Water and Sanitation Submission to the UAE – Belém work programme on indicators for measuring progress achieved towards the targets of the Global Goal on Adaptation framework

1. Introduction and context

The Glasgow–Sharm el-Sheikh work programme COP 28 Decision's on the global goal on adaptation (GGA) included the launching of a two-year UAE – Belém work programme on indicators for measuring progress achieved towards the targets established in paragraphs 9 and 10 of the Decision, with a view to identifying and, as needed, developing indicators and potential quantified elements for those targets.

At the same time, Parties and Observers were invited to submit via the United Nations Framework Convention on Climate Change (UNFCCC) submission's portal by March 31st 2024 views on the development of indicators and quantified elements for the GGA targets, as well as views on modalities of the UAE – Belém work programme (e.g. organization of work, timelines, inputs, outputs and the involvement of stakeholders).

This submission is made by a set of partners XXXXXXX [**To be completed, an annex can include recognition to all partners endorsing it**]…. of the Sanitation and Water for All (SWA) Partnership, as well as other partners of the broader water community following GGA discussions that were held at the COP28 Water Pavilion. The submission describes existing definitions and initial considerations for each of the water elements that have been explicitly referred to under two of seven the thematic targets listed in paragraph 9 of the Decision (paragraphs 9a, and 9d). A case is also made on how beyond the explicit references to water in those two targets, water needs to be considered as a cross cutting element that is essential to achieve climate adaptation, reduction of vulnerability and resilience within each of all other GGA thematic targets. This submission also describes particularities that should be considered in relation to water and sanitation across the four GGA targets around the iterative adaptation cycle, as listed in paragraph 10 of the Decision. Finally, reflections are shared in relation to the modalities of work of the UAE – Belem work programme building on lessons learnt from the UN-Water Integrated Monitoring Initiative for the Sustainable Development Goal 6 (IMI-SDG6).

2. Initial views on metrics for the explicit water and sanitation references in GGA targets

Paragraph 9 of the Decision is dedicated to seven thematic targets that are to be achieved by 2030 and progressively beyond.

Paragraph 9a of the Decision is dedicated to water and sanitation, bringing together in the narrative of the target the following elements:

- Significantly reducing climate-induced **water** scarcity;
- Enhancing climate resilience to **water**-related hazards;
- Towards a climate-resilient **water** supply, climate-resilient **sanitation**; and
- Towards access to safe and affordable potable **water** for all.

In addition to this, paragraph 9d, dedicated to ecosystems and biodiversity, also makes an explicit reference to water:

- [...] Accelerating […] management, enhancement, restoration and conservation and the protection of […] inland **water** […] ecosystems.

Following is an analysis of existing definitions against those elements, as well as initial considerations for metrics.

2.1 Significantly reducing climate-induced water scarcity

According to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6)[i], **water scarcity and water insecurity are related concepts but not identical**, and each has a range of interpretations leading to some overlap. **Water scarcity can be broadly described as a mismatch between the demand for fresh water and its availability, quantified in physical terms**. Some **definitions of water scarcity** also incorporate broader issues. For example, **economic water scarcity** has been defined as a situation where human, institutional, and financial capital limit access to water, even though water in nature is available locally to meet human demands. Economic water scarcity can also occur where infrastructure exists, but water distribution is inequitable. Much of the literature exploring the impacts of climate change on water security, focuses on quantifying physical water scarcity.

A commonly used measure of physical water scarcity is the **Falkenmark index** which measures the amount of renewable freshwater available per capita. However, IPCC considers that the Falkenmark index is now regarded as an incomplete measure, as it does not account for water needed for non-human needs**.** Using a water scarcity index defined as the ratio of demand and availability, and accounting for non-human needs, it is estimated that 4 billion people live under conditions of severe water scarcity for at least one month per year (Mekonnen and Hoekstra, 2016). **Quality-induced water scarcity** is an additional factor beginning to be considered. Recent analysis has found that current and future water scarcity becomes a substantially more severe issue globally when assessing "clean-water scarcity" (Wang, M. *et al.* 2024).

Although regions with high water scarcity are already naturally dry, human influence on climate is leading, according to the IPCC AR6, to reduced water availability in many regions. **While, a conclusion in the AR6 is that quantification of the contribution of anthropogenic climate change to current levels of water scarcity is not yet available, the report expresses high confidence that improving societal aspects of water management will be key in adapting to climate change-driven increases in water scarcity in the future.**

Aligned to these conclusions are the **recently published Green Climate Fund Water Security Guidelines**, that recognize that climate change, rapid urbanization, population growth, and pollution **are all** contributing to increased water scarcity. GCF proposes then a climate financing pathway towards responsible and sustainable water management relying not only in more 'hard' infrastructure but through a combination of (i) saving water through water conservation, water efficiency, non-revenue water reduction, and water re-use and water recycling; (ii) educating the public and policy-makers; (iii) allocating scarce water resources through proper regulation; and (iv) a well-managed mix and integration of the Grey-Green Infrastructure[1] to enhance the adaptability and resilience of coastal and upstream communities to climate change (drought and flooding).

Considering this, and in relation to potential **metrics towards "significantly reducing climate-induced water scarcity"** the SWA and Partners submission to the GGA Work Programme in March 2023 recommended that a strong baseline can consist of some of the existing Sustainable Development Goal (SDG) 6 indicators:

- **SDG Indicator 6.3.1: Proportion of domestic and industrial wastewater flows safely treated.** The World Health Organization (WHO), the United Nations Human Settlements Programme (UN-Habitat) and the United Nations Statistics Division (UNSD) are the custodians of this indicator.
- **SDG Indicator 6.3.2: Proportion of bodies of water with good ambient water quality.** The United Nations Environment Programme (UNEP) is the custodian of this indicator.

[1] **Green infrastructure** refers to natural systems including forests, floodplains, wetlands and soils that provide additional benefits for human well-being, such as flood protection and climate regulation. **Gray infrastructure** refers to structures such as dams, seawalls, roads, pipes or water treatment plants.

- SDG Indicator 6.4.1: **Change in water-use efficiency over time**. The FAO is the custodian of this indicator.
- SDG Indicator 6.4.2: **Level of water stress: freshwater withdrawal as a proportion of available freshwater resources.** The FAO is the custodian of this indicator.

To address the issue acknowledged by the IPCC that quantification of the contribution of anthropogenic climate change to current levels of water scarcity is not yet available, an initial step could be to map the areas (globally and nationally) where water scarcity overlaps with high exposure to climate hazards (e.g. droughts, floods, etc.) and track progress there towards the SDG indicators mentioned above as a means to also track progress towards "significantly reducing climate-induced water scarcity".

This is what UNICEF has done recently using water risk data from the World Resources Institute (WRI) and drought events data from the Global Data Risk Platform of the United Nations Environment Programme (UNEP).[2] A water scarcity index has been created by overlapping and mapping: 1. Baseline water stress, which measures the ratio of total water withdrawals to available renewable surface and groundwater supplies; 2. Drought events; 3. Interannual variability, which measures the average between-year variability of available water supply, including both renewable surface and groundwater supplies; 4. Seasonal variability, which measures the average within-year variability of available water supply; 5. Groundwater table decline, which measures the average decline of the groundwater table. Data for each country can be consulted HERE.

Potential additional considerations for metrics in the overlap of water scarcity and high exposure to climate hazards:

- M3 of water saved per year (compared to baseline)
- M3 of water reused (compared to baseline)
- M3 of wastewater recycled and reused
- Number of countries that have developed and implement water demand management strategies that factor in the human rights to water and sanitation
- Number of people benefited from interventions targeting water conservation, efficiency and reuse
- Number of countries with Improved regulatory measures for water demand management, water reuse, circularity (and other measures related to reducing water scarcity)
- Number of countries with enhanced communication and awareness mechanisms for adequate water conservation, reuse and efficiency
- Number of countries with enhanced measures to integrate green and grey infrastructure into national policy and budgeting
- Volume of climate adaptation finance invested in projects to address all (or some of) the above.

In addition to the SDG indicators indicated above, it is important to consider that the Environment Statistics Section of the United Nations Statistics Division (UNSD) is engaged in the development of methodology, data collection, capacity development, and coordination in the fields of environmental statistics and indicators. The following are indicators in relation to "**Inland Water Resources" from the Global Set of Climate Change Statistics and Indicators** that could be considered, in areas highly exposed to climate impacts, against this element of the GGA water target:

- Fresh groundwater abstracted
- Fresh surface water abstracted
- Freshwater abstracted
- Freshwater abstracted as proportion of renewable freshwater resources

[2] The climate crisis is a child rights crisis: Introducing the Children's Climate Risk Index - UNICEF DATA (see from page 31)

- Inflow of surface and groundwaters from neighboring countries
- Internal flow
- Renewable freshwater resources
- Renewable freshwater resources per capita
- Wastewater generation and treatment (latest year)
- Water resources (latest year)

Box 1. Transboundary Water Cooperation and Climate Change

Worldwide, 153 countries share rivers, lakes and aquifers, and 286 river basins and 592 aquifers cross sovereign borders (UNECE, 2018). Transboundary basins account for an estimated 60 per cent of global freshwater flow, and are home to more than 40 per cent of the world's population (UN Water, 2008).

While transboundary water is not a thematic GGA target, the article 18 of the Decision adopted at COP28 "*Recognizes* that climate change impacts are often transboundary in nature and may involve complex, cascading risks that can benefit from collective consideration and knowledge-sharing, climate-informed transboundary management and cooperation on global adaptation solutions".

The existing SDG indicator 6.5.2 "Proportion of transboundary (river) basin area with an operational arrangement for water cooperation" can be an initial point of departure to track adaptation measures of transboundary water cooperation worldwide. In 2023-2024, the third reporting exercise is ongoing and UNESCO and UNECE, as co-custodian agencies of this indicator, have approached 153 countries sharing transboundary waters for updated information. As of 30 January 2024, 129 replies had been received. Data is being submitted to the UN statistical commission in February 2024. In addition, by Summer 2024, a progress report will be prepared. The thematic focus of the third progress report will be climate change, disaster risk reduction and transboundary cooperation. The first draft of the report is due by 1 April 2024.

2.2 Enhancing climate resilience to water-related hazards

Water-related hazards encompass a range of dangerous situations or conditions related to water, both natural and man-made. Those include weather and climate related water hazards such as tropical cyclones, floods, drought, heatwaves, cold spells, coastal storm surges, and heavy rainstorms, as well as others that are not related to the climate such as tsunamis. A water hazard may also be a biological or chemical agent or physical property of water that has the potential to cause injury or illness to an individual. **Water-related hazards are particularly sensitive to even small shifts in climate**, so that the frequency, magnitude and intensity of these hazards are shifting over times (Milly et al., 2005).

The World Meteorological Organization (WMO) has recently reported that **most disasters are water-related and climate change is increasing their frequency and severity**. Indeed, since 2000, flood-related disasters have increased by 134%, and the number and duration of droughts also increased by 29% (WMO, 2021b). Between 1970 and 2019, 11,072 disasters attributed to weather-, water-, and climate-related hazards, have involved 2.06 million deaths and US$ 3.6 trillion in economic losses (WMO, 2021a).

The GCF Water Security Sectoral Guide indicates that the vision for a paradigm shift in water security for **mitigating water-related hazards** differs depending on the location and the type of hazard including area with water-borne diseases.

Table 1. Examples of sensitive elements of water supply, sanitation and hygiene towards climate-induced water-related hazards (by the Green Climate Fund[3])

Climate-induced change	Water-related hazard	Sensitive elements of water supply, sanitation, hygiene
Decrease in net precipitation	Drought	Reduction in raw water supplies, reduced flow in rivers, lower groundwater levels, less dilution/increased concentration of pollutants in water, challenge to hygiene practices
Increase in precipitation and/or storms	Riverine flooding and/or local urban flooding	Pollution of wells, inundation of wells, inaccessibility of water sources, flooding of latrines, physical damages to infrastructure, landslides around water sources, sedimentation and turbidity, challenges to sustainability of sanitation and hygiene behaviours, and water borne diseases
Sea level rise and storm surge	Coastal zone flooding and saltwater intrusion into freshwater aquifers, or river mouths	Reduction in availability of drinking water, with high impacts on quality
Increase in temperature	Heatwaves	Damage to infrastructure, increase in pathogens in water leading to increased risk of disease
Increase in temperature	Melting and thawing of glaciers, snow, sea ice and frozen ground	Seasonality of riverine flows affected leading to a reduction in water availability in summer
Compound climate effect: increase in temperature and decrease in net precipitation	Growing water stress	Imbalance between the naturally renewable water supply and (growing) water demand due to higher evapotranspiration (e.g., for irrigated agriculture and nature) introduce significant trade-offs among water users

The GCF highlights the requirements for sustained participation in planning and management; improved coverage and application of digital solutions; increased acceptance and use of non-traditional financing mechanisms; and environmentally sound use of structural measures to increase resilience. The GCF also indicates that **ecosystem-based management** and smart systems provide opportunities to mitigate water-related hazards with a climate cross-cutting impact potential combined with sustainable development co-benefits.

Considering this, and in relation to potential **metrics towards "enhancing climate resilience to water-related hazards",** initial indicators for consideration can include:

- Number of countries with prevention, response and financing strategies to climate induced water-related hazards
- Number of countries with strategies on the use of green/grey infrastructure /use of nature-based solutions to address water-related hazards

Beyond that, the UN Secretary-General has called for every person on Earth to be protected by early warning systems by 2027. According to the World Meteorological Organization (WMO) and the United Nations Office for Disaster Risk Reduction (UNDRR), advances in early warning systems and preparedness have saved tens of thousands of lives and hundreds of billions of dollars. People-cantered, end-to-end, water-hazard early-warning systems can help minimize the

[3] The table displayed in the GCF Water Security Guide Annex 2 and reproduced here is an adapted version of the Global Water Partnership – UNICEF Strategic Framework for Climate Resilient Water, Sanitation and Hygiene Development.

harm to people, assets, and livelihoods by triggering early action that is well-prepared and tested. Yet, WMO has reported that as of 2022, only half of countries globally are protected by multi-hazard early warning systems. The numbers are even lower for developing countries; less than half of the Least Developed Countries and only one-third of Small Island Developing States have a multi-hazard early warning system.

In November 2022, an Executive Action Plan was launched at COP27 to implement the initiative and designated as the co-leads the WMO and UNDRR. Within the Early Warnings for All Initiative / Early Warnings for All Initiative dashboard indicators capture the global impact of natural disasters and the status of Multi-Hazard Early Warning Systems.

The dashboard is the product of the global cooperation on the Initiative, with partners who put together data, sources and methodologies towards the creation of an online monitoring tool. The dashboard presents selected monitoring indicators structured along three categories:

- **Global indicators:** metrics that capture the Initiative's impact on the availability of end-to-end, people-centred multi-hazard early warning systems. The data is based on official reporting mechanisms, such as the Sendai Framework online Monitoring Tool, and information from the WMO Monitoring System.
- **Implementation indicators:** metrics based on the Initiative's monitoring and evaluation framework. Along with the cross-cutting indicators on the enabling environment, **a subset of them includes water references such as:**
  - Country Hydromet Diagnosis conducted
  - Assessment for End-to-End Flood Forecasting
  - Countries supported for the provision of hydrological outlooks (HydroSOS)
  - Coverage of centres providing advisories and guidance for severe weather, tropical cyclones, and flash-floods.
- **Country capacity indicators:** baseline data on the early warning capacity of the roll-out countries.

2.3 Towards a climate-resilient water supply and climate-resilient sanitation

The Sustainable Development Goal 6 aims at ensuring availability and sustainable management of water and sanitation for all and includes ambitious targets for "achieving universal and equitable access to safe and affordable drinking water" (target 6.1), and "equitable sanitation and hygiene for all" (target 6.2) by 2030. Key related definitions to monitor progress towards those targets include the globally and sector wide agreed definitions by the WHO-UNICEF Joint Monitoring Program:

Drinking Water: refers to water used, or intended to be available for use, by humans for drinking, cooking, food preparation, personal hygiene and other essential domestic purposes.

- **Improved water sources:** those with the potential to deliver safe water by nature of their design and construction.
- **Basic service:** Drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing.
- **Safely managed service:** Drinking water from an improved water source that is accessible on premises, available when needed, and free from faecal and priority chemical contamination.

Sanitation: refers to the provision of facilities and services for the safe management and disposal of human urine and faeces.

- **Improved sanitation facilities:** those designed to hygienically separate excreta from human contact.
- **Basic service:** Use of improved facilities which are not shared with other households.
- **Safely managed service:** Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated offsite

The Green Climate Fund (GCF) paradigm shift for climate-resilient water supply and climate-resilient sanitation describes in its Water Security Guides that: "Climate resilient water supply, sanitation and hygiene (WASH) applied to the full water cycle in a sustainable way and implementing climate risk smart innovation technologies, will lead to health improvements, better agricultural livelihoods, reduction of environmental risks, low-energy emissions and generates more-income activities, and as such performs a shift to building more resilient communities."

To promote the envisioned enhancement of climate-resilient water supply and sanitation, GCF considers that additional objectives (to traditional WASH) must be added. These new objectives refer to elements of water supply and sanitation that are sensitive to climate change and trigger climate adaptation and mitigation efforts:

- **To ensure water supply and sanitation infrastructure, services and behaviours are sustainable, safe and resilient to climate-related risks.** This goes together with the sustainable use, protection and management of surface and groundwater resources, and resilient waste management. Typical decision metrics include reliability of services, storage in reservoirs, frequency of flooded infrastructure, frequency of non-functioning river intakes due to low flow, water quality parameters, etc.
- **To ensure that resilient water supply and sanitation programmes contribute to building community resilience to help them adapt to the impacts of climate change**. To achieve this, attention is needed first to those communities and groups that are disproportionately vulnerable to climate threats, with lack of access to WASH playing a role in restricting their capacity to respond effectively. Further WASH contributions to community resilience can be achieved through capacity development and by fostering income generation, as well as food, energy and ecosystem resilience. Typical decision metrics include number of individuals, groups, communities, etc. with improved resilience.
- **To work towards a low-carbon water supply and sanitation sector** by improving water and energy efficiency and ensuring, where possible, the use of renewable energy for water and sanitation operations to lower greenhouse gas (GHG) emissions, and energy generation from waste. Typical decision metrics involve the volume of biogas and biomass that can be recovered from wastewater and used as energy sources, area of reduced deforestation, etc.

By engaging with GCF accredited entities and other institutions, GCF aims to contribute towards ensuring that communities most vulnerable to the impacts of climate change will have secure year-round access to water supply and sanitation. This will increase their resilience to climate change.

Considering this, and in relation to potential **metrics towards "climate-resilient water supply and climate-resilient sanitation",** it is important to note that while some of the above are consolidated and sector-wide agreed definitions, **not even the indicators associated to the higher levels of service provision related to safely managed drinking water and safely managed sanitation integrate any climate-resilient considerations. Therefore, the existing and agreed definitions and indicators cannot be, by themselves or without contextualization (e.g. by overlapping with high exposure to climate hazards), enough to track progress towards climate-resilient water supply and climate-resilient sanitation**. Indeed, the water-sanitation community is currently undertaking extensive consultations to develop a sector wide understanding of the elements that need to be in place to consider water supply and sanitation services as climate-resilient:

1. In November 2023 the **SWA Climate Task Team started a consultation to further define and agree on the elements that constitute a climate-resilient water supply and sanitation service**. The baseline is the draft definition that was included in the SWA and Partners submission to the Glasgow- Sharm El Sheik Work Programme on the Global Goal on Adaptation in March 2023. There, it was mentioned that climate resilient drinking water and sanitation services refer to services which are resilient to climate-related shocks and stresses and incorporate the following:

    - **Climate risk analysis:** identification of impacts of climate variability and change (including extreme weather events) in the performance of water, sanitation and hygiene systems and associated behaviours.
    - **Preventive measures:** infrastructure is designed to cope with and respond to climate-related shocks and stresses (e.g., elevated infrastructures in flood-prone areas, additional water storage capacities, additional treatment capacity etc.).
    - **Resilient management/service delivery models:** are financially sustainable and sufficiently robust and flexible to cope with crisis, consider different climatic scenarios and thresholds, and incorporate redundancy (e.g., ready to provide alternative service solutions) to ensure continuity of the services (and reestablishment of services following extreme events), and to prioritise a risk-based approach (for instance, applying water/sanitation safety plans).
    - **Environmental considerations:** (e.g., sustainable use, protection and management of surface and groundwater resources in the context of climate change, resilient waste management) **and social considerations (**e.g., local and indigenous adaptation knowledge, differentiated impacts on different populations) are observed and standards/regulations in place followed**.**
    - **Contributions to community resilience:** are considered in the design of water, sanitation and hygiene interventions through capacity development and by fostering additional contributions such as (but not limited to) income generation, food, energy and ecosystem resilience.
    - **Greenhouse gas emissions:** the impact of the service/system is considered in terms of greenhouse emissions and (when feasible) use renewable energy sources and reduce energy demands.

    The on-going consultation to re-assess and consolidate a definition of climate-resilient water supply and sanitation services is expected to be completed in the next months and will also serve as key information towards a parallel on-going consultation led by the UNICEF-WHO Joint Monitoring Programme (of SDG 6 targets 6.1 and 6.2) as described below.

2. In December 2023 **the UNICEF-WHO Joint Monitoring Programme launched a request for proposals to enter into a contractual agreement with a successful bidder to carry out work to identify global indicators for climate-resilient water supply, sanitation and hygiene (WASH)** to be monitored by:

    a. WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation and Hygiene; and

    b. The UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS).

    This review has the following objectives and will ultimately inform global indicators for climate resilient WASH to be monitored by GLAAS and JMP:

    1. To review and catalogue emerging definitions, tools and indicators for monitoring climate resilient WASH (short term)

2. To identify and prioritize indicators for enhanced national and global monitoring of climate resilient WASH (medium term)
3. To pilot priority indicators and to progressively integrate them into national WASH monitoring systems (long term)

The review will involve inputs from principal groups:

1) a secretariat led by WHO and UNICEF; 2) a research partner(s) to provide technical support for the process; 3) a working group(s) to provide technical feedback on key findings from each stage of the review; and 4) a broad set of stakeholders who will be engaged through consultations to solicit inputs to the review and provide feedback on the findings and recommendations. Over the course of two years (2024-2025), the working group(s) will meet five times in addition to online and email consultations.

It is proposed then, that the advances with the two consultations outlined above are well considered and inform the work of the two-year UAE – Belém work programme on indicators for measuring progress achieved towards climate-resilient water supply and climate-resilient sanitation.

2.4 Towards access to safe and affordable potable water for all

In section 2.3 of this submission it has been described how **the Sustainable Development Agenda, more concretely target 6.1, already includes an ambitious target for "achieving universal and equitable access to safe and affordable drinking water"**. This is indeed a similar narrative to the one in the GGA water target, with four considerations:

- SDG Target 6.1 includes an additional reference to the access being "equitable", therefore, it is even more ambitious by definition than the GGA water supply target.
- Because there are no adaptation or climate resilience considerations to this specific water reference of the GGA target it can be understood that the existing monitoring and tracking by the Joint Monitoring Programme can provide a strong basis to track access progress, **but not necessarily adaptation progress**.
- The reference to "potable" water could be reconsidered during the mandate of the UAE – Belém work programme, as the water-sanitation community, as well as the sustainable development agenda agreed definitions, refer to "drinking" in English instead of "potable". This difference could vary depending on the other languages to which the GGA decision is being translated (i.e. Spanish – "*agua para consumo"*, and French – "*eau de boisson")*. It would be desirable to align such reference in the GGA water target to that of the SDG Target 6.1 (the term drinking preferred over potable, at least in English).
- Finally, and since the GGA target recognizes the importance of advancing towards climate-resilient sanitation, it would be desirable if an urgent call is placed through the work on developing indicators so that the GGA also tracks advances towards the achievement of "equitable sanitation and hygiene for all".

An additional consideration, linking to what it has been described in section 2.3, and as reported by the IPCC AR6, is that "**Adaptation options that are feasible and effective to the 3.4 billion people living in rural areas around the world and <u>who are especially vulnerable to climate change must</u> include the provision of basic services, such as water and sanitation (high confidence)"[4].** For them, the provision and sustained management of resilient **water, sanitation and hygiene services reduces community vulnerability to climate change and is a critical component of adaptive capacity and resilience**.

[4] IPCC AR5 had already concluded that the most effective measures to address patterns of risks due to climate change and reduce near-term vulnerability are "programs that implement and improve basic public health measures such as provision of clean water and sanitation […]." (IPCC, 2014)

Therefore, urgent efforts by countries, that could be tracked and monitored, are needed to map/identify and then prioritize the areas where high exposure to climate hazards overlap with insufficient access to drinking water (as well as to sanitation and hygiene) as indicated in the figure below (overlap of black and grey ellipses). This is particularly important in the least developed countries (e.g., those that have contributed least to climate change) as they overwhelmingly lag behind in terms of access to these essential services, and at the same time will have the most immediate impact and positive contribution towards global adaptation.

Figure 1. Prioritization of water supply and sanitation interventions for vulnerable populations highly exposed to climate hazards.

It must be noted that based on the most recent JMP global estimates, achieving the SDG drinking water target by 2030 will require a sixfold increase in current rates of progress. **Because this target is now a double SDG and GGA target, and the JMP already monitors access, a proposed way to monitor adaptation progress is to track the amount of additional climate adaptation financing directed towards its achievement.**

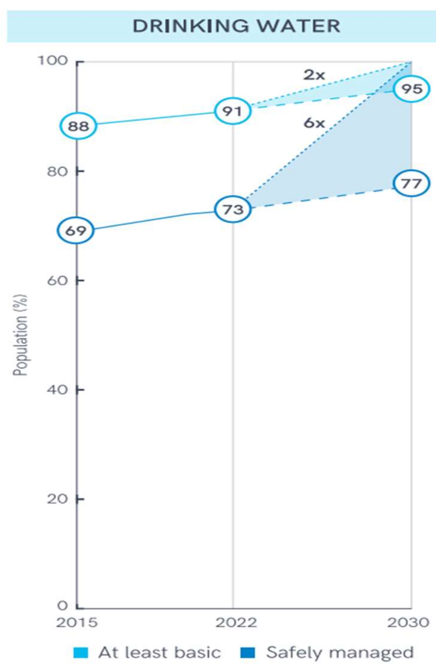

Figure 2. Global coverage of drinking water, 2015–2022 (%), and acceleration required to reach universal coverage (>99%) by 2030[5]

Parties to the Paris Agreement can easily consult global, regional and national level of drinking water (as well as access to sanitation and hygiene) service provision at the JMP website in a

[5] Progress on household drinking water, sanitation and hygiene 2000–2022: special focus on gender. New York: United Nations Children's Fund (UNICEF) and World Health Organization (WHO), 2023

very simple way HERE. It should be noted as well that JMP also monitors access to drinking water, sanitation and hygiene in schools and in health care facilities.

2.5 Accelerating management, enhancement, restoration and conservation and the protection of inland water ecosystems

The paragraph 9d of the GGA Decision sets a thematic target on ecosystems and biodiversity where water is explicitly mentioned: "(by 2030 and progressively beyond) Reducing climate impacts on ecosystems and biodiversity, and accelerating the use of ecosystem-based adaptation and nature-based solutions, including through their management, enhancement, restoration and conservation and the protection of terrestrial, **inland water**, mountain, marine and coastal ecosystems".

The Convention on Biological Diversity (CBD) refers to **"inland waters"** as aquatic-influenced environments located within land boundaries. This includes those located in coastal areas, even where adjacent to marine environments. Therefore, inland waters include lakes, rivers, ponds, streams, groundwater, springs, cave waters, floodplains, as well as bogs, marshes and swamps, which are traditionally grouped as inland wetlands.

The CBD has adopted the Ramsar Convention's definition of **"wetland"** and takes a broad approach in determining the wetlands that come under its aegis. Under the text of the Convention (Article 1.1), wetlands are defined as: **"Areas of marsh, fen, peatland[6] 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."**

The CBD notes that this definition includes all possible kinds of inland water body or ecosystem, or components thereof, including groundwater. The depth limit applies only to marine areas and not to inland water bodies.

The related concept of **"Inland water ecosystems"** includes also land. In that context, the CBD describes how from the ecological, hydrological, environmental and socio-economic perspective, all land is an integral part of an inland water ecosystem because fresh water (usually from rain) runs off it into rivers, lakes and wetlands. "Inland water habitat" also includes land that is influenced directly by aquatic habitat. For example, the vegetation near water bodies (in the riparian zone), even if never submerged, is influenced greatly by proximity to water. The clearest example of land-water interactions is with seasonally flooded areas, e.g., river floodplains, which may be dry or submerged depending on flood conditions.

The CDB has reported how **inland water ecosystems are often extensively modified by humans, more so than marine or terrestrial systems, and are amongst the most threatened ecosystem types of all**. Physical alteration, habitat loss and degradation, water withdrawal, overexploitation, pollution and the introduction of invasive alien species are the main threats to these ecosystems and their associated biological resources.

Adaptation to reduce the vulnerability of ecosystems and their services to climate change has been addressed in several IPCC reports, with the fourth and fifth assessments reports (AR4 and AR5) recognising both "autonomous" adaptation and "human-assisted" adaptation to protect natural species and ecosystems. In AR5, **ecosystem-based adaptation**, adaptation for people, based on the **better protection, restoration and management of the natural environment**, was identified as an area of emerging opportunity.

[6] The International Peatland Society explains that peatlands are terrestrial wetland ecosystems in which waterlogged conditions prevent plant material from fully decomposing. Consequently, the production of organic matter exceeds its decomposition, which results in a net accumulation of *peat*

An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems, highlighted in 2019 how conservation, ecosystem-based adaptation and related concepts were integrated throughout. Another IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways (in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty) also had noted in 2018 the role of ecosystem-based adaptation. Between AR5 and the most recent IPCC assessment report (AR6), the scientific literature has expanded considerably, with growing interest in the concept of **nature-based solutions**.

Beyond important references to water ecosystems in its Water Security Guides, GCF also considers ecosystems and ecosystems services in a Sectoral Guide that focuses primarily on ecosystem-based management of terrestrial, freshwater, coastal, and marine ecosystems (including peatlands). The GCF vision for a **paradigm shift in ecosystems is to secure their resilience, functionality, and the maintenance of ecosystem services under conditions of climate change.** The guide explains that this can be achieved through large-scale protection, restoration, and adaptive management along two paradigm shifting investment pathways: a) ecosystem-based management of terrestrial and freshwater ecosystems; b) ecosystem-based coastal and marine zone management.

For the ecosystem-based management of terrestrial and freshwater ecosystems, GCF aims at maintaining or enhancing ecosystem function at scales sufficiently large to be sustainable and **facilitate adaptation to climate change**.

Table 2. Examples of benefits provided by EbA practices as highlighted by GCF Ecosystems Guide.

Examples of EbA practices	Examples of Benefits
Protect and restore riparian ecosystems	• Provide water storage • Increase bank stability (erosion control) • Regulate floods • Produce a physical barrier that restricts the flow of pollutants and sediments and prevents them from being washed into the aquatic ecosystem • Improve water quality through lower suspended sediment loads. • Provide shade, temperature control, wildlife refugia, and secure water flows to protect sensitive populations of flora and fauna, especially in arid regions
Restore and manage wetlands and coastal areas	• Sustain or improve water quality by trapping sediments, filtering pollutants, and absorbing nutrients • Increase biodiversity and improve connectivity between habitats. • Lower flood peaks downstream • Protect coasts against storms and inundation
Reconnect rivers to floodplains	• Increase natural storage capacity • Reduce flood risk • Restore wetlands • Enhance habitats for migratory species

In relation to potential metrics for tracking progress towards "**accelerating management, enhancement, restoration and conservation and the protection of inland water ecosystems"** the Kunming-Montreal Global Biodiversity Framework (GBF) builds on the Convention's previous Strategic Plans, and sets out 4 goals for 2050 and 23 targets for 2030.

Among those, three targets make explicit references to "inland water", although those are not directly formulated in a context of addressing climate change:

- **Target 2:** Ensure that by 2030 at least 30 per cent of areas of degraded **inland water** are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity.
- **Target 3**: Ensure and enable that by 2030 at least 30 per cent of **inland water** especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed […].
- **Target 11**: Restore, maintain and enhance nature's contributions to people, including ecosystem functions and services, such as the regulation of air, **water** and climate, soil health, pollination and reduction of disease risk […].

The Kunming-Montreal GBF is accompanied by a detailed **monitoring framework comprised of a set of agreed indicators for tracking progress towards the Goals and Targets of the Framework.** The monitoring framework includes **"headline indicators"** which are recommended for national, regional and global monitoring, and more detailed component and **"complementary indicators".** An ad hoc technical expert group (AHTEG), composed of 45 experts, 30 nominated by Parties and 15 by Observers was established to provide guidance on the operationalization of the monitoring framework for the period to the 2024 United Nations Biodiversity Conference (COP16), also known as the Conference of the Parties to the UN Convention on Biological Diversity (CBD), which is scheduled to take place from October 21 to November 1, 2024 in Cali, Colombia. At COP16, the world will take stock of the targets and commitments that have been set.

A contextualization to climate change of the targets and related indicators above can be a strong basis to track adaptation progress in the context of this water element of the GGA ecosystems and biodiversity target.

3. Initial views on the water dependency of all GGA thematic targets

Water is the connector between many thematic areas. This has been extensively discussed in the context of the sustainable development agenda, it has been argued by the GCF in its Water Security Guide, and applies now to the thematic targets of the GGA. In the case of GCF, it should be noted that the fund operates around eight result areas that have been targeted because of their potential to deliver a substantial impact on mitigation and adaptation in response to climate change. Those eight result areas correspond in a great manner with the seven GGA thematic targets and GCF highlights how water security has synergistic opportunities with all the other GCF result areas. Considering that, and in a graphic way, the following table aims at highlighting the water dependency for the achievement of all GGA thematic targets, beyond the targets, or part of targets (i.e. ecosystems) where water is explicitly mentioned in the GGA Decision (and that have been extensively discussed in the previous sections of this submission).

Table 3. Cross-cutting GGA water thematic considerations

GGA thematic target	Water considerations for developing GGA metrics
FOOD-AGRICULTURE: Attaining climate-resilient food and agricultural production and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all.	Climate change alters the frequency and intensity of rainfall, floods and droughts, causing significant impacts on agriculture and food production. Water-food-agriculture climate considerations by GCF include: climate smart agriculture through irrigation and efficient water-use including treated wastewater. IPCC AR6 highlights that agricultural water use is projected to increase globally due to cropland expansion and intensification and climate change induced changes in water requirements (high confidence). Parts of temperate drylands may experience increases in suitability for rainfed production based on mean climate conditions; however, risks to rain-fed agriculture increase globally because of increasing variability in precipitation regimes and changes in water availability (high confidence). Water-related impacts on economically valuable crops will increase regional economic risks (medium evidence, high agreement). Regions reliant on snowmelt for irrigation purposes will be affected by substantial reductions in water availability (high confidence). Depending on underlying assumptions and the constraints on water resources implemented in the global agricultural models, irrigation water requirements are projected to increase two- to three-fold by the end of the century. While the combined effects of population and land use change as well as irrigation expansion account for the significant part of the projected increases in irrigation water demand by the end of the century, around 14% of the increase is directly attributed to climate change.

	Globally, 11% (5%) of croplands are estimated to be vulnerable to projected climate driven water scarcity by 2050 (Fitton et al., 2019). Climate-resilient water resource management is a potentially powerful mechanism to achieve local, and possibly global, food security (encompassing food production, preparation distribution, consumption and waste). Global crop water consumption of green water resources (soil moisture) is projected to increase by about 8.5% by 2099 relative to 1971–2000 as a result of climate drivers, with additional smaller contributions by land use change (Huang et al., 2019) IPCC AR5 had already concluded that overall irrigation water demand would increase by 2080, while the vulnerability of rain-fed agriculture will further increase. Also, IPCC SR1.5 (2018) concluded that both the food and the water sectors would be negatively impacted by global warming with higher risks at 2°C than at 1.5°C, and these risks could coincide spatially and temporally, thus increasing hazards, exposures and vulnerabilities across populations and regions. While global crop models and estimates of yield impacts often focus on major staple crops relevant for global food security, crops of high economic value are projected to become increasingly water dependent. (Beringer et al., 2020).
HEALTH: Attaining resilience against climate change related health impacts, promoting climate-resilient health services, and significantly reducing climate-related morbidity and mortality, particularly in the most vulnerable communities	The influence of climate change on the human right to health is significant and varied. A primary impact is the spread of infectious diseases, many of which are waterborne and already present a major burden to vulnerable populations worldwide. (UN Water, 2019). Waterborne diseases such as cholera are highly sensitive to changes in temperature, precipitation and humidity (WHO, 2012). Indirectly, climate change can reduce agricultural productivity, negatively influence nutrition and increase the spread of food-borne illness. Increased incidences of extreme weather can intensify human exposure to water contaminated by agricultural run-off, flooded water and sewage treatment systems, and standing water (a habitat for toxic algal blooms and a breeding ground for disease vectors that increase malaria risk), while drought can decrease water quantity and quality (Christopher Portier and others, 2010). Drought also increases the entrainment of dust and fine particulate matter in the air, causing a variety of human health impacts, particularly for children and the elderly. These impacts are felt over a range of timescales, requiring advanced planning and adaptation measures that can respond to short-term emergencies and longer-term stressors. Climate-resilient water and sanitation safety planning (WHO, 2017) are relevant risk-based management approaches for managing health risks associated with climate variability and change. The IPCC AR6 highlights that climate change is expected to compound existing vulnerabilities and increasing water-related health risks (medium evidence, high agreement). Therefore, additional research is required on disease-, country-, and population-specific risks due to future climate change impacts.

INFRASTRUCTURE-HUMAN SETTLEMENTS: Increasing the resilience of infrastructure and human settlements to climate change impacts to ensure basic and continuous essential services for all, and minimizing climate-related impacts on infrastructure and human settlements	Urban water supply resiliency; urban water treatment; urban sanitation including decentralised wastewater management. • Flood management, including sponge cities using Ecosystem Based Management (EbM) within an integrated urban water approach. Circular economy to manage the water cycle, including urban farming. IPCC AR6 highlights that, rapid population growth, urbanisation, ageing infrastructure and changes in water use are responsible for increasing the vulnerability of urban and peri-urban areas to extreme rainfall and drought, particularly in less developed economies with limited governance capacity (high confidence). In addition, modified stream flows due to climate change are projected to affect the amount and variability of water inflows to storage reservoirs that serve urban areas and may exacerbate challenges to reservoir capacity, such as sedimentation and poor water quality (high confidence). AR5 reported with medium confidence that climate change would impact residential water demand, supply and management. According to AR5, water utilities are also confronted by changes to the availability of supplies, water quality and saltwater intrusion into aquifers in coastal areas due to higher ambient and water temperatures (medium evidence, high agreement), altered streamflow patterns, drier conditions, increased storm runoff, sea level rise and more frequent forest wildfires in catchments. In nearly a third of the world's largest cities, water demand may exceed surface water availability by 2050, based on projections. Under all models, the global volume of domestic water withdrawal is projected to reach 700–1500 km3 yr–1 by 2050, indicating an increase of 50 to 250%, compared to the 2010 water use intensity (400–450 km3 yr–1). Increasing water demand by cities is already spurring competition between cities and agricultural users for water, which is expected to continue. As climate change poses a substantial challenge to urban water management, further refinement of urban climate models, downscaling and correction methods (e.g., Goore Bi et al., 2017; Jaramillo and Nazemi, 2018) is needed. Additionally, given that 90% of urban growth will occur in less developed regions, where urbanisation is largely unplanned (UN-Habitat, 2019), further research is needed to quantify the water-related risks of climate change and urbanisation on informal settlements.
POVERTY ERADICATION-LIVELIHOODS: Substantially reducing the adverse effects of climate	To be completed

change on poverty eradication and livelihoods, in particular by promoting the use of adaptive social protection measures for all	
CULTURAL HERITAGE: Protecting cultural heritage from the impacts of climate-related risks by developing adaptive strategies for preserving cultural practices and heritage sites and by designing climate-resilient infrastructure, guided by traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems	IPCC AR5 already found that climate change will threaten cultural practices and values, although the risks vary across societies and over time (medium evidence, high agreement). Furthermore, AR5 concluded that significant changes in the natural resource base on which many cultures depend would directly affect the cultural core, worldviews, cosmologies and symbols of indigenous cultures. IPCC SR1.5 concluded with high confidence that limiting global warming to 1.5°C, rather than 2°C, will strongly benefit terrestrial and wetland ecosystems and their services, including the cultural services provided by these ecosystems. IPCC AR6 expresses with high confidence that climate-driven hydrological changes to cultural water uses and culturally significant ecosystems and species are projected to pose risks to the physical well-being of Indigenous Peoples, local communities and traditional peoples. There is high confidence that the cultural water uses of Indigenous Peoples, local communities and traditional peoples are at risk of climate change-related hydrological change. Climate-driven variations in streamflow, saltwater intrusion and projected increases in water temperature will exacerbate declines of culturally important species and lead to variations or depletion of culturally important places and subsistence practices. For example, In Australia, Yuibera and Koinmerburra Traditional Owners fear the saltwater inundation of culturally significant sites and waterholes, while the flooding of culturally significant wetlands will negatively affect the Lumbee Tribe (USA). Moreover, changes in the carrying capacity of ice, snow quality and formation will probably increase the physical risks to Saami practising reindeer herding. IPCC AR6 concludes that further research is necessary to assess the extent and nature of climate-driven risks to cultural water uses in the context of broader socioeconomic, cultural and political challenges facing diverse Indigenous Peoples and local and traditional communities. In addition, given the significance of Indigenous knowledge and local knowledge to adaptive capacity and community-led adaptation, the potential risks of climate-related hydrological changes to diverse cultural water uses warrant closer study.

4. Initial water and sanitation views on the four GGA adaptation cycle targets

In a graphic way the following table aims at describing water and sanitation considerations against the 4 GGA dimensional targets of the iterative adaptation policy cycle.

Table 4. Water and sanitation considerations across the GGA adaptation policy cycle targets

GGA thematic target	Water considerations for developing GGA metrics
Impact, vulnerability and risk assessment: by 2030 all Parties have conducted up-to-date assessments of climate hazards, climate change impacts and exposure to risks and vulnerabilities and have used the outcomes of these assessments to inform their formulation of national adaptation plans, policy instruments, and planning processes and/or strategies, and by 2027 all Parties have established multi-hazard early warning systems, climate information services for risk reduction and systematic observation to support improved climate-related data, information and services	IPCC AR6 highlights that observed sectoral water-related impacts have been documented across world regions and climate change is projected to further exacerbate many of these risks. Risks manifest as a consequence of the interplay of human and natural vulnerability, **sector specific exposure as well as the climate hazard as a driver of climate change**. • The **Climate Risk Informed Decision Analysis (CRIDA) methodology**, developed by UNESCO, is a five-step process that adopts a participatory, bottom-up approach to identify water security risks related to hydro-climatic events, and is sensitive to the water vulnerabilities of indigenous populations and is guided by a gender perspective. • The **risk assessments methodology for water supply and sanitation,** developed by the Global Water Partnership and UNICEF guides the facilitation of national and subnational workshops and sets out an approach for conducting risk assessments for water supply and sanitation, providing evidence to support the prioritisation of risks requiring action: It covers risks across a wide range of hazard groups that affect the WASH sector, as well as climate related risks in more detail: It focuses primarily on rural services encompassing small-scale and community systems; however, the approach can be applied to both rural and urban settings.
Planning: by 2030 all Parties have in place country-driven, gender-responsive, participatory and fully transparent national adaptation plans, policy instruments, and planning processes and/or strategies,	• The **Water Tracker** developed by the Alliance for Global Water Adaptation (AGWA) questionnaire guides climate planners and policymakers to systematically evaluate both the explicit and implicit ways in which water is included in a country's national climate plans and planning processes. This includes exploring the synergies and trade-offs between multiple water-using sectors.

covering, as appropriate, ecosystems, sectors, people and vulnerable communities, and have mainstreamed adaptation in all relevant strategies and plans	• The Global Water Partnership has developed with UNFCCC A **NAP water supplement to the NAP technical guidelines.** The NAP water supplement is designed for countries to use as they prepare their NAPs, and contains examples of actions that countries, regional institutions, and development banks have taken on water-related adaptation. • The water, sanitation and hygiene Bottleneck Analysis Tool (WASH BAT) is a valuable resource developed jointly by UNICEF and the World Bank. The primary objective of WASHBAT is to assess the enabling environment for Water, Sanitation, and Hygiene (WASH) delivery. WASHBAT enables stakeholders to define targeted activities aimed at addressing the root causes of these bottlenecks. Recently, a new version of the WASHBAT Country Implementation Guide was introduced, incorporating over 10 years of implementation experience across several countries. This updated version includes a new module specifically designed to support the implementation of Risk-Informed WASHBATs, which play a crucial role in adapting to climate shifts and ensuring resilient WASH services • **Sectoral NAPs / Case studies:** ▪ In Zambia, the country has taken a comprehensive approach to address climate adaptation. The first phase will enable long term strategic planning and coordination of adaptation. The second phase will be a water focused NAP that recognizes water as an essential connector to all sectors. The Water NAP will serve as an important pathway for building resilience and strengthen synergies between health and agriculture. ▪ The Uganda government work on the formulation, implementation, monitoring and evaluation of the NAP is led by the Ministry of Water and Environment (MoWE), with the engagement of all other national actors and stakeholders through multi-stakeholder working teams and committees. However, as climate change adaptation is a need across different sectors, separate sectoral NAPs are considered necessary to guide the different actions required by each sector. In Uganda, so far, a sectoral NAP has only been prepared by the agriculture sector. MoWE is working now to develop a NAP for Water, Sanitation, and hygiene (WASH) to guide adaptation actions for the water and environment sector in Uganda.

Implementation: by 2030 all Parties have progressed in implementing their national adaptation plans, policies and strategies and, as a result, have reduced the social and economic impacts of the key climate hazards identified	• We could present views on climate financing and/or development of climate financing strategies. • Suggestions welcomed
Monitoring, evaluation and learning: by 2030 all Parties have designed, established and operationalized a system for monitoring, evaluation and learning for their national adaptation efforts and have built the required institutional capacity to fully implement the system	• Suggestions welcomed. This can link to the next session where we are drafting text around lessons learnt from the UN-Water SDG6 Integrated Monitoring Initiative • We can include some lessons learned from organizations who are currently monitoring adaptation/resilience progress

5. Views on the modalities of work of the UAE – Belem work programme

TO BE COMPLETED

[Brief narrative to explain that the water community proposes a work modality with thematic parallel working groups. Explains how support can be provided to take further the analysis showed in this submission (e.g. support to online consultations), it is also proposed that water experts are part of other thematic working groups on the other GGA thematic areas and dimensional targets (building on what is explained in the sections 3 and 4 of this submission).

5.1 lessons learnt from the UN-Water SDG6 Integrated Monitoring Initiative

TO BE COMPLETED

[This section could elaborate on the lessons learned about data gathering, national surveys, data analysis, etc. Also to explain how it aims at reducing reporting burdens to countries. Also, Lessons learned on how to integrate gender and other aspects into monitoring etc.]

Through the UN-Water Integrated Monitoring Initiative for SDG 6 (IMI-SDG6), the United Nations seeks to support countries in monitoring water- and sanitation-related issues within the framework of the 2030 Agenda for Sustainable Development, and in compiling country data to report on global progress towards SDG 6. IMI-SDG6 brings together the UN organizations that are formally mandated to compile country data on the SDG 6 global indicators, and builds on ongoing efforts. This enables synergies across UN organizations, leading to more efficient outreach and a reduced reporting burden on countries. At the national level, IMI-SDG6 promotes coordination and collaboration across sectors in the collection, analysis and use of data for national and global reporting, and supports related capacity development.

The overarching goal of IMI-SDG6 is to accelerate the achievement of SDG 6, by increasing the availability of high-quality data for evidence-based policy-making, regulations, planning and investments at all levels. Credible data also provide stronger accountability and political commitment. Water and sanitation monitoring involves a wide range of stakeholders, across sectors and levels of government, and by bringing them and their datasets together, more efficient use of monitoring resources as well as more holistic policies and integrated resources management will follow.

Partners: World Health Organization (WHO), United Nations Children's Fund (UNICEF), United Nations Settlement Programme (UN-Habitat), United Nations Environment Programme (UNEP), Food and Agriculture Organization of the United Nations (FAO), United Nations Economic Commission for Europe (UNECE), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Meteorological Organization (WMO), United Nations Water (UN-Water) (all United Nations / Multilateral body)

WATER COMMUNITY PARTNERS AND ORGANIZATIONS SUBSCRIBING THIS SUBMISSION

To be completed

SANITATION AND WATER FOR ALL

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