Toward a Universal Measure of What Works on Rural Water Supply: Rural Water Metrics Global Framework

Problem Statement: Value of a Set of Universal Metrics

Globally, the proportion of people living without improved drinking water was halved between 1990 and 2010; however, inequities remain between and within countries. For example, eight out of 10 people who are still without access to improved drinking water sources live in rural areas.

Countries are now aiming for the Sustainable Development Goal (SDG) 6, which calls for universal and equitable access by 2030. This represents a far more ambitious challenge at a time when many rural water systems in developing countries are not functioning, or are performing below expected levels. Recent data suggest that although 78 percent of water point schemes are functional at one time, almost **15 percent** of water points fail after one year and **25 percent** of water points are non-functional by their fourth year (Banks et al. 2016).

Although there is general understanding among professionals about these low levels of performance, there are few country monitoring systems that provide decision makers with sufficient and comparable evidence on numbers of systems, types of systems, and performance of systems. Given this global challenge, it might be valuable to have a standardized set of indicators that could be adopted and adapted by countries, thus facilitating improved national and global reporting and analysis.

Background to the Study

Countries have developed their own monitoring indicators—many of which have commonalities but are not necessarily exactly the same, and may not be similarly comprehensive. Decision makers in all countries, however, would likely benefit from ensuring that their monitoring framework produces a standard set of indicators against which to compare their rural water systems.

By having one standardized global set of indicators, countries could begin to assess sustainability across aspects that are common to all situations, and in the long term to adapt their own monitoring system toward alignment for producing this set. The adoption of such global indicator set could also facilitate and contribute—along

with better country monitoring systems—to the global reporting on safely managed drinking water for the Joint Monitoring Programme of UNICEF and the World Health Organization, among others. The recent SDG baseline report illustrated that only 19 countries were able to report both urban and rural data for safely managed drinking water services, underscoring the need for a better monitoring of service levels.

This briefing note provides a summary of a recent World Bank study to set out such a global set of indicators. It presents the methodology and the proposed metrics which were derived from the empirical findings. It closes with a discussion on next steps and ways forward to disseminate the findings and engage with key global and national sector monitoring initiatives.

Efforts to Date

The most notable experiences for gathering and sharing common information on rural water supply are the Water Point Data Exchange (WPDx) and the *Sistema de Información de Agua y Saneamiento Rural* (SIASAR, Rural Water Supply and Sanitation Information System). The WPDx[1] is a platform that collects water point data from different sources and processes them into a common format to allow data comparability. SIASAR[2] is a country monitoring system, adopted by 11 countries so far, which is able to capture both piped water system information and point-sources (instead of water point functionality by WPDx) and produce sustainability indexes.

In the urban sector, a common, global set of indicators has been developed under the International Benchmarking Network for Water and Sanitation (IBNET) system[3] to measure the quality of service and performance of service providers. These indicators include those related to the level of service provided (for example, compliance with water quality standards and continuity of supply), and secondly to the technical and financial performance of the provider (for example, in terms of non-revenue water and financial balance sheets). In the rural sector, however, no such common set of indicators and definitions exists, which hampers comparability and benchmarking. This reflects the fact that i) there are different levels of technical complexity that set rural water services apart from those in urban settings (for example, a broader mix of technologies from rainwater harvesting, simple wells with hand pumps, to more complex piped systems with water treatment) and ii) urban indicators assume that there is an established utility-like provider while in rural areas there are many types of service provider, from informal water committees to local governments and even private providers.

Study Methodology

The study examined rural water service delivery metrics based on host country definitions of what is considered "rural." As a result, a range of different scenarios arise, including **concentrated** rural communities (often referred to as "rural growth centers"), **rural** (typical village centers), and **dispersed** (scattered, low density) rural populations.

The study was conducted in three main phases. In the first phase, in an iterative manner, a conceptual framework was developed, based on a literature review, identifying three broad dimensions of rural water indicators:

- **service levels** (the characteristics of water that users receive)
- **functionality** (the physical condition and functioning of a supply system)
- **sustainability factors**, considered in two parts, namely:
  - i) the performance of the service provider in its role of operation, maintenance, and administration
  - ii) the extent of external back-up support to the service providers.

In the second phase, using this conceptual framework, a range of indicators sets from countries and development partners were analyzed, including 20 national

monitoring systems and 20 monitoring frameworks from donors (including from the World Bank, UNICEF, and USAID). The study also took into account previous studies conducted on rural water functionality and sustainability, and particular attention was paid to the SIASAR model from Latin America.

In the third phase of the study, the results of the empirical data were used to identify a shortlist of indicators and associated metrics to be included in the main output, which is a proposed global framework. In addition to developing the global indicator set, the study drafted definitions of these indicators and recommended data collection protocols and approaches.

Proposal for Global Indicator Framework

Based on the findings of the empirical study of 40 example frameworks, a global framework of indicators for rural water service provision was developed. To ensure that the framework is as flexible as possible and can be applied to different types of technologies, country contexts, and different capacities and types of service providers, three levels of metrics have been developed for each indicator: **minimum**, **basic**, and **advanced,** as set out below (see table 1):

- The **minimum metrics category**[4] should be applicable and used in contexts of less advanced institutional and policy frameworks or weak governance, where service providers, service authorities, and government capacities are likely to be limited. In such a context, formally recognized and legally established service providers may only just be emerging, while service authorities may not have clear mandates. An example of this metric is *whether there is a service provider in place or not* under the "Presence of a legally established service provider" indicator.
- The **basic metrics category** embeds the minimum set (as above), but includes indicators with more complex (mostly non-binary) metrics. Indicators in this category are applicable in contexts where service provision can be assumed to be broadly established, although not necessarily in all types of communities or across all geographic regions. *Compliance with legal requirements to be established as service provider* is an example of a basic metric under the "Presence of a legally established service provider" indicator.
- The **advanced metrics category** embeds both the minimum and basic metrics or implicitly assumes they are being met, depending on the context. In the setting of an established professionalized service delivery (for example, through utility provision), minimum indicators such as *presence of a recognized service provider* are not assessed because it is assumed that all systems are managed by a professional operator. Such indicators are more likely to be applied in contexts where access levels are

TABLE 1. Proposed "Three by Four" Indicator Matrix

Dimensions	Minimum	Basic	Advanced
Service levels	Access and continuity of supply	Accessibility, availability, quality	Affordability, reliability, user satisfaction
Functionality	Water system physical condition (hand pumps and piped systems)		
Sustainability: service provider performance	Presence and limited performance assessment of service provider	Developed assessment of service provider performance	Performance optimization metrics
Sustainability: service authority or technical assistance provider performance	Presence and limited performance assessment of service authority	Developed assessment of service authority performance	Performance optimization metrics

high and the challenge is now orientated toward optimizing the performance of service provision (for example, reducing operating costs or improving quality of service).

In total, 24 indicators were selected as being key to monitoring rural water supply services. For each indicator, at least one associated metric was identified and metrics were categorized into "minimum," "basic," or "advanced." Indeed, some indicators or metrics were found to belong across all categories (as table 1 indicates). For example, *functionality* metrics for water points, which measure the physical condition of a water facility at a specific point in time, are identical across the three categories. The final selection of relevant indicators for rural water supply monitoring is presented in appendix A. *Service levels* indicators are presented in table A.1; *functionality* indicators are shown in table A.2; *service provider performance* indicators are shown in table A.3; and, finally, *sustainability* indicators for the service authority or technical assistance provider are shown in table A.4.

This initial proposal for a global framework includes a generic **data collection protocol** that sets out a description of each indicator; an explanation of the metrics used to measure these indicators (categorized as minimum, basic, and advanced); the data to collect in order to inform the metrics; the unit of analysis for each indicator (that is, *what* is being measured); and the potential sources of data (that is, whether it was derived from household, service provider, or service authority). Further work is being undertaken to field test this protocol and the need for data aggregation.

Next Steps and Way Forward

The global indicator framework developed through this study is based on a consultative process, working with national partners and some of the key global players engaged in sector monitoring. It has been deliberately kept to a limited and manageable number of indicators. Critically, it includes a "menu" of options in terms of the proposed minimum, basic, and advanced categories of indicator metrics, recognizing that countries and their monitoring systems are at different levels of development.

Dissemination and testing of this proposed framework is the next step. This process is not without challenges, as every country presents a unique context; often with a fragmentation of monitoring efforts in rural areas. The alignment of country monitoring systems with the proposed core set of global indicators may thus be a gradual process. However, the global monitoring of safely managed drinking water for the SDG achievement could be one of the incentives for countries to move toward the adoption of a core set of indicators. The pathway to adopting and adapting a global core set of indicators to measure the performance and sustainability of rural water requires a set of short and medium term actions:

- **Short-term recommendations** include further validation by a set of rural water practitioners. Dissemination efforts with regional and global partners such as Rural Water Supply Network (RWSN), Joint Monitoring Programme (JMP), Sanitation and Water for All (SWA), and African Ministers Council on Water (AMCOW) will be critical to galvanize support for the adoption of the global rural water indicator framework. Finally, ensuring that existing platforms, such as WPDx and SIASAR are compatible with the indicator framework, are also recommended as short-term actions.
- **In the medium term**, there should be engagement with key platforms such as SWA and JMP and regional platforms such as AMCOW and FOCARD-APS (Regional Forum for Central America and Dominican Republic for Water and Sanitation) for the adoption of this framework. Longer-term actions recommended include the creation of a global platform linked to the IBNET initiative to support governments in collecting data, establishing a database, sharing data, tracking trend lines and providing access to common definitions and protocols.

Appendix A: Proposed Global Indicator Framework

TABLE A.1. Service Levels Indicators and Metrics

Indicator	Metrics		
	Minimum	Basic	Advanced
Type of source (1)	The type of source a person uses, as per JMP definitions.	Same as minimum	Same as minimum
Accessibility (2)	n/a	Travel time of a round trip to fetch water in minutes, or whether the source is located on premise.	Same as basic
Availability (3)	Proportion of time that a service is provided to households, taking into account planned interruption (continuity).	Binary: Household responding positively to having water available when needed.	Same as basic
Quality (4)	n/a	Frequency and percentage of water quality test that falls within national standards for water quality, further subdivided into bacteriological (*E. coli*) and specific physiochemical parameters (arsenic and fluoride).	Same as basic
Reliability (5)	n/a	n/a	Proportion of time that a service is provided to a particular household, taking into account unplanned interruption.
Affordability (6)	n/a	n/a	The amount spent on water in relation to a household's total consumption.
User satisfaction (7)	n/a	n/a	Overall satisfaction with the service, satisfaction over quantity, satisfaction over quality.

Note: n/a = not applicable.

TABLE A.2. Functionality Indicators and Metrics

Indicator	Metrics		
	Minimum	Basic	Advanced
Functionality (at level of individual hand pump) (8)	Multi-category: functioning, partial, or non-functioning; based on the results of the discharge or leakage test.	Same as minimum	Same as minimum
Physical condition of the water supply infrastructure (system performance) (9)	Water infrastructure condition index, based on physical condition of main components of the water system (intake, reservoir, and so on).	Same as minimum	Number of breakdowns/ leakages or leaks per kilometer of pipe.

TABLE A.3. Sustainability Indicators and Metrics

Indicator	Metrics		
	Minimum	Basic	Advanced
Governance			
Presence of a legally established service provider (10)	Binary: Whether there is a service provider in place or not.	Compliance with legal requirements to be established as service provider.	Same as basic
Staffing (11)	Presence of at least one skilled staff member needed to carry out the tasks associated with their position.	Multi-category: whether the service provider has organizational charts, job descriptions for all positions including regular staff, volunteers, and board members, and whether these posts are filled.	Staff ratio expressed as number of full-time equivalent (FTE) per unit (number of connections or cubic meters sold) which indicates the size of the service provider.
Performance in operation and maintenance			
Maintenance (12)	Binary: Whether any type of maintenance has been carried out in the last 12 months.	Percentage of breakdowns over last 12 months repaired within the established (national) norm for response time.	Ordinal score for asset management planning.
Chlorination (13)	Binary: Whether the service provider is carrying out chlorination or not (for piped schemes only).	Same as minimum	Residual chlorine concentration in milligrams per liter (or parts per million).
Coverage (14)	Percentage of the population served by a service provider in its service area.	Same as minimum	Same as minimum
Non-revenue water (15)	n/a	n/a	Difference between water supplied and water sold (non-revenue water).
Financial management			
Tariff structure (16)	Type of tariff structure, including not levying a tariff.	Same as minimum	Whether the tariff is based on an adequate tariff calculation.
Financial management (17)	Binary: Whether the service provider has a general ledger or cash-book.	Multi-category: Whether the service provider has, and keeps, updated monthly or annual financial reports.	Presence of financial reports including all required elements for informed decision making (billing receipts, operating expenditure, volume of water produced, volume of water sold).
Tariff collection efficiency (18)	Percentage of users with outstanding debts.	The ratio between the amount the income from water bills and the total amount that was billed over the last financial year.	Same as basic

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TABLE A.3. Continued

Indicator	Metrics		
	Minimum	Basic	Advanced
Financial sustainability (19)	Ratio between operational income and expenditure during the last financial year (working ratio).	Ratio between current assets and current liabilities of the service provider (liquidity ratio).	Ratio between all current and non-current assets and all current and non-current liabilities (solvency ratio).
	n/a	n/a	Short- and long-term debt payments (ratio between average monthly income and average monthly expenditure) (debt-service ratio).
Environmental and water resources management			
Source, catchment, and water resources management (20)	Binary: Whether the service provider has undertaken any type of source, catchment, or water resources management activity in the last 12 months.	Binary: Whether the service provider has a source water protection plan or wellhead protection plan in place and implements the plan on a regular basis.	Ordinal scale on the number and types of source, catchment or water resources management plans and activities undertaken by the service provider.
Customer relations			
Complaints handling mechanism (21)	Binary: Whether the service provider holds regularly scheduled, publicly announced meetings, or other mechanism to provide feedback to users over a given period.	Same as minimum	Binary: Whether a customer care mechanism exists.
			Percentage of complaints or requests that is handled within an established period.

Note: n/a = not applicable.

TABLE A.4. Sustainability Indicators and Metrics: Service Authority or Technical Assistance Provider Performance

Indicator	Metrics		
	Minimum	Basic	Advanced
Service authority presence and functions			
Service authority capacity (22)	Binary: Presence of a service authority, as per the legislative and administrative requirements of the country.	Percentage of sanctioned positions for rural water in the service authority structure that are filled.	Percentage of allocated financing available for functioning in the service authority or technical assistance role in relation to what was calculated as being required over a 12-month planning period.
Service authority support functions (23)	Binary: Whether the service authority provided any type of support function to rural water scheme operators in the last 12 months.	Binary: Whether the service authority has in place and has applied a proactive schedule of support visits to rural water scheme operators in the last 12 months.	Percentage of communities, systems, or providers that have met, out of the universe of communities, systems, or providers in the service area (during the last 12 months).

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TABLE A.4. Continued

Indicator	Metrics		
	Minimum	Basic	Advanced
Performance in monitoring role			
Presence of an information system (24)	Binary: Whether an information system is in place at the level of the service authority (or any designated third party).	Binary: Whether the information system has been updated in the last 12 months.	Multi-category or ordinal scale: Information system contains updated data on service levels, functionality, and service provider performance.

Notes

1. http://www.waterpointdata.org.
2. Currently SIASAR (http://www.siasar.org) is being applied in Honduras, Nicaragua, Panama, the Dominican Republic, Costa Rica, Oaxaca (Mexico), Peru, Bolivia, Colombia, Ceará (Brazil), and Paraguay.
3. IBNET (http://www.ib-net.org) is an online database for water and sanitation utilities' performance data. It supports and promotes good benchmarking practice among water and sanitation services by providing guidance on indicators and definitions, facilitating the establishment of national or regional benchmarking schemes, and undertaking peer group performance comparisons.
4. Typically, only the most basic levels of service are provided. Indicators belonging to this category usually have binary metrics (for example, the presence or absence of a service provider). This "minimum set" comprises only 18 of the 24 indicators.

Reference

Banks et al. 2016. "*What's Working, Where, and for How Long: A 2016 Water Point Update.*" PowerPoint presentation, 7th RWSN Forum, November 29, Abidjan, Côte d'Ivoire. Available at https://rwsnforum7.files.wordpress.com/2016/12/full_paper_0150_submitter_0239_banks_brian.pdf.

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