60 per cent of the world's freshwater flows, and more than three billion people depend on these waters for their social, economic and environmental needs.

Climate change poses a major threat to transboundary waters. While often under-appreciated, transboundary rivers, lakes and aquifers also offer great potential in avoiding conflicts between countries, and accelerating the global transition towards adaptation and mitigation.⁸ However, the Intergovernmental Panel on Climate Change (IPCC) 2023 Sixth Assessment Report warns that, "increasing transboundary risks are projected across the food, energy and water sectors as impacts from weather and climate extremes propagate through supply-chains, markets, and natural resource flows ... and may interact with impacts from other crises such as pandemics".⁹ Also, a large part of disaster risks, including floods, droughts, typhoons/cyclones, landslides and water quality emergencies, are directly or indirectly linked to water management issues.¹⁰

Recent decisions of the UN Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) have stressed the links between transboundary water cooperation and climate change. For example, the COP28 decision on the global goal on adaptation (GGA) adopts the UAE Framework for Global Climate Resilience¹¹ and includes water as its first thematic target, calling for parties to significantly reduce "climate-induced water scarcity and enhance 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".¹²

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- 6 Oregon State University, *Transboundary Freshwater Spatial Database*, <https://transboundarywaters.ceoas.oregonstate.edu/transboundary-freshwater-spatial-database>, accessed 10 June 2024.
- 7 IGRAC, *Transboundary Aquifers of the World [map]*, 2021, <https://unesdoc.unesco.org/ark:/48223/pf0000380193?posInSet=1&queryId=04eaf331-dd0b-409a-9c97-43ef221adee2>, accessed 6 May 2024.
- 8 World Economic Forum, *Global Risk Report 2023*, <https://www.weforum.org/publications/global-risks-report-2023>, accessed 6 May 2024, at p. 61.
- 9 IPCC, *Synthesis Report of the IPCC Sixth Assessment Report (AR6)*, https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf, accessed 6 May 2024, at p. 63.
- 10 See UNECE and UN Office for Disaster Risk Reduction, *Words into Action Guidelines - Implementation Guide for Addressing Water-Related Disasters and Transboundary Cooperation*, UN Doc. ECE/MP.WAT/56, <https://www.undrr.org/publication/words-action-guidelines-implementation-guide-addressing-water-related-disasters-and#:~:text=This%20Words%20into%20Action%20guide,into%20account%20climate%20change%20adaptation>, accessed 6 May 2024.
- 11 Decision 2/CMA.5, *Global Goal on Adaptation*, https://unfccc.int/sites/default/files/resource/cma2023_16a01_adv_0.pdf, accessed 7 May 2024, para 6.
- 12 Ibid, para 9.

Figure 3: Transboundary river and lake basins, transboundary aquifers and international borders.



(Source: UNESCO-IGRAC. 2015. Map of Transboundary Aquifers of the World. Scale 1:50 000 000. Paris, France (aquifers); UNEP and GEF, TWAP River Basins Data Portal (river and lake basins)).

This decision also stresses the importance 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’.¹³ Moreover, the decision recognises 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’.¹⁴ The COP28 decision on the first global stocktake also recognizes that climate

change impacts, both “require knowledge-sharing and international cooperation”, and require “international collaboration, including transboundary cooperation, for contributing to progress towards the goals of the Paris Agreement.”¹⁵

Another important feature of COP28 Decision on the global goal on adaptation is the introduction of targets, as well as the two-year UAE-Belém work programme on indicators.¹⁶ The targets call for the establishment of impact, vulnerability and risk assessments and multi-hazard early warning systems; national adaptation

¹³ Ibid.

¹⁴ Ibid, para 18.

¹⁵ Decision 1/CMA.5, *Outcome of the First Global Stocktake*, https://unfccc.int/sites/default/files/resource/cma2023_16a01_adv_0.pdf, accessed 7 May 2024, para 52 and 156.

¹⁶ Decision 2/CMA.5, *supra* note 11, para 10.

plans, policies and strategies to be in place that cover ecosystems, sectors, people and vulnerable communities; and, urge these plans to be effectively monitored and evaluated, and the required institutional capacity to be in place to support their full implementation.¹⁷ Where countries share transboundary waters, these assessments, early warning systems, national adaptation plans, policies and strategies will benefit from coordination, which in turn will require institutional capacity to be enhanced at the transboundary level through the adoption and strengthening of operational arrangements and joint bodies, such as river basin organisations or bilateral commissions.

The links between transboundary waters and climate change are many and varied. While cooperation over transboundary waters offers cross-sectoral benefits, climate change, as a risk multiplier, places additional stresses and strains on the ability of countries to share waters equitably and sustainably. For example, the challenges posed by climate change include increased uncertainty regarding water availability and variability, growing tensions between competing water users, greater risks of natural disasters, deteriorating water quality, increased risk of water-related diseases, changing water demands, and increased costs of water management.¹⁸ The unequal distribution of climate-induced effects and resulting impacts from one region to another poses an additional challenge. Where waters cross national borders, it is imperative that countries co-ordinate their responses to these challenges. Coordinated responses offer the most efficient and effective option. Uncoordinated unilateral action may not just be inefficient, but in some instances may risk doing more harm than good.

While climate change poses a major threat to transboundary waters, cooperation also has a key role to play in tackling climate adaptation and mitigation. Through transboundary water cooperation, countries can enhance their capacity to adapt to the above challenges through, for example, the sharing of data,

costs and benefits of any planned measures, better forecasting and risk assessments, contingency planning, and the adoption of early warning systems. Cooperative processes can also help countries to locate measures, such as flood protection infrastructure or water storage, where they have the optimum effect in a basin. In line with the Biodiversity Convention's Kunming-Montreal Global Biodiversity Framework, transboundary cooperation can also help countries implement nature-based solutions that support both climate adaptation and mitigation, through for example, improved natural storage.¹⁹ Additionally, within a transboundary context, water cooperation is often a key component in mitigation efforts designed to transition away from fossil fuels to clean energy. Increased use of water for hydropower, cooling of nuclear plants, the use of geothermal resources, and the extraction and processing of metals, minerals and other natural resources used to produce renewable technologies, such as batteries, will all require trade-offs to be made between different water users. While cooperation can help maximize the shared benefits of transboundary rivers, lakes and aquifers, an uncoordinated drive to clean energy can lead to unsustainable practices, heightened competition, and tension between countries sharing the same waters.

¹⁷ Ibid, para 39.

¹⁸ UNECE, *Handbook on Water Allocation in a Transboundary Context*, UN Doc. ECE/MP.WAT/64, December 2021, <https://unece.org/environment-policy/publications/handbook-water-allocation-transboundary-context>, accessed 6 May 2024, p. 37.

¹⁹ Convention on Biological Diversity, *Decision 15/4 Kunming-Montreal Global Biodiversity Framework*, UN Doc. CBD/COP/DEC/15/4, 19 December 2022, <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>, accessed 6 May 2024.



Mekong River shared by Cambodia, China, Laos, Myanmar, Thailand and Vietnam. © Adobe Stock*

2. The reporting process and the role of custodian agencies

2.1 Overview of SDG indicator 6.5.2 third monitoring and process

The SDG indicator 6.5.2 monitoring exercise takes place every three years. An invitation letter is sent by UNESCO and UNECE as co-custodian agencies of the indicator to line ministries of countries sharing transboundary river and lake basins, or aquifers. The 2023 exercise, which had a submission deadline of 30 June 2023, marks the third cycle of this ongoing process, and builds upon the previous exercises conducted in 2017 and 2020. Countries are invited to fill out a template that enables them to not only calculate the final indicator value but also provide detailed information on the content of their arrangements for transboundary water cooperation and progress in their implementation. The data submitted through the template enables custodian agencies to verify the data while also allowing countries an opportunity to review progress, assess any gaps and challenges, and identify steps that might be taken to advance their cooperation.

UNECE and UNESCO, as co-custodian agencies of SDG indicator 6.5.2,²⁰ have been guiding countries throughout the reporting process, and in so doing have stressed the importance of enhancing data quality and consistency. Their support, together with global and regional partner organizations, has included specific actions for the promotion of exchange of best practices and lessons learned, which has ultimately contributed to more robust reporting.²¹

Box 1: Definition of SDG indicator 6.5.2

SDG indicator 6.5.2 monitors the ‘proportion of transboundary basin area [within a country] with an operational arrangement for water cooperation’.*

‘Basin area’ includes the areas of both ‘river and lake basins’ and ‘aquifers’.

For an ‘arrangement for water cooperation’** to be operational, all four of the following criteria must be met:

- There must be a joint body or mechanism for transboundary cooperation in place.
- There must be at least annual meetings between riparian countries.
- A joint or coordinated water management plan or joint objectives must have been established.
- There must be at least annual exchanges of data and information.

* UNECE and UNESCO, *Step-by-step monitoring methodology for SDG indicator 6.5.2 (version 2020)*, <https://unece.org/guidance-materials-and-information-countries>, accessed 6 May 2024; UNECE, *Guide to reporting under the Water Convention and as a contribution to SDG indicator 6.5.2*, UN Doc. ECE/MP.WAT/60, https://unece.org/sites/default/files/2021-02/ece_mp.wat_60_eng_web.pdf, accessed 6 May 2024

**A definition of an ‘arrangement for water cooperation’ is provided in the two publications listed above.

²⁰ For a definition of SDG indicator 6.5.2 see box 1.

²¹ For instance, among others the following activities were held to support countries during the third monitoring exercise: Global Webinars on SDG indicator 6.5.2 Transboundary Water Cooperation supporting countries in preparing national reports for the 3rd reporting exercise with a focus on coordination (17 and 18 April 2023); Webinars, in Spanish, dedicated to the third monitoring exercise on SDG indicator 6.5.2 - How to prepare and use the national reports on transboundary water cooperation? (27 April & 4 May 2023); SDG 6 2023 Data Drive kick-off webinars (2 May 2023); Special Session on SDG Indicator 6.5.2 during the Regional Workshop on the accession process and implementation of the Water Conventions in West Africa, Ouagadougou, Burkina Faso (3-5 May 2023); Workshop on the legal and institutional arrangements for transboundary water cooperation and data exchange, Beirut, Lebanon (in cooperation with ESCWA) (30-31 May 2023); Asia Region Online Workshop: Supporting Countries in preparing National Reports for the 3rd reporting exercise of SDG Indicator 6.5.2 on Transboundary Water Cooperation in Asia Pacific (8-9 June 2023); Special Session on SDG Indicator 6.5.2 focusing on Transboundary Aquifers during ISARM Americas Congress for Transboundary Aquifers Management (13 September 2023); Special Session on SDG Indicator 6.5.2 during the regional workshop on the effective governance and the sustainable management of shared aquifers, Ouagadougou, Burkina Faso (28 and 29 September 2023); Special Session on SDG Indicator 6.5.2 at the Southeast Asia Water Security - IWRM Regional Conference, organized by GWP-SEA and other partners in Bali, Indonesia (10-11 October 2023).

The 2023 monitoring exercise resulted in enhanced quality of reported data, which has ultimately improved the reliability of the results. During the preparation of reports, the custodian agencies encouraged countries sharing the same river, lake or aquifer to coordinate their efforts, which in turn has helped to ensure that the data provided is not only of good quality but also consistent across borders. In addition, this emphasis on coordination has supported the harmonization of data sources, methodologies, and reporting practices among riparian countries.²²

2.2 Overview of SDG indicator 6.5.2 responses and the review process

There has been notable progress and changes in country responses to SDG indicator 6.5.2 compared to the previous rounds, which underscores the growing global recognition of the indicator's importance (see figures 4-8). While the second SDG indicator 6.5.2 monitoring exercise was marked by the challenges posed by the COVID-19 pandemic, a total of 129 countries responded to the exercise, which surpassed the 107 countries that participated in the first exercise. In 2023, the total number of responses is again 129, with seven countries submitting national reports for the first time (Bahrain, Mauritania, Nepal, San Marino, Syria, Timor-Leste and Yemen).²³ This is due in part to the efforts of the custodian agencies to target and support countries that had previously not submitted national reports on SDG indicator 6.5.2 or had struggled to provide sufficient data to calculate their indicator value. A total of 11 countries have not responded to any of the three SDG indicator 6.5.2 monitoring exercises.

Overall in 2023, 117 countries possess a full value for the indicator²⁴ compared to 101 in 2020, and only 67 countries in 2017.²⁵ There has been notable progress in the availability of data related to transboundary aquifers, with 111 countries presenting an indicator value in 2023, compared to just 94 in 2020, and 65 in 2017. This reflects an increased attention towards, and recognition of transboundary aquifers. It also reflects a greater willingness of countries to provide aquifer-related data where it was previously absent, and where appropriate, to interpret river and lake basin arrangements in a way that recognizes connected aquifers. The flexibility in applying the methodology, particularly regarding estimates of aquifer surface areas, has also played a key role in facilitating these advancements.

An important point to consider when reviewing changes in the indicator value between exercises is that those changes may not necessarily be a result of the evolution of cooperation but might instead be due to a clarification in data, such as an update in the number and area of river and lake basins and aquifers (see examples in box 2), or a re-interpretation of information relevant to the operationality criteria. The nature of any changes is categorized in Annex I. Data in the annex shows that in only eight instances was an improvement in the indicator value due to the adoption of new operational arrangements. The majority of changes (that is 26) were due to countries updating their data. In the vast majority of cases, these updates reflect the willingness of countries to better account for their transboundary aquifers. Through the SDG indicator 6.5.2, countries have, for example, recognized the importance of accounting for connected aquifers within their river and lake basin arrangements. In two instances (Belarus and Ukraine), decreased cooperation resulted in a reduction of the country's SDG indicator 6.5.2 value.

22 For the third monitoring exercise, the custodian agencies prepared a document in English, French, Russian and Spanish that explains the ways in which neighbouring countries can coordinate and harmonize their data (see UNECE and UNESCO, *Opportunities to coordinate with neighboring countries when completing the SDG indicator 6.5.2 national report*, <https://unesdoc.unesco.org/ark:/48223/pf0000384985>, accessed 6 May 2024).

23 The total number of responses includes seven countries that reported for the first time, and four countries that responded in 2017 and 2023, but not in 2020. These 11 countries are offset by 11 countries that responded in 2020 but not in 2023.

24 Full value means that it is possible to calculate both the river and lake basin, and the aquifer component of the indicator for a country.

25 This figure includes nine countries that submitted data in 2020 but did not update their data for the 2023 exercise or it was not possible to calculate an indicator value on the basis of the data they provided.

These changes show how a regular monitoring exercise constitutes an important opportunity for countries to continually reconsider their data both in light of improvements in data quality and advances in transboundary cooperation. Where this is done in collaboration with different government departments, scientific and technical experts and civil society, it can raise the profile of transboundary water cooperation

within a country. Figure 9 provides an overview of the groups consulted during the development of SDG indicator 6.5.2 national reports.

A change in the third reporting template was the inclusion of several questions related to gender. The results of the responses to these questions are provided in box 3.

Box 2: Examples of updated information reported by countries during the third monitoring exercise

- 3 'new' river basins (Hakhoum, Tavush, and Hakhinja) and 2 'new' aquifers reported by Armenia
- 1 'new' river sub-basin (Andis Koisu) and 1 'new' basin (Psou) reported by Georgia
- 3 'new' river sub-basins (Marano, Ausa, and San Marino) reported by Italy
- 1 'new' river basin (Rezovska) reported by Bulgaria
- 2 'new' aquifers (Dibdiba and Dammam) reported by Iraq
- 3 'new' river basins (Yarmouk, Zarqa, and Hamad) and 1 'new' aquifer (Jafer) reported by Jordan
- 1 'new' aquifer (Sebatik Island Aquifer) reported by Malaysia
- 2 'new' river basins (Manipura, and Thaungyin) reported by Myanmar

Figure 4: Overview of the responses received to indicator 6.5.2 (2017, 2020, 2023).

The number of countries submitting responses to SDG indicator 6.5.2 has grown, but there are still notable gaps in coverage.

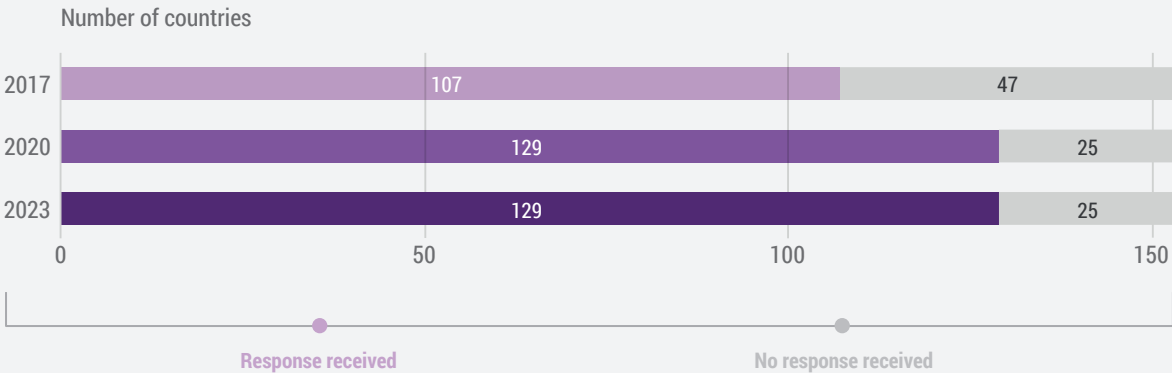


Figure 5: Number of countries sharing transboundary waters and availability of SDG indicator 6.5.2 value (comparison between 2017, 2020 and 2023 data).

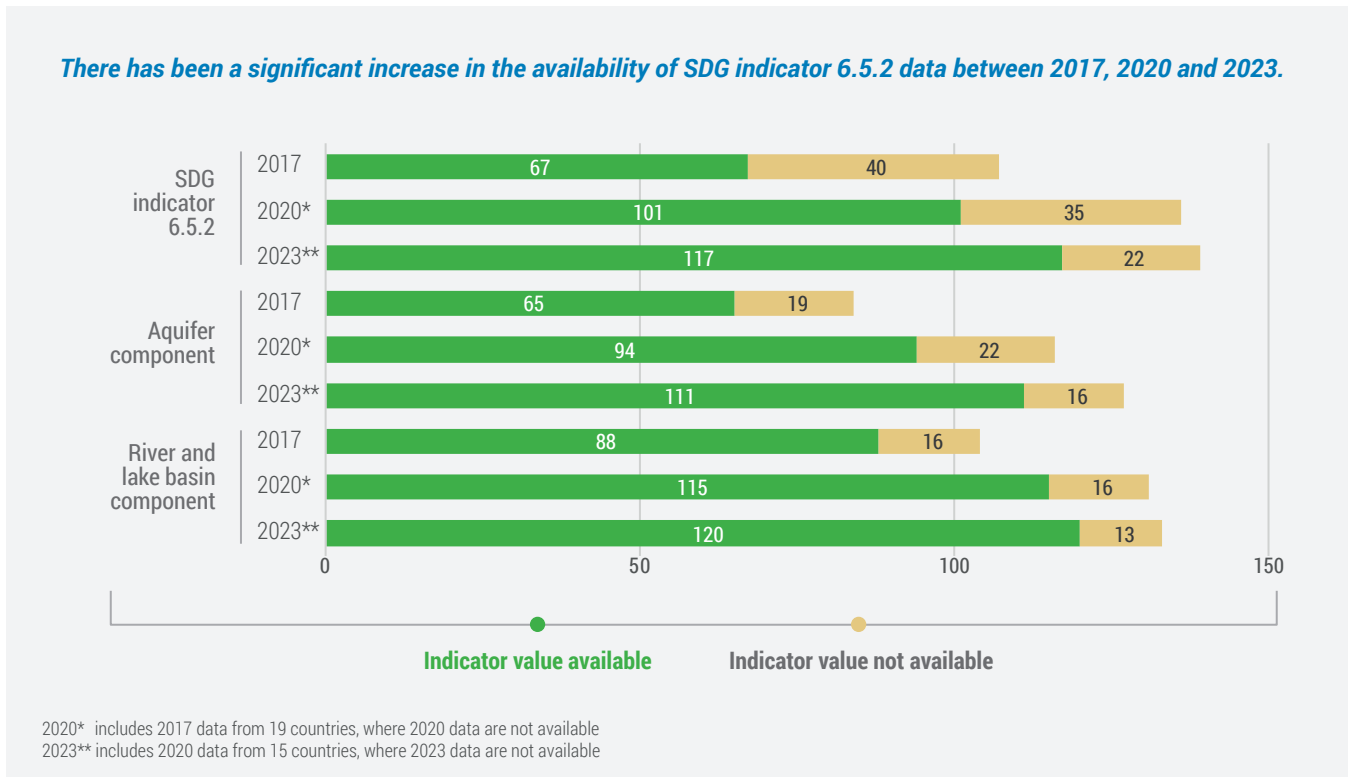
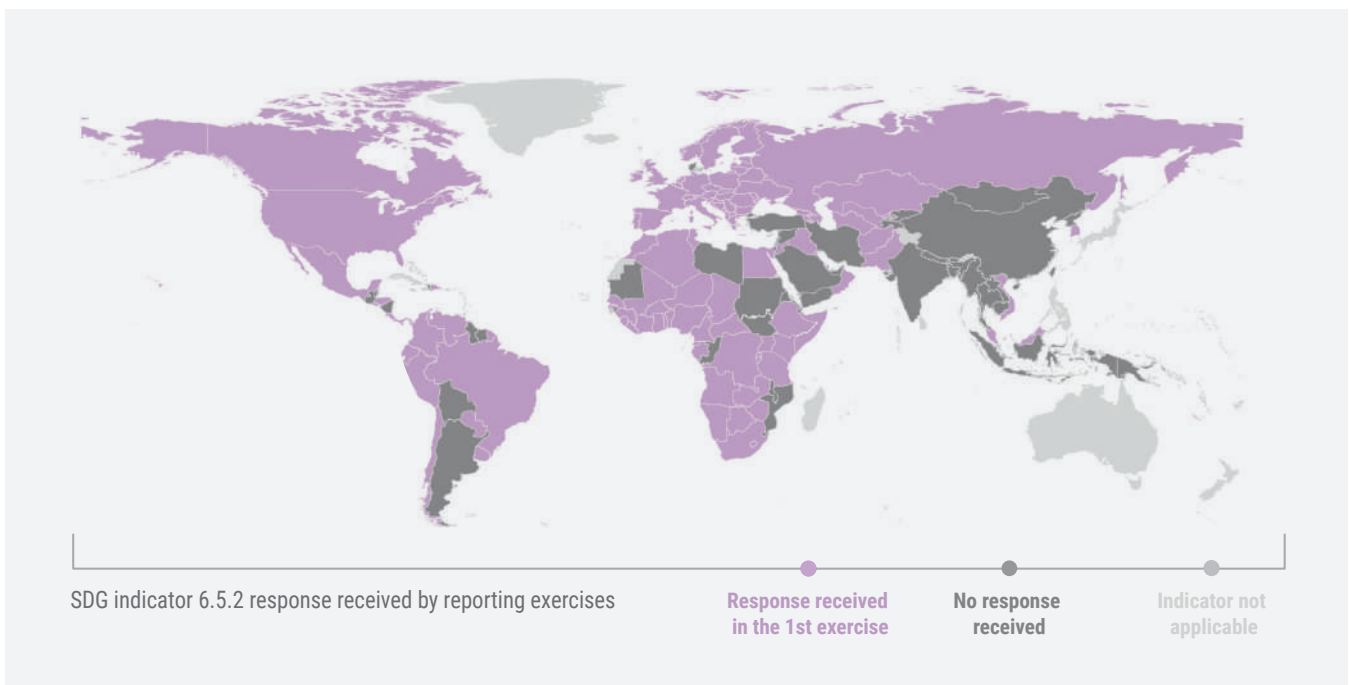
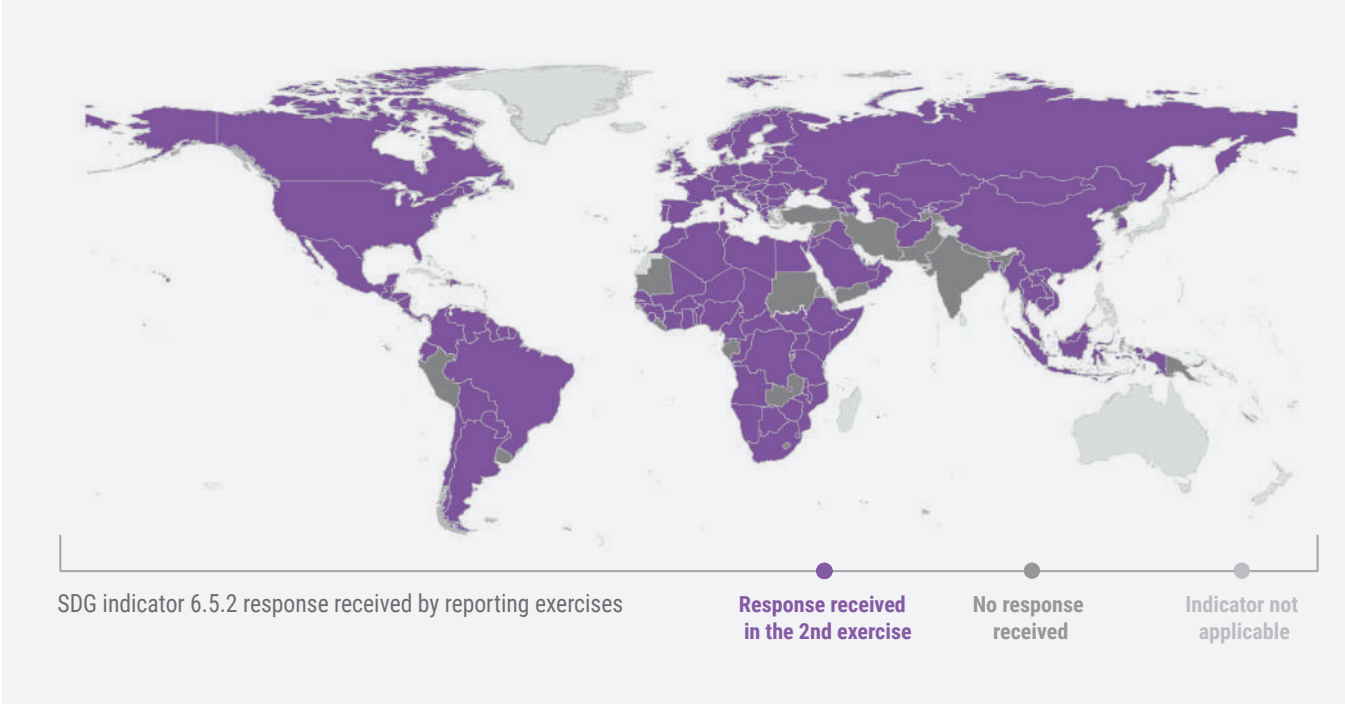


Figure 6: Overview of the responses received in the first (2017) monitoring exercise of SDG indicator 6.5.2.



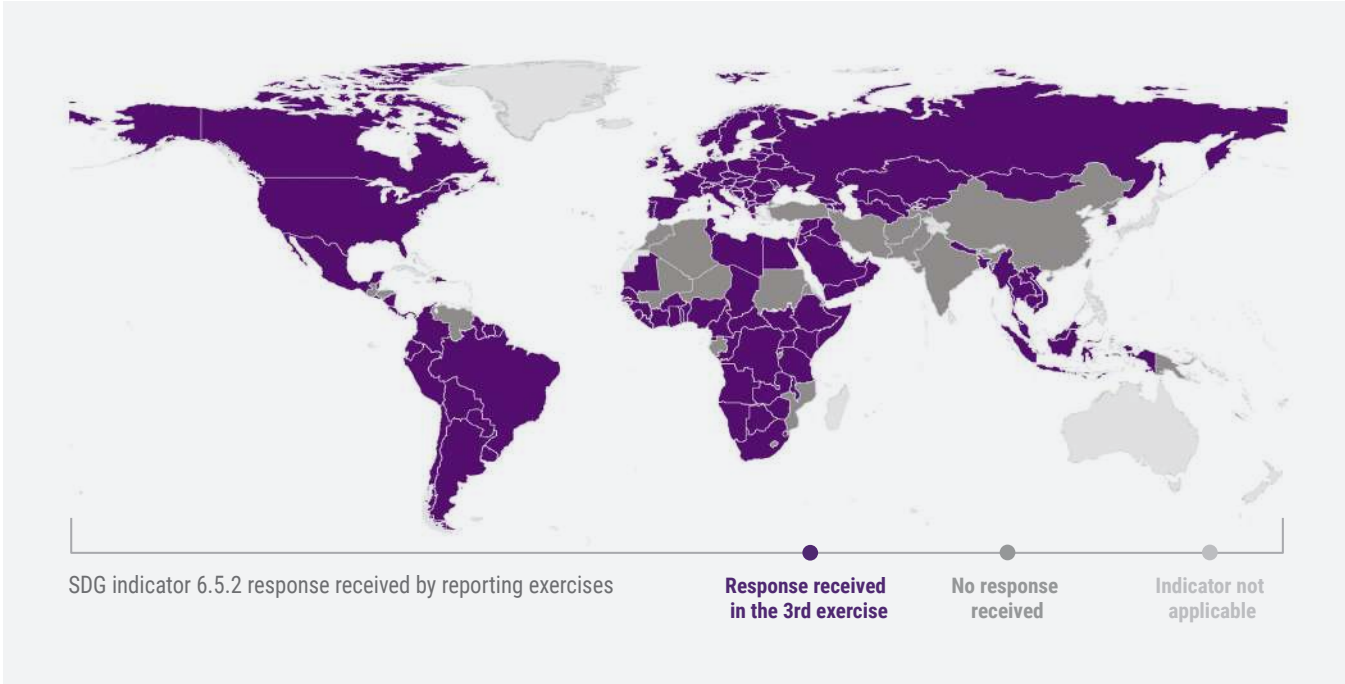
(Source: developed by UNESCO and UNECE)

Figure 7: Overview of the responses received in the second (2020) monitoring exercise of SDG indicator 6.5.2.



(Source: developed by UNESCO and UNECE)

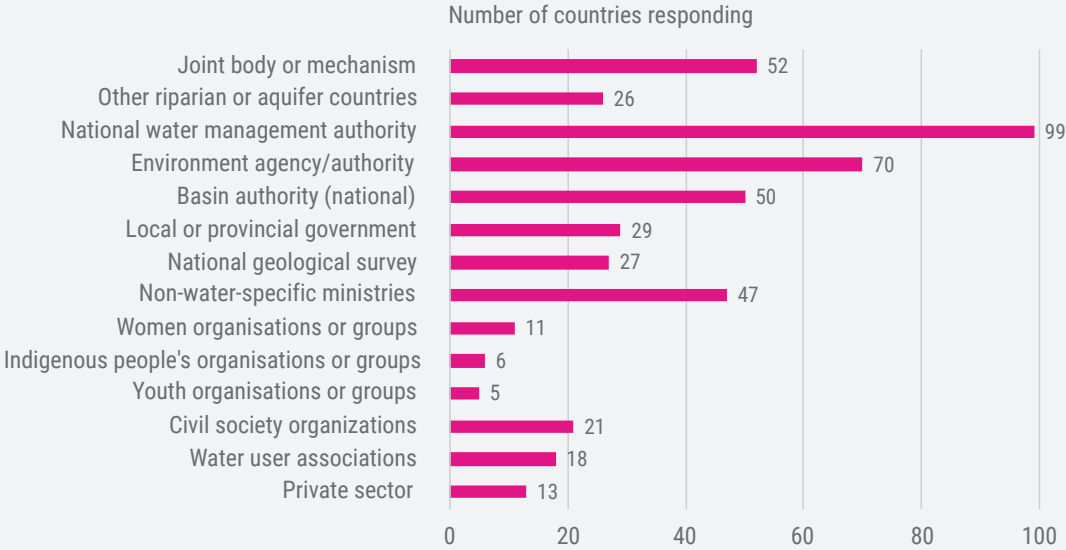
Figure 8: Overview of the responses received in the third (2023) monitoring exercise of SDG indicator 6.5.2.



(Source: developed by UNESCO and UNECE)

Figure 9: Institutions consulted during the completion of the questionnaire (SDG indicator 6.5.2 reporting template, section IV, question 3).

There has been a modest increase in the number of countries that have consulted joint bodies or mechanisms (52 in 2023, 46 in 2020) in the preparation of their national reports.



Box 3: Analysing gender aspects of transboundary water cooperation

Gender considerations are increasingly recognized by countries as being pivotal yet often under-addressed in transboundary water management. Data contained in SDG indicator 6.5.2 national reports sheds some light on prevailing gender disparities and some of the initiatives aimed at tackling gender within a transboundary water context.

Data regarding the gender composition of joint bodies is only reported by 20 out of 129 countries that responded. The national reports therefore indicate that sex-disaggregated data on the membership and/or staff of the joint body is not routinely collected or available. While limited there are, however, some concerted efforts towards rectifying gender imbalances within transboundary water governance, such as the Limpopo Basin Commission's Gender Equality and Social Inclusion (GESI) Strategy (2021-2025). Similar strategies have been developed by Okavango River Basin Water Commission (OKACOM), that is Gender Mainstreaming and Implementation Plan (2020), the Orange-Senqu River Commission (ORASECOM), that is Gender Mainstreaming Strategy (September 2014), and the Zambezi Watercourse Commission (ZAMCOM), that is Gender Mainstreaming Strategy and

Implementation Plan (November 2018). National measures that promote gender inclusion are also mentioned by many countries, such as constitutional provisions, national legislation and regulations, and action plans.

Despite such initiatives, many challenges persist. For example, some countries highlight the lack of gender balance as a consideration in the nomination processes of country representation within joint bodies for transboundary water cooperation. Other SDG indicator 6.5.2 data confirms this lack of gender mainstreaming in operational arrangements and joint bodies related to transboundary water cooperation. For instance, only 19 per cent of basins have an arrangement for transboundary water cooperation in place that includes the *promotion of equality and inclusion, including gender equality*, as a topic of cooperation within that arrangement.* Similarly, only 15 per cent of basins integrated gender-related aspects of water management within the tasks of their joint bodies.* In addition, the involvement of women's organizations within joint bodies is low. Women's organizations are afforded observer status in just 10 per cent of basins, an advisory role in 8 per cent of basins, and a decision-making role in only 3 per cent of basins.* These data suggest that, given this low representation, there is not only a problem of gender equality, but also a lack of use of the knowledge and perspectives that women can contribute to the management of water resources.

A gender analysis of experts engaged in the preparation of national reports on SDG indicator 6.5.2 further underscores the existing gender gap. In total, 58 reports listed women as the person, or one of the persons, in charge of filling out the questionnaire. However, only 40 reports were signed by women. This suggests that women are more represented at the technical level but underrepresented in higher roles within the transboundary water cooperation domain. In this regard, SDG indicator 6.5.2 data is reflective of a wider recognition that women are underrepresented within transboundary water management. For instance, currently a significant minority of transboundary basin organizations are headed by women.

* The basin-related data in this box is based on a total number of 291 river and lake basins listed in section II of the national reports submitted. As not all countries sharing transboundary waters provided a national report, the number is lower than the total number of transboundary river basins shared by countries, that is 313. Where a country submitted multiple responses for the same basin, for example they submitted data for a basin arrangement and sub-basin arrangements, the highest-level arrangement was used, that is the basin arrangement. Percentages are based on at least one country within a basin responding affirmatively to the relevant question in section II of their SDG indicator 6.5.2 national report, for example ticking the relevant box.

2.3 How well is the indicator working?

SDG indicator 6.5.2's approach of directly sourcing data from countries has provided a unique set of data regarding transboundary water cooperation globally, which in partnership with SDG indicator 6.5.1 (see box 4), helps to monitor progress on SDG target 6.5. Through the incorporation of a list of operationality criteria, which mostly stems from customary international law while

still leaving margin to account for different situations, the indicator provides a balanced way to capture and compare cooperative efforts across a diverse range of transboundary water contexts (see box 1).

The indicator does not capture all aspects of transboundary water cooperation.²⁶ For example interactions and intermediate steps that might lead to the development of operational arrangements, as well as regional and global-scale activities supporting transboundary water cooperation, are not captured.

26 Capturing all aspects of transboundary water cooperation would raise significant methodological and practical challenges - see Rieu-Clarke, A, Bernardini, F., Tiefenauer-Linardon, S., and Aureli, A., 'Advances in monitoring transboundary water cooperation? Reflecting on the development and implementation of SDG indicator 6.5.2' 42(3) Water International 438 (2022).

However, the indicator's focus on both the existence of arrangements and their operationality has provided an objective evaluation of the concrete efforts that countries have taken to progress cooperation within their shared rivers, lakes and aquifers, whilst also identifying potential gaps or areas of concern. Moreover, the reporting template provides countries with the opportunity to supplement and support their SDG indicator 6.5.2 value with additional information related to the cooperative activities they have in place with neighbouring countries. The indicator has also proven challenging in encouraging countries to source data on their transboundary rivers, lakes and aquifers, whilst not being overly complex. This balance has ensured a high level of engagement of countries sharing transboundary waters in the monitoring exercises and has allowed meaningful data to be gathered at the global level across a diverse range of contexts.

Having monitoring exercises every three years has allowed countries to collaborate and engage in dialogue on SDG indicator 6.5.2, fostering a proactive approach

to addressing gaps in cooperation, or in harmonizing their data, and has helped to grow the global recognition of the importance of transboundary water cooperation, particularly within the framework of the SDGs.

Countries have demonstrated a continued commitment to SDG indicator 6.5.2, with productive exchanges taking place between focal points and custodian agencies during the report verification process. The SDG indicator 6.5.2's approach of obtaining data directly from countries and its flexibility in capturing different situations has been effective in fostering dialogue and collaboration among countries. For instance, in preparation of their second national report, Sweden held consultative meetings with both Norway and Finland to ensure that data on their shared rivers, lakes and aquifers was consistent. The SDG indicator 6.5.2 also in part triggered dialogue between Gambia, Guinea Bissau, Mauritania and Senegal, which in turn led to the countries signing a Ministerial Declaration on the Senegalo-Mauritanian Aquifer Basin in September 2021.

Box 4: What can SDG indicator 6.5.1 data tell us about the countries where SDG indicator 6.5.2 data is unavailable?

While SDG indicator 6.5.1 data is not as detailed as 6.5.2 in terms of assessing all transboundary rivers, lakes and aquifers,* and it does not assess the operationality of any arrangements for transboundary water cooperation,** it is more representative in its coverage. SDG indicator 6.5.1 data is available for an additional 37 countries that either did not submit an SDG indicator 6.5.2 report in 2023, or where it was not possible to calculate the SDG indicator 6.5.2 value. Some of these countries (India and Israel) comment in their SDG indicator 6.5.1 report that arrangements for transboundary water management are 'fully implemented', with a further 25 countries commenting that their arrangements are 'partly' or 'mostly' implemented. Of the remaining countries, six have adopted arrangements, two countries (Papua New Guinea and Timor-Leste) state that no arrangements have been developed, and two countries (Ethiopia and Guatemala) state that they are being prepared. These insights suggest that it is important to motivate these countries to submit their SDG indicator 6.5.2 reports or to provide clarifications to enable the calculation of their SDG indicator 6.5.2 values. Such efforts would provide a comprehensive picture on the state of cooperation in their respective transboundary basins.

* SDG indicator 6.5.1 data asks countries to comment on 'the situation in most of the "most important" transboundary basin/aquifers' within their country.

** In contrast to the operationality criteria used for SDG indicator 6.5.2, SDG indicator 6.5.1 asks countries to comment on whether an arrangement is absent, being prepared, partly implemented, mostly implemented or fully implemented.



Škocjan Caves in Slovenia formed by the underground stream of the Reka/Timavo River shared by Croatia, Italy and Slovenia. © Adobe Stock*



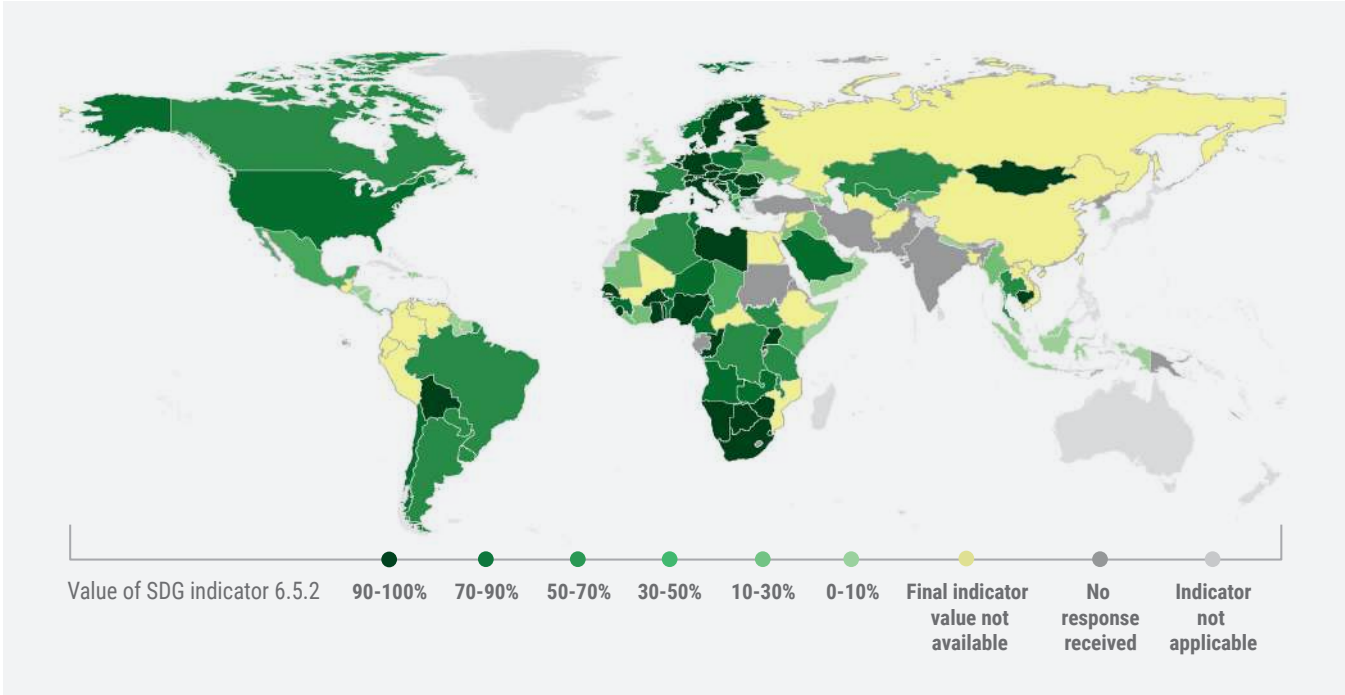
Western Great Chu Canal, flowing from Kyrgyzstan to Kazakhstan. © Alexander Belokurov

3. Assessing progress in transboundary water cooperation at the global and regional levels

3.1 Global progress in transboundary water cooperation

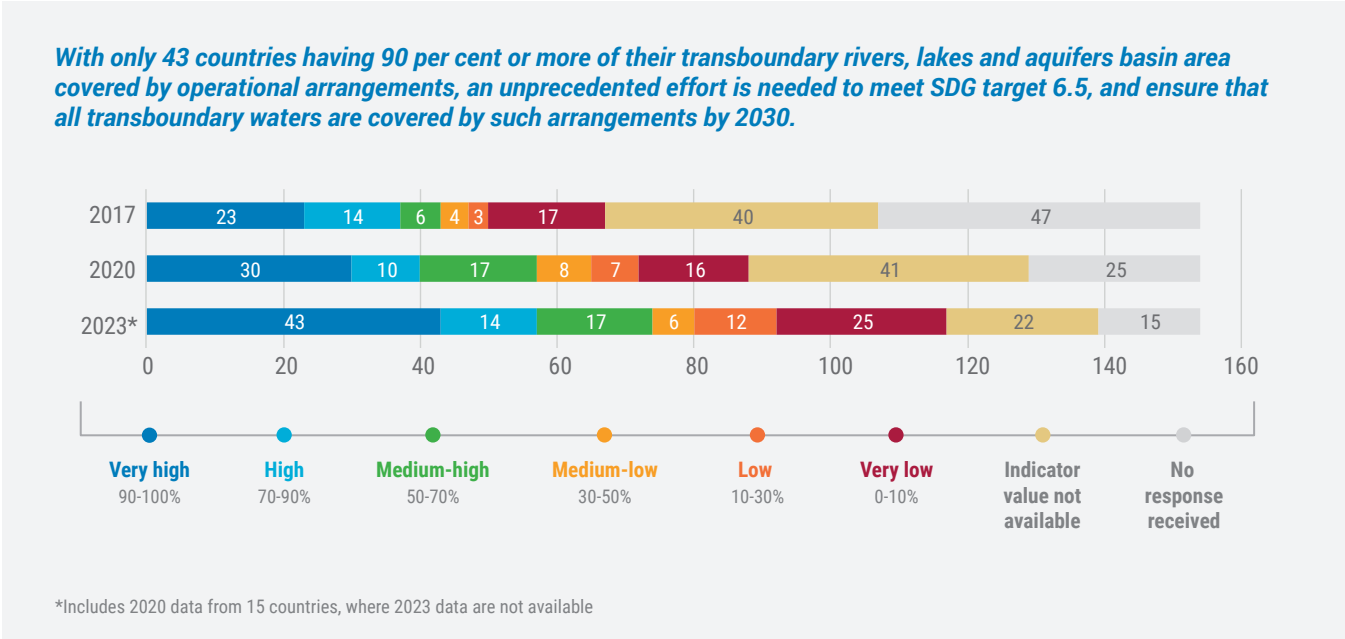
3.1.1 Overview of SDG indicator 6.5.2 value

Figure 10: Global map of SDG indicator 6.5.2 value per country (2024).



(Source: developed by UNESCO and UNECE).

Figure 11: Number of countries sharing transboundary waters and breakdown of SDG indicator 6.5.2 values (comparison between 2017, 2020, and 2023 data).



As noted previously, 313 river basins²⁷ and 468 aquifers²⁸ are shared by two or more countries, and in total, 153 UN Member States share these waters. Despite common issues associated with their transboundary nature, these waters also reflect significant contextual diversity. For example, 52 countries have more than 90 per cent of their territory, and eight countries have less than 10 per cent of their territory, within a transboundary river basin.²⁹ Different issues are also experienced in cooperation over river and lake basins compared to transboundary aquifers. While collaboration is critical for all transboundary waters, the nature of aquifers, often described as an invisible resource, demands close cooperation between countries from the outset to assess their extent and transboundary dynamics.

SDG indicator 6.5.2 is now available for 117 countries sharing transboundary rivers, lakes and aquifers.³⁰ The global average of the indicator value across the three monitoring exercises has not changed markedly. In 2023 it is 59 per cent, whereas in 2020 it was 58 per cent, and in 2017 it was 59 per cent. Only 26 countries have their transboundary basin area fully covered by operational arrangements, that is corresponding to an indicator value of 100 per cent, and only 43 countries sharing transboundary waters have 90 per cent or more of their transboundary basin area covered by operational arrangements (see figure 11). This represents an increase of 13 countries compared to 2020 and 20 countries more than in 2017.

However, as noted above, the changes in indicator values mainly reflect an effort by countries to update their data rather than showing progress in the adoption of new arrangements or revising existing ones to make them operational. Only eight countries have increased their indicator value from 2020 to 2023 due to improved cooperation, and for two countries (Belarus and Ukraine), the indicator value has even decreased (see annex I).

Also, these changes are not reflected in the global average mainly because they have been offset by the influence of new countries reporting an indicator value for the first time during the third monitoring exercise.

Global averages also mask significant regional variation. Relatively greater coverage of operational arrangements can be found in Europe and North America, where 23 out of 42 countries sharing transboundary waters have 90 per cent or more of their transboundary waters covered by operational arrangements; and in Sub-Saharan Africa, where 16 out of 42 countries sharing transboundary waters have 90 per cent or more of their transboundary basin area covered by operational arrangements. However, only two countries in Asia, one country in Latin America and one country in Northern Africa have 90 per cent or more of their transboundary basin area covered by operational arrangements. An unprecedented effort is therefore needed to ensure that all transboundary waters are covered by operational arrangements by 2030.

27 See supra note 6.

28 See supra note 7.

29 See supra note 6.

30 This includes data from 11 countries that responded in 2020, but either did not update that data in 2023, or the data that was submitted required further clarification.

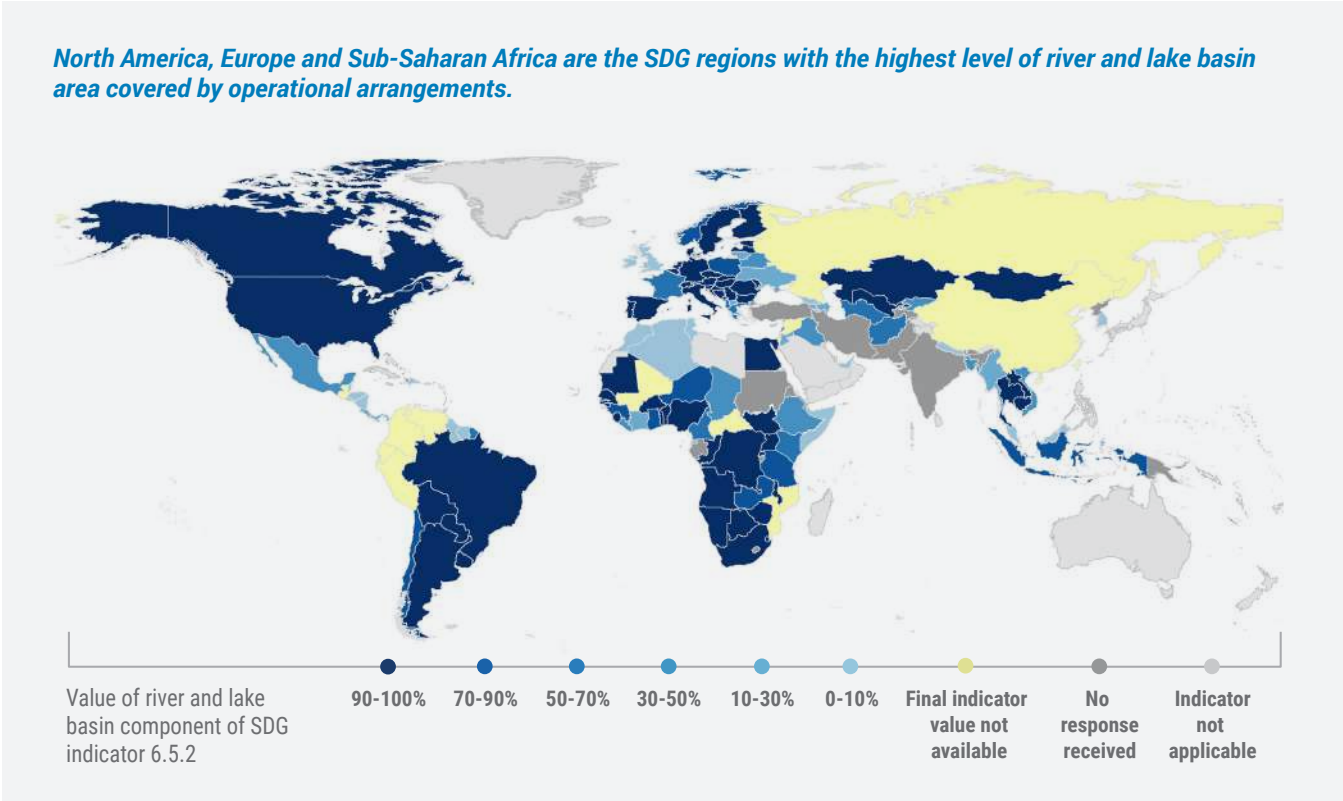
Table 2: Recent examples of progress in the adoption and entry into force of arrangements for transboundary water cooperation – as reported by countries in their national reports.

ARRANGEMENT	YEAR OF ADOPTION/ ENTRY INTO FORCE	COUNTRIES
Central, Eastern, Southern and South-Eastern Asia		
Agreement between the Cabinet of Ministers of the Kyrgyz Republic and the Government of the Republic of Uzbekistan on joint management of water resources of the Kempirabad (Andijan) Reservoir	Adopted 2022	Kyrgyzstan; Uzbekistan
Agreement between the Government of Turkmenistan and the Government of the Republic of Uzbekistan on management, protection and rational use of water resources of the Amu Darya River	Adopted 2022	Turkmenistan; Uzbekistan
Agreement between the Government of the Republic of Uzbekistan and the Government of Turkmenistan on joint Uzbek-Turkmen intergovernmental commission on water management	Adopted 2021	Turkmenistan; Uzbekistan
Agreement between the Water Resources Service under the Ministry of Agriculture of the Kyrgyz Republic and the Ministry of Water Management of the Republic of Uzbekistan on cooperation on water management issues	Adopted 2022	Kyrgyzstan; Uzbekistan
Northern Africa and Western Asia		
Memorandum of Understanding on Araks River water use and monitoring signed at the 17th session of the Intergovernmental Joint Commission between Armenia and Iran	Adopted 2022	Armenia; Iran
(Ministerial) Protocol of Intention on Cooperation in the Field of Geology, Hydrometeorology and Climate Change	Adopted 2022	Azerbaijan; Georgia
Sub-Saharan Africa		
Cavally Basin Transboundary Committee (Memorandum of Understanding, Tripartite Agreement)	Adopted 2022	Côte d'Ivoire; Guinea; Liberia
Ministerial Declaration on the Senegalo-Mauritanian aquifer basin (SMAB)	Adopted 2021	Gambia; Guinea-Bissau; Mauritania; Senegal
OMVS-OMVG Joint Protocol on the Secretariat for SMAB	Adopted 2023	Gambia; Guinea-Bissau; Mauritania; Senegal

ARRANGEMENT	YEAR OF ADOPTION/ ENTRY INTO FORCE	COUNTRIES
Europe and North America		
Agreement on cooperation 2021-2027 between the Swedish Agency for Marine and Water Management (Sweden) and the Environment Directorate (Norway) on water management in accordance with EU WFD	Adopted 2020	Norway; Sweden
Agreement on international waterway transport on Ohrid Lake	Adopted 2022	Albania; North Macedonia
(Ministerial) Declaration on cooperation on the management of the Prut River basin	Adopted 2023	Republic of Moldova; Romania; Ukraine
Memorandum of Understanding in the field of Geology and Mineral Resources between the Polish Geological Institute-National Research Institute and the State Geology and Subsoil Service of Ukraine	Adopted 2022	Poland; Ukraine
Agreement between the Government of the Republic of Poland and the Government of the Republic of Belarus on cooperation in the field of protection and rational use of transboundary waters	Adopted 2020	Belarus; Poland
Latin America and the Caribbean		
Guarani Aquifer Agreement	Entered into force 2020	Argentina; Brazil; Paraguay; Uruguay
Agreement for the Creation of the Binational Commission for the Integrated Management of Water Resources in Transboundary Basins between the Republic of Ecuador and the Republic of Peru	Adopted 2020, Entered into force 2022	Ecuador; Peru

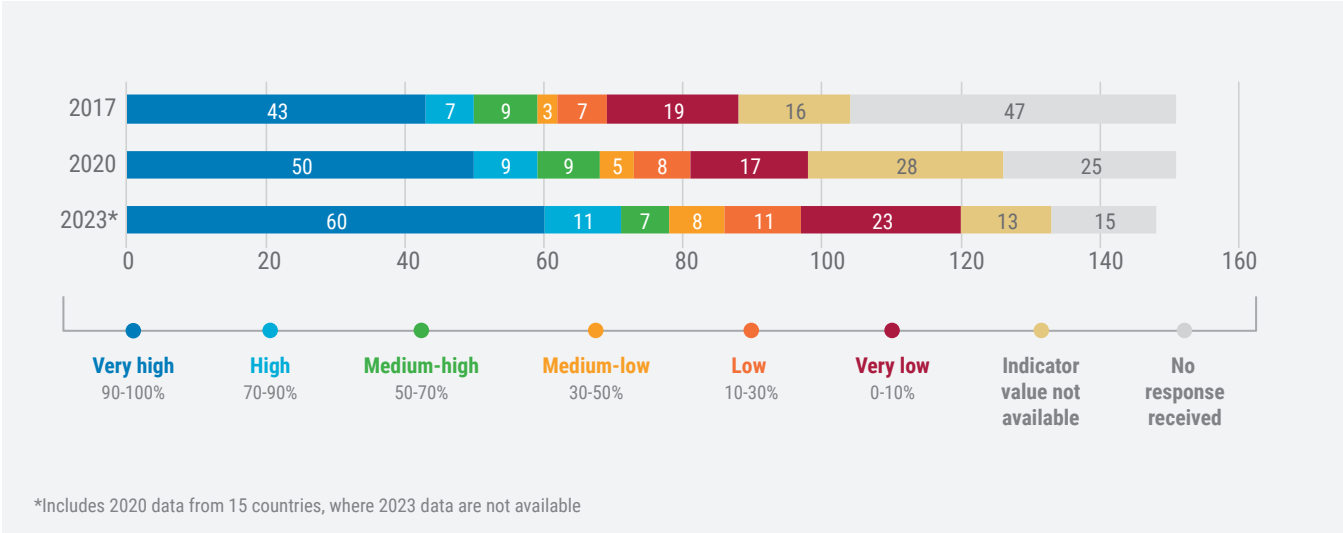
3.1.2 Transboundary river and lake basin component of the SDG indicator 6.5.2

Figure 12: Proportion of transboundary river and lake basin area in a country covered by an operational arrangement (2024).



(Source: developed by UNESCO and UNECE).

Figure 13: Number of countries sharing river and lake basins and breakdown of SDG indicator 6.5.2 values (comparison between 2017, 2020, and 2023 data).

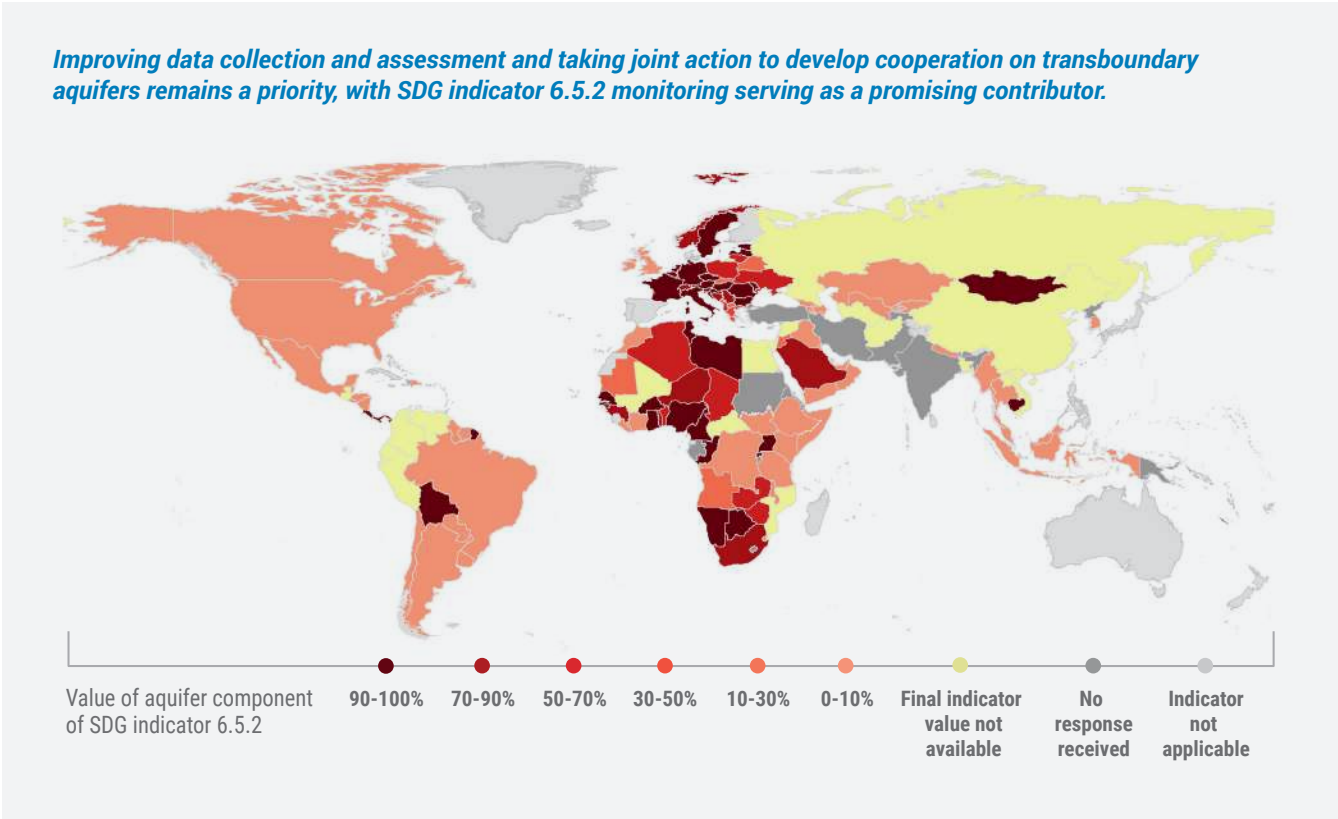


Based on an indicator available for 120 countries sharing river and lake basins, the average value for SDG indicator 6.5.2 in relation to the river and lake basins component is 65 per cent, which is almost the same value as in 2020. Across the three monitoring exercises, the split of countries across different levels of cooperation is also similar (see figure 13). Most of the

differences between 2020 and 2023 data reflect a few countries reconsidering the data for the calculation of the indicator (basin area and criteria of operability). The few new arrangements that have been adopted (see table 2) have not changed the river and lake basin SDG indicator 6.5.2 value significantly.

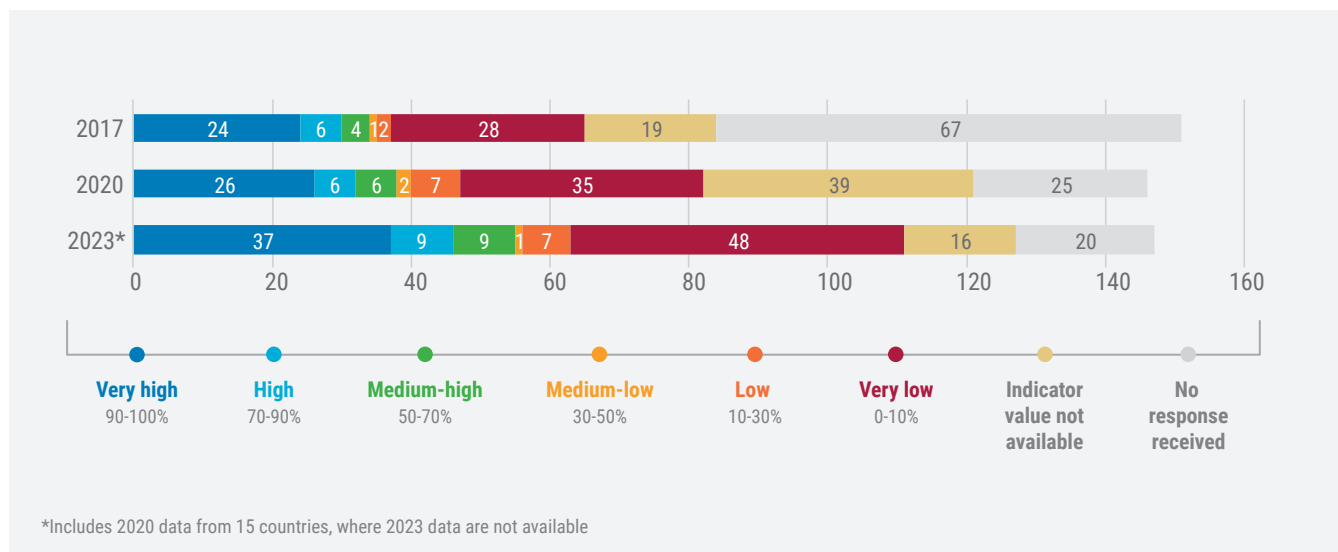
3.1.3 Transboundary aquifer component for SDG indicator 6.5.2

Figure 14: Proportion of transboundary aquifer area in a country covered by an operational arrangement (2024).



(Source: developed by UNESCO and UNECE).

Figure 15: Number of countries sharing transboundary aquifers and breakdown of SDG indicator 6.5.2 values (comparison between 2017, 2020, and 2023 data).



The transboundary aquifer component of the indicator has shown once again positive developments as the value of this component is now available for 111 countries, compared with 94 countries in 2020 and with 65 in 2017 (see figure 15). The global average of the aquifer component is 46 per cent (compared with 42 per cent in 2020). The improvements in both the number of countries reporting data for the component and the global average are closely tied to an increased consideration of transboundary aquifers covered by non-aquifer specific arrangements, that is river basin arrangements that cover both surface water and groundwater, in many cases triggered by the indicator 6.5.2 reporting process.

Effective cooperation on transboundary aquifers takes place within some river and lake basin arrangements, through action plans, subsidiary arrangements, or the creation of groundwater task forces or working groups. An example is the Multi-Country Cooperation Mechanism (MCCM) established in August 2017 by the Governments of Botswana, Namibia, and South Africa for joint governance and management of the Stampriet Transboundary Aquifer System (STAS).

The STAS MCCM is nested within the Orange-Senqu Watercourse Commission's Ground Water Hydrology Committee (GWHC).

Another significant factor is the simplification of aquifer delineation for calculating the indicator value, which was allowed in 2023 in line with a trend initiated in 2020. Using international databases, such as IGRAC's Global Groundwater Information System,³¹ countries were allowed to provide partial and approximate information on the surface area of a transboundary aquifer within their territory without the need for costly and in-depth studies. It was also possible for countries to include only some of their transboundary aquifers in the assessment while they worked with neighbouring countries on the delineation of other aquifers. Efforts to improve clarity and consistency of the data submitted by countries in previous exercises also helped improve the data.

This positive trend reflects the influence of the SDG indicator 6.5.2 monitoring exercise itself, which has focused greater attention on aquifers. However, the above-mentioned simplifications, especially the ones regarding aquifer delineation, indicate also that efforts

31 See <https://www.un-igrac.org/resource/transboundary-aquifers-world-map-2021>, accessed 18 June 2024.

are still required in many cases to deepen knowledge and understanding on transboundary aquifers, and while considering aquifers in river and lake basin arrangements is encouraging in terms of raising the visibility of transboundary groundwater issues, there remains much work to be done to further enhance surface and groundwater linkages, and take action on the ground.³² Improving cooperation in terms of data collection, assessment, and joint action remains essential, with SDG indicator 6.5.2 monitoring serving as a promising contributor.

Given that many countries have no data or limited cooperation on their transboundary aquifers (48 countries have less than 10 per cent of their aquifer area covered), significant work is still needed to improve data availability and foster cooperation. At present, 24 countries report having a total of 13 aquifer-specific arrangements – this figure includes five arrangements that do not meet the SDG indicator 6.5.2 operationality criteria (see table 3). Ensuring that operational arrangements cover all transboundary aquifers by 2030 remains a priority. These efforts should be supported by increasing the technical capacity of countries to assess their transboundary aquifers both at the national and transboundary levels.

Table 3: Aquifer-specific arrangements included in SDG indicator 6.5.2 national reports during the third monitoring exercise.

AGREEMENT TITLE	YEAR OF ADOPTION	PARTIES ⁽ⁱ⁾	OPERATIONALITY
Ministerial Declaration on the Senegal-Mauritania Aquifer Basin	2021	<u>Gambia</u> ; <u>Guinea-Bissau</u> ; <u>Mauritania</u> ; <u>Senegal</u>	Operational
Letter of Intent on the governance of the Ocotepeque-Citala Aquifer	2019	<u>El Salvador</u> ; Honduras	Operational
Agreement for the provision and exchange of data relating to groundwater management in the Carboniferous Limestone	2017	<u>Belgium</u> ; France	Operational
Agreement on cooperation between the Lithuanian Geological Survey under the Ministry of Environment and the Latvian Environment, Geology and Meteorology Centre on cross-border groundwater monitoring	2016	<u>Latvia</u> ; <u>Lithuania</u>	Operational
Agreement between the Government of the Hashemite Kingdom of Jordan and the Government of the Kingdom of Saudi Arabia for the Management and Utilization of the Ground Waters in the Al-Sag/Al-Disi Layer	2015	<u>Jordan</u> ; <u>Saudi Arabia</u>	Operational

³² If work on aquifers has not been initiated, some countries have proven reluctant to include aquifers in their SDG indicator 6.5.2 calculation, even where they might fall within the scope of a river basin arrangement.

AGREEMENT TITLE	YEAR OF ADOPTION	PARTIES ^[i]	OPERATIONALITY
Memorandum of Understanding for the establishment of a Consultation Mechanism for the Integrated Management of the Water Resources of the Iullemeden, Taoudeni/Tanezrouft Aquifer Systems	2014	Algeria; <u>Benin</u> ; Burkina Faso; Mali; <u>Mauritania</u> ; Niger; <u>Nigeria</u>	Not operational
Agreement between the Lithuanian Geological Survey under the Ministry of Environment of Lithuania and the Belarussian Scientific and Research Institute for Geological Prospecting on Cooperation in the Field of Geology and Hydrogeology	2012	Belarus, <u>Lithuania</u>	Not operational
Guarani Aquifer Agreement	2010	<u>Argentina</u> ; <u>Brazil</u> ; <u>Paraguay</u> ; <u>Uruguay</u>	Not operational
Joint Report of the Principal Engineers Regarding the Joint Cooperative Process United States-Mexico for the Transboundary Aquifer Assessment Program	2009	<u>Mexico</u> ; USA	Not operational
Convention on the Protection, Utilization, Recharge and Monitoring of the Franco-Swiss Genevois Aquifer between the Community of the 'Annemassienne' region, the Community of the 'Genevois' Rural Districts, and the Rural District of Viry, on the one hand, the Republic and Canton of Geneva, on the other	2007	<u>France</u> ; <u>Switzerland</u>	Operational
Agreement establishing a Consultation Mechanism for the North-Western Sahara Aquifer System	2002	<u>Algeria</u> ; <u>Libya</u> ; <u>Tunisia</u>	Operational
Abbotsford-Sumas Aquifer International Task Force (formed under 1992 Environmental Cooperation Agreement between British Columbia and Washington)	1992	<u>Canada</u> ; USA	Not operational
Nubian Sandstone Aquifer System Board of Directors (Joint Authority for the Study and Development of the Nubian Sandstone Aquifer System)	1991	<u>Chad</u> ; <u>Libya</u> ; Egypt; Sudan	Operational

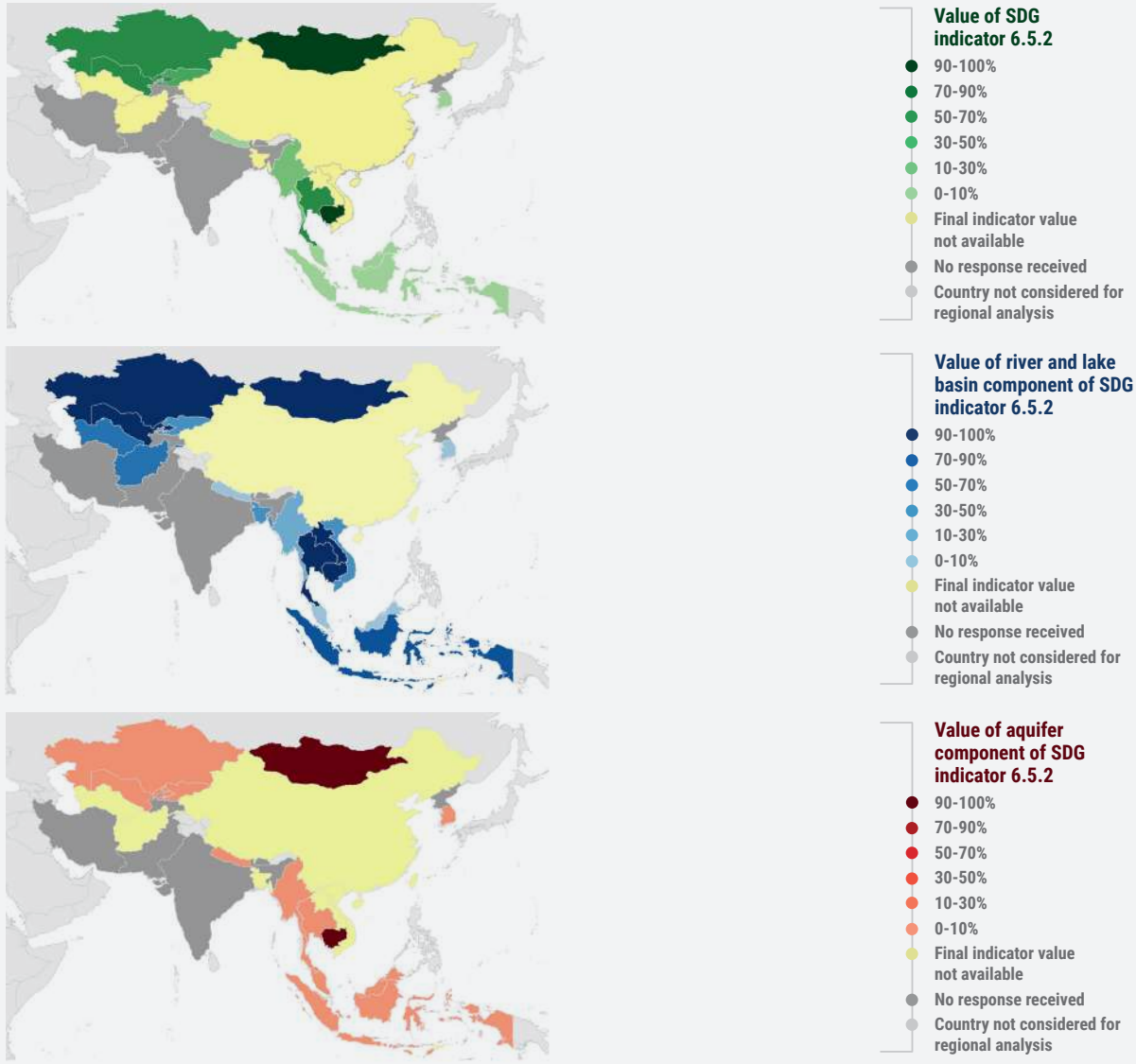
[i] Countries that reported on the arrangements in 2023 are underlined.

3.2 Regional progress in transboundary water cooperation

3.2.1 Central, Eastern, Southern and South-Eastern Asia

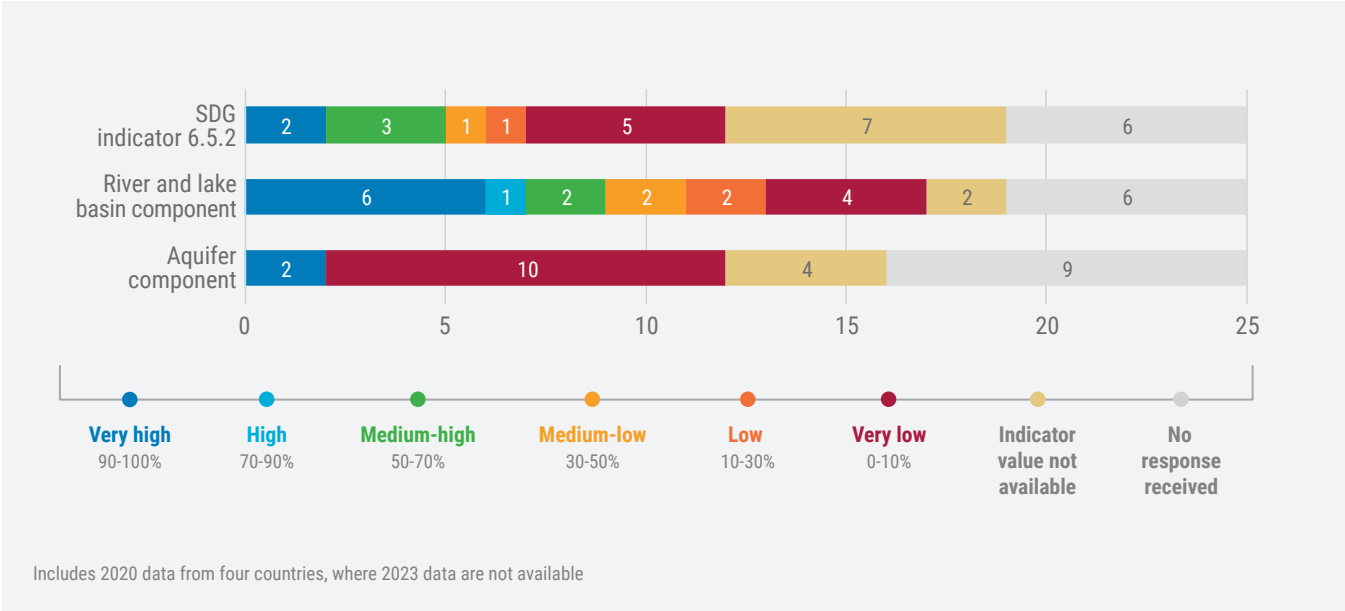
Figure 16: Central, Eastern, Southern and South-Eastern Asia – Proportion of transboundary basin area in a country covered by an operational arrangement (2024).

With only 2 out of 25 countries with 90 per cent or more of their transboundary rivers, lakes and aquifer basin area covered by operational arrangements, a major push is needed to develop transboundary water arrangements in Central, Eastern, Southern and South-Eastern Asia.



(Source: developed by UNESCO and UNECE).

Figure 17: Central, Eastern, Southern and South-Eastern Asia – Number of countries sharing transboundary rivers, lakes and aquifers and breakdown of SDG indicator 6.5.2 values.



In Central, Eastern, Southern, and South-Eastern Asia, 25 out of the 30 countries share transboundary rivers, lakes, and aquifers. Noteworthy examples of transboundary water cooperation include the Mekong River Basin, with the Lower Mekong countries (Cambodia, Lao People’s Democratic Republic (Lao PDR), Thailand and Vietnam), collaborating under the 1995 Mekong Agreement. Meanwhile, cooperation with the upstream countries (China and Myanmar) continues to evolve through the Lancang-Mekong Cooperation Mechanism. However, several major transboundary basins in the region lack comprehensive basin-wide operational arrangements, including,

- Ganges-Brahmaputra-Meghna River Basins (Bangladesh, Bhutan, China, India and Nepal).
- Salween River Basin (China, Myanmar and Thailand).
- Irrawaddy River Basin (China, India and Myanmar).
- Red River Basin (China and Vietnam).

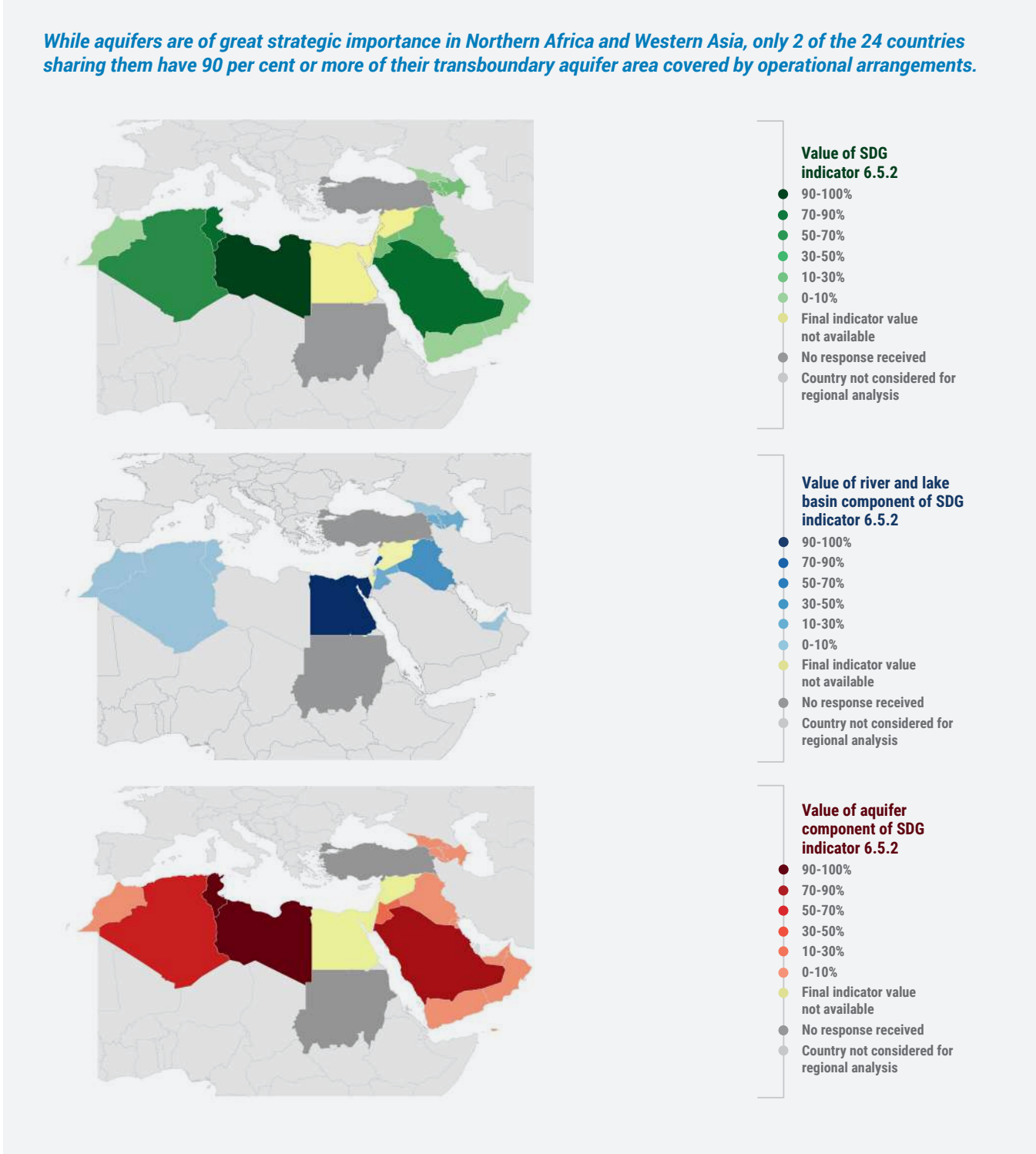
Having experienced the highest increase in response rate between the 2017 and 2020 SDG indicator 6.5.2 monitoring exercises, only two countries submitted a

report for the first time in 2023 (Nepal and Timor-Leste). Six countries of the region did not provide a report for any of the monitoring exercises. Regarding the river and lake basins component, data is now available for 17 countries and shows that there are five countries where operational arrangements cover 10 per cent or less of the country’s transboundary basin area (see figure 17). Only six countries have more than 90 per cent of their rivers and lake basins covered, with cooperation more advanced in several of the Mekong River Basin countries (Cambodia, Lao PDR and Thailand), as well as Kazakhstan, Uzbekistan and Indonesia (see figure 17). Since 2020, several new arrangements were reported by Kyrgyzstan, Turkmenistan and Uzbekistan (see table 2).

Regarding aquifers, only two countries report a value of 90 per cent or more for the aquifer component, while ten countries have no operational arrangements in place (see figure 17). This reflects a lack of integration of aquifers within river and lake basins arrangements, especially as compared with other regions.

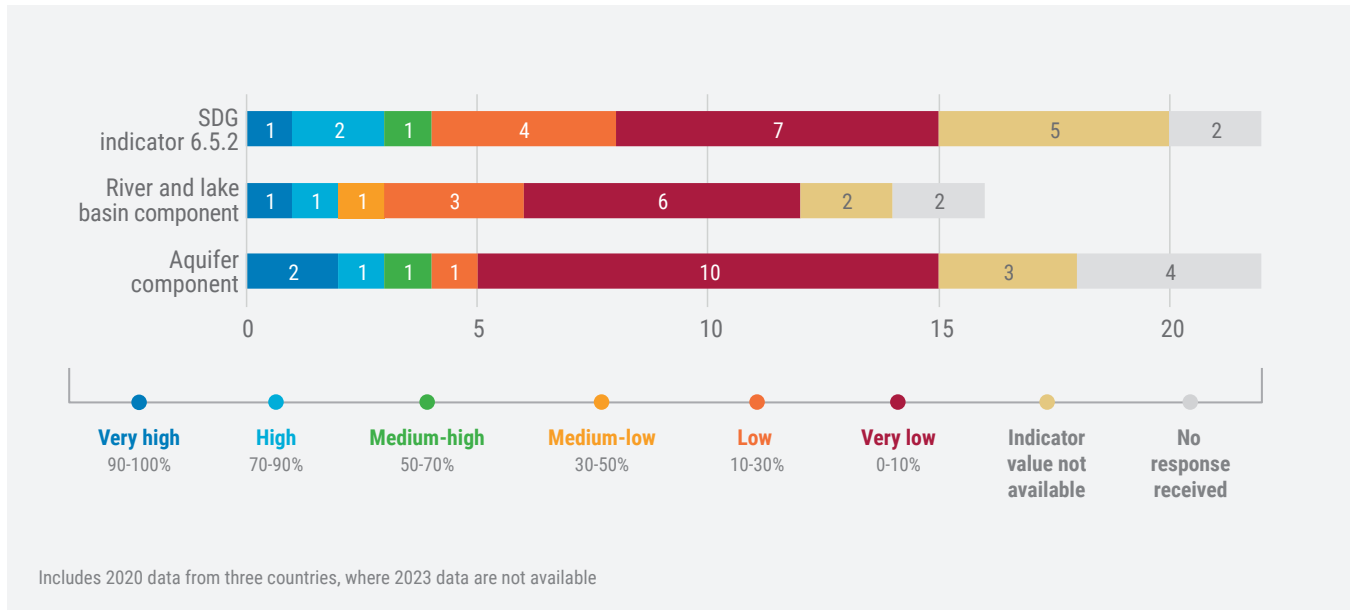
3.2.2 Northern Africa and Western Asia

Figure 18: Northern Africa and Western Asia – Proportion of transboundary basin area in a country covered by an operational arrangement (2024).



(Source: developed by UNESCO and UNECE).

Figure 19: Northern Africa and Western Asia – Number of countries sharing transboundary rivers, lakes and aquifers and breakdown of SDG indicator 6.5.2 values.



In Northern Africa and Western Asia, 16 out of 24 countries share transboundary river and lake basins and 22 out of 24 countries share transboundary aquifers. The region’s climate ranges from arid to semi-arid, leading to variable surface water availability. As a result, groundwater has become an increasingly crucial resource for safeguarding water supply at both national and transboundary levels. Significant efforts to progress transboundary water cooperation include the establishment of arrangements for the management of major aquifers, such as the North-Western Sahara Aquifer System (spanning Algeria, Libya and Tunisia), the Nubian Sandstone Aquifer System (shared by Chad, Egypt, Libya and Sudan), and the Al-Disi/Saq-Ram Aquifer (between Jordan and Saudi Arabia).

While the results for Northern Africa and Western Asia are similar in 2023 to 2020 for the river and lake basins component (with one additional country reporting),

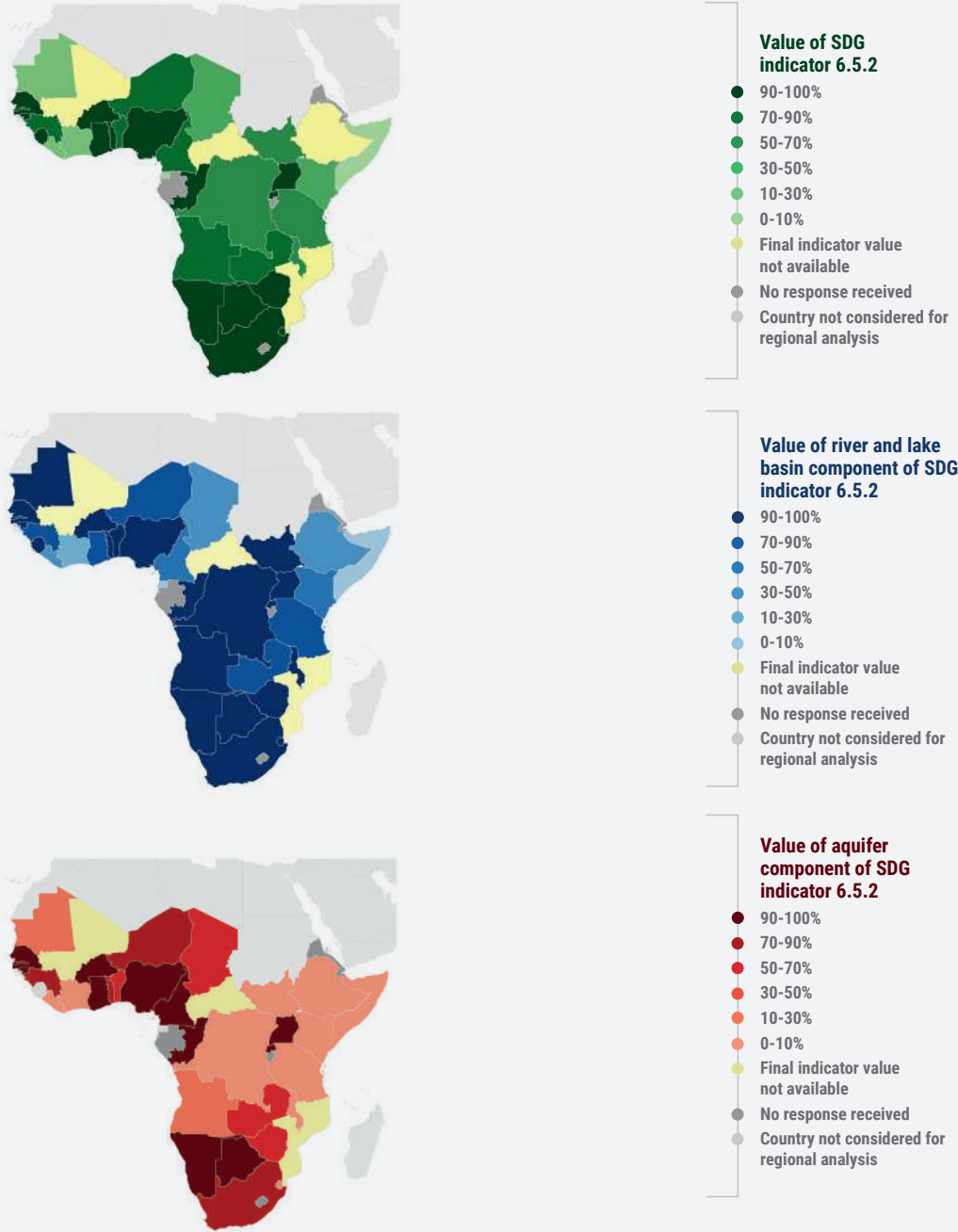
and only one country with more than 90 per cent of their rivers and lake basin area covered by operational arrangements, four more countries were able to calculate a value for their transboundary aquifers (Kuwait, Oman, Saudi Arabia and Yemen). However, only two countries have more than 90 per cent of their aquifer area covered (see figure 19).

3.2.3 Sub-Saharan Africa

In Sub-Saharan Africa, 42 out of the 48 countries share transboundary rivers, lakes, and aquifers. Arrangements have been adopted for most of the major river basins, including the Senegal, Gambia, Volta, Niger, Congo, Zambezi, Okavango, Limpopo and Orange-Senqu River basins.

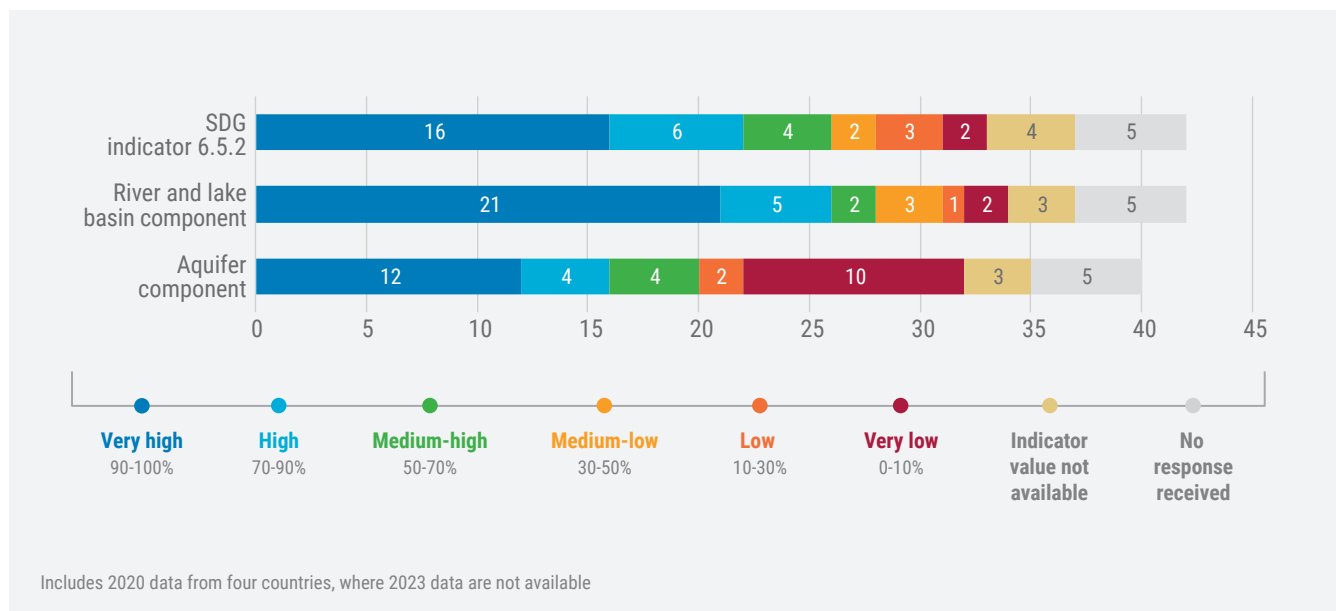
Figure 20: Sub-Saharan Africa – Proportion of transboundary basin area in a country covered by an operational arrangement (2024).

Sub-Saharan Africa shows relatively high levels of coverage of operational arrangements, particularly in relation to the region’s major transboundary river and lake basins.



(Source: developed by UNESCO and UNECE).

Figure 21: Sub-Saharan Africa – Number of countries sharing transboundary rivers, lakes and aquifers and breakdown of SDG indicator 6.5.2 values.



While often orientated towards surface waters, these arrangements tend to include groundwater interacting with the surface water of the basin within their scope.

An SDG indicator 6.5.2 value is now available for 33 countries in Sub-Saharan Africa (as compared to 27 countries in 2020); this development is mainly associated with the aquifer component, as described below. For transboundary river and lake basins, 21 countries in the region have 90 per cent or more of their transboundary basin area covered by operational arrangements, which is three more countries than in 2020 (see figure 21). The comparatively high level of operational arrangements in this region is related to the long tradition of transboundary cooperation through basin organizations, such as the Senegal River Basin Development Organization, the Niger Basin Authority, the Okavango Watercourse Commission, the Orange-Senqu Watercourse Commission and the

Lake Chad Basin Commission, as well as the work of regional organizations, including the Southern Africa Development Community (SADC), the Economic Community of West African States (ECOWAS) and the Economic Community of Central African States (ECCAS) to promote transboundary water cooperation.³³

Recent developments in the region include a 2021 Agreement among Mano River Union (MRU) local platforms of Guinea, Liberia and Côte D'Ivoire for the establishment of the Transboundary Water Resources Management Committee of the Cavally river basin.³⁴ The Mono river basin between Benin and Togo also became operational with the implementation of the Mono Basin Authority in 2019, on the basis of the 2014 Convention establishing the Statutes of the Mono River and creation of the Mono Basin Authority. Also, in the case of earlier operational arrangements, new frameworks have been adopted to reinvigorate and update cooperation.³⁵

³³ See for instance the 2000 revised SADC Protocol on Shared Watercourses, the 2008 ECOWAS Water Resources Policy, the 2017 Convention for the Prevention of Conflicts related to the Management of Shared Water Resources in Central Africa.

³⁴ The Agreement was signed by the local platform members of various countries and the head of the Mano River Union Programme and not by the Foreign Ministers of the various MRU countries.

³⁵ Such as the OKACOM Agreement 1994, which was revised in 2021 (Namibia, Angola and Botswana), and the Incomati-Maputo Water Commission (INMACOM) Agreement Between Mozambique, South Africa and Eswatini for Cooperation on the Protection and Sustainable Utilization of the Water Resources of the Incomati and Maputo Watercourses (2021).

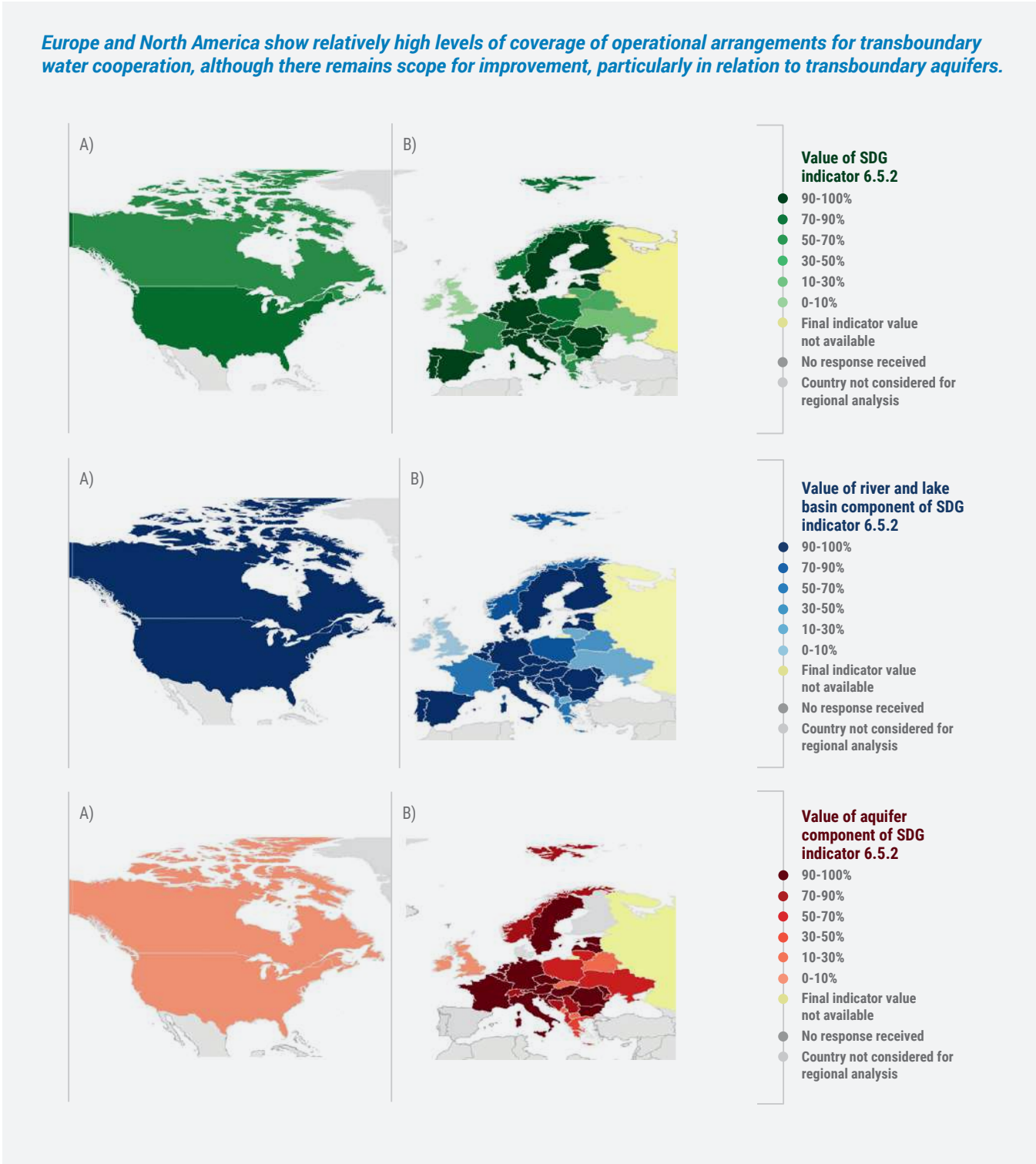
However, many gaps remain, and there has been varying degrees of progress in sub-regions, with Central Africa lagging behind others.

In relation to transboundary aquifers, there has been significant progress from the second to the third SDG indicator 6.5.2 exercise. An additional eight countries report having 90 per cent or more of their transboundary area covered by operational arrangements, which means that in total there are now 12 countries with coverage of 90 per cent or more (see figure 21). The two main reasons for these changes were the adoption of new operational arrangements (Gambia, Guinea-Bissau, Senegal, Togo, Zimbabwe), and updated data, that is aquifers being considered within the scope of river basin agreements. Initiatives, such as SADC's Regional Strategic Action Plans for IWRM, have also proved effective in promoting sustainable groundwater

management. Similarly, initiatives to focus attention on groundwater have taken place in the Volta, Niger and Lake Chad basins as well as within the activities of the Nile Basin Initiative. A recent development has been the Memorandum of Agreement for data sharing in transboundary aquifers in Ethiopia, Kenya and Somalia signed July 2023. In terms of aquifer specific arrangements, the 2021 Ministerial Declaration on the Senegalo-Mauritanian Aquifer System (SMAB), and the 2023 Organization for the Development of the Senegal River (OMVS) and the Organization for the Development of the Gambia River (OMVG) Joint Protocol on the Secretariat for SMAB, represent major advancements for the Senegalo-Mauritanian Aquifer System, which is now considered as covered under the SDG indicator 6.5.2 criteria, and explains the notable progress of the countries sharing this aquifer.

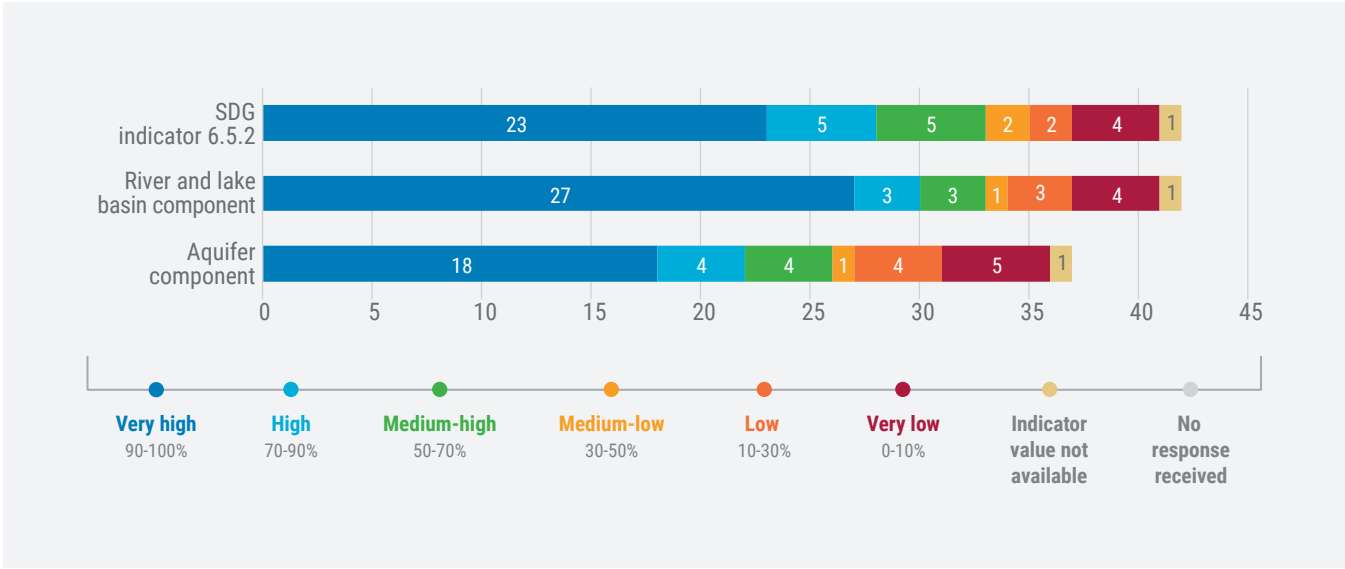
3.2.4 Europe and Northern America

Figure 22: Europe and Northern America – Proportion of transboundary basin area in a country covered by an operational arrangement (2024).



(Source: developed by UNESCO and UNECE).

Figure 23: Europe and North America – Number of countries sharing transboundary rivers, lakes and aquifers and breakdown of SDG indicator 6.5.2 values.



In Europe and North America, 42 out of the 45 countries share transboundary rivers, lakes, and aquifers. Europe’s commitment to cooperative water management is reflected in two major frameworks for water resources management: the 2000 European Union Directive 2000/60/EC establishing a framework for community action in the field of water policy (Water Framework Directive) and the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention). In North America, the commitment to transboundary water cooperation is evidenced by historical treaties, such as the 1909 Boundary Waters Treaty between the United States and Canada, and the 1944 Treaty concerning the Colorado and Tijuana Rivers and the Rio Grande, between the United States and Mexico.

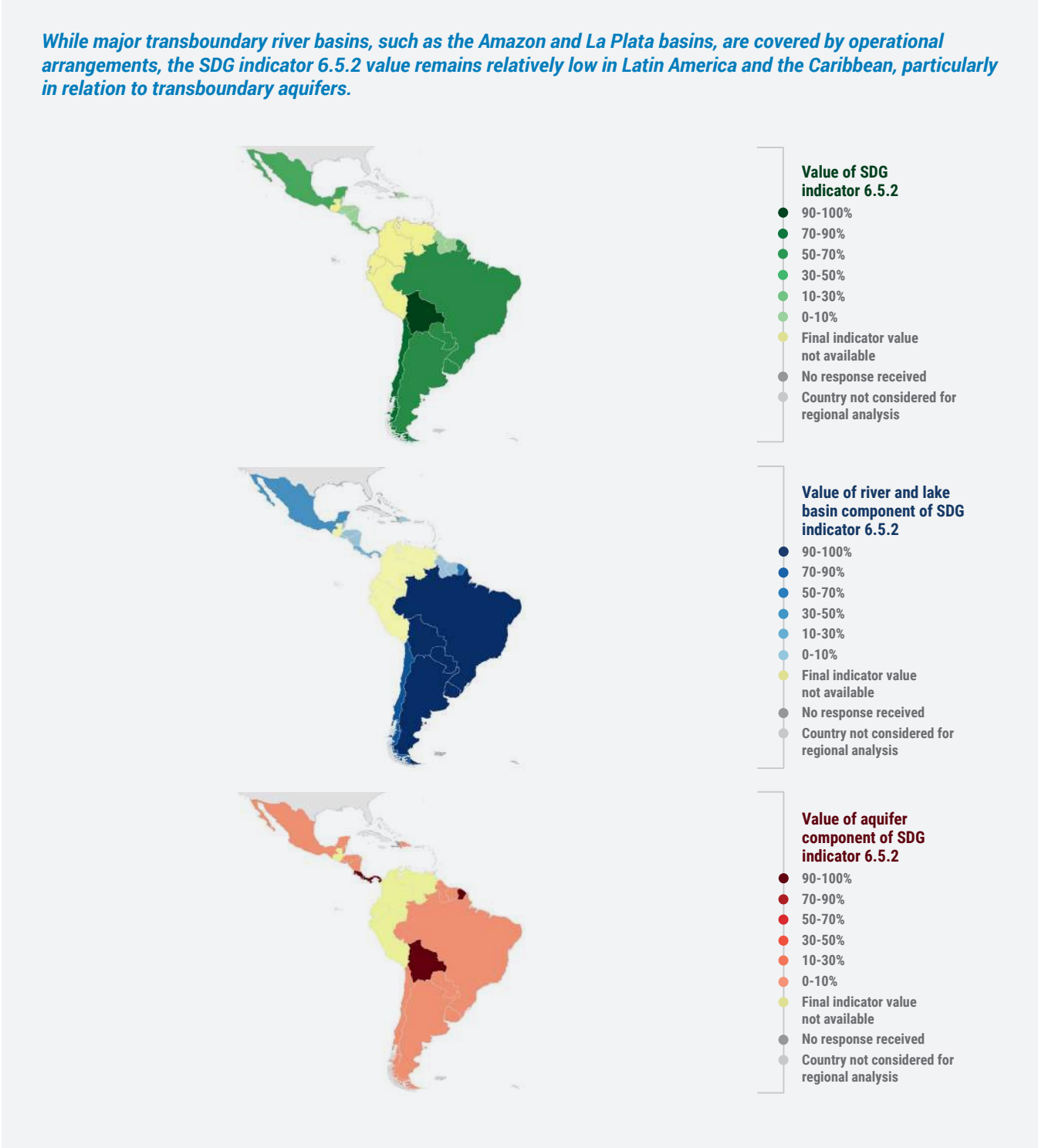
All 42 countries in the Europe and North America region that share transboundary waters share transboundary rivers and lakes. Based on the data from 41 countries, the level of advancement of cooperation is similar to

the second SDG indicator 6.5.2 monitoring exercise with changes mainly linked to a reconsideration of some data. The Europe and North America SDG region remains the most advanced region in terms of coverage of operational arrangements for transboundary water cooperation, although a significant number of countries (18) still have less than 90 per cent of their transboundary basin area (rivers, lakes and aquifers) covered by operational arrangements, and for an additional country the indicator value is not available (see figure 23). The need for extending and continued cooperation is therefore evident.

In terms of aquifers, some countries have also reconsidered the data sources for the calculation of the indicator. In most of these instances, river and lake basin arrangements incorporate groundwater. Within the European Union context, this may be driven in part by the EU Water Framework Directive, which requires member states to define and manage ‘groundwater bodies’ within ‘river basin districts’.

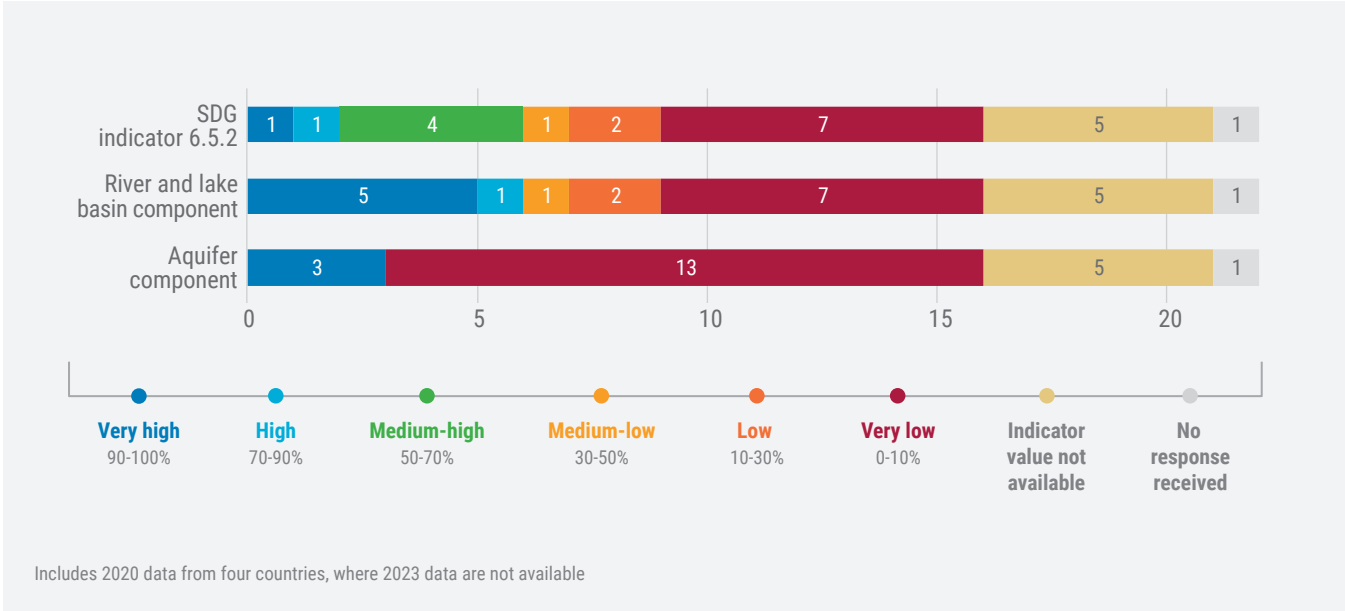
3.2.5 Latin America and the Caribbean

Figure 24: Latin America and the Caribbean – Proportion of transboundary basin area in a country covered by an operational arrangement (2024).



(Source: developed by UNESCO and UNECE).

Figure 25: Latin America and the Caribbean – Number of countries sharing transboundary rivers, lakes and aquifers and breakdown of SDG indicator 6.5.2 values.



In the Latin America and the Caribbean region, 22 out of the 33 countries share transboundary rivers, lakes, and aquifers. The region is characterized by a significant proportion and diversity of transboundary waters, including major river basins, such as the Amazon, which flows through Bolivia, Brazil, Colombia, Ecuador, Guyana and Peru, and the Orinoco, shared by Colombia, Guyana and Venezuela. Another major river basin in the region is the La Plata River, shared by Argentina, Bolivia, Brazil, and Paraguay. The Guarani Aquifer System extends beneath Argentina, Brazil, Paraguay and Uruguay. Additionally, the region includes numerous smaller basins jointly managed by two or more countries.

All 22 countries in the Latin America and the Caribbean region that share transboundary waters share transboundary river and lake basins. Based on the 16 countries where data is available, the proportion of basin area covered by operational arrangements for transboundary water cooperation remains low in the majority of countries (see figure 25). For instance, seven countries have 10 per cent or less of their transboundary river and lake basin area covered by operational arrangements (compared to eight in 2020), and only five countries (Argentina, Bolivia, Brazil, Paraguay and Uruguay) have 90 per cent or more of their transboundary river and lake basin area covered

(compared to four in 2020) (see figure 25). Bolivia and Costa Rica have improved their indicator value due to the recognition of some aquifers within the scope of agreements covering river and lake basins. Notable recent developments include the entry into force of the Agreement for the Creation of the Binational Commission for the Integrated Management of Water Resources in Transboundary Basins between the Republic of Ecuador and the Republic of Peru in May 2022, and the Guarani Aquifer Agreement in 2020, as well as Panama’s accession to the 1992 Water Convention in July 2023.

Transboundary aquifers are shared by all countries in the region. Despite the notable increase from one to three countries with more than 90 per cent of their transboundary basin area covered by operational arrangements, the region remains the one with the highest share of countries in the very low category, depicting a situation where aquifers are largely not considered (see figure 25). However, some notable initiatives, while not matching the criteria of SDG indicator 6.5.2, are addressing this issue. This is the case, for instance, of the Guarani Aquifer agreement, which while a positive example of progress on transboundary water cooperation, is not yet operational.



Marsh near Al-Chibayish in the Euphrates River Basin shared by Iraq, Syria and Türkiye. © Adobe Stock*



Water pumped out of the River Nile into irrigation canals. © Adobe Stock*

4. Thematic analysis – SDG indicator 6.5.2 and climate change³⁶

"It is estimated that the global average annual loss from disasters will increase from an annual average of US\$ 260 billion in 2015 to US\$ 414 billion by 2030. This puts at risk economic growth, poverty reduction, peace, and more generally, the achievement of the Sustainable Development Goals."³⁷

³⁶ The basin-related data in this chapter is based on a total number of 291 river and lake basins listed in section II of the national reports submitted. As not all countries sharing transboundary waters provided a national report, the number is lower than the total number of transboundary river basins shared by countries, that is 313. Where a country submitted multiple responses for the same basin, for example they submitted data for a basin arrangement and sub-basin arrangements, the highest-level arrangement was used, that is the basin arrangement. Percentages are based on at least one country within a basin responding affirmatively to the relevant question in section II of their SDG indicator 6.5.2 national report, for example ticking the relevant box.

³⁷ UNECE and UN Office for Disaster Risk Reduction, *Words into Action Guidelines - Implementation Guide for Addressing Water-Related Disasters and Transboundary Cooperation*, UN Doc. ECE/MP.WAT/56, <https://www.undrr.org/publication/words-action-guidelines-implementation-guide-addressing-water-related-disasters-and#:~:text=This%20Words%20into%20Action%20guide,into%20account%20climate%20change%20adaptation>, accessed 6 May 2024, p. iii.

4.1 Introduction

While climate change mitigation and adaptation measures have tended to target the local and national levels,³⁸ transboundary cooperation is gradually being recognized as an important means by which to coordinate those efforts in a way that maximises their effectiveness and avoids maladaptation. Considering mitigation and adaptation measures at all levels – from local to national to transboundary – is essential for building resilience. Transboundary cooperation, aligned to the principles of equity and sustainability, is the only way in which most countries will be able to identify win-win solutions, manage trade-offs, and more generally enhance resilience and minimize impacts associated with climate change.

Using the results of the third SDG indicator 6.5.2 monitoring exercise, this section explores the role of operational arrangements in progressing transboundary water cooperation and tackling climate change. In particular, the section focuses on how the operability criteria of SDG indicator 6.5.2 have the potential to support countries in their efforts to tackle climate change. Table 4 provides a snapshot of key linkages between SDG indicator 6.5.2 and climate change. The following sub-sections then provide more insights into how cooperative arrangements, coupled with joint bodies, such as basin organizations or bilateral commissions, regular meetings (both technical and political), frequent data and information exchange, and joint or coordinated planning can provide a solid foundation upon which countries can effectively respond to the specific climate change challenges they face in their transboundary rivers, lakes and aquifers.

Table 4: Potential ways in which SDG indicator 6.5.2 operability criteria supports climate change action within transboundary rivers, lakes and aquifers.

SDG 6.5.2 INDICATOR CRITERIA	POINTS TO CONSIDER	DISASTER RISK REDUCTION (DRR)	WATER ALLOCATION IN TIMES OF CLIMATE CHANGE	OTHER ADAPTATION MEASURES
Agreements or other arrangements (see sub-section 4.2)	Where appropriate, provisions contained in agreements or other arrangements address extreme events, early warning systems, contingency planning, mutual assistance, flood risk and drought management plans.	Agreements or other arrangements provide explicit provisions obliging countries to cooperate on climate mitigation and adaptation, or they have sufficiently broad scope to facilitate an IWRM and ecosystem-based approach.	Agreements or other arrangements provide explicit provisions obliging countries to cooperate on climate mitigation and adaptation, or they have sufficiently broad scope to facilitate an IWRM and ecosystem-based approach.	Flexibility in the design of agreements and arrangements allows countries to adapt their commitments based on deeper knowledge and understanding, and in response to future challenges.
Joint bodies, such as basin organizations (see sub-section 4.3)	Joint bodies mandated to support the development, implementation, monitoring and review of disaster risk management strategies and plans.	Mandate of a joint body is sufficiently broad to facilitate IWRM and ecosystem-based approaches to basin planning.	Mandate of a joint body is sufficiently broad to facilitate IWRM and ecosystem-based approaches to basin planning.	Joint bodies able to leverage financing for climate change related initiatives.

³⁸ See Chapter 3 of UNEP (2024) supra note 2.

SDG 6.5.2 INDICATOR CRITERIA	POINTS TO CONSIDER	DISASTER RISK REDUCTION (DRR)	WATER ALLOCATION IN TIMES OF CLIMATE CHANGE	OTHER ADAPTATION MEASURES
	<p>Regular technical cooperation established through specialised work /task groups related to floods and droughts, climate change, etc.</p> <p>Joint bodies provide a platform to address new challenges, for example 'Natural Hazards Triggering Technological Disasters' or Natech</p>			<p>Joint bodies provide a platform to facilitate stakeholder engagement and cross-sectoral collaboration.</p> <p>Gender mainstreaming facilitated by joint bodies.</p>
<p>Regular exchange of data and information (see sub-section 4.4)</p>	<p>Early warning and alarm systems in place.</p>	<p>Sufficient data generated and exchanged to support tailored climate change scenarios and modelling.</p>	<p>Disaster risk/ vulnerability assessments conducted.</p> <p>Joint monitoring and assessment systems in place.</p> <p>Shared information systems (database/GIS)</p>	
<p>Joint or coordinated plans, objectives or similar (see sub-section 4.5)</p>	<p>Joint or coordinated disaster risk reduction plans, climate change adaptation strategies or plans, flood risk management plans and similar adopted as appropriate.</p>	<p>Basin-wide plans account for trade-offs and synergies, natural storage (green infrastructure, wetlands protection/ preservation, groundwater and conjunctive management).</p> <p>Climate change plans incorporated into basin management plans where relevant.</p>	<p>National adaptation plans co-ordinated at transboundary level.</p> <p>Coordination of NDCs and NAP development where appropriate.</p>	

4.2 Arrangements and climate change within a transboundary water context

SDG indicator 6.5.2 monitors whether countries have operational arrangements for their transboundary rivers, lakes and aquifers in place. These arrangements have the potential to offer a predictable, transparent, flexible and robust framework for long-term cooperation over the protection and use of transboundary waters.³⁹ Additionally, their negotiation and adoption, when resulting from an equitable and legitimate process, build knowledge and capacity, confidence, trust and shared understanding amongst countries. The central importance of arrangements for transboundary waters is reflected in both the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses (Watercourses Convention), and was also stressed at the UN 2023 Water Conference through a call on governments, in partnership with non-governmental actors and the international community, to establish such arrangements where they are lacking or where the existing arrangements are not fit for purpose.⁴⁰

While countries have entered into more than 450 agreements or other arrangements for transboundary water cooperation, as SDG indicator 6.5.2 data shows, operational arrangements are lacking in many rivers, lakes and aquifers. The lack of coverage of arrangements across these rivers, lakes and aquifers constitutes a serious barrier to climate action due to the limited opportunities countries will have to develop coordinated responses to this common challenge.

Although most arrangements do not explicitly refer to climate change, if their scope is broad enough to cover all water uses and sectors, or they have a sufficiently broad mandate to adapt to changing circumstances, they can provide countries with a foundation upon which to develop more bespoke climate change programmes, plans and strategies. Unfortunately, data from the SDG 6.5.2 national reports shows that only 56 per cent of basins have arrangements in place that cover all water uses.

An example of a broad and flexible approach can be seen in the 1944 Treaty between the United States of America and Mexico on the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande. Through a flexible mandate and option to adopt 'minutes' to the treaty, the two countries have been able to develop a succession of measures to deal with the impacts of climate change, such as Minute 323 of 21 September 2017 on 'Extension of Cooperative Measures and Adoption of a Binational Water Scarcity Contingency Plan in the Colorado Basin'. In other contexts, it might be preferable to re-negotiate arrangements or develop new arrangements. For instance, as a result of droughts in 2022 and 2023, France and Switzerland are looking to 'future-proof' their existing cooperation over the Genevese aquifer system, which was established pursuant to a cross-border agreement first adopted in 1978, and later revised in 2007.

There are examples of recent arrangements that make specific reference to climate change within their text, see for example, the 2019 Agreement between Mozambique and Zimbabwe on Cooperation on the Development, Management and Sustainable Utilization of the Water Resources of the Buzi Watercourse. Along similar lines, Eswatini and Mozambique are reviewing the 1976 Umbeluzi Agreement in part due to climate change impacts and weather patterns.

39 UNECE, *Practical Guide for the Development of Agreements or Other Arrangements for Transboundary Water Cooperation*, UN Doc. ECE/MP.WAT/68, October 2021, <https://unece.org/environment-policy/publications/practical-guide-development-agreements-or-other-arrangements>, accessed 28 June 2024, pp. 5-6.

40 UN, *Interactive dialogue 4: Water for Cooperation: transboundary and international cooperation, cross-sectoral cooperation, including scientific cooperation, and water across the 2030 Agenda for Sustainable Development (Sustainable Development Goal targets 6.5 and 6.b and Goals 16 and 17) – Concept paper prepared by the Secretariat*, UN Doc. A/CONF.240/2023/7, 31 January 2023, <https://documents.un.org/doc/undoc/gen/n23/029/39/pdf/n2302939.pdf>, accessed 28 June 2024, pp. 17-18.

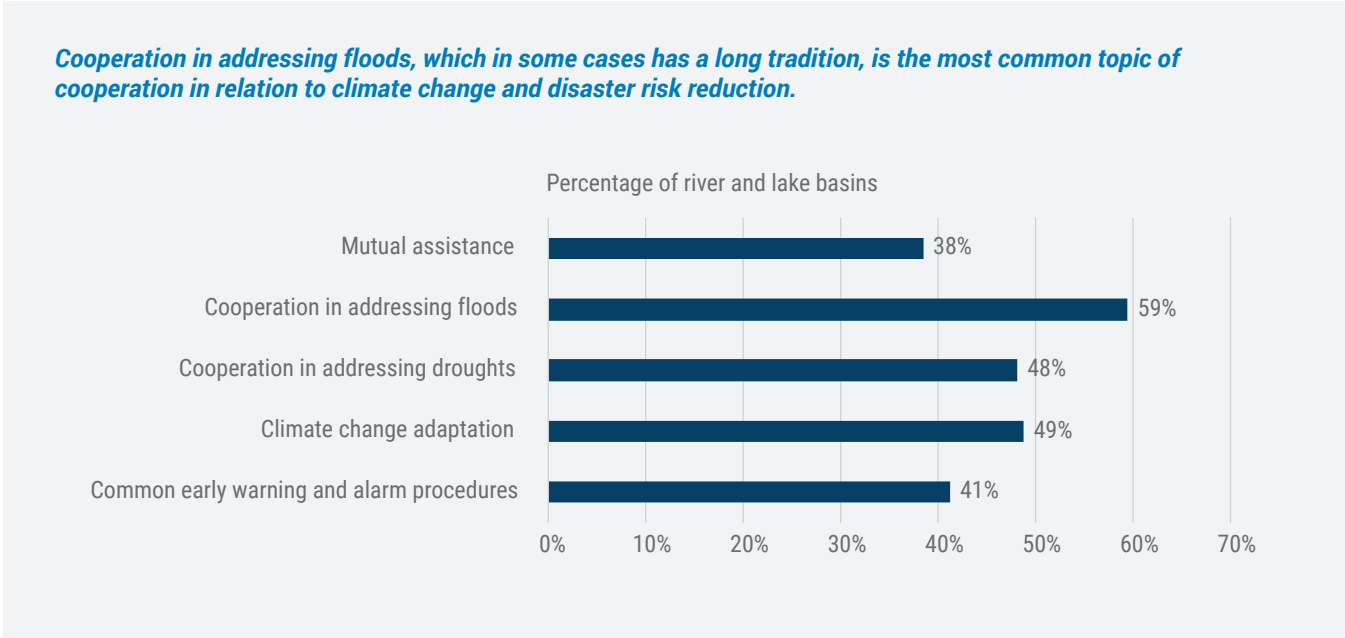
While not explicitly referring to climate change, some arrangements also include provisions that address key impacts of climate change and disasters. For example, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, several countries have a long history of incorporating measures into their arrangements to address emergency situations, such as floods and droughts. They have also included commitments to develop joint contingency plans, to notify without delay of extreme events, and where appropriate to provide assistance, to construct or coordinate flood protection or drought mitigation infrastructure, and to establish or coordinate flood preparedness measures, such as early warning systems. However, SDG indicator 6.5.2 data also suggests that such provisions are lacking in many basin arrangements (see figure 26).

In the face of climate change, the content of arrangements should be flexible enough to accommodate uncertainty and variability. Any allocation mechanisms within these arrangements should be

capable of managing inter-sectoral synergies and trade-offs in a way that is in line with IWRM (as monitored by SDG indicator 6.5.1) and takes into account the water-food-energy-ecosystem nexus. The Agreement establishing the Binational Commission for Transboundary Waters between Ecuador and Peru, which entered into force in May 2022, is an example of how countries are adopting a holistic approach to water cooperation which encompasses multiple sectors, sustainability, and climate change (see box 5).

Agreements and other arrangements for transboundary water cooperation are also an important pre-requisite for attracting climate financing and investment. The stability of arrangements helps address possible risks associated with cooperation at a transboundary scale. In turn, as demonstrated by a recent study of the Adaptation Fund, transboundary cooperation enhances the impact of climate finance by generating benefits at a regional level – and beyond those that could be achieved solely by national interventions.⁴¹

Figure 26: Percentage of basins where climate change-related topics or subjects of cooperation are included in an agreement or arrangement (SDG indicator 6.5.2 reporting template, section II, question 2(d)) (based on at least one country within a basin responding positively to the question).



41 Adaptation Fund, *Transboundary Approaches to Climate Adaptation: Lessons learned from the Adaptation Fund's Regional Projects and Programmes*, April 2022, <https://www.adaptation-fund.org/wp-content/uploads/2022/04/Transboundary-Adaptation-final-April-2022.pdf>, accessed 7 May 2024.

Box 5: The objectives of the 2017 Agreement establishing the Binational Commission for Transboundary Waters between Ecuador and Peru

The specific objectives of the 2017 Agreement between Ecuador and Peru are:

1. Provide for the integrated management of water resources in transboundary hydrographic basins of the parties, ensuring the participation of institutions and organizations of water users and civil society;
2. Contribute to the availability, use and sustainability of water resources, through the preparation, implementation, monitoring and evaluation of the 'Integrated Management Plans of Water Resources in the Basin' (hereinafter, IWRM Plans for the Basin), as an instrument of planning at the proposal of both parties;
3. Articulate and align processes for the preparation of studies, execution of programs and projects, investment, aimed at the recovery and improvement of the quality and safety of water, for human consumption and food security; and,
4. Coordinate the implementation of adaptation and mitigation measures to climate change, regarding resources and water risk management, in harmony with the national policies of each country.

4.3 Joint bodies and climate change within a transboundary water context

Box 6: What are joint bodies for transboundary water cooperation?

“Any bilateral or multilateral commission or other appropriate institutional arrangements for cooperation between countries sharing transboundary waters.”*

While joint bodies may vary significantly across river, lake and aquifer contexts, common features include: i) a permanent body meeting at reasonable, regular intervals; ii) composed of representatives of countries sharing the transboundary water or waters in question; iii) usually comprised of a decision-making body, an executive body; iv) usually having a secretariat; and v) sometimes supplemented by subsidiary bodies, such as working or expert groups, monitoring units, data and processing units, a network of national offices, a consultative group of donors, an information centre, a training centre and/or observers.

* UNECE, *Guide to Implementing the Water Convention*, UN Doc. ECE/MP.WAT/39, September 2013, <https://unece.org/environment-policy/publications/guide-implementing-water-convention>, accessed 7 May 2024.

Joint bodies are a vital complement to any operational arrangement for transboundary water cooperation (for a definition of 'joint bodies' see box 6). Through their structures and formalized regular technical and political communication, they can ensure that operational arrangements evolve over time in a way that both responds to contemporary challenges and manages future risks. For instance, the International Joint Commission between Canada and the United States of America, which was established by the 1909 Boundary Water Treaty, has evolved over the course of more than 100 years to address issues related to the regulation of shared water uses, water quality and ecosystem health, and air quality (see box 7). Joint bodies with a broad

competence demonstrate an ability to tackle a wide spectrum of issues related to sustainable development, IWRM, and climate change.⁴²

Several tasks and activities that a joint body possesses might be particularly important within the context of climate change, including the management and prevention of flood and drought risk, preparedness for extreme events, water allocation and flow regulation, climate change adaptation, and common early warning and alarm procedures. However, SDG indicator 6.5.2 data suggests that a significant proportion of joint bodies are not mandated to specifically address these tasks and activities (see figure 27).

Box 7: Climate change and the work of the International Joint Commission (IJC) (Canada and the United States of America)

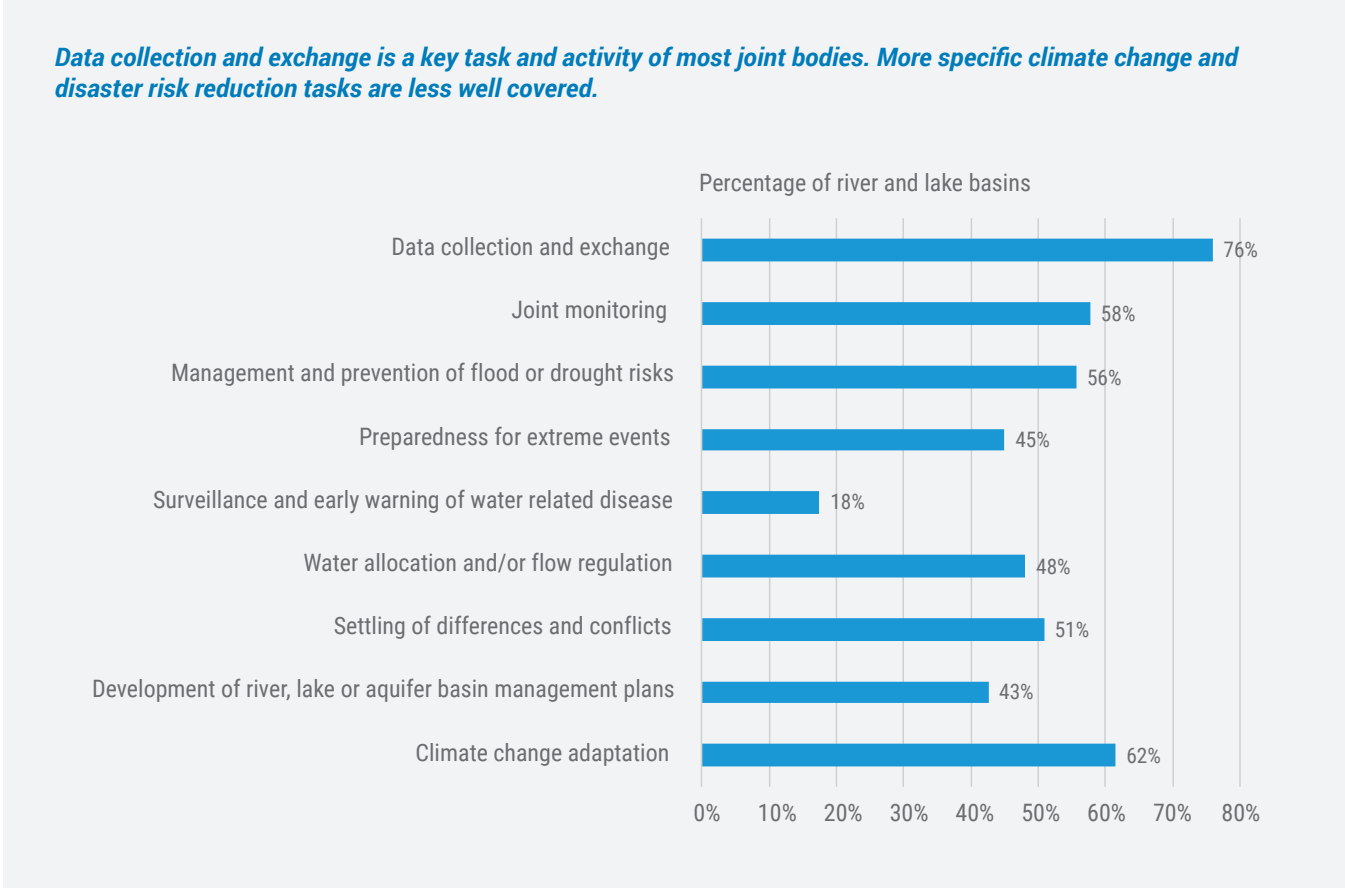
In 1997, the governments of Canada and the United States of America requested the IJC to propose strategies to address the 21st century environmental challenges that both countries faced. Climate change was recognized as a key concern which directly and indirectly impacted on other concerns such as water supply, air pollution, toxic chemical use and release, habitat loss and biological diversity loss, exotic species, waste management, and infrastructure needs. In response, the IJC introduced the International Watersheds Initiative, which includes the impact of climate change on water quantity and quality as one of its strategic initiatives.* Part of this initiative has been the development of a Climate Change Guidance Framework that can be used by the IJC to mainstream climate change considerations within its planning and operations.**

* IJC, *International Watersheds Initiative – 24th Anniversary Showcase Report*, October 2023, <https://www.ijc.org/sites/default/files/IJC-IWI-25th-Anniversary-Showcase-Report.pdf>, accessed 7 May 2024.

** IJC, *Climate Change Guidance Framework*, <https://www.ijc.org/en/what/climate/framework>, accessed 7 May 2024.

42 UNECE, *Principles of Effective Joint Bodies for Transboundary Water Cooperation*, UN Doc. ECE/MP.WAT/50, 2018, https://unece.org/fileadmin/DAM/env/water/publications/WAT_Joint_Bodies/ECE_MP.WAT_50_Joint_bodies_2018_ENG.pdf, accessed 28 June 2024, p. 8.

Figure 27: Percentage of basins where climate change related task and activities are assigned to a joint body (SDG indicator 6.5.2 reporting template, section II, question 3(g)) (based on at least one country within a basin responding positively to the question).



When given a relevant mandate, joint bodies have proven to play an effective role in the coordination of planning and the implementation of disaster risk reduction measures, water allocation, climate change adaptation, and early warning systems through activities such as the development of joint or coordinated strategies and plans, and the monitoring of their implementation and effectiveness. One example is the Volta Basin Authority, which together with the World Meteorological Organization and Global Water Partnership, and through a US\$8 million funded project from the Climate Change Adaptation Fund, is working on an early warning system for floods and droughts.⁴³ In the last 20 years, floods and droughts are estimated to have negatively affected almost two million people in the basin.

Creating technical working groups under a joint body can be an important means by which to support the development of disaster risk management strategies and plans. For example, the Flood and Low Water Working Group under the International Commission for the Protection of the Rhine addresses flood risk management, climate change adaptation, and the management of low water events.

Joint bodies also have an important role to play in addressing water allocation challenges within the context of climate change. They can support efforts to monitor and assess current water allocations and climate change impacts thereon, provide a platform for negotiating and planning future water allocations,

⁴³ Volta Basin Authority, *Volta Flood and Drought Management*, <https://www.floodmanagement.info/volta-basin/#:~:text=The%20Volta%20Basin%20project%20entitled,empowering%20the%20National%20Meteorological%20and>, accessed 7 May 2024.

and monitor the implementation and effectiveness of any agreed plans. For example, the Commission for the Implementation and Development of the Albufeira Convention (CADC) between Spain and Portugal plays a central role in the definition, implementation and review of flow regimes that are aimed at providing water of sufficient quantity and quality to meet multiple economic and social uses, whilst also protecting ecosystems. Additionally, since 2022, monthly hydro-meteorological technical meetings take place at the technical level to monitor the flow regime and anticipate extreme events, which might require the flow regime to be altered.

Joint bodies also play a key role in leveraging funding to support climate change adaptation and resilience efforts on the transboundary level, which in turn can also support the implementation of measures foreseen by the national climate strategies and plans such as Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). The Adaptation Fund is currently the only climate fund that has a regional window, and thus accepts transboundary project proposals. As well as the Volta Basin example noted above, the Adaptation Fund has been utilized by other basin organizations. For example, the Adaptation Fund was utilized by Kenya, Tanzania, Uganda, Burundi and Uganda for a US\$5 million funded project to enhance climate resilience within the Lake Victoria Basin. The fact that a strong regional institution already existed and had the capacity to oversee the project, that is the Lake Victoria Basin Commission, with implementation support from UNEP, offered assurances that a clear mandate and the political will to act was present at the regional level.⁴⁴ Similarly, in the face of growing climate-induced flood risk, the riparians of the Drin Basin (Albania, North Macedonia, Greece, Kosovo⁴⁵ and Montenegro), were

able to rely on their joint body, the Drin Core Group, and its Expert Working Group on Floods, to implement a US\$10 million project focused on achieving an integrated climate resilient river basin management approach at the local, national and basin level. Also, the Niger Basin Authority played a key role in facilitating funding from various donors, including the Green Climate Fund (GCF) for the implementation of the Programme for Integrated Development and Adaptation to Climate Change (PIDACC). This programme includes measures focused on building community resilience and the establishment of the Regional Climate Change Adaptation Fund for the Niger Basin.

While funding is central to progressing transboundary water cooperation, SDG indicator 6.5.2 data suggests that funding remains a challenge for joint bodies. A lack of resources was identified as a main difficulty in the operation of joint bodies or mechanisms within 40 per cent of basins, including major transboundary river and lake basins, such as the Amazon, Aral Sea, Colorado, Columbia, Congo, Danube, Gambia, Lake Chad, Limpopo, La Plata, Mekong, Niger, Nile, Okavango, Rhine, Senegal, Volta, and Zambezi. SDG indicator 6.5.1 data also highlights the challenge countries face in financing transboundary cooperation, with only 31 countries stating that they have full funding in place to finance their transboundary cooperation.⁴⁶

Exchanges of experience among joint bodies on climate change adaptation are promoted by the Global network of basins working on climate change adaptation coordinated by UNECE and International Network of Basin Organizations (INBO) that currently brings together the 19 most advanced basins on climate change adaptation (see box 8).

44 See <https://www.adaptation-fund.org/wp-content/uploads/2022/04/Transboundary-Adaptation-final-April-2022.pdf>, accessed 28 June 2024.

45 This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

46 See UNEP (2024) *supra* note 2.

Box 8: Global network of basins working on climate change adaptation

The Global network of basins working on climate change adaptation was created in the framework of the Water Convention, in cooperation with INBO in 2013. It aims to promote cooperation on adaptation in transboundary basins and discuss different methodologies and approaches for adapting to climate change.

This is the only global network focusing on transboundary climate change adaptation involving basin organizations from different continents and regions. There are currently 19 basins that are part of the global network: the Amazon River Basin, the Chu Talas River Basin, the Congo River Basin, the Danube River Basin, the rivers and wetlands of Dauria Steppes, the Dniester River Basin, the Drin River Basin, the Lake Victoria Basin, the Lower Mekong River Basin, the Meuse River Basin, the Neman River Basin, the Niger River Basin, the North Western Sahara Aquifer System, the Okavango River Basin, the Rhine River Basin, the Sava River Basin, the Senegal River Basin, the Sixaola River Basin and the Volta River Basin.*

The network provides an opportunity for peer learning, capacity-building, the exchange of experiences, and offers technical advice on how to engage various stakeholders, such as local communities and civil society, as well as how to mobilize funding to ensure efficient and inclusive climate change adaptation in transboundary basins. Also, periodic progress reports submitted by basin organizations document the history and progress that countries have made in addressing climate change adaptation.* Meetings of the network are focused on various aspects of development and implementation of climate change adaptation frameworks such as flood and drought risk management, ecosystem-based adaptation, data exchange, integration of climate change into river basin management planning and others. A training on preparing bankable projects for climate change adaptation was organized in 2017.

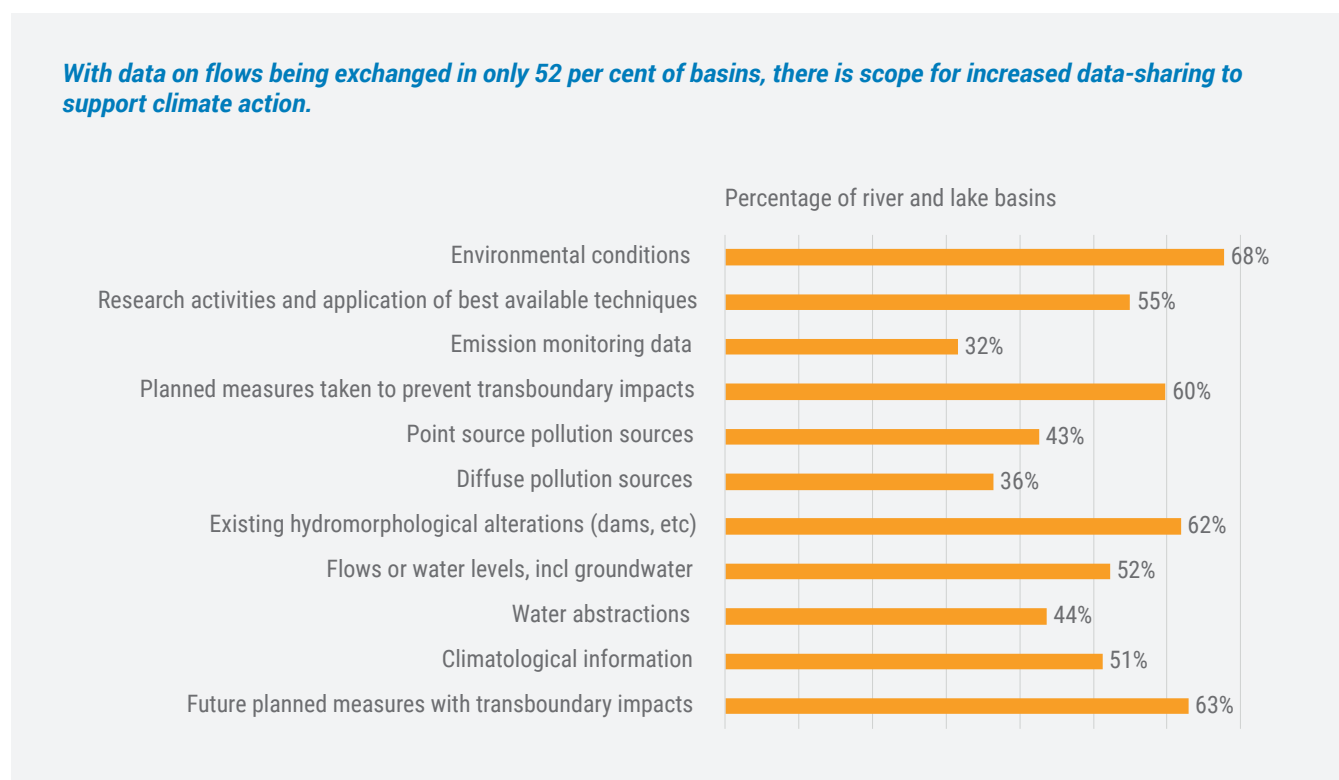
*See basin organizations implementing activities in these basins at: UNECE, *Progress report of the Global network of basins working on climate change adaptation as of April 2023, 2023*, https://unece.org/sites/default/files/2023-07/Global_network_overview_pilot%20projects_progress_May2023_ENGL_Final_0.pdf, accessed 7 May 2023.

4.4 Data and information exchange and climate change within a transboundary water context

"Data and information are the foundation of climate smart sustainable development. We need data to understand how climate change is affecting our water systems; to understand where, how much, and in what quality water is and will be available. We need information to know where and how our actions can best support our access to the precious resource and protect us from water hazards and disasters."⁴⁷

SDG indicator 6.5.2 includes regular, that is at least annual, exchange of data and information as an important criterion in assessing whether an arrangement for transboundary water cooperation is operational. By regularly sharing data and information at both a technical and political level, countries and sectors can deepen their knowledge and understanding of climate change effects, improve their models, and better assess vulnerabilities connected to climate change.⁴⁸ Data and information across a range of subjects and sectors must be available and accessible for countries to make informed decisions on synergies and trade-offs across multiple sectors. Figure 28 provides an overview of the subjects where data and information are exchanged between countries.

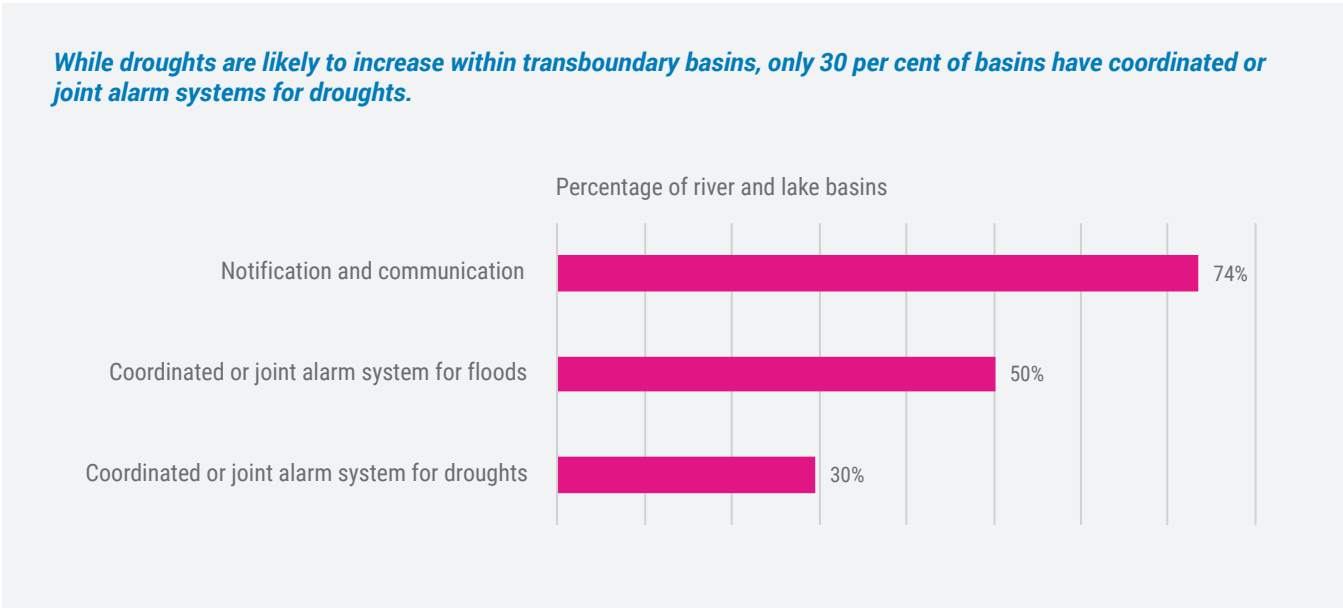
Figure 28: Percentage of basins where certain climate change-related data and information subjects are exchanged (SDG indicator 6.5.2 reporting template, section II, question 6(d)) (based on at least one country within a basin responding positively to the question).



⁴⁷ Water and Climate Coalition Leaders, *Action Plan for Integrated Water and Climate Agenda*, https://www.water-climate-coalition.org/wcc/wp-content/uploads/2022/06/Endorsed_Action_plan.pdf, accessed 7 May 2024, p. 3.

⁴⁸ UNECE, *Guidance on Water and Adaptation to Climate Change*, UN Doc. ECE/MP.WAT/30, <https://unece.org/environment-policy/publications/guidance-water-and-adaptation-climate-change#:~:text=The%20Guidance%20on%20Water%20and,to%20develop%20an%20adaptation%20strategy>, accessed 7 May 2024, p. 4.

Figure 29: Percentage of basins where measures are implemented to prevent or limit the transboundary impact of extreme weather events and climate change (SDG indicator 6.5.2 reporting template, section II, question 11) (based on at least one country within a basin responding positively to the question).



Ideally, informed decision-making on water adaptation measures would be based upon joint bodies developing joint or coordinated monitoring and assessment systems. However, SDG indicator 6.5.2 data suggest that joint monitoring is only carried out in 45 per cent of basins, and joint assessments are only carried out in 55 per cent of basins. Additionally, only 28 per cent of basins have a shared database or information platform in place.

As an example, through funding from UK Aid’s Climate Resilient Infrastructure Development Facility, the Permanent Okavango River Basin Water Commission (OKACOM) was able to conduct a vulnerability assessment in 2019, which through existing data and citizen science, identified basin ‘hotspots’ where compounding challenges affect the ability of communities to adapt or respond to climate change. In consultation with the affected communities, OKACOM uses this assessment to identify and develop project responses designed to address food, livelihood and health challenges within the basin.

Early warning systems are essential for preparedness for extreme weather events. Combined meteorological and hydrological monitoring and forecasting systems can provide timely information on the extent and severity of extreme events.⁴⁹ Figure 29 shows that the majority of basins have measures in place related to the notification and communication of extreme events, and half have adopted alarm systems for floods. However, only 30 per cent of basins have similar systems in place for droughts.

The 2023 Vientiane Declaration on Innovation and Cooperation for Water Secure and Sustainable Mekong, recognized the need to reduce adverse impacts on vulnerable communities in the lower Mekong from floods and droughts through the establishment of more accurate flood and drought forecasting based on modern tools and collaboration, early warning and disaster preparedness, and through the promotion of integrated regional flood and drought management. The duration and magnitude of droughts in the Lower

49 UNECE and UN Office for Disaster Risk Reduction, *Words into Action Guidelines - Implementation Guide for Addressing Water-Related Disasters and Transboundary Cooperation*, UN Doc. ECE/MP.WAT/56, <https://www.undr.org/publication/words-action-guidelines-implementation-guide-addressing-water-related-disasters-and#:~:text=This%20Words%20into%20Action%20guide,into%20account%20climate%20change%20adaptation>, accessed 6 May 2024, p. 25.

Mekong has significantly increased in the last two decades bringing hardship to millions of fishing and farming communities.⁵⁰ The lower Mekong countries, through the Mekong River Commission (MRC), have been monitoring flood conditions since 1996. In 2006, the MRC established the Regional Flood Management and Mitigation Centre, which was renamed the Regional Flood and Drought Management Centre (RFDMC) in 2019 to reflect an expanded mandate. During the wet season (June to October), the RFDMC issues daily flood forecasts and warnings, and during the dry season (November to May) weekly water levels and flow monitoring is provided. Information is disseminated through the Near Real-Time Monitoring,⁵¹ Flood Forecasting, and Drought Forecasting and Early Warning⁵² websites. In July 2023, the MRC Secretariat also set up a TV Channel on Mekong Flood and Drought Forecast which is designed to improve public awareness and understanding of Mekong River conditions in the Lower Mekong River Basin.

Since January 2021 the countries of the Gambia River Basin Development Organization (Gambia, Guinea, Guinea-Bissau and Senegal) have been in the process of developing a shared management and data enhanced platform, which relies upon and coordinates existing national systems and data sources, as well as international data sources on the basis of subsidiarity, interoperability, and shared management.

In the Amazon River Basin, shared between Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela, the Amazon Cooperation Treaty Organization (ACTO) in 2021 inaugurated the Amazon Regional Observatory, an information reference centre and permanent virtual forum that facilitates the flow and exchange of information on the Amazon. Data

shared include hydrometeorological monitoring of river levels and flows, water quality monitoring and critical situations (floods and droughts).

4.5 Joint or coordinated planning and climate change within a transboundary water context

For an arrangement to be considered operational, SDG indicator 6.5.2 requires countries to demonstrate that joint or coordinated management plans, strategies or objectives have been set. While for the purposes of SDG indicator 6.5.2 the content of these plans, etc., are not considered, within the context of climate change, joint or coordinated planning is vital. Additionally, planning at the transboundary level, through joint bodies, can help coordinate national plans, and avoid any issues associated with maladaptation.⁵³

The importance of joint or coordinated planning is reflected in both the 1997 Watercourses Convention and the 1992 Water Convention. Under the Watercourses Convention, for example, countries are encouraged to plan for the sustainable development of an international watercourse and provide for the implementation of any plans adopted. Under the Water Convention, riparian parties are obliged to develop harmonized policies, programmes and strategies for relevant catchment areas. Similarly, under the 2008 ILC Draft Articles on the Law of Transboundary Aquifers, aquifer countries are obliged to, 'establish and implement plans for the proper management of their transboundary aquifers or aquifer systems'.

Climate change considerations should be mainstreamed into basin-wide planning and strategic basin planning (see for example boxes 9, 10 and 11), which should ideally be based on the nexus approach with the aim of engaging across sectors, and increasing resource efficiency, reducing trade-offs, building synergies and enhancing governance amongst and between sectors.

50 Mekong River Commission, Vientiane Declaration, <https://www.mrcmekong.org/>, accessed 5 June 2024.

51 Mekong River Commission, Data Portal, <https://portal.mrcmekong.org/monitoring/river-monitoring-telemetry>, accessed 7 May 2024.

52 MRC, Drought Forecasting and Early Warning for the Lower Mekong Basin, <http://droughtforecast.mrcmekong.org/maps>, accessed 7 May 2024.

53 On the adoption of the plans at the national level see UNEP (2024) supra note 2.

Ecosystem needs should also be mainstreamed within such planning processes, and strong stakeholder engagement is required, to ensure plans can be

effectively implemented. Such efforts are needed at national (see SDG indicator 6.5.1)⁵⁴ and transboundary (SDG indicator 6.5.2) levels to enhance shared

Box 9: The Danube River Basin Management Plan Update 2021 and climate change

In accordance with the EU Water Framework Directive, the countries of the International Commission for the Protection of the Danube River (ICPDR) updated the River Basin Management Plan (RBMP) and Flood Risk Management Plan (FRMP) for the Danube in 2021. The 2021 RBMP update includes ‘five “significant water management issues” within the basin, one of which is the ‘effects of climate change (drought, water scarcity, extreme hydrological phenomena and other impacts)’. The RBMP update provided an opportunity for the countries to incorporate their Strategy on Adaptation to Climate Change (which was first adopted in 2012 and updated in 2018), into both plans. Overall, the Strategy itself guides how to integrate climate change adaptation into ICPDR planning and management processes and served as a basis for the elaboration of a toolbox of possible adaptation measures. These basin level efforts are also key to the coordination of similar plans adopted at both the national and sub-basin levels.

See <https://www.icpdr.org/tasks-topics/tasks/river-basin-management>, accessed 30 August 2024.

Box 10: Updating the Binational Master Plan in the Titicaca-Desaguadero-Poopo-Salar de Coipasa (TDPS) System

Through a bilateral agreement, Bolivia and Peru established the Binational Authority of the TDPS system in 1996. At that time a ‘Global Master Plan’ was established to promote shared management of the basin. Droughts and floods are a major concern throughout the TDPS system and are linked not only to natural and increasingly varying rainfall and water-flow patterns, but also to unsustainable land use practices, urban pollution, and other anthropocentric factors. In an effort to address these concerns the countries implemented a US\$47 million project in 2016 to update the Global Master Plan and enhance the integration of climate change considerations within the conservation and sustainable use of the waters of the TDPS system.

⁵⁴ See Chapter 3 of UNEP (2024) supra note 2.

Box 11: Incorporating climate change adaptation into the work of the Chu Talas Basin Commission

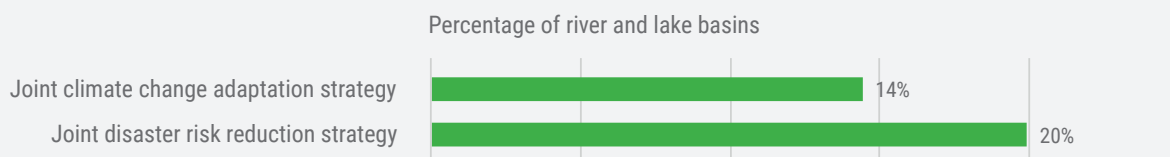
The importance of embedding climate change in strategic plans is clear in the case of the Chu and Talas River Basins shared between Kazakhstan and Kyrgyzstan. The melting of glaciers, as well as rising temperatures and an overall increase in aridity, has led to declining water availability. In 2023, Kazakhstan and Kyrgyzstan, through the Chu Talas Basin Commission and with support from UNECE and UNDP, adopted a Strategic Action Programme for the river basin, which includes adaptation to climate change as part of its vision and as a central objective. In addition, a dedicated Working Group on Adaptation to Climate Change and Long-term Programmes was established and a few concrete adaptation measures focused on floodplain forest restoration, water efficiency for irrigation and raising awareness were implemented.

As well as mainstreaming climate change considerations into basin management plans, countries have developed specific plans, strategies and objectives to address climate change (see boxes 12, 13 and 14). For instance, major accidental pollution in the Sava River Basin in 2018 and 2019, and devastating floods in 2014, highlighted the need for the countries of the International Sava River Basin Commission (Bosnia and Herzegovina, Croatia, Serbia and Slovenia) to improve their procedures for responding to accidental pollution and floods. Through the development of a toolbox and strategies for transboundary water contingency management, the countries have been able to develop coordinated responses to extreme flooding and pollution events. A

draft Protocol on Emergency Situations has been adopted by the Sava Commission, which requires that all affected parties and the Sava Commission are notified without delay via an alarm and emergency warning system, at all appropriate levels of an emergency situation or imminent threat.⁵⁵ Other countries have developed specific plans related to climate change adaptation. For example, the International Commission for the Protection of the Danube River developed the first transboundary adaptation strategy in 2012. However, SDG 6.5.2 indicator data suggests that the adoption of climate change adaptation strategies or disaster risk strategies is still not commonplace within transboundary basins (figure 30).

Figure 30: Percentage of basins where a climate change adaptation strategy or disaster risk strategy is in place (SDG indicator 6.5.2 reporting template, section II, question 11) (based on at least one country within a basin responding positively to the question).

While encouraging examples of climate change adaptation strategies and disaster risk strategies exist, they are lacking in the majority of river and lake basins.



⁵⁵ Climate Adapt, *Toolbox for transboundary water contingency management in the Sava River Basin*, https://climate-adapt.eea.europa.eu/en/metadata/case-studies/toolbox-for-transboundary-water-contingency-management-in-the-sava-river-basin/#legal_aspects, accessed 7 May 2024.

Procedures for mutual assistance in case of a critical situation are also an important means by which countries can enhance their resilience to the impacts of

climate change within transboundary basins. However, SDG indicator 6.5.2 data suggests that only a third of basins have such procedures in place.

Box 12: Addressing the effects of climate vulnerability and change in the La Plata Basin and the Paraná River

Within the context of the La Plata Basin, shared between Argentina, Bolivia, Brazil, Paraguay and Uruguay, a Framework Programme for the Sustainable Management of La Plata Basin's Water Resources, with respect to the Effects of Climate Variability and Change* has been in place for over 20 years. Following a basin-wise assessment during the first phase of the programme, the main critical issues within the basin were identified and a strategic action programme for the La Plata Basin was formulated. Key issues identified and addressed through the strategic action programme include extreme hydrological events, loss of water quality, unsustainable use of aquifers in critical areas, and lack of disaster contingency plans.

The Paraná River, shared between Brazil and Paraguay, suffered extreme droughts in 2020 and 2021, severely limiting the uses of the river in both countries. A binational governing council established under the 1973 Itaipu Treaty proved instrumental in ensuring that data and information was collected and exchanged between key stakeholders during these periods, and the countries were able to reconcile their competing uses in an equitable and reasonable way. Through what has been described as the 'Water Windows' special operation, the governing council agreed to deviate from normal operational arrangements and release enough water from the Itaipu reservoir to ease the effects of droughts downstream, whilst safeguarding hydropower energy production**.

* Cuenca del Plata (CIC), Framework Program for the La Plata Basin, https://cicplata.org/wp-content/uploads/2017/09/framework_program_of_the_la_plata_river_basin.pdf, accessed 7 May 2024.

** Maria A Gwynn, 'International law and transboundary dams: lessons learned from the Binational Entity ITAIPU (Brazil and Paraguay)' (2023) 5 *Frontiers in Climate*, <https://www.frontiersin.org/articles/10.3389/fclim.2023.1272254/full>, accessed 5 June 2024.

Box 13: The Programme for Integrated Development and Adaptation to Climate Change in the Zambezi Basin

The Zambezi River Basin, shared by eight African countries, is home to over 250 million people. Severe drought events are negatively affecting water, energy and food securities in the basin, and almost 20 per cent of the population in the basin are facing food shortages. While climate change is likely to result in growing aridity within the basin, climate variability and uncertainty also place additional pressures on the basin. It is within this context that the Zambezi Watercourse Commission (ZAMCOM) has developed the *2023-2028 Programme for Integrated Development and Adaptation to Climate Change (PIDACC)*,* which has an overarching aim to build strong communities that are resilient to climate and economic shocks in the Zambezi Basin by promoting inclusive transformative investments, job creation, and ecosystem-based solutions.

* Global Center on Adaptation, *Programme for Integrated Development and Adaptation to Climate Change in the Zambezi*, <https://gca.org/projects/pidacc-zm/#:~:text=Its%20overarching%20goal%20is%20to.%2C%20and%20ecosystem%2Dbased%20solutions>, accessed 7 May 2024.

Box 14: Conjunctive management of surface water and groundwater resources to combat climate change

The 2022 World Water Development Report recognized that ‘groundwater is well placed to play a vital role in enabling societies to adapt to intermittent and sustained water shortages caused by climate change’.* With US\$5.3 million support for the Global Environmental Facility, the Nile Basin Initiative’s Groundwater Project – Enhancing Conjunctive Management of Surface Water and Groundwater Resources in Selected Transboundary Aquifers focuses on the Kagera (Burundi, Rwanda, Tanzania and Uganda), Mt Elgon (Kenya and Uganda) and Gedaref-Adigrat (Ethiopia and Sudan) aquifers.** A key component of the project is the development of a regional shared aquifers integrated management action plan for strengthening cooperative management and utilization of the selected shared aquifers.

* UN-Water and UNESCO, *The United Nations World Water Development Report 2022 – Groundwater: Making the invisible visible*, <https://www.unesco.org/reports/wwdr/2022/en#:~:text=The%202022%20edition%20of%20the,of%20groundwater%20across%20the%20world>, accessed 7 May 2024.

** NBI, *Enhancing Conjunctive Management of Surface and Groundwater Resources in Selected Transboundary Aquifers*, <https://unece.org/sites/default/files/2023-10/3.2%20Maha%20Ismail%20NBI%20UPDATED.pdf>, accessed 7 May 2024.



Traditional irrigation system in Switzerland in the Rhône Valley. © Adobe Stock*



Lake Cochrane/Pueyrredón shared by Argentina and Chile. © Sarah Tiefenauer-Linardon

5. Conclusions and recommendations

“Political will is critical to advancing water cooperation. Member States should capitalize on the momentum created by the United Nations 2023 Water Conference, as well as support target 5 of Sustainable Development Goal 6, to provide a clear signal on the importance of transboundary water cooperation.”⁵⁶

⁵⁶ UN, *Report of the United Nations Conference on the Midterm Comprehensive Review of the Implementation of the Objectives of the International Decade for Action, “Water for Sustainable Development”, 2018-2028, 22-24 March 20123*, UN Doc. A/CONF.240/2023/10, para 148.

5.1 Lessons learned from the SDG indicator 6.5.2 monitoring exercises

The 2017, 2020 and 2023 SDG indicator 6.5.2 monitoring exercises have provided an unprecedented opportunity to assess the status and progress in the coverage of operational arrangements for transboundary water cooperation. While both the quality and coverage of data have improved during each monitoring exercise, there is still a need to further improve data quality and ensure that the full indicator value is available for all the countries sharing transboundary waters. Moreover, data collection and exchange related to transboundary aquifers remains a key challenge that many developed and developing countries face.

It is, however, encouraging to see that this global effort to produce and share data for the calculation of the indicator is in itself having a positive outcome on transboundary water cooperation. At the country level, governments are engaging across departments to improve data quality and availability, such as engaging with national geological surveys to improve aquifer-related data. At the transboundary level, SDG indicator 6.5.2 has provided a trigger to encourage countries to cooperate, such as the case of the Senegalo-Mauritanian Basin. At regional and global levels, the results of the SDG indicator 6.5.2 exercise have provided the evidence-base to call for a stronger cooperation between countries over their transboundary rivers, lakes and aquifers and to enhance support for such cooperation. As part of the SDG framework, this has allowed SDG indicator 6.5.2 data to influence high-level policy debates on accelerating progress on the SDGs, such as successive High-Level Political Forums on Sustainable Development and the UN 2023 Water Conference.

Key recommendations:

- To ensure full coverage of the SDG indicator 6.5.2 value, all countries are encouraged to engage in the 2026 monitoring exercise. With support of the custodian agencies and partners, and also to ensure full coverage of the SDG indicator 6.5.2 value, countries should address any data and information gaps, particularly in relation to

transboundary aquifers. As the SDG indicator 6.5.2 monitoring exercise demonstrates, data and information exchange can be an important catalyst for cooperation and helps to build trust between countries sharing transboundary waters.

- At the national level, countries can use their SDG indicator 6.5.2 national reports to take stock of progress, identify gaps, and develop action plans to address those gaps. This process should also consider and build on SDG indicator 6.5.1 reporting, and where relevant SDG indicator 6.5.1 and 6.5.2 reporting should be coordinated.
- At the basin level, countries should exchange their draft SDG indicator 6.5.2 national reports and seek to coordinate data related to their shared rivers, lakes and aquifers. Where present, joint bodies, such as river basins and bilateral commissions, can provide a platform for the exchange and review of SDG indicator 6.5.2 data. Where appropriate, countries should capitalize on SDG indicator 6.5.2 monitoring exercises to trigger discussions with their neighbours on the adoption or revision of arrangements for transboundary water cooperation. Even small steps, such as regular meetings and information exchange, can be an important catalyst for long-term cooperation.
- Global and regional partners, including UN agencies, international financial institutions, regional organizations, basin organizations, civil society groups and others, can play an important role in supporting the submission of SDG indicator 6.5.2 data, coordinating the efforts of countries sharing transboundary waters, providing technical assistance, and analysing data at the regional level.

5.2 Drawing on SDG indicator 6.5.2 findings to progress transboundary water cooperation

Global SDG indicator 6.5.2 data reveals that in 2023, while 153 UN Member States share transboundary waters, only 43 countries have 90 per cent or more of those waters are covered by operational arrangements for cooperation. While this marks an increase of

13 countries compared to the 2020 monitoring exercise, the majority of progress relates to improvements in the data submitted to the 2023 SDG indicator 6.5.2 exercise rather than progress in the adoption of new operational arrangements for transboundary water cooperation.

Global data also masks significant regional variation. Europe, North America and Sub-Saharan Africa show the highest levels of cooperation, with 39 out of 84 countries having 90 per cent or more of their transboundary basin area covered by operational arrangements. However, throughout Asia, Latin America and North Africa, only four countries have 90 per cent or more of their transboundary basin area covered by operational arrangements, whereas 68 countries in these regions share transboundary waters.

Variations also exist between river and lake basins, and aquifers. Whereas in 2023, 60 countries stated that 90 per cent or more of their river and lake basin area is covered by operational arrangements; only 37 countries state that 90 per cent or more of their transboundary aquifers are covered by operational arrangements. An associated challenge has been the lack of data on transboundary aquifers, which has precluded some countries from submitting SDG indicator 6.5.2 data or has meant that a full SDG indicator 6.5.2 is not available for a country. However, there has been positive progress in the availability of SDG indicator 6.5.2 data on aquifers. In 2020, it was not possible to calculate the SDG indicator 6.5.2 value for 40 countries, with the aquifer component not being available for 39 countries, whereas in 2023, it was not possible to calculate the SDG indicator 6.5.2 value for 19 countries, with the aquifer component not available for 18 countries.

Key recommendations:

- Countries, together with technical assistance provided by the custodian agencies and partners, should enhance their capacity-building initiatives related to transboundary water cooperation, as a way to exchange experiences and best practice, and strengthen the adoption and implementation of agreements and other arrangements. Activities and tools under the 1992 Water Convention, such as the

Practical Guide for the Development of Agreements or other Arrangements for Transboundary Water Cooperation can help support such efforts.

- Countries should capitalize on the legal frameworks that support transboundary water cooperation, including the 1992 Water Convention, the 1997 Watercourses Convention and the 2008 ILC Draft Articles on the Law of Transboundary Aquifers, as a basis for the negotiation and implementation of their transboundary water arrangements. The intergovernmental institutional framework and the programme of work of the 1992 Water Convention, UNESCO's Internationally Shared Aquifer Resources Management (ISARM) initiative, GEF-International Waters and similar programmes can be utilized by countries to provide practical support in the development of arrangements and the establishment of joint bodies.
- Countries should mobilize political will in support of transboundary water cooperation through accession to the global water conventions, and participation in the activities of the 1992 Water Convention.
- Given that national funding remains the key funding source, especially in order to cover the core costs of joint bodies, finance should be mobilized from national sources for transboundary cooperation. Innovative financing mechanisms should also be advanced, such as the Blue Peace Fund,⁵⁷ and international financial institutions should improve their financing of transboundary water cooperation in order for countries to capitalize on the benefits of transboundary water cooperation based on sound legal and institutional frameworks.
- The limited available data from the SDG indicator 6.5.2 reports highlight significant gender disparities within transboundary water management. At the same time, several initiatives have demonstrated the value of adopting gender mainstreaming strategies at the basin level and increasing the representation of women in decision-making related to transboundary water management. Both at a national and transboundary level, countries and their joint bodies, should explore opportunities to integrate a gender perspective and address the gender imbalance in transboundary water cooperation.

⁵⁷ See <https://www.thebluepeaceinitiative.org/blue-peace-financing.html>.

- Partners, including UN agencies, international financial institutions, regional organizations, basin organizations, civil society groups and others, should use the 6.5.2 reporting data for their own work and, jointly or in coordination, support countries in establishing and strengthening transboundary water cooperation. The UN System-Wide Strategy for Water and Sanitation adopted in 2024 and the Transboundary Water Cooperation Coalition launched in 2022 represent positive developments in this regard.
- These partners, together with countries, can also help ensure that SDG indicator 6.5.2 data is used to call for increased efforts to promote transboundary water cooperation both within and beyond the water community, including via the UN Water conferences in 2026 and 2028, the High-Level Political Forum on Sustainable Development, the Meeting of the Parties to the Water Convention and the World Water Forums, among others, and ensure that the importance and benefits of water cooperation are high on the political agenda, particularly in light of post-2030 discussions.

Figure 31: Number of countries that have all transboundary waters covered by operational arrangements – current and required rates.

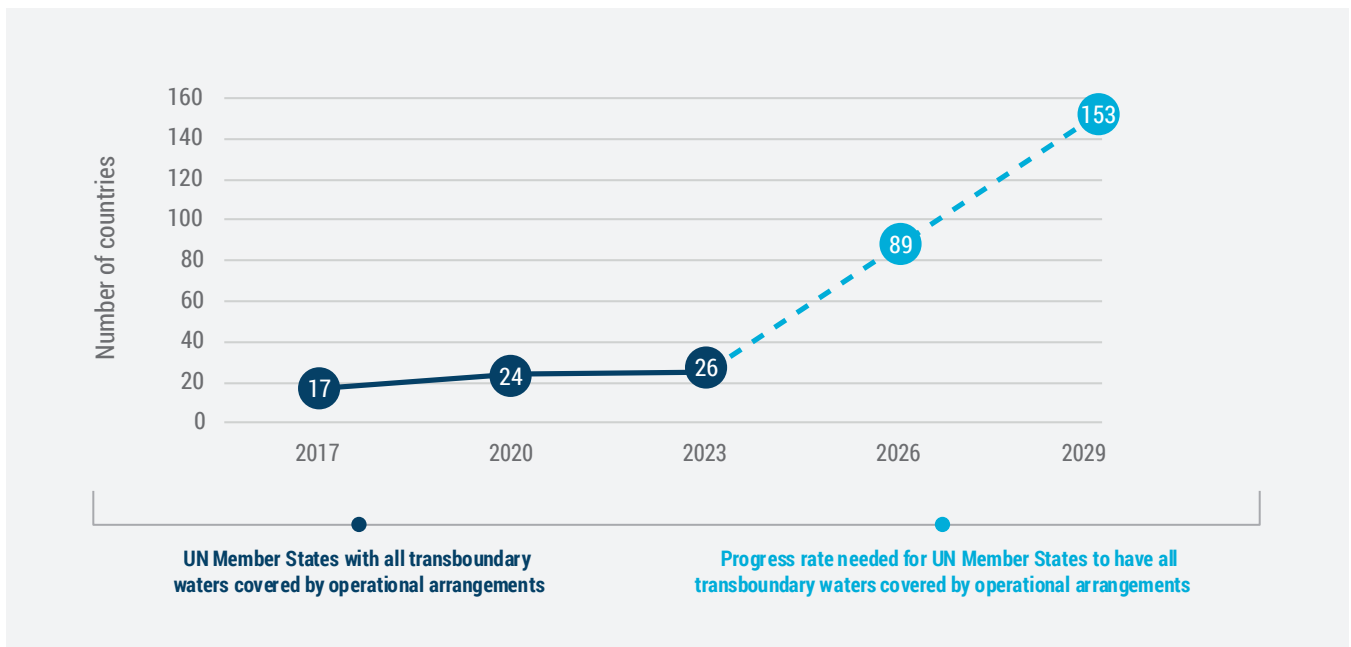


Figure 32: Percentage of countries sharing transboundary waters by SDG region with all transboundary waters covered by operational arrangements – current status and progress needed.

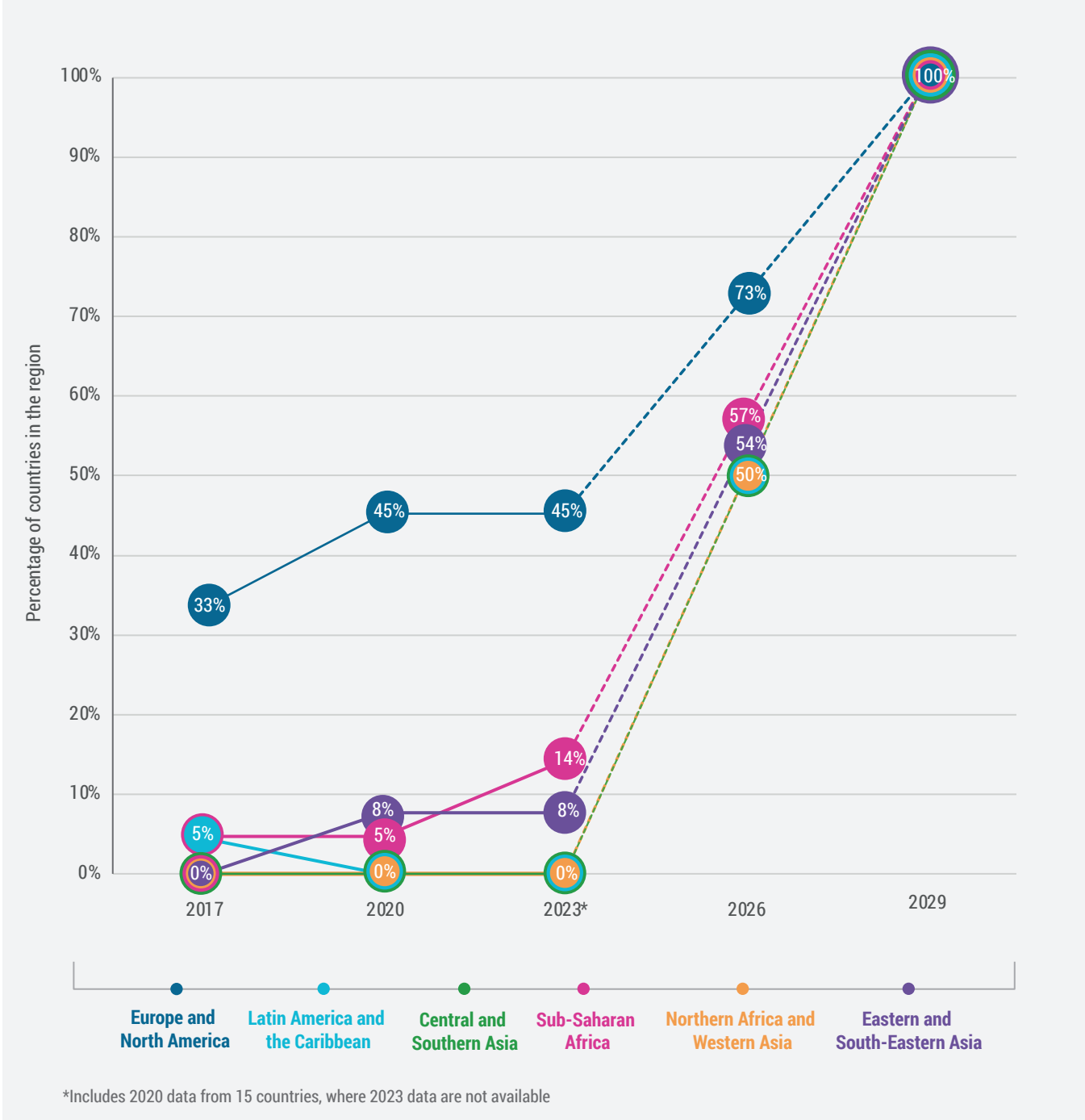
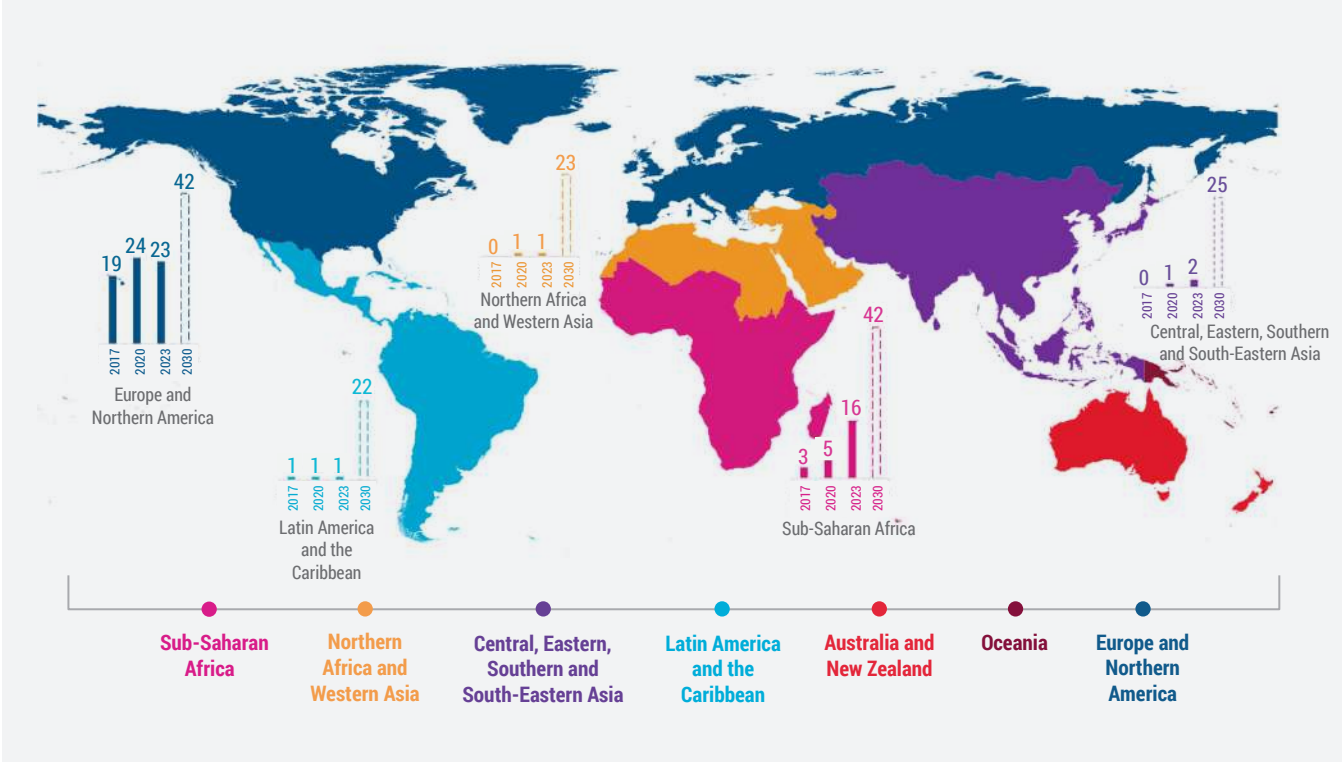


Figure 33: Number of countries in each SDG region with the indicator 6.5.2 value between 90-100 per cent and progress needed to have all transboundary waters in each region covered by operational arrangements in 2030.



Notes: Data for Central, Southern, Eastern and South-Eastern Asia are combined; No country from Oceania submitted a report on the indicator 6.5.2; Australia and New Zealand do not have transboundary rivers, lakes nor aquifers. (Source: developed by UNESCO and UNECE).

5.3 Insights from SDG indicator 6.5.2 for transboundary water cooperation and climate change

Climate change adds another layer of complexity to the challenge of how countries share their transboundary rivers, lakes and aquifers in an equitable and sustainable manner. The increased magnitude and frequency of water-related hazards, such as floods and droughts, climate-induced water scarcity as well as greater unpredictability of water supplies, has the potential to increase competition over waters shared by two or more countries. However, transboundary water cooperation

also offers an opportunity for countries to promote regional integration, progress sustainable development at the basin scale, and accelerate the global transition towards climate change adaptation and mitigation.

Transboundary risks, climate-informed transboundary management and cooperation are referred to in several important recent global climate reports by the IPCC and decisions on the global goal on adaptation and global stocktake adopted at the 28th session of the Conference of the Parties to the UNFCCC (COP28, Dubai, 30 November 12 December 2023). Where arrangements for transboundary water cooperation and joint bodies are in place, regular meetings at both technical and political levels take place, and joint or coordinated plans, strategies and objectives are adopted, countries have demonstrated that they have been able to both maximize the shared benefits of transboundary waters, whilst also enhancing their collective resilience to climate

change. However, to fully capitalize on the potential water cooperation can offer when tackling climate change at transboundary and regional level, there is a need for countries to strengthen their cooperation over transboundary waters and to address the climate change and disaster risk through that cooperation. As noted above, too many rivers, lakes and aquifers are lacking the necessary operational arrangements to provide an effective platform for countries to combine and coordinate their efforts. Even where operational arrangements are in place, they may be lacking the necessary measures to address climate change, such as the adoption of a joint climate change adaptation strategy (present in only 14 per cent of basins), or a joint disaster risk reduction strategy (present in only 20 per cent of basins).

Key recommendations:

- Countries should embed climate change considerations into the adoption of new or revised arrangements for transboundary water cooperation, and in the tasks and activities of existing and new joint bodies.
- Where operational arrangements are in place, countries should consider if there are opportunities to strengthen those arrangements to tackle climate change, such as through data and information exchange, the establishment of thematic working groups focused on climate change, the development of joint or coordinated adaptation strategies, disaster risk reduction strategies, joint alarm systems for floods and droughts, mainstreaming climate change within basin management plans or similar, ecosystem-based approaches, and engaging a diverse range of stakeholders in water management decisions.
- Depending on the context, countries may, through their joint bodies, be able to explore opportunities to leverage climate finance for climate adaptation measures at the transboundary level, which can also facilitate funding for implementing adaptation actions at the national level, as foreseen by National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs).
- Transboundary water cooperation for adaptation should also be incorporated into the overall process for a global adaptation goal. In particular, within the UAE Framework for Global Climate Resilience, it would be beneficial to consider transboundary and regional water cooperation as an opportunity to better understand transboundary climate change impacts and risks and to support collective consideration and knowledge-sharing resulting in climate-informed transboundary management at the basin and regional levels. SDG indicator 6.5.2 can be used as a basis for informing that process by tracking progress in adaptation measures of transboundary water cooperation worldwide, including through the new two-year UAE–Belém work programme on indicators.
- Where relevant, countries should incorporate transboundary water cooperation into their NAPs and their next NDCs (due to be revised by February 2025),⁵⁸ and, where appropriate, NAPs and NDCs or their relevant sections, should be coordinated at the basin level to maximize the benefits of water-related climate change mitigation and adaptation measures and to avoid negative and potentially inadvertent impacts that might result from uncoordinated national action. Additionally, any update to the current NAP technical guidance, as envisaged at COP28,⁵⁹ should take into account SDG indicator 6.5.1 and 6.5.2 data, as well as the importance of transboundary water cooperation in enhancing climate change adaptation, and any lessons learned in that regard.
- The Global network of basins working on climate change adaptation in transboundary basins coordinated by the Water Convention and INBO, and the Water Convention's Task Force on Water and Climate, can be utilized as important global platforms by which to share experiences and demonstrate the tangible benefits of adopting and implementing climate change adaptation strategies and plans at the transboundary level. Numerous guidance documents on water and climate by the Water Convention, INBO, AGWA, WMO, UNCCD, UNDRR, UNESCO, UNFCCC and others can help countries in climate-proofing their transboundary waters.

⁵⁸ Decision 1/CMA.5, *Outcome of the First Global Stocktake*, https://unfccc.int/sites/default/files/resource/cma2023_16a01_adv_0.pdf, accessed 7 May 2024, para 166.

⁵⁹ Decision 2/CMA.5, *Global Goal on Adaptation*, https://unfccc.int/sites/default/files/resource/cma2023_16a01_adv_0.pdf, accessed 7 May 2024, para. 47.



Victoria Falls on the Zambezi River shared by Angola, Botswana, Mozambique, Namibia, Zambia and Zimbabwe. © UNESCO / Guy Broucke



Historical irrigation system in the Sahara desert. © Adobe Stock*

Annexes

Annex I

Countries with breakdown of SDG 6.5.2 indicator value, river and lake basin value, and aquifer value for each

COUNTRY NAME	SDG INDICATOR 6.5.2 (%) 1ST EXERCISE, 2017	SDG INDICATOR 6.5.2 (%) 2ND EXERCISE, 2020	RIVER AND LAKE BASIN COMPONENT (%) 3RD EXERCISE, 2023	AQUIFER COMPONENT (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 DIFFERENCE 2020-2023	REASONS FOR CHANGE 2020-2023*
Afghanistan	NaN**	NaN	NaN	NaN	NaN		
Albania	75.58	54.49	56.01	51.67	54.49	↔	
Algeria	NaN	57.54	NaN	NaN	NaN		
Andorra	NaN	4.38	4.38	N***	4.38	↔	
Angola	78.89	78.84	NaN	NaN	NaN		
Argentina	NaN	60.41	99.57	0.00	60.41	↔	
Armenia	0.12	11.34	11.30	0.00	10.15	↓	1; 2.1
Austria	100.00	100.00	100.00	100.00	100.00	↔	
Azerbaijan	NaN	21.73	27.75	3.86	21.73	↔	
Bahrain	N	N	N	0.00	0.00		
Bangladesh	NaN	NaN	38.46	NaN	NaN		
Belarus	NaN	67.43	38.62	28.22	30.32	↓	2.1; 4
Belgium	100.00	100.00	100.00	100.00	100.00	↔	
Belize	NaN	NaN	0.00	0.00	0.00		
Benin	81.46	83.33	98.30	68.05	86.93	↑	3
Bhutan	NaN	NaN	NaN	NaN	NaN		
Bolivia (Plurinational State of)	NaN	65.74	94.57	94.90	94.68	↑	2.2
Bosnia and Herzegovina	92.60	92.60	96.32	73.32	92.75	↑	1
Botswana	100.00	100.00	100.00	100.00	100.00	↔	
Brazil	62.36	61.82	99.76	0.00	55.75	↓	2.1
Brunei Darussalam	NaN	0.00	NaN	NaN	NaN		

COUNTRY NAME	SDG INDICATOR 6.5.2 (%) 1ST EXERCISE, 2017	SDG INDICATOR 6.5.2 (%) 2ND EXERCISE, 2020	RIVER AND LAKE BASIN COMPONENT (%) 3RD EXERCISE, 2023	AQUIFER COMPONENT (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 DIFFERENCE 2020-2023	REASONS FOR CHANGE 2020-2023*
Bulgaria	99.55	99.55	100.00	100.00	100.00	↑	2.1
Burkina Faso	NaN	NaN	93.57	100.00	94.91		
Burundi	88.34	NaN	NaN	NaN	NaN		
Cambodia	NaN	56.00	100.00	94.85	97.67	↑	2.2
Cameroon	88.57	88.25	69.23	92.03	73.01	↓	1; 2.2
Canada	87.89	NaN	91.27	0.00	69.69		
Central African Republic	NaN	NaN	NaN	NaN	NaN		
Chad	50.41	44.42	35.85	53.18	44.42	↔	
Chile	0.00	87.21	87.21	0.00	78.60	↓	2.1
China	NaN	NaN	NaN	NaN	NaN		
Colombia	NaN	NaN	NaN	NaN	NaN		
Costa Rica	NaN	9.00	13.76	100.00	14.46	↑	2.2
Côte d'Ivoire	NaN	NaN	28.30	0.00	25.18		
Croatia	NaN	100.00	100.00	100.00	100.00	↔	
Czechia	100.00	100.00	100.00	100.00	100.00	↔	
Democratic People's Republic of Korea	NaN	NaN	NaN	NaN	NaN		
Democratic Republic of the Congo	NaN	NaN	99.86	0.00	66.41		
Denmark	NaN	100.00	100.00	N	100.00	↔	
Djibouti	NaN	NaN	NaN	NaN	NaN		
Dominican Republic	0.00	0.00	0.00	0.00	0.00	↔	
Ecuador	100.00	NaN	NaN	NaN	NaN		
Egypt	NaN	NaN	100.00	NaN	NaN		
El Salvador	0.00	0.07	0.28	0.64	0.32	↑	1

COUNTRY NAME	SDG INDICATOR 6.5.2 (%) 1ST EXERCISE, 2017	SDG INDICATOR 6.5.2 (%) 2ND EXERCISE, 2020	RIVER AND LAKE BASIN COMPONENT (%) 3RD EXERCISE, 2023	AQUIFER COMPONENT (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 DIFFERENCE 2020-2023	REASONS FOR CHANGE 2020-2023*
Equatorial Guinea	0.00	0.00	0.00	N	0.00	↔	
Eritrea	NaN	NaN	NaN	NaN	NaN		
Estonia	100.00	100.00	100.00	100.00	100.00	↔	
Eswatini	NaN	91.91	100.00	8.14	91.96	↑	2.2
Ethiopia	NaN	NaN	49.51	0.00	NaN		
Finland	100.00	100.00	100.00	N	100.00	↔	
France	NaN	56.54	51.83	100.00	53.27	↓	1; 2.1
Gabon	0.00	NaN	NaN	NaN	NaN		
Gambia	48.99	46.86	90.65	100.00	95.33	↑	3
Georgia	0.00	0.00	0.00	0.00	0.00	↔	
Germany	100.00	100.00	100.00	100.00	100.00	↔	
Ghana	91.05	91.05	88.36	95.68	91.05	↔	
Greece	32.76	32.76	58.79	45.40	52.56	↑	1; 2.1; 2.2
Guatemala	NaN	NaN	NaN	NaN	NaN		
Guinea	NaN	NaN	79.08	73.61	78.95		
Guinea-Bissau	NaN	42.86	100.00	100.00	100.00	↑	1; 3
Guyana	NaN	5.94	8.05	0.00	5.73	↓	1
Haiti	NaN	NaN	NaN	NaN	NaN		
Honduras	0.00	0.00	NaN	NaN	NaN		
Hungary	100.00	100.00	100.00	100.00	100.00	↔	
India	NaN	NaN	NaN	NaN	NaN		
Indonesia	NaN	1.22	NaN	NaN	NaN		
Iran (Islamic Republic of)	NaN	NaN	NaN	NaN	NaN		
Iraq	13.55	10.61	34.40	0.00	18.38	↑	1; 2.1
Ireland	100.00	NaN	0.00	0.00	0.00		
Israel	NaN	NaN	NaN	NaN	NaN		

COUNTRY NAME	SDG INDICATOR 6.5.2 (%) 1ST EXERCISE, 2017	SDG INDICATOR 6.5.2 (%) 2ND EXERCISE, 2020	RIVER AND LAKE BASIN COMPONENT (%) 3RD EXERCISE, 2023	AQUIFER COMPONENT (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 DIFFERENCE 2020-2023	REASONS FOR CHANGE 2020-2023*
Italy	100.00	100.00	96.02	100.00	97.11	↓	1
Jordan	21.91	23.23	29.30	23.82	25.73	↑	1; 2.1
Kazakhstan	72.36	63.22	100.00	0.00	63.41	↑	2.1
Kenya	26.75	NaN	54.99	0.00	35.84		
Kuwait	NaN	NaN	N	0.00	0.00		
Kyrgyzstan	NaN	27.20	43.68	0.00	39.39	↑	1; 3
Lao People's Democratic Republic	NaN	NaN	92.75	NaN	NaN		
Latvia	97.31	97.29	100.00	93.49	97.06	↓	2.1
Lebanon	NaN	NaN	79.69	NaN	NaN		
Lesotho	50.00	NaN	NaN	NaN	NaN		
Liberia	NaN	NaN	30.39	0.00	29.42		
Libya	NaN	97.96	N	97.96	97.96	↔	
Liechtenstein	NaN	100.00	100.00	100.00	100.00	↔	
Lithuania	34.96	34.06	25.69	50.17	34.06	↔	
Luxembourg	100.00	100.00	100.00	100.00	100.00	↔	
Malawi	NaN	61.40	93.14	4.45	61.40	↔	
Malaysia	NaN	1.73	0.00	0.00	0.00	↓	1; 2.1
Mali	75.35	NaN	NaN	NaN	NaN		
Mauritania	NaN	NaN	94.38	17.87	26.60		
Mexico	1.31	38.57	49.65	0.00	33.19	↓	4;
Mongolia	NaN	100.00	100.00	100.00	100.00	↔	
Montenegro	79.51	66.68	84.80	21.47	67.04	↑	2.1
Morocco	0.00	0.00	NaN	NaN	NaN		
Mozambique	NaN	NaN	NaN	NaN	NaN		
Myanmar	NaN	20.02	23.37	0.00	19.04	↓	1; 2.1
Namibia	100.00	100.00	100.00	100.00	100.00	↔	

COUNTRY NAME	SDG INDICATOR 6.5.2 (%) 1ST EXERCISE, 2017	SDG INDICATOR 6.5.2 (%) 2ND EXERCISE, 2020	RIVER AND LAKE BASIN COMPONENT (%) 3RD EXERCISE, 2023	AQUIFER COMPONENT (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 DIFFERENCE 2020-2023	REASONS FOR CHANGE 2020-2023*
Nepal	NaN	NaN	8.35	0.00	4.91		
Netherlands	100.00	100.00	100.00	100.00	100.00	↔	
Nicaragua	NaN	NaN	0.00	0.00	0.00		
Niger	89.65	85.66	NaN	NaN	NaN		
Nigeria	NaN	NaN	100.00	96.71	98.72		
North Macedonia	NaN	12.94	13.24	12.22	12.94	↔	
Norway	59.47	89.45	89.46	88.31	89.45	↔	
Oman	NaN	NaN	N	0.00	0.00		
Pakistan	NaN	NaN	NaN	NaN	NaN		
Panama	9.13	NaN	13.40	100.00	17.80		
Papua New Guinea	NaN	NaN	NaN	NaN	NaN		
Paraguay	50.86	50.86	NaN	NaN	NaN		
Peru	NaN	NaN	NaN	NaN	NaN		
Poland	NaN	55.68	83.34	66.51	79.26	↑	1; 2.1
Portugal	NaN	100.00	100.00	N	100.00	↔	
Qatar	0.00	NaN	N	N	N		
Republic of Congo	NaN	NaN	96.59	94.34	95.59		
Republic of Korea	0.00	0.00	0.00	0.00	0.00	↔	
Republic of Moldova	95.81	100.00	100.00	100.00	100.00	↔	
Romania	100.00	100.00	100.00	100.00	100.00	↔	
Russian Federation	NaN	NaN	NaN	NaN	NaN		
Rwanda	NaN	47.90	100.00	100.00	100.00	↑	2.2
San Marino	NaN	NaN	0.00	0.00	0.00		
Saudi Arabia	NaN	NaN	N	70.93	70.93		

COUNTRY NAME	SDG INDICATOR 6.5.2 (%) 1ST EXERCISE, 2017	SDG INDICATOR 6.5.2 (%) 2ND EXERCISE, 2020	RIVER AND LAKE BASIN COMPONENT (%) 3RD EXERCISE, 2023	AQUIFER COMPONENT (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 DIFFERENCE 2020-2023	REASONS FOR CHANGE 2020-2023*
Senegal	34.06	35.21	100.00	100.00	100.00	↑	1; 3
Serbia	90.01	89.65	92.51	73.73	89.65	↔	
Sierra Leone	7.02	NaN	100.00	N	100.00		
Slovakia	100.00	80.92	100.00	27.93	81.50	↑	2.1; 3
Slovenia	100.00	100.00	100.00	100.00	100.00	↔	
Somalia	0.00	0.00	0.00	0.00	0.00	↔	
South Africa	NaN	94.91	100.00	72.91	96.36	↑	2.2
South Sudan	NaN	NaN	100.00	0.00	55.51		
Spain	NaN	100.00	100.00	N	100.00	↔	
State of Palestine	NaN	NaN	0.00	NaN	NaN		
Sudan	NaN	NaN	NaN	NaN	NaN		
Suriname	NaN	0.00	0.00	0.00	0.00	↔	
Sweden	78.08	100.00	100.00	100.00	100.00	↔	
Switzerland	NaN	90.23	93.50	74.11	90.23	↔	
Syrian Arab Republic	NaN	NaN	NaN	NaN	NaN		
Tajikistan	NaN	NaN	NaN	NaN	NaN		
Thailand	NaN	NaN	90.11	0.00	62.33		
Timor Leste	NaN	NaN	NaN	NaN	NaN		
Togo	60.17	60.17	100.00	80.81	95.73	↑	3
Tunisia	80.47	80.47	0.00	100.00	80.47	↔	
Türkiye	NaN	NaN	NaN	NaN	NaN		
Turkmenistan	NaN	NaN	66.02	NaN	NaN		
Uganda	83.56	84.93	98.47	100.00	98.68	↑	2.2
Ukraine	NaN	60.59	24.04	63.76	27.00	↓	4
United Arab Emirates	NaN	0.00	NaN	NaN	NaN		

COUNTRY NAME	SDG INDICATOR 6.5.2 (%) 1ST EXERCISE, 2017	SDG INDICATOR 6.5.2 (%) 2ND EXERCISE, 2020	RIVER AND LAKE BASIN COMPONENT (%) 3RD EXERCISE, 2023	AQUIFER COMPONENT (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 (%) 3RD EXERCISE, 2023	SDG INDICATOR 6.5.2 DIFFERENCE 2020-2023	REASONS FOR CHANGE 2020-2023*
United Kingdom	0.00	NaN	0.00	0.00	0.00		
United Republic of Tanzania	NaN	NaN	79.09	3.42	61.23		
United States of America	NaN	NaN	100.00	0.00	83.37		
Uruguay	NaN	NaN	100.00	0.00	54.64		
Uzbekistan	NaN	69.59	100.00	0.00	69.59	↔	
Venezuela (Bolivarian Republic of)	3.51	NaN	NaN	NaN	NaN		
Viet Nam	NaN	NaN	28.86	NaN	NaN		
Yemen	NaN	NaN	N	0.00	0.00		
Zambia	70.03	NaN	78.84	66.07	77.74		
Zimbabwe	NaN	69.90	94.38	53.57	90.36	↑	3

Notes:

- * Reasons for change: 1. updated data (surface area) for surface waters; 2.1 updated data (surface area) for ground waters; 2.2 updated data (consideration within existing surface waters agreement) for ground waters; 3. improved cooperation (new operational arrangement or operationalization of existing arrangement); 4. decreased cooperation.
- ** NaN: indicates that the indicator value is not available.
- *** N: Non-relevant: indicates that the figure is not available because the indicator – as defined for the global monitoring – does not apply to the circumstances of the specific country, and therefore is not reported.

Annex II

Selected responses from section II of the SDG indicator 6.5.2 national reports

Note: Most of the following figures are based on a total number of 291 river and lake basins listed in section II of the national reports. As not all countries sharing transboundary waters provided a national report, the number is lower than the total number of transboundary river basins shared by countries, that is 313. Where a country submitted multiple responses for the same basin, for example they submitted data for a basin arrangement and sub-basin arrangements, the highest-level arrangement was used, that is the basin arrangement. Percentages are based on at least one country within a basin responding affirmatively to the relevant question in section II of their SDG indicator 6.5.2 national report, for example ticking the relevant box. Figure II.3 is based on all responses to an open question and is presented as a word cloud.

A. Agreements and arrangements for transboundary water cooperation

Figure II.1: What topics or subjects of cooperation are included in the agreement or arrangement? (SDG indicator 6.5.2 reporting template, section II, question 2(d)) (based on at least one country within a basin responding positively to the question).

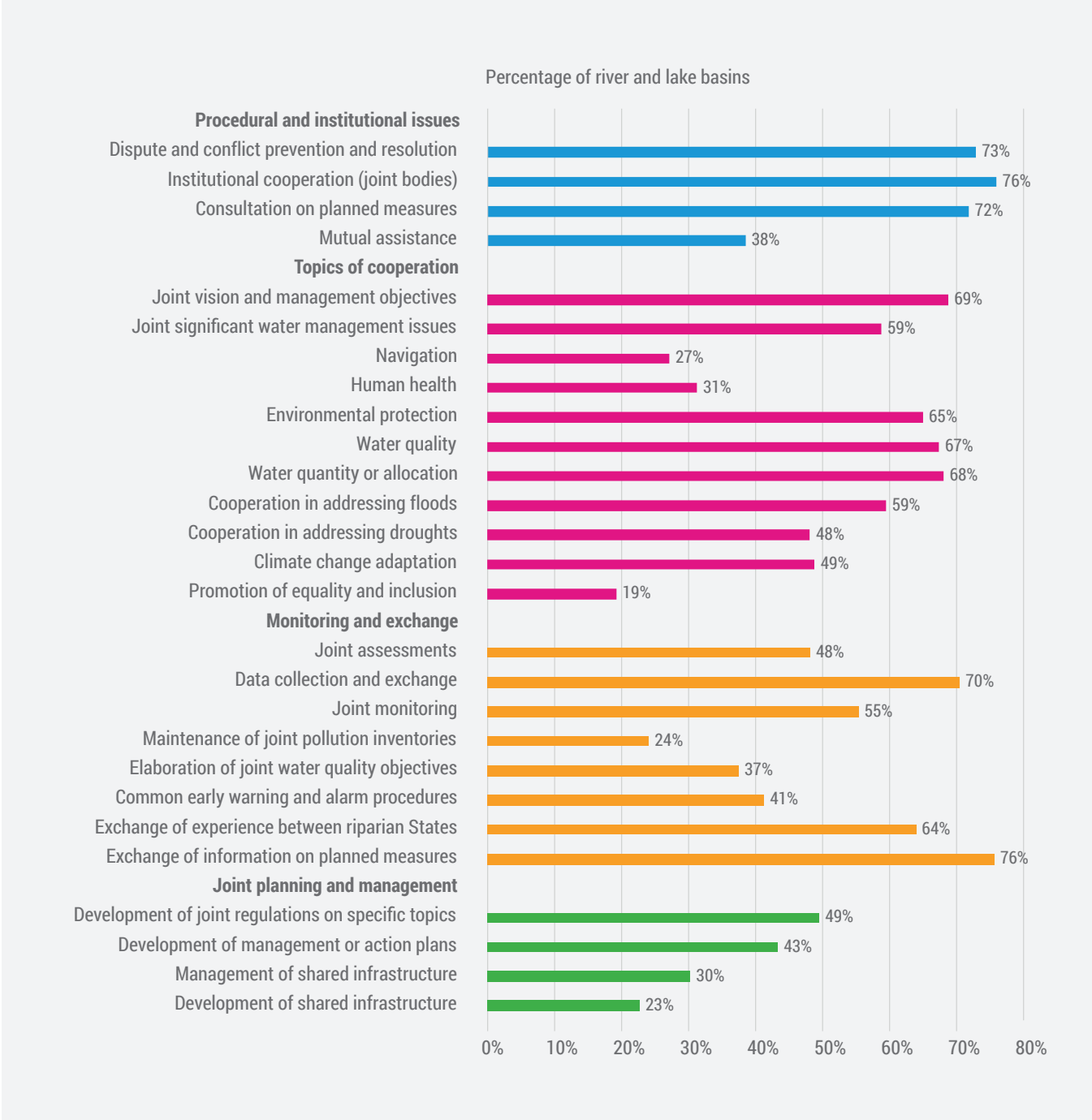


Figure II.2: What are the main difficulties and challenges that your country faces with the agreement or arrangement and its implementation, if any? (SDG indicator 6.5.2 reporting template, section II, question 2(e)) (based on at least one country within a basin responding positively to the question).

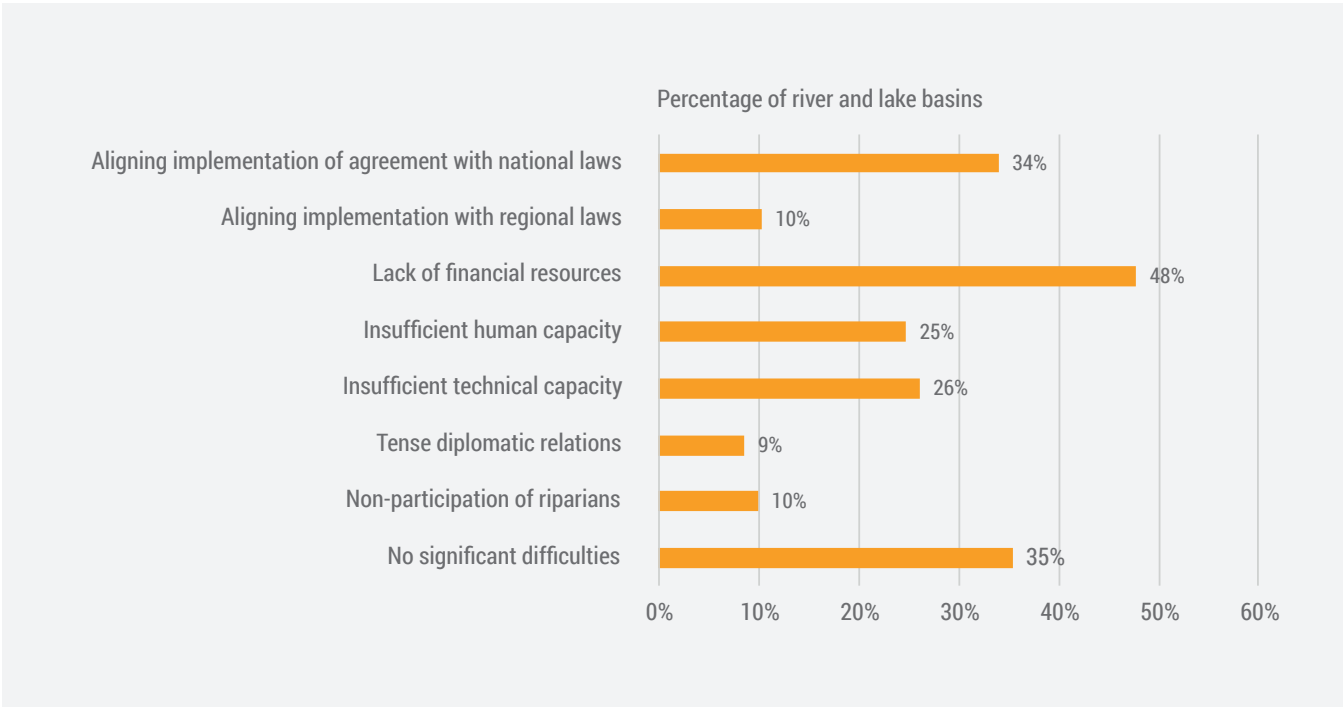
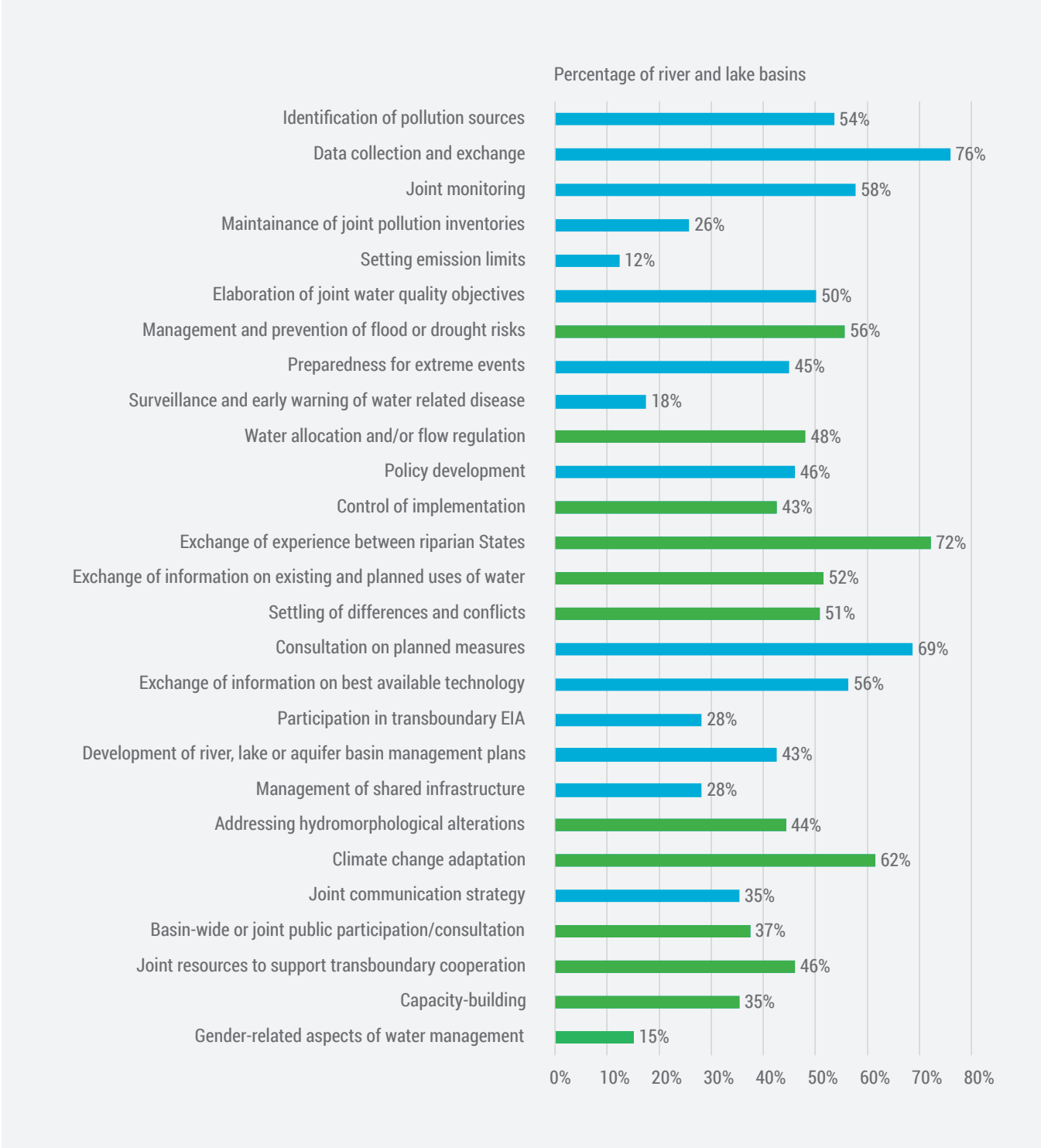


Figure II.3: What are the main achievements in implementing the agreement or arrangement, and what are the keys to achieving such success? (SDG indicator 6.5.2 reporting template, section II, question 2(f)) (based on the most frequently used keywords and phrases from the free text responses submitted by countries).



B. Joint bodies or mechanisms

Figure II.4: What are the tasks and activities of this joint body or mechanism? (SDG indicator 6.5.2 reporting template, section II, question 3(g)) (based on at least one country within a basin responding positively to the question).



Note: EIA stands for Environmental Impact Assessment.

Figure II.5: What are the main difficulties and challenges that your country faces with the operation of the joint body or mechanism, if any? (SDG indicator 6.5.2 reporting template, section II, question 3(h)) (based on at least one country within a basin responding positively to the question).

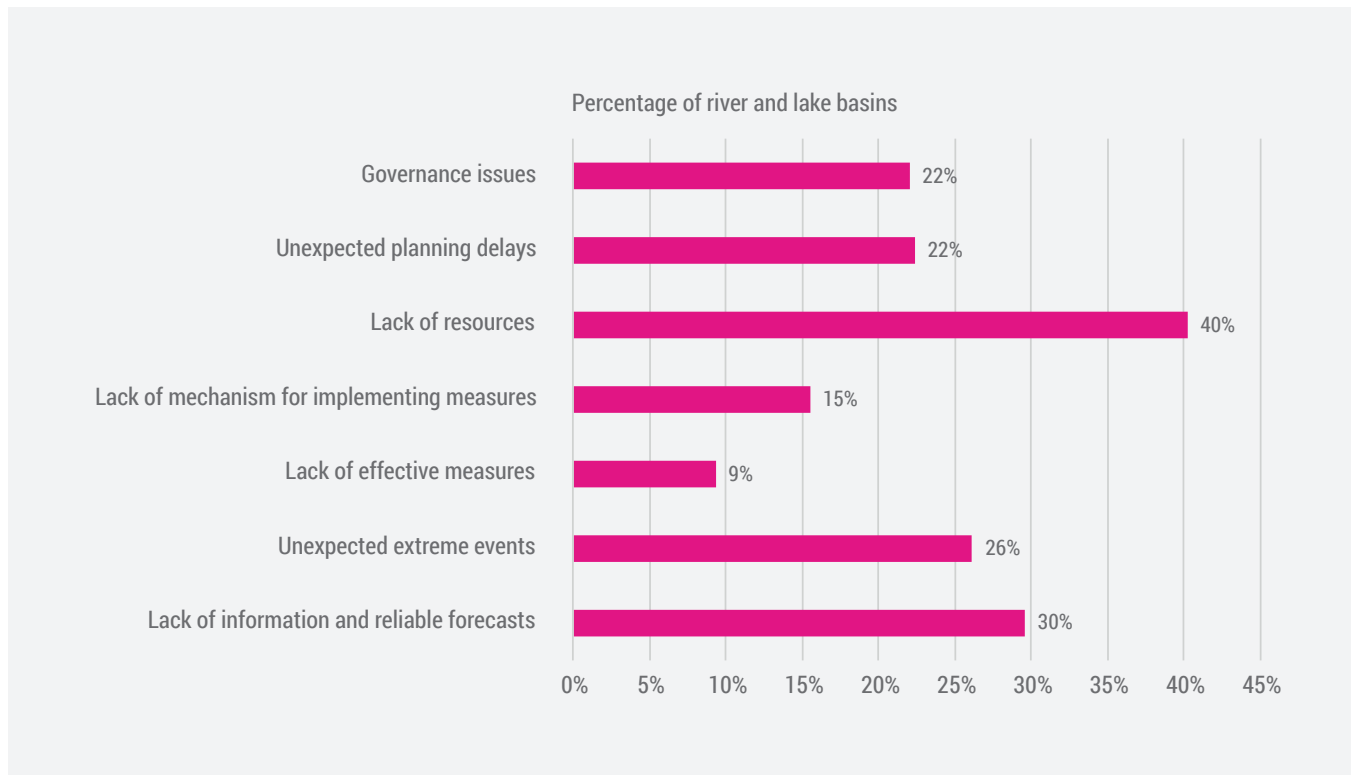


Figure II.6: What are the main achievements with regards to the joint body or mechanism? (SDG indicator 6.5.2 reporting template, section III, question 3(j)) (based on the most frequently used keywords and phrases from the free text responses submitted by countries).



C. Other selected responses from section II of the template

Figure II.7: How is the basin protected, including the protection of ecosystems in the context of sustainable and rational water use? (SDG indicator 6.5.2 reporting template, section II, question 5) (based on at least one country within a basin responding positively to the question).

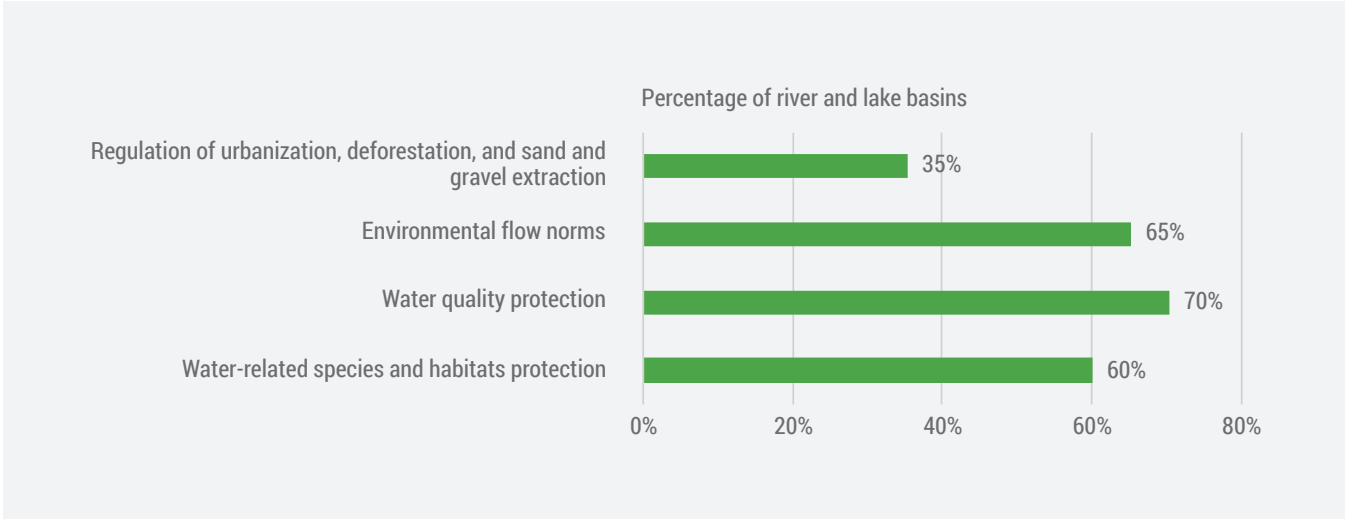


Figure II.8: If countries regularly exchange data and information, on what subjects are information and data exchanged? (SDG indicator 6.5.2 reporting template, section II, question 6(d)) (based on at least one country within a basin responding positively to the question).

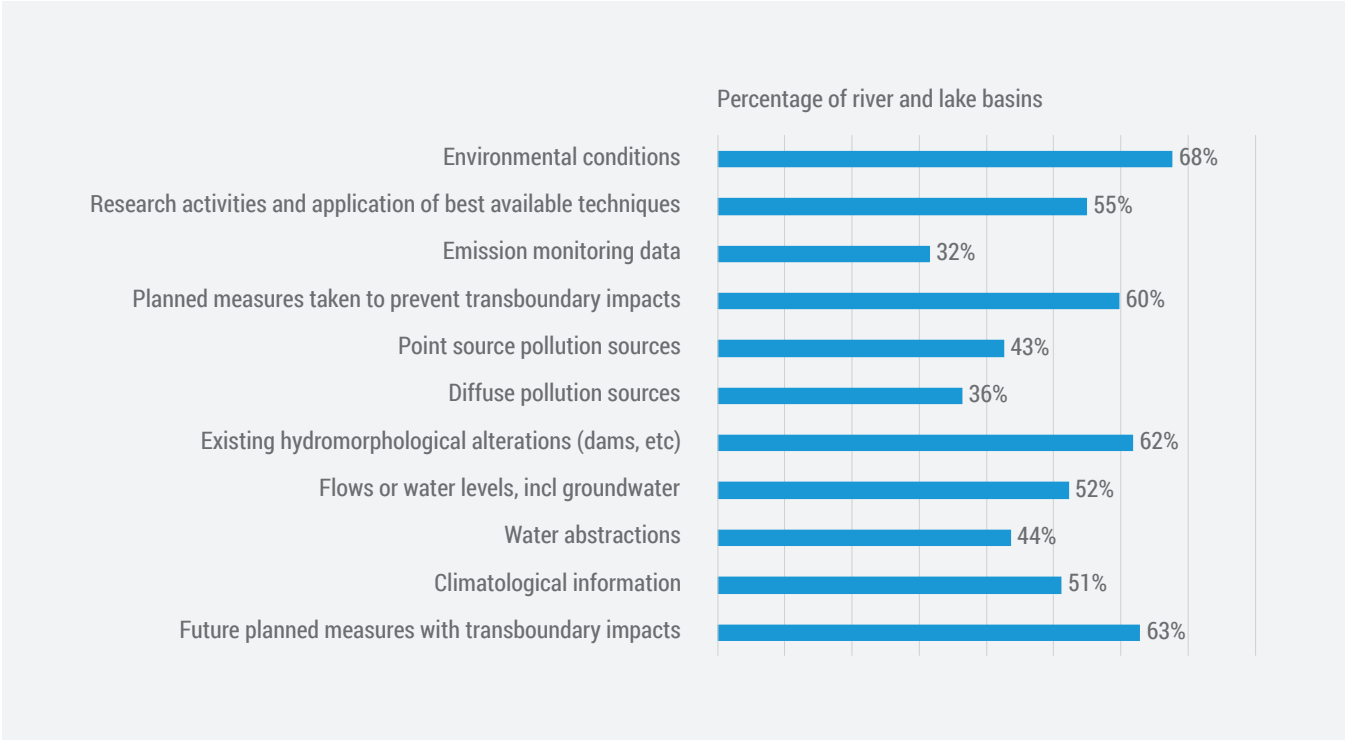


Figure II.9: What are the main difficulties and challenges to data exchange? (SDG indicator 6.5.2 reporting template, section II, question 6(g)) (based on at least one country within a basin responding positively to the question).

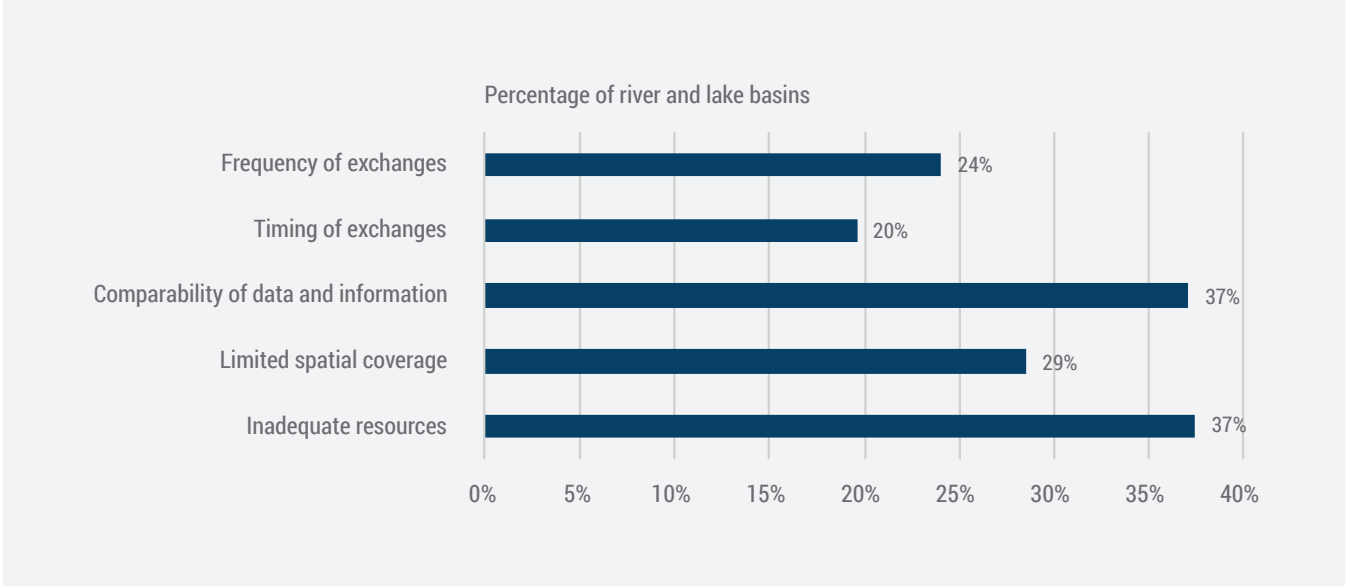


Figure II.10: If joint monitoring is carried out, how is this done? (SDG indicator 6.5.2 reporting template, section II, question 7(b)) (based on at least one country within a basin responding positively to the question).

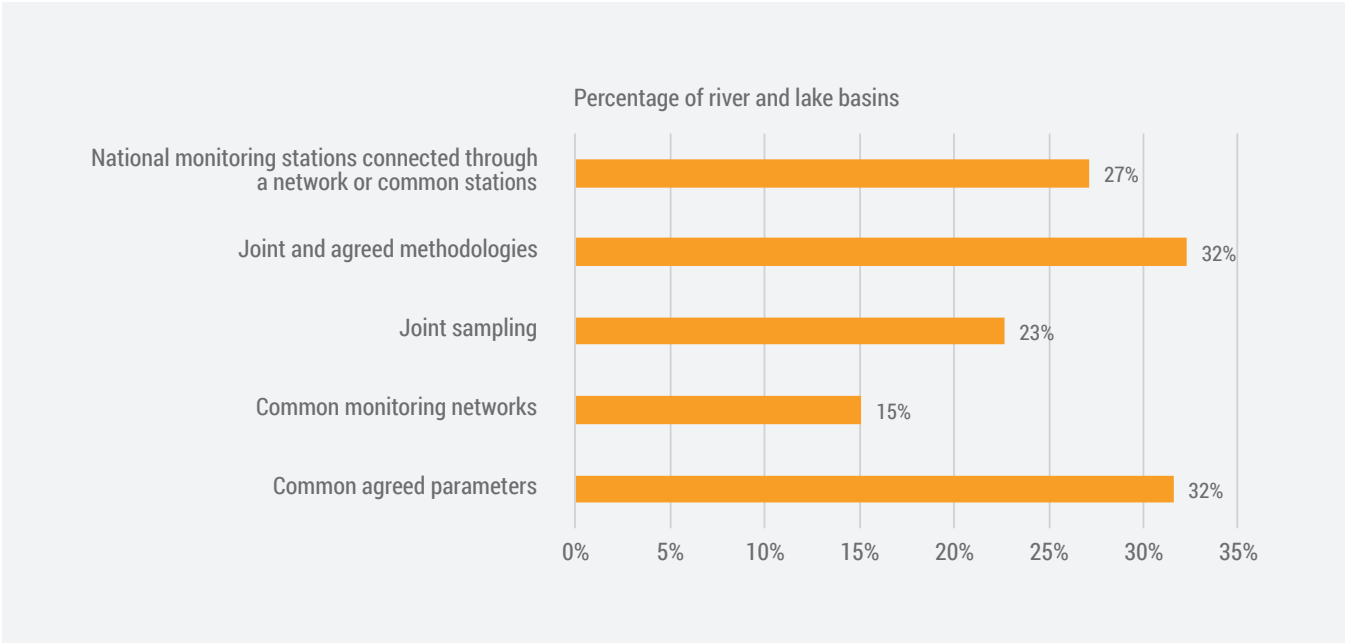


Figure II.11: What are the measures implemented to prevent or limit the transboundary impact of accidental pollution? (SDG indicator 6.5.2 reporting template, section II, question 10) (based on at least one country within a basin responding positively to the question).

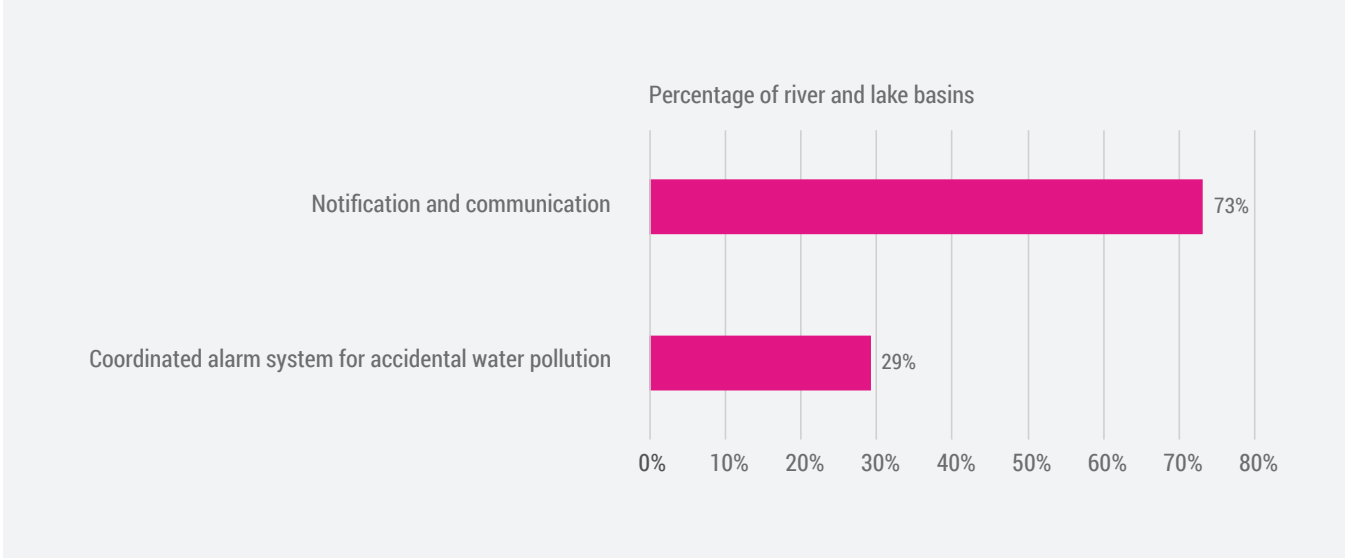


Figure II.12: What are the measures implemented to prevent or limit the transboundary impact of extreme weather events and climate change? (SDG indicator 6.5.2 reporting template, section II, question 11) (based on at least one country within a basin responding positively to the question).

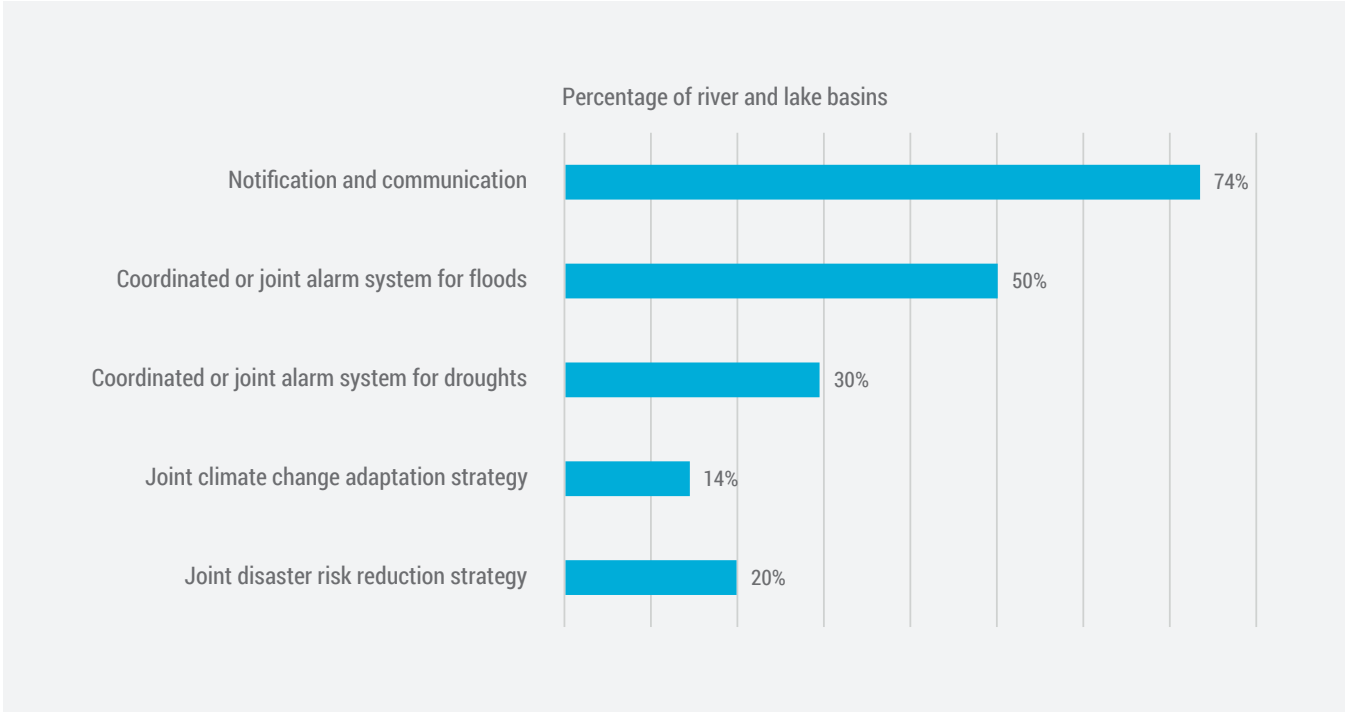


Figure II.13: If the public or relevant stakeholders are involved in transboundary water management, how are they involved? (SDG indicator 6.5.2 reporting template, section II, question 13) (based on at least one country within a basin responding positively to the question).

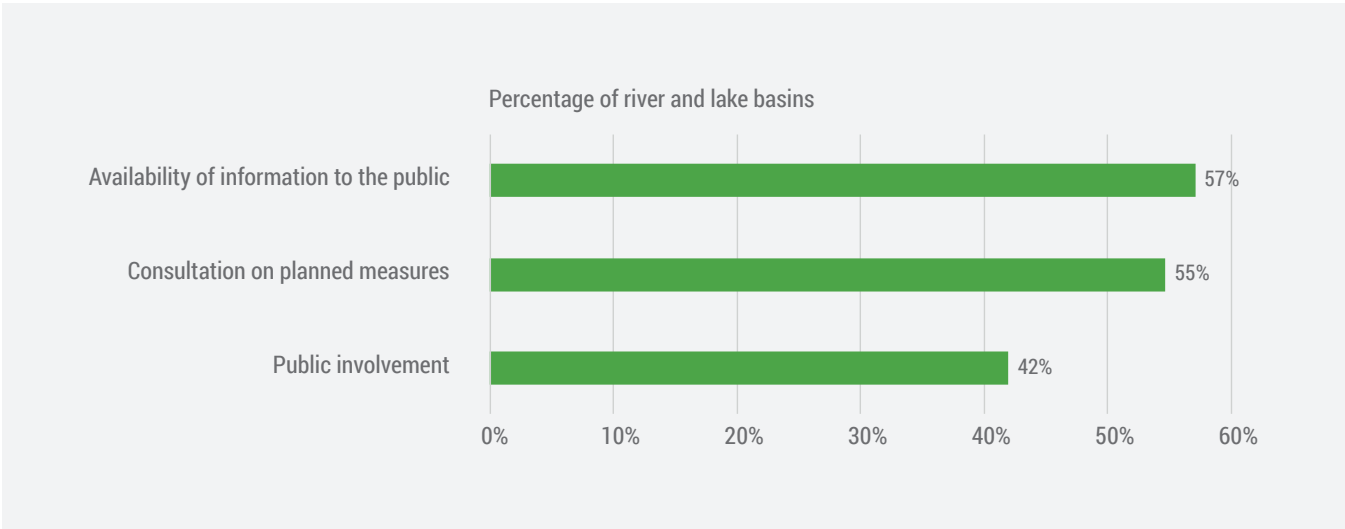
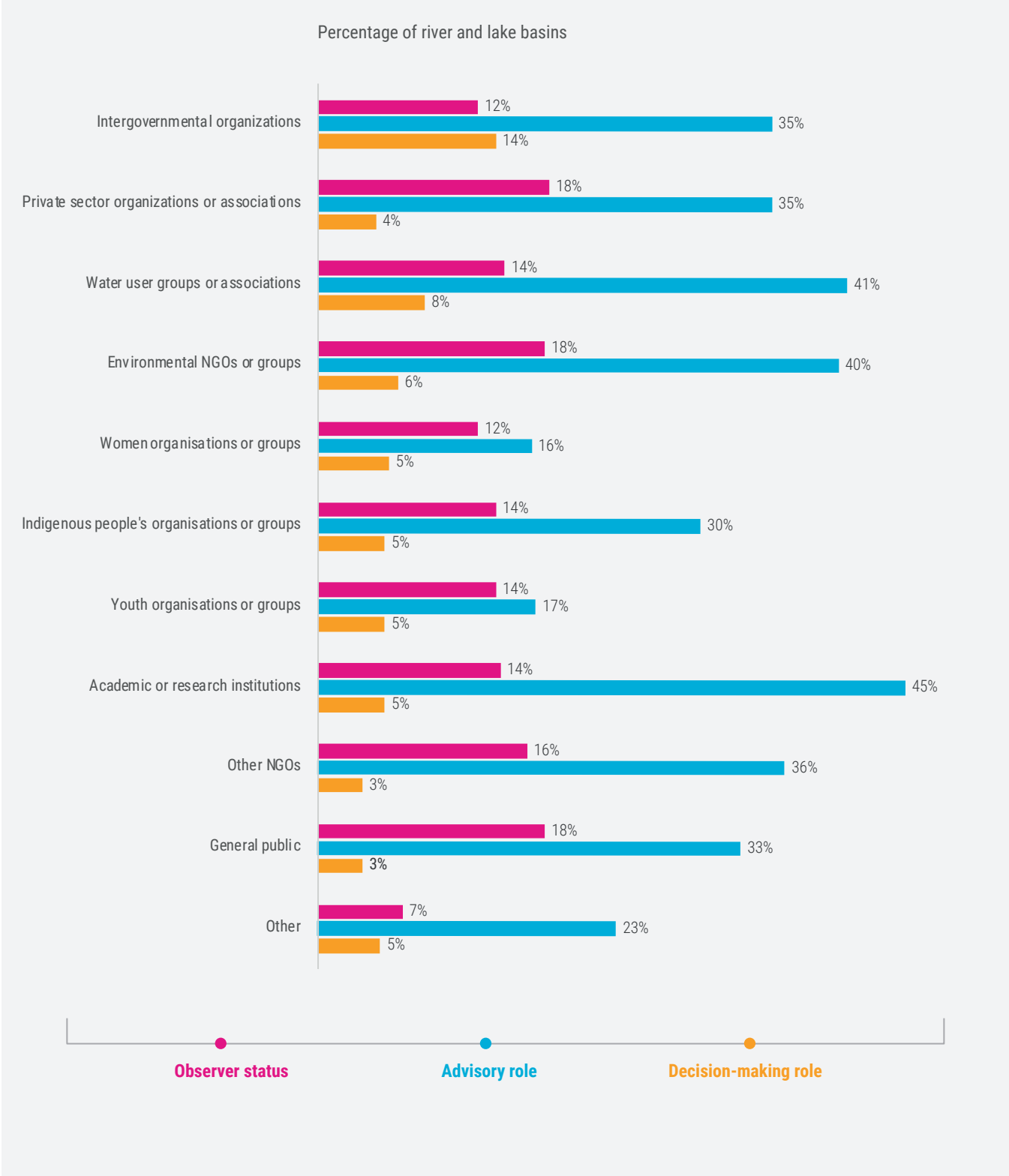


Figure II.14: If the public or relevant stakeholders are involved in transboundary water management, what role do they have? (SDG indicator 6.5.2 reporting template, section II, question 13) (based on at least one country within a basin responding positively to the question).



Annex III

Reporting on global SDG indicator 6.5.2

TEMPLATE of the third reporting exercise

CONTENT OF THE TEMPLATE

The template is divided into four parts:

- Section I – Calculation of SDG indicator 6.5.2
- Section II – Information on each transboundary basin or group of basins
- Section III – General information on transboundary water management at the national level
- Section IV – Final questions

Country name: [fill in]

I. Calculation of Sustainable Development Goal indicator 6.5.2

METHODOLOGY

1. Using the information gathered in section II, the information gathered in this section allows for the calculation of Sustainable Development Goal global indicator 6.5.2, which is defined as the proportion of transboundary basin area with an operational arrangement for water cooperation.
2. The step-by-step monitoring methodology for indicator 6.5.2, developed by UNECE and UNESCO in the framework of UN-Water, should be referred to for details on the necessary data, the definitions and the calculation.^a
3. The value of the indicator at the national level is derived by adding up the surface area in a country of those transboundary basins (river and lake basins and aquifers) that are covered by an operational arrangement and dividing the area obtained by the aggregate total area in a country of all transboundary basins (both river and lake basins, and aquifers).
4. Transboundary basins are basins of transboundary waters, that is, of any surface waters (notably rivers, lakes) or groundwaters which mark, cross or are located on boundaries between by two or more States. For the purpose of the calculation of this indicator, for a transboundary river or lake, the basin area is determined by the extent of its catchment. For groundwater, the area to be considered is the extent of the aquifer.

^a Available from the UN-Water website: www.unwater.org/our-work/integrated-monitoring-initiative-sdg-6/indicator-652-proportion-transboundary-basin-area (updated version "2020").

5. An “arrangement for water cooperation” is a bilateral or multilateral treaty, convention, agreement or other formal arrangement among riparian countries that provides a framework for cooperation on transboundary water management.
6. For an arrangement to be considered “operational” all the following criteria need to be in place in practice:
 - (a) There is a joint body, joint mechanism or commission (e.g., a river basin organization) for transboundary cooperation (criterion 1);
 - (b) There are regular (at least once per year) formal communications between riparian countries in form of meetings (either at the political or technical level) (criterion 2);
 - (c) Joint objectives, a common strategy, a joint or coordinated management plan, or an action plan have been agreed upon by the riparian countries (criterion 3);
 - (d) There is a regular (at least once per year) exchange of data and information (criterion 4).

CALCULATION OF INDICATOR 6.5.2

7. Please list in the tables below the transboundary basins (rivers and lakes and aquifers) in your country’s territory and provide the following information for each of them:
 - (a) The country/ies with which the basin is shared;
 - (b) The surface area of the basin (the catchment of rivers or lakes and the aquifer in the case of groundwater) within the territory of your country (in square kilometres (Km²));
 - (c) Whether a map and/or a geographical information system (GIS) shapefile of the basin has been provided;
 - (d) Whether there is an arrangement in force for the basin;
 - (e) The verification of each of the four criteria to assess operationality;
 - (f) The surface area of the basin within the territory of your country which is covered by a cooperation arrangement that is operational according to the above criteria.
8. In case an operational arrangement is in place only for a sub-basin or a portion of a basin, please list this sub-basin just after the transboundary basin it is part of. In case there is an operational arrangement for the whole basin, do not list sub-basins in the table below.

Table 1: Transboundary river or lake basins (please add rows as needed)

NAME OF TRANS-BOUNDARY RIVER OR LAKE BASIN/SUB-BASIN	IT IS A BASIN OR A SUB-BASIN? ^b	COUNTRIES SHARED WITH	SURFACE AREA OF THE BASIN/SUB-BASIN (IN KM ²) WITHIN THE TERRITORY OF THE COUNTRY	MAP AND/OR GIS SHAPEFILE PROVIDED (YES/NO)	COVERED BY AN ARRANGEMENT (ENTIRELY, PARTLY, NO) (SEE SECT. II QUESTION 1)	CRITERION 1 APPLIED (YES/NO) (SEE SECT. II QUESTION 3)	CRITERION 2 APPLIED (YES/NO) (SEE SECT. II QUESTION 3(I))	CRITERION 3 APPLIED (YES/NO) (SEE SECT. II QUESTION 4)	CRITERION 4 APPLIED (YES/NO) (SEE SECTIONS 6 (A) AND (B))	SURFACE AREA OF THE BASIN/SUB-BASIN (IN KM ²) COVERED BY AN OPERATIONAL ARRANGEMENT WITHIN THE TERRITORY OF THE COUNTRY
------------------------------------------------------	--------------------------------------------	-----------------------	-----------------------------------------------------------------------------------------------	--------------------------------------------	----------------------------------------------------------------------------	--------------------------------------------------------	-----------------------------------------------------------	--------------------------------------------------------	-----------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------

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(A)
Total surface area of transboundary basins/sub-basins of rivers and lakes covered by operational arrangements within the territory of the country (in km²)
(do not double count sub-basins)

(B)
Total surface area of transboundary basins of rivers and lakes within the territory of the country (in km²)
(do not double count sub-basins)

^b List sub-basins after the basin they belong to.

INDICATOR VALUE FOR THE COUNTRY

Surface waters:

Percentage of surface area of transboundary basins of rivers and lakes covered by an operational arrangement:

$$A/B \times 100 =$$

Aquifers:

Percentage of surface area of transboundary aquifers covered by an operational arrangement:

$$C/D \times 100 =$$

Sustainable Development Goal indicator 6.5.2:

Percentage of surface area of transboundary basins covered by an operational arrangement:

$$((A + C)/(B + D)) \times 100 =$$

Spatial information

If a map (or maps) of the transboundary surface water catchments and transboundary aquifers (i.e., “transboundary basins”) is available, please consider attaching them. Ideally, shapefiles of the basin and aquifer delineations that can be viewed in GIS should be sent.

Additional information

If the respondent has comments that clarify assumptions or interpretations made for the calculation, or the level of certainty of the spatial information, please write them here:

Does your country have transboundary agreements or arrangements for the protection and/or management of transboundary waters (i.e., rivers, lakes or groundwater), whether bilateral or multilateral?

Yes /No

If yes, list the bilateral and multilateral agreements or arrangements (listing for each of the countries concerned): [fill in]

II. Questions for each transboundary basin, sub-basin, part of a basin, or group of basins (river, lake or aquifer)

Please complete this second section for each transboundary basin (river or lake basin, or aquifer), sub-basin, part of a basin or a group of basins covered by the same agreement or arrangement where conditions are similar.¹ In some instances, you may provide information on both a basin and one or more of its sub-basins or parts thereof, for example, where you have agreements² or arrangements on both the basin and its sub-basin. You may coordinate your responses with other States with which your country shares transboundary waters, or even prepare a joint report. General information on transboundary water management at the national level should be provided in section III and not repeated here.

Please reproduce this whole section with its questions for each transboundary basin, sub-basin, part of a basin or group of basins for which you will provide a reply.

Name of the transboundary basin, sub-basin, part of a basin or group of basins: [fill in]

List countries shared with: [fill in]

Percentage of the basin, sub-basin, part of a basin or group of basins within your country's territory: [fill in]

1. Is there one or more transboundary (bilateral or multilateral) agreement(s) or arrangement(s) on this basin, sub-basin, part of a basin or group of basins?

One or more agreements or arrangements exist and are in force

Agreement or arrangement developed but not in force

Agreement or arrangement developed, but not in force for all riparians

Please insert the name of the agreement(s) or arrangement(s) [fill in]

Agreement or arrangement is under development

No agreement or arrangement

If there is no agreement or arrangement or it is not in force, please explain briefly why not and provide information on any plans to address the situation: [fill in]

If there is no agreement or arrangement and no joint body or mechanism for the transboundary basin, sub-basin, part of a basin or group of basins then jump to question 4; if there is no agreement or arrangement, but a joint body or mechanism then go to question 3.

Questions 2 and 3 to be completed for each bilateral or multilateral agreement or arrangement in force in the transboundary basin, sub-basin, part of a basin or group of basins.

¹ In principle, section II should be submitted for every transboundary basin, river, lake or aquifer, in the country, but States may decide to group basins in which their share is small or leave out basins in which their share is very minor, e.g., below 1 per cent.

² In section II, "agreement" covers all kinds of treaties, conventions and agreements ensuring cooperation in the field of transboundary waters. Section II can also be completed for other types of arrangements, such as memorandums of understanding.

2. (a) Does this agreement or arrangement specify the area subject to cooperation?

Yes /No

If yes, does it cover the entire basin or group of basins and all riparian States?

Yes /No

Additional explanations? [fill in]

Or, if the agreement or arrangement relates to a sub-basin, does it cover the entire sub-basin?

Yes /No

Additional explanations? [fill in]

Which States (including your own) are bound by the agreement or arrangement? (*Please list*): [fill in]

(b) If the agreement or arrangement relates to a river or lake basin or sub-basin, does it also cover aquifers?

Yes /No

If yes, please list the aquifers covered by the agreement or arrangement: [fill in]

(c) What is the sectoral scope of the agreement or arrangement?

All water uses

A single water use or sector

Several water uses or sectors

If one or several water uses or sectors, please list (check as appropriate):

Water uses or sectors

Industry

Agriculture

Transport (e.g., navigation)

Households

Energy: hydropower and other energy types

Fisheries

Tourism

Nature protection

Other (*please list*): [fill in]

(d) What topics or subjects of cooperation are included in the agreement or arrangement?

Procedural and institutional issues

- Dispute and conflict prevention and resolution
- Institutional cooperation (joint bodies)
- Consultation on planned measures
- Mutual assistance

Topics of cooperation

- Joint vision and management objectives
- Joint significant water management issues
- Navigation
- Human health
- Environmental protection (ecosystem)
- Water quality
- Water quantity or allocation
- Cooperation in addressing floods
- Cooperation in addressing droughts
- Climate change adaptation
- Promotion of equality and inclusion, e.g. gender equality, inclusion of indigenous people, youth or other minority groups

Monitoring and exchange

- Joint assessments
- Data collection and exchange
- Joint monitoring
- Maintenance of joint pollution inventories
- Elaboration of joint water quality objectives
- Common early warning and alarm procedures
- Exchange of experience between riparian States
- Exchange of information on planned measures

Joint planning and management

- Development of joint regulations on specific topics
- Development of international or joint river, lake or aquifer basin management or action plans
- Management of shared infrastructure

Development of shared infrastructure

Other (*please list*): [fill in]

(e) What are the main difficulties and challenges that your country faces with the agreement or arrangement and its implementation, if any?

Aligning implementation of agreement or arrangement with national laws, policies and programmes

Aligning implementation of agreement or arrangement with regional laws, policies and programmes

Lack of financial resources

Insufficient human capacity

Insufficient technical capacity

Tense diplomatic relations

Non-participation of certain riparian countries in the agreement

No significant difficulties

Other (*please describe*): [fill in]

(f) What are the main achievements in implementing the agreement or arrangement and what were the keys to achieving such success? [fill in]

(g) Please attach a copy of the agreement or arrangement or provide the web address of the document (*please attach document or insert web address, if applicable*): [fill in]

3. Is your country a member of any joint body or mechanism for this agreement or arrangement?

Yes /No

If yes, please provide its official name: [fill in]

If no, why not? (please explain): [fill in]

Where there is a joint body or mechanism

(a) Which kind of joint body or mechanism (*please tick one*)?

Plenipotentiaries

Bilateral commission

Basin or similar commission

Expert group meeting or meeting of national focal points

Other (*please describe*): [fill in]

(b) Does the joint body or mechanism cover the entire transboundary basin, sub-basin, part of a basin or group of basins?

Yes /No

(c) Which States (including your own) are members of the joint body or mechanism?

(Please list): [fill in]

(d) Are there any riparian States that are not members of the joint body or mechanism?

(Please list): [fill in]

(e) If not all riparian States are members of the joint body or mechanism how does the joint body or mechanism cooperate with them?

No cooperation

They have observer status

Other *(please describe): [fill in]*

(f) Does the joint body or mechanism have any of the following features *(please tick the ones applicable)*?

A secretariat

If the secretariat is a permanent one, is it a joint secretariat or does each country host its own secretariat?

(Please describe): [fill in]

A subsidiary body or bodies

Please list (e.g., working groups on specific topics): [fill in]

Other features *(please list): [fill in]*

If sex-disaggregated data is collected on the membership and/or staff of the joint body or mechanism, please provide additional information here, e.g. the type of data collected, the percentage split of men and women within the joint body or mechanism, requirements related to gender-balance within the regulations of the joint body or mechanism, and/or links to relevant documents: [fill in]

(g) What are the tasks and activities of this joint body or mechanism?³

Identification of pollution sources

Data collection and exchange

Joint monitoring

³ This may include tasks according to the agreement or tasks added by the joint body, or its subsidiaries. Both tasks which joint bodies coordinate and tasks which they implement should be included.

- Maintenance of joint pollution inventories
- Setting emission limits
- Elaboration of joint water quality objectives
- Management and prevention of flood or drought risks
- Preparedness for extreme events, e.g., common early warning and alarm procedures
- Surveillance and early warning of water-related disease
- Water allocation and/or flow regulation
- Policy development
- Control of implementation
- Exchange of experience between riparian States
- Exchange of information on existing and planned uses of water and related installations
- Settling of differences and conflicts
- Consultations on planned measures
- Exchange of information on best available technology
- Participation in transboundary EIA
- Development of river, lake or aquifer basin management or action plans
- Management of shared infrastructure
- Addressing hydromorphological alterations
- Climate change adaptation
- Joint communication strategy
- Basin-wide or joint public participation and consultation of, for example, basin management plans
- Joint resources to support transboundary cooperation
- Capacity-building
- Gender-related aspects of water management
- Any other tasks (*please list*): [fill in]

(h) What are the main difficulties and challenges that your country faces with the operation of the joint body or mechanism, if any?

- Governance issues
- Please describe, if any:* [fill in]
- Unexpected planning delays
- Please describe, if any:* [fill in]
- Lack of resources

Please describe, if true: [fill in]

Lack of mechanism for implementing measures

Please describe, if true: [fill in]

Lack of effective measures

Please describe, if true: [fill in]

Unexpected extreme events

Please describe, if any: [fill in]

Lack of information and reliable forecasts

Please describe, if any: [fill in]

Others (please list and describe, as appropriate): [fill in]

(i) Does the joint body or mechanism, or its subsidiary bodies meet regularly?

Yes /No

If yes, how frequently does it meet?

More than once per year

Once per year

Less than once per year

(j) What are the main achievements with regard to the joint body or mechanism? [fill in]

(k) Did the joint body or mechanism ever invite a non-riparian coastal State to cooperate?

Yes /No

If yes, please give details. If no, why not, e.g. are the relevant coastal States also riparian States and therefore already members of the joint body or mechanism? [fill in]

4. Have joint objectives, a common strategy, a joint or coordinated management plan or action plan been agreed for the basin, sub-basin, part of a basin or group of basins?

Yes /No

If yes, please provide further details: [fill in]

5. How is the transboundary basin, sub-basin, part of a basins or group of basins protected, including the protection of ecosystems, in the context of sustainable and rational water use?

- Regulation of urbanization, deforestation, and sand and gravel extraction.
- Environmental flow norms, including consideration of levels and seasonality
- Water quality protection, e.g. nitrates, pesticides, faecal coliforms, heavy metals
- Water-related species and habitats protection
- Other measures (*please describe*): [fill in]

6. (a) Does your country regularly exchange information and data with other riparian States in the basin, sub-basin, part of a basin or group of basins?

Yes /No

(b) If yes, how often:

- More than once per year
- Once per year
- Less than once per year

(c) Please describe how information is exchanged (e.g. in connection with meetings of joint bodies): [fill in]

(d) If yes, on what subjects are information and data exchanged?

- Environmental conditions
- Research activities and application of best available techniques
- Emission monitoring data
- Planned measures taken to prevent, control or reduce transboundary impacts
- Point source pollution sources
- Diffuse pollution sources
- Existing hydromorphological alterations (dams, etc.)
- Flows or water levels (including groundwater levels)
- Water abstractions
- Climatological information
- Future planned measures with transboundary impacts, such as infrastructure development

Sex-disaggregated data or other gender-related information

Other subjects (*please list*): [fill in]

Other comments, e.g. spatial coverage of data and information exchange: [fill in]

(e) Is there a shared database or information platform?

Yes /No

(f) Is the database publicly available?

Yes /No

If yes, please provide the web address: [fill in]

(g) What are the main difficulties and challenges to data exchange, if applicable?

Frequency of exchanges

Timing of exchanges

Comparability of data and information

Limited spatial coverage

Inadequate resources (technical and/or financial)

Other (please describe): [fill in]

Additional comments: [fill in]

(h) What are the main benefits of data exchange on the basin, sub-basin, part of a basin or group of basins? (*please describe*): [fill in]

7. Do the riparian States carry out joint monitoring in the transboundary basin, sub-basin, part of a basin or group of basins?

Yes /No

(a) If yes, what does the joint monitoring cover?

	Hydrological	Ecological	Chemical
Border surface waters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surface waters in the entire basin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surface waters on the main watercourse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surface waters in part of the basin <i>please describe</i> [fill in]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transboundary aquifer(s) (connected or unconnected)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aquifer(s) in the territory of one riparian hydraulically connected to a transboundary river or lake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(b) If joint monitoring is carried out, how is this done?

- National monitoring stations connected through a network or common stations
 - Joint and agreed methodologies
 - Joint sampling
 - Common monitoring network
 - Common agreed parameters
- Please briefly describe how joint monitoring is carried out:* [fill in]

(c) Please describe the main achievements regarding joint monitoring, if any: [fill in]

(d) Please describe any difficulties experienced with joint monitoring: [fill in]

8. Do the riparian States carry out joint assessment of the transboundary basin, sub-basin, part of a basin or group of basins?

Yes /No

If yes, please provide the date of the last or only assessment, the frequency and scope (e.g., surface waters or groundwaters only, pollution sources, etc.) of the assessment, and assessment methodology applied: [fill in]

9. Have the riparian States agreed to use joint water quality standards?

Yes /No

If yes, what standards have been applied, e.g. international or regional standards (please specify which), or have national standards of the riparian States been applied? [fill in]

10. What are the measures implemented to prevent or limit the transboundary impact of accidental pollution?

Notification and communication

Coordinated or joint early warning or alarm system for accidental water pollution

Other (*please list*): [fill in]

No measures

If not, why not? What difficulties does your country face in putting in place such measures?: [fill in]

11. What are the measures implemented to prevent or limit the transboundary impact of extreme weather events and climate change?

Notification and communication

Coordinated or joint alarm system for floods

Coordinated or joint alarm system for droughts

Joint climate change adaptation strategy

Joint disaster risk reduction strategy

Other (*please list*): [fill in]

No measures

If not, why not? What difficulties does your country face in putting in place such measures?: [fill in]

12. Are procedures in place for mutual assistance in case of a critical situation?

Yes /No

If yes, please provide a brief summary: [fill in]

13. Are the public or relevant stakeholders involved in transboundary water management in the basin, sub-basin, part of a basin or group of basins?

Yes /No

If yes, how (please tick all applicable)?

Availability of information to the public

Consultation on planned measures or river basin management plans⁴

Public involvement

⁴ Or, where applicable, aquifer management plans.

Involvement in the joint body or mechanism (*please tick all applicable*):

	Observer status	Advisory role	Decision-making role
Intergovernmental organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private sector organisations or associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water user groups or associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental non-governmental organisations or groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Women organisations or groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indigenous peoples' organisations or groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Youth organisations or groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Academic or research institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other non-governmental organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
General public	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

please describe: [fill in]

Other (*please specify in case there are other types of participation*): [fill in]

Please remember to complete section II for each of the transboundary basins, sub-basin, part of a basin or group of basins. Please also remember to attach copies of agreements or arrangements, if any.

III. Water management at the national level

In this section, you are requested to provide general information on water management at the national level as it relates to transboundary waters. Information on specific transboundary basins, sub-basins, part of basins and groups of basins, should be presented in section II and not repeated here.

1. (a) Does your country's national legislation, policies, action plans and strategies refer to measures to prevent, control and reduce any transboundary impact?

Yes /No

If yes, please briefly describe the main national laws, policies, action plans and strategies [fill in]

(b) Does your country's legislation provide for the following principles?

Precautionary principle Yes /No

Polluter pays principle Yes /No

Sustainable development Yes /No

User pays principle Yes /No

If yes, please briefly describe how these principles are implemented at the national level: [fill in]

(c) Does your country have a national licensing or permitting system for wastewater discharges and other point source pollution? (e.g., in industry, mining, energy, municipal, wastewater management or other sectors)?

Yes /No

If yes, for which sectors?

Industry

Mining

Energy

Municipal

Livestock raising

Aquaculture

Other (please list): [fill in]

Please briefly describe the licensing or permitting system: [fill in]

Does the system provide for setting emission limits based on best available technology?

Yes /No

If yes, for which sectors? (please list): [fill in]

If not, please explain why not (giving the most important reasons) or provide information if there are plans to introduce a licensing or permitting system: [fill in]

(d) Are the authorized discharges monitored and controlled?

Yes /No

If yes, how? (Please tick the ones applicable):

Monitoring of discharges

Monitoring of physical and chemical impacts on water

Monitoring of ecological impacts on water

Conditions on permits

Inspectorate

Other means (*please list*): [fill in]

If your country does not have a discharge monitoring system, please explain why not or provide information if there are plans to introduce a discharge monitoring system: [fill in]

(e) What are the main measures which your country takes to reduce water pollution on transboundary waters from diffuse sources (e.g., from agriculture, transport, forestry or aquaculture)? The measures listed below relate to agriculture, but other sectors may be more significant. Please be sure to include these under “others”:

Legislative measures

Norm for uses of fertilizers

Norms for uses of manure

Permitting system

Bans on or norms for use of pesticides

Others (*please list*): [fill in]

Economic and financial measures

Monetary incentives

Environmental taxes (such as fertilizer taxes)

Others (*please list*): [fill in]

Agricultural extension services

Technical measures

Source control measures

Crop rotation

Tillage control

Winter cover crops

Others (*please list*): [fill in]

Other measures

- Buffer/filter strips
- Wetland reconstruction
- Sedimentation traps
- Chemical measures
- Others (*please list*): [fill in]
- Other types of measures**
- If yes, please list:* [fill in]

(f) What are the main measures which your country takes to enhance water resources allocation and use efficiency?

Please tick as appropriate (not all might be relevant)

- A regulatory system regarding water abstraction
- Monitoring and control of abstractions
- Water rights are defined
- Water allocation priorities are listed
- Water-saving technologies
- Advanced irrigation techniques
- Demand management activities
- Stakeholder consultations are held, including with civil society representatives
- Other means (please list)

(g) Does your country apply the ecosystems approach?

Yes /No

If yes, please describe how: [fill in]

(h) Does your country take specific measures to prevent the pollution of groundwaters?

Yes /No

If yes, please briefly describe the most important measures: [fill in]

2. Do your national laws require transboundary environmental impact assessment (EIA)?

Yes /No

If yes, please briefly describe the legislative basis, and any related implementing procedures. [fill in]

If not, do other measures provide for transboundary EIA? [fill in]

IV. Final questions

1. What are the main challenges your country faces in cooperating on transboundary waters?

- Differences between national administrative and legal frameworks
- Lack of relevant data and information
- Difficulties in data and information exchange
- Sectoral fragmentation at the national level
- Language barrier
- Resource constraints
- Environmental pressures, e.g. extreme events
- Sovereignty concerns
- Please list other challenges and/or provide further details: [fill in]

2. What have been the main achievements in cooperating on transboundary waters?

- Improved water management
- Enhanced regional integration, i.e. beyond water
- Adoption of cooperative arrangements
- Adoption of joint plans and programmes
- Long-lasting and sustained cooperation
- Financial support for joint activities
- Stronger political will for transboundary water cooperation
- Better knowledge and understanding
- Dispute avoidance
- Stakeholder engagement
- Please list other achievements, keys to achieving success, and/or provide concrete examples: [fill in]

3. Please indicate which institutions were consulted during the completion of the questionnaire

- Joint body or mechanism
- Other riparian or aquifer countries
- National water management authority
- Environment agency/ authority
- Basin authority (national)

- Local or provincial government
- Geological survey (national)
- Non-water specific ministries, e.g. foreign affairs, finance, forestry and energy
- Women organisations or groups
- Indigenous peoples' organisations or groups
- Youth organisations or groups
- Civil society organizations
- Water user associations
- Private sector
- Other (please list): [fill in]
- Please briefly describe the process by which the questionnaire was completed: [fill in]

4. If you have any other comments please add them here (*insert comments*): [fill in]

5. Details of the person(s) who filled out the questionnaire (*please insert*):

Name: [fill in]

Gender: Female / Male / Other / Prefer not to answer

Contact details: [fill in]

If different to the above, details of the person(s) who signed the questionnaire:

Name: [fill in]

Gender: Female / Male / Other / Prefer not to answer

Contact details: [fill in]

Date: [fill in] Signature: [fill in]

Thank you very much for taking the time to complete this report

Learn more about progress towards SDG 6

Sustainable Development Goal (SDG) 6 expands the Millennium Development Goal (MDG) focus on drinking water and basic sanitation to include the more holistic management of water, wastewater and ecosystem resources, acknowledging the importance of an enabling environment. Bringing these aspects together is an initial step towards addressing sector fragmentation and enabling coherent and sustainable management. It is also a major step towards a sustainable water future.

Monitoring progress towards SDG 6 is key to achieving this SDG. High-quality data help policymakers and decision makers at all levels of government to identify challenges and opportunities, to set priorities for more effective and efficient implementation, to communicate progress and ensure accountability, and to generate political, public and private sector support for further investment.

The 2030 Agenda for Sustainable Development specifies that global follow-up and review shall primarily be based on national official data sources. The data are compiled and validated by the United Nations custodian agencies, who contact country focal points every two to three years with requests for new data, while also providing capacity-building support. The last global “data drive” took place in 2023, resulting in status updates on seven of the global indicators for SDG 6 (please see below). These reports provide a detailed analysis of current status, historical progress and acceleration needs regarding the SDG 6 targets.

To enable a comprehensive assessment and analysis of overall progress towards SDG 6, it is essential to bring together data on all the SDG 6 global indicators and other key social, economic and environmental parameters. This is exactly what the SDG 6 Data Portal does, enabling global, regional and national actors in various sectors to see the bigger picture, thus helping them make decisions that contribute to all SDGs. UN-Water also publishes synthesized reporting on overall progress towards SDG 6 on a regular basis.



Summary Brief: Mid-term status of SDG 6 global indicators and acceleration needs

Based on latest available data on all SDG 6 global indicators. Published by UN-Water through the UN-Water Integrated Monitoring Initiative for SDG 6.



Progress on household drinking water, sanitation and hygiene 2000–2022: special focus on gender

Based on latest available data on SDG indicators 6.1.1 and 6.2.1. Published by World Health Organization (WHO) and United Nations Children’s Fund (UNICEF).

<https://www.unwater.org/publications/who/unicef-joint-monitoring-program-update-report-2023>



Progress on the proportion of domestic and industrial wastewater flows safely treated – Mid-term status of SDG Indicator 6.3.1 and acceleration needs, with a special focus on climate change, wastewater reuse and health

Based on latest available data on SDG indicator 6.3.1. Published by WHO and United Nations Human Settlements Programme (UN-Habitat) on behalf of UN-Water.



Progress on Ambient Water Quality: Mid-term status of SDG Indicator 6.3.2 and acceleration needs, with a special focus on health

Based on latest available data on SDG indicator 6.3.2. Published by United Nations Environment Programme (UNEP) on behalf of UN-Water.



Progress on Change in Water-Use Efficiency. Mid-term status of SDG Indicator 6.4.1 and acceleration needs, with special focus on food security and climate change

Based on latest available data on SDG indicator 6.4.1. Published by Food and Agriculture Organization of the United Nations (FAO) on behalf of UN-Water.



Progress on the Level of Water Stress. Mid-term status of the SDG Indicator 6.4.2 and acceleration needs, with special focus on food security and climate change

Based on latest available data on SDG indicator 6.4.2. Published by FAO on behalf of UN-Water.



Progress on implementation of Integrated Water Resources Management. Mid-term status of SDG indicator 6.5.1 and acceleration needs, with a special focus on climate change

Based on latest available data on SDG indicator 6.5.1. Published by UNEP on behalf of UN-Water.



Progress on transboundary water cooperation. Mid-term status of SDG Indicator 6.5.2, with a special focus on climate change – 2024

Based on latest available data on SDG indicator 6.5.2. Published by United Nations Economic Commission for Europe (UNECE) and United Nations Educational, Scientific and Cultural Organization (UNESCO) on behalf of UN-Water.



Progress on Water-related Ecosystems. Mid-term status of SDG Indicator 6.6.1 and acceleration needs, with a special focus on Biodiversity

Based on latest available data on SDG indicator 6.6.1. Published by UNEP on behalf of UN-Water.



Strong systems and sound investments: evidence on and key insights into accelerating progress on sanitation, drinking-water and hygiene.

The UN-Water global analysis and assessment of sanitation and drinking-water (GLAAS) 2022 report

<https://www.unwater.org/publications/un-water-glaas-2022-strong-systems-and-sound-investments-evidence-and-key-insights>.



Based on latest available data on SDG indicators 6.a.1 and 6.b.1. Published by WHO through the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) on behalf of UN-Water.

UN-Water reports and other relevant publications

UN-Water coordinates the efforts of United Nations entities and international organizations working on water and sanitation issues. UN-Water publications draw on the experience and expertise of UN-Water's Members and Partners.

United Nations System-Wide Strategy for Water and Sanitation

The United Nations system-wide strategy for water provides a system-wide approach for the United Nations to work collaboratively on water and sanitation. In September 2023, Member States adopted General Assembly resolution 77/334, which requested the Secretary-General to present a United Nations system-wide water and sanitation strategy in consultation with Member States before the end of the seventy-eighth session. The strategy has been developed by UN-Water under the leadership of the UN-Water Chair, as requested by the Secretary-General, and will be launched in July 2024.

Blueprint for Acceleration: Sustainable Development Goal 6 Synthesis Report on Water and Sanitation 2023

The report, written by the UN-Water family of Members and Partners, is a concise guide to delivering concrete results – offering actionable policy recommendations directed towards senior decision-makers in Member States, other stakeholders, and the United Nations System to get the world on track to achieve SDG 6 by 2030. It was released ahead of the discussions of Member States and relevant stakeholders at the 2023 High-level Political Forum on Sustainable Development (HLPF), which includes a Special Event focused on SDG 6 and the Water Action Agenda.

United Nations World Water Development Report

The United Nations World Water Development Report is UN-Water's flagship report on water and sanitation issues, focusing on a different theme each year. The report is published by UNESCO on behalf of UN-Water, and its production is coordinated by the UNESCO World Water Assessment Programme.

SDG 6 Progress Update – 9 reports, by SDG 6 global indicator

This series of reports provides an in-depth update and analysis of progress towards the different SDG 6 targets and identifies priority areas for acceleration. *Progress on household drinking water, sanitation and hygiene, Progress on wastewater treatment, Progress on ambient water quality, Progress on water-use efficiency, Progress on level of water stress, Progress on integrated water resources management, Progress on transboundary water cooperation, Progress on water-related ecosystems and Progress on international cooperation and local participation.* The reports, produced by the responsible custodian agencies, present the latest available country, region and global data on the SDG 6 global indicators, and are published every two to three years.

Progress reports of the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP)

The JMP is affiliated with UN-Water and is responsible for global monitoring of progress towards SDG 6 targets for universal access to safe and affordable drinking-water and adequate and equitable sanitation and hygiene services. Every 2 years, the JMP releases updated estimates and progress reports for WASH in households (as part of the progress reporting on SDG 6, see above), schools and health care facilities.

UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS)

The GLAAS report is produced by WHO on behalf of UN-Water. It provides a global update on the policy frameworks, institutional arrangements, human resource base, and international and national finance streams in support of water and sanitation. It is a substantive input into the activities of Sanitation and Water for All as well as the progress reporting on SDG 6. The next report will be published in 2025.

UN-Water Country Acceleration Case Studies

To accelerate the achievement of SDG 6 targets as part of the SDG 6 Global Acceleration Framework, UN-Water releases SDG 6 Country Acceleration Case Studies to explore countries' pathways to achieving accelerated progress on SDG 6 at the national level. Since 2022, six case studies have been released from Costa Rica, Pakistan, Senegal, Brazil, Ghana and Singapore. Three new are planned to be released in July 2024 from Cambodia, Czechia and Jordan.

Policy and Analytical Briefs

UN-Water's Policy Briefs provide short and informative policy guidance on the most pressing freshwater-related issues that draw upon the combined expertise of the United Nations system. Analytical Briefs provide an analysis of emerging issues and may serve as basis for further research, discussion and future policy guidance.

UN-Water Planned Publications

- **UN-Water Policy Brief on Transboundary operation – update**

More information: <https://www.unwater.org/unwater-publications/>

How is the world doing on Sustainable Development Goal 6?
View, analyse and download global, regional and
national water and sanitation data

<http://www.sdg6data.org/>

Most of the world's water resources are shared between countries. These transboundary waters create social, economic, environmental and political interdependencies that make cooperation a precondition to sustainable development and peace. SDG indicator 6.5.2 measures cooperation on both transboundary river and lake basins, and transboundary aquifers. In this report, you can learn more about the progress of transboundary water cooperation.

This report is part of a series that tracks progress towards the various targets set out in SDG 6 using the SDG global indicators. To learn more about water and sanitation in the 2030 Agenda for Sustainable Development, and the Integrated Monitoring Initiative for SDG 6, visit the website: www.sdg6monitoring.org.

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