Tackling the Challenges of SDG Monitoring:

A Roadmap Outlining the Costs and Value of a Water Sector Monitoring System

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Overview

A coalition of technical experts propose to provide analysis that integrates new data instruments, technologies, standards and approaches with existing systems for the monitoring of Goal 6 of the Sustainable Development Goals (SDGs). This analysis is critical to building an action plan that incorporates costs and shows the benefits of integrated water data collection systems, generating models relevant to national and regional agencies and the ongoing SDG indicator design process. The goal is to enhance global and national monitoring systems for the water sector. This analysis will support the Global Partnership for Sustainable Development Data (to be launched in September 2015), the Sustainable Development Solutions Network (SDSN) thematic group on data, the Inter-Agency and Expert Group on Sustainable Development Indicators (IAEG-SDG), as well as National Statistics Offices, which will be the focal points to design national SDG monitoring processes.

The Need for a Modern, Integrated Water Monitoring System

Water security is to sustainable development what water is to life. Whilst the Millennium Development Goals (MDGs) included an important—but limited—set of water indicators focused on access to improved water and sanitation, SDG 6 seeks to ensure the availability and sustainable management of water and sanitation for all. This expands the scope of the potential benefits to humankind, as well as brings new challenges. Effectively measuring progress toward the expanded targets under SDG 6 will require new approaches to monitoring; innovations that integrate all relevant data sources and fill missing data gaps in unique ways.

The expanded SDG 6 water targets—water quality, wastewater treatment, water-use efficiency, integrated water resources management, and protection of water-related ecosystems—require coordinated, fit-for-purpose monitoring systems that serve multiple actors, scales and applications.[1] Monitoring systems make development investments go further, help steer decision-making, foster learning about which interventions work and which do not, and can support productive integration with other sectors and targets within the SDGs.

Nevertheless, the above-mentioned benefits will come about with significant investments and tradeoffs. Monitoring systems need to be integrated and scaled into a consistent framework in order to meet the operational needs of public and private stakeholders addressing SDG 6 at the community-level implementation, the national-scale planning, and the global monitoring. New resources would be used to leverage existing data systems, to address key gaps, and to expand capacity in underserved countries and communities. Investments in monitoring systems would provide substantial benefits in terms of improved targeting and efficiency in integrated water resources management, in water quality, in water and sanitation infrastructure, and in water-related programs and policies.

Water supply and demand data provide a myriad of economic, social, and environmental benefits across the public and the private sectors. Public access to weather-monitoring data generated multimillion-dollar weather forecasting industries[2]; river monitoring has improved decisions on water release to ensure endangered fish can move upstream to spawning areas[3]; and, smart metering of agricultural irrigation has improved water allocation across large watershed systems, especially throughout droughts.

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[1] GEMI. (2015). Monitoring Waste Water, Water Quality and Water Resources Management: Options for Indicators and Monitoring Mechanisms for the Post-2015 Period. Available at http://www.unwater.org/fileadmin/user_upload/unwater_new/docs/Other/Discussion_Paper_GEMI_Meeting_Geneva_29-30Jan15_220115_FINAL.pdf

[2] Weiher, R. (2009). *Assessing the Economic and Social Benefits of NOAA. The Socioeconomic Effects of Public Sector Information on Digital Networks.* Workshop Summary. U.S. National Committee for CODATA, National Research Council of the National Academies. Washington D.C.

[3] Null, S. et al. (2014). *Optimizing the dammed: Water supply losses and fish habitat gains from dam removal in California.* Journal of Environmental Management. V. 136. April 2014, pp. 121-131

Water monitoring comprises diverse components, instruments, and data collection tools:

- Data on **access to water and sanitation** are collected using surveys and censuses, conducted primarily by national statistics offices.
- Data on **wastewater treatment** (connection rates and treatment) are collected using surveys and censuses, either by government administrative, regulatory bodies or by self-reporting private sector utilities.
- Data on **quality of drinking-water** are collected by public regulatory bodies, private sector entities that supply bottled water and/or bottled soft drinks, and by remote sensing, which can provide measures of water quality for environmental and human health contaminants.
- Data on **water-quantity** are collected using meteorological stations, river gauge networks, and satellite remote sensing systems, which include components of surface water and subterranean water sources.
- Data on **water consumption**—by sectors (including agriculture), households, and industry—are collected through water meters. These types of data are necessary for the efficient use of water resources.
- Data on **water-related ecosystems** are often collected by government agencies through field studies and remote sensing-based methods.
- Data on **extreme events** (e.g., floods) are collected through remote sensing products and government reports.

Each of these components requires multiple data inputs, monitoring methodologies, reporting standards, and technologies used for the data collection. Since the launch of the MDGs, there have been significant advances in monitoring technologies. The SDGs offer an opportunity to systematically review the available monitoring systems and to identify how each one contributes to meet the requirements of SDG 6. This systemic review includes a specific focus on new technologies and approaches that can fill the gaps and increase the quality, frequency, scale, and accessibility of water data. Some illustrative examples of new data streams include unmanned aerial vehicles (commonly referred as drones), sensor webs, mobile networks, smart meters and citizen science campaigns. Combining novel approaches with traditional methods holds the promise of constructing a global water monitoring system that provides timely, complete, and accurate information; superior to the status quo.[4] This vision could be part of the technology facilitation mechanism that is proposed in the FfD Revised Draft of the Addis Ababa Accord.

Designing and Building a Global Water Monitoring System

A global action plan for country-level monitoring agencies is now required to cover the multiple axes of water quantity, quality, and access in SDG 6. Monitoring water systems span multiple institutional mechanisms for collecting data, technologies, regulatory and programmatic issue areas, scientific disciplines, and public and private sector activities,. Therefore new modalities are required to design an appropriate monitoring architecture, and new financing mechanisms are required to implement these innovations and systems.

The latest SDSN publication—*Data for Development: A Needs Assessment for SDG Monitoring and Statistical Capacity Development*—acknowledges several limitations to their cost assessment of the core statistical tools that will be needed to measure sustainable development.[5] Notable among these are administrative records (primarily originating from line ministries) and earth observations. Both of these tools, in addition to other new data inputs, will play important roles for overall SDG monitoring and for water sector monitoring. It is therefore recognized that the additional data architecture for the water sector remains absent from these cost estimates.

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[4] Proposed monitoring method for indicators for wastewater as presented at the Expert Group Meeting on indicators and monitoring framework for the SDGs: http://unstats.un.org/unsd/post-2015/activities/egm-on-indicator-framework/docs/Statistical%20note%20on%20Water%20for%20UNSC%20final%2025Feb2015.pdf

[5] Espey, J. et al. (2015). *Data for Development: A Needs Assessment for SDG Monitoring and Statistical Capacity Development.* Available at http://unsdsn.org/resources/publications/a-needs-assessment-for-sdg-monitoring-and-statistical-capacity-development/

To date, there has not been a collective effort at the global scale to create national action plans for monitoring water systems that integrate new technologies and sensors in order to fill existing gaps or reduce overall costs. The design of an appropriate monitoring and data architecture for the full range of variables requires the mobilization of appropriate scientific and technical communities, as well as political will and a funding infrastructure. The proposed technical analysis would model the costs and benefits for national scale, fit-for-purpose, monitoring networks. This framework requires the right balance between standardization and innovation, as well as a balance between new technologies and policy needs. It also requires designing public and private partnerships that are able to make monitoring systems viable and useful.

This proposed methodological approach could be adapted to serve as a model for the monitoring and implementation of other SDGs. There are tight linkages to other SDG monitoring efforts, such as energy, ecosystem, and urban infrastructure, which serve in both directions. Integrated monitoring is necessary to achieve cost-effectiveness and to generate the right signals for decision makers seeking to manage these interactions effectively.

This coalition of multidisciplinary technical experts and organizations is committed to undertaking this analysis and an action-oriented plan in support of the Global Partnership for Sustainable Development Data and the ongoing United Nations SDG design process.

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