Sustainability Index of WASH Interventions: Global Findings and Lessons Learned

international h$_2$o collaboration

USAID FROM THE AMERICAN PEOPLE

Rotary

1 CONTEXT OF THE SUSTAINABILITY CHALLENGE

The long-term sustainability of water, sanitation, and hygiene (WASH) interventions is widely recognized as a complex and persistent challenge facing communities, governments, and international development partners alike. These entities have collectively invested billions of dollars in interventions over the past decades, resulting in tens of millions of unserved people gaining new access to improved water supply and sanitation infrastructure.[1] However, it is also commonly acknowledged that a significant proportion of those who are "served," rather than "unserved," also can experience major failings in access, sometimes within a few short years. Communities often are unable to manage their programs properly and lack support and reliable financing, which can easily lead to inadequate maintenance, breakdowns, and poor water quality. For example, studies of the rural water subsector consistently indicate breakdown rates of approximately 30 percent to 40 percent of all systems.[2] Experience with sanitation and hygiene raises similar concerns over poorly sustained benefits. These failings result in not only a loss of financial investment and community aspiration but also a very real threat to human health and well-being.

Changing our measure of impact and success

Over many years, approaches to monitoring WASH programs, particularly for populations not served by formal utilities, have tended to focus on coverage, measured in terms of systems built and approximate numbers of people served. Such approaches do not normally take into account the actual services delivered, and in many cases those services fall far short of the design standard, with the result that real coverage rates are much lower than is estimated.

To deal with this problem, a different type of monitoring is required, one that focuses on the service delivered over time rather than on the number of systems built. Accepting that a reliable water or sanitation service requires not only well-functioning hardware (for example, pumps, latrines, and pipes) but also a range of so-called soft elements (such as reliable management, long-term support, sound financing plans, continued training) is an important departure from the conventional way of assessing success. This change implies expanding our area of inquiry beyond simply the physical water supply or sanitation infrastructure and assessing what is — or in many cases what is not — happening around these systems at the level of operators, districts or municipalities, and even the nation, where supportive polices and legislation can have a direct impact on the community.

2 A NEW COLLABORATION FOR WATER, SANITATION, AND HYGIENE

The U.S. Agency for International Development (USAID) and Rotary International (RI) are organizations that work in quite different ways, but they share the desire to bring about meaningful changes in the lives of the poor in developing countries. Most important, both organizations are committed to providing long-lasting benefits to the poor through the implementation of sustainable water, sanitation, and hygiene projects. A new venture, the International H_2O Collaboration, was launched in March 2009, and the first round of pilot projects were finalized in 2012 in the Dominican Republic, Ghana, and the Philippines. The central goal of this collaboration between RI and USAID is to support water, sanitation, and hygiene initiatives that will have lasting impacts in target communities.

---

[1] More than 2 billion people gained access to improved water sources and 1.8 billion people gained access to improved sanitation facilities between 1990 and 2010; WHO/UNICEF Joint Monitoring Programme on Water Supply and Sanitation (2012), "Progress on drinking water and sanitation: 2012 update." www.wssinfo.org/fileadmin/user_upload/resources/JMP-report-2012-en.pdf

[2] Rural Water Supply Network (RWSN) (2009), Myths of the rural water supply sector, Perspectives No. 4, RWSN Executive Steering Committee, July (St. Gallen, Switzerland: Rural Water Supply Network); Taylor, B. (2009), Addressing the sustainability crisis: Lessons from research on managing rural water projects (Dar es Salaam, Tanzania: Wateraid); Reddy, V.R., Rammohan Rao, M.S., and Venkataswamy, M. (undated), "Slippage": The bane of drinking water and sanitation sector (A study of extent and causes in rural Andhra Pradesh); Rivera Garay, C.J., and Godoy Ayestas, J.C. (2004), "Experiencias, estrategias y procesos desarrollados por Honduras en el sector agua potable y saneamiento en el area rural," Foro Centroamericano y República Dominicana de Agua Potable y Saneamiento, August.

At a more strategic level, the collaboration is intended to support a deeper shift in both organizations away from direct service provision to a more systemic approach to sustainable WASH service delivery over the long term. The aim of the collaboration is to use the strengths and resources of both organizations, and to choose and design initiatives carefully, in order to best serve the broader strategies of RI and USAID.

The collaboration is governed by a steering committee of six representatives from RI and USAID. A manager who is based at RI World Headquarters and whose position is jointly funded coordinates the work of the collaboration. At the country level, committees made up of USAID mission staff, Rotary club members, and representatives from implementing partners and local government agencies oversee program activities.

An overview of the International H$_2$O Collaboration's first pilot programs

In each of the three countries with pilot programs — the Dominican Republic, Ghana, and the Philippines — RI and USAID have each raised approximately US$1 million for project activities through volunteers and mission budgets, for a total collaboration investment of some $6 million. Under the pilot programs, more than 15,670 interventions were made in 496 urban and rural communities, ranging from household hygiene promotion to water point-source rural water supply systems and utility-managed urban services.

Dominican Republic

In the Dominican Republic, the International H$_2$O Collaboration funded a range of activities, including more than 6,700 household water treatment and safe storage systems and sanitation and hygiene activities in barrios and bateyes throughout the country. Partners include Save the Children, ENTRENA, and Mujeres en Desarrollo Dominicana.

Community health promoters led community-based hygiene and hand washing promotion trainings, environmental health days, and school health and nutrition trainings annually.
Photo by Ryan Schweitzer/Aguaconsult

A local Rotarian from District 4060 teaches schoolchildren how to properly use and maintain the Hydraid® Biosand Water Filter.
Photo by Amanda Robertson

Ghana

In Ghana, the International H$_2$O Collaboration provided WASH services in more than 100 rural communities in several regions of the country. Projects involve capacity building, construction of water supply and sanitation systems (including ventilated improved pit latrines and pour-flush or flush toilets), and hygiene education. Partners include the governmental Community Water and Sanitation Agency and the nongovernmental organization Relief International.

Ventilated pit latrines constructed as part of RI/USAID International Collaboration initiative in Osiem, Ghana. Photo by the Rotary Club of Accra Ring Road Central

Community members from Agona East collected water from an unprotected source, prior to the installation of boreholes and hand pumps by the RI-USAID International H$_2$O Collaboration. Photo by Amanda Robertson

Local woman from Agona East using borehole and hand pump installed by USAID Ghana Mission and the Rotary Club of Tema. Photo by the Rotary Club of Tema

Santa Anna waste water plant in Manila, Philippines. Photo by Jeremy Ockelford/Aguaconsult

Philippines

In the Philippines, the International H$_2$O Collaboration supported activities at five sites in Luzon and Mindanao, including construction of a wastewater treatment plant, development of a septage and desludging system, rural water-supply service provision, and hygiene training projects. Implementing partners include the Philippine Water Revolving Fund, the Philippine Sanitation Alliance, and the Alliance for Mindanao Off-Grid Renewable Energy Program.

A new approach to measuring the sustainability of WASH interventions

As part of its commitment to this overarching aim of sustainability, the International H_2O Collaboration commissioned an external review of the sustainability of its WASH interventions in the first pilot.[3] This review is consistent with an emerging trend on the part of funding agencies to assess different dimensions of sustainability, such as the efforts of the Dutch Ministry of Foreign Affairs' support of UNICEF.[4] It represents an explicit effort to feed the policy debate with more concrete and rigorous measures of the likely drivers and constraining factors that may affect the success of WASH investments over the long term.

This review included the design and application of a first-generation WASH Sustainability Index. The objective of the tool is to enable a quantitative assessment of the likely sustainability of WASH interventions using a range of both quantitative and qualitative indicators. The tool was designed to assess the extent to which crucial sustainability criteria are being met (expressed in percentages) across a range of indicators grouped under four main factors: institutional, management, financial, and technical.

Data was collected from multiple sources because factors that affect sustainability include practices and policies not only at the household and service provider levels but also at the district and national levels. The final design of the index and the selection of indicators were based on internationally recognized principles and standards for WASH services, a literature review of monitoring indicators, and recent research by organizations working on the assessment of sustainability in the WASH sector.[5] The WASH Sustainability Index was used to review 11 separate interventions across the three pilot countries, with surveys carried out in

144 of the 496 communities and in more than 2,330 households. Interventions that were incomplete at the time of the evaluation were either substituted with a completed intervention or not included.

3 THE WASH SUSTAINABILITY INDEX

The WASH Sustainability Index uses each of the discrete International H_2O Collaboration interventions as the basic unit of analysis. For each intervention type, general criteria for sustainability are developed into key indicators under each of the four main factors, as described earlier. Each of these indicators is then applied at three different levels as follows:

- The **service provision (SP)** level focuses on the individual or organization responsible for management and operation of a specific service and can include an individual household in the case of latrines or water treatment, a community management entity, a small private operator, or a utility or institution such as a school or health facility in the case of institutional latrines or water supply. In addition, investigation at this level includes assessment of physical infrastructure, such as the functioning of a borehole or the condition of a household latrine.

- The **district level (DL)** includes assessment of conditions, capacities, and roles of a range of factors responsible for providing important support or oversight functions, spare parts, and other goods and services. Local government normally plays a central role in this case, but assessment may also be focused on the role of the local private sector, nongovernmental organizations, or other public bodies (e.g., a ministry of health or education).

---

[3] The external assessment, including the development and piloting of the WASH Sustainability Index, was carried out between February and July 2012 by a consortium led by Aguaconsult (www.aguaconsult.co.uk) and Building Partnerships for Development in Water and Sanitation (www.bpd-waterandsanitation.org), both based in England and with teams working in all three countries.

[4] Godfrey, S., Freitas, M., Muianga, A., Amaro, M., Fernandez, P., and Sousa Mosies, L. (2009), *Sustainability check: A monitoring tool for the sustainability of rural water supplies*, paper presented at the 34th international conference of the Water, Engineering, and Development Centre, Addis Ababa, Ethiopia.

[5] Sources for the development of the indicator areas included a list provided by the client in the ToR, information from the Triple-S initiative (www.waterservicesthatlast.org), and a review of previous experiences with measuring sustainability.

- The **national level (NL)** refers to a set of policies, institutions, and functions, often termed the enabling environment, which are critical to long-term sustainability in that they provide nationwide frameworks for monitoring, financing flows (including subsidies), technical standards, and the ensuring of good coordination. In this case, the assessment normally focuses on the ministries responsible for WASH, finance and regulatory authorities, where they exist.

The extent to which indicators are being met is assessed through a series of associated indicator questions, which are then translated into survey formats for use in the field, either in paper form or for mobile-phone data collection. The methodology for applying the WASH Sustainability Index includes three key steps:

1) **Contextualization of sustainability indicators and questions:** The frameworks drawn from global experience were developed on the basis of an understanding of the International H_2O Collaboration interventions. These were subsequently tailored to the specific conditions and norms for each country and intervention (see table 1). For example, indicators on downtime, or nonfunctionality, of hand pumps were adjusted on the basis of national and local norms expressed in days per month or year. To avoid bias or subjective interpretations, the field survey questions were designed to have only yes or no as possible responses. All questions have a unique code to allow for subsequent data entry and analysis.

2) **Data collection:** To inform the individual indicator questions, data was collected by teams of enumerators under the guidance of country coordinators through household survey questionnaires and observations; direct check of physical infrastructure; key informant interviews with operators, private-sector suppliers, local government and national agencies; and review of documents, including sector policy, legislation, and local bylaws.

3) **Data analysis and scoring:** Once received from the field, the raw data was collated and checked for consistency and gaps; for example, if not enough information was known in advance about the system, some questions may have become inappropriate, and so scoring was adjusted. Excel spreadsheets are used to enable the linking and aggregation of indicator scores to yield a mean score per factor (see figure 1). This aggregation was done independently for each assessed intervention to enable for a comparison of factor scores between communities to determine where scores differentiate. A higher-level view of the findings can come from aggregating scores of all communities and factors, but tends to hide important variations.

The sampling protocol used in the WASH Sustainability Index is based on accepted guidelines and incorporates best practices from relevant monitoring and evaluation literature in the WASH sector. The protocol involves multistate stratified sampling used to identify the sample frame at the service provider level and multistate random sampling to identify households. Sampling was used to characterize household and/or user opinions and behaviors. The confidence interval for sampling is 90 percent, with a 7 percent margin of error. Population distribution is assumed to be normal (p= 0.5). When the primary unit of analysis was not the household, data collection included all relevant individuals (i.e., all possible service providers in a community and all local government stakeholders).

Table 1: Example of institutional factor indicator questions for community-managed hand pump intervention, Ghana

Code	Description
WT-CHP-I-SP1	**There is a water committee which has been constituted in line with national norms and standards**
WT-CHP-I-SP1	**Score using 20 points per positive answer**
WT-CHP-I-SP1a	a) Is there a water committee?
WT-CHP-I-SP1b	b) Are there national (or local) norms and standards for the composition of a water committee?
WT-CHP-I-SP1c	c) Is the water committee constituted in line with the national (or local) norms and standards, in terms of number and functions of members?
WT-CHP-I-SP1d	d) Is the water committee constituted in line with the national norms and standards, in terms of gender? In the absence of a standard, how many men? _____ How many women? _____
WT-CHP-I-SP1e	e) Has the water committee been democratically elected with involvement of the entire community?
WT-CHP-I-D1	**Roles, responsibilities of district (service authority), and ownership arrangements clearly defined**
WT-CHP-I-D1	**Score (25 points each)**
WT-CHP-I-D1a	a) Are there formalized roles and responsibilities for the service authority?
WT-CHP-I-D1b	b) Are the roles and responsibilities of the service authority written down and accessible? (Check)
WT-CHP-I-D1c	c) Are the roles and responsibilities of the service authority understood by all in the service authority involved in overseeing the water system?
WT-CHP-I-D1d	d) Are the roles and responsibilities of the service authority understood by the service provider?
WT-CHP-I-N1	**National policy, norms, and guidelines for community-managed water supply and enabling legislation is in place**
WT-CHP-I-N1	**Score (1/3 of 100 each)**
WT-CHP-I-N1a	a) Does national policy for water supply recognize community management?
WT-CHP-I-N1b	b) Have national norms and standards been set on the constitution and governance of community-based service providers (e.g., water committees in terms of functions)?
WT-CHP-I-N1c	c) Is legislation in place that gives community management legal standing (e.g., bylaws formalizing water committees)?

Figure 1: Hygiene and hand washing program: aggregated results by factor for 19 communities with interventions in the Dominican Republic
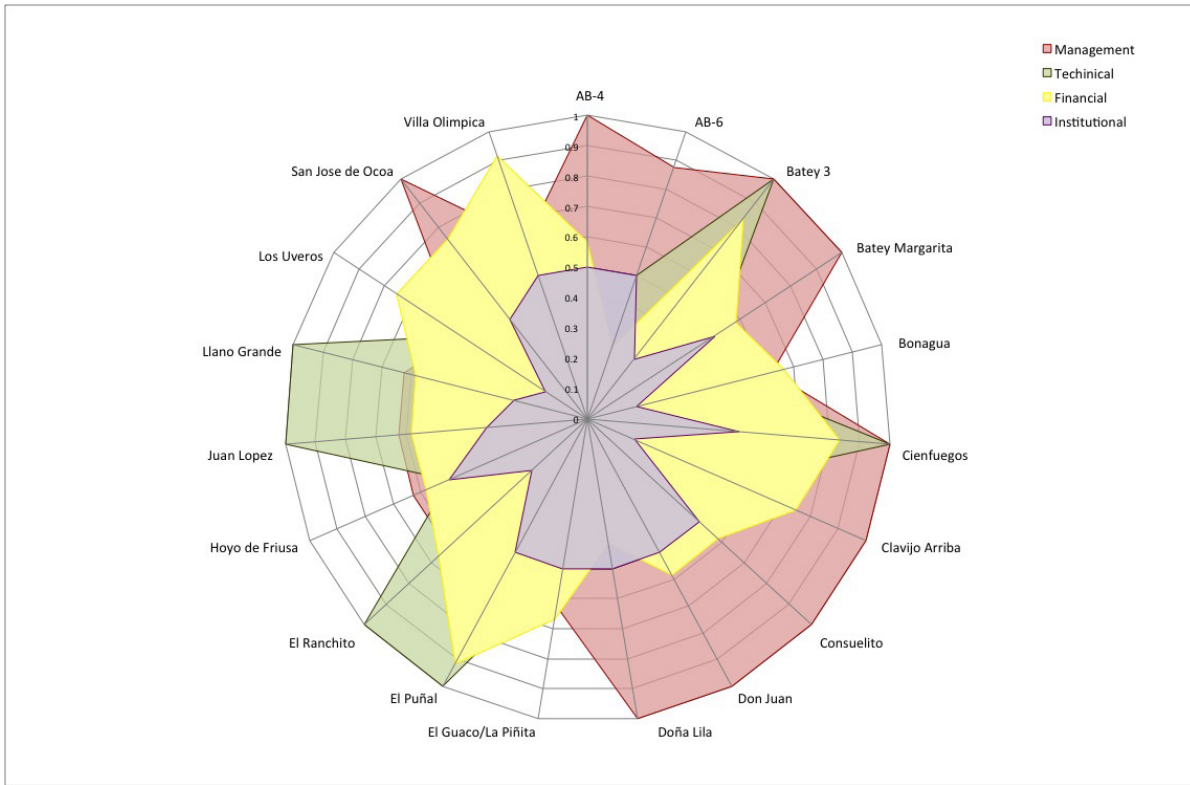
4 GLOBAL FINDINGS AND LESSONS LEARNED

Because of the varying nature and characteristics of the three countries with pilot programs — as expressed in sector development, levels of decentralization, political economy, population density, and topography — the making of cross-country comparisons is difficult and possibly even misleading. Nonetheless, the findings from the first WASH Sustainability Index do provide some common lessons (see figures 2 and 3 for the Dominican Republic and Ghana, respectively).[6]

▶ First, the results indicate that most of the collaboration's interventions in all countries have been well designed and are technically sound. Because of the timing and nature of these very new projects, it is not surprising that these factors score consistently highly (although not in every case). To make a more meaningful assessment of sustainability trends, it would be necessary to review these factors over time in order to track any significant improvements or declines in the relative scoring of the different indicators.

▶ Second, in all three countries — and across almost all interventions — aspects of financing scored relatively poorly, which suggests that collaboration interventions will face challenges related to inadequate revenue streams or other financing sources, particularly in meeting long-term capital replacement costs. In most cases this difficulty is due to low or very low tariffs, which are unlikely to meet even ongoing operating costs. But equally important over the long term is the apparent lack of mechanisms for addressing major capital maintenance or replacement through effective redistribution of taxes or transfers from aid funding in the form of cross-subsidies. The few interventions addressing financing systematically and with a form of institutionalized cross-subsidy in place were some urban projects in the Philippines.

---

[6] Because of the one-off and small-scale nature of the interventions in the Philippines, it was not possible to generate similar comparative analysis.

Figure 2: Distribution of factor scores by intervention for the WASH Sustainability Index in the Dominican Republic
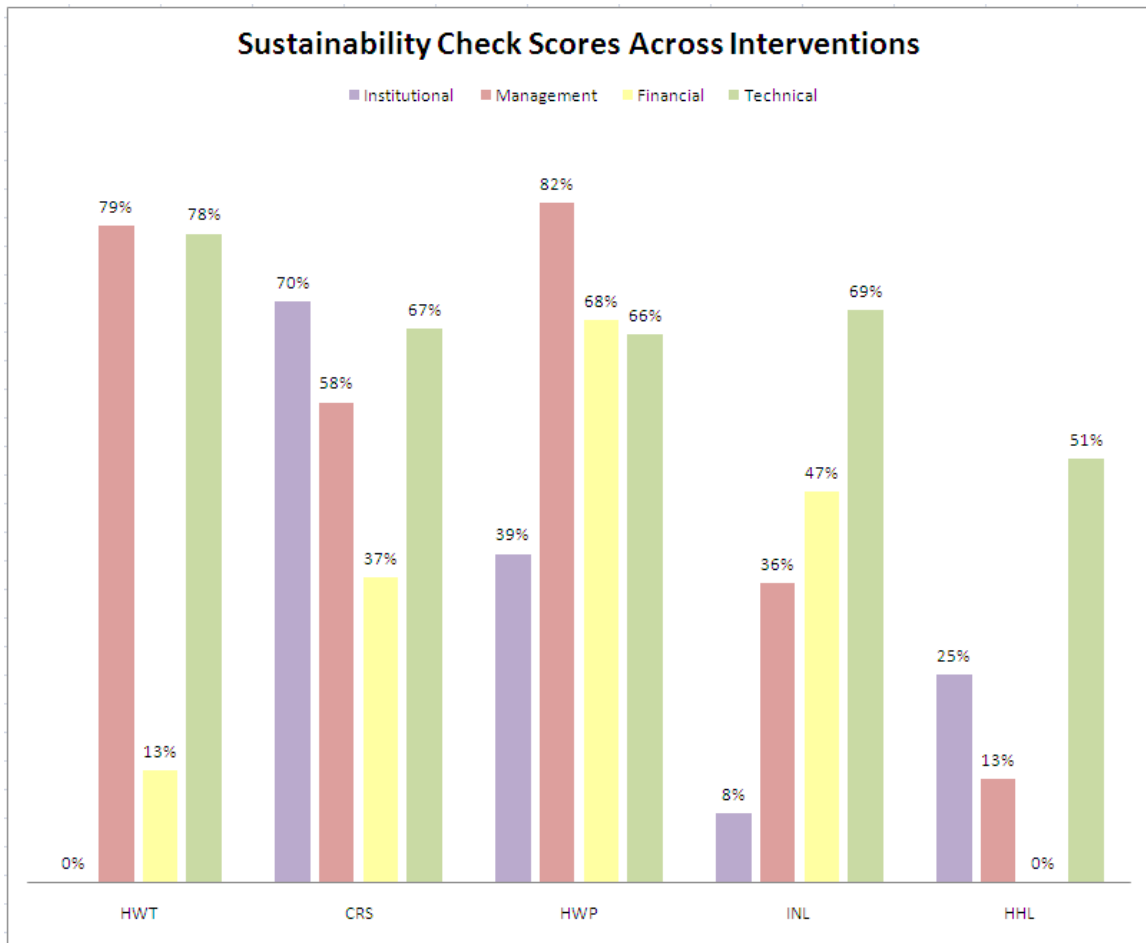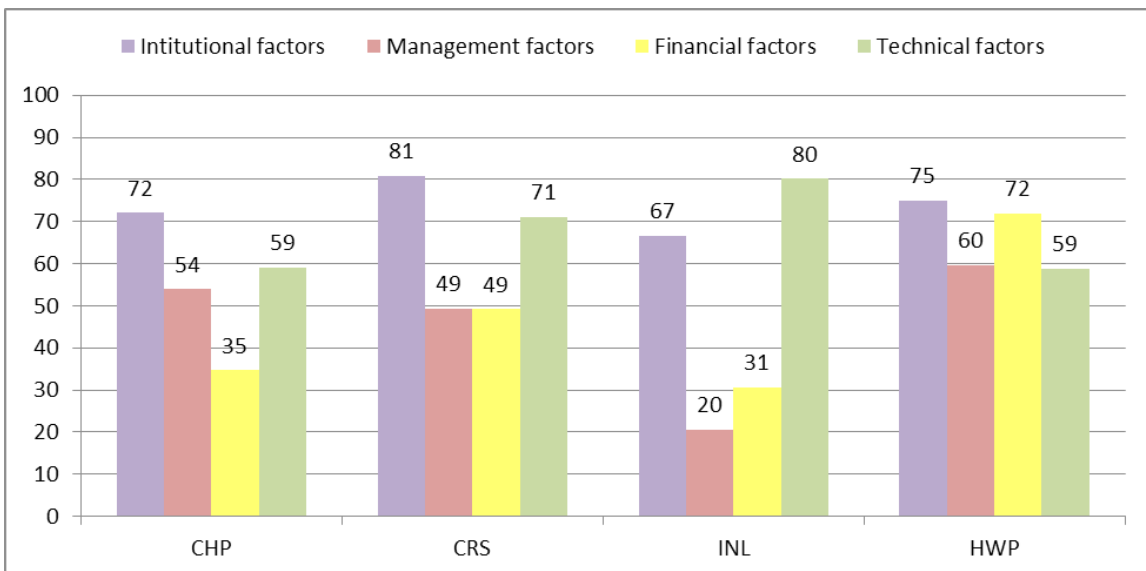

Figure 3: Distribution of factor scores by intervention for the WASH Sustainability Index in Ghana

▶ Third, across the three pilot countries, the findings from the WASH Sustainability Index highlighted low scores — corresponding to a higher sustainability risk — for interventions that were carried out in an institutional or policy vacuum. For example, the sanitation and household water treatment interventions in the Dominican Republic and the rural water interventions in the Philippines suffered from a lack of formalized sector policy or mandated institution, with the result that these interventions may tend to be overlooked over the long term. Although the interventions are needed and have merit in their own right, the lack of policy or institutional frameworks means that the risks to their long-term functionality are higher.

▶ The fourth factor in sustainability, particularly for rural interventions, is the capacity and willingness for local and national institutions to provide long-term follow-up support. This is expressed positively, mainly in cases where national programs for hygiene promotion or relatively strong decentralized units of a ministry of health can step in after initial collaboration activities have begun (in Ghana and the Dominican Republic, respectively). Conversely, the lack of such support is a high risk to interventions in rural areas, where decentralized capacity is weak (as for rural water-supply systems in the Dominican Republic and Ghana) or where there is a lack of political will (as was found to be the case for community-managed systems in the rural Philippines). Such lack of direct support (often referred to as postconstruction support) is a well-recognized problem in the water sector, particularly for rural communities, and it reflects a general — though in some cases extremely pronounced — capacity gap at the decentralized or district level. This challenge is not unique to the WASH sector, but rather it reflects broader weaknesses in public administration reform and the slow and often-patchy decentralization found in many countries.

These aggregated findings, however, should be viewed with various caveats in mind. First, the sample size of interventions is probably too small in the context of each country's water sector for these trends to be completely reliable. It also may be the case that the design of the WASH Sustainability Index, as well as the indicators and questions,

has resulted in scoring that more strongly reflects certain issues. In short, one may find what one is looking for in the results. Nonetheless, there is no doubt, given the relatively small scale and nature of some of the interventions, that their long-term sustainability will be dictated largely by the context in which the interventions have been implemented and will continue to function over time.

5 POLICY IMPLICATIONS

The application of the first-generation WASH Sustainability Index as part of the International H$_2$O Collaboration pilot program revealed some key operational strengths and weaknesses. Specific and detailed recommendations have been provided to the stakeholders across all three countries to make improvements to ongoing programming. However, the review also highlighted some trends and issues at a more strategic level that are important for the collaboration to consider for its own policy development, as well as broader lesson to learn in the sector. Relevant to funding agencies, intervention implementers, and government, the following lessons can contribute to more sustainable WASH programming:

- **Viewing monitoring through a sustainability lens can shift the policy dialogue:** Use of more rigorous and evidenced-based assessments, such as the results of this first WASH Sustainability Index, to inform internal reflection and planning decisions is an important step in promoting change. The (aggregated) findings can also be used to engage with local and national stakeholders in efforts to improve WASH programming and to promote changes in policy and practice.

- **Addressing systemic capacity constraints even in short-term projects is possible and desirable, particularly at the district and local levels:** Although capacity building can be a long-term process, there are opportunities to improve capacity building in discrete interventions, such as by training local government staff on project management, administrative and contract management tasks, or improving local private-sector capacity for supply chains and services.

- **Improving links with decentralized and national authorities in the sector helps provide better returns on investment in the long term:** Relevant authorities should be involved from the outset of planning interventions, both to improve sector coordination and to ensure that outputs of project activities are better integrated into the broader sector after the physical works are completed. Registering newly built systems and linking these to district data sets are particularly important for postconstruction and follow-up support and monitoring.

- **Having a good understanding of life-cycle costs can lead to discussions about financing and who pays for what:** Greater attention to interventions is needed to improve understanding of their true life-cycle costs and constituent components. A better assessment of these actual costs and potential costs will allow for more informed discussions about financing as part of planning processes, as well as about what costs are met and by whom. Costs will vary according to country, and may include subsidy mechanisms, but without a good understanding of different costs, the conversation cannot begin.

- **Advocacy is not a dirty word:** Raising a strong voice about what can be done to address certain policy or capacity gaps (as revealed by the WASH Sustainability Index, for example) is a valid part of any intervention. Given the current status of the enabling environment in many countries, simply implementing WASH programs will not address the substantive constraints that have direct effects on the long-term sustainability of physical infrastructure and investments on the ground.

AGUACONSULT

Author: Harold Lockwood, Aguaconsult
Wivenhoe, Essex, England