

Making the Case for a World Water Quality Assessment

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The importance of water quality

Freshwater is essential for life on our planet, yet makes up only around 2.5% of all its water. Less than 1% of all freshwater is available for direct human use and can be found accessible in ecosystems such as wetlands, rivers, aquifers and lakes – with the rest locked in the form of deep underground aquifers or ice. Managed well, freshwater ecosystems are some of the world's most productive, providing essential services such as drinking water, water for agriculture and energy, natural solutions for water purification and climate resilience, and habitats for fish and other aquatic lifeforms. In addition freshwater ecosystems provide services such as recreation and tourism. They directly support terrestrial ecosystems, such as mountains and forests, marine ecosystems and coastal zones, and are essential for sustainable development and general human well-being.

Water stress and scarcity have traditionally received more attention in political spheres, having been addressed during the MDG period along with access to drinking water and sanitation. Yet to function properly, freshwater ecosystems require both adequate water quantity **and** quality of those water resources. Water quality also determines the quantity available for certain uses. This interdependency will be even stronger in light of rapid demographic change, displacements of people and climate change. The dimensions of the resulting consequences for humans and the environment may have been significantly underestimated in previous assessments and have to be reconsidered in the light of the SDG agenda (UNEP 2016).

The current extent of the water quality problem

Already highly vulnerable to natural disasters which are being exacerbated by climate change, freshwater ecosystems are bearing the brunt of the impacts of human activities such as pollution, in particular through pathogens (largely from the expansion of sewer systems that discharge wastewater untreated into surface water systems), organic matter (including plant nutrients from agricultural runoff such as nitrogen or phosphorus) and salinity (from irrigation, domestic wastewater and runoff of mines into rivers).

A preliminary assessment of the current water quality situation was laid out in a recent publication produced by UN Environment (UNEP 2016), *A Snapshot of the World's Water Quality*. Considering the sources, extent, and impacts of organic and pathogenic pollution, the *Snapshot* presents a picture of how pollution is affecting river stretches in Latin America, Africa and Asia: severe pathogenic pollution in around one-third of all rivers; severe organic pollution in around one-seventh of all rivers; and severe and moderate salinity pollution in around one-tenth of all rivers. Put together, these kinds of pollution put at risk the health not only of people, but also the freshwater fishing industry (threatening food security and livelihoods), and the use of river water for irrigation, industry and other uses.

More needs to be done on top of this *Snapshot* to understand the full extent and nature of the problem globally, including the mitigation options and governance approaches which will be needed to address this problem. Overcoming current limitations of data availability and accessibility would enable policy makers to grasp the extent of the water quality problem, and enable the setting of quality targets both for water and related ecosystems.

From MDGs to SDGs

During the MDG period, millions of people gained access to “improved” drinking water and sanitation between 1990 and 2015 – meaning they were provided in a way that was free from outside contamination or human contact, particularly in regards to basic hygiene. Yet a major shortcoming of that period was the lack of political and institutional prioritization or measurement of the quality of those water resources. It is well understood that poor sanitation, hygiene and access to drinking water are closely linked and a leading cause of child mortality and undernutrition, for example, leading to stunting and negative effects for lifelong health and development of the individual. But, water quality is also a critical determinant of the use of water for purposes such as agriculture, energy and for its essential role to sustain biodiversity and its services including food, fuel and fiber.

Water quality is now an essential prerequisite to the human rights to drinking water and sanitation, declared in 2010, and Sustainable Development Goal (SDG) 6, agreed in 2015. Both require access to “safe” drinking water. That in turn requires information about water quality in order to be measured.

Water quality at the heart of SDG 6

SDG 6 greatly expands upon water and sanitation in the MDG era by addressing the *sustainability* of water uses and sanitation access by looking at their availability and sustainable management. As such, it addresses not only the entire water cycle, but also what happens to the wastewater domain once sanitation access has been provided.

To maintain the range of services provided by freshwater ecosystems for drinking, recreation and agriculture, both sufficient quantity (minimal environmental flows, managed across competing users and uses) and quality (by managing pollution and wastewater) must be ensured. The impacts of climate change on both quantity and quality must also be taken into account.

These aspects are captured in the targets of SDG 6, which touch upon safe drinking water and sustainable management of sanitation (targets 6.1 and 6.2), water pollution and water quality (target 6.3), water-use efficiency and scarcity (6.4), improving freshwater governance through integrated water resources management (6.5), protecting and restoring water-related ecosystems (6.6). All of these targets rely upon good water quality to be successfully met. They also depend on substantial improvement of the enabling and institutional conditions encapsulating the dimensions of water governance as reflected in the targets on international cooperation and capacity-building (6.a) and local participation in water management (6.b).

Water quality and other SDGs

Just as SDG 6 relies upon water quality to meet all of its interrelated targets, in the same way water quality also impacts upon, or is impacted by, realization of targets in other SDGs.

For example, water quality can be negatively affected by the impacts of climate change, including flood and drought (SDG 11); it is also potentially negatively impacted by increased food (SDG 2) and energy (SDG 7) production and economic growth (SDG 8). At the same time, poor water quality is a major cause of poor health and productivity, including death and disease (SDG 3), contributing to the loss of tourism and poor working conditions (SDG 8). Achieving the management of chemicals and waste and sustainable consumption and production (SDG 12) will improve water quality, leading also to improvements in marine, coastal and terrestrial ecosystems (SDGs 14 and 15).

Monitoring and evaluation

The achievement of the SDGs rests on country ownership and accountability, through country monitoring and reporting on progress. Monitoring and evaluation of water quality are essential for understanding the intensity and scope of the global water quality challenge. Yet the availability and accessibility of data in many parts of the world is inadequate for this purpose.

The global indicator for the water quality target, 6.3, calls for

“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”
Indicators listed by IAEG-SDG Proportion of wastewater safely treated Proportion of bodies of water with good ambient water quality.”

Through GEMI, integrated monitoring of water and sanitation related SDG targets (www.unwater.org/gemi), an initiative is underway under the UN-Water umbrella to help countries build up national monitoring for SDG 6, as the foundation for regional and global monitoring. A worldwide water quality assessment would be an important step in this process to understand where to prioritize and focus attention. A global water quality assessment is essential to provide the underlying evidence to the monitoring process of SDG indicators, thus enabling countries and regions to react accordingly and embrace a cross-sectoral ecosystem based approach to water quality. By elaborating in detail on the water quality challenge, the drivers, pressures, impacts and current and future responses would provide the urgently needed direction for sustainable water policy in the Agenda 2030, including and well beyond SDG 6, as would look into those interlinkages which are most critical under a nexus perspective, e.g. water, energy, food, and health as well as urbanization and the cause-effect dimension of people displacement.

Water Quality and UN Environment’s Mandate

UN Environment (UNEP) is the agency custodian for SDG indicators contained in target 6.3 (on water quality), 6.5 (on integrated water resources management) and 6.6 (on water-related ecosystems). Strengthened at Rio+20 by an expanded, now universal, country membership, UN Environment’s mandate to advocate and protect the global environment extends to water. It is already engaged, for example, in creating International Water Quality Guidelines for Ecosystems (IWQGES), mandated by UNEP Governing Council (GC) Decision 27/3 in February 2013 and aiming to help countries set national standards for their own water quality by applying an ecosystem health perspective. Through the Global Environmental Monitoring System (GEMS) Water, UN Environment also already has a long standing mandate renewed and strengthened by the United Nations Environment Assembly in its first session 2014 (Resolution 1/9) and a decades long track record of monitoring, analyzing and assessing data related to water quality at large. The resulting data were instrumental in the preliminary water quality assessment but also highlight the substantial shortfalls in certain regions and time coverage. This finding gave another reason for the urgency to underpin the emerging SDG process by a thorough full global water quality and scenario assessment.

Therefore, reflecting growing awareness of the urgency of water quality issues, UN Environment is taking a lead role in upcoming topics for the World Water Development Report and key global conferences and celebrations such as World Water Day and Stockholm World Water Week, which are looking at wastewater in 2017 and nature-based solutions for water in 2018. Water quality will have a key role to play throughout both years.

Methods, timeline and budget of a worldwide water quality assessment

SDG 6 will initially be reviewed at the High-level Political Forum (HLPF) in summer 2018. To provide input for this, UN-Water is planning to produce **an SDG 6 Synthesis Report** in early 2018, based on the data collected from countries through a global roll-out of SDG 6 indicators in 2017. This will provide an initial baseline of the water quality situation relying on a basic set of water determinants and yet only in a selected number of countries. A comprehensive worldwide water quality assessment is therefore imminently needed to expand on this baseline and complement the SDG process by developing a comprehensive global picture of the water quality and its close multisectoral interlinkages.

A worldwide assessment would further address the inadequate availability of data in many places, with significant disparities in the density of water quality measuring stations across different regions of the world, for example. An urgent task, therefore, is to expand the collection, sharing, and analysis of water quality data, especially by strengthening national capacity for water quality monitoring by building on the existing work of the GEMS/Water Programme, FAO AQUASTAT and other international activities but also by including other sources such as remoted sensing derived data. Hot spot areas of water pollution identified in the *Snapshot* can be used to set priorities for data collection complemented by in-depth in country consultations with water sectors and stakeholders.

Based on the advanced data basis and analysis of the *Snapshot*, the assessment will elaborate the main mitigation options identified in that and earlier reports. These comprise: (i) pollution prevention, (ii) treatment of polluted water, (iii) the safe use of wastewater and (iv) the restoration and protection of ecosystems. Critical data for a wide range of mitigation options will be compiled and evaluated including the type of water pollutants that are mitigated by a particular option, the technical advantages and disadvantages of different options, and the costs of their implementation. In order to compensate for monitoring gaps and meet the uncertainties inherent to quantification methods, a combined data and model driven methodology, as developed and demonstrated within the *Snapshot*, is of advantage. Modelling is a prerequisite for any kind of quantitative scenario studies. In the proposed assessment all of these factors could be fully elaborated for each mitigation option and for groups of countries. Both their technical and economic potentials would be evaluated.

The ambitious but fundamental assessment will rely on strong and multifaceted partnerships in the scientific, institutional and financial realm. In particular the funding gap is considerable. The assessment outlined in the aforementioned UN-Water Analytical Brief, while relying on substantial in-kind support through the parallel efforts undertaken on the SDG indicator monitoring and related activities as outlined above,, will require resources in the order of \$4.0 – 4.5 million USD over 3 years, but building upon the existing efforts of both countries and international organizations, and the support of several Governments e.g. for the IWQGES, GEMS / Water, GEMI the task is achievable. If undertaken, the benefits and utility of a worldwide water quality assessment are considerable.

References

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UN-Water, integrated monitoring of water and sanitation related SDG targets, www.unwater.org/gemi.