Adjustment of H2020 Water indicators

Concept note

Date: 25 September 2017

1. Background

The UfM Ministerial meeting on Environment and Climate Change, held in Athens on 13 May 2014, emphasized for the 2nd phase the need for all partner countries "to address data needs by applying the principles of Shared Environment Information Systems (SEIS) in line with the commitments under the ECAP Decisions of the Barcelona Convention; also contributing to its regional integrated monitoring." UfM Ministers gave the H2020 Steering Group the mandate to develop and adopt a work programme for the second phase in line with the on-going ECAP/MSFD work, the update National Action Plans (NAPs) and MSSD review.

2. Objectives

The objective of this document is to provide more information on the further development of the H2020 Water indicators supported by the ENI SEIS II South project. During the discussion at the "1st ENI SEIS II South Support Mechanism Regional workshop on indicators" that took place on 17-18 May 2017 in Copenhagen, the participants agreed to keep the 3 existing water indicators, with some adjustments. The existing H2020 core water indicators are:

	Name of indicator	Link to Indicator Specification sheet developed under Phase 1
IND 3	Share of population with access to an improved sanitation system (total, urban, rural)	IND 3 Specification sheet
IND 4	Volume of waste water collected, of which volume of waste water treated (and type of treatment)	IND 4 Specification sheet
IND 5	Nutrient concentrations in transitional, coastal and marine waters	IND 5 Specification sheet

These indicators are complementary to other existing indicators (e.g. SGD, MSSD, IMAP, NAPs). These links are identified below. It is assumed that if the same indicator is already reported under parallel processes (e.g. SDG), it should not be reported again under H2020 in accordance to the principles of SEIS. However, in most other cases, the further development of H2020 indicators is considered as a mechanism to support progress under other initiatives (e.g. MSSD, NAPs).

3. Approach for developing water indicators

The proposed approach for the elaboration of the H2020 Water indicators is as follows:

i. Identification of the methodological shortcomings and challenges of the H2020 core water indicators (IND3- IND5) identified in the Phase I of the ENI SEIS project and proposal for way forward;

ii. Identification of the methodological aspects of the proposed "satellite" indicators/supplementary information;

iii. Justification and adequacy of the proposed water indicators further developed under ENI SEIS II South project through the application of a set of selection criteria.

4. Core H2020 indicators

In this section, the Core Water Indicators (IND 3, IND 4, IND 5) and their adjustments or extensions proposed for ENP SEIS South Phase 2 are presented and discussed. It includes challenges identified in Phase 1 and a few points for consideration with the countries.

IND 3: Share of population with access to an improved sanitation system (total, urban, rural)

Lack of sanitation poses health risks from contaminated drinking water to life-threatening forms of diarrhea to infants, particularly for poorer segments of the population who are most exposed to inadequate human waste disposal. This indicator gives an indication of the accessibility to sanitation services, e.g. sewerage network.

Links with existing indicators

IND 3 corresponds to Millennium Development Goals (MDGs; 2000-2015) Indicator 7.9: Proportion of population using an improved sanitation facility. Under the Sustainable Development Goals (SDGs; 2015-2030), the definition of the sanitation indicator (SGD 6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water) has been (slightly) revised by referring to "safely managed sanitation services" instead of "improved sanitation systems". According to the SDG metadata[1] for SGD 6.2.1 Metadata-06-02-01 "(…) *the above consultation concluded that post-2015 targets, which apply to all countries, should go beyond the basic level of access and* ***address indicators of safe management of sanitation services, including dimensions of accessibility, acceptability and safety****. The Expert Working Group called for analysis of faecal waste management along the sanitation chain, including containment, emptying of latrines and septic tanks, and safe on-site disposal or transport of wastes to designated treatment sites. Classification of treatment will be based on categories defined by SEEA and the International Recommendations for Water Statistics and following a laddered approach (primary, secondary and tertiary treatment)."* This means that the indicator is extended to consider the management aspects (not just access), linking closely to IND 4 (see below).

IND 3 also corresponds to MSSD indicator 2.14 (MSSD factsheet in Annex) and core NAP indicator EO5(1).

Identified challenges

- **Geographical scope**: In ENP SEIS Phase 1, most of the data obtained for IND 3 was at the national level, with the exception of Morocco that provided data for the coastal watersheds the 16 provinces and prefectures in the coastal hydrological basins of Oued Moulouya and Tangier in the Mediterranean region. Within the context of H2020, it is most relevant to get more information at the sub-regional level, namely at the coastal watershed level[2]. However, data at this level may not be available for most countries. There is a need to provide capacity building on developing methodological options for downscaling national data to the coastal watershed level.

[1] https://unstats.un.org/sdgs/metadata/

[2] Coastal watershed data is mainly of relevance for Algeria, Morocco, Tunisia, Libya, Egypt, Jordan. For other countries, such as, Israel, Lebanon and Palestine, the national territories (i.e. not only the Mediterranean hydrological basins) could be considered as the coastal hydrological basins, as in Phase 1.

Points for consideration

- Change in the exact definition of the SDG indicator as compared to MDG (from improved sanitation system to safely managed sanitation services), the MSSD indicator 2.14 and core NAP indicator EO5(1). In this respect, we propose to keep the current definition (improved sanitation system) in line with the ongoing process in MAP system. However, we will investigate the linkages between "improved sanitation system" and "safely managed sanitation system" whenever possible.

IND 4 - Volume of waste water collected, of which volume of waste water treated (and type of treatment

The discharge of untreated wastewater directly in freshwater, coastal and marine environments causes enormous health concern. It also represents a significant pressure on aquatic ecosystems as wastewater carries high loads of nutrients (nitrogen and phosphorus), and pathogenic micro-organisms (including coliforms, faecal streptococcus, salmonella etc.). In cities, sewage discharged directly into public sewerage systems generally contains a variety of chemical wastes originating from households and industrial installations.

Links with existing indicators

IND 4 corresponds to SDG indicator 6.3.1 Proportion of wastewater safely treated (indicator classified by SDG process as Tier II[3]; no SDG metadata file available yet); MSSD indicator 2.5 Percentage of wastewater treated (no MSSD factsheet yet available for this indicator); and core NAP indicators EO5(2) and EO5(3) – see points for consideration below.

Development of IND 4

During the May workshop it was proposed to complement this indicator with more information about the wastewater treatment infrastructure such as **design/actual capacity, age, performances over time**, and with the **quality of effluents** (taking into account information on national standards on effluent quality). Note that during this workshop the quality of effluents was discussed under IND 5 Nutrient concentrations in transitional, coastal and marine waters. However, it would be more logical to include it as an extension of IND 4.

Another extension of IND 4 should include the use of non-conventional water resources, e.g. treated wastewater and desalinated water. In the context of IND 4, it would be logical to strengthen the collection of data and information on the extent of **reuse of treated waste water**.

Identified challenges

- As for IND 3, the most logical geographical scope would be the coastal watershed. That would require the reporting of disaggregated data (volume collected; volume treated; quality of effluent; information on wastewater infrastructure) for each WWTP (above a certain capacity) that falls within the coastal watershed.

- In ENP SEIS Phase 1, the data collected for this indicator had a number of gaps. In some countries, the required dataset is not regularly collected. The results of the metadata survey are expected to provide more information on the availability of data.

- Reported data in Phase 1 showed that the volume of treated wastewater follows closely the volume of collected wastewater. This could be explained by the fact that the volume of wastewater collected is estimated based on the volume of wastewater entering the WWTPs, whereas the volume of wastewater treated is estimated on wastewater leaving the WWTPs. However, this doesn't give a clear picture of the performance of the WWTPs and effectiveness of the wastewater management and treatment. Another shortcoming of the

[3] Tier II: Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries.

indicator is that the fraction of generated wastewater that remains uncollected (and therefore untreated) is not accounted for.

Points for consideration

- This indicator can be also expressed in terms of population equivalent (p.e.)[4]; an expression of the per capita contribution of wastewater BOD, as compared to the BOD of standard wastewater. Thus the p.e. indicates the number of people who would be responsible for the wastewater that has the same characteristics (e.g. BOD) as standard wastewater. P.e. is a useful index of the strength of wastewater for the purpose of treatment at a municipal wastewater treatment plant. When compared to volumes, it provides additional information for assessing changes due to wastewater treatment.

- During the May workshop, the quality of WWTP effluents was discussed under IND 5 "Nutrient concentrations in transitional, coastal and marine waters". However, it would be more logical to include it as an extension of IND 4, as part of the information on the effectiveness of the wastewater management and treatment.

- Considering the multiple proposals for extending the scope of IND 4, it would be best to consider the "Volume of waste water collected, of which volume of waste water treated" as the main indicator, supplemented by additional information on:
    - Volume of wastewater generated
    - Wastewater treatment infrastructure: design/actual capacity, age, performance over time of WWTP
    - Type of treatment (primary, secondary, tertiary)
    - Quality of effluent
    - Volume of (treated) wastewater re-used

[4] OECD definition of Population equivalent (in waste-water monitoring and treatment): PE refers to the amount of oxygen—demanding substances whose oxygen consumption during biodegradation equals the average oxygen demand of the waste water produced by one person. For practical calculations, it is assumed that one unit equals 54 grams of BOD per 24 hours. p.e.) https://stats.oecd.org/glossary/detail.asp?ID=2086
EC definition: The organic biodegradable load having a five-day biochemical oxygen demand (BOD5) of 60 g of oxygen per day http://ec.europa.eu/environment/water/water-urbanwaste/info/glossary_en.htm

IND 5 - Nutrient concentrations in transitional, coastal and marine waters

Although the main body of water of the Mediterranean is characterized by very low nutrient concentrations, some coastal hotspots receive excessive loads of nutrients from sewage effluents, river fluxes, aquaculture farms, fertilizers, and industrial facilities, resulting into intense eutrophic phenomena with adverse effects for the marine ecosystem and humans. This explains why eutrophication in the Mediterranean is mostly limited to coastal areas, enclosed bays, river estuaries, coastal lagoons or embayments with restricted water exchange with the open sea. Although eutrophication has been more intense in the Northern part of the basin, special attention also has to be paid to the Southern part where the population keeps on growing steadily, agricultural and industrial activities are in rapid development and sewage treatment facilities are still lacking behind.

Links with existing indicators

IND 5 corresponds to the Common Indicator 13. Key nutrients concentration in water column being developed under IMAP as part of Ecologic Objective 5. *Human-induced eutrophication is prevented, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters.* Its further development will be streamlined with the development of IMAP indicators.

Development of IND 5

The Workshop participants also proposed to look at **Bathing Water Quality**.

In the Mediterranean region, a number of assessments of the state of microbial pollution have been carried out in collaboration with World Health Organization (e.g. UNEP/WHO 1996 MTS 108; UNEP/MAP-MED POL/WHO 2008 MTS 170). The MAP Technical Reports Series (MTS) no. 108 consolidates and updates all data from 1985-1995 on the state of microbiological pollution of the Mediterranean Sea regarding coastal recreational and shellfish growing areas. Monitoring data were submitted from national MED POL monitoring programmes, MED POL research projects, EC annual reports on bathing waters and other national and international sources. The more recent MTS 170 provides a series of data on microbial pollution in the Mediterranean Sea during the 1996-2006 decade based on the results of compliance monitoring programmes that highlight directly the degree of compliance to the national, Mediterranean or EC legislation. In addition, it shows the trend with respect to compliance monitoring and compares the data with the results of the 1996 report.

The EEA bathing water quality indicator (EEA CSI 022) describes the changes over time in the quality of identified bathing waters (inland and coastal) in EU in terms of compliance with standards for parameters introduced by the EU Bathing Water Directive (76/160/EEC), i.e. microbiological parameters (total coliforms and faecal coliforms) and physicochemical parameters (mineral oils, surface-active substances and phenols), as well as in terms of meeting standards for parameters introduced by the New Bathing Water Directive (2006/7/EC), i.e. microbiological parameters (intestinal enterococci and *Escherichia coli*). The revised Bathing Water Directive (BWD) of 2006 updated and simplified these rules. It requires Members States to monitor and assess the bathing water for at least two parameters of (faecal) bacteria. In addition, they must inform the public about bathing water quality and beach management, through the so-called bathing water profiles. These

profiles contain for instance information on the kind of pollution and sources that affect the quality of the bathing water and are a risk to bathers' health (such as waste water discharges).

The data are expressed in terms of percentage of inland and coastal bathing waters complying with the mandatory values and guide values for microbiological and physicochemical parameters (assessment under the Bathing Water Directive (76/160/EEC) in previous years) and with the mandatory value for *E.coli* and guide values for *E.coli* and intestinal enterococci respectively (assessment during transition period). The data are also expressed in terms of percentage of inland and coastal bathing waters of excellent and at least sufficient quality (assessment under the New Bathing Water Directive (2006/7/EC).

Identified challenges

As identified in IMAP Indicator Assessment Factsheet, the main challenges are:

- Criteria for reference condition and boundaries for key nutrients in the water column have to be built and harmonised through the Mediterranean region;
- Coastal Water types for key nutrients in the water column have to be built and harmonised through the Mediterranean region;
- A clear sampling strategy with a simplified approach in monitoring design and data handling needs to be developed.

Points for consideration

- The data required for an eventual bathing water quality indicator should be available in ENP South countries

5. Proposed "satellite" indicators on water resource management

Taking into account the enlarged scope of the second phase of H2020 to the whole water area (freshwater and marine), participants of the May workshop pointed out the importance to address water resources with a particular focus on water scarcity/water shortage issues as well as non-conventional water resources (see also section on IND 4).

Several indicators have been identified in existing lists that may be considered in the context of H2020. These include:

1. **Change in water-use efficiency over time (SDG 6.4.1) – Water efficiency index (MSSD 2.2),**
2. **Exploitation index of renewable natural resources (MSSD 2.12)**
3. **Water Exploitation Index+ (EEA CSI 018)**
4. **Level of water stress - freshwater withdrawal as a proportion of available freshwater resources (SDG 6.4.2, SCP 2.1)**

The proposed indicators on water resource management should be considered as "satellite" indicators, as a way to distinguish them from the core H2020 indicators. Given the core scope of the H2020 Initiative to "Depollute the Mediterranean Sea" and its tight timeframe, it is considered that although the satellite indicators could be used to strengthen the regional assessment, their development will not go as far as that of the core indicators. This implies that no specific specification/assessment sheet will be produced as part of the ENP-SEIS II South project and no reporting on these indicators is expected by the countries under the H2020 Initiative (tbc). However, the capacity of the countries to produce these indicators in the future will be assessed and support on their development for the purpose of other reporting obligations/initiatives, will be provided, as necessary.

Methodological details of these indicators are included in the Annex.

6. Other information

For this sector, participants of the May indicator workshop raised the importance to explicitly introduce **climate change** as a key driver of change.

The aspects of water governance, water pricing, awareness raising and the nexus pollution/public health have also been identified as relevant elements to be further explored and analysed in the framework of H2020 – in particular in relation with long term investments and post 2020 vision. These aspects will not be addressed using specific H2020 indicators (neither core nor satellite).

7. Selection criteria

A number of selection criteria have been defined to help in the further development of the H2020 Water indicator set and to offer a factual basis for the justification of the selection of new indicators. These are:

1	Be simple, straight-forward, concise, easy to interpret
2	Be issue specific yet relevant to all countries
3	Build on existing indicators process in the region to ensure full use of existing information and data
4	Provide realistic and representative baseline of the current situation
5	Contribute to a balanced DPSIR distribution
6	Provide a comprehensive, yet non-exhaustive coverage of the priority areas
7	Allow for periodic review and update in line with future developments
8	*Is in line with extension of H2020 scope*
9	*Allow for in-depth analysis in relation to previous assessments*
10	*Is able to reflect the effectiveness/impact of new investments*
11	*Is relevant to other regional processes (e.g. EcAP, MSSD)*
12	*To a large extent answers the key H2020 policy question: "What is the progress in depolluting the Mediterranean Sea?"*

Note that criteria 1-7 were used in ENI SEIS I and are now supplemented by 5 additional criteria (8-12) to provide a more comprehensive analysis and assess the added value of new indicators.

The additional indicators discussed above were scored against these criteria:

LEGEND				
Rate	***the extent to which indicator fulfils criterion***			
	Positive/large extent			
	Neutral			
	Negative /low extent			

In the scoring, it was assumed that all criteria carry the same weighting for the sake of simplicity. The scoring is based on 10-5-1 points, corresponding to Green-Yellow-Red categories.

Priority Area	Proposed in relation to H2020 Core Indicator	Indicator/supporting information	1	2	3	4	5	6	7	8	9	10	11	12
Water	IND 4	*WWT Infrastructures (design/actual capacity, age, performance, etc)*												
Water	IND 4	*Volume of (treated) wastewater re-used*											?	
Water	IND 5	*E. coli (Bathing water quality)*												
Water	IND 4/5 (new IND 7?)	*Nutrients from Municipal WWT effluents*												
Water	"Satellite indicators" on water resource management	*Water Efficiency Index (MSSD 2.2); Change in water-use efficiency over time (SDG 6.4.1); Water Exploitation Index+ (EEA CSI 018); Level of water stress (SDG 6.4.2, SCP2.1)*												

Priority Area	Proposed in relation to H2020 Core Indicator	Indicator/supporting information	1	2	3	4	5	6	7	8	9	10	11	12	SCORE
Water	IND 4	*WWT Infrastructures (design/actual capacity, age, performance, etc)*	5	10	1	10	5	5	10	5	10	10	1	5	77
Water	IND 4	*Volume of (treated) wastewater re-used*	10	5	1	10	5	10	10	10	10	5	1	1	78
Water	IND 5	*E. coli (Bathing water quality)*	10	10	5	5	10	5	10	5	10	10	5	10	95
Water	IND 4/5 (new IND 7?)	*Nutrients from Municipal WWT effluents*	5	10	5	10	10	5	10	5	10	10	10	10	100
Water	"Satellite indicators" on water resource management	*Water Efficiency Index (MSSD 2.2); Change in water-use efficiency over time (SDG 6.4.1); Water Exploitation Index+ (EEA CSI 018); Level of water stress (SDG 6.4.2, SCP2.1)*	5	10	10	10	5	1	5	10	10	1	10	1	78

DPSIR distribution

Criterion 5: *Contribute to a balanced DPSIR distribution* is based on the mapping of the indicators (core and additional ones) according to their indicator types (DPSIR). This mapping shows that the core water indicators are mainly Response indicators, implying that proposed Pressure/State/Impact water indicators are favourably scored (green). Note that the allocation of indicators to DPSIR framework was approached from the perspective and objectives of H2020 Initiative. This can be subject to discussion and other interpretation, especially if applied to another context e.g. management of freshwater resources.

				DPSIR Framework				
Priority Area		Indicator	Sub-Indicator/ Suporting information	**Driver**	**Pressure**	**State**	**Impact**	**Response**
H2020 CORE INDICATORS								
Water	3.	Share of total, urban and rural population with access to an improved sanitation system						
Water	4.	Volume of wastewater collected, of which volume of wastewater treated						
Water	4.A	Volume of wastewater collected, of which volume of wastewater treated	Type of treatment					
Water	5.	Nutrient concentrations in transitional, coastal and marine waters						
NEW INDICATORS				"x" - contributing to a balanced distriution across DPSIR				
Water	*4.B*	Volume of wastewater collected, of which volume of wastewater treated	*WWT Infrastructures (design/actual capacity, age, performance, etc)*					
	4.C	Volume of wastewater collected, of which volume of wastewater treated	*Volume of (treated) wastewater re-used*					
Water	*5.B*	(Bathing Water Quality)	*E. coli (Bathing water quality)*			x	x	
Water	*new?*	(Nutrients/ Quality of effluents)	*Nutrients from Municipal WWT effluents*		x			
Water	*new?*	("Satellite indicators" on water resource management)	Water Efficiency Index (MSSD 2.2); Change in water-use efficiency over time (SDG 6.4.1); Water Exploitation Index+ (EEA CSI 018); Level of water stress (SDG 6.4.2, SCP2.1)					

Annex I – Methodological Details of Proposed "Satellite" Indicators

1. **Change in water-use efficiency over time (SDG 6.4.1) – Water efficiency index (MSSD 2.2)**

6.4.1 Change in water-use efficiency over time: Classified by SDG process as Tier III[5] for which no metadata file is yet available.

Water efficiency index (MSSD 2.2): MSSD factsheet_ Water Efficiency Index and PEGASO Water Efficiency Index methodological factsheet.

This index allows the monitoring of progress in terms of the water saved as a result of the demand to reduce the water loss and wastage during the process of both the transport and the use. It is subdivided into total and sectoral efficiency (drinking water, agriculture and industry).

2. **Exploitation index of renewable natural resources (MSSD 2.12)**

Although this indicator is an MSSD indicator, no indicator factsheet is yet available under the revised MSSD. *This implies that either the indicator is still under development and may be modified, adapted or replaced as necessary.* According to 2006 MSSD Factsheet, this indicator measures the relative pressure of annual abstraction (A) over traditional renewable natural drinking water resources (R).

(A / R) x 100

A: Amount of annual traditional renewable natural water volumes consumed for all other purposes, including volume losses during transport ;

R: Annual traditional renewable natural water flow volume. Country resources are individually defined by surface run-off and underground flows, either formed or entering the territory. Volumes are measured on the basis of hydrological data, in reference to average values over sufficiently long periods to ensure stability, and to avoid double accounting of surface and underground water.

The renewable resources exploitation index can sometimes exceed 100%.

3. **Water Exploitation Index+ (EEA CSI 018)**

The WEI+ is a water **scarcity** indicator that provides information on the level of pressure that human activity exerts on the natural water resources of a particular territory. This helps to identify those areas prone to water stress problems. The purpose of implementing the WEI+ at spatial (e.g. sub-basin or river basin) and temporal (monthly or seasonal) scales, which are finer than the annual average at the country scale, is to better capture the balance between renewable water resources and water use. A detailed specification and assessment factsheet for WEI+ in Europe (EEA CSI 018) is available. Note that WEI+ differs from the previous WEI approach by enabling the depiction of more seasonal and regional aspects of water stress conditions across Europe.

[5] Tier III: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested

The regionalised WEI+ is calculated according to the following formula:

WEI+ = (abstractions – returns)/renewable water resources.

Renewable water resources are calculated as 'ExIn + P – Eta – ΔS' for natural and semi-natural areas, and as 'outflow + (abstraction – return) – ΔS' for densely populated areas.

Where: ExIn = external inflow; P = precipitation; ETa = actual evapotranspiration; ΔS = change in storage (lakes and reservoirs); outflow = outflow to the downstream/Sea.

It is assumed that there are no pristine or semi-natural river basin districts or sub-basins in Europe. Therefore, the formula 'outflow + (abstraction – return) – ΔS' is used to estimate renewable water resources.

The WEI+ is part of the set of water indicators published by several international organisations, such as the United Nations Environment Programme (UNEP), the Organisation for Economic Co-operation and Development (OECD), Eurostat and the Mediterranean Blue Plan. There is an international consensus about the use of this indicator.

Once water asset accounts are implemented according to the United Nations System of Environmental Accounting Framework for Water (2012), the necessary parameters for calculating water use and renewable freshwater water resources are harvested

4. **Level of water stress - freshwater withdrawal as a proportion of available freshwater resources (SDG 6.4.2, SCP 2.1).**

This SDG indicator measures the ratio between total freshwater withdrawn by all major sectors and total renewable freshwater resources, after taking into account environmental water requirements. Main sectors, as defined by ISIC standards, include agriculture; forestry and fishing; manufacturing; electricity industry; and services. This indicator is also known as **water withdrawal intensity** (SDG 6.4.2 Metadata-06-04-02). According to the SDG classification, it is classified as Tier II.

Total freshwater withdrawal (TWW) is the volume of freshwater extracted from its source (rivers, lakes, aquifers) for agriculture, industries and municipalities. It is estimated at the country level for the following three main sectors: agriculture, municipalities (including domestic water withdrawal) and industries. Freshwater withdrawal includes primary freshwater (not withdrawn before), secondary freshwater (previously withdrawn and returned to rivers and groundwater, such as discharged wastewater and agricultural drainage water) and fossil groundwater. It does not include non-conventional water, i.e. direct use of treated wastewater, direct use of agricultural drainage water and desalinated water. TWW is in general calculated as being the sum of total water withdrawal by sector minus direct use of wastewater, direct use of agricultural drainage water and use of desalinated water.

Total renewable freshwater resources (TRWR) are expressed as the sum of internal and external renewable water resources. The terms “water resources” and “water withdrawal” are understood here as freshwater resources and freshwater withdrawal. Internal renewable water resources are defined as the long-term average annual flow of rivers and recharge of groundwater for a given country generated from endogenous precipitation. External renewable water resources refer to the

flows of water entering the country, taking into consideration the quantity of flows reserved to upstream and downstream countries through agreements or treaties.

Environmental water requirements (Env.) are the quantities of water required to sustain freshwater and estuarine ecosystems.

Annex II – MSSD Indicator 2.14 Factsheet