

# STEP-BY-STEP MONITORING METHODOLOGY FOR SDG INDICATOR 6.5.2

PROPORTION OF TRANSBOUNDARY BASIN AREA WITH AN OPERATIONAL ARRANGEMENT FOR WATER COOPERATION

## CONTENT

|       |                                                                                                                                                                            |    |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 1.    | Presentation of SDG indicator 6.5.2 and main definitions .....                                                                                                             | 2  |
| 1.1   | Transboundary river/lake basins and aquifers management and SDG indicator 6.5.2 .....                                                                                      | 2  |
| 1.2   | Monitoring concept and main definitions.....                                                                                                                               | 2  |
| 1.3   | Specific approach for transboundary aquifers .....                                                                                                                         | 4  |
| 2.    | The Reporting Template and Linkages to Other Reporting Initiatives .....                                                                                                   | 4  |
| 2.1   | The reporting template and links with the Convention on the protection and use of transboundary watercourses and international lakes .....                                 | 4  |
| 2.2   | SDG indicator 6.5.1 and other Reporting initiatives .....                                                                                                                  | 5  |
| 3.    | Progress and updates between monitoring cycles.....                                                                                                                        | 6  |
| 4.    | Data sources and collection .....                                                                                                                                          | 6  |
| 4.1   | Data requirements to calculate the indicator value .....                                                                                                                   | 6  |
| 4.1.1 | Basin area/delineations .....                                                                                                                                              | 6  |
| 4.1.2 | Cooperation arrangements and their operability .....                                                                                                                       | 7  |
| 4.2   | Sources of data.....                                                                                                                                                       | 7  |
| 4.2.1 | Existing data sources.....                                                                                                                                                 | 8  |
| 4.3   | Recommendations on data management and quality .....                                                                                                                       | 8  |
| 5.    | Step-by-step data collection and computation of indicator 6.5.2 .....                                                                                                      | 9  |
| 5.1.1 | Step 1 Identify the transboundary River and Lake basins and aquifers .....                                                                                                 | 9  |
| 5.1.2 | Step 2 Calculate the surface area of each transboundary basin and aquifer, and the total sum.....                                                                          | 9  |
| 5.1.3 | Step 3 Review existing arrangements for transboundary cooperation in water management and verify which transboundary waters are covered by a cooperation arrangement ..... | 10 |
| 5.1.4 | Step 4 Check which of the existing arrangements satisfy which criteria for operability.....                                                                                | 11 |
| 5.1.5 | Step 5 Calculate the indicator value .....                                                                                                                                 | 12 |
| 6.    | Contact .....                                                                                                                                                              | 12 |

## 1. PRESENTATION OF SDG INDICATOR 6.5.2 AND MAIN DEFINITIONS

### 1.1 TRANSBOUNDARY RIVER/LAKE BASINS AND AQUIFERS MANAGEMENT AND SDG INDICATOR 6.5.2

Most of the world’s water resources are shared: at least 592 transboundary aquifers have been identified and 310 transboundary lake and river basins cover nearly one half of the Earth’s land surface and account for an estimated 60% of global freshwater. Approximately 40% of the world’s population live in river and lake basins shared by two or more countries and over 90% live in countries that share basins. The use of water resources has potential impacts across these transboundary waters (rivers, lakes and aquifers), which in turn necessitates cooperation between countries that share them. Intensive water use, flow regulation or pollution of transboundary waters potentially limit a country’s development aspirations and therefore makes transboundary cooperation essential. Transboundary water cooperation can also act as a catalyst for regional integration and wider development between countries that can achieve greater gains than might be possible from unilateral action. Also, cooperation can be seen as a pre-requisite to adaptation strategies on transboundary waters to mitigate the impacts of climate change.

Cooperation over transboundary waters can take many varied forms at local, national, regional and global levels. While capturing all types of cooperative efforts is impossible, SDG indicator 6.5.2 seeks to capture an aspect that is central to sustaining cooperation in the long-term, namely the presence of ‘operational’ agreements or other arrangements concluded between countries and relating to specific transboundary rivers, lakes and/or aquifers. The importance of having specific agreements or other arrangements in place is reflected in the Convention on the Law of the Non-navigational Uses of International Watercourses (New York, 1997), the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992), and the draft Articles on The Law of Transboundary Aquifers (2008; UN General Assembly resolutions 63/124, 66/104, 68/118, and 71/150)), as well as in the experience of many countries that have adopted and effectively implemented such arrangements.

In supporting the monitoring of SDG target 6.5, monitoring the presence of operational arrangements for transboundary water cooperation, SDG indicator 6.5.2 provides a complement to SDG indicator 6.5.1 which measures the advancement of integrated water resources management (IWRM) at all levels.

### 1.2 MONITORING CONCEPT AND MAIN DEFINITIONS

**Target 6.5** By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

**Indicator 6.5.2** Proportion of transboundary basin area with an operational arrangement for water cooperation

The indicator is defined as the proportion of **transboundary basin** area with an operational arrangement for water cooperation within a State.

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DEFINITION</b> | A <b>transboundary basin</b> 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 <b>basin</b> comprises the entire catchment area of a surface water body (river or lake), or for groundwater, the area of the aquifer, i.e. the entire permeable water-bearing geological formation. For the purpose of calculating the value of SDG indicator 6.5.2 the <b>transboundary basin area</b> is the extent of the catchment area (river or lake); or the extent of the aquifer (groundwater). |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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

- the spatial coverage of transboundary basin areas located in a State;
- a determination of the extent to which these areas are covered by operational **arrangements for water cooperation**.

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DEFINITION</b> | <b>Arrangement</b> for water cooperation refers to: a bilateral or multilateral treaty, convention, agreement or other arrangement, such as memorandum of understanding, between riparian States that provides a framework for cooperation on transboundary water management. Agreements or other kind of formal arrangements may be interstate, intergovernmental, interministerial, interagency or between regional authorities. For additional guidance on what constitutes an ‘arrangement for water cooperation’ see note [2], Guide to reporting <sup>1</sup> . |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

SDG indicator 6.5.2 measures operational arrangements for both river and lake basins and aquifers. The relative importance of surface water and groundwater may differ per State; therefore, the indicator allows for the possibility to disaggregate the data and highlights specific needs at national, regional and global levels related to both river and lake basins, and transboundary aquifers separately.

|                       |                                                                                                                                                                                                                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>COMMON MISTAKE</b> | 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. The indicator is therefore not referring to the whole area of a basin (see below section 4.1.1). |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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

- There is a **joint body or mechanism** (e.g. a river basin organization) for transboundary cooperation;
- 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 coordinated 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.

While many other factors influence cooperation, the criteria for a specific basin to be considered “operational” seek to capture if key elements are in place to foster transboundary water cooperation.

---

<sup>1</sup>UNECE, 2019, *Guide to reporting under the Water Convention and as a contribution to SDG indicator 6.5.2*

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GOOD PRACTICE | It is not necessary to have an arrangement in place to report on SDG indicator 6.5.2. The reporting template compiles information on the existence of arrangements, on the four “operationality” criteria as well as on informal cooperation. As such, States are strongly invited to fill the reporting template in order to report on existing cooperation processes, even when those do not take place in the framework of an arrangement. |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The four criteria seek to determine whether the State in question has cemented its cooperation through activities subsequent to the adoption of an arrangement. The criterion on joint or co-ordinated objectives, strategies or plans could for example *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. In addition to the four criteria, to assess “operationality”, other principles should be supported to ensure result-oriented arrangements, 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 cooperation is also critical. Both financing and gender considerations are addressed in SDG indicator 6.5.1.

### 1.3 SPECIFIC APPROACH FOR TRANSBOUNDARY AQUIFERS

A transboundary aquifer can be considered as covered by an operational arrangement in two situations.

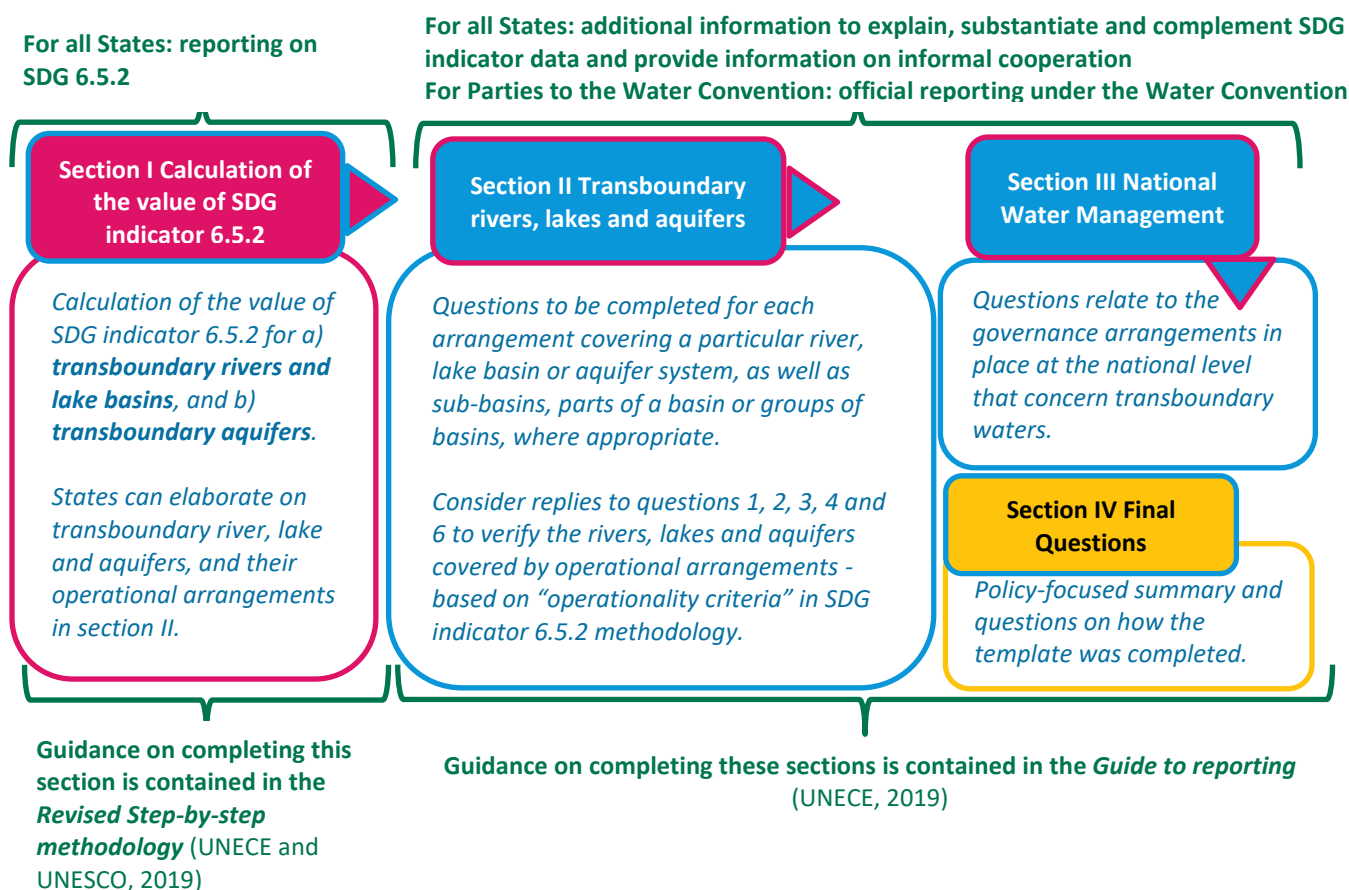
- 1) There is an arrangement specifically dedicated to the aquifer that is in place, and this arrangement complies with the four criteria listed above;
- 2) There is no arrangement specifically dedicated to the aquifer, but there is evidence that the aquifer is covered in the provisions or activities related to an operational arrangement, e.g. groundwaters are included within an operational arrangement that covers a specific transboundary river or lake basin. For additional guidance on the inclusion of aquifers in river and lake basin arrangements see note [30], Guide to Reporting.

## 2. THE REPORTING TEMPLATE AND LINKAGES TO OTHER REPORTING INITIATIVES

### 2.1 THE REPORTING TEMPLATE AND LINKS WITH THE CONVENTION ON THE PROTECTION AND USE OF TRANSBOUNDARY WATERCOURSES AND INTERNATIONAL LAKES

The introduction of SDG indicator 6.5.2 coincided with the introduction of a reporting mechanism under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention). In order to maximise synergies between the reporting by 43 Parties to the Water Convention, and reporting on SDG indicator 6.5.2, UNECE and UNESCO aligned both reporting processes. From a practical standpoint this means that reporting for SDG indicator 6.5.2, and reporting under the Water Convention, are aligned using a single reporting template. The figure below illustrates how that alignment is done. Sections I and II are focused on gathering data to calculate the value of SDG indicator 6.5.2 and to provide substantial details underpinning the calculation of the value of SDG Indicator 6.5.2. Sections II and III allow States to further explain, substantiate and complement the data provided under section I. Section IV summarizes key challenges and achievements in transboundary water cooperation, and provides background information on the reporting process, e.g. who was responsible for completing the reporting template.

Structure of the reporting template for the second reporting exercise



The template helps to provide States with a fuller picture of the progress made on transboundary water cooperation within the State that cannot be explained from the value of the SDG indicator 6.5.2 alone, i.e., in section I. Completing all sections of the reporting template affords all States sharing transboundary waters a wider greater appreciation range of cooperative efforts than can be captured solely by SDG indicator 6.5.2. Parties to the Water Convention have the benefit that they can use one reporting template to report both on SDG indicator 6.5.2 and on progress in implementing the Water Convention.

## 2.2 SDG INDICATOR 6.5.1 AND OTHER REPORTING INITIATIVES

Within the framework of UN-Water’s Integrated Monitoring Initiative for SDG 6, reporting on SDG Indicator 6.5.2 has been co-ordinated with other SDG indicators, notably SDG indicator 6.5.1. SDG 6.5.1 measures the implementation of IWRM at all levels, including transboundary. When reporting on SDG Indicator 6.5.1, States are asked to report on the degree of IWRM implementation in their most important rivers, lakes and aquifers, including their arrangements for transboundary water management, any organisational frameworks in place, the degree to which data and information is exchanged, the level of financing for transboundary cooperation, as well as gender

objectives<sup>2</sup>. Where appropriate, States should co-ordinate the submission of their national reports related to 6.5.1 and 6.5.2 in order to ensure for a consistent response.

States are also encouraged to refer to other reporting commitments, as there might be synergies with reporting under indicator 6.5.2 Some States already report to regional organizations (e.g. the European Union, African Ministerial Council on Water or the Southern African Development Community) on the advancement of transboundary water cooperation.

### 3. PROGRESS AND UPDATES BETWEEN MONITORING CYCLES

Reporting for SDG indicator 6.5.2 takes place every three years. During the first reporting exercise 108 States sharing transboundary waters responded, and almost all those States submitted national reports. Based on the experience from the first reporting exercise, revisions were made to the reporting template e.g. some questions were clarified. However, a similar reporting template is being used for the second reporting exercise, which means that States can use previously submitted reports as a basis for their subsequent submission. In so doing, the requirements of subsequent reporting exercises should be lighter, and States can concentrate on highlighting any developments since the previous reporting exercise, or, where appropriate, by providing additional detail / clarification to their previous submission.

### 4. DATA SOURCES AND COLLECTION

#### 4.1 DATA REQUIREMENTS TO CALCULATE THE INDICATOR VALUE

##### 4.1.1 BASIN AREA/DELINEATIONS

For a **transboundary river or lake**, the basin area is determined by the extent of its catchment. The catchment area of a surface water body should be understood as the area receiving the waters from rain or snow melt, which drain downhill (on the surface or below the surface of the ground in the unsaturated or saturated zones) into a surface water body. In hydrological terms “catchment area” equally applies to areas from which water drains downhill into a part of the river (for example, the area upstream of the point of the confluence of a river with its tributary or the area upstream of the outflow of a lake) or areas from which water drains downhill into the totality of a river (i.e. the area upstream of the point where the river flows into the sea, an enclosed lake or desert sink). The boundaries of the catchment and its extent are easily obtained from topographic maps.

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

---

<sup>2</sup> UNESCO WWAP, 2019, Toolkit on Sex-disaggregated Water Data

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. For more information on an aquifer as a water statistical unit and on types of aquifers, see the “International Recommendations for Water Statistics” document.<sup>3</sup>

**Surface areas of a country which are part of a transboundary river, lake or aquifer basin** (in km<sup>2</sup>) are derived from intersecting basin areas with country borders.

#### 4.1.2 COOPERATION ARRANGEMENTS AND THEIR OPERATIONALITY

States should also gather information on all their **cooperation arrangements** on all their transboundary waters (both surface and groundwater) including information on the scope of such arrangements (e.g. are both surface water and groundwater covered by the arrangement? Is the basin fully or only partially covered, e.g. only the section close to the border?).

In addition, for each basin and **under each cooperation arrangement**, States should gather information determining the **operationality** of the arrangements. Namely on the following aspects:

- Existence of a joint body or mechanism (e.g. a river basin organization) for transboundary cooperation;
- Regular (at least once per year) communications between riparian States in form of meetings - either at the political or technical level;
- Existence of joint or coordinated water management plan(s), or of joint objectives;
- Regular exchange of data and information (at least once per year) between riparians.

These criteria do not have to be embedded in the agreement/arrangement but should be happening in practice.

#### 4.2 SOURCES OF DATA

At the country level, ministries and agencies responsible for surface water and groundwater resources (e.g. ministry of the environment, water, natural resources, energy or agriculture; institutes of water resources, hydrology or geology, or geological surveys) typically have spatial information relating to the location and extent of surface water basin boundaries and aquifer delineations (as Geographical Information Systems shapefiles). Information on any existing arrangements and their operationality is also commonly available from the same institutions.

Moreover, a number of organizations at the basin level, such as established river basin organizations with a mandate for transboundary cooperation, have databases with relevant information, including in some cases also on transboundary aquifers. The Parties to the respective basin agreements report specific information which may be relevant for monitoring the indicator and for coordinating reporting by States. Some transboundary cooperation organizations or ministries that represent a riparian party to an agreement make available information about their meetings and activities (monitoring and planning cooperation and information sharing), in some cases through websites, which can contribute to validating information on operationality.

---

<sup>3</sup> UNDESA, Statistics Division, Statistical papers Series M 91, 2012,  
[https://unstats.un.org/unsd/publication/seriesM/seriesm\\_91e.pdf](https://unstats.un.org/unsd/publication/seriesM/seriesm_91e.pdf)

#### 4.2.1 EXISTING DATA SOURCES

In the absence of available information at the national level, global datasets on transboundary basins as well as about arrangements and organizations for transboundary cooperation are available, which could be used in the absence of more detailed information, in the short term in particular.

##### *Delineations of transboundary waters*

For basins which have not been delineated nationally, in particular for transboundary aquifers, delineations are available through the Transboundary Waters Assessment Programme<sup>4</sup>, as well as through the Transboundary Freshwater Dispute Database of the Oregon State University<sup>5</sup> (with 310 transboundary river basins). Relevant information has also been compiled for 592 transboundary aquifers (including transboundary groundwater bodies as defined in the European Union Water Framework Directive) by the UNESCO IGRAC project<sup>6</sup>. Such delineations could be used if no other information is available. Gradually the quality of the spatial information can be improved.

Those openly available databases can support States in verifying the delineations of their transboundary basins.

##### *Cooperation arrangements*

The International Freshwater Treaties Database<sup>7</sup>, maintained by Oregon State University (OSU), which was last updated to include all arrangements up to 2008, includes 686 international freshwater treaties.

**Organizations for transboundary water cooperation:** the International River Basin Organization Database from OSU<sup>8</sup> contains detailed information on 120 international river basin organizations, including bilateral commissions, around the world. The comprehensive information includes, for example, functional scope, decision making and information sharing mechanisms, as well as whether groundwater issues are a part of the organization’s scope.

**Regional assessments describing and inventorying agreements** have been undertaken, contributing to the baseline globally, for example, status of transboundary water cooperation in the pan-European region<sup>9</sup> or the inventory of shared water resources in Western Asia<sup>10</sup>; and regional inventories of transboundary aquifers under the Internationally Shared Aquifer Resources Management programme (UNESCO’s International Hydrological Programme)<sup>11</sup>.

#### 4.3 RECOMMENDATIONS ON DATA MANAGEMENT AND QUALITY

The spatial data of basin areas should ideally be kept as GIS shapefiles to facilitate the necessary calculations, at different scales, if needed. **It is good practice to store the GIS data on river and lake basins and aquifers as distinct**

<sup>4</sup> <http://www.geftwap.org/>

<sup>5</sup> <https://tfddmgmt.github.io/tfdd/map.html>

<sup>6</sup> spatial data are available at [http://ihp-wins.unesco.org/layers/geonode:tba\\_map2015](http://ihp-wins.unesco.org/layers/geonode:tba_map2015)

<sup>7</sup> Available at <http://www.transboundarywaters.orst.edu/publications/atlas/index.html>

<sup>8</sup> Available at <http://www.transboundarywaters.orst.edu/research/RBO/index.html>

<sup>9</sup> [http://www.unece.org/env/water/publications/pub/second\\_assessment.html](http://www.unece.org/env/water/publications/pub/second_assessment.html)

<sup>10</sup> <https://www.unescwa.org/publications/inventory-shared-water-resources-western-asia>

<sup>11</sup> <http://www.isarm.org/>

data layers, while ensuring consistency of coordinate systems and projection used to allow for easy calculations using appropriate spatial analysis tools.

Sufficient supporting information to enable interpretation and reporting should also be stored. It is particularly important to keep track of operationality criteria to ensure consistency in reporting over time. Also, for this information, keeping track of cooperation on river and lake basins and aquifers separately is advisable.

Exchange of information and ideally coordination of approaches through collaboration among co-riparian or aquifer sharing States would be beneficial. Especially, consistency among all States sharing transboundary waters would be valuable. The compatibility of the data may be improved gradually with country-to-country dialogue and technical investigations, notably on transboundary aquifers.

## 5. STEP-BY-STEP DATA COLLECTION AND COMPUTATION OF INDICATOR 6.5.2

### 5.1.1 STEP 1 IDENTIFY THE TRANSBOUNDARY RIVER AND LAKE BASINS AND AQUIFERS

As the first step, the river and lake basins and aquifers in the territory of the country that are transboundary should be identified. While the identification of transboundary river and lake basins is relatively straightforward, the identification of transboundary aquifers may prove more challenging. The absence of transboundary river and lake basins should not be taken as evidence for the absence of transboundary aquifers, especially in arid areas.

If there are no transboundary river and lake basins or aquifers, reporting is not applicable.

In the case where States have not considered it necessary to establish an arrangement for transboundary waters - e.g. due to the small size of the river, lake or aquifer, or the proportion of area in one country being negligible –the basin has still to be identified and listed in the reporting template. In section II, question 1 of the template States have the opportunity to explain why an arrangement is not in place.

|                      |                                                                                                                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FILLING THE TEMPLATE | The list of the transboundary river and lake basins and aquifers should be reported in the corresponding two tables of section I of the reporting template; this information must then be supplemented through responses to section II of the reporting template. |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 5.1.2 STEP 2 CALCULATE THE SURFACE AREA OF EACH TRANSBOUNDARY BASIN AND AQUIFER, AND THE TOTAL SUM

Commonly at least the basins of the rivers and lakes have been delineated through topographic maps and the basin area is known or easily measurable.

For transboundary aquifers, at least estimates of aquifer extents should be available in ministries and/or agencies competent in the field of water resources. If estimates are not available and further studies are not possible within the reporting timeframe, information on delineation gathered from global databases can be used (see section 4.2 above).

The delineations of the river and lake basins and of the aquifer extent can be verified with existing open databases (referenced above), and reference to supporting data reviews or investigations could be provided, if necessary. It is also recommended that the consistency of this information is checked with co-riparian/aquifer sharing States.

The total transboundary surface area in the country is the sum of the surface areas in the country of each of the transboundary river and lake basins and aquifers (expressed in km<sup>2</sup>). Transboundary areas for different types of systems (e.g. river and lake basins and aquifers) or multiple aquifers may overlap. The area of transboundary aquifers, even if located within a transboundary river basin, should be added together to be able to track progress of cooperation on transboundary aquifers. As both the area of river and lake basins and aquifers count towards the total indicator value, the transboundary basin area can be larger than the area of the country itself. However, as the indicator value is a percentage, its value can never be more than 100 per cent.

Alternatively, where the precise area of any river and lake basins and/ or aquifers is unknown but it is clear that all waters are covered by an operational arrangement or arrangements, then the value of the indicator value can be given as 100 per cent. Conversely, where the precise area of any river and lake basins and/or aquifers is unknown and there are no operational arrangements in place for these waters, the indicator can be given as 0 per cent.

The calculations can most easily be carried out with GIS.

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SPECIAL CASE FOR AQUIFERS | <p><b>Overlapping aquifers</b></p> <p>In the case of hydraulically connected overlapping aquifer layers, the aquifer can be treated as a single multi-layer aquifer system, and the total transboundary area for the aquifer component can be the aggregate projection of the aquifers on the land surface. When different aquifer systems not hydraulically connected are vertically overlapping, the different relevant projected areas are to be considered separately. When the delineation of aquifer systems is based on other rules at the national level, those rules can be used, such as in the case of “groundwater bodies” as defined in the European Union legislation.</p> <p>In general, the areas corresponding to the projection on the land surface of different overlapping aquifers that have no hydraulic connection are computed each as a different transboundary area and summed up.</p> |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

5.1.3 **STEP 3 REVIEW EXISTING ARRANGEMENTS FOR TRANSBOUNDARY COOPERATION IN WATER MANAGEMENT AND VERIFY WHICH TRANSBOUNDARY WATERS ARE COVERED BY A COOPERATION ARRANGEMENT**

Review all existing agreements and other arrangements (e.g. treaties, conventions, memoranda of understanding) concerning transboundary waters shared by the country and associate them to the appropriate transboundary river and lake basins, and/or aquifers.

As older agreements/arrangements provide a basis for operational cooperation, the review should not be limited to recent agreements only. Moreover, the scope of arrangements may vary. For example, some arrangements may refer only to a specific use, while others cover multiple uses. The next steps allow for the determination whether the different arrangements operationally support transboundary water cooperation.

Some operational arrangements for integrated management of transboundary waters cover both surface waters and groundwaters. In such cases, it should be clear that the geographical extent of both (i.e. the sum of the transboundary river and lake basins and transboundary aquifers’ extent) is used to calculate the indicator value.

In other cases, the area of application may be limited to a border section of the watercourse and in such cases only the corresponding area should be considered as potentially having an operational arrangement for calculating the

indicator value. For further information on determining the area of cooperation within an arrangement see note [23] of the Guide to Reporting (UNECE, 2019).

|                      |                                                                                                                                                                                                                                                                                      |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GOOD PRACTICE</b> | In situations where more than two riparian States share a basin, but only some of them have operational arrangements in place, the indicator value may mask the fact that a riparian country does not have operational arrangements with all its upstream and downstream neighbours. |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

At the end of this step, the transboundary basins covered by cooperation arrangements (and their respective areas) should be known.

#### 5.1.4 STEP 4 CHECK WHICH OF THE EXISTING ARRANGEMENTS SATISFY WHICH CRITERIA FOR OPERATIONALITY

The following check-list allows States to determine which criteria for operationality, a particular cooperation arrangement satisfies, and if where all four criteria are satisfied, the arrangement can be considered to be ‘operational’.

##### Check-list for operationality:

- Is there a joint body for transboundary cooperation? For guidance on what constitutes a ‘joint body or mechanism’ see notes [38]-[44] of the Guide to Reporting.
- Do the relevant States **meet regularly**, i.e., at least once per year, either at the political and/or technical level?
- Have the riparian States adopted joint or **coordinated water management plan(s), strategies and/or objectives?** For guidance on this criterion see note [59] of the Guide to Reporting
- Do the relevant States **regularly exchange of information and data (at least once per year)?** For guidance on this criterion see note [64] of the Guide to Reporting

The four criteria should apply within the framework of the arrangement in question in order to consider the associated transboundary basin covered by an operational arrangement.

If any of the aforementioned question are answered ‘no’, the cooperation arrangement cannot be considered operational.

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GOOD PRACTICE</b> | Even if the transboundary area in question is not covered by a formal arrangement for water cooperation, information can be provided for each of the four ‘operationality criteria’. This will allow the reporting to compile, analyse and share lessons about situations where cooperation takes place out with formal arrangements. In addition, States have the opportunity to provide further information on the progress towards adoption and implementation of any arrangements, and any cooperative activities that fall out with the four criteria of operationality, in section II and IV of the reporting template (see notes [21], [36], [39], [56], [58], [64] and [69] of the Guide to Reporting). |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FILLING<br>THE<br>TEMPLATE | The presence of an arrangement and each of the four criteria of operationality can be reported directly and separately in the section I of the reporting template. This is a new feature of the template used for the second reporting phase, which allows tracking better the advancement of cooperation and evidencing the calculation of the indicator. In section II States should then supplement their responses relating to specific transboundary river and lake basins and/or aquifers. |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 5.1.5 STEP 5 CALCULATE THE INDICATOR VALUE

Calculate the indicator value by adding the surface areas in the country of the transboundary river and lake basins and/ or aquifers that are covered by an operational cooperation arrangement and dividing it by the total summed up area in the country of all transboundary basins (including aquifers). The total sum should then be multiplied by 100 to obtain a percentage.

Parts of a country’s territory that covered by a river and/or lake basin, and an aquifer, which are both covered by an operational arrangement, will be double-counted. This means that the areas of river and lake basins and the extent of any aquifers will be both included in the calculation of the indicator value. Adopting such an approach allows the indicator to track both separately and joint progress on cooperation on both transboundary river and lake basins and aquifers.

If an operational agreement covers only a sub-basin (or a portion of the transboundary basin), this will be considered in the calculation of the value of SDF indicator 6.5.2 by computing the relevant area covered by the operational arrangement (and not the whole basin area).

## 6. CONTACT

Any queries related to SDG indicator 6.5.2 and the reporting process should be sent to both UNECE and UNESCO, at the following email addresses:

UNECE: [transboundary\\_water\\_cooperation\\_reporting@un.org](mailto:transboundary_water_cooperation_reporting@un.org)

UNESCO: [transboundary\\_water\\_cooperation\\_reporting@unesco.org](mailto:transboundary_water_cooperation_reporting@unesco.org)

Additional materials related to SDG indicator 6.5.2 are available at the following websites:

UN-Water: <http://www.sdg6monitoring.org/indicators/target-65/indicators652/>

UNECE: [http://www.unece.org/water/transboundary\\_water\\_cooperation\\_reporting.html](http://www.unece.org/water/transboundary_water_cooperation_reporting.html)

UNESCO: <http://ihp-wins.unesco.org/documents/332>