



United Nations
Economic Commission for Africa



PROGRESS ON TRANSBOUNDARY WATER COOPERATION IN AFRICA

Accelerating progress on transboundary water
co-operation to achieve SDG Indicator 6.5.2



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To order copies of *progress on transboundary water co-operation in Africa* , please contact:

Publications Section
Economic Commission for Africa
P.O. Box 3001
Addis Ababa, Ethiopia
Tel: +251 11 544-9900
Fax: +251 11 551-4416
E-mail: eca-info@un.org
Web: www.uneca.org

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First printing March | 2023

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Designed and printed in Addis Ababa, Ethiopia by the ECA Printing and Publishing Unit. ISO 14001:2015 certified.
Printed on chlorine free paper



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List of acronywms

ANEW	Africa Civil Society Networks on Water & Sanitation
EAC	East African Community
ECCAS	Economic Community of Central African States
ECOWAS	Economic Commission of West African States
FAO	Food and Agriculture Organization
GWP	Global Water Partnership
IWRM	Integrated Water Resource Management
MENA	Middle East and North Africa
OKACOM	Okavango River Commission
OMVG	Organisation pour la Mise en Valeur du Fleuve Gambie
OMVS	Organisation pour la Mise en Valeur du Fleuve Sénégal
OSS	Observatory for the Sahara and Sahel
RBO	River Basin Organizations
REC	Regional Economic Community
SADC	Southern Africa Development Community
SDG	Sustainable Development Goal
SSA	Sub Saharan Africa
AMU	Arab Maghreb Union
UNECA	United Nations Economic Commission for Africa
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
WMO	World Meteorological Organization
ZAMCOM	Zambezi Watercourse Commission

Acknowledgement

I would like to acknowledge with thanks all the staff at the River Basin Organizations in Senegal (OMVG and OMVS), Zimbabwe (ZAMCOM) and Botswana (OKACOM) especially the late Michael Mutale of ZAMCOM and Phera Ramoeli of OKACOM. On Aquifers, my gratitude goes to Mr Dodo of OSS and Mr Frigui of the Directorate General for Water Resources in Tunisia for the welcome and facilitating the consultations. I am also grateful for the support received from the Ministries of Water in Senegal, Zimbabwe, Botswana and Tunisia.

For guidance and review of the various drafts I am grateful for the support of Mr Frank Rutabingwa of UNECA and Ms Sonja Koppel and her very able team at UNECE. Finally, I thank Mrs. Barbara Zida for her painstaking editing of the final draft.

Stephen Max Donkor, Senior Consultant.

Foreword

UNECA

The Technology, Climate Change and Natural Resources Management Division (TCND) of the United Nations Economic Commission for Africa (ECA) provides functional support to UN-Water and the African Union Commission to enable Member States to monitor their progress toward SDG Target 6.5 by 2030, implement integrated water resources management at all levels, including through transboundary co-operation as appropriate. The Water Convention (hosted by the UN Economic Commission for Europe-ECE) aims at protecting and ensuring the quantity, quality and sustainable use of transboundary water resources by facilitating and promoting co-operation to secure peace and stability, economic development and growth, the protection of natural resources and sustainable development.

In 2020, the second reporting exercise on SDG indicator 6.5.2 (Proportion of transboundary basin area with an operational arrangement for water co-operation) was carried out by the co-custodian agencies, UNECE and UNESCO. The '2021 Status report on the progress on Transboundary Water co-operation in Africa known as the Regional report on SDG Indicator 6.5.2' will provide an analytical perspective of the results to reflect on how to accelerate the achievement of Target 6.5 by 2030, based on the second reporting exercise on SDG indicator 6.5.2 carried out in 2020.

This African Regional Report provides an analysis of progress in the reporting process and the status of transboundary water co-operation for both surface water and aquifer resources in Africa. It also provides an analysis of gaps and recommendations for improving transboundary water co-operation to meet the SDG target 6.5.

1. Introduction and background

1.1. Why is transboundary water co-operation important?

Africa has a combined¹ population of about 1.2 billion people, which represents about 17.1% of the global population in 2019. The population of Africa is expected to almost double by 2050. Renewable water resources for the whole of Africa² amount to about 3 930 km³, or less than 9% of global renewable resources. Africa's water resources are unevenly distributed, with the six most water-rich countries in Central and Western Africa holding 54% of the continent's total resources and the water-poorest twenty-seven countries holding only 7%. Availability of water in an area mainly depends on two interlinked factors: rainfall (often highly seasonal) and internal renewable resources. Rainfall replenishes the renewable resources, and if the rains fail, the groundwater stocks and reservoirs are not replenished.

Kofi Annan on Africa's green and blue revolution

If we want to accelerate Africa's transformation, then we have to significantly boost our agriculture and fisheries, which together provide livelihoods for roughly two-thirds of all Africans. [...] The time has come to unleash Africa's green and blue revolutions. These revolutions will transform the face of our continent for the better. Beyond the valuable jobs and opportunities, they will provide, such revolutions will generate a much-needed improvement to Africa's food and nutrition security."

Source: Africa Progress Panel (2014, p. 11).

Africa has over 50 significant water basins spanning nearly all the countries. For 14 of these, practically their entire national territories fall within shared river basins. There are also large inland water bodies such as lakes Victoria, Chad and the Kariba. In Sub-Saharan Africa (SSA), international river basins constitute the principal source of water resources. About one-third of the world's international river basins are found in SSA. Thirty-five countries in the region share the 17 major river basins. Furthermore, international rivers also include 11 river basins covering between 30,000 and 100,000 sq. km.

There are a number of important considerations associated with these international rivers that have implications for long-term management of water resources. The distribution of water in major parts of Africa is characterized by complex patterns and striking paradoxes which exhibit an abundance of rainfall over the equatorial zone contrasted by extensive and extreme aridity of the Sahara Desert in the north and the Kalahari Desert in the south. About 50% of the total surface water resources of the continent are in one single river basin i.e., the Congo basin and 75% of total water resources are concentrated in eight major river basins i.e., the Congo, Niger, Ogoague (Gabon), Zambezi, Nile, Sanga, Chari-Logone and Volta.

Rivers are the main sources of fresh water in the region. However, several of the rivers and lakes in Africa are undergoing a marked reduction in flow rates with Lake Chad facing the most serious problem. Groundwater constitutes about 20% of the total water resources of the continent and provides limited supplies for drinking and for small-scale irrigation. However, in some countries it is the main source of water supply.

¹ <http://www.un.org/en/development/desa/population/publications/database/index.asp>

² http://www.fao.org/nr/water/aquastat/countries_regions/profile_segments/africa-WR_eng.stm

Generally, the major water-consumptive uses in Africa are for agricultural activities and human settlements. However, there has been an increasing use of water in the industrial sectors which is affecting water quality. One of the reasons why water resources development in Africa has not progressed well is the low priority accorded to the sector at the policy level. In addition, even where water for development activities have been undertaken, a comprehensive multi-purpose integrated development approach was not adopted. Consequently, disjointed planning which did not take into account complementary activities has given cause to past failures. Emphasis was often given to hydropower development at the expense of other water development sectors. In fact, as early as in 1988, the inter-regional meeting on river and lake basin development noted that river basin planning has invariably been the prerogative of most energy and irrigation agencies and as such did not encompass other aspects of economic and social dimensions to realize sustainability. Africa's future development orientation should be based on an integrated and multi-purpose strategy. This calls for the adoption of a comprehensive approach with a balance mix of policy measures including water management, as well as legal and institutional frameworks to serve the sectoral and national development objectives.

Rapid urbanization adds additional stress on the relationship between available water quantity and water quality. Cities are faced with mounting cost of water shortages, water treatment, well deepening and development of new sources. They not only have limited means to expand the supply of water and maintain its quality but also need to expand water supply services to meet the ever-increasing needs of industry and to support the growing population. Consequently, there is an alarming widening of the gap between water demand and supply and between consumption and potentially available safe water resources.

All the considerations of Africa's transboundary rivers, lakes and aquifers with impact on long term water resources management are further stressed by climate change. Africa contributes very little to global warming which is the root cause of climate change. However, it is disproportionately impacted by the effects of climate change which accentuates already existing high degrees of climate variability resulting in extreme events manifested as more frequent and severe droughts and intense flooding. With less capacity (technical and financial) to cope, the continent is relatively more vulnerable and the damage to livelihoods more acute. For Africa climate change demands more capacity to adapt, and adaptation is centred on extremes of water occurrence, either too little or too much in an unpredictable sequence.

1.2. Regional co-operation on transboundary basins

Out of 63 transboundary river/lake basins in the region, only the 14 major river/lake basins have some kind of co-operative legal and institutional arrangement having certain degree of responsibility for development of common resources. Even the existing basin institutions have been constrained by some or all of the following:

- a. Absence of clearly designated and mandated agency to act on behalf of the riparian countries;
- b. Technical and managerial weaknesses at the level of the secretariat of the basin authorities;
- c. Inadequate funding by member States of the basin authorities;
- d. Inability to mobilize external funds for pre-investment studies and for investment and;
- e. Politicization of the selection of key personnel.

The above being the underlying problems of existing institutions, the most serious problem of the other 49 basins is the total absence of common and formal co-operative mechanisms on which the development of transboundary water resources for socio-economic development of riparian countries on an integrated and equitable basis could be addressed. As most countries of the region are riparian to one or more river basins and since about 64 percent of the area in Africa falls within transboundary basins, the problem pervades a large portion of the continent and remains a serious impediment to water resources development. This is illustrated by the inter-state conflict between upstream and lower riparian states of the Nile River Basin.

1.3. Transboundary water co-operation as a driver of peace and development

In Africa, given the many watersheds shared by numerous African nations and the potential for discord over water management in them, there is a need and an opportunity to avoid conflict by promoting co-operation in transboundary water basins. Africa shared basins cover about 64 percent of the continental area.

Africa has more rivers shared by three or more countries than any other continent. Every country on mainland Africa has at least one international river or aquifer, with the Congo and Nile basins shared by as many as 11 countries (Sadoff et al, 2002). There are a number of ways in which disagreements over water use can arise among countries that share the resource. These include:

- a. Where one country transfers or plans to transfer water outside the basin (for example, there is a planned project to transfer water from the Ubangi River to Lake Chad);
- b. When activities (consumptive uses- Irrigation, industry etc.) in upstream sections of a basin threaten downstream users and vice-versa (in the Okavango Transboundary watershed, for example, there is the potential for disputes between users in Angola and Namibia in the upper part of the river and those in Botswana downstream);
- c. Where development outside a river basin threatens the river's water availability or quality, or vice-versa (for example, urban and industrial developments outside the Congo basin watershed make demands on the basin's waters);
- d. Where there is competition for the same water among different economic sectors both within and between countries, including irrigation, hydroelectricity, industry, navigation, tourism, and mining; or,
- e. When richer countries or large corporate development projects threaten water use by poorer users in another part of the basin (Roy and others 2010).

1.4. Show how transboundary water co-operation is at the heart of regional integration and poverty alleviation

A good example of transboundary water co-operation is found in southern Africa. The SADC Protocol provides the framework for transboundary water co-operation to ensure regional economic development and integration. Transboundary water resources in this region are vital for human health, economic vitality and environmental processes. Transboundary river basins, which extend across national boundaries and are shared by two or more states, constitute 68 percent of the area of the SADC region, 74 percent of the people and 91 percent of the available freshwater resources. Many of the underground aquifers in the region also extend across national boundaries and are shared by multiple countries (Turton et al.,

2006; Ashton and Turton,). These surface and groundwater resources create interdependence through the territories which they span or travel which means that water use in one section of river basin or aquifer can affect the quantity and quality of water available elsewhere in the watercourse system. The international boundaries that bisect these watercourse systems separate sovereign nations with distinct policies and legal frameworks, creating barriers for coherent management of active systems. While these barriers pose a potential source of conflict between states, they may be addressed through co-operative state interaction, through which nations co-ordinate behaviour for mutual benefit (Frey 1993). In the absence of a supranational authority, states may overcome these barriers by developing norms, rules and decision-making procedures to govern and regulate the management of internationally shared waters. The hydro-political history of the SADC region is marked by a high number of formal international agreements regarding shared waters.

For example, there was unprecedented demand for water in the Okavango River Basin, in part due to the increase in returning refugees and renewed commerce and trade after the end of the Angolan Civil war. It was anticipated that water scarcity in the future will limit economic development and create tensions between water users at local level as well as between the Riparian states. Factors that exacerbate this situation are:

- a. *Climate change which threatens to stress shared waters:* Predicted climate changes may have negative impacts on supply and demand, and may further exacerbate situations in which water is shared among countries (Cooley and others 2009).
- b. *Water is declining in shared aquifers:* Africa's aquifers contain large amounts of fossil water, which is thousands of years old. Their recharge rate is now much less than the withdrawal rate (UNEP 2006). A drop in groundwater levels or a decline in its quality may threaten the political stability of the region, especially where numerous countries share the resource (Turton 2008b).
- c. *There are seasonal differences in water supplies:* Conflicts can also occur between upstream and downstream users due to large seasonal variations in water flows and periodic droughts and floods that are characteristic in Africa (Turton and others 2006).
- d. *Inadequate joint management laws and conflicting national interests stress joint management capacities:* Given that Africa's national boundaries are not aligned with water bodies, water resource management needs to include regional considerations rather than just national objectives (Ashton 2007). Vague or inadequate international laws regarding joint management of shared waters, however, make it hard for riparian states to manage both a single basin with other states and multiple basins in the same state. The water needs and economic situation in each country also varies (Turton 2008b).
- e. *Conflicting interests and inequity in capacities* between riparian states further constrain negotiations on international watershed management (Van der Zaag 2007).

1.5. Aims, objectives and outline of the report: from consolidating the baseline to accelerated progress

The goal of the assignment was to provide functional support to UN-Water and the African Union Commission to enable Member States to monitor their progress towards the integrated water resources management (IWRM) at all levels. Specifically, it was to assess the level of transboundary water co-operation in order to strengthen the regional integration and ensure sustainable development and the

achievement of the SDG 6 target by 2030. The methodology of the assignments comprised a combination of desk-based literature review, missions to selected river basin organizations (OMVS, OMVG, ZAMCOM, OKACOM, and OSS), consultations with national transboundary water focal points, analysis of data from the 2nd cycle of the UNESCO/UNECE SDG 6.5.2 reporting exercise, and key informant Interviews in Senegal, Tunisia, Zimbabwe, Botswana and Nigeria. In addition, consultations were held with the UNECE and UNECA on the planning and execution of the missions as well as the outline of the Report. Access was provided to the database of the SDG 6.5.2 Reporting Exercise and reports including maps were adapted to reflect Africa as a whole instead of the separation between SSA and MENA.

If target 6.5 is to be achieved by 2030, progress must be accelerated. Data have been submitted and analyzed to determine current status of Member States, and to share experiences on the successful implementation, exchange of data to expand knowledge in order to identify where to best target efforts in the process, consequently leading to make existing arrangements operational or adopt new ones.

The SDG indicator 6.5.2 which measures the proportion of the transboundary basin area of lakes, rivers and aquifers with an operational arrangement for water co-operation in riparian countries, has four criteria and all four must be met for it to be considered operational. In 2020, the second reporting exercise on SDG indicator 6.5.2 (Proportion of transboundary basin area with an operational arrangement for water co-operation) was carried out by the co-custodian agencies, UNECE and UNESCO. Worldwide 129 countries out of the 153 sharing transboundary water resources responded. In Africa, so far, 39 out of 48 countries have responded. Based on the second reporting exercise on SDG indicator 6.5.2 carried out in 2020, this regional report on SDG Indicator 6.5.2' provides an analytical perspective of the results to reflect on how to accelerate the achievement of Target 6.5 by 2030.

The specific objectives are to:

- Evaluate and report on the current status and trends in transboundary water co-operation across African countries.
- Identify the challenges and opportunities to having transboundary basins covered by an operational arrangement in African countries.
- Determine the support needed to enhance the capacity of African countries to accelerate progress on transboundary water co-operation towards achieving SDG target 6.5.
- Assess the way forward in framing transboundary water co-operation as an instrument of regional integration in Africa which is the main goal of the African Union's Agenda 2063 - The Africa We Want and the African Water Vision 2025.

2. The reporting process and the role of custodian agencies

2.1. Overview of SDG indicator 6.5.2 and process

The SDG Target 6.5 states that by 2030, integrated water resources management (IWRM) should be implemented at all levels, including through transboundary co-operation as appropriate. SDG indicator 6.5.2 measures the proportion of transboundary basin area covered by an operational arrangement for water co-operation.

DEFINITION

A transboundary basin refers to a river or lake basin, or an aquifer system that mark, cross or is located on boundaries between two or more states. A basin comprises the entire catchment area of a surface water body (river or lake), or for groundwater, the area of the aquifer, i.e. the area of the entire permeable water-bearing geological formation. For the purpose of calculating the value of SDG indicator 6.5.2, the transboundary basin area is the extent of the catchment area (river or lake); or the extent of the aquifer (groundwater).

-The UNESCO/UNECE Integrated Monitoring Guide for SDG 6 Step-by-step monitoring methodology for SDG indicator 6.5.2 version "2020" Final version 2020-01-25

The calculation of the indicator value is based on two main elements or tiers:

Countries calculate SDG indicator 6.5.2 through a series of steps. Step one requires the countries to estimate the spatial coverage of transboundary basin areas located in a State. Step two calls for a determination of the extent to which these areas are covered by operational arrangements for water co-operation. An 'arrangement for water co-operation' refers to any bilateral or multilateral treaty, convention, agreement or other arrangement, such as memorandum of understanding, between States that provides a framework for co-operation on transboundary waters. Agreements or other kinds of formal arrangements may be interstate, inter-governmental, inter-ministerial, inter-agency or between regional authorities.

The relative importance of surface water and groundwater may differ per State; therefore, the indicator allows for the possibility to disaggregate data and highlight specific needs at national, regional and global levels related to both river and lake basins, and transboundary aquifers separately. As with most SDG indicators, SDG indicator 6.5.2 provides a national value. The transboundary basin area referred in the wording of the indicator correspond to the national portion(s) of a transboundary basin.

For an arrangement for co-operation between the riparian States to be considered operational, all the following four criteria need to be in place in practice:

Criteria for Operational Arrangements

- There is a joint body or mechanism (e.g. a river basin organization) for transboundary co-operation;
- There are regular (at least once per year) formal communications between riparian States in form of meetings (either at the political and/or technical level);
- There is a joint or co-ordinated water management plan(s), or similar instrument, such as an action plan, common strategy, or joint objectives regarding the status or conditions of the transboundary waters (such as water quality objectives) in place, for additional guidance on what constitutes joint or co-ordinated objectives, strategies or plans, see note [59], Guide to Reporting;
- There is a regular exchange (at least once per year) of data and information, for additional guidance on the type of data and information that should be exchanged, see note [64], Guide to reporting.

UNECE & UNESCO, 2019, Step-by-step monitoring methodology for SDG indicator 6.5.2 (version 2020)

The four criteria seek to determine whether the State in question has cemented its co-operation through activities subsequent to the adoption of an arrangement. The criterion on joint or co-ordinated objectives, strategies or plans should therefore not be contained within the arrangement itself but adopted after the arrangement is in force, for example through a decision of a joint body or mechanism.

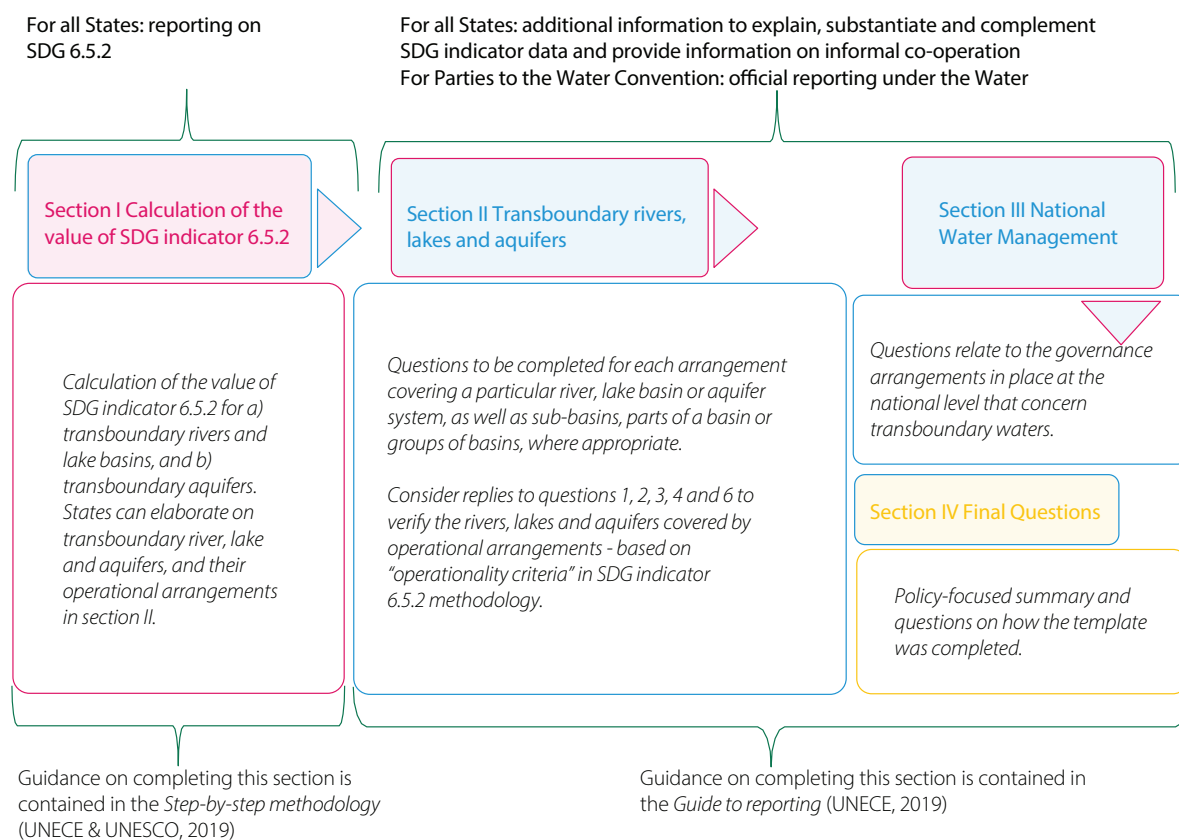
While the four criteria of operationality might be seen as reflecting basic elements to foster cooperation between countries on transboundary waters, a myriad of other factors will influence the impact of any cooperative activities, including the promotion of gender consideration, e.g., within joint bodies or mechanisms, the nomination of representatives to meetings or the targeted actions within management plans and strategies. Ensuring sufficient financing is in place to sustain transboundary water co-operation is also critical. Both financing and gender considerations are addressed in SDG indicator 6.5.1.

The second round of reporting in 2020 provided an opportunity for countries in the Africa region (39 out of 48) to confirm, improve quality and further substantiate their first round of reporting in 2018. It is also provided those countries who did not report in the first round an opportunity to participate with guidance and training by the custodian agencies, UNESCO and UNECE.

2.2. Structure of the reporting template for the second reporting exercise

'SDG indicator 6.5.2 was developed under the auspices of UN-Water and first implemented in 2017. All countries sharing transboundary waters were asked to report during an initial exercise. The structure of the reporting exercise is presented in the diagram below and further guidance on completing this section is contained in the Revised Step-by-step methodology (UNECE and UNESCO, 2019).

Figure 1 Structure of the reporting exercise



The actual reporting template for SDG 6.5.2 is presented in Annex 2 of this report and shows the calculation of areas, the operationality criteria and complementary information on the status of transboundary water co-operation. The next sections show the results for Africa of the 2nd Reporting Cycle through Maps produced by the UN Water database.

2.3. Overview of SDG indicator 6.5.2 responses and the review process

The value of SDG indicator 6.5.2 is available for more (23 instead of 31) African reported in the 2nd Reporting cycle of 2020 than in the first cycle of 2017, despite the challenges of communication during the Covid pandemic and shutdowns. The responses by African countries were also more detailed and of improved quality since there was more co-ordination between national agencies in the preparation of the reports.

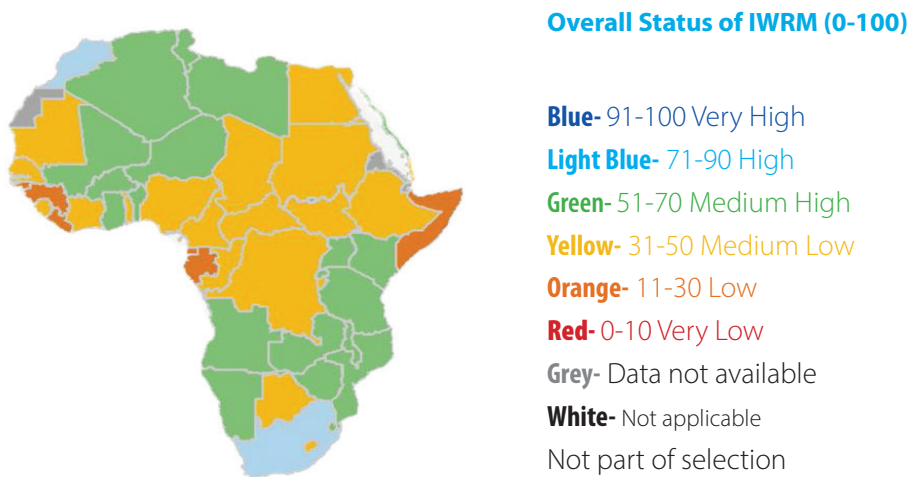
The 2nd Cycle Reporting indicates that not all countries are participating in the reporting process. Reporting in Southern, Central and West Africa is almost complete. However, Liberia and Mauritania in West Africa did not report. On the other side of Africa, Burundi, Djibouti, Eritrea, Gabon, Lesotho, Sudan and Zambia did not report. This may most likely be due to the lack of both technical and institutional capacity to respond.

The improvement in detail and quality of reporting between both exercises was confirmed during consultations with the focal point Ministries in Senegal, Zimbabwe, Botswana and Tunisia. The support

of the custodian agencies (UNESCO and UNECE) through virtual consultations, emails and other remote contacts were acknowledged as being helpful for the co-ordination and technical analysis of the country data collected. The quality control and guidance was also greatly appreciated by the focal points. The regional results are presented for overall progress, and separately for river and lake basins, and aquifers.

Prior to presenting the Africa Regional Status of the SDG 6.5.2 indicators, it is helpful to look at the aspects of the progress made in adopting IWRM at the national level, since the co-ordination and evaluation of the transboundary co-operation indicator was mostly undertaken as a component of the SDG target 6.5 in all the countries visited in preparing this report. The Map (Figure 2) below shows the status of IWRM in the Africa Region.

Figure 2 Overall Status of IWRM.



This map shows that with the exception of Morocco and South Africa where the level of IWRM implementation is High (71 -90 %), the majority of Africa countries rank as medium high (51-70%) or medium low (31 -50%) with Liberia, Guinea, Gabon and Somalia ranked as low (11-30%). This indicates that there is a lot of work to be done in the short term to achieve full implementation of IWRM which also influences the capacity and potential of individual countries to effectively enter and complete transboundary co-operation agreements with their neighbouring riparian states on an equitable basis. Asymmetrical capacities in data collection, analysis and interpretation of water resources and socio-economic data often lead to difficult negotiations and poor implementation even if agreement is achieved on paper. It is against this background that the status results of SDG 6.5.2 on transboundary co-operation is presented in the next section.

3. Assessing progress in transboundary water co-operation at the regional level

The results of the 2nd Cycle of reporting on SDG indicator 6.5.2 for Africa show that more countries reported and the quality of data and analyses improved with support from the custodian agencies. The national processes of consultation were also more comprehensive as reported during consultation with Focal Points in the countries visited. Where possible River Basin or Aquifers Organizations were consulted during missions undertaken to prepare this report. These included the Senegal Basin Organization (OMVS in Dakar), Gambia Basin Organization (OMVG in Dakar), Zambezi River Basin Commission (ZAMCOM in Harare), Okavango Basin Organization (OKACOM) and the Observatory for the Sahara and Sahel (OSS in Tunis).

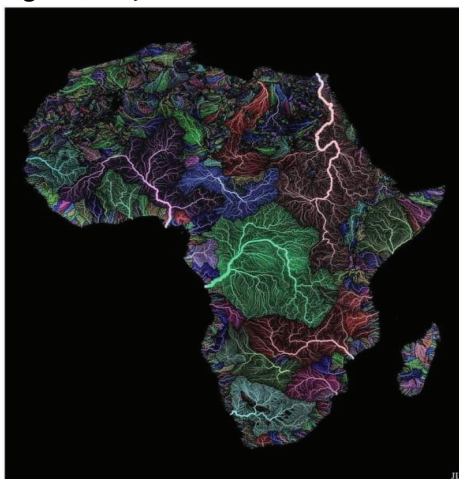
3.1. Regional progress in transboundary water co-operation

The graphs of the status of progress in monitoring the SDG 6.5.2 show in each country the overall value for all water resources, i.e., river and lake basins, and aquifers. These are presented in the next subsections.

3.1.1. Overview of SDG indicator 6.5.2 Overall value (Surface and Ground water)

The major river and lake basins are presented in the map below as a prelude to showing the national results of the 2nd cycle of SDG 6.5.2 reporting.

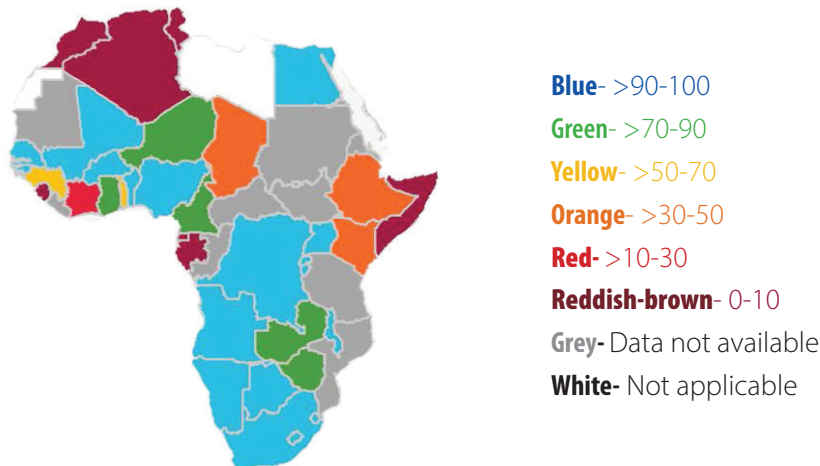
Figure 3 Major Rivers and Lake Basins



From the mission consultations with the OMVS, OMVG, and OKACOM it was confirmed that the River Basin Organizations participated in the national level preparatory processes for the 2nd reporting cycle. These included participation in workshops, webinars and data exchange and harmonization.

The status of transboundary co-operation based on SDG 6.5.2 indicator is presented in Fig 6 below.

Figure 4 Status of Transboundary Co-operation



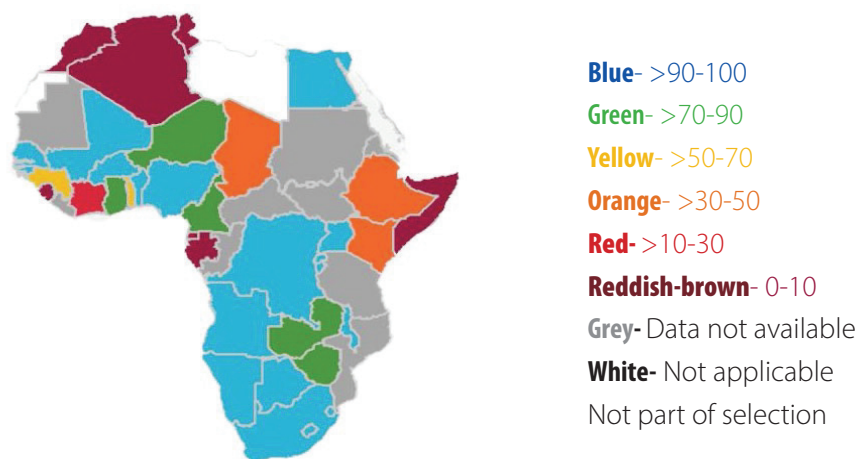
Proportion of transboundary basin area with an operational arrangement for co-operation (%).

The proportion of transboundary basins (river and lake basins, and aquifers) with operational arrangements for co-operation in place is generally very high in Southern Africa, Central Africa and West Africa (between 90 and 100 percent coverage). In the South, this may be due to the longstanding effort at promoting transboundary co-operation which started with the SADC protocol and has evolved into substantive planning and execution of a joint project co-ordinated by the Regional Economic Community. In Central Africa, the dominant basin, the Congo Basin, has also been organized at the ECCAS Regional Economic Community level with the Congo River Basin Commission charged with basin-wide planning for among others Navigation (Trade), Energy and other uses. Similarly, the major West African basins, i.e., Niger, Senegal, Volta and Lake Chad, have longstanding institutional set ups with varying degrees of effectiveness and efficiency in delivering on their mandates. These cover most of the West African territory. In the East, the major basin is the Nile which has 11 riparians and 2 major tributaries for planning purposes, i.e., the White and Blue Nile. This basin has been subject to major disagreements in recent years between lower and upper riparian states due to the construction of the Grand Ethiopia Renaissance Dam (GERD) on the Blue Nile tributary. The process of building co-operation on the Nile is discussed in much more detail in the next section.

3.1.2. SDG indicator 6.5.2 for transboundary river and lake basins

The reporting pattern of rivers and lake basins is similar to the overall indicator only in terms of the number of countries reporting in the 2nd cycle as indicated in Fig 7. A specific region worth noting are the parts of Central and East Africa which cover the Nile Basin. It is the Basin with the highest potential conflict and current tensions have reached the point of threats of war. Even as these threats persist, it is worth noting that efforts at building transboundary water co-operation among the 11 riparians is long standing and started in the 1980s. Much progress was made with the creating of the Nile Basin Initiative in 1999 and it offers a framework for the ultimate resolutions of the dispute which is currently deadlocked.

Figure 5 Proportion of transboundary basin area with an operational arrangement for co-operation (%).



The key achievements from 20 years of work by the 11 riparian states are the mutual trust built which has made it possible to jointly develop technical tools and identify joint projects which are being implemented under the Nile Basin Subsidiary Programs. For the Blue Nile such projects were developed under ENTRO based in Ethiopia and for the White Nile under NELSAP based in Rwanda. The main activities co-ordinated from the Headquarters in Uganda have been implementing the projects with impacts basin wide. These include programs to build trust and develop the Co-operative Framework Agreement (signed by 6 and ratified by 4 of the 11 states), Basin-wide Development Plans and Strategies, Knowledge and Capacity Building of staff and national institutions, environmental protection and water quality conservation projects.

3.1.3. SDG indicator 6.5.2 for transboundary aquifers

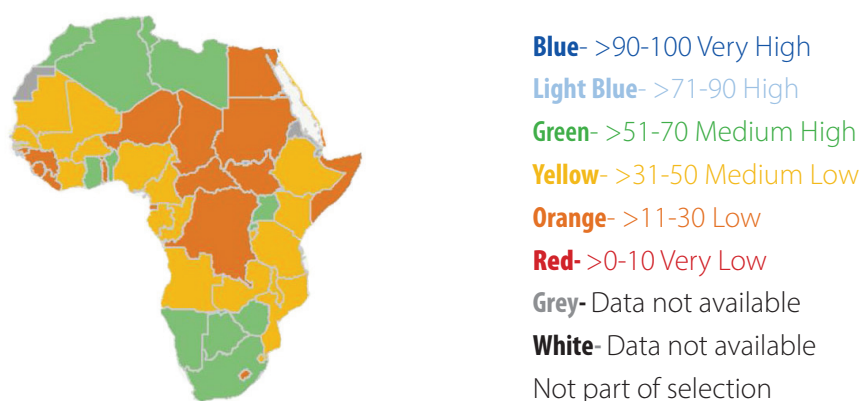
Groundwater resources tend to receive less attention due to the fact that they are not “visible” and thus difficult to measure and utilize as compared to rivers and lakes. In Africa, the groundwater resources stored in aquifers however play a vital role in meeting the increasing demand for water due to the rapidly increasing population. In tandem with the development of the concept of IWRM, much effort has been undertaken across the region to map and quantify groundwater resources in both time and space. Programs such as the UNESCO Intergovernmental Hydrological Programme (IHP) in partnership with National Geological and Hydrological Institutions have led this effort in Africa. This is very important since most rural and urban water demand depend on such aquifers as their source of water. It is particularly true for the countries in arid north and south regions of the continent. However, even in the humid regions of Africa, groundwater is an important source of water for all uses (domestic, agricultural, industrial and industrial) due to either long distances from rivers and lakes or where surface water is polluted especially in the vicinity of urban areas. Defining boundaries for transboundary aquifers is much more difficult technically and most aquifers are still being explored and mapped. This is also reflected in the inability of countries to determine where such aquifers are transboundary or not and, even when so determined, to physically determine boundaries as well as directions of flow.

The 2nd Cycle Reporting of the SDG6.5.2 therefore shows far fewer countries responding with respect to co-operative arrangements in the use of transboundary aquifers as shown in Fig 9 below. The Northern Africa countries depend mainly on aquifers and have invested more human, technical and financial resources in both their assessment and management. A mission to Tunisia and OSS confirmed this

ordinating SDG 6.5.2 national reports, e.g., ensuring consistency in the data submitted by countries sharing the same basin. SDG 6.5.2 monitoring and outcomes might be included as a regular agenda item of RBOs, and any gaps might be discussed and addressed at the basin level, e.g., where aquifer data might be lacking. However, it should be noted that the basins that are lacking operational arrangements are also likely to be lack RBOs.

- c. Similarly, the Regional Economic Communities (SADC, ECOWAS, ECCAS, EAC, UMA) are the building blocks of African development. Water is one of the major resources required to achieve sustainable development and thus its planning and utilization are of vital importance to the RECs. Their key mandate is to promote regional social and economic integration and the SDG 6.5.2 on transboundary water co-operation could be utilized as a measure of water co-operation and an instrument of regional integration. This could be for uses ranging from navigation to food security to hydropower and more. The reporting process as is designed so far does not include the RECs.
- d. Institutionalizing and financing the reporting process varies for different countries. Some have inter-ministerial co-ordination within the context of IWRM processes and others do not. This deserves some attention in future reporting cycles. A formal institutional co-ordination set up will make it easier to carry out the task and also likely make it easier to be funded by domestic sources routinely. Financing the reporting system for SDG 6.5.2 needs to be assessed in the context of financing the overall IWRM in each country as a proxy. Data on financing IWRM is presented in Figure 7 below.

Figure 7 Financing IWRM in Africa (0-100)



4. Conclusions, Recommendations and Way Forward

4.1. Conclusions

Some conclusions can be drawn from the analyses and review of data collected and discussions with the national focal points and RBOs visited in the selected countries. These may be summarized as follows:

- a. Africa has more boundaries on its territory than all the other continents and this is traversed by more transboundary rivers and aquifer systems than probably any other continent due to the colonial boundaries which were drawn at the Berlin Conference in 1884. With 63 major transboundary rivers and lakes, almost all countries need to have transboundary co-operation as a priority for water management. The rules and principles set out in the Convention on the Law of Non-Navigational Uses of International Watercourses (Watercourses Convention) as well as the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) are therefore essential for managing Africa's water resources. Thirteen African states have ratified the Watercourses Convention, and now that the Water Convention is open to all UN Member States, several African States have joined (Chad, Ghana, Guinea-Bissau, Senegal and Togo), or are in the process of joining the latter instrument. The OMVS and ZAMCOM seem to have made the most progress in transboundary cooperation, while the Nile may prove the most important in term of regional impact if the Comprehensive Framework Agreement (CFA) is finally agreed and a Nile River Commission made operational. The SDG indicator 6.5.2 is a very important means by which to monitor such efforts to ensure that water resources are utilized equitably without any harm to other riparian states.
- b. The SDG 6.5.2 indicator is useful to River/Lake/Aquifer Basin Organizations (RBOs), but their role in the Reporting cycles are secondary and supportive only to national reports. This is based on consultations with the sample of RBOs visited. RBOs can play an effective role in supporting the development of national reports, and ensuring co-ordination at the basin level. In addition, making these mechanisms more effective in achieving their mandate of regional co-operation and fostering overall basin-wide economic and social integration. This is a call to countries and their partners in water development.
- c. Transboundary water infrastructure, especially considering climate change impacts, is vital to building resilient water systems in Africa. To achieve the related goals set out in the African Water Vision and considering budgetary limitations of most African countries, co-operation between states in sourcing finance from the African Development Bank and sister International Financial Institutions is the most feasible way to funding such projects. This Financial Institutions must be invited to participate and support the Reporting process at the national and basin levels since the results can be used to improve financing decisions for their transboundary water infrastructure lending.
- d. The national mechanisms for conducting the SDG 6.5.2 must be streamlined, taking into account existing national co-ordination mechanisms. From consultations held with Senegal, Zimbabwe, Botswana and Tunisia, integrating the process firmly in existing IWRM processes and clearly defining funding in budget lines of participating institutions (ministries, INGOs, RBOs, Research bodies, private sector, CSOs and other sectoral organization) which utilize the water bodies will be a major step. Clarity of responsibilities and timelines for delivery must be enhanced and quality control

of data and processes should be explicitly defined where necessary with the technical support of custodian agencies (UNESCO, UNECE) and their regional partners (UNECA, WMO, FAO, GWP, ANEW, Bilateral Partners). The level of participation of these stakeholders in the context of IWRM in general is presented for the 2nd Reporting Cycle:

4.2. Recommendations and Way Forward for transboundary water co-operation

Some key recommendations to inform the way forward in the next cycles of reporting are summarized as follows:

- a. The reporting process for SDG 6.5.2 is aligned with reporting under the Water Convention, which has yielded more efficiency and effectiveness allowing Parties to the Water Convention to report on their operational arrangements and their progress in implementing the Water Convention at the same time. It is recommended that this be extended to include the regular reporting processes of River/Lake/Aquifer(R/L/A) Basin Organizations so that the process is sustained. The data and reporting outcomes can also be linked to the RECs at the sub-regional level for planning and the AMCOW maintained Water Information System, WASSMO, at the African continental level. UNECE confirmed that Indicator I-5.4 of WASSMO has the same definition and methodology as SDG 6.5.2.
- b. The SDG 6.5.2 report should be integrated in the R/L/A basin organizations Annual Policy meetings as a regular agenda item and used to keep track of their mandate of transboundary water use as an instrument of Regional Economic Integration. Similarly, these reports must be linked to WASSMO (AMCOW) to provide regular quantitative and qualitative measures of progress in transboundary water co-operation in Africa to the regular sessions of the African Union. This is a requirement under the Sharm el Sheik Summit Declaration of the AU in 2006. This requires regular annual reporting on progress made in achieving the goals and targets of the African Water Vision 2025 including progress on Transboundary Water Co-operation. In view of the elevation of transboundary water co-operation to the UN Security Council (in the case of the Nile) and the reference of negotiations back to the African Union, such reports will be very essential in supporting the negotiations for a peaceful solution to the Nile crisis and others which may follow.
- c. At the national level, it is recommended that the progress reports be widely publicized and if possible routinely shared with Parliament and the Foreign Ministries of Member States, to both inform and mobilize support for transboundary water development projects and programs, highlighting common interests and benefits of “win-win” co-operation. Building Parliamentary (i.e., Lake Chad Parliamentary Caucus) support for transboundary water co-operation through advocacy and sensitization will assure sustained financing for RBOs and their activities including SDG 6 monitoring and reporting for national planning.
- d. Improve dissemination of benefits of water co-operation to national and local populations to promote ownership of Institutions and programs on transboundary waters.

4.3. The way forward- Water as an instrument of Regional Integration

The Southern African Development Community (SADC) and the Senegal River Development Organization (OMVS) are the only two organizations that operate basin-wide shared water management (Kliot and others 2001). The Senegal River group, including Mali, Senegal, Guinea and Mauritania, decided not to argue about water entitlements in favour of distributing projects equitably such that a dam may be built

in one country but the electricity generated is distributed elsewhere in exchange for another benefit (Grimond 2010).

Issues among other organizations include lack of legitimacy and effectiveness, a “not-invented-here” syndrome (referring to models not developed in Africa) and inadequate consideration of the realities and needs of the local people (Merrey 2009). A mixture of these issues can lead to tense relations among riparian countries and increased potential for conflict.

Transboundary water co-operation provides the means to deal with these challenges and constraints through negotiated basin-wide sharing for all riparian states. The sustainability of water available within a river basin that crosses two or more countries may be assured and even increased via transboundary agreements. The SADC Protocol for example aims to assure equity in the provision of water for all and help maintain peace and security. It was negotiated on the basis of equitable water sharing and has contributed as a catalyst for wider political co-operation and economic integration in southern Africa.

Although water has generally been described as a cause of political tension and armed conflicts, in reality, water has seldom been the primary cause of a war. Contrary to common perceptions, water has been a binding factor between otherwise hostile states. The Indus Water Treaty, for example, has survived three wars between India and Pakistan and Iraq gave Kuwait water “in brotherhood” without compensation. In Africa, confrontation between Swaziland, South Africa and Mozambique on water sharing within the Incomati River Basin because of competing interests ended after negotiations between 1964 and 2002. The deadlock was broken when the management of the adjacent Maputo River Basin was included so that some of the benefits were tradable between the parties (Van der Zaag 2007, Van der Zaag and Carmo Vaz 2003). A case study of competition and co-operation in the Incomati water issue concluded that:

“The hypothesis that water drives peoples and countries towards co-operation is supported by the developments in the Incomati basin. Increased water use has indeed led to rising co-operation”
(Van der Zaag and Carmo Vaz 2003).

In the case of transboundary groundwater, conflicts are often attributed to the lack of information about the boundaries of the physical resource, resource capacity and conditions that suggest water quality. Yet, with all of these potential triggers for conflict, there are no documented cases where intensive groundwater use in a medium or large-sized aquifer has caused serious social conflicts (Jarvis 2006). Thus, there appears to be no historical reason to suggest that the problem of sharing water among riparian countries is likely to be a cause of future conflict in Africa or elsewhere; rather, it can be the catalyst for co-operation.

Successful transboundary water distribution is inherently dependent on political co-operation between the involved riparian states. In the absence of strong rules and laws, treaties are the best form of formal river basin management. These regimes define implicit and explicit principles, norms, rules and decision-making procedures to help meet actors’ expectations. The formation of such institutions, including liability and sanctions in case of non-compliance, can help shift “negative peace” (absence of war) into “positive peace” (co-operation and confidence) (Turton 2003). Such co-operation in managing shared or competing interests in common water basins can promote many benefit-sharing possibilities, including international trade in water. For example, Lesotho and South Africa entered into a multi-billion-dollar water transfer and hydropower project on the Orange/Senqu river basin called The Lesotho Highlands

Project. It includes mechanisms such as direct payments for water, purchase agreements and financing arrangements and has enabled Lesotho to earn valuable foreign exchange from the water it sells to South Africa (Ashton 2000, Roy and others 2010). In the case of the Senegal River, a burden-sharing formula enabled Senegal, Mali and Mauritania to agree on how to share the development costs and benefits of infrastructure they jointly operate on the river. There has been a decided change from top-down to co-operative management approaches to managing transboundary water resources in Africa, as illustrated by the formation of OKACOM in the Okavango River Basin, which brought the riparian nations together under the slogan **“Three Nations, One River”** in a new model of water sharing (Roy and others 2010).

Other examples of successful water-sharing bodies or mechanisms in Africa can provide benchmark lessons in co-operative management are the Nile Basin Initiative, in which eleven riparian nations have met amicably for more than a decade (2000-2010) before negotiations stalled after a Comprehensive Framework Agreement (CFA) was concluded by all riparians except Egypt and Sudan (Donkor S.M.K, 2021). This is currently experiencing tension and turbulence due to disagreements over the Grand Ethiopian Renaissance Dam (GERD) which pits Ethiopian energy needs against Egypt’s need for water for agriculture and domestic use.

Common interests in transboundary rivers and basins, like water quality, supply, flood control, effects of climate change, etc., are potential arenas in which to build institutional capacity through collaboration among co-riparian states. Joint efforts in collecting data, understanding impacts and improving socio-economic models can bring the actors together and thus avoid potential conflicts. Transboundary co-operation can broaden the knowledge base, enlarge the range of measures available for prevention, preparedness and recovery, develop better responses and offer more cost-effective solutions. In short Transboundary Water Co-operation can serve as a vital Instrument of Regional Integration in Africa.

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Annex I

Reporting on global SDG indicator 6.5.2

TEMPLATE of the second cycle for reporting

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]

1. 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.³
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.
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

1. 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;

³ Available from the UN-Water website: <https://www.sdg6monitoring.org/indicators/target-65/indicators652/> (updated version “2020”).

- 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.
1. 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 basin (please add rows as needed)

Name of transboundary river or lake basin/sub-basin	It is a basin or a sub-basin? 4	Countries shared with	Surface area of the basin/sub-basin (in km2) within the territory of the country	Map and/or GIS shapefile provided (yes/no)	Covered by an arrangement (entirely, partly, no) (Ref. to questions in sect. II)	Criterion 1 applied (yes/no) (Ref. to questions in sect. II)	Criterion 2 applied (yes/no) (Ref. to questions in sect. II)	Criterion 3 applied (yes/no) (Ref. to questions in sect. II)	Criterion 4 applied (yes/no) (Ref. to questions in sect. II)	Surface area of the basin/ sub-basin (in km2) covered by an operational arrangement within the territory of the country
(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)										

4 List sub-basins after the basin they belong to.

Table 2 Transboundary aquifers (please add rows as needed)

Name of the transboundary aquifer shared with Countries	Surface area of the aquifer ⁵ (in km ²) within the territory of the country	Map and/or GIS shapefile provided (yes/no)	Covered by an aquifer specific arrangement (entirely, partly, no) (Ref. to questions in sect. II)	Covered within an arrangement not specific to the aquifer ⁶ (entirely, partly, no) (Ref. to questions in sect. II)	Criterion 1 applied (yes/no) (Ref. to questions in sect. II)	Criterion 2 applied (yes/no) (Ref. to questions in sect. II)	Criterion 3 applied (yes/no) (Ref. to questions in sect. II)	Criterion 4 applied (yes/no) (Ref. to questions in sect. II)	Surface area of the aquifer (in km ²) covered by an operational arrangement within the territory of the country
(C) Sub-total: surface area of transboundary aquifers covered by operational arrangements (in km ²)									
(D) Total surface area of transboundary aquifers (in km ²)									

5 For a transboundary aquifer, the extent is derived from the aquifer system delineation which is commonly done relying on information of the subsurface (notably the extent of geological formations). As a general rule, the delineation of aquifer systems is based on the delineation of the extent of the hydraulically connected water-bearing geological formations. Aquifer systems are three-dimensional objects and the aquifer area taken into account is the projection on the land surface of the system. Ideally, when different aquifer systems not hydraulically connected are vertically superposed, the different relevant projected areas are to be considered separately, unless the different aquifer systems are managed conjunctively.

6 In the text of the agreement or arrangement or in the practice.

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]*

2. 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.⁷ 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 agreements⁸ 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 of the riparian States: [fill in]

In the case of an aquifer, what is the nature of the aquifer and its relation with the river or lake basin:

Unconfined aquifer connected to a river or lake	<input type="checkbox"/>
Unconfined aquifer with no or limited relation with surface water	<input type="checkbox"/>
Confined aquifer connected to surface water	<input type="checkbox"/>
Confined aquifer with no or limited relation with surface water	<input type="checkbox"/>
Other	<input type="checkbox"/>
<i>Please describe: [fill in]</i>	<input type="checkbox"/>
Unknown	<input type="checkbox"/>

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

	<input type="checkbox"/>
One or more agreements or arrangements exist and are in force	
Agreement or arrangement developed but not in force	<input type="checkbox"/>
Agreement or arrangement developed, but not in force for all riparians	<input type="checkbox"/>
<i>Please insert the name of the agreement(s) or arrangement(s) [fill in]</i>	
Agreement or arrangement is under development	<input type="checkbox"/>
No agreement or arrangement	<input type="checkbox"/>

⁷ 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.

⁸ 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.

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.

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	<input type="checkbox"/>
A single water use or sector	<input type="checkbox"/>
Several water uses or sectors	<input type="checkbox"/>

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

Water uses or sectors

Industry	<input type="checkbox"/>
Agriculture	<input type="checkbox"/>
Transport (e.g., navigation)	<input type="checkbox"/>
Households	<input type="checkbox"/>
Energy: hydropower and other energy types	<input type="checkbox"/>

Fisheries	<input type="checkbox"/>
Tourism	<input type="checkbox"/>
Nature protection	<input type="checkbox"/>
Other (<i>please list</i>): [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	<input type="checkbox"/>
Institutional cooperation (joint bodies)	<input type="checkbox"/>
Consultation on planned measures	<input type="checkbox"/>
Mutual assistance	<input type="checkbox"/>

Topics of cooperation

Joint vision and management objectives	<input type="checkbox"/>
Joint significant water management issues	<input type="checkbox"/>
Navigation	<input type="checkbox"/>
Human health	<input type="checkbox"/>
Environmental protection (ecosystem)	<input type="checkbox"/>
Water quality	<input type="checkbox"/>
Water quantity or allocation	<input type="checkbox"/>
Cooperation in addressing floods	<input type="checkbox"/>
Cooperation in addressing droughts	<input type="checkbox"/>
Climate change adaptation	<input type="checkbox"/>

Monitoring and exchange

Joint assessments	<input type="checkbox"/>
Data collection and exchange	<input type="checkbox"/>
Joint monitoring	<input type="checkbox"/>
Maintenance of joint pollution inventories	<input type="checkbox"/>
Elaboration of joint water quality objectives	<input type="checkbox"/>
Common early warning and alarm procedures	<input type="checkbox"/>
Exchange of experience between riparian States	<input type="checkbox"/>
Exchange of information on planned measures	<input type="checkbox"/>
	<input type="checkbox"/>

Joint planning and management

Development of joint regulations on specific topics	<input type="checkbox"/>
Development of international or joint river, lake or aquifer basin management or action plans	<input type="checkbox"/>
Management of shared infrastructure	<input type="checkbox"/>

Development of shared infrastructure	<input type="checkbox"/>
Other (<i>please list</i>): [fill in]	
	<input type="checkbox"/>

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	<input type="checkbox"/>
Aligning implementation of agreement or arrangement with regional laws, policies and programmes	<input type="checkbox"/>
Lack of financial resources	<input type="checkbox"/>
Insufficient human capacity	<input type="checkbox"/>
Insufficient technical capacity	<input type="checkbox"/>
Tense diplomatic relations	<input type="checkbox"/>
Non-participation of certain riparian countries in the agreement	<input type="checkbox"/>
No significant difficulties	<input type="checkbox"/>
Other (<i>please describe</i>): [fill in]	<input type="checkbox"/>

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

Where there is a joint body or mechanism

a. If there is a joint body or mechanism, which kind of joint body or mechanism (*please tick one*)?

Plenipotentiaries	<input type="checkbox"/>
Bilateral commission	<input type="checkbox"/>
Basin or similar commission	<input type="checkbox"/>
Expert group meeting or meeting of national focal points	<input type="checkbox"/>
Other (<i>please describe</i>): [fill in]	<input type="checkbox"/>

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]

g. What are the tasks and activities of this joint body or mechanism?⁹

Identification of pollution sources	<input type="checkbox"/>
Data collection and exchange	<input type="checkbox"/>
Joint monitoring	<input type="checkbox"/>
Maintenance of joint pollution inventories	<input type="checkbox"/>
Setting emission limits	<input type="checkbox"/>
Elaboration of joint water quality objectives	<input type="checkbox"/>
Management and prevention of flood or drought risks	<input type="checkbox"/>
Preparedness for extreme events, e.g., common early warning and alarm procedures	<input type="checkbox"/>
Surveillance and early warning of water related disease	<input type="checkbox"/>
Water allocation and/or flow regulation	<input type="checkbox"/>
Policy development	<input type="checkbox"/>
Control of implementation	<input type="checkbox"/>
Exchange of experience between riparian States	<input type="checkbox"/>
Exchange of information on existing and planned uses of water and related installations	<input type="checkbox"/>
Settling of differences and conflicts	<input type="checkbox"/>
Consultations on planned measures	<input type="checkbox"/>
Exchange of information on best available technology	<input type="checkbox"/>
Participation in transboundary EIA	<input type="checkbox"/>
Development of river, lake or aquifer basin management or action plans	<input type="checkbox"/>
Management of shared infrastructure	<input type="checkbox"/>

⁹ 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.

Addressing hydromorphological alterations	<input type="checkbox"/>
Climate change adaptation	<input type="checkbox"/>
Joint communication strategy	<input type="checkbox"/>
Basin-wide or joint public participation and consultation of,	<input type="checkbox"/>
for example, basin management plans	<input type="checkbox"/>
Joint resources to support transboundary cooperation	<input type="checkbox"/>
Capacity-building	<input type="checkbox"/>
Any other tasks (<i>please list</i>): [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	<input type="checkbox"/>
<i>Please describe, if any:</i> [fill in]	
Unexpected planning delays	<input type="checkbox"/>
<i>Please describe, if any:</i> [fill in]	
Lack of resources	<input type="checkbox"/>
<i>Please describe, if true:</i> [fill in]	
Lack of mechanism for implementing measures	<input type="checkbox"/>
<i>Please describe, if true:</i> [fill in]	
Lack of effective measures	<input type="checkbox"/>
<i>Please describe, if true:</i> [fill in]	
Unexpected extreme events	<input type="checkbox"/>
<i>Please describe, if any:</i> [fill in]	
Lack of information and reliable forecasts	<input type="checkbox"/>
<i>Please describe, if any:</i> [fill in]	
Others (<i>please list and describe, as appropriate</i>): [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	<input type="checkbox"/>
Once per year	<input type="checkbox"/>
Less than once per year	<input type="checkbox"/>

j. What are the main achievements with regards 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.	<input type="checkbox"/>
Environmental flow norms, including consideration of levels and seasonality	<input type="checkbox"/>
Water quality protection, e.g. nitrates, pesticides, faecal coliforms, heavy metals	<input type="checkbox"/>
Water-related species and habitats protection	<input type="checkbox"/>

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	<input type="checkbox"/>
Once per year	<input type="checkbox"/>
Less than once per year	<input type="checkbox"/>

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	<input type="checkbox"/>
Research activities and application of best available techniques	<input type="checkbox"/>
Emission monitoring data	<input type="checkbox"/>
Planned measures taken to prevent, control or reduce transboundary impacts	<input type="checkbox"/>
Point source pollution sources	<input type="checkbox"/>
Diffuse pollution sources	<input type="checkbox"/>
Existing hydromorphological alterations (dams, etc.)	<input type="checkbox"/>
Flows or water levels (including groundwater levels)	<input type="checkbox"/>

Water abstractions	<input type="checkbox"/>
Climatological information	<input type="checkbox"/>
Future planned measures with transboundary impacts, such as infrastructure development	<input type="checkbox"/>
Other subjects (<i>please list</i>): [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	<input type="checkbox"/>
Timing of exchanges	<input type="checkbox"/>
Comparability of data and information	<input type="checkbox"/>
Limited spatial coverage	<input type="checkbox"/>
Inadequate resources (technical and/or financial)	<input type="checkbox"/>
Other (<i>please describe</i>): [fill in]	<input type="checkbox"/>

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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surface waters in part of the basin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>please describe</i> [fill in]			

Transboundary aquifer(s) (connected or unconnected)

Aquifer(s) in the territory of one riparian hydraulically connected to a transboundary river or lake

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

National monitoring stations connected through a network or common stations

Please describe: [fill in]

Joint and agreed methodologies

Please describe: [fill in]

Joint sampling

Please describe: [fill in]

Common monitoring network

Please describe: [fill in]

Common agreed parameters

Please describe: [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	<input type="checkbox"/>
Coordinated or joint early warning or alarm system for accidental water pollution	<input type="checkbox"/>
<i>Other (please list):</i> [fill in]	<input type="checkbox"/>
No measures	<input type="checkbox"/>

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	<input type="checkbox"/>
Coordinated or joint alarm system for floods	<input type="checkbox"/>
Coordinated or joint alarm system for droughts	<input type="checkbox"/>
Joint climate change adaptation strategy	<input type="checkbox"/>
Joint disaster risk reduction strategy	<input type="checkbox"/>
<i>Other (please list):</i> [fill in]	<input type="checkbox"/>
No measures	<input type="checkbox"/>

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)	<input type="checkbox"/>
Stakeholders have observer status in a joint body or mechanism	<input type="checkbox"/>
Stakeholders have an advisory role in the joint body	<input type="checkbox"/>
Stakeholders have a decision-making role in the joint body	<input type="checkbox"/>
If yes, please specify the stakeholders for the joint body or mechanism:	<input type="checkbox"/>
[fill in]	<input type="checkbox"/>
Intergovernmental organizations	<input type="checkbox"/>
Private sectors organizations or associations	<input type="checkbox"/>
Water user groups or associations	<input type="checkbox"/>
Academic or research institutions	<input type="checkbox"/>
Other non-governmental organizations	<input type="checkbox"/>
General public	<input type="checkbox"/>
Other (please specify): [fill in]	<input type="checkbox"/>
Availability of information to the public	<input type="checkbox"/>
Consultation on planned measures or river basin management plans ¹⁰	<input type="checkbox"/>
Public involvement	<input type="checkbox"/>
Other (please specify): [fill in]	

¹⁰ Or, where applicable, aquifer management plans.

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.

3. 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 <input type="checkbox"/> /No <input type="checkbox"/>
Polluter pays principle	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Sustainable development	Yes <input type="checkbox"/> /No <input type="checkbox"/>
User pays principle	Yes <input type="checkbox"/> /No <input type="checkbox"/>

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	<input type="checkbox"/>
Mining	<input type="checkbox"/>
Energy	<input type="checkbox"/>
Municipal	<input type="checkbox"/>
Livestock raising	<input type="checkbox"/>
Aquaculture	<input type="checkbox"/>
Other (<i>please list</i>): [fill in]	<input type="checkbox"/>

Please briefly describe the licensing or permitting system, indicating whether the system provides for setting emission limits based on best available technology?

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	<input type="checkbox"/>
Monitoring of physical and chemical impacts on water	<input type="checkbox"/>
Monitoring of ecological impacts on water	<input type="checkbox"/>
Conditions on permits	<input type="checkbox"/>
Inspectorate	<input type="checkbox"/>
Other means (please list): [fill in]	<input type="checkbox"/>

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 diffuse sources of water pollution on transboundary waters (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	<input type="checkbox"/>
Norms for uses of manure	<input type="checkbox"/>
Permitting system	<input type="checkbox"/>
Bans on or norms for use of pesticides	<input type="checkbox"/>
Others (please list): [fill in]	<input type="checkbox"/>
	<input type="checkbox"/>

Economic and financial measures

Monetary incentives	<input type="checkbox"/>
Environmental taxes (such as fertilizer taxes)	<input type="checkbox"/>
Others (please list): [fill in]	<input type="checkbox"/>

Agricultural extension services

Technical measures

<i>Source control measures</i>	<input type="checkbox"/>
Crop rotation	<input type="checkbox"/>
Tillage control	<input type="checkbox"/>
Winter cover crops	<input type="checkbox"/>
Others (please list): [fill in]	<input type="checkbox"/>

Other measures	<input type="checkbox"/>
Buffer/filter strips	<input type="checkbox"/>
Wetland reconstruction	<input type="checkbox"/>
Sedimentation traps	<input type="checkbox"/>
Chemical measures	<input type="checkbox"/>
Others (<i>please list</i>): [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)	<input type="checkbox"/>
A regulatory system regarding water abstraction	<input type="checkbox"/>
Monitoring and control of abstractions	<input type="checkbox"/>
Water rights are defined	<input type="checkbox"/>
Water allocation priorities are listed	<input type="checkbox"/>
Water-saving technologies	<input type="checkbox"/>
Advanced irrigation techniques	<input type="checkbox"/>
Demand management activities	<input type="checkbox"/>
Other means (<i>please list</i>)	<input type="checkbox"/>

- 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]

4. Final questions

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

Differences between national administrative and legal frameworks	<input type="checkbox"/>
Lack of relevant data and information	<input type="checkbox"/>
Difficulties in data and information exchange	<input type="checkbox"/>
Sectoral fragmentation at the national level	<input type="checkbox"/>
Language barrier	<input type="checkbox"/>
Resource constraints	<input type="checkbox"/>
Environmental pressures, e.g. extreme events	<input type="checkbox"/>
Sovereignty concerns	<input type="checkbox"/>
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	<input type="checkbox"/>
Enhanced regional integration, i.e. beyond water	<input type="checkbox"/>
Adoption of cooperative arrangements	<input type="checkbox"/>
Adoption of joint plans and programmes	<input type="checkbox"/>
Long-lasting and sustained cooperation	<input type="checkbox"/>
Financial support for joint activities	<input type="checkbox"/>
Stronger political will for transboundary water cooperation	<input type="checkbox"/>
Better knowledge and understanding	<input type="checkbox"/>
Dispute avoidance	<input type="checkbox"/>
Stakeholder engagement	<input type="checkbox"/>

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	<input type="checkbox"/>
Other riparian or aquifer countries	<input type="checkbox"/>
National water management authority	<input type="checkbox"/>
Environment agency/ authority	<input type="checkbox"/>
Basin authority (national)	<input type="checkbox"/>
Local or provincial government	<input type="checkbox"/>
Geological survey (national)	<input type="checkbox"/>
Non-water specific ministries, e.g. foreign affairs, finance, forestry and energy	<input type="checkbox"/>
Civil society organizations	<input type="checkbox"/>
Water user associations	<input type="checkbox"/>
Private sector	<input type="checkbox"/>
Other (please list): [fill in]	<input type="checkbox"/>

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. Name and contact details of the person(s) who filled out the questionnaire (please insert): [fill in]

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

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

