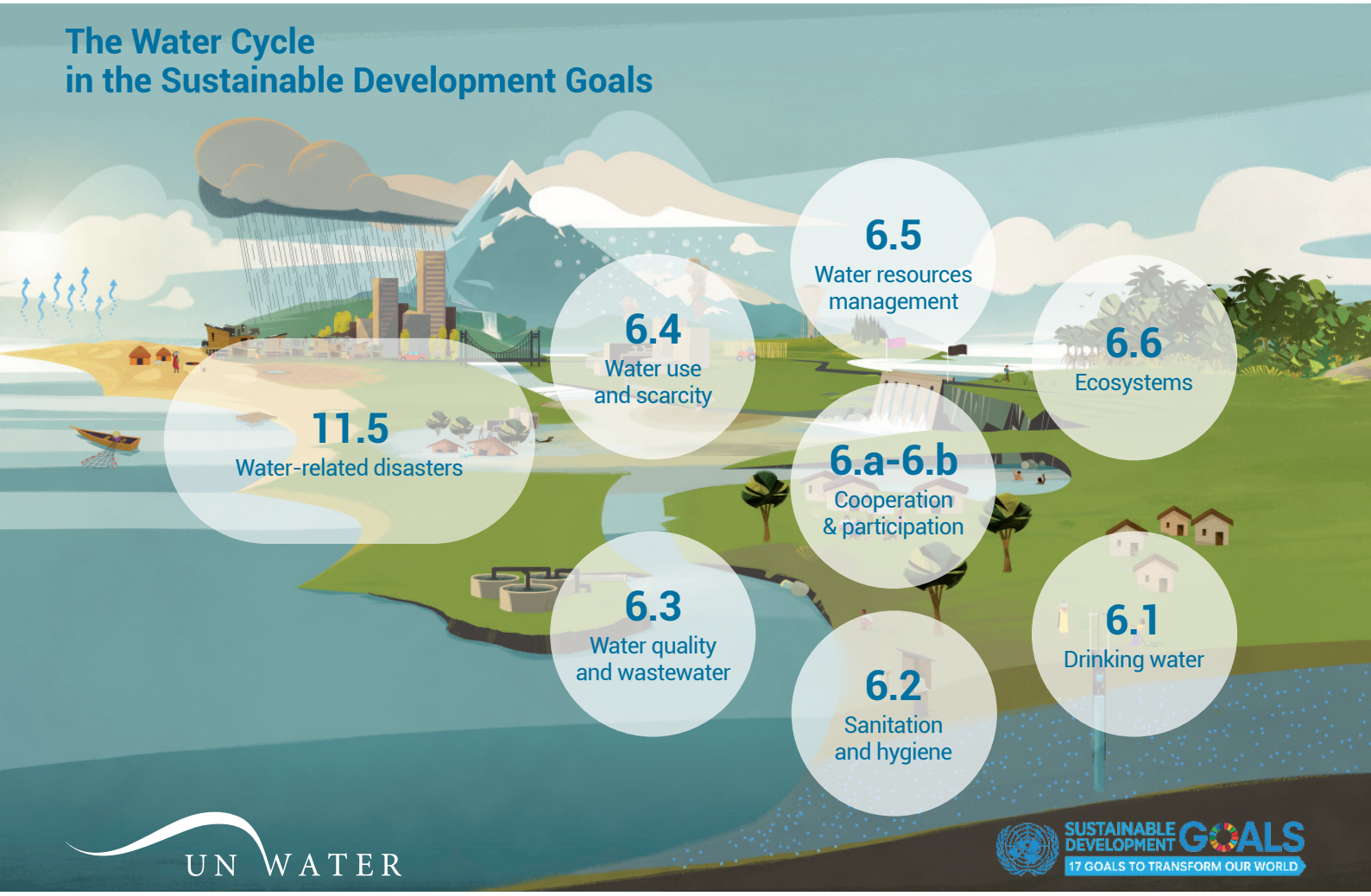
Integrated Monitoring Guide for SDG 6
Targets and global indicators



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Cross-cutting and fragmented, at the core of sustainable development

Water and sanitation are at the very core of sustainable development. Safe drinking water and adequate sanitation and hygiene are pillars of human health and well-being. In addition to domestic purposes, water is needed for food, energy and industrial production – uses that are highly interconnected and potentially conflicting. These various uses generate wastewater, which may cause pollution if not properly managed. Water is also needed to ensure healthy ecosystems, which, in turn, can improve the quantity and quality of freshwater, as well as overall resilience to human-induced and environmentally induced changes. The effects of climate change are often reflected in shifts in water availability, for example, increasing water scarcity in some regions and flooding in others. Consequently, water is a key factor in managing risks related to famine, disease epidemics, migration, inequalities within and among countries, political instability and natural disasters.

Cutting across all these sectors, water can be instrumental in the implementation of integrated solutions. However, water resources are commonly developed and managed by different parts of governments and within different sectors, with little coordination among them and without an overall picture of the state of the resource. Inherent to this sectoral approach is the problem of coherence, where policies and decision-making in one sector could contradict or duplicate policies and decision-making in another sector. Furthermore, water resources are naturally confined to water basins, the scale of which, from physical and ecological points of view, is the most appropriate one for management. Nevertheless, water resources are often managed according to administrative units, which commonly cut across the water basins, resulting in further fragmentation, especially in the case of transboundary water basins.

To ensure sustainable management of water and sanitation for all, it is essential to look at the water cycle in its entirety, including all uses and users. Countries need to move away from sectoral development and management of water resources, in favour of a more integrated approach that can balance different needs in a just manner. This is exactly what SDG 6 seeks to do: by expanding the Millennium Development Goal (MDG) focus on drinking water and basic sanitation to include water, wastewater and ecosystem resources, and together with target SDG 11.5 on water-related disasters, it covers all the main aspects related to freshwater in the context of sustainable development. Bringing these aspects together under one goal is a first step towards addressing sector fragmentation and enabling coherent and sustainable management, thus making SDG 6 a major step forward towards a sustainable water future.

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Acronyms

FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GEMI	Integrated Monitoring of Water and Sanitation Related SDG Targets
GLAAS	Global Analysis and Assessment of Sanitation and Drinking-Water
GRDC	Global Runoff Data Centre
IBNET	International Benchmarking Network for Water and Sanitation Utilities
IGRAC	International Groundwater Resources Assessment Centre
ISARM	Internationally Shared Aquifer Resources Management
ISIC	International Standard Industrial Classification
IWRM	Integrated water resources management
JMP	Joint Monitoring Programme for Water Supply and Sanitation
LEGOS	Laboratory of studies on Spatial Geophysics and Oceanography
MDG	Millennium Development Goal
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
OSU	Oregon State University
SDG	Sustainable Development Goal
TBA	Transboundary aquifer
TWAP	Transboundary Waters Assessment Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN-Habitat	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNSD	United Nations Statistics Division
WASH	Water, sanitation and hygiene
WHO	World Health Organization
WHOS	WMO Hydrological Observing System
WMO	World Meteorological Organization

Target 6.1
Drinking water

"By 2030, achieve universal and equitable access to safe and affordable drinking water for all"

One of the most essential uses of water is for drinking and hygiene purposes within households. This use is captured in target 6.1, which seeks to secure safe and affordable drinking water for all. Water "for all" households represents an important share of total water use (target 6.4). "Safe" drinking water means that it is free of contaminants; the treatment needed to reach "safe" is directly dependent on the quality of the raw water (targets 6.2, 6.3 and 6.6).

Targets 6.1 and 6.2 build on the MDG targets on drinking water and sanitation, and respond directly to the human right to safe drinking water and sanitation. The two targets contribute to reducing multidimensional poverty and achieving universal access to basic services (SDGs 1 and 11), and are prerequisites for wider improvements in nutrition (SDG 2), health (SDG 3), education (SDG 4), gender equality (SDG 5) and productivity (SDG 8).

In 2015, 91% of people worldwide had access to an improved drinking water source compared to 76% in 1990; however, the water is not necessarily safe to drink. *Source:* Millennium Development Goals Report (2015)

Drinking water can easily be contaminated through poor sanitation and hygiene

Target 6.1

Target text	Normative interpretation
By 2030, achieve universal	Implies all exposures and settings including households, schools, health-care facilities and workplaces
and equitable	Implies progressive reduction and elimination of inequalities among population subgroups
access	Implies sufficient water to meet domestic needs is reliably available close to home
to safe	Safe drinking water is free from pathogens and elevated levels of toxic chemicals at all times
and affordable	Payment for services does not present a barrier to access to or prevent people from meeting basic human needs
drinking water	Water used for drinking, cooking, food preparation and personal hygiene
for all	Suitable for use by men, women, girls and boys of all ages, including people with disabilities

Indicator 6.1.1

Global indicator 6.1.1	Definition and rationale
Proportion of population using safely managed drinking water services	Definition: Population using an improved drinking water source (piped water into dwellings, yards or plots; public taps or standpipes; boreholes or tubewells; protected dug wells; or protected springs and rainwater) that is located on premises and available when needed and which is free of faecal and priority chemical contamination. This indicator builds on the MDG indicator "proportion of population using an improved drinking water source" (where "improved" was used as a proxy for "safe" due to the lack of data on drinking water quality), but also incorporates aspects of quality ("safe", free of contamination), accessibility ("located on premises") and availability ("available when needed") to further address the normative criteria of the human right to water. This indicator can be disaggregated by service level: no services, basic services and safely managed services. The monitoring of access "for all", as well as the aspect of affordability, call for disaggregation of data to capture potential inequalities across socioeconomic strata, including within households. In certain regions, it may be useful to add an indicator on time spent collecting water, to further analyse the "basic services" situation. It is also imperative to monitor access beyond the households, in institutional settings such as schools, health-care facilities and workplaces.

Data for indicator 6.1.1

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: Household surveys, institutional/utility records Global databases: WHO/UNICEF JMP Global compilation: WHO/UNICEF JMP on behalf of UN-Waterr	Household surveys combined with population records for information on access and type of services. No information on water quality, and reporting to the basic level but not to the safely managed services level. Disaggregation of household data by place of residence, subnational region and wealth.	Inclusion of water quality testing for faecal contamination in household survey instruments. Incomplete data from utilities and national authorities on availability and quality of drinking water services. Disaggregation of data by informal settlements and locally important marginalized groups.	Inclusion of water quality testing for faecal contamination and priority chemicals (arsenic and fluoride) by utilities and/or in household survey instruments. High temporal and spatial resolution of institutional/utility data. Disaggregation of data by intra-household characteristics.

Target 6.2
Sanitation and hygiene

"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"

Target 6.2 aims for adequate and equitable sanitation and hygiene for all. "Adequate" implies a system that safely separates excreta from human contact throughout the sanitation chain, either through safe containment and disposal in situ, or through safe transport and treatment/reuse off premises.

A safely managed sanitation chain is essential to protect the health of individuals and communities, as well as the environment. For example, leaking latrines and raw wastewater can spread disease and provide a breeding place for mosquitoes, as well as polluting groundwater and surface water (targets 6.3 and 6.6) including potential sources of drinking water (target 6.1).

Hygiene, including handwashing with soap and water after defecation and before food preparation and intake, is equally as important as a safely managed sanitation chain for limiting the spread of communicable diseases.

The ambition to pay special attention to the needs of women and girls, also part of target 6.1, includes increasing access to drinking water and sanitation services on premises. Not having to walk for hours to collect water or care for sick household members frees up women's time, and not having to share sanitary facilities with other households improves women's security. Improved access to safe drinking water and sanitation facilities in the public sphere, including for menstrual hygiene management, will also contribute to more women and girls being able to attend schools and work outside of the home.

In 2015, some 2.4 billion people were still using unimproved sanitation facilities, of which a third practiced open defecation; this makes the MDG target on sanitation one of those that is lagging behind most of others. *Source:* Millennium Development Goals Report (2015)

Poor sanitation and hygiene threathen human and environmental health

Target 6.2

Target text	Normative interpretation
By 2030, achieve access	Implies facilities close to home that can be easily reached and used when needed
to adequate	Implies a system that hygienically separates excreta from human contact as well as safe reuse/ treatment of excreta in situ, or safe transport and treatment off site
and equitable	Implies progressive reduction and elimination of inequalities among population subgroups
sanitation	The provision of facilities and services for safe management and disposal of human urine and faeces
and hygiene	The conditions and practices that help maintain health and prevent spread of disease including handwashing, menstrual hygiene management and food hygiene
for all	Suitable for use by men, women, girls and boys of all ages, including people with disabilities
and end open defecation	Excreta of adults or children are: deposited (directly or after being covered by a layer of earth) in the bush, a field, a beach or any other open area; discharged directly into a drainage channel, river, sea or any other water body; or are wrapped in temporary material and discarded
paying special attention to the needs of women and girls	Implies reducing the burden of water collection and enabling women and girls to manage sanitation and hygiene needs with dignity. Special attention should be given to the needs of women and girls in high-use settings such as schools and workplaces, and high-risk settings such as health-care facilities and detention centres
and those in vulnerable situations	Implies paying attention to specific drinking water, sanitation and hygiene (WASH) needs found in special cases including in refugee camps, detention centres, mass gatherings and pilgrimages

Indicator 6.2.1

Global indicator 6.2.1	Definition and rationale
Proportion of population using safely managed sanitation services, including a handwashing facility with soap and water	Definition: Population using an improved sanitation facility at the household level that is not shared with other households and where excreta is safely disposed of in situ or treated off site, including a handwashing facility with soap and water in the household. Improved sanitation facilities include flush or pour flush toilets to sewerage systems, septic tanks or pit latrines, improved pit latrines (pit latrines with a slab or ventilated pit latrines) and composting toilets. A handwashing facility is a device to contain, transport or regulate the flow of water to facilitate handwashing. This indicator builds on the MDG indicator "proportion of population using an improved sanitation facility", and also incorporates aspects of accessibility (at the household level), acceptability and safety (not shared with other households), to further address the normative criteria of the human right to water. To ensure public health beyond the household level, this indicator incorporates the safe management of faecal waste along the entire sanitation chain, from containment to final treatment and disposal, and thus serves as a multi-purpose indicator contributing to indicator 6.3.1 on wastewater treatment. Handwashing with soap is widely agreed to be the top hygiene priority for improving health outcomes, and the presence of handwashing facilities with soap and water available is used as a proxy for handwashing behaviour. This indicator is included as a standard element in many household surveys, and is recorded by field team observation rather than self-reporting by survey respondents. The sanitation and hygiene indicator can be disaggregated by service level: no services, basic services and safely managed services. The monitoring of access "for all" calls for further disaggregation of data to highlight inequalities across socioeconomic strata and geographic locations (urban/rural and subnational).

Data for indicator 6.2.1

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: Household surveys, institutional/utility records, licensed emptying service providers Global databases: WHO/UNICEF JMP Global compilation: WHO/UNICEF JMP on behalf of UN-Water	Household surveys combined with population records for information on access and type of services. Estimation of the proportion of the total population using basic sanitation services, but no national data on management of faecal waste. Disaggregation of household data by place of residence, subnational region and wealth.	Inclusion of questions on disposal/ transportation in household survey instruments. Estimations backed up with surveys of service providers and data from off-site treatment plants. Disaggregation of data by informal settlements and locally important marginalized groups.	Detailed and high-resolution data from off-site service providers. Consideration of the use of on-site disposal and licensed emptying service providers. Disaggregation of data by intra-household characteristics.

Target 6.3
Water quality and wastewater

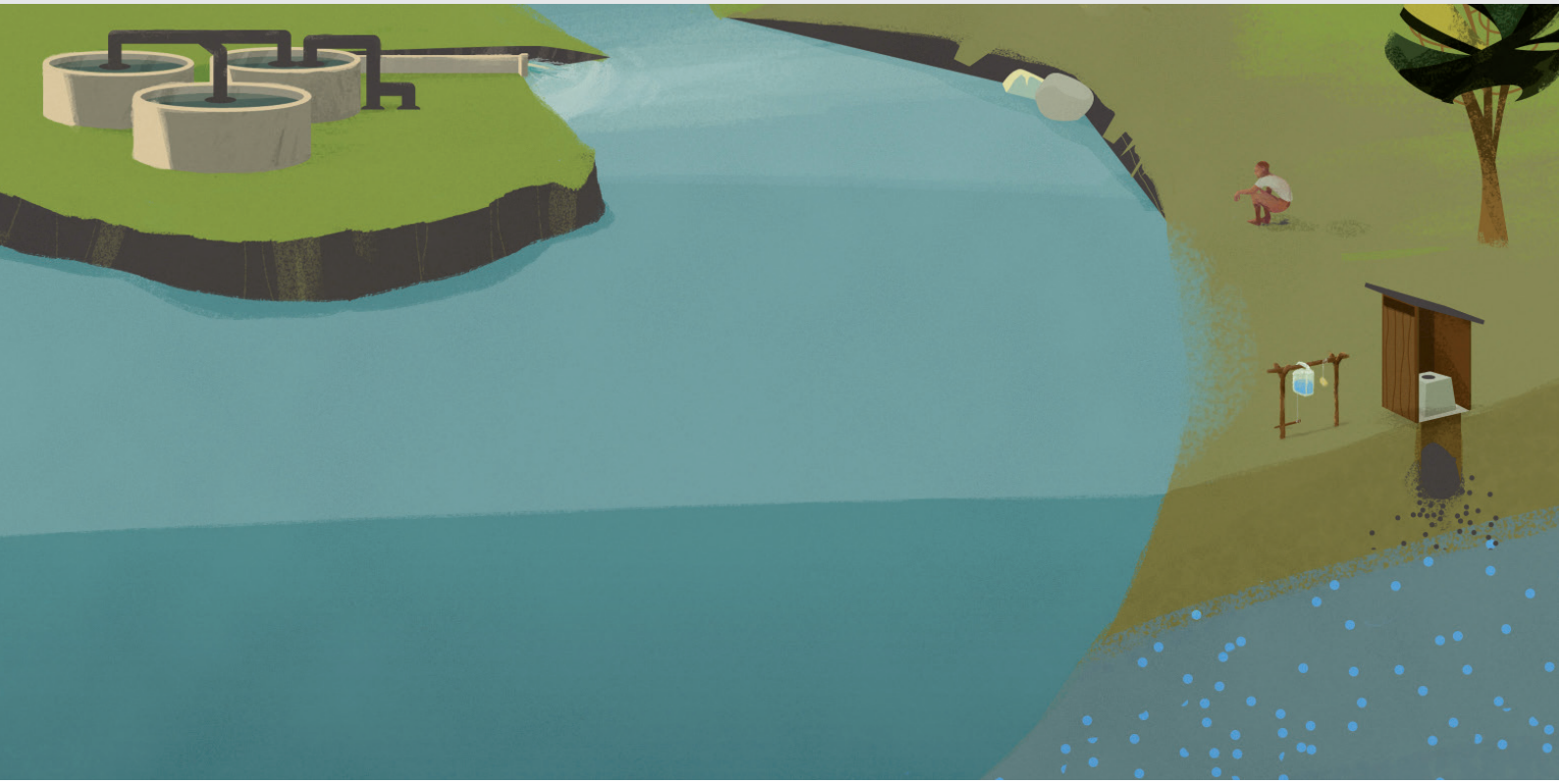
"By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally"

Target 6.3 sets out to improve ambient water quality, which is essential to protect both ecosystem health (target 6.6 and SDGs 14 and 15) and human health (recreational waters and drinking water sources, target 6.1), by eliminating, minimizing and significantly reducing different streams of pollution into water bodies. The main sources of pollution include wastewater from households, commercial establishments and industries (point sources), as well as runoff from urban and agricultural land (diffuse sources).

Wastewater generated by households, measured as a component of the sanitation chain (target 6.2), can result in the spread of pathogens and detrimental nutrient loadings in receiving waters, if it is discharged without treatment. Wastewater generated by economic activities such as manufacturing industries may contain a variety of pollutants including hazardous substances. The elimination of all inadequate disposal of waste (dumping) and the minimization of the generation, use and discharge of hazardous substances are consistent with the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, and the Stockholm Convention on Persistent Organic Pollutants.

The focus on recycling (for example, recirculating water within an industry) and reuse (for example, using wastewater in agriculture) are complementary to the focus on reduced freshwater withdrawals and increased use efficiency (target 6.4).

Currently there is only a small amount of data available on wastewater treatment at the global scale, but some sources estimate that about 80 % of all wastewater generated globally is discharged without any treatment.



On-site sanitation, such as latrines, is part of the wastewater challenge

Target 6.3

Target text	Normative interpretation
By 2030, improve water quality by	Implies achieving adequate quality of receiving water bodies so that they do not present risks to the environment or human health
reducing pollution	Implies minimizing the generation of pollutants at source and reducing the discharge of polluting substances, from point sources (for example, wastewater outlets from economic activities and households) and non-point sources (for example, urban and agricultural runoff)
eliminating dumping and	Implies ending all inadequate disposal of waste (solid and liquid, for example, leachates from poorly managed solid waste)
minimizing release of hazardous chemicals and materials	Implies reducing the generation, use and discharge of hazardous substances, as defined and listed in the conventions of Basel, Rotterdam and Stockholm
halving the proportion of	Implies halving the proportion of wastewater that is untreated, generated by households and all economic activities (based on International Standard Industrial Classification (ISIC) Rev. 4); some economic activities are of special relevance due to high wastewater generation, including agriculture, mining and quarrying, manufacturing, electricity and sewerage
untreated	Treatment implies any process for rendering wastewater fit to meet applicable environmental standards or other quality norms; treatment can be categorized into primary, secondary and tertiary treatments (and further by mechanical, biological and advanced technology treatments)
wastewater	Discarded water that is no longer required by the owner or user, including discharges to drains or sewers for treatment or direct discharges into the environment, as well as water reused by another user without further treatment
and increasing recycling	Implies increasing the on-site reuse of water within the same establishment or industry
and safe	Implies water has undergone sufficient treatment, combined with non-treatment barriers to protect human health, for the intended use (as described in the 2006 WHO Guidelines for safe use of wastewater, excreta and greywater)
reuse	Implies wastewater supplied to a user for further use, with or without prior treatment (for example, use of household wastewater in agriculture), excluding the recycling of water within the same establishment
globally	Implies increased recycling and safe reuse at the global scale, allowing for differentiated efforts at the national and regional scales, focusing efforts on water-scarce regions

Wastewater from industry and agriculture can be detrimental to ambient water quality

Indicator 6.3.1

Global indicator 6.3.1	Definition and rationale
Proportion of wastewater safely treated	Definition: Percentage of wastewater generated by households (sewage and faecal sludge) and economic activities (based on ISIC categories) that is safely treated. The household component of this indicator, monitored as part of the sanitary chain, is directly linked to indicator 6.2.1. The inclusion of on-site facilities is critical from a public health, environment and equity perspective because approximately two thirds of the world's population use on-site facilities. The indicator includes wastewater generated by all economic activities, and monitoring will initially focus on manufacturing, trade and service activities. Diffuse pollution (for example, runoff from agriculture) will be indirectly captured by indicator 6.3.2. Data can be disaggregated by treatment level (primary/secondary/tertiary), source (household/economic activity) and recipient (freshwater/sea/soil). To capture the full ambition of the target, additional indicators on recycling and reuse are needed with links to indicators 6.4.1 and 6.4.2.

Data for indicator 6.3.1

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: Institutional/utility records, household surveys, on-site service providers, registers over economic activities Global databases: FAO's AQUASTAT, IBNET, WHO/UNICEF JMP, UNSD/UNEP Water Questionnaire for non OECD/Eurostat countries, OECD/Eurostat Questionnaire for OECD countries, UNIDO Statistics Data Portal Global compilation: WHO/UN-Habitat on behalf of UN-Water	Estimation of total wastewater generation by households from household surveys and population records. Estimation of total wastewater generation by economic activities from industry inventories, focusing on a few economic activities. Estimation of the proportion of wastewater received and treated from institutional/ utility records.	Inclusion of questions on disposal/ transportation in household survey instruments. Household estimations backed up with field surveys and data from licensed emptying service providers. Economic activities estimations backed up with institutional/utility records on agreed volumes; focus expanded to include more economic activities. Improved spatial and temporal resolution of institutional/utility data. Inclusion of information on treatment levels.	Inclusion of information on treatment compliance and reuse, as well as operation and maintenance aspects. High spatial and temporal resolution of institutional/utility data (metered volumes). Data can be fully disaggregated by treatment level (primary/secondary/tertiary), source (household/economic activity) and recipient (freshwater/sea/soil).

Indicator 6.3.2

Global indicator 6.3.2	Indicator definition and rationale
Proportion of bodies of water with good ambient water quality	Definition: Percentage of water bodies (area) in a country with good ambient water quality. "Good" indicates an ambient water quality that does not damage ecosystem function and human health according to core ambient water quality parameters. Overall water quality is estimated based on a core set of five parameters that inform on major water quality impairments present in many parts of the world: electric conductivity/total dissolved solids; percentage dissolved oxygen; dissolved inorganic nitrogen/total nitrogen; dissolved inorganic phosphorus/total phosphorus; and faecal coliform/Escherichia coli bacteria. This indicator gives an overall picture of all pollution (including from diffuse sources not captured in indicator 6.3.1) and pollution reduction activities, and is essential to describe the environmental status of freshwater systems (feeding into indicator 6.6.1). It allows for an assessment of the impact of human development on ambient water quality, as well as the potential to obtain future ecosystem services from the water body (for example, drinking water production and biodiversity). Data can be disaggregated by water body and water quality parameter.

Data for indicator 6.3.2

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: National line ministries and institutions Global databases: UNEP's GEMStat, OECD Lake and river quality, Earth observations Global compilation: UNEP on behalf of UN-Water	Monitoring of the five core water quality parameters.	Improved spatial and temporal resolution of national data (more sampling stations and higher sampling frequencies). Inclusion of more water quality parameters.	High spatial and temporal resolution of national data (more sampling stations, higher sampling frequencies and use of Earth observations). Inclusion of more water quality parameters and considerations of overall ecosystem health.

Target 6.4
Water use and scarcity

"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"

Target 6.4 addresses water scarcity, aiming to ensure enough water for people and the economy, as well as for the environment, by increasing water-use efficiency across all sectors of society. Securing environmental water requirements, that is, leaving enough water in the environment at any given moment to sustain its natural processes, is essential for maintaining ecosystem health and resilience (closely related to target 6.6 and SDG 15).

Increasing water-use efficiency means generating more output per water input (for example, more crops per cubic metre of water), including by reducing water losses (for example, in municipal distribution networks). In this regard, some sectors are of special relevance due to their high water use, for example, agriculture, industry, energy and municipal water supply. The use efficiency component has strong synergies with water recycling and reuse (target 6.3), sustainable food production (SDG 2), economic growth (SDG 8), infrastructure and industrialization (SDG 9), cities and human settlements (SDG 11), and consumption and production (SDG 12).

Worldwide, freshwater resources are abundant, with only 9% withdrawn by society. However, available resources are unevenly distributed across regions and within countries. In 2011, 41 countries experienced water stress, of which 10 withdrew more than 100% of their renewable energy resources. Water scarcity – both physical as well as economic due to poor management – is currently affecting more than 40% of the global population. *Source:* Millennium Development Goals Report (2015).

Freshwater is used by all sectors of society, with the biggest user of them all being agriculture

Target 6.4

Target text	Normative interpretation
By 2030, substantially increase water-use efficiency	Implies maximizing the productivity of economic activities while minimizing their water use (generating more output per input of water, including by reducing water losses); closely related to the concept of sustainable production and consumption
across all sectors	All economic activities (based on ISIC Rev. 4 categories); some industries are of special relevance due to high water use, including agriculture, mining and quarrying, manufacturing, electricity, and water collection, treatment and supply
and ensure sustainable withdrawals	Implies that water withdrawals do not lead to permanent depletion of water bodies, taking environmental water requirements into account
and supply of freshwater	Naturally occurring water with a low concentration of salts, or generally accepted as suitable for abstraction and treatment to produce potable water (to compare with brackish and marine water – defining salinity concentrations varies among countries); the definition of inland water resources includes both freshwater and brackish water, categorized as surface water, groundwater and soil water
to address water scarcity	The point at which the aggregate impact of all users impinges on the supply or quality of water, to the extent that, under prevailing institutional arrangements, the demand by all sectors, including the environment, cannot be fully satisfied; physical water scarcity prevails when more than 75% of available water resources is withdrawn; economic water scarcity prevails when malnutrition exists, although less than 25% of available water resources is withdrawn
and substantially reduce the number of people suffering from water scarcity	Implies targeting physical and economic water scarcity to reduce its impact on people, for example, by helping those suffering from malnutrition

Indicator 6.4.1

Global indicator 6.4.1	Definition and rationale
Change in water use efficiency over time	Definition: Output from a given economic activity (based on ISIC categories), per volume of net water withdrawn by the economic activity. This indicator includes water use by all economic activities, focusing on agriculture (excluding the portion generated by rain-fed agriculture), manufacturing, electricity, and water collection, treatment and supply (looking at distribution efficiency and capturing network leakages). By assessing changes over time, the sectoral values can be aggregated into one. This indicator informs on the economic component of the target ("increase water-use efficiency across all sectors"), highlighting sectors where water-use efficiency is lagging behind that of other sectors. Regional differences in climate and water availability must be considered in the interpretation of the indicator, in particular, in relation to agriculture. The indicator is multi-purpose and can be used to report on targets 2.4, 8.4, 9.4, 12.2 and 12.3.

Data for indicator 6.4.1

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: Line ministries and national statistics offices Global databases: FAO's AQUASTAT, UNSD/UNEP Water Questionnaire for non OECD/Eurostat countries, OECD/Eurostat Questionnaire for OECD countries, FAO's FAOSTAT, World Bank, UNSD's National Accounts Main Aggregates, World Energy Outlook, IBNET Global compilation: FAO on behalf of UN-Water	Estimations based on internationally available data on water use and value generation in different sectors. Aggregated national data.	Estimations based on nationally produced data. Data can be disaggregated to the subnational level.	High spatial and temporal resolution of national data (metered volumes). Data can be fully disaggregated by source (surface water / groundwater) and use (economic activity).

Indicator 6.4.2

Global indicator 6.4.2	Definition and rationale
Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	Definition: Ratio between total freshwater withdrawn by all economic activities (based on ISIC categories) and total renewable freshwater resources, after taking into account environmental water requirements (also known as water withdrawal intensity). This indicator includes water withdrawals by all economic activities, focusing on agriculture, manufacturing, electricity, and water collection, treatment and supply. This indicator builds on the MDG indicator "proportion of total water resources used", but also accounts for environmental water requirements, which is necessary to protect the basic environmental services of freshwater ecosystems (feeding into indicator 6.6.1). This indicator provides an estimate of pressure by all economic activities on the country's renewable freshwater resources, directly responding to the environmental component of the target ("ensure sustainable withdrawals and supply of freshwater"). A high level of water stress can result in negative effects on economic development, increasing competition and potential conflicts among users, calling for effective supply and demand management policies and an increase in water-use efficiency. Data can be disaggregated by source (freshwater/sea/soil) and economic activity. The disaggregation of data to the basin level, supported by geo-referencing, enables a more detailed analysis of water scarcity and its impacts on humans, which is essential for covering the social component of the target ("substantially reduce the number of people suffering from water scarcity").

Data for indicator 6.4.2

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: Line ministries and national statistics offices Global databases: FAO's AQUASTAT, UNSD/UNEP Water Questionnaire for non OECD/Eurostat countries, OECD/Eurostat Questionnaire for OECD countries, WMO WHOS Global compilation: FAO on behalf of UN-Water	Estimations based on internationally available data on water availability and withdrawals by different sectors. Aggregated national data.	Estimations based on nationally produced data. Inclusion of estimations of environmental water requirements, based on values available in the literature. Data can be disaggregated to the subnational level.	High spatial and temporal resolution of national data (geo-referenced, metered volumes). Estimations of environmental water requirements backed up by field measurements. Data can be fully disaggregated by source (surface water / groundwater) and use (economic activity).

Some water-stressed cities must pipe freshwater from very distant sources to cover the needs of people and the economy

The Water Cycle in the Sustainable Development Goals

UN WATER


SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

Target 6.5
Water resources management

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

As described above, many different sectors are dependent on water; as a consequence, where water resources are limited, use conflicts arise. The commonly fragmented management of water resources is particularly inept at solving such conflicts and ensuring a sustainable use of the resource. As a response, target 6.5 aims for the implementation of integrated water resources management (IWRM) at all levels. The concept of IWRM seeks to promote the coordinated development and management of water- and land-related resources, in order to maximize economic and social welfare in an equitable manner, without compromising the sustainability of ecosystems. Target 6.5 builds on the Johannesburg Plan of Implementation (2002) arising from the United Nations World Summit for Sustainable Development (1992).

Water resources are naturally confined in water basins, which, from an ecological point of view, is the most appropriate scale for water resources management. However, water basins often cut across administrative borders, calling for coordination and cooperation among several administrative units, including at the transboundary level. In target 6.5, this is reflected in the wording "at all levels"; the explicit mentioning of the transboundary level is related to the fact that most of the world's freshwater resources are transboundary, and that coordination and cooperation across national borders, while necessary, can be especially challenging.

By bringing together stakeholders from across sectors and regions, IWRM provides a framework to balance the need for drinking water and sanitation services for all (targets 6.1 and 6.2) and the demand for water by all economic sectors, with the sustainable management of water, wastewater and ecosystems resources at large (targets 6.3, 6.4 and 6.6). IWRM also serves to improve overall resilience to water-related disasters (target 11.5).

In the 2012 UN-Water Status Report on the Application of Integrated Approaches to Water Resources Management for Rio+20, 65% of the participating countries reported on plans for IWRM in place at the national level, and in more than 50% of these countries, the implementation was already advanced. Some 54% of the countries reported on engagement in the implementation of transboundary agreements for specific basins.

IWRM is about balancing the water needs of society, the economy and the environment

Target 6.5

Target text	Normative interpretation
By 2030, implement	Refers to the Johannesburg Plan of Implementation (2002) objective to develop IWRM and water efficiency plans
integrated water resources management	Process that promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems, taking into account hydrological and technical aspects, as well as socioeconomic, political and environmental dimensions
at all levels,	Refers primarily to vertical levels of governance, from national government to local government, basin authorities and stakeholder participation
including through transboundary	Surface water or groundwater basins (aquifers) that cross or are located on boundaries among two or more countries; refers to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992) and the Convention on the Law of the Non-navigational Uses of International Watercourses (New York, 1997)
cooperation as appropriate	ustomary international water law requires countries to cooperate in managing transboundary waters, with the main principles contained in the above-mentioned United Nations conventions; apart from island countries without a terrestrial border or countries not having transboundary waters, transboundary water cooperation is appropriate

Indicator 6.5.1

Global indicator 6.5.1	Definition and rationale
Degree of integrated water resources management implementation (0- 100)	Definition: The degree to which IWRM is implemented, by assessing the four components of policies, institutions, management tools and financing. It takes into account the various users and uses of water, with the aim of promoting positive social, economic and environmental impacts at all levels, including the transboundary level, where appropriate. The method builds on official United Nations IWRM status reporting as specified in the Johannesburg Plan of Implementation (2002). This indicator supports decision-making at the country level, as it enables countries to identify barriers to progress and ways in which they can be addressed, feeding directly into the means of implementation indicators 6.a.1 and 6.b.1. The indicator also facilitates coherence among the various water- and sanitation-related targets by supporting monitoring, planning and evaluation, as well as associated capacity-building. The survey instrument is a questionnaire with questions relating to each of the four components. Although the responses to each individual question are aggregated into one national value for the purpose of global reporting, the strength of this indicator lies in maintaining and assessing the responses to the individual questions.

Data for indicator 6.5.1

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National source: Response on IWRM questionnaire from national line ministries and institutions Global database : 2012 Status Report on IWRM Global compilation: UNEP on behalf of UN-Water	Survey response prepared by IWRM focal point in national government based on ad hoc consultations with colleagues and partners.	Survey response consolidated by formal consultations among stakeholders including national and subnational governments, non-governmental organizations, the private sector and academia.	Survey response used as a diagnostic tool for national IWRM planning, including all relevant stakeholders.

Indicator 6.5.2

Global indicator 6.5.2	Definition and rationale
Proportion of transboundary basin area with an operational arrangement for water cooperation	Definition: Percentage of transboundary basin area within a country that has an operational agreement or other arrangement for water cooperation. For the purpose of the indicator, "basin area" is defined for surface waters as the extent of the catchment, and for groundwater as the extent of the aquifer. An "arrangement for water cooperation" is a bilateral or multilateral treaty, convention, agreement or other formal arrangement among riparian countries that provides a framework for cooperation on transboundary water management. The criteria for the arrangement to be considered "operational" are based on key aspects of substantive cooperation in water management, such as the existence of institutional mechanisms, regular communication among riparian countries, joint or coordinated management plans or objectives, as well as a regular exchange of data and information. By tracking progress on the degree to which transboundary surface water and groundwater are covered by operational cooperation arrangements, this indicator responds directly to the target component "including through transboundary cooperation as appropriate".

Data for indicator 6.5.2

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National source: National line ministries and institutions Global databases: Reporting under the Water Convention, GEF TWAP, ISARM TBA, OSU Global compilation: UNECE and UNESCO on behalf of UN-Water	--	--	--

Regular communication and coordinated planning between countries sharing water bodies are examples of transboundary cooperation

Target 6.6
Water-related ecosystems

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

Water-related ecosystems ultimately answer for the provision of water services to society, and are important for improving water quantity (because they can capture and store water) and water quality (because they can decompose and/or absorb water pollutants). Target 6.6 seeks to halt the degradation and destruction of these ecosystems, and to assist the recovery of those already degraded and destructed. The target not only includes aquatic ecosystems such as rivers, lakes and wetlands, but also mountains and forests, which are important for storing freshwater (for example, in glaciers) and for maintaining high water quality.

Target 6.6 directly contributes to wider improvements in ecosystem health, both terrestrial (SDG 15) and marine (SDG 14), and it builds on the Aichi Biodiversity Targets of the Strategic Plan for Biodiversity 2011–2020 (reflected in the target year of 2020), the Convention on Wetlands of International Importance (Ramsar) and the

Scientific studies show that 64% of the world's wetlands have disappeared since 1900; measured against 1700, an estimated 87% have been lost. Source: Ramsar Fact Sheet 1 (Wetlands: why should I care?).

Ecosystems replenish and purify water resources, and need to be protected in order to safeguard human and environmental resilience

Target 6.6

Target text	Normative interpretation
By 2020	Refers to the Aichi Biodiversity Targets to be reached by 2020
protect and	Implies a reduction in or eradication of the loss or degradation of ecosystems
restore	Implies a reversal of loss or degradation; assisting the recovery of degraded, damaged or destroyed ecosystems by re-establishing structural characteristics, species composition and ecological processes
water-related ecosystems,	Whereas all ecosystems depend on water, some ecosystems – as specified below – play a more prominent role in the provision of water-related services to society
including mountains,	Most of the world's rivers are fed from mountain sources, with snow acting as a storage mechanism for downstream users; more than half of humanity depends on mountains for water
forests,	Large areas of land covered with trees or other woody vegetation, covering about 30% of the world's land area and accounting for 75% of gross primary production; forests are central for safeguarding water quantity and quality
wetlands,	Swamp, pond, peat or water, natural or artificial, permanent or temporary, stagnant or flowing water, including estuaries and marine waters down to 6 m below the low-tide mark (definition by the Ramsar Convention)
rivers,	Channels where water flows continuously or periodically
aquifers and	Underground zones that contain sufficient saturated permeable material to yield significant quantities of water to wells and springs
lakes	Depressions in the Earth's surface occupied by bodies of standing water; they also include small and shallow water bodies, such as ponds and lagoons

Indicator 6.6.1

Global indicator 6.6.1	Definition and rationale
Change in the extent of water-related ecosystems over time	Definition: Changes over time in (1) the spatial extent of water-related ecosystems (wetlands, forests and drylands); (2) the quantity of water in ecosystems (rivers, lakes and groundwater); and (3) the resulting health of ecosystems. In addition, indicator 6.3.2 on ambient water quality and indicator 6.4.2 on environmental water requirements are critically important for understanding ecosystems, and need to be factored into the assessment of indicator 6.6.1. The subcomponents are derived from the hydrological and biological aspects that are needed to adequately characterize ecosystems. The health subcomponent factors in all of the other subcomponents, as the resulting health of an ecosystem depends upon spatial extent, water quantity and environmental water requirements, and water quality. By assessing changes over time, the subcomponent values can be aggregated into one. The individual subcomponents can be disaggregated by, for example, type of ecosystem and water basin. To capture the full ambition of the target, this indicator is complemented by additional indicators under SDG 15 that focus on mountains (15.4.1) and forests (15.1.1), as well as on land degradation (15.3.1) and ecosystem protection (15.1.2 and 15.5.1). This indicator can support reporting on targets 11.5, 11.6, 11.7, 12.2, 13.1, 14.2, 14.5, 15.1, 15.3 and 15.5.

Data for indicator 6.6.1

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: National line ministries and institutions, ground-based surveys Global databases (selection): RAMSAR Convention on Wetlands, Global Runoff Database at GRDC, Global Groundwater Information System of IGRAC, GlobWetlands II, Hydroweb from LEGOS, Earth observations Global compilation: UNEP on behalf of UN-Water	Monitoring of the subindicator spatial extent and water quantity, based on Earth observations and site collection of water quantities.	Ground-based verification and interpretation of Earth observation data. Ground-based assessment of spatial extent, including classification of wetland type.	Monitoring of subindicator ecosystem health, for example, through assessments of benthic macroinvertebrates or fish in rivers.

Target 6.a

International cooperation and capacity-building

"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"

Although the implementation of SDG 6 is expected to generate benefits that widely exceed the costs of doing so, some hundreds of billions of dollars still need to be raised for the purpose. Needs are greatest in developing countries, calling for an increased mobilization of domestic funds, but also a significant scaling-up of external support. In this regard, target 6.a seeks to expand international cooperation and capacity-building support to developing countries. International cooperation refers to external aid in the form of grants or loans, including official development assistance (ODA). Capacity-building includes strengthening the skills, competencies and abilities in developing countries in regard to water governance and management.

Creating an enabling environment is an essential first step for succeeding with the implementation of any management response. Target 6.a supports the implementation of all SDG 6 targets (6.1–6.6 and 6.b) by promoting the provision of finance and of capacity-building in developing countries. The "means of implementation" targets 6.a and 6.b are complementary to the dedicated means of implementation goal (SDG 17) and its 19 targets, which focus on finance, technology, capacity-building, trade and systemic issues.

Human and financial resources are needed to implement SDG 6, and international cooperation is essential for making it happen

Target 6.a

Target text	Normative interpretation
By 2030, expand international cooperation	Implies aid in the form of grants or loans from external support agencies
and capacitybuilding support to developing countries	Implies strengthening the skills, competencies and abilities of people and communities, so that they can overcome the causes of their exclusion and suffering
in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	Practices, processes and technologies that support progress towards water- and sanitation-related targets; the monitoring of water and sanitation, including observation networks and databases for surface and groundwater, is also important

Indicator 6.a.1

Global indicator 6.a.1	Definition and rationale
Amount of water- and sanitation-related official development assistance that is part of a government coordinated spending plan	Definition: Amount and percentage of ODA that is included in a government coordinated spending plan, whether: (1) on treasury or (2) on budget. ODA flows are official financing with the main objective of promoting economic development and welfare of developing countries; they are concessional in character with a grant element of at least 25%. By convention, ODA flows comprise contributions from donor government agencies, at all levels, to developing countries, either bilaterally or through multilateral institutions. A government coordinated spending plan is defined as a financing plan/budget for water and sanitation projects, clearly assessing the available sources of finance and strategies for financing future needs. It is essential to assess ODA flows to a country in relation to how much of it is included in the government coordinated spending plan, to better understand how much the country depends on external support, as well as to what extent ODA flows are coordinated by the government. A low value of this indicator (near 0%) would suggest that international donors are investing in water- and sanitation-related activities and programmes in the country outside the purview of the national government. A high value (near 100%) would indicate that donors are aligned with national government and national policies and plans for water and sanitation. The indicator can be disaggregated for type of water and sanitation activity/programme (according to the OECD Creditor Reporter System purpose codes). ODA is a quantifiable proxy for "international cooperation and capacity-building support", but it does not capture all types of support in this regard. Given the broad range of involved stakeholders, it is envisaged that the indicator will be further qualified during the SDG period.

Data for indicator 6.a.1

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: Response on GLAAS and IWRM questionnaires from national line ministries and institutions Global databases: OECD's Creditor Reporting System, UN-Water GLAAS Global compilation: WHO/UNEP on behalf of UN-Water	Information on the amount of ODA received.	Inclusion of information on the government coordinated spending plan for WASH (through the GLAAS TrackFin initiative). .	Expanding information on the government coordinated spending plan to also cover water resources management in general (all components of SDG 6).

In 2014, more than USD 7 billion was disbursed as ODA, specifically targeted towards water supply and sanitation, constituting about 4% of the total ODA disbursed that year (source: OECD). In the same year, almost half of the countries participating in the 2014 GLAAS survey responded that they lacked more than 50% of the funds necessary to meet the MDG targets on drinking water and basic sanitation.

Target 6.b
Stakeholder participation

"Support and strengthen the participation of local communities in improving water and sanitation management"

Target 6.b aims for the participation of local communities in water and sanitation planning and management, which is essential for ensuring that the needs of all people are being met. The involvement of relevant stakeholders is further necessary to ensure: that the technical and administrative solutions decided upon are suitable for specific socioeconomic contexts, the full understanding of the impacts of a certain development decision and the encouragement of local ownership of the solutions when implemented (to ensure sustainability over time). Target 6.b supports the implementation of all SDG 6 targets (targets 6.1–6.6 and 6.a) by promoting the meaningful involvement of local communities, which is also a central component of IWRM.

In the GLAAS 2013/2014 survey, 83% of the countries reported that procedures for stakeholder participation in WASH planning programmes were clearly defined in law or policy, but less than half of the countries had reached a "moderate" extent of implementation. Similarly, in the IWRM Status Report (2012), 86% of the countries responded that they had a mechanism for stakeholder participation in place, but only 38% could report on an "advanced stage" of implementation.

To ensure sustainability it is essential to include local communities in water and sanitation management

Target 6.b

Target text	Normative interpretation
Support and strengthen the participation of	Participation implies a mechanism by which individuals and communities can meaningfully contribute to decisions and directions on water and sanitation planning that affect or can be affected by them
local communities	Groups of interacting people living in a common location
in improving water and sanitation management	Implies improving the management of all aspects of water and sanitation

Indicator 6.b.1

Global indicator 6.b.1	Definition and rationale
Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management	Definition: Percentage of local administrative units within a country with established and operational policies and procedures for participation of local communities in water and sanitation management. Local administrative units refer to subdistricts, municipalities, communes or other local community-level units covering both urban and rural areas to be defined by the government. Policies and procedures for participation of local communities in water and sanitation management define a mechanism by which individuals and communities can meaningfully contribute to decisions and directions on water and sanitation management. Data can be disaggregated by subnational regions as well as by urban/rural regions (for countries that have categorized their local administrative units in this way), providing information on equity. Defining the procedures in policies or laws for the participation of local communities is vital for ensuring that the needs of all in a community are met, including the most vulnerable. It is also essential for ensuring the sustainability of water and sanitation solutions over time, for example, the choice of appropriate solutions for a given social and economic context, the full understanding of the impacts of a certain development decision and local ownership of the solutions. This indicator, by assessing the extent and degree of participation of local communities, thus provides a proxy for the sustainability of water and sanitation management in a country.

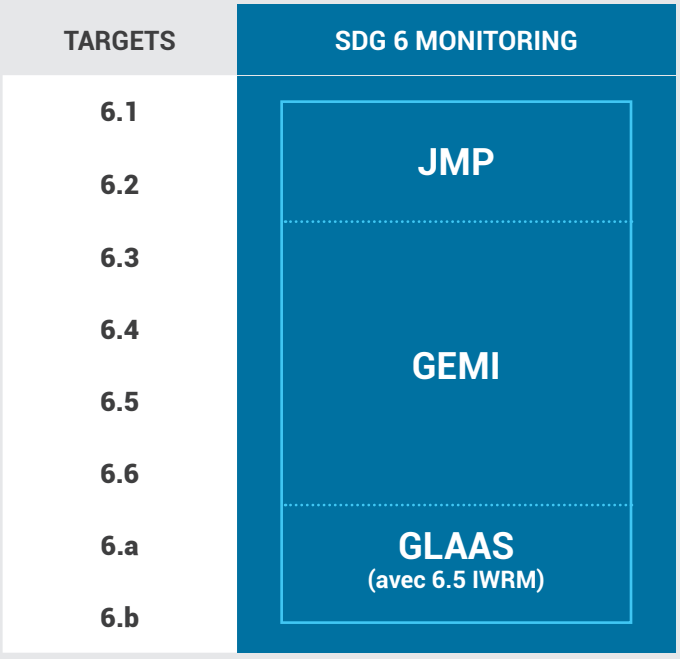
Data for indicator 6.b.1

Sources of data	1st step of progressive monitoring (example)	2nd step of progressive monitoring (example)	3rd step of progressive monitoring (example)
National sources: Response on GLAAS and IWRM questionnaires from national line ministries and institutions Global databases: UN-Water GLAAS, 2012 Status Report on IWRM Global compilation: WHO/UNEP on behalf of UN-Water	Qualitative estimation of degree of stakeholder participation at the national level.	Quantitative estimation of the total number of local administrative units and qualitative estimation of the degree of stakeholder participation in each of them.	Quantitative assessment of the degree of stakeholder participation.

Coherent framework for global monitoring of Sustainable Development Goal 6

Building on national monitoring efforts, UN-Water stands ready to support United Nations Member States in the global monitoring of SDG 6.

For WASH (SDG targets 6.1 and 6.2), the WHO / UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) is well placed, with 15 years of experience gained from MDG monitoring. For the new targets on wastewater treatment and water quality, water use and water-use efficiency, IWRM and water-related ecosystems (SDG targets 6.3–6.6), a new global monitoring initiative, Integrated Monitoring of Water and Sanitation Related SDG Targets (GEMI), is currently being developed based on existing monitoring initiatives. And finally, the monitoring of the means of implementation (SDG targets 6.a and 6.b) can build on the UN-Water GLAAS and GEMI reporting towards target 6.5 on IWRM, which is based on the existing UN-Water IWRM status reporting. JMP, GEMI and GLAAS will be progressively aligned to ensure a coherent SDG 6 monitoring framework; together, they will be able to monitor progress towards the entirety of SDG 6, while also underpinning the monitoring of many other SDGs and targets through the use of multi-purpose indicators.



Contact information

Integrated monitoring of water and sanitation related SDG targets - GEMI is an inter-agency initiative composed of UNEP, UN-Habitat, UNICEF, FAO, UNESCO, WHO and WMO, operating under the umbrella of UN-Water. For more information, please contact one of our focal points.

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Learn more

About water and sanitation in the 2030 Agenda for Sustainable Development: www.unwater.org/sdgs/en/
About the GEMI monitoring initiative: www.unwater.org/gemi/en/

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