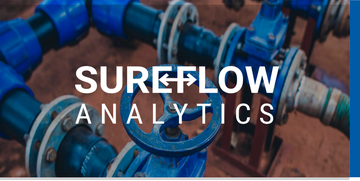


Automated Digital Data Integration for Scalable Rural Water Service Provision

Primary Author: Pamela Crane-Hoover (Global Water Center) **Additional Authors:** Megan Lindmark (Cova), Tanner Hoffman (Ugandan Water Project), Tom Duong (Assetas), Jon Viducich (Jon Viducich Consulting), and Tess Brodie (Global Water Center)

BACKGROUND

Global Water Center (GWC) is bringing the rural water sector together with innovative technology and professional water education. Their purpose is equipping leaders to solve the global water crisis together. GWC is accelerating the professionalization of the rural water sector by providing capacity development and technical services achieved through collective action.

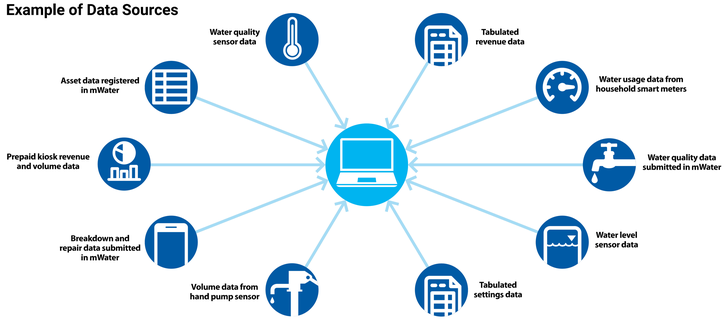
Professional rural water service providers in low-resource contexts face a myriad of operational obstacles: limited sustainable funding (Nilsson et al. 2021), low customer population density, cultural barriers to novel service model adoption, lack of institutional government support, and more. Recent innovations in smartphone-based data collection tools and smart water infrastructure offer a major opportunity for service providers to systematize and streamline operations (Greeff et al. 2019; Harvey 2015; Ingram and Memon 2020; Nagel et al. 2015; Tashman et al. 2020; Wilson et al. 2016), and the advent of performance-based funding opportunities further incentivizes providers to collect relevant, systematic operational data (Nilsson et al. 2021). However, synthesizing and operationalizing those data remain ongoing challenges that must be overcome to facilitate reliable and affordable drinking water services at scale (Hope 2024).

Many rural water service providers do not currently collect the types and quality of systematic data required for operations at scale or for performance-based funding (Nilsson et al. 2021). Among those that do, one key obstacle is the inability to automatically aggregate data generated in different platforms (Harvey 2015). For example, a service provider operating a piped water system may use the following tools: a smartphone-based survey tool to manually record water point breakdown and service data, smart meters from Manufacturer A to automatically collect household-level customer revenue and volume data, and smart sensors from Manufacturer B to automatically collect flow and water quality data at the system source. Because each of these data sources has its own associated user interface to view the data, routinely aggregating and analyzing the cross-platform data to develop actionable metrics and products and disseminating that information to relevant personnel remains a specialized, labor-intensive task—and as a result, data are often underutilized and potential gains in operational efficiency are unrealized. Some solutions have enabled service providers to aggregate data from various sources, but their primary purpose has been to create data repositories to facilitate data sharing, rather than to support day-to-day operational use by ongoing rural water service providers. GWC's Sureflow Analytics aims to fill this gap.

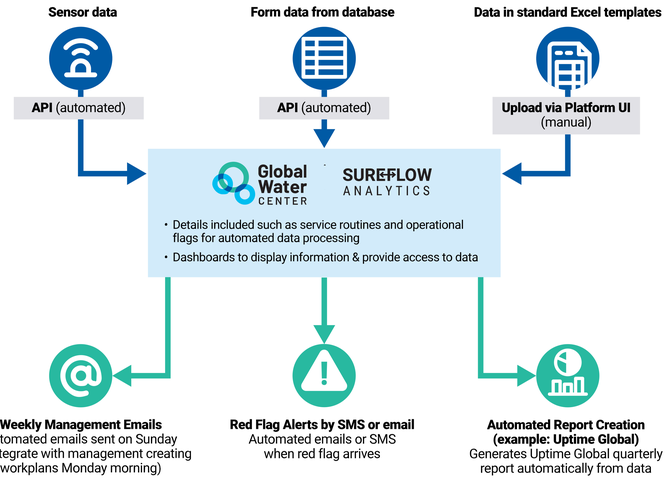
PROJECT DESIGN

This project, funded by GWC, seeks to assess whether a tool that automatically aggregates, synthesizes, and presents operationally relevant data to the right individuals at the right time can enable rural water service providers to improve the quality of rural water service provision while reducing the time spent on data management and reporting. The tool was developed in partnership with Assetas, an asset monitoring and management platform, which aggregated operational data from various sources, including form data, smart meters, sensors, and manually uploaded spreadsheets. GWC adapted the platform, calling it Sureflow Analytics, to specifically meet the needs of the rural water sector.

Example of Data Sources



The platform was piloted in 2023 and 2024 with rural water service providers operating in Central America (Cova) and Uganda (Ugandan Water Project). Baseline, midline, and endline assessments were performed over 1-year of system use to evaluate the number of water points managed, time spent on scheduling and reporting, and impacts on level of service provided.



KEY FINDINGS

Raw data from partners' various sources were synthesized through Sureflow Analytics and presented in dashboards, with urgent, actionable issues highlighted using customizable flags. Each week, the platform automatically generated and emailed a spreadsheet to field managers with relevant information about assets (operational flags, upcoming service visits, performance data, etc.). Field managers used the data to allocate staff resources and develop weekly work plans.

Partners found that a spreadsheet sent weekly with actionable information transformed field-level operational planning. **By removing the need to access dashboards or wait on others to process data, the weekly email enabled field offices to meet operational targets more efficiently**. Additionally, partners found that using Sureflow Analytics to automatically generate results-based financing reports to Uptime Global saved substantial staff time.

During the 1-year pilot, partners saw substantial results, as seen in the table below.

	Managed Water Points	Overdue Service Visits	Hours Scheduling Visits Weekly	Hours Reporting Uptime Quarterly
UWP	+8%	-48%	-3.0	-4.9
Cova	+21%	-15%	-6.0	-8.0
Average	**+14%**	**-32%**	**-4.5**	**-6.5**

In their first year using Sureflow Analytics, partners saved an average equivalent of **32 workdays** on operations and substantially reduced overdue service visits—while increasing the total number of communities served.

Sample Weekly Report

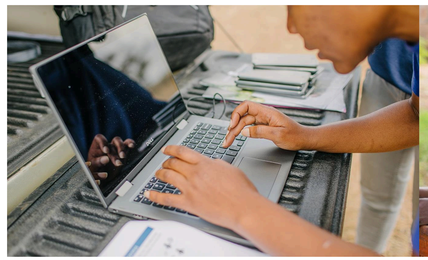
Water Point ID	Service Status	Last Service Date	Next Service Date	Water Quality Test Next Service	Days Since Last Service	Functional Status	Sensor Flag	Operational Flag	Financial Flag
#1004	OVERDUE	2024-06-18	2024-09-16	Yes	100	Functional	No Flag	Green Flag	Green Flag
#1005	OVERDUE	2024-06-19	2024-09-17	Yes	99	Functional	No Flag	Green Flag	Orange Flag
#1007	OVERDUE	2024-06-27	2024-09-25	Yes	91	Functional	No Sensor Data	Orange Flag	Red Flag
#1011	OVERDUE	2024-06-27	2024-09-25	Yes	91	Not functional	Red Flag	Red Flag	Red Flag
#1006	Upcoming Date	2024-07-05	2024-10-03	No	83	Functional	No Flag	Green Flag	Green Flag
#1014	Upcoming Date	2024-07-08	2024-10-06	Yes	80	Functional	No Flag	Green Flag	Green Flag
#1016	Upcoming Date	2024-07-18	2024-10-16	No	69	Functional	No Flag	Green Flag	Green Flag
#1010	Upcoming Date	2024-07-20	2024-10-18	Yes	68	Functional	No Flag	Green Flag	Green Flag
#1012	Upcoming Date	2024-07-24	2024-10-22	Yes	64	Functional	No Flag	Green Flag	Green Flag
#1024	Recent Completion	2024-09-15	2024-12-14	Yes	11	Not functional	Red Flag	Orange Flag	Orange Flag
#1019	Recent Completion	2024-09-15	2024-12-14	Yes	11	Functional	No Flag	Green Flag	Green Flag
#1026	Recent Completion	2024-09-16	2024-12-15	Yes	10	Functional	Red Flag	Orange Flag	Red Flag
#1018	Recent Completion	2024-09-16	2024-12-15	Yes	10	Functional	No Flag	Green Flag	Orange Flag
#1023	Recent Completion	2024-09-17	2024-12-16	Yes	9	Functional	No Flag	Green Flag	Green Flag
#1021	Recent Completion	2024-09-17	2024-12-16	No	8	Functional	No Flag	Green Flag	Orange Flag
#1020	Recent Completion	2024-09-18	2024-12-17	No	8	Functional	No Sensor Data	Green Flag	Green Flag
#1017	Recent Completion	2024-09-24	2024-12-23	Yes	2	Functional	No Flag	Green Flag	Green Flag
#1025	Recent Completion	2024-09-24	2024-12-23	Yes	2	Functional	No Flag	Green Flag	Green Flag
#1031	Future Date	2024-08-18	2024-11-16	No	39	Functional	No Sensor Data	Green Flag	Green Flag
#1036	Future Date	2024-08-21	2024-11-19	Yes	36	Functional	No Sensor Data	Green Flag	Green Flag
#1037	Future Date	2024-09-01	2024-11-30	Yes	25	Functional	No Flag	Green Flag	Orange Flag
#1032	Future Date	2024-09-04	2024-12-03	No	22	Functional	No Flag	Green Flag	Green Flag
#1035	Future Date	2024-09-08	2024-12-07	No	18	Functional	No Sensor Data	Green Flag	Green Flag
#1033	Future Date	2024-09-08	2024-12-07	No	18	Functional	No Flag	Green Flag	Green Flag

SECTOR IMPACT

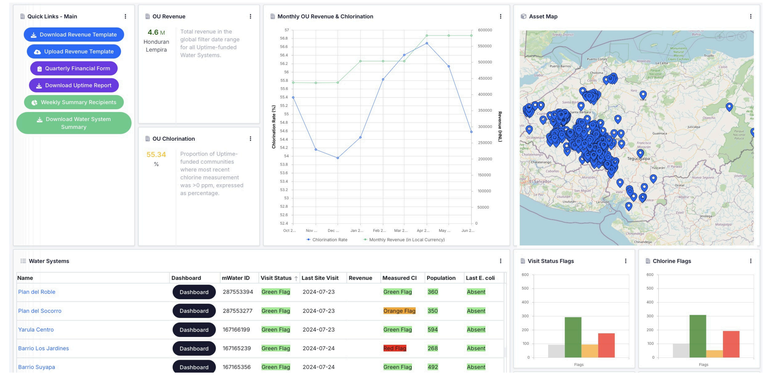
This tools developed under this project enable safe water enterprises to scale by saving time and money on routine operational functions, increasing operational excellence, and focusing efforts on keeping safe water flowing. Aggregating data from forms and sensors will support automation and make data actionable, ultimately reducing the time spent on reporting and increasing the level of service of rural water provision. GWC plans to continue development of this platform and to scale it for broader use in the rural water sector, making data more automated and actionable.

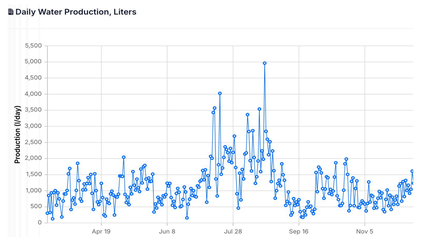
"Sureflow Analytics was extremely helpful for our team to visualize the magnitude of how many communities were not receiving monitoring visits as frequently as we might have expected. This led to beneficial conversations about how we can adjust our program based on the data. We discovered that a bottleneck in the reporting process was causing many overdue communities, which we resolved quickly!"
Cova

"Before Sureflow Analytics, we were only able to audit our 'on timeservice delivery' performance once. It was too timeconsuming the way we had to do it,taking 2+ days oftime.Our staff was trying to track quarterly visits for ~125 customersusing Google Calendars. Visits were getting missed, and itshowed."
Ugandan Water Project



Sample Dashboards





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Scan for more information
Contact: pcranehoover@globalwatercenter.org