



MAKING THE CASE FOR INCREASING THE USE OF DATA IN WASH AND WRM

USAID's Water Security, Sanitation, and Hygiene Data and Analytics (WSSH D&A) Activity works to accelerate progress towards universal access to water and sanitation services along with sustainable and equitable management of water resources by strengthening the global WSSH data landscape and increasing data-informed decision-making.

The use of data in decision making has been identified as a key contributing factor to accelerate progress towards the Sustainable Development Goals¹. In the WASH and WRM sectors, an increasing number of organizations are highlighting how the use of data has helped to achieve better outcomes², though there is much more to be done to normalize the expectation that data has a "seat at the table" during the design and implementation of new programs. Data can be used to strengthen a range of routine decisions including identifying locations with the greatest need, allocating resources, understanding key risk factors, and tracking progress towards service delivery targets.

As global challenges such as climate change and population growth increase, the use of data-driven strategies will become increasingly important to help governments, and their partners provide resilient and sustainable WASH services. This article highlights key characteristics of evidence-informed decisions, explores the importance of data-driven decision making, and discusses tools and opportunities for increasing the use of data for decision support in the WASH and WRM sectors.

CHARACTERISTICS OF A DATA-DRIVEN DECISION

Evidence-informed decisions are decisions which are based on findings from data alongside other considerations such as political pressures, personal experience, and anecdotes. Evidence-informed decisions result from an intentional process of asking specific questions and then using qualitative and quantitative data to determine an accurate, objective, and dependable way forward. By using evidence and data to guide the decision and incorporating iterative processes that include feedback and integration of new information, this process can improve the dependability of a specific decision.

While more and more data is being collected and visualized, it can be difficult to determine the extent of if and how data is actually being used to make decisions. Through WSSH D&A, we are exploring how we can use a simple set of steps to ensure that data has truly been an influential component of the decision-making process. Few decisions will be made solely on data, as other factors (political, social, financial) also play key roles in the decision-making process, but the theory of change is that including data and analytics in the process will lead to better outcomes by providing objective insights into the process. These objective insights might directly inform decisions,

¹ US Global Water Strategy, 2022; UN Water, 2021

² WaterAid, 2020

or might spark important conversation, less directly informing the decision but still improving the outcome. Throughout the activity, we will test and refine the initial list of questions shown in Figure 1 below.

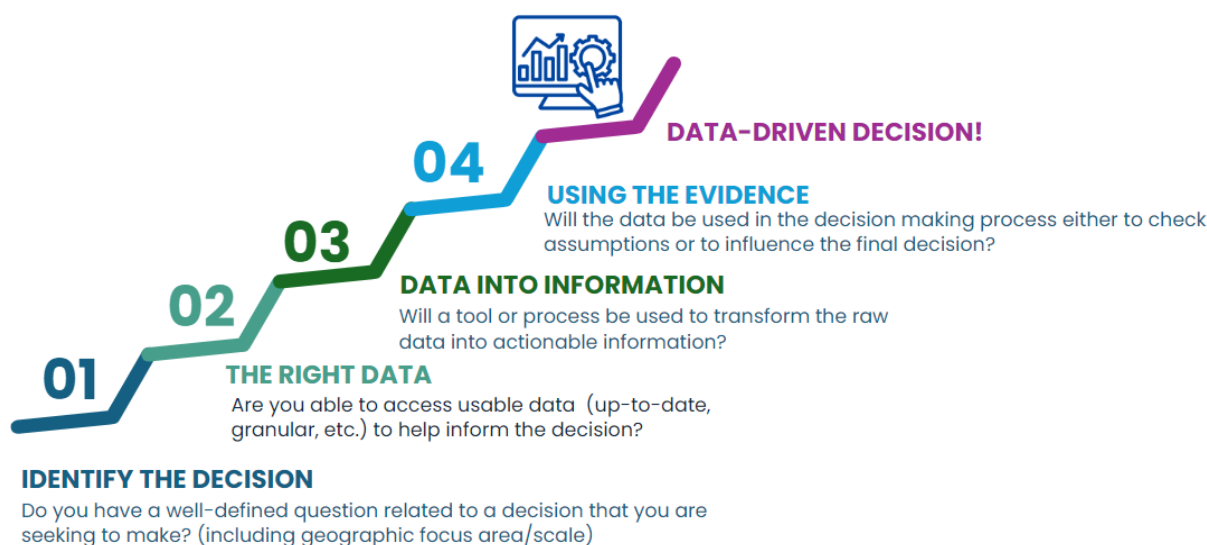


Figure 1. Steps to making a data-driven decision.

Data-driven decisions have many benefits such as increased transparency, accuracy, and objectivity (Figure 2). The figure below describes these benefits³ which can help advance both equity and efficiency.

Accuracy and Objectivity	Data can reduce biases and increase reliability
Predictive Power	Forecasting trends in data can improve longer-term intervention planning
Efficiency	Resource allocation can be streamlined and targeted to determine highest priority interventions
Accountability and Transparency	Decisions can be traced through the data-driven process which enhances accountability

Figure 2. Key characteristics and benefits of data-driven decisions.

Data can inform decisions from global to local scales and each level has specific data requirements for appropriate planning and interventions. For example, while the international development community may focus on national and regional data to identify global trends and priority areas for funding, district governments require more

³ McKinsey & Company, 2022; Harvard Business Review, 2020

granular data on services and households to create action-oriented annual planning documents. Figure 3 provides an overview of these scales and the unique data needs for driving decisions at each level.

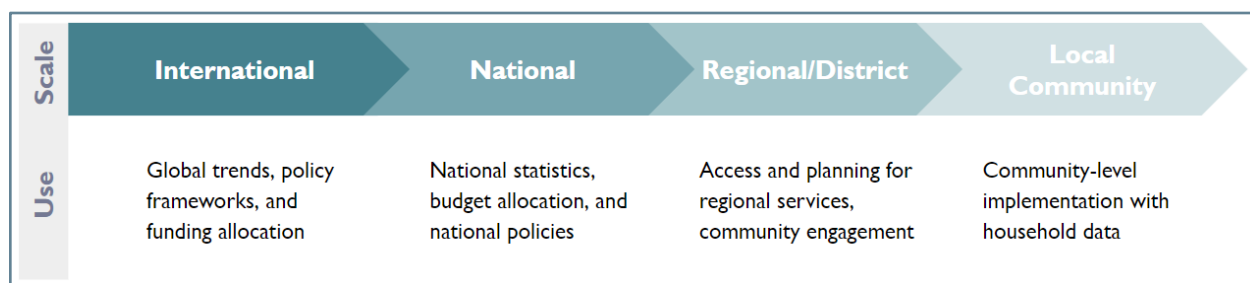


Figure 3. Uses of data from local to international scales.

USER-CENTERED DECISION SUPPORT TOOLS

The term tool can be used to describe a range of utilities that help with data-related tasks, such as gathering, organizing, processing, and displaying data to inform decision-making processes⁴. These tools can vary from apps that collect field and survey data on mobile devices to data management tools that store large volumes of data to visualization tools that present data for many audiences to use the information. Within WSSH D&A, we are focused on decision support tools that transform raw data into actionable insights to inform the decision-making process. By the WSSH D&A definition, the tools we are most interested in should help users move through the steps to making a data-driven decision shown in Figure 1 while reducing resources needed, analysis time, and barriers to engage. To be effective, decision support tools should be designed with specific objectives and users in mind. For example, decisions for the development of programs in rural areas require a different set of factors to be considered than a program in an urban area. Similarly, an analysis to identify the priority areas for a new sanitation program will need different parameters and considerations than an analysis for a water program.

Results from decision support tools should be presented so that they can be easily interpreted and understood by a range of users, without a requirement for an expertise in data science. In some cases, tools may need to connect to existing systems or provide results in specific formats so that they can be integrated most efficiently into the decision-making process. User-centered tool design is essential for uptake and should include considerations around the specific question/s being asked by the user, the format and scale of the existing data to feed into the tool, the analysis type, and the most useful output for the intended audience.

While many organizations do not have a dedicated data analyst to develop decision support tools, there are a growing number of tools being created that provide cutting edge data visualizations and analytics to a broad audience. Many of these tools draw on secondary data sources, collected by leading government and research agencies.

Data Quality Matters

Using high quality data as the input in decision support tools is key to creating actionable and reliable insights, because even the most cutting-edge analytics cannot provide good results if they are drawing from faulty data. Over the past decade, data availability has grown at an immense rate, propelled by the increasing popularity of digital data collection tools and online storage. However, not all data collected is accessible or useful. While data can provide much needed visibility to otherwise invisible challenges and populations, the opposite is also true if the data provides a skewed or incomplete perspective. USAID's guidance for conducting Data Quality Assessments

⁴ Akvo, UNICEF

describes five standards for performance monitoring indicators which can be applied to evaluate other existing datasets. The categories of standards include validity, integrity, precision, reliability and timeliness. While it can be challenging to complete a detailed assessment of a secondary data source, reviewing available metadata and methods can help provide users with a sense of confidence or caution in using a specific dataset.

For instance, stakeholders in Nicaragua cited the regular updating of a rural water information system as a key reason for their continuous use of that data. Stakeholders additionally reported that they trusted the quality of data following a structured data verification process.⁵ Establishing a standard practice of review that all stakeholders can buy in to increases transparency and accountability thereby increasing confidence in a dataset. On the other hand, data production and trust in data can be undermined by lack of fuel for travel, broken phones, inaccessible data files, and inappropriate units of analysis, among other factors. Data producers and users must contend with the inherent challenges that arise when data production and dissemination meet real world implementation.

The source and scale of data is also a key component for consideration when identifying datasets to be used in a decision support tool. Global tools often draw from international datasets which include data from many countries. These datasets are created using global standards and may differ from country-specific datasets depending on the rules and criteria used to create the compiled dataset. One example is administrative boundaries which may be updated more frequently at the national and sub-national level than the pace at which global boundary datasets are updated. Having a clear understanding of the user and the use case will help to determine which sources and scales of data are most appropriate for use in a specific analysis.

The use of existing data can save substantial time and money if done with care and consideration, but it is critical that data analysts and decision makers understand that the strength of a decision or reliability of a tool often relies on the quality of data.

...sound sector data are lacking, which hinders [policymakers'] ability to make data-driven decisions. Without data, policymakers cannot identify needs, develop appropriate policies and/or interventions, allocate resources toward the most urgent priorities, or monitor and evaluate the effectiveness of development interventions.

-USAID Global Waters⁶

WHY DATA-DRIVEN DECISIONS?

Being data-driven in the WASH sector enables stakeholders to make informed decisions, improve service delivery, and target resources more efficiently, ultimately improving access to safe water, sanitation, and hygiene for communities.⁷ For example, a policy brief from WaterAid found that in Sierra Leone, the Ministry of Finance requires the use of water point data in all rural water service investment decisions to ensure proper targeting.⁸ Institutional standards such as these affirm that neither data production nor data use can be considered in isolation, and that organizations and programs must aim to strengthen the whole sector monitoring sub-system.

⁵ WaterAid, 2020

⁶ Global Waters, 2020

⁷ WaterAid, 2020

⁸ Ibid

Requiring the use of data and ensuring that timeliness, relevance, and reliability are requirements maintains trust and drives data use in the sector.

Other development sectors are using data to drive decisions for planning and prioritizing interventions with measurable results. Below are examples of data-driven decisions from the agriculture and global health sectors that show the statistical impact of data-driven decision making in action.

Examples of data-driven planning decisions across sectors:

- **Agriculture and Food Security:** Precision agriculture provides farmers location-based recommendations on weather conditions, harvest timing, etc. to help farmers optimize their yields and determine what to plant. A McKinsey study found that data-driven precision farming can increase yields by 20%.¹⁰
- **Global Health:** Data on health outcomes help identify where to target interventions. WHO's Global Health Observatory data shows that global mortality rates have declined about 60% over the past 20 years due to data-driven interventions such as targeted vaccination campaigns and nutrition programs.¹¹

Public Sector Example in Evidence-Informed Decision Making

USAID's Water for Africa through Leadership and Institutional Support (WALIS) initiated the Improving WASH Evidence-Based Decision-Making (IWED) program to shift toward sustainable service delivery through smart use of data and evidence building.

Through IWED in Madagascar, an improved data collection process was the foundation upon which the Government of Madagascar developed plans for village-level WASH interventions.⁹

The section below outlines the opportunities for evidence-informed decision making in the WASH sector.

OPPORTUNITIES FOR DATA-DRIVEN DECISIONS IN THE WASH SECTOR

With the ongoing development and popularity of digital data collection platforms, geospatial and advanced analytics, and automation through machine learning and artificial intelligence use, increasing amounts of data have been collected in the last decade. This presents both an opportunity to utilize this data for planning, but also a challenge in ensuring the data is accessible. Amidst these challenges, there are initiatives that are working toward strengthening data ecosystems for improved decision support for governments and other organizations. For example, USAID's WALIS Activity and Ethiopia's ONE WASH National Program implemented a knowledge management platform that enabled policymakers to access WASH data and information through a digital platform for planning interventions and resource mobilization.¹² With improved data management structures for WASH and WRM data, there are more opportunities to leverage that data for key decisions.

The data must also be relevant, actionable and interoperable with other datasets to fully support data-driven decision making by stakeholders. For example, stakeholders in Nicaragua opted to complement the use of a rural sanitation information system with complementary monitoring systems to cover their data needs and drive evidence-informed decision making. In Sierra Leone, stakeholders prioritized using financial data along with WASH outputs and outcomes to better drive decisions around budgeting and planning.¹³ In Rwanda, World Vision integrated publicly available spatial datasets with field-collected monitoring data to carry out water service

⁹ Global Waters, 2020

¹⁰ McKinsey & Company, 2020

¹¹ WHO/Global Health Observatory

¹² Global Waters, 2021

¹³ WaterAid, 2020

coverage analyses, verify improvements to coverage, and track and report this information through an mWater data hub.¹⁴ These cases highlight the power of data and digital tools to inform improved water service delivery.

Additional integration of data-driven results in global frameworks is also moving the needle on increasing evidence-informed decision making in the WASH and WRM sectors. For example, USAID’s 2022-2027 U.S. Global Water Strategy includes an intermediate result to “Advance transparency, accountability, equity, and efficiency through participatory, data-driven decision-making.”¹⁵ Increasing the expectation by donors to include evidence in the decision-making process is a step toward wider scale adoption of the practice in the WASH and WRM sectors.

In the WASH sector, there are a number of key categories of routine decisions where the use of data could result in improvements in efficiency and equity of services. The table below shows these decisions, potential decision-makers, and how they can be based on data and supported by evidence. This initial list will be updated throughout the life of WSSH D&A to reflect new insights and findings from implementation.

Decision Type	Potential Decision Makers ¹⁶	Routine Decisions made in WASH Sector	How can these decisions be data-informed through tools and data and analytics?
Planning	WASH Ministries, International Cooperation Agencies, National/Regional/Local Governments	Resource allocation	Data-driven budgeting and program planning based on population needs and service gaps
	Humanitarian Actors, Water Basin Organizations, Water User Associations	Site selection	Using geospatial analytics to determine areas of opportunity and priority for project needs such as analysis of access to WASH services, rural/urban contexts that consider population density, etc.
	Water User Associations, Utilities	Technology selection	Choosing the appropriate technology for water access or sanitation (e.g. latrines, toilets) based on analysis of local context, feasibility, etc.
	Humanitarian Actors, National/Regional/Local Governments, Meteorology and Hydrology Services	Emergency response	Prioritizing locations for water supply and sanitation during natural disasters or other shocks, such as conflict, using geospatial analytics to determine most affected areas.

¹⁴ World Vision, 2024

¹⁵ USAID, 2022

¹⁶ SSWM, 2018

Decision Type	Potential Decision Makers ¹⁶	Routine Decisions made in WASH Sector	How can these decisions be data-informed through tools and data and analytics?
Monitoring	Utilities, Governments, Water User Associations, Water Basin Organizations	Maintenance / Asset Management	Establish systems for monitoring resource availability and the usage and functionality of infrastructure to ensure continual access by communities with the use of sensors or alert systems to ensure repairs are completed
		Monitoring Service Delivery	Data collection on water resources and WASH service infrastructure to determine where gaps exist in coverage to prioritize new construction
Engagement	International Health Organizations, WASH Ministries, National/Regional/Local Governments	Behavior Change Strategies	Data on hygiene practices can assist with where hygiene promotion campaigns should be strengthened and additional interventions planned
		Capacity building	Building the capacity of local governments to leverage data and analytics can help sustain WASH services and assist with planning interventions

CONCLUSION

The growing adoption of data-driven decision-making in the WASH and WRM sectors marks a pivotal shift towards the potential for more effective and equitable management of water resources. As this article highlights, leveraging high-quality data and robust analytics tools can significantly enhance the planning, implementation, and evaluation of WASH and WRM projects.

The integration of digital tools that collect, manage, and visualize data has made it easier for decision-makers at all levels to utilize data for informed decision-making. However, the effectiveness of these tools hinge on the quality of the underlying data as well as the ability to identify which tool is the most appropriate and when that tool should be employed. Incomplete or poor-quality data can undermine decision-making processes, emphasizing the need for continual improvement in data collection practices and data management structures.

The potential for data to revolutionize WASH sector decision-making is immense. With ongoing advancements in technology and data analytics, stakeholders are better equipped to tackle new challenges. By fostering a culture of evidence-informed decision-making and investing in data capacity building, the WASH and WRM sectors can achieve more sustainable and impactful outcomes, ensuring safe water, sanitation, and hygiene for all communities. In the coming months, WSSH D&A will launch new decision support tools, help connect users to existing tools through a series of ‘data-clinic’ style webinars and share case studies that demonstrate how the use of data leads to more equitable and efficient WASH and WRM outcomes.

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