Goal 6 Ensure availability and sustainable management of water and sanitation for all

(Updated on 31 March 2016)

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Target 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

Indicator 6.1.1: Proportion of population using safely managed drinking water services

From UN-Water, WHO and UNICEF:

Definition and method of computation	**Definition**: Population using a basic drinking water source ('improved' sources of drinking water used for MDG monitoring i.e. piped water into dwelling, yard or plot; public taps or standpipes; boreholes or tubewells; protected dug wells; protected springs and rainwater) which is located on premises and available when needed and free of faecal (and priority chemical) contamination. **Method of computation**: Household surveys and censuses currently provide information on types of basic drinking water sources listed above, and also indicate if sources are on premises. These data sources often have information on the availability of water and increasingly on the quality of water at the household level, through direct testing of drinking water for faecal or chemical contamination. These data will be combined with data on availability and compliance with drinking water quality standards (faecal and chemical) from administrative reporting or regulatory bodies. The WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) estimates access to basic services for each country, separately in urban and rural areas, by fitting a regression line to a series of data points from household surveys and censuses. This approach was used to report on use of 'improved water' sources for MDG monitoring. The JMP is evaluating the use of alternative statistical estimation methods as more data become available. The accompanying Statistical Note describes in more detail how data on availability and quality from different sources, can be combined with data on use of different types of supplies, as recorded in the current JMP database to compute the proposed indicator.
	Predominant type of statistics: national estimates adjusted for global comparison.
Rationale and interpretation	MDG target 7C called for 'sustainable access' to 'safe drinking water'. At the start of the MDG period, there was a complete lack of nationally representative data about drinking water safety in developing countries, and such data were not collected through household surveys or censuses. The JMP developed the indicator use of 'improved' water sources, which was used as a proxy for 'safe water', as such sources are likely to be protected against faecal contamination, and this metric has been used since 2000 to track progress towards the MDG target. International consultations since 2011 have established consensus on the need to build on and address the shortcomings of this indicator; specifically, to address normative criteria of the human right to water including accessibility, availability, and quality. The above consultation concluded that JMP should go beyond the basic level of access and address safe management of drinking water services, including dimensions of accessibility, availability and quality. The proposed indicator of 'safely managed drinking water services' is designed to address this.

Sources and data collection	Access to water and sanitation are considered core socio-economic and health indicators, and key determinants of child survival, maternal, and children's health, family wellbeing, and economic productivity. Drinking water and sanitation facilities are also used in constructing wealth quintiles used by many integrated household surveys to analyse inequalities between rich and poor. Access to drinking water and sanitation is therefore a core indicator for most household surveys. Currently JMP database holds around 1600 such surveys and for over 140 countries, at least five data points are available which include information about basic water and sanitation for the period 1990-2015. In high-income countries where household surveys or censuses do not usually collect information on basic access, estimates are drawn from administrative records. Data on availability and faecal and chemical quality of drinking water, and regulation by appropriate authorities will be collected by JMP through consultation with the government departments responsible for drinking water supply and regulation. JMP routinely conducts country consultations with national authorities before publishing country estimates. Data on availability and quality of water supplies are currently available from household surveys or administrative sources including regulators for over 70 high-income countries, and at least 30-40 low- and middle-income countries. Thus, data are currently available from ca. 100 countries, covering the majority of the global population. This number will rise as regulation becomes more widespread in low- and middle-income countries. The population data used by JMP, including the proportion of the population living in urban and rural areas, are those routinely updated by the UN Population Division.
Disaggregation/ additional dimension	Place of residence (urban/rural) and socioeconomic status (wealth, affordability) is possible for all countries. Disaggregation by other stratifiers of inequality (subnational, gender, disadvantaged groups, etc.) will be made where data permit. Drinking water services will be disaggregated by service level, including no service, basic, and safely managed services.
Comments and limitations	Data on availability and safety of drinking water is increasingly available through a combination of household surveys and administrative sources including regulators, but definitions have yet to be standardized. Data on faecal and chemical contamination, drawn from household surveys and regulatory databases, will not cover all countries immediately. However, sufficient data exist to make global and regional estimates of safely managed drinking water services by the time the global community adopts the SDG indicators in
	2016/17.
Gender equality issues	In household surveys access to drinking water is measured at the household level and in most cases it is not possible to disaggregate to accurately measure intra-household inequalities such as sex, age, or disability. Gender-specific data are available for household management of drinking water, and the time spent for water collection (including waiting time at public supply points) can be used as a proxy for gender equality.
Data for global and regional monitoring	JMP will draw upon the national data described above, and regional and global aggregations will be made in a similar fashion as has been done for MDG reporting. Estimates of faecal and chemical contamination, and regulation by appropriate authorities, will be collected from countries and used to adjust the data on use of basic drinking water sources as needed.

Supplementary information	JMP has developed a detailed Statistical Note outlining and illustrating proposals for measuring safely managed drinking water services, building on the Statistical Note shared at the Expert Group Meeting in February 2015. JMP will continue to measure and report on use of 'basic' and unimproved drinking water sources as part of its drinking water ladder to ensure continuity with MDG monitoring.
References	The most recent JMP report: Progress on sanitation and drinking water 2015 update and MDG assessment. New York: UNICEF/WHO, 2015. http://www.wssinfo.org/fileadmin/user_upload/resources/JMP-Update-report-2015_English.pdf http://www.wssinfo.org/definitions-methods/data-sources/ WASH targets and indicators post-2015: recommendations from international consultations. Geneva: Water Supply and Sanitation Collaborative Council; 2014 http://www.wssinfo.org/fileadmin/user_upload/resources/post-2015-WASH-targetsfactsheet-12pp.pdf Methodological note on monitoring WASH and wastewater for the SDGs: http://www.wssinfo.org/fileadmin/user_upload/resources/Methodological-note-onmonitoring-SDG-targets-for-WASH-and-wastewater_WHOUNICEF_8October2015_Final.pdf. Guidelines for drinking water quality, fourth edition. Geneva: WHO; 2011. http://www.who.int/water_sanitation_health/publications/2011/dwq_guidelines/en/ JMP Task Force on Methods Final Report. New York: WHO/UNICEF, December 2014. http://www.wssinfo.org/task-forces/

Target 6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

Indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

From UN-Water, WHO and UNICEF:

Definition and method of computation	**Definition**: Population using a basic sanitation facility at the household level ('improved' sanitation facilities used for MDG monitoring i.e. flush or pour flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with a slab, and composting toilets, the same categories as improved sources of drinking water used for MDG monitoring) which is not shared with other households and where excreta is safely disposed in situ or treated off-site. This is therefore a multipurpose indicator also serving the household element of the wastewater treatment indicator (6.3.1). **Method of computation:** Household surveys and censuses provide data on use of types of basic sanitation facilities listed above. The percentage of the population using safely managed sanitation services is calculated by combining data on the proportion of the population using different types of basic sanitation facilities with estimates of the proportion of faecal waste which is safely disposed in situ or treated off-site. The JMP estimates access to basic sanitation facilities for each country, separately in urban and rural areas, by fitting a regression line to a series of data points from household surveys and censuses. This approach was used to report on use of 'improved sanitation' facilities for MDG monitoring. The JMP is evaluating the use of alternative statistical estimation methods as more data become available. The Statistical Note describes in more detail how 'safety factors', or the proportion of household wastewater that is safely disposed of in situ or transported to a designated place, will be generated through a national assessment process, and combined with data on use of different types of supplies, as recorded in the current JMP database. Calculation of safety factors for safe management of sanitation are the same used for safety factors for wastewater treatment required for household part of the indicator 6.3.1. **Predominant type of statistics**: national estimates adjusted for global comparison.
Rationale and interpretation	MDG target 7C called for 'sustainable access' to –'basic sanitation'. JMP developed the metric of use of 'improved' sanitation facilities, which are likely to hygienically separate human excreta from human contact, and has used this indicator to track progress towards the MDG target since 2000. International consultations since 2011 have established consensus on the need to build on and address the shortcomings of this indicator; specifically, to address normative criteria of the human right to water including accessibility, acceptability, and safety. Furthermore, the safe management of faecal wastes should be considered, as discharges of untreated wastewater into the environment create public health hazards. 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),
Sources and data collection	Access to water and sanitation are considered core socio-economic and health indicators, and key determinants of child survival, maternal, and children's health, family wellbeing, and economic productivity. Drinking water and sanitation facilities are also used in constructing wealth quintiles used by many integrated household surveys to analyse inequalities between rich and poor. Access to drinking water and sanitation is therefore a core indicator for most household surveys. Currently JMP database holds around 1600 such surveys and for over 140 countries, at least five data points are available which include information about basic water and sanitation for the period 1990-2015. In high income countries where household surveys or censuses do not usually collect information on basic access, estimates are drawn from administrative records. Estimates of excreta management will be collected from countries and used to adjust the data on use of basic sanitation facilities as needed. Administrative, population and environmental data can also be combined to estimate safe disposal or transport of excreta, when no country data are available. Data on disposal or treatment of excreta are limited but estimates for safe management of faecal wastes can be calculated based on faecal waste flows associated with the use of different types of basic sanitation facility. The population data used by JMP, including the proportion of the population living in urban and rural areas, are those established by the UN Population Division.
Disaggregation/ additional dimension	Place of residence (urban/rural) and socioeconomic status (wealth, affordability) is possible for all countries. Disaggregation by other stratifiers of inequality (subnational, gender, disadvantaged groups, etc.) will be made where data permit. Sanitation services will be disaggregated by service level, including no service, shared, basic, and safely managed services. Supplementary geospatial analysis will be made to identify populations most at risk of exposure to untreated wastewater.
Comments and limitations	A framework for measuring faecal waste flows and safety factors has been developed and piloted in 12 countries (World Bank Water and Sanitation Program, 2014), and is being adopted and scaled up by key elements of the sanitation sector. This framework has served as the basis for monitoring plans for indicators 6.2.1 and 6.3.1. Data on safe disposal and treatment is not available for all countries immediately. However, sufficient data exist to make global and regional estimates of safely managed sanitation services by the time the global community adopts the SDG indicators in 2016/17.
Gender equality issues	In household surveys access to sanitation facilities is measured at the household level and in most cases in not possible to disaggregate to accurately measure intra-household inequalities such as sex, age, or disability. Novel data sources, like rapid assessment methods, or crowd-sourced data could be utilized to see intra-household disparity in access or gender discrimination on the use of safe management of sanitation services.
Data for global and regional monitoring	JMP will draw upon the national data described above, and regional and global aggregations will be made in a similar fashion as has been done for MDG reporting.
Supplementary information	JMP has developed a detailed statistical note outlining and illustrating proposals for measuring safely managed sanitation services. JMP will continue to measure and report on

	use of 'basic' sanitation facilities as a subset of safely managed sanitation services.
References	Progress on sanitation and drinking water 2015 update and MDG assessment. New York: UNICEF/WHO, 2015. http://www.wssinfo.org/fileadmin/user_upload/resources/JMP-Update-report2015_English.pdf Methodological note on monitoring WASH and wastewater for the SDGs: http://www.wssinfo.org/fileadmin/user_upload/resources/Methodological-note-on-monitoring-SDG-targets-for-WASH-and-wastewater_WHOUNICEF_8October2015_Final.pdf. WASH targets and indicators post-2015: recommendations from international consultations. Geneva: Water Supply and Sanitation Collaborative Council; 2014 http://www.wssinfo.org/fileadmin/user_upload/resources/post-2015-WASH-targetsfactsheet-12pp.pdf The Missing Link in Sanitation Service Delivery: A Review of Fecal Sludge Management in 12 Cities. World Bank Water and Sanitation Program, 2014. http://documents.worldbank.org/curated/en/2014/04/19549016/targeting-urban-poorimproving-services-small-towns-missing-link-sanitation-service-delivery-review-fecalsludge-management-12-cities

Target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

Indicator 6.3.1: Proportion of wastewater safely treated

From WHO and UN-Habitat through GEMI, on behalf of UN-Water:

Definition and method of computation	**Definition**: Proportion of wastewater generated both by households (sewage and faecal sludge), as well as economic activities (based on ISIC categories) safely treated compared to total wastewater generated both through households and economic activities. While the definition conceptually includes wastewater generated from all economic activities, monitoring will focus on wastewater generated from hazardous industries (as defined by relevant ISIC categories). **Method of computation**: The wastewater safely treated is calculated by combining the percentage of household (sewage and faecal sludge) wastewater and the percentage of wastewater from hazardous industries treated. Household surveys and censuses provide information on use of types of basic sanitation facilities. These estimates are combined with safety factors for on-site disposal and for transportation to designated places for safe disposal or treatment, as described in indicator 6.2.1. The information generated for indicator 6.2.1 will be combined with safety factors describing the proportion of wastewater from hazardous industries which is safely treated before disposal or reuse to produce indicator 6.3.1. Calculation of safety factors for household wastewater (sewage and faecal sludge) treatment will be coordinated with estimation of similar safety factors for safe management of sanitation required for indicator 6.2.1. The accompanying Statistical Note describes in more detail how 'safety factors' for wastewater treatment, disposal and reuse will be generated through a national assessment process, and combined with data on use of different types of sanitation facilities, as recorded in the current JMP database. Statistical methods for measurement of the wastewater treatment (called "wastewater to sewerage" by SEEA-Water) align with the SEEA definitions and treatment categories (primary, secondary, tertiary). Statistical methods for the treatment of industrial wastewater align with the SEEA definitions and treatment categories using ISIC classifications and treated volumes from permits data.
Rationale and interpretation	SDG proposed target calls for reducing water pollution, minimizing release of hazardous chemical and increasing treatment and reuse. Household wastewater includes faecal waste from onsite facilities (such as emptying and cleaning of cesspools and septic tanks, sinks and pits) as well as off-site wastewater treatment plants according to the ISIC definition 3700 for "Sewerage". Inclusion of onsite facilities is critical from a public health, environment and equity perspective since approximately two thirds people globally use onsite facilities. Industrial wastewater (which includes point source agricultural discharges) responds to minimizing release of hazardous chemicals. Diffuse agricultural pollution is a major source of water pollution but cannot be monitored at source and therefore its impact on ambient
	water quality will be monitored under 6.3.2.

Sources and data collection	The aim is to cover households and the entire economy, and to build on the monitoring framework of JMP, AQUASAT, IBNET, UNSD/UNEP Water Questionnaire for non OECD/Eurostat countries, OECD/Eurostat Questionnaire for OECD countries, etc., as well as pop density, depth to groundwater, land-use/land-cover data from earth observations. Statistical methods for measurement of wastewater treatment will align with the SEEA[3] statistical standard and associated definitions, classifications and treatment categories. The calculation of the indicator value as derived from the framework is the amount treated (off-site and on-site) divided by the total amount of waste generated. The indicator for household wastewater could be expressed in population as expressed in indicator 6.2.1. Data will come from a variety of sources combining utility and regulator data for off-site and potentially household survey questions and measurements relating to onsite treatment supplemented by modelled estimates where no reliable national data exist. The total volume of industrial wastewater (the denominator) can be reliably estimated from an inventory of industries, maintained by vast majority of member states through International Standard Industrial Classification from all economic activities, revision 4, ISIC Rev4)[4]. This can be populated from databases and records held by Ministries of Industry, Tax offices, local authority registries etc. For each industry, records will be available on the amount of water they abstract from municipal supplies or from boreholes or other sources. Given the knowledge of the type of industry, from and a mass balance of products in and out, the proportion of wastewater flow generated as waste water can be estimated.
Disaggregation/ additional dimension	Household (on and off-site) and industrial wastewater. The household part of this indicator is also addressed by safely managed sanitation services (indicator 6.2.1) Household wastewater could be further disaggregated to estimate the proportion of treated wastewater that is safely reused responding to the target component “substantially increase recycling and reuse”. However, data availability will be challenging in many countries.
Comments and limitations	A framework for measuring faecal waste flows and safety factors have been developed and piloted in 12 countries (World Bank Water and Sanitation Program, 2014), and is being scaled up post-2015. This framework has served as the basis for monitoring plans for indicators 6.2.1 and 6.3.1. Data on safe disposal and treatment remain scarce, and will not be available all countries immediately. However, sufficient data exist to make global and regional estimates of safely treated wastewater by 2018.
Gender equality issues	Gender disaggregation for wastewater will not be possible since data on use of sanitation facilities is derived from household surveys. Measurement of treatment of wastewater from on-site sanitation is specifically included to respond to equity issues as approximately two thirds of all sanitation is on-site and predominantly used by poorest wealth quintiles who are seldom served by a sewer connection. Unsafe disposal of wastewater in disproportionately affects the poorest who are more likely to reside in affected areas.

[3] System of Environmental and Economic Accounting for Water, adopted by Statistical Commission in 2014. This accounting structure means that these activities cover the whole economy and are considered for each industry, which are defined according to the International Standard Industrial Classification of all Economic Activities (ISIC), and covering 1) abstraction and distribution of water, 2) discharge, reuse and treatment of wastewater, and 3) consumption and returns of water back to the environment, in this accounting structure, disaggregated by industry in a standardised way. Economic activities by ISIC broadly covers agriculture, hazardous industries and other economic activities.

[4] ISIC revision 4 from UN Statistical Division: http://unstats.un.org/unsd/cr/registry/isic-4.asp

Data for global and regional monitoring	Wastewater generated from types of sanitation facilities or types of industries will be aggregated to get national and regional estimates.
Supplementary information	Please refer to the accompanying statistical note for detailed methodology.
References	Progress on sanitation and drinking water 2015 update and MDG assessment. New York: UNICEF/WHO, 2015. http://www.wssinfo.org/fileadmin/user_upload/resources/JMP-Update-report2015_English.pdf Methodological note on monitoring WASH and wastewater for the SDGs: http://www.wssinfo.org/fileadmin/user_upload/resources/Methodological-note-on-monitoring-SDG-targets-for-WASH-and-wastewater_WHOUNICEF_8October2015_Final.pdf. The Missing Link in Sanitation Service Delivery: A Review of Fecal Sludge Management in 12 Cities. World Bank Water and Sanitation Program, 2014. http://documents.worldbank.org/curated/en/2014/04/19549016/targeting-urban-poorimproving-services-small-towns-missing-link-sanitation-service-delivery-review-fecalsludge-management-12-cities SEEA-Water System of Environmental-Economic Accounting for Water, United Nations Department of Economic and Social Affairs, 2012 International Standard Industrial Classification of All Economic Activities, Rev.4 http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27 Report of the First Stakeholders Consultation on Post-2015 monitoring: Indicators and Monitoring Mechanisms: http://www.unwater.org/fileadmin/user_upload/unwater_new/docs/Topics/SDG/GEMI_Report_First_Stakeholders_Consultation_Post-2015_Monitoring_FINAL2015-04-27.pdf

Indicator 6.3.2: Proportion of bodies of water with good ambient water quality

From UNEP (GEMS/Water) through GEMI, on behalf of UN-Water:

<table>
<tr>
<td>Definition and method of computation</td>
<td>
Definition: Proportion of water bodies (area) in a country with good ambient water quality compared to all water bodies in the country. “Good” indicates an ambient water quality that does not damage ecosystem function and human health according to core ambient water quality indicators.
Concept: Water quality is estimated based on a core set of five determinands that inform on major water quality impairments present in many parts of the world: total dissolved solids (TDS); percentage dissolved oxygen (% DO); dissolved inorganic nitrogen (DIN); dissolved inorganic phosphorus (DIP); and Escherichia coli (E. coli).
As monitoring capacities and coverage vary between countries, a monitoring ladder is proposed. On the first rung, the number of determinands not meeting national water quality guidelines based on the existing monitoring sites are used to estimate the water quality. On the second rung, a water quality index is used to combine the determinand values in a statistically more robust manner, and the monitoring coverage increased. On consecutive rungs, the monitoring coverage can be step-wise increased and complementary determinands covering additional aspects of ambient water quality can be included depending on the national capacities and requirements enabling the indicator to inform on the status of ambient water quality in a more comprehensive way.
Method of computation:
The GEMS/Water[1] water quality index approach[2] is used as a general model to calculate the index, in which measured determinand values are compared to guideline values (proximity to target approach):

Proximity-to-target (PTT) scores for each determinand at single monitoring sites are calculated as the difference between the temporal average (for the accounting period) of the determinand concentration and the target divided by the range between the (winsorized) minimum or maximum of the measured determinand concentration (for exceedance and non-exceedance targets, respectively) and the target. The PTT scores are scaled to the range between 0 and 100, where 100 indicates that the target is met and decreasing scores indicate an increasing distance from the target.
The water quality index (WQI) at site level is computed as the arithmetic mean of the site-level PTT scores for the selected determinands. The WQI scale can be divided into different water quality categories, ranging from very bad to excellent. The thresholds for these categories are country specific and should be reported in the monitoring system by the individual countries
For the spatial aggregation at the basin level and country level, the water bodies are divided into stretches of homogenous quality (between consecutive monitoring stations).
The final indicator is calculated from the proportion of the stretches with good quality compared to all water bodies assessed.

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Rationale and interpretation	The proposed indicator informs on the quality of water bodies. The indicator allows for evaluating the impact of human development on ambient water quality and thus enables countries to assess the future services they can obtain from aquatic ecosystems (clean water for drinking, biodiversity, water for food production etc.). Water quality represents the actual outcome of all pollution and pollution reduction activities, and is thus essential to fully describe the environmental status of freshwater systems, as well as to fully report on target 6.3. Water quality also feeds into all other water-related targets, and the proposed indicator can be used to directly report on many other targets or parts of targets (refer to supplementary information).
Sources of and data collection	Existing data (in situ and modelled values) are available from UNEP's GEMS/Water (GEMStat[3]) and OECD. Additional information on optical water properties from remote sensing can be used as proxies for sediments and eutrophication/nutrient loading. Measurements would be completed at local laboratories and/or achieved using field measurements on appropriate protocols for sample collection and analysis. For data-poor areas estimates can be generated using existing in situ data combined with modelled data and remote sensing information. GEMStat (UNEP) contains 4 million records from over 3000 stations in 100 countries, although the sets of parameters, the choice of monitoring station and the collection frequency varies by large between countries.
Disaggregation	Data is collected at the scale of river basins and can be aggregated to the country and regional scale.
Comments and limitations	Both indicators proposed for 6.3 are considered necessary to deduct comprehensive adaptation strategies and management options with regard to improving water quality and reporting on the target. 6.3.1 is a policy relevant indicator that provides information on local point source pollution, whereas 6.3.2 is an outcome indicator that enables the evaluation of integral impacts of human development on ambient water quality.
Gender equality issues	The indicator is a measure of ambient water quality and therefore is "gender neutral". However, ambient water quality can impact women, men and socio-economic groups in different ways. These dimensions are therefore relevant to the interpretation of the indicator.
Data for global and regional monitoring	**Entity responsible for global monitoring:** UNEP (through GEMS/Water), on behalf of UNWater. The monitoring of this indicator will be integrated into the GEMI initiative, which together with JMP and GLAAS, under the UN-Water umbrella, will provide Member States with a coherent framework for global monitoring of SDG 6. Related to indicator 6.3.2, GEMI will draw upon metadata standards which are already in place, among other sources on pre-existing datasets such as GEMStat and FAO-AQUASTAT.
Supplementary information	The proposed indicator is multipurpose and can be used to report on the following targets: 3.3 (water-borne diseases) 8.4 (decouple economic growth from environmental degradation) 11.5 (water-related disasters) 11.6 (reduce environmental impact of cities) 12.4 (environmentally sound management of chemicals and all wastes, reduce their release to air, water and soil)
	14.1 and 14.2 (marine and costal pollution and ecosystem management) 15.1 (status of freshwater ecosystems)

References	[1] GEMS/Water website: www.unep.org/gemswater [2]GEMS/Water WQI: Water Quality Index for Biodiversity, Technical Report, GEMS/Water, 2008, available at http://www.unep.org/gemswater/Portals/24154/pdfs/new/2008%20Water%20Quality%20Index%20for%20Biodiversity%20TechDoc%20July%2028%202008.pdf [3]GEMStat: www.gemstat.org

Target 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

Indicator 6.4.1: Change in water-use efficiency over time

From FAO (AQUASTAT) through GEMI, on behalf of UN-Water:

<table>
<tr><td>Definition and method of computation</td><td>
Definition: This indicator is defined as the output over time of a given major sector per volume of (net) water withdrawn (showing the trend in water use efficiency). Following ISIC 4 coding, sectors are defined as agriculture, forestry and fishing (ISIC 4-A); manufacturing, constructions, mining and quarrying (ISIC 4-B, 4-C and 4-F); electricity industry (ISIC 4-D); and the municipal sector (ISIC 4-E).

For the purpose of this note, the following terminology is used:
• Water use: general non-specific term that describes any action through which water provides a service
• Water withdrawal: water abstracted from a river, lake, reservoir or aquifer (V)
• Return flow: water returning to a river, lake, reservoir or aquifer[5] (R)
• Net water withdrawal: water withdrawn (V) minus return flow (R)
Note: If no information is available on (R), then only (V) will be used.

Method of computation:
The indicator is disaggregated by sector, in order to allow for different metrics in different sectors.

Water efficiency in irrigated agriculture is calculated as the agricultural value added per agricultural (net) water withdrawn, expressed in USD/m³.

In formula:
$$A_{we} = \frac{GVA_a \times (1 - C_r)}{V_a - R_a}$$
Where:
• A_{we} = Irrigated agriculture water efficiency [USD/m³]
• GVA_a = Gross value added by agriculture (excluding river and marine fisheries and forestry) [USD]
• C_r = Proportion of agricultural GVA produced by rainfed agriculture [-]
• V_a = Volume of water withdrawn by the agricultural sector (including irrigation, livestock and aquaculture) [m³]
• R_a = Volume of water returned to the hydrologic system (return flow) [m³]

The volume of water withdrawn by the agricultural sectors (V) is collected at country level through national records and reported in questionnaires, in units of km³/year or million m³/year (see example in AQUASTAT http://www.fao.org/nr/water/aquastat/sets/aq-5yr-
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[5] Water quality and its suitability for use are a concern with this indicator. It is considered that the quality of return flow will be taken into account under target 6.3.

quest_eng.xls). Agricultural value added in national currency is obtained from national statistics, converted to USD and deflated to the baseline year 2015.

The C_r coefficient can be estimated as C_r= 37%, on the basis of the general FAO assumption on the ratio between rainfed and irrigated yield. More detailed estimations are however possible and encouraged at country level.

Water efficiency of industries is calculated as the industrial value added per unit of industrial (net) water withdrawn, and expressed in USD/m^3.

In formula:

$$I_{we} = \frac{GVA_i}{V_i - R_i}$$

Where:

- I_{we} = *Industrial water efficiency [USD/m^3]*
- GVA_i = Gross value added by industry (excluding energy) [USD]
- V_i = Volume of water withdrawn by the industries (excluding energy) [m^3]
- R_i = Volume of water returned to the hydrologic system (return flow) [m^3]

Industrial water withdrawal (V) is collected at country level through national records and reported in questionnaires, in units of km^3/year or million m^3/year (see example in AQUASTAT http://www.fao.org/nr/water/aquastat/sets/aq-5yr-quest_eng.xls). Industrial value added is obtained from national statistics, deflated to the baseline year 2015.

Energy (power) water efficiency is calculated as the value added of power production per unit of (net) water withdrawn for energy production, and expressed in *MWh*/m^3.

In formula:

$$E_{we} = \frac{TEP}{V_e - R_e}$$

Where:

- E_{we} = *Energy water efficiency [MWh/m^3]*
- TEP = Total energy production [MWh]
- V_e = Volume of water withdrawn for energy production, i.e. for the cooling of power plants (including evaporation from reservoirs created behind dams for hydropower) [m^3]
- R_e = Volume of water returned to the hydrologic system (return flow) [m^3]

Volume of water withdrawn for energy production (V) is collected at country level through national records and reported in questionnaires, in units of km^3/year or million m^3/year (see example in AQUASTAT http://www.fao.org/nr/water/aquastat/sets/aq-5yr-quest_eng.xls). Value added of electricity production is obtained from national statistics, deflated to the baseline year 2015.

Municipal water supply efficiency is the ratio between water effectively distributed to the municipal users and the water withdrawn for municipal use by water supply utilities (i.e. distribution efficiency, size of network losses).

In formula:

$$M_{we} = \frac{Mu_d}{V_m}$$

Where:

- M_{we} = *Municipal water supply efficiency [-]*
- Mu_d = Water distributed to municipal users [m^3]
- V_m = Volume of water withdrawn by municipal utilities (i.e. the public

	distribution network) [m^3] Data on volumes of withdrawn and distributed are collected at country level from the municipal supply utilities records.
Rationale and interpretation	The rationale behind this indicator consists in providing information on the efficiency of the economic and social usage of water resources, i.e. output generated by the use of water in the different main sectors of the economy, and distribution network losses. Energy production has been disaggregated from the industrial sector due to its specific importance for the general development of a country. The distribution efficiency of water systems is explicitly considered only for the municipal sector, but it is nonetheless implicit within the calculations also for the other sectors, and could be made explicit if needed and where data are available. This indicator addresses specifically the target component "substantially increase water-use efficiency across all sectors", by measuring the output per unit of water from productive uses of water as well as losses in municipal water use. It does not aim at giving an exhaustive picture of the water utilization in a country. Other indicators, specifically those for Targets 1.1, 1.2, 2.1, 2.2, 5.4, 5.a, 6.1, 6.2, 6.3, 6.5 will complement the information provided by this indicator. In particular, the indicator needs to be combined with the water stress indicator 6.4.2 to provide adequate follow-up of the target formulation. Together, the four sectoral efficiencies provide a measure of overall efficiency in a country. The indicator provides incentives to improve water use efficiency through all sectors, highlighting those sectors where water use efficiency is lagging behind.
Sources and data collection	The components of the indicator can be calculated using existing datasets and new data to be collected during country updates from FAO-AQUASTAT (FAO) on water withdrawals in different sectors (including new data on return flows), together with datasets on value generation from National Accounts Main Aggregates (UNSD), World Energy Outlook (International Energy Agency), UN Population Division demographic datasets, FAOSTAT, World Bank, WaterStat database (Water Footprint Network) and IBNET (the International Benchmarking Network for water and sanitation utilities). UNSD Environment Statistics Section collects data from official national sources for water abstraction by ISIC activity through its biennial UNSD/UNEP Water Questionnaire from non OECD/Eurostat countries. UNSD closely collaborates with FAO-AQUASTAT and shares and validates data to provide together the best possible data at the global level. Data for OECD and Eurostat countries are being collected through the OECD/Eurostat Questionnaire that is consistent with the UNSD/UNEP Questionnaire, so data are comparable. Modelled data can be used to fill in possible gaps while capacity in data collection is being developed, so that the indicator can be calculated for all countries immediately.
Disaggregation	The indicator covers agricultural, industrial, energy and municipal sectors, so to provide the means for a more detailed analysis of the water use efficiency for national planning and decision-making. Although it would be difficult to disaggregate the indicator to hydrological basin or subnational scales, the calculations and methods provided as part of indicator development could be replicated by countries or water management organizations to provide similar data for sub-national or basin units, to be then aggregated to give the country-level indicator.
Comments and limitations	The corrective coefficient Cr for the agricultural sector is needed in order to focus the indicator on the irrigated production. This is done in order to eliminate a potential bias of the indicators, which otherwise would tend to decrease if rainfed cropland is converted to irrigated. Regional differences, in particular in relation to irrigated agriculture and different climatic

	conditions (including variability), are to be considered in the interpretation of this indicator, especially in countries with large amounts of available water resources. Also for this reason, coupling this indicator with water stress (6.4.2) is important for the interpretation of the data.
Gender equality issues	As the indicator components are not measured by gender, it is not possible to disaggregate this indicator by gender. However, it is especially indicator 6.4.2 which is important for gender equality issues, since water scarcity disproportionately affects women, particularly in developing countries, and jeopardizes the achievement of their human rights.
Data for global and regional monitoring	**Entity responsible for global monitoring**: FAO (through AQUASTAT), on behalf of UN-Water. The monitoring of this indicator will be integrated into the GEMI initiative, which together with JMP and GLAAS, under the UN-Water umbrella, will provide a coherent framework for global monitoring of SDG 6. Data on water withdrawal for the compilation of the indicator are available on AQUASTAT for all countries across sectors. The estimation of the volumes of water withdrawn for energy production would be possible making several assumptions. Main sources of data for the gross value added by irrigated agriculture and industry are FAOSTAT and the World Bank database. Other sources include the World Energy Outlook of the International Energy Agency and the UNIDO database.
Supplementary information	The proposed indicator is multipurpose and can be used to report on the following targets: 2.4 (resource use efficiency in agriculture) 8.4 (resource use efficiency in consumption and production) 9.4 (for infrastructure and industry: increased resource use efficiency and adoption of clean and environmentally sound technologies and industrial processes) 12.2 (efficient use of natural resources) 12.3 (reduce food losses along production and supply chains (e.g. drinking-water net losses)
References	• AQUASTAT, FAO's Global Water Information System. Food and Agriculture Organization of the United Nations, Rome. The following resources on this site of specific interest to this indicator are: - AQUASTAT glossary - AQUASTAT Main Database - Water use web page - Water resources web page - Disambiguation of water statistics (2012) - Irrigation water requirement and water withdrawal by country (2012) - Cooling water for energy generation and its impact on national-level water statistics (2011) - Municipal and industrial water withdrawal modelling for the years 2000 and 2005 using statistical methods (2011) - Evaporation from artificial lakes and reservoirs (2015) - The role of women in agricultural water management (2014) • FAOSTAT production database • UNSD/UNEP Questionnaire on Environment Statistics – Water Section (http://unstats.un.org/unsd/environment/questionnaire.htm) http://unstats.un.org/unsd/environment/qindicators.htm • Framework for the Development of Environment Statistics (FDES 2013) (Ch. 3) • OECD/Eurostat Questionnaire on Environment Statistics – Water Section • International Recommendations for Water Statistics (IRWS) (2012)

	• UNSD-System of Environmental Economic Accounting for Water (SEEA-Water) (2007). UNSD-System of Environmental Economic Accounting (SEEA) (2012) World Bank Open Data. • World Energy Outlook • International Standard Industrial Classification of All Economic Activities (ISIC Rev. 4). • UNIDO Statistics Data Portal • UNDATA Explorer

Indicator 6.4.2: Level of water stress: freshwater withdrawal as a proportion of available freshwater resources

From FAO (AQUASTAT) through GEMI, on behalf of UN-Water:

Definition and method of computation	**Definition:** the ratio between total freshwater withdrawn by all major sectors and total renewable freshwater resources, after having taken into account environmental water requirements. Main sectors, as defined by ISIC standards, can include for example agriculture; forestry and fishing; manufacturing; electricity industry; and municipalities. This indicator is also known as water withdrawal intensity. The indicator builds on MDG indicator 7.5 and also accounts for environmental water requirements. **Concepts:** This indicator provides an estimate of pressure by all sectors on the country's renewable freshwater resources. A low level of water stress indicates a situation where the combined withdrawal by all sectors is marginal in relation to the resources, and has therefore little potential impact on the sustainability of the resources or on the potential competition between users. A high level of water stress indicates a situation where the combined withdrawal by all sectors represents a substantial share of the total renewable freshwater resources, with potentially larger impacts on the sustainability of the resources and potential situations of conflicts and competition between users. *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 (and, where available, the reduction of flow due to upstream withdrawal). *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) and fossil groundwater. It does not include nonconventional 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. *Environmental water requirements* (Env.) are established in order to protect the basic environmental services of freshwater ecosystems. Methods of computation of Env. are extremely variable. For the purpose of the SDG indicator, Env. are expressed as a

	percentage of the available water resources. More details on method of calculation of the above variables can be found at http://www.fao.org/nr/water/aquastat/water_res/index.stm or http://www.fao.org/nr/water/aquastat/data/wrs/readPdf.html?f=AFG-WRS_eng.pdf. **Method of computation:** The indicator is computed as the total freshwater withdrawn (TWW) divided by the difference between the total renewable freshwater resources (TRWR) and the environmental water requirements (Env.), multiplied by 100. All variables are expressed in km3/year (10^9 m3/year). $$Stress\ (\%) = \frac{TWW}{TRWR - Env.} * 100$$ It is proposed to classify the level of water stress in three main categories (levels): low, high and very high. The thresholds for the indicator could be country specific, to reflect differences in climate and national water management objectives. Alternatively, uniform thresholds could be proposed using existing literature and taking into account environmental water requirements.
Rationale and interpretation	The purpose of this indicator is to show the degree to which water resources are being exploited to meet the country's water demand. It measures a country's pressure on its water resources and therefore the challenge on the sustainability of its water use. It tracks progress in regard to "withdrawals and supply of freshwater to address water scarcity", i.e. the environmental component of target 6.4. The indicator shows to what extent water resources are already used, and signals the importance of effective supply and demand management policies. It can also indicate the likelihood of increasing competition and conflict between different water uses and users in a situation of increasing water scarcity. Increased water stress, shown by an increase in the value of the indicator, has potentially negative effects on the sustainability of the natural resources and on economic development. On the other hand, low values of the indicator indicate that water does not represent a particular challenge for economic development and sustainability.
Sources and data collection	Data for this indicator are usually collected by national ministries and institutions having water-related issues in their mandate, such as ministries of water resources, agriculture, or environment. Data are mainly published within national water resources and irrigation master plans, national statistical yearbooks and other reports (such as those from projects, international surveys or results and publications from national and international research centres).
Disaggregation	To compute this indicator, several sectoral data are needed. The indicator can be disaggregated to show the respective contribution of different sectors to the country's water stress, and therefore the relative importance of actions needed to contain water demand in the different sectors (agriculture, municipalities and industry). At national level, water resources and withdrawal are estimated or measured at the level of appropriate hydrological units (river basins, aquifers). It is therefore possible to obtain a geographical distribution of water stress by hydrological unit, thus allowing for more targeted response in terms of water demand management.
Comments and limitations	Water withdrawal as a percentage of water resources is a good indicator of pressure on limited water resources, one of the most important natural resources. However, it only partially addresses the issues related to sustainable water management. Supplementary indicators that capture the multiple dimensions of water management would combine data on water demand management, behavioural changes with regard to

	water use and the availability of appropriate infrastructure, and measure progress in increasing the efficiency and sustainability of water use, in particular in relation to population and economic growth. They would also recognize the different climatic environments that affect water use in countries, in particular in agriculture, which is the main user of water. Sustainability assessment is also linked to the critical thresholds fixed for this indicator and there is no universal consensus on such threshold. Trends in water withdrawal show relatively slow patterns of change. Usually, three-five years are a minimum frequency to be able to detect significant changes, as it is unlikely that the indicator would show meaningful variations from one year to the other. Estimation of water withdrawal by sector is the main limitation to the computation of the indicator. Few countries actually publish water use data on a regular basis by sector. Renewable water resources include all surface water and groundwater resources that are available on a yearly basis without consideration of the capacity to harvest and use this resource. Exploitable water resources, which refer to the volume of surface water or groundwater that is available with an occurrence of 90% of the time, are considerably less than renewable water resources, but no universal method exists to assess such exploitable water resources. There is no universally agreed method for the computation of incoming freshwater flows originating outside of a country's borders. Nor is there any standard method to account for return flows, the part of the water withdrawn from its source and which flows back to the river system after use. In countries where return flow represents a substantial part of water withdrawal, the indicator tends to underestimate available water and therefore overestimate the level of water stress. Other limitations that affect the interpretation of the water stress indicator include: • difficulty to obtain accurate, complete and up-to-date data; • potentially large variation of sub-national data; • lack of account of seasonal variations in water resources; • lack of consideration to the distribution among water uses; • lack of consideration of water quality and its suitability for use; and • the indicator can be higher than 100 per cent when water withdrawal includes secondary freshwater (water withdrawn previously and returned to the system), non-renewable water (fossil groundwater), when annual groundwater withdrawal is higher than annual replenishment (over-abstraction) or when water withdrawal includes part or all of the water set aside for environmental water requirements. Some of these issues can be solved through disaggregation of the index at the level of hydrological units and by distinguishing between different use sectors. However, due to the complexity of water flows, both within a country and between countries, care should be taken not to double-count.
Gender equality issues	Women and men tend to have different water-related uses, priorities and responsibilities. There are also trends along gender lines in terms of access and control over water and water rights. Gender differences and inequalities mean that women and men experience and respond to changes in water availability, services or water policies differently. Thus the impact of water stress on women and men should be studied in order to better capture the gender dimension of water use.
Data for global and regional monitoring	**Entity responsible for global monitoring:** FAO (through AQUASTAT), on behalf of UNWater. The monitoring of this indicator will be integrated into the GEMI initiative, which together with JMP and GLAAS, under the UN-Water umbrella, will provide Member States

	with a coherent framework for global monitoring of SDG 6. The Food and Agriculture Organization of the United Nations (FAO) is the agency responsible for compiling data and calculating this indicator at the international level. This is done through its Global Water Information System (AQUASTAT) country surveys since 1994. These surveys are carried out every ten years, on average. Data are obtained through detailed questionnaires filled in by national experts and consultants who collect information from the different institutions and ministries having water-related issues in their mandate. Literature and information at the country and subcountry level are reviewed including national policies and strategies; water resources and irrigation master plans; national reports, yearbooks and statistics; reports from projects; international surveys; results and publications from national and international research centres; and the Internet. Env. data are presently not systematically collected by AQUASTAT, but several methods are available and could be used to compute Env. for countries that do not have the institutional arrangements and standards in place to assess or collect these data. Data obtained from national sources are systematically reviewed to ensure consistency in definitions and consistency in data from countries located in the same river basin. A methodology has been developed and rules established to compute the different elements of national water balances. Estimates are based on country information, complemented, when necessary, with expert calculations based on unit water use figures by sector, and with available global datasets. In the case of conflicting sources of information, the difficulty lies in selecting the most reliable one. In some cases, water resources figures vary considerably from one source to another. There are various reasons for such differences, including differing computation methods, definitions or reference periods, double counting of surface water and groundwater or of transboundary river flows. Moreover, estimates of long-term average annual values can change due to the availability of better data from improvements in knowledge, methods or measurement networks. Where several sources result in divergent or contradictory information, preference is given to information collected at the national or sub-national level rather than at regional or world levels. Moreover, except in the case of evident errors, official sources are privileged. As regards shared water resources, the comparison of information between countries makes it possible to verify and complete data concerning the flows of transboundary rivers and to ensure data coherence at the river basin level. In spite of these precautions, the accuracy, reliability and frequency with which information is collected vary considerably by region, country and category of information. Information is completed using models when necessary. Regional and global level aggregations are obtained by applying the same procedure as for country level computation. AQUASTAT data on water resources and use are published when new information becomes available on the FAO-AQUASTAT website at http://www.fao.org/nr/aquastat. Modelled data are used with caution to fill gaps while capacity is being developed. Data on water resources can be modelled by using GIS-based hydrological models. Data on water withdrawal are estimated by sector on the basis of standard unit values of water withdrawal. UNSD Environment Statistics Section collects data from official national sources for water abstraction by ISIC activity through its biennial UNSD/UNEP Water Questionnaire from non
	OECD/Eurostat countries. UNSD closely collaborates with FAO-AQUASTAT and shares and validates data to provide together the best possible data at the global level. Data for OECD and Eurostat countries are being collected through the OECD/Eurostat Questionnaire that is consistent with the UNSD/UNEP Questionnaire, so data are comparable.

Supplementary information	The proposed indicator is multipurpose and can be used to report on the following target: 15.1 (level of pressure on freshwater ecosystems)
References	Food And Agricultural Organization Of The United Nations. AQUASTAT. FAO's Global Information System on Water and Agriculture. Rome. Website http://www.fao.org/nr/aquastat. The following resources of specific interest to this indicator are available on this site: • AQUASTAT glossary (http://www.fao.org/nr/water/aquastat/data/glossary/search.html). • AQUASTAT Main country database (http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en) • AQUASTAT Water use (http://www.fao.org/nr/water/aquastat/water_use/index.stm). • AQUASTAT Water resources (http://www.fao.org/nr/water/aquastat/water_res/index.stm). • AQUASTAT publications dealing with concepts, methodologies, definitions, terminologies, metadata, etc. (http://www.fao.org/nr/water/aquastat/catalogues/index.stm) • For surface water, environmental water requirement databases include: http://waterdata.iwmi.org/apps/flow_management_classes/ • http://www.iwmi.cgiar.org/resources/models-and-software/environmental-flowcalculators/. Environmental water requirement data for groundwater bodies will be available at IWMI by the end of 2015. • UNSD/UNEP Questionnaire on Environment Statistics – Water Section (http://unstats.un.org/unsd/environment/questionnaire.htm) http://unstats.un.org/unsd/environment/qindicators.htm • Framework for the Development of Environment Statistics (FDES 2013) (Chapter 3) http://unstats.un.org/unsd/environment/FDES/FDES-2015-supportingtools/FDES.pdf • OECD/Eurostat Questionnaire on Environment Statistics – Water Section • International Recommendations for Water Statistics (IRWS) (2012) http://unstats.un.org/unsd/envaccounting/irws/

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

Indicator 6.5.1: Degree of integrated water resources management implementation (0-100)

From UNEP through GEMI, on behalf of UN-Water:

Definition and method of computation	**Definition:** This indicator reflects the extent to which integrated water resources management (IWRM) is implemented. It takes into account the various users and uses of water with the aim of promoting positive social, economic and environmental impacts on all levels, including transboundary, where appropriate. **Method of computation:** National surveys are structured in 4 components: policies, institutions, management tools, and financing. Within each component there are questions with defined response options giving scores of 0-100. Questions scores are aggregated to the component level, and each component score is equally weighted to give an aggregated indicator score of 0-100. The method builds on official UN IWRM status reporting, from 2008 and 2012, of the Johannesburg Plan of Implementation from the UN World Summit for Sustainable Development (1992).
Rationale and interpretation	The indicator captures the degree of implementation of all main elements of IWRM. It supports decision making at the country level, as results can be disaggregated to review progress on different aspects. This will strengthen stakeholder participation, transparency and accountability. It also enables countries to identify barriers to progress and ways in which they can be addressed. It also facilitates coherence between the various targets within the water and sanitation goal by supporting water monitoring, planning and evaluation, as well as associated capacity building and thus the achievement of the overall water goal.
Sources and data collection	UN Environment Programme (UNEP) as part of a UN-Water monitoring framework called GEMI (Integrated Monitoring of Water and Sanitation Related Targets) will coordinate the UN-Water support to countries to collect the data for this target. Work will be closely linked to other proposed water monitoring and reporting efforts, including regional governmental bodies, to support coordinated long-term monitoring for the entire SDG 6. The primary data sources for international monitoring are national surveys for all UN member states (one per country) in the form of a score-based questionnaire completed by the government ministries. Regional and global estimates are aggregated from national data. UNEP and UN-Water partners have both the experience and resources in place for supporting countries' capacity building needs for monitoring and reporting. UN-Water has assisted countries with periodic monitoring of the status of IWRM implementation in 2008 and 2012 (e.g. http://www.unwater.org/publications/statusreport-on-integrated-water-resources-management/en/). Data is available for a total of 134 countries (http://www.unepdhi.org/rioplus20 (see data file zip link).
Disaggregation	Data are collected at the national level. The IWRM surveys will specifically address issues relating to gender, governance, ecosystems, expenditures, and human capacity, as well as transboundary interests. National estimates can be aggregated to present regional and global estimates.

Comments and limitations	Advancing the implementation of IWRM has been included in SDG-6 by UN Member States as a continuation of the JPOI agreement, to advance good water governance at all levels and to ensure coordination between the other water-related SDG targets. UNWater is exploring ways by which this indicator can be more closely linked to the outcome-oriented targets within the water and sanitation Goal.
Gender equality issues	Gender equity and women's empowerment in water resources management is one of the cornerstones of the Dublin-Rio principles upon which IWRM is founded. Gender plays an intricate role in IWRM, not just in the planning process but also through the stakeholder consultations and in helping to secure and enforce rights and responsibilities relating to many different aspects of use. These aspects are captured in the IWRM survey questions.
Data for global and regional monitoring	National estimates can be aggregated to present regional and global estimates.
Supplementary information	The indicator is also critical for reporting on target 6.b "Support and strengthen the participation of local communities in improving water and sanitation management" which has already been accepted by the IAEG-SDG.
References	UN-Water 2012: Status Reports on IWRM. Internet site : http://www.unwater.org/publications/status-report-on-integrated-water-resourcesmanagement/en/ AMCOW 2012 : Status Report on Water Resources Management in Africa, http://www.amcowonline.org/index.php?option=com_content&view=article&id=262&Itemid=141&lang=en UN-Water 2008 : Status Report on IWRM for CSD-16, http://www.unwater.org/publications/publications-detail/en/c/206480/UNEP-DHI Data from the 2012 Survey on the Application of Integrated Approaches to Water Resources Management. Internet site: http://www.unepdhi.org/rioplus20 GEMI – Integrated Monitoring of Water and Sanitation-related SDG Targets. Internet site: http://www.unwater.org/gemi/en/

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

From UNECE (as Secretariat for the Water Convention), UNESCO and UNEP through GEMI, on behalf of UNWater:

Definition and method of computation	**Definition:** Proportion of surface area of transboundary basins that have an operational arrangement for transboundary water cooperation. Regular meetings of the riparian countries to discuss IWRM and exchange of information are required for an arrangement to be defined as "operational". **Concepts: Integrated Water Resources Management** (IWRM) is an approach to managing water in a coordinated way. It takes into account the different water sources as well as various users and uses in a given situation, with the aim of maximizing positive social, economic and environmental benefits. It uses catchments and aquifers, as the principle unit of water management, and stresses decentralization of governance structures and active stakeholder participation in decision making. **Transboundary basins** are surface water or groundwater basins (aquifers) which cross or are located on boundaries between two or more States. **An agreement, institutional arrangement and/or an established organization** provides a framework for cooperation on transboundary water management. Such a framework is commonly based on an agreement covering different aspects of transboundary water management. Agreements may be interstate, intergovernmental, interministerial or interagency. In addition to an agreement (e.g. a treaty, convention, Memorandum of Understanding), such framework can be provided by a bilateral or multilateral commission or other appropriate institutional arrangements for cooperation. Furthermore, multisectoral cooperation institutions can cover for water issues. For a **cooperation framework** to be considered as "**operational**", it requires that there are regular meetings of the riparian countries to discuss the integrated management of the water resource and to exchange information. **Method of computation:** Calculated – for any spatial unit (country, region) – as the percentage that the total surface area (in km^2) of transboundary basins that have an operational arrangement for water cooperation makes up of the total surface area of transboundary basins (km^2). GIS data on the extent and location of transboundary basins facilitates the spatial analysis, corresponding datasets available globally.
Rationale and interpretation	Target 6.5 stresses the importance of transboundary cooperation to implement integrated water resources management of shared basins, to ensure availability and sustainable management of water resources. Most of the world's water resources are shared: 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 lives in transboundary river and lake basins and over 90% lives in countries that share basins. However, cooperation on shared water resources is in most cases not advanced. The single most important factor enabling transboundary water cooperation is the existence of a cooperation framework (agreement, institution or other adequate arrangement) and it being operational, i.e. ensuring regular dialogue and exchange between riparian countries.

Sources and data collection	Existing data and sources for this indicator include: Spatial data (delineating transboundary basins) are available for all known transboundary basins. Data are available at global level at the 120 international river basin organisations. Spatial data are available for all currently known 286 surface water basins and 592 transboundary aquifers. Associated uncertainties (i.e. delineation of transboundary aquifers) are being refined gradually. A global database of freshwater treaties and international river basin organizations exists as well as several regional ones, e.g., for the Pan-European region the second Assessment under the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and for the Americas, compilations by UNESCO and the Organization for American States. Further detailed information on cooperation for different types of transboundary waters (rivers, lakes and groundwaters) is expected to become available through a regular reporting mechanism on transboundary water cooperation, established under the UNECE Water Convention in November 2015 by a decision of the Meeting of the Parties to this Convention opened for accession by all UN Member States. A global baseline comparative assessment of transboundary waters, including river basins and aquifers has been undertaken by the Transboundary Waters Assessment Project (TWAP, completed in 2014), involving generation of geo-referenced datasets, including on transboundary cooperation. This is based on a database which includes in total 686 international freshwater treaties.
Disaggregation	Surface areas of a country which are part of a transboundary river, lake or groundwater basin (in km^2) can be derived from intersecting basin areas by country borders. Basin level data can also be disaggregated to country level (for national reporting) and aggregated to regional and global level.
Comments and limitations	In line with the target, the indicator measures (and provides an incentive for) extending cooperation in transboundary basins. Without an adequate coordination at the basin level water resources management cannot be truly integrating the different water uses and ensure sustainability. Transboundary cooperation frameworks are highly diverse, differing in quality and effectiveness. At the same time, depending on the level of economic activities and the degree of development, and hence the coordination need, also vary. The monitoring can be based on general principles of cooperation. Eventually, the scope, quality and/or extent of application of operational arrangements for transboundary cooperation could be reviewed for refining the monitoring. A part of the operational arrangements for integrated management of transboundary basin areas in place cover both surface waters and groundwaters but this is not always the case. The calculation should also take into account the present arrangements that are specific for groundwaters. The information is expected to get gradually refined, notably on the delineations and consequently on the spatial extent of the aquifers as well as their exact number.
Gender equality issues	Gender equity and women's empowerment in water resources management is one of the cornerstones of the Dublin-Rio principles. Gender plays an intricate role in IWRM, not just in the planning process but also through the stakeholder consultations and in helping to
	secure and enforce rights and responsibilities relating to many different aspects of use. Adequate institutional frameworks help to ensure participation of relevant interest groups, social groups and genders

Data for global and regional monitoring	**Entity responsible for global monitoring:** UNECE (as Secretariat for the Water Convention), UNESCO and UNEP on behalf of UN-Water. The monitoring of this indicator will be integrated into the GEMI initiative, which together with JMP and GLAAS, under the UN-Water umbrella, will provide Member States with a coherent framework for global monitoring of SDG 6. the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (the "Water Convention") provides a legal and intergovernmental framework for transboundary water cooperation. Originally designed as an agreement for the pan-European region, the Convention was amended to open it for accession to all UN Member States. The amendments entered into force in February 2013. The regular reporting on transboundary water cooperation adopted by the Meeting of the Parties to the Convention in November 2015 includes questions by transboundary basins, rivers, lakes and aquifers (as appropriate) about existence, scope and features of agreements and arrangements for transboundary water cooperation. Both Parties and non-Parties are invited to report. UNECE acts as secretariat for the Convention. In the framework of the UNESCO Internationally Shared Aquifer Resources Management (ISARM) Initiative a world inventory of transboundary aquifers has been compiled since 2002, involving work on delineation and analysis of transboundary aquifer systems. The ISARM network consists of five regional networks of experts. Spatial data (delineating transboundary basins) are available for all knowntransboundary river basins and groundwaters UNESCO's Global Groundwater Information System (GGIS) is a web-based portal to groundwater-related information and knowledge. It includes spatial data for most currently known 592 transboundary aquifers. Countries have information about which basins are covered by operational arrangements for transboundary water cooperation, and what is the corresponding area share though uncertainties for groundwaters exist.
Supplementary information	(Blank)
References	Convention on the Protection and Use of Transboundary Watercourses and International Lakes: a globalizing framework http://www.unece.org/env/water.html Reporting under the Water Convention http://www.unece.org/fileadmin/DAM/env/documents/2015/WAT/11Nov_1719_MOP7_Budapest/ECE_MP.WAT_2015_7_reporting_decision_ENG.pdf GEMI – Integrated Monitoring of Water and Sanitation-related SDG Targets. Internet site. http://www.unwater.org/gemi/en/ Global Environment Facility's Transboundary Waters Assessment Project http://www.geftwap.org/ Treaties on transboundary waters: Transboundary Freshwater Dispute Database (TFDD) at Oregon State University http://www.transboundarywaters.orst.edu/publications/atlas/index.html River Basin Organisations http://www.transboundarywaters.orst.edu/research/RBO/index.html
	A regional example: Status of transboundary water cooperation in the pan-European region: http://www.unece.org/env/water/publications/pub/second_assessment.html Internationally Shared Aquifer Resources Management (UNESCO's International Hydrological Programme): Regional inventories of transboundary groundwaters http://www.isarm.org/

Target 6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

Indicator 6.6.1: Change in the extent of water-related ecosystems over time

From UNEP supported by CBD and Ramsar through GEMI, on behalf of UN-Water:

Definition and method of computation	**Definition:** Percentage of change in water-related ecosystems over time (% change/year). The indicator would track changes over time in the extent of wetlands, forests and drylands, and in the minimum flows of rivers, volumes of freshwater in lakes and dams, and the groundwater table. The Ramsar Convention broad definition of "wetland" is used, which includes rivers and lakes, enabling three of the biome types mentioned in the target to be assessed - wetlands, rivers, lakes - plus other wetland types. **Method of computation:** It is proposed to estimate percentage change in each major ecosystem present in a country, and the indicator will enable Member States to report on those water-related ecosystems that are important to them. Wetland extent is computed through the existing Living Planet Index methodology for data collection and analysis (http://www.livingplanetindex.org/home/index). It consists of a number of stages including harvesting of time series data, codification and database entry, aggregation into sub-indices to reduce sampling bias, and further aggregation to create sub-global (ecologically and regionally specific) and global indices. The methodology is flexible to incorporating improving sources of information and data, for a more comprehensive assessment of trends. The structure of the indicator can be designed to align with the SEEA Water accounts and estimate percentage change in Natural Water Capital available to society based on a) Mean Annual Water Availability; b) Mean Annual Water Withdrawals; c) Environmental Water requirements Aquastat (FAO); GEMS Water for national data (UNEP).
Rationale and interpretation	Definitions of target elements: • *Protect* implies a reduction or eradication in loss or degradation. • *Restore* implies a reversal of loss or degradation. • *Mountains, Forests, Wetlands, Rivers, Aquifers and Lakes* include ecosystems that provide freshwater-related ecosystem services. • *Wetlands* are further defined under the Ramsar Convention as areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. It may also include subterranean hydrological systems. Wetlands are a prominent ecosystem type influencing the water cycle and therefore of direct importance to the achievement of Goal 6. Wetlands loss leads to increasing water insecurity and wetlands restoration (increasing wetland area) is now a widespread response to achieving sustainable water. Examples include how wetlands contribute to flood regulation, regulation of surface water flows (flow regulation), and nutrient cycling (pollution regulation/water quality).
Sources and	Biophysical data on extent, volume and quantity are available for the majority of freshwater systems listed in the majority of the countries but with temporal gaps; in some

data collection	cases there has been no access to national data. It is proposed to estimate percentage change in each major ecosystem present in a country using a mixture of ground data and earth observations. The indicator will enable Member States to report (through existing mechanisms) on those water-related ecosystems that are important to them. The EO data are universally available, and can be used by national institutions at a relatively low cost. The collection of data is possible through the collaboration of international and national institutions (UNEP (GEMS Water); WCMC; Biodiversity indicators Partnership – Ramsar, Convention on Biological Biodiversity; Convention on Combatting Desertification; GEO/GEOSS, NASA, GRDC), the methodology and networks required and the capacity to undertake this work. The different frameworks will be integrated through the GEMI monitoring initiative, operating under the UN-Water umbrella. Downscaling to the national level is undertaken on the UNEP Live platform with the relevant national institution in the Indicator Reporting and Information System. **A. Percentage change in extent of freshwater systems** ESA Sentinel-2A provides 10-day repeat coverage of Earth's land areas, which in combination with the 8-day coverage from Landsat 7 and 8 NASA Land Use/Land Cover Change combined will give better-than-weekly coverage at moderate resolution. • **Forest extent/cover**: ESA Sentinel-2A; Global Forest Change 2000–2014 (UMD) University of Maryland; Forests of the World 2010 (FRA 2015) FAO; Globalforest/non-forest map PALSAR mosaic - Jaxa • **Swamps/marshes (including swamps forests)**: GlobeCover Sentinel 2A statistics • **Ponds/lakes/open water**: Global Land Surface Water Dataset in 30m • **Peat**: Optical data ESA Sentinel 2 data for extent; Radar data for changes with ground based verification; RAMSAR has national maps for arctic peats • **Mangrove**: World Mangrove Atlas (UNEP-WCMC) ; JAXA Global Mangroves Watch • **Rivers/floodplains**: River Global Land Surface Water Dataset in 30m; River HydroSHED[6] and HydroBASINS (USGS, WWF); Flood plains PREVIEW Global Flood Model (UNEP, UNISDR) • **Reservoirs and Dams**: Global System Water Project GRaND and with socioeconomic data Ciesin GRaND • **Deserts/dry lands**: Global Aridity Index (Global-Aridity)- CGIAR-CSI; FAO Drylands - Percent of Total Area (2003) **B. Percentage change in Quantity** • Flows/discharge: WMO data distributed by Global Runoff Data Centre • Depth (volume) of water bodies: Exists for major water bodies; Rivers and lakes database; HydroWeb (LEGOS);

[6] Hydrological data and maps based on SHuttle Elevation Derivatives at multiple Scales. HydroSHEDS is a mapping product that provides hydrographic information for regional and global-scale applications in a consistent format. It offers a suite of geo-referenced data sets (vector & raster) at various scales, including river networks, watershed boundaries, drainage directions, and flow accumulations. HydroSHEDS is based on high-resolution elevation data obtained during a Space Shuttle flight for NASA's Shuttle Radar Topography Mission (SRTM).

	Changes to groundwater table/shallow aquifers: Grace mission (NASA); **C. Quality** • GEMS-Water will provide national data where available • **Eutrophication of rivers**: Sentinel 2 can be considered • **Eutrophication of estuaries**: Sentinel 2 can be considered • **Eutrophication of lakes**: 300 m resolution available today (VIIRS, MODIS); Sentinel 3 to be considered from 2016 (300 m resolution); Sentinel 2 (10 m resolution) • **Eutrophication of the coastal inshore**: 762 sites showing eutrophication and/or hypoxia WRI • **Salinity of groundwater**: IGRAC http://www.un-igrac.org/news/salinegroundwater • **Other WQ variables**: Experts also identified possibility to monitor turbidity (Landsat 8, Sentinel 2); 10 -30 m resolution; 300 m resolution (MODIS, VIIRS, Sentinel 3) is quantifiable; Blue-green algae – fully operational; Oil spills – done using Radar, Sentinel 1 (high resolution) **D. State of water ecosystems** • **Wetland health, indices, vegetation etc**: Through RAMSAR RSIS; LiMES (automated change detection, NDVI) for monitoring health of wetlands **Risk mapping**: PREVIEW
Disaggregation	The data can be disaggregated by type of water-related ecosystem.
Comments and limitations	
Gender equality issues	The indicator is a measure of ecosystem extent and therefore is “gender neutral”. However, through their local impacts on water quality and quantity, wetlands can impact women, men and socio-economic groups in different ways. These dimensions are therefore relevant to the interpretation of the indicator.
Data for global and regional monitoring	**Entity responsible for global monitoring:** CBD and UNEP, on behalf of UN-Water. Wetland assessments are undertaken by the Ramsar Convention on Wetlands, in collaboration with CBD (including the biodiversity indicators partnership) and UNEP, through the GEMI monitoring initiative. The monitoring of this indicator will be integrated into the GEMI initiative, which together with JMP and GLAAS, under the UN-Water umbrella, will provide Member States with a coherent framework for global monitoring of SDG 6.
Supplementary information	The proposed indicator is multipurpose and can be used to report on the following targets: 11.5 (decrease economic losses due to water-related disasters) 11.6 (reduce environmental impact of cities) 11.7 (green spaces) 12.2 (sustainable management of natural resources) 13.1 (resilience and adaptive capacity to climate-related hazards and natural disasters) 14.2 and 14.5 (status of marine and costal ecosystems) 15.1 and 15.3 and 15.5 (status of wetlands, natural habitats and biodiversity).
References	Included above

Target 6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

Indicator 6.a.1: Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan

From WHO through UN-Water GLAAS, supported by UNEP through GEMI (target 6.5), on behalf of UNWater, in collaboration with OECD:

Definition and method of computation	"International cooperation and capacity-building support" implies aid (most of it quantifiable) in the form of grants or loans by external support agencies. The amount of water and sanitation-related Official Development Assistance (ODA) can be used as a proxy for this, captured by the Creditor Reporting System (CRS) of the Organisation for Economic Co-operation and Development (OECD). Realising that the role of ODA in international cooperation is evolving and that a broad range of stakeholders is involved in "international cooperation and capacity development support", it is envisaged that this indicator will evolve and will be further qualified during the SDG period. UN-Water is working together with OECD to align the proposed indicator and methodology with OECD work. Official Development Assistance (ODA) is defined as flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25 per cent (using a fixed 10 per cent rate of discount). By convention, ODA flows comprise contributions of donor government agencies, at all levels, to developing countries ("bilateral ODA") and to multilateral institutions. ODA receipts comprise disbursements by bilateral donors and multilateral institutions. Lending by export credit agencies—with the pure purpose of export promotion—is excluded (OECD source IMF 2003). A government coordinated spending plan is defined as a financing plan/budget for the water and sanitation sector, clearly assessing the available sources of finance and strategies for financing future needs The indicator is computed as the proportion between the amount of water and sanitation related Official Development Assistance a government receives, and the total amount budgeted for water and sanitation in a government coordinated spending plan.
Rationale and interpretation	Target 6.a includes many elements. The amount of water and sanitation-related Official Development Assistance (ODA) is a quantifiable measurement as a proxy for "international cooperation and capacity development support" in financial terms, because this data are readily available from the Creditor Reporting System (CRS) of the Organisation for Economic Co-operation and Development (OECD). It is essential to be able to assess ODA in proportion with information about the government coordinated spending plan in proportion of ODA to gain a better understanding of how much countries depend/rely on ODA and highlighting countries total water and sanitation budgets over time.

Sources and data collection	The monitoring of the Means of Implementation of SDG 6 builds directly on the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) (for drinking water, sanitation and hygiene issues) financial information, complemented by the TrackFin initative that aims to track financial information in the WASH sector and the Integrated Water Resources Management (IWRM) reporting in SDG target 6.5 (for wastewater and water quality, water efficiency, water resource management, and the status of waterrelated ecosystems). The main data source is the Creditor Reporting System of the Organisation for Economic Co-operation and Development, in particular the reporting on "Water Supply and Sanitation". UN-Water is working together with OECD to align the proposed indicator and methodology with OECD work. The analysis of these data is currently done on a biennial basis by the UN-Water GLAAS, led by WHO, for drinking water, sanitation and hygiene matters collected biennially (in 94 countries in 2013/2014) that collects financial information, including the specific initiative "Tracking financing to sanitation, hygiene and drinking-water" (TrackFin). The analysis of the data on water resources management was done by UN-Water in 2008 (led by UN-DESA) and in 2012 (led by UNEP, UNDP, GWP and SIWI) as requested by the UN Commission for Sustainable Development.
Disaggregation	By disaggregating ODA according to the CRS Purpose Codes (www.oecd.org/dac/stats/49819385.pdf), specific information can be obtained on the level of international cooperation in water and sanitation related activities, including infrastructure development, policies, and capacity development. The "Water Supply and Sanitation" CRS Purpose Codes are: 14010 Water sector policy and administrative management 14015 Water resources conservation (including data collection) 14020 Water supply and sanitation - large systems 14021 Water supply - large systems 14022 Sanitation - large systems 14030 Basic drinking water supply and basic sanitation 14031 Basic drinking water supply 14032 Basic sanitation 14040 River basins' development 14050 Waste management / disposal 14081 Education and training in water supply and sanitation
Comments and limitations	"International cooperation and capacity-building support" implies aid (most of it quantifiable) in the form of grants or loans by external support agencies, for which ODA can be considered a best available proxy. ODA does however not capture all types of support in this regard. The UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) results indicate that here are substantial gaps in our understanding and tracking of financing to the WASH sector. Financial reporting is often insufficient to make sound and evidence-based planning and budgeting decisions. To help address the issue, WHO lead the "*TrackFin*" initiative under the UN-Water GLAAS project, which complements financial

	information collected in more than 90 countries in 2013/2014 through its GLAAS survey. Although many gaps still remain, the evidence base is growing incrementally and reporting such information will help improve understanding of how financial resources for WASH are allocated both at national and at global levels. GLAAS information aims to assess whether there is a financing plan or budget for WASH, the extent of its implementation and whether it includes all main areas (water/sanitation/hygiene, urban/rural). In some countries there may be several plans each covering a specific area e.g. separate plans for drinking-water, sanitation and hygiene, separate plans for urban and rural areas, even sometimes different plans for urban differentiating according to utility boundaries and urban areas not covered by the national utility for example. Although plans and budgets may both exist in countries and present different figures/estimates, the aim of this information is to identify if there is an agreed allocation for WASH.
Gender equality issues	Both UN-Water GLAAS and IWRM work includes information about inequality issues, which can be directly used to support indicator analysis in this regard.
Data for global and regional monitoring	WHO, through the UN-Water GLAAS and with the support of UNEP through the reporting in SDG target 6.5, on behalf of UN-Water.
Supplementary information	The proposed indicator can also be used to report on the following targets: 7.a (enhance international cooperation to facilitate access to clean energy research and technology) 13.b (mechanisms for raising capacity for climate change-related planning and management, focusing on women, youth and local and marginalized communities) 15.9 (integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts).
References	See above

Target 6.b Support and strengthen the participation of local communities in improving water and sanitation management.

Indicator 6.b.1: Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

From WHO through UN-Water GLAAS, supported by UNEP through GEMI, on behalf of UN-Water:

Definition and method of computation	This indicator builds on data that are already regularly collected by UN-Water GLAAS on the presence, at the national level, of clearly defined procedures in laws or policies for participation by service users. This indicator will also build on the data collected for the Status of Integrated Water Resources Management (IWRM) reporting in SDG target 6.5, in particular on the presence of formal stakeholder structures established at sub-catchment level. Because of the above, it is envisaged that this indicator will evolve and will be further qualified during the SDG period, focussing on sanitation, drinking water and hygiene first and then expanding on water resources management.

Rationale and interpretation	Defining the procedures in policy or law for the participation of local communities is vital to ensure needs of all the community is met, including the most vulnerable and also encourages ownership of schemes which in turn contributes to their sustainability.
Sources and data collection	The main data sources are the UN-Water GLAAS surveys and the IWRM surveys for SDG target 6.5, with ground truthing thanks to the data collected for SDG target 6.1 which also provides information on regulated water supplies, and from household surveys.
Disaggregation	This indicator builds on data that are already regularly collected by UN-Water GLAAS on the presence, at the national level, and data can currently be disaggregated by: i) urban sanitation, ii) rural sanitation, iii) urban drinking-water, iv) rural drinking-water and v) hygiene promotion.
Comments and limitations	Information gathered through the GLAAS survey aims to assess whether there are formal mechanisms in place to ensure participation of users in planning WASH activities and whether these are used. Participation of users helps ensure that solutions will be relevant and also encourages ownership in the programmes which in turn aids in the sustainability of the services. For instance, planning a national hygiene campaign would need input from representatives of some local communities to understand the main issues to address around hygiene promotion and resources needed to carry out the campaign, thus ensuring ownership and sustainability of the campaign.
Gender equality issues	Both UN-Water GLAAS and IWRM work includes information about inequality issues, which can be directly used to support indicator analysis in this regard.
Data for global and regional	WHO, through the UN-Water GLAAS and with the support of UNEP through the reporting in SDG target 6.5, on behalf of UN-Water.
monitoring	
Supplementary information	The proposed indicator can also be used to report on the following targets: 7.a (enhance international cooperation to facilitate access to clean energy research and technology) 13.b (mechanisms for raising capacity for climate change-related planning and management, focusing on women, youth and local and marginalized communities) 15.9 (integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts)
References	See above