Sustainable WASH Systems Learning Partnership
End of Project Report

Photo credit: Nancy Gladstone

About the Sustainable WASH Systems Learning Partnership: The Sustainable WASH Systems Learning Partnership is a global United States Agency for International Development (USAID) cooperative agreement with the University of Colorado Boulder (UCB) to identify locally driven solutions to the challenge of developing robust local systems capable of sustaining water, sanitation, and hygiene (WASH) service delivery. The consortium of partners — Environmental Incentives, IRC, LINC, Oxford University, Tetra Tech, WaterSHED, Whave, and UCB — are demonstrating, learning about, and sharing evidence on systems-based approaches for improving the sustainability of WASH services in four countries. This report is made possible by the generous support of the American people through USAID under the terms of the Cooperative Agreement AID-OAA-A-16-00075. The contents are the responsibility of the Sustainable WASH Systems Learning Partnership and do not necessarily reflect the views of USAID or the United States Government. For more information, visit www.globalwaters.org/SWS, or contact Amy Javernick-Will (amy.javernick@colorado.edu), Karl Linden (karl.linden@colorado.edu), or Ryan Mahoney (rymahoney@usaid.gov).

Front cover: Community members fetch water after SWS partner Whave has rehabilitated the community hand pump. Photo credit: Whave

FOREWORD

Sustainable water, sanitation, and hygiene (WASH) can be achieved when country partners and communities take ownership of the service, and local systems are in place to maintain results and deliver impacts beyond the life of projects. Sustainability has been a core concern for the WASH sector for decades, yet many approaches have proven unsuccessful. That's why the United States Agency for International Development (USAID) co-designed the Sustainable WASH Systems Learning Partnership (SWS) with its partners.

Poor service functionality and backsliding on key WASH behaviors plague developing communities all over the world. Strengthening only one actor in the system has been insufficient to drive sustained change; rather, a diverse set of actors — from national and local governments down to private firms and individuals — play pivotal roles in securing lasting access to WASH services. Various aspects of WASH cut across multiple government line ministries, but in the end these services meet the user at the local level, and local governments are increasingly the responsible authorities.

How local systems influence the sustainability of WASH services is complex, inadequately understood, and poorly defined, and the systems are connected in ways not always apparent when using traditional approaches to design and implement WASH programs. Because sustainability depends on local systems, understanding these systems is essential.

SWS drew upon best practices in USAID's Local Systems Framework to catalyze systems thinking

and conducted cutting-edge research to pilot and scale systems-strengthening interventions. Our Local Systems Framework is an overarching approach to transforming innovations and reforms into sustained development. It is rooted in the reality that achieving any robust and resilient development outcome depends on the contributions of multiple and interconnected actors. Therefore, activities should focus on the system as a whole, including the actors and factors that shape and incentivize their relationships. The local nature of WASH services and behaviors lends itself well to this framework.

As we learned in SWS, approaching WASH service delivery improvements through a systems lens not only yields better results but also helps USAID to find new ways of supporting local systems — an important goal outlined in the Local Systems Framework. Ultimately, SWS demonstrated that WASH approaches that empower and improve local systems have cross-sectoral effects on improving government effectiveness and citizen participation, which help build resilient, democratic societies.

SWS has undertaken a tremendous amount of work across a diverse set of partners, all with a devotion to transparency and sharing of approaches and findings. The SWS partnership's journey has achieved so much over its 5 years, and what we learned will help WASH and systems practitioners understand what to do next.

Ryan Mahoney
USAID Agreement Officer Representative for SWS
December 2021

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ACRONYMS

AMS	Asset Management System
ASP	Area Service Provider
CDSA	Constituent-Driven Systems Assessment
FSD	Fecal Sludge Disposal
MOU	Memorandum of Understanding
MRD	Ministry of Rural Development
NGO	Non-Governmental Organization
O&M	Operations and Maintenance
ONA	Organizational Network Analysis
PAYF	Pay-As-You-Fetch
PPP	Public-Private Partnership
RuSH	Rural Sanitation and Hygiene Network
SNA	Social Network Analysis
SWS	Sustainable WASH Systems Learning Partnership
UCB	University of Colorado Boulder
UGX	Ugandan Shilling
ULGDP	Urban Local Government Development Program
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene
WMSTF	Water Service Maintenance Trust Fund

EXECUTIVE SUMMARY

The Sustainable WASH Systems Learning Partnership consists of eight partners, including the University of Colorado Boulder (UCB), Environmental Incentives, IRC, LINC, Oxford University, Tetra Tech, WaterSHED, and Whave Solutions. For the past 5 years this consortium has worked with local partners in Cambodia, Ethiopia, Kenya, and Uganda to understand their systems and test approaches to overcome barriers for improving WASH service sustainability. These include learning how systems understanding and engagement can help service providers navigate the complex challenges to service sustainability, maintaining rural water services that incentivize preventive maintenance and fast repair times, and supporting collective action platforms to bring about policy change. Evidence from SWS experience shows that these promising approaches can result in improved performance of WASH services.

Incubated in early 2016, the SWS team, consisting of more than 50 members, spent 5 years helping USAID define what research and learning about sustainable WASH systems could actually look like. The first task consisted of building a community of learning and developing trusting relationships among a diverse set of teams in the partnership. Hosting the kickoff meeting at UCB helped emphasize the focus on research and learning in this cooperative agreement. Graduate students from the university joined with country field partners to support their learning activities and develop strong ties throughout the project.

The SWS exploration involved four activities:

- IRC and Tetra Tech worked to understand and strengthen rural water and small town sanitation service delivery systems in one Ugandan district, and two districts and two towns in Ethiopia. In each location, SWS collaborated with local partners to promote and facilitate multisectoral coalitions (collective action) to strengthen and sustain WASH services.
- WaterSHED and LINC worked with Cambodia's Rural Sanitation and Hygiene network to increase the network's understanding of the country's rural sanitation and hygiene system. SWS used network analysis and systems mapping tools to identify and engage relevant local actors, collectively prioritize high potential areas of collaboration to achieve sector goals, and better understand how collective efforts contribute to long-term sustainability of services.

- Whave is testing a professionalized maintenance approach to cultivate sustainable rural water service delivery in three rural Ugandan towns. Whave incentivizes local technicians to prevent breakdowns before they happen and is working with local coalitions and the government to institutionalize and regulate professionalized maintenance.

14

number of learning visits conducted with local actors

- The University of Oxford worked with UNICEF and Rural Focus Ltd. to develop, scale up, and test the FundiFix model that uses a performance-based approach to maintain water infrastructure in rural water services in Kitui County, Kenya. Oxford worked with government officials and the Kitui County WASH forum (collective action) to strengthen the institutional coordination necessary for effective service delivery.

In the second year of the project, SWS partners identified four overarching learning themes to jointly investigate: collective action, professionalized maintenance services, network analysis, and stakeholder understanding. This learning collaboration among USAID, SWS, and its in-country partners tested new ideas, approaches, and tools to strengthen local WASH systems and improve service sustainability.

All teams used network analysis to understand the connections and relationships between the actors. This helped to inform decisions about who should be included in a coalition; what collaboration needs to be supported through intervention; and whether the SWS interventions worked based on monitoring and tracking changes in the network structure, actors, and interaction.

SWS hypothesized that sustained improvements in service delivery will only come about by addressing and strengthening the weaknesses of local and national systems. To explore this premise, the activity investigated professionalized maintenance approaches in Uganda, Ethiopia, and Kenya. Three partners' explorations helped SWS identify what elements needed to be in place to scale up this approach: political support; smart and targeted subsidies; the right policies and regulations; and an understanding of the existing service context before new investments can take place.

Finally, SWS studied factors that collaboratively strengthened WASH systems, as well as the resources that were required to apply these approaches. Although the partnership did not identify any one single formula to apply, the research uncovered five core elements that worked together in different ways to make progress: local government uptake, the availability of external funds for the coalition's activities, continuity and accountability in the coalition's membership, having a hub with convening power, and collaboratively identifying problems and solutions.

SWS also explored how stakeholders conceptualize the interconnected factors that hinder or enable sustainable

Photo credit: Ella Waweru

Defining the System for WASH Services

The WASH system is made up of actors and factors that influence the sustainability of WASH services in the selected area.

Examples of the actors in the system include:

- Members of households and communities
- Local businesses and entrepreneurs who offer products and other services to repair or sustain WASH services
- Public or private utilities
- Local government political leaders accountable for ensuring that citizens have access to sustainable WASH services
- Local government technical staff that have roles and responsibilities to support households and communities in sustaining WASH services and provide regulatory oversight to private sector WASH providers
- Regional and national level government staff with responsibility for WASH policy and strategy
- NGOs, other development partners, external donors (such as USAID), and international financial institutions

Factors include all the institutional, social, environmental, technical, and financial elements of the system that influence WASH service sustainability. These factors can be examined within a given geographic, technical, or political boundary and may take many forms in many different contexts. Examples of factors that might influence sustainability include government regulations, financial planning, water resources, cultural norms, gender, and appropriate technology.

water and sanitation service delivery. Specifically, SWS analyzed whether views of factor interactions shifted over time and measured engagement during more than 200 learning activities, including outcome mapping, network analyses, sustainability scorecards, qualitative comparative analysis, among others.

Annual consortium-wide learning events, called pause and reflect meetings, took place in different locations globally and provided an opportunity for all learning partners to interact with their peers, share experiences across countries, and reflect on the SWS Theory of Change. COVID-19 impacted travel and froze the research teams' activities temporarily. However, the team quickly adapted to online virtual meetings, which built on the trusting relationships formed during the initial project years.

Learning and Achievement

Six brief examples highlight some of the many contributions that SWS has made over its program cycle.

1. SWS found that systems assessments are an important starting point for WASH interventions to fully understand layered local context for the creation of sustainable and reliable service.

2. Collectively, SWS partners conducted 16 different types of systems assessments, including asset inventory, building block assessments, financial analysis, network analysis, outcome mapping, borehole sensor analysis, and sustainability assessments. These were often participatory and conducted with, and validated by, local stakeholders.

3. In five out of nine SWS geographies an endline assessment showed a significant increase in the likelihood that WASH services will be sustained based on measures of financial, institutional, environmental, technological, and social aspects of sustainability.

200+

number of knowledge products and presentations by SWS partners

Photo credit: Jacob Katuva/FundiFix

Additionally, all geographies showed an improvement in the overall strength of their WASH networks.

4. WASH partners, FundiFix in Kenya and Whave in Uganda, implemented professionalized maintenance approaches over the project's 5 years. Each demonstrated substantial evidence that by providing scheduled mechanical maintenance and repairs to water infrastructure and systems, rural water supplies and services can remain highly functional and cost effective with minimal breakdowns.

5. SWS implemented collective action approaches in Kenya, Uganda, Ethiopia, and Cambodia, either establishing multistakeholder platforms where they did not previously exist, such as setting up learning alliances in two small towns in Ethiopia to address sanitation challenges, or strengthening existing platforms such as formalizing a governance structure for a WASH forum in Kitui County, Kenya.

6. These platforms achieved a wide range of outcomes. Notable outcomes included resolving long-standing conflicts between the water supply and sanitation utility and a municipality to construct fecal sludge disposal sites, developing a 10-year master plan for a district, and successfully advocating for greater resource allocation from local government.

This end of project report captures work across SWS as applied to rural water and small town sanitation services. Throughout its work SWS partners faced challenges balancing systems strengthening and scaling their approaches with the need to collect evidence for learning and research, turnover of actors, and the length of time required to increase sustainability of service delivery. In addition to presenting findings and recommendations that resulted from an exploration of the learning themes, this report includes a summary of these challenges as well as lessons and achievements. It also links to some of the many SWS studies and journal articles that delve more deeply into the details of the evidence generated through the partnership's exploration of locally driven, systems-based approaches.

An End of Project Annex and bibliography have been published separately from this report and are available on Globalwaters.org/SWS. The annex contains comprehensive information on how SWS partners addressed their learning questions and includes a summary of SWS Monitoring, Evaluation, and Learning.

It is hoped that as USAID, other development institutions, and key local and global actors apply this learning, global WASH programming will be improved, leading to greater at-scale sustainability of WASH services.

THEORY OF CHANGE

The SWS Theory of Change explores systems-based approaches to increase the sustainability of WASH services. Although SWS partners implemented activities in different contexts, they follow a common set of broad steps: (1) improving understanding of local systems, (2) strengthening these systems, and (3) improving service sustainability. Along the way, adaptation and iteration occurs based upon the measurement of the changing systems. Ultimately, SWS is working to improve service sustainability to reach its goal of more sustainable rural water and small town sanitation services. These steps, or intermediate results, make up the foundation of the partnership's approach and overarching Theory of Change.

The SWS Theory of Change diagram illustrates the logical flow of the theory of how SWS sought to achieve its programmatic goals through a series of intermediate results and associated activities.

SWS began with the premise that if actors better understand the local systems for delivering sustained WASH services and are supported to undertake interventions that aim to improve the way in which actors coordinate or address WASH factors that influence service sustainability, then these systems will be strengthened. This in turn will lead to increases in the sustainability of WASH services at the national and sub-national level.

Understanding the System

SWS begins with a rigorous mapping and analysis of the system's actors, factors, and interactions among them. This allows for a better understanding of how actors in the system interact with each other and how these interactions affect the system's ability to deliver sustainable services. Results from systems analyses are used to identify and prioritize leverage points that provide opportunities to greatly improve outcomes or gaps that need to be addressed.

Strengthening the System and Seeking Sustainability

Systems-strengthening interventions are those that aim to improve the way in which actors coordinate and/or identify and address factors that influence service sustainability. Such interventions contribute to addressing the factors that constrain sustainable WASH services, such as misaligned sector policies or strategies, weak institutional arrangements, gaps in sector financing, or poor monitoring and enforcement systems. Stronger systems are expected to improve the likelihood of WASH services being sustained. Over time, this is expected to improve the sustainability of services in intervention areas.

Building an Evidence Base on Systems Change

As a learning partnership, the creation of evidence at each step is fundamental to the entire SWS Theory of Change. It is assumed that if this evidence is generated and disseminated effectively, both on systems approaches and their resulting impacts on sustainable services, then it will eventually be absorbed and applied by USAID, national governments, and other sector actors. This will result in programmatic changes that will increase the sustainability of both sectoral programming and subsequent WASH service delivery.

HIGHLIGHTS OF SWS'S APPLICATION OF ITS THEORY OF CHANGE

Understanding the System

- Data on water pump functionality are now available for the first time to government maintenance service providers in Afar, Ethiopia.
- Comprehensive sanitation assessments spurred sanitation stakeholders to join and form a learning alliance and convince decision-makers to prioritize sanitation with other development activities in Debre Birhan, Ethiopia.
- An audit of water infrastructure for 1,887 educational facilities in Kitui County, Kenya, found a heavy reliance on poorly performing rainwater harvesting systems and identified the need for the local government to monitor and regulate water access at education facilities.
- More than 100 sanitation actors in Cambodia participated in a baseline systems network analysis, which uncovered a number of potential focus areas for improving collective action and accelerating progress toward achieving the Rural Sanitation and Hygiene (RuSH) sector vision.

Strengthening the System

- Master plans to coordinate investments and align efforts of WASH actors to attain Sustainable Development Goal 6 have been developed for domestic and institutional WASH services in five districts in Uganda and Ethiopia.

- The Kitui County Water Services Bill and Policy now specifies government funding support for WASH forums in Kenya and the role of private sector actors in the provision of professionalized maintenance.
- An mWater database for monitoring infrastructure and water access rates has been established in Kitui County.
- Kamuli, Kumi, and Nakaseke districts in Uganda signed public-private partnership contracts, appointing Whave as the Area Service Provider.
- Multiple across-country and regional learning exchanges on rural water asset management led to draft policy documents on post-construction support in Ethiopia.
- The Debre Birhan town municipal office, in collaboration with other WASH stakeholders, identified 10 sites for construction of shared latrine facilities.
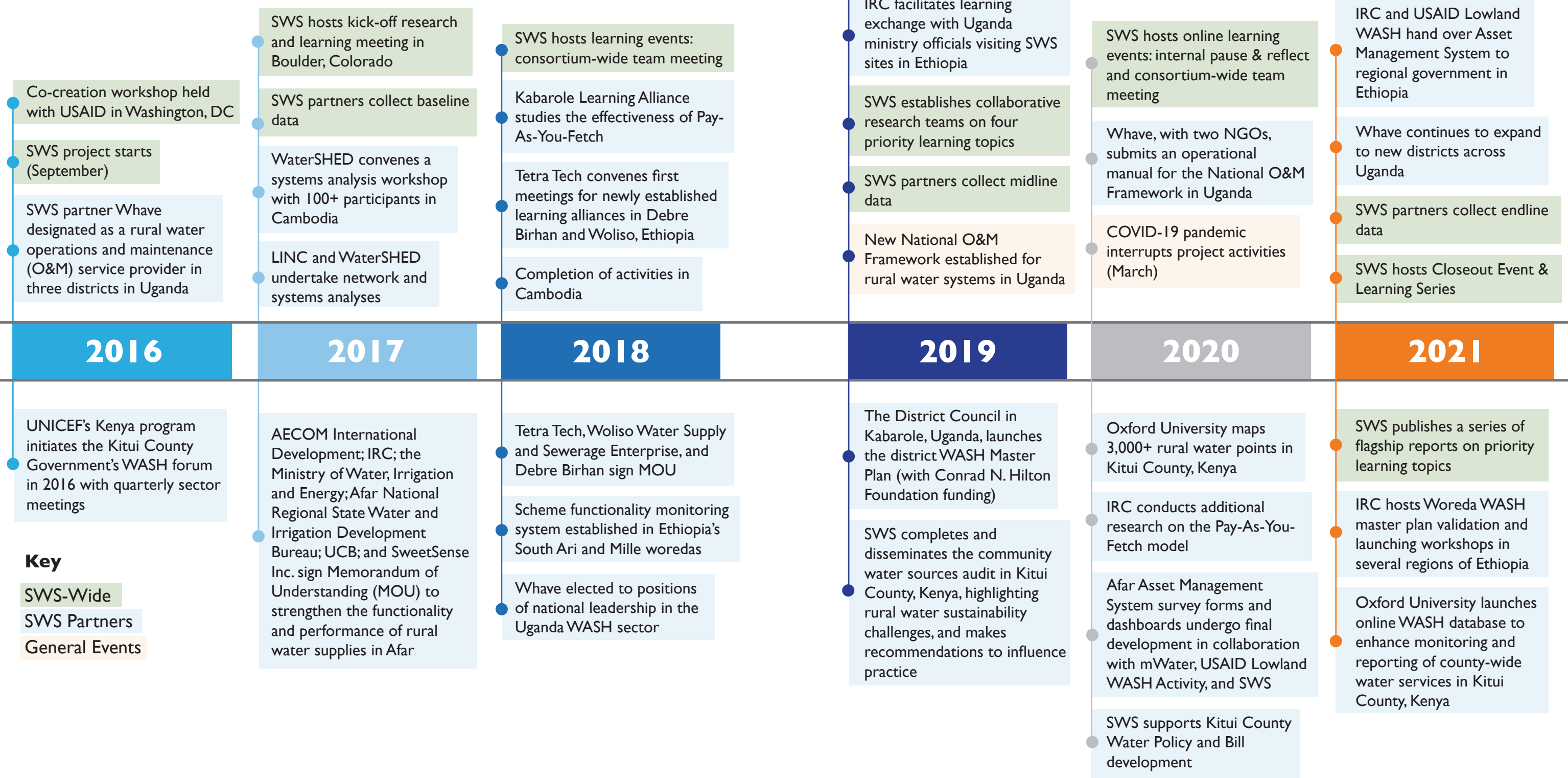
Measuring the Change

- The project conducted 64 analyses to improve stakeholder understanding of WASH systems.
- Seventy-five percent of coalition members reported an improved understanding of the WASH system.
- SWS partners developed and shared more than 200 knowledge products and presentations.
- WASH forum surveys and stakeholder understanding results indicate a shift toward more perceived importance of maintenance over new infrastructure investments.
- Increased budgets toward monitoring and maintenance followed the asset inventory data collection in South Ari, Ethiopia, highlighting levels of non-functionality.

Improving Service Sustainability

- By establishing professionalized maintenance services in at least 700 paying communities, Whave's experience in Uganda showed it was possible to achieve reliable functionality in a rural context.
- After years of prioritizing water over sanitation in Debre Birhan, Ethiopia, the town administration increased allocations for sanitation by 27 percent in 2020, and by 56 percent in 2021. The town administration as well as private actors also mobilized funds for the procurement of land, the development of the fecal sludge disposal site, and the construction of shared latrines.
- The Fostering Civic Champions leadership development program in Cambodia enabled participants to better understand their local sanitation scenarios and how to influence and advocate for community WASH improvements.

SWS TIMELINE

Co-creation workshop held with USAID in Washington, DC

SWS project starts (September)

SWS partner Whave designated as a rural water operations and maintenance (O&M) service provider in three districts in Uganda

SWS hosts kick-off research and learning meeting in Boulder, Colorado

SWS partners collect baseline data

WaterSHED convenes a systems analysis workshop with 100+ participants in Cambodia

LINC and WaterSHED undertake network and systems analyses

SWS hosts learning events: consortium-wide team meeting

Kabarole Learning Alliance studies the effectiveness of Pay-As-You-Fetch

Tetra Tech convenes first meetings for newly established learning alliances in Debre Birhan and Woliso, Ethiopia

Completion of activities in Cambodia

SWS hosts learning events: in-country pause & reflect and consortium-wide team meeting

IRC facilitates learning exchange with Uganda ministry officials visiting SWS sites in Ethiopia

SWS establishes collaborative research teams on four priority learning topics

SWS partners collect midline data

New National O&M Framework established for rural water systems in Uganda

SWS hosts online learning events: internal pause & reflect and consortium-wide team meeting

Whave, with two NGOs, submits an operational manual for the National O&M Framework in Uganda

COVID-19 pandemic interrupts project activities (March)

IRC and USAID Lowland WASH hand over Asset Management System to regional government in Ethiopia

Whave continues to expand to new districts across Uganda

SWS partners collect endline data

SWS hosts Closeout Event & Learning Series

2016	**2017**	**2018**	**2019**	**2020**	**2021**

UNICEF's Kenya program initiates the Kitui County Government's WASH forum in 2016 with quarterly sector meetings

Key
SWS-Wide
SWS Partners
General Events

AECOM International Development; IRC; the Ministry of Water, Irrigation and Energy; Afar National Regional State Water and Irrigation Development Bureau; UCB; and SweetSense Inc. sign Memorandum of Understanding (MOU) to strengthen the functionality and performance of rural water supplies in Afar

Tetra Tech, Woliso Water Supply and Sewerage Enterprise, and Debre Birhan sign MOU

Scheme functionality monitoring system established in Ethiopia's South Ari and Mille woredas

Whave elected to positions of national leadership in the Uganda WASH sector

The District Council in Kabarole, Uganda, launches the district WASH Master Plan (with Conrad N. Hilton Foundation funding)

SWS completes and disseminates the community water sources audit in Kitui County, Kenya, highlighting rural water sustainability challenges, and makes recommendations to influence practice

Oxford University maps 3,000+ rural water points in Kitui County, Kenya

IRC conducts additional research on the Pay-As-You-Fetch model

Afar Asset Management System survey forms and dashboards undergo final development in collaboration with mWater, USAID Lowland WASH Activity, and SWS

SWS supports Kitui County Water Policy and Bill development

SWS publishes a series of flagship reports on priority learning topics

IRC hosts Woreda WASH master plan validation and launching workshops in several regions of Ethiopia

Oxford University launches online WASH database to enhance monitoring and reporting of county-wide water services in Kitui County, Kenya

COLLECTIVE ACTION

OVERVIEW

Between 2016 and 2021, SWS implemented collective action approaches in nine WASH contexts in Ethiopia, Uganda, and Kenya. Researchers from UCB and Environmental Incentives worked with implementing teams to collect and analyze data on several collective action approaches, adding two non–SWS cases (USAID Sanitation for Health in Uganda and Millennium Water Alliance in Ethiopia) for a total of 11 cases. Research focused on: (1) defining collective action approaches, (2) investigating the factors that drive their progress, and (3) identifying resource requirements.

SWS defines collective action as a process where a coalition, or a group of local, multisectoral stakeholders, regularly convene to take joint action toward addressing an agreed upon public issue that is complex in nature and whose solution requires deliberation and coordination among many actors. The coalition defines and agrees on the issues, roles, and responsibilities, and works together to explore possible solutions. Necessary to a coalition is a hub — an entity that facilitates and guides the logistics and administrative functions of the coalition. A hub can be one designated entity, or multiple.

To carry out this study, the team first conducted a literature review and consulted with 17 experts who have implemented collaborative approaches to identify factors that influence collective action in WASH. The team also conducted 40 interviews with stakeholders, experts, and other support organizations local to each case to measure the progress of the program's collective action initiatives and WASH interventions.

Ultimately, SWS researchers used fuzzy set Qualitative Comparative Analysis to identify combinations of factors

associated with progress on outcomes for collective action approaches. The five key factors assessed included: hub structure, WASH challenge identification process, resource requirements, stakeholder commitment and accountability, and government buy-in.

FINDINGS

This analysis revealed insights regarding what makes collective action approaches more, or less, effective:

1. Different starting points for collaboration carry different benefits and risks. In some instances, stakeholders collectively identified a WASH challenge, identified broad solutions to address the challenge, and then detailed activities to carry out solutions. In other cases, a lead support organization, often in collaboration with a few government officials, identified an existing challenge, solutions, and then organized a coalition of local stakeholders to collaboratively explore and implement that concept or solution.

Contrary to some collective action literature, the former method is not always required for program success or progress; rather, risks are associated with both approaches. SWS found risk mitigation is a deciding factor of program progress, no matter which approach was used. The more stakeholders mitigated risk during the application of a collective action approach, the greater the progress that context registered.

2. Effective hubs have convening power and administrative capacity. A hub is the entity that manages the logistics, facilitation, leadership, and administrative functions of the coalition (defined above). Hubs can be concentrated within one independent organization (e.g., an

NGO or government agency), or they can be shared between such entities. SWS found a hub's convening power and administrative capacity are the two most critical factors for effectiveness. Where government structures and institutions are reliable and consistent, that is, have convening power and capacity, a government hub is recommended. Where governance systems or institutions are weak and the lead support organization has strong regional convening power in the area, an NGO or organization hub is recommended. Where governance systems and institutions are reliable and consistent but capacity is low and long-term funding for the coalition is not secure, a shared government-NGO hub structure is recommended.

3. Government support of collective action is critical and requires continual engagement with government actors. In all 11 cases, getting government decision-makers (e.g., regional water offices, town authorities) to first perceive the value of collective action methods and then allocate resources to them is a critical step in an initiative's collective action success. SWS found that frequent communication and engagement with government officials, continuous demonstration of the coalition's legitimacy and the WASH initiative's value, and ensuring alignment of the initiative with government-mandated objectives are the most effective ways to engage and maintain government support.

4. Three possible pathways determined success. The cross-case analysis revealed three pathways, or combinations of contextual factors (illustrated at right) that contributed to coalition progress toward difficult outcomes. The three pathways show that progress can be made when a hub has convening power, has local government uptake, or buy-in, and either has external funds for coalition activities, or has coalition member continuity and accountability. Other cases progressed to a degree with collective problem identification, secured
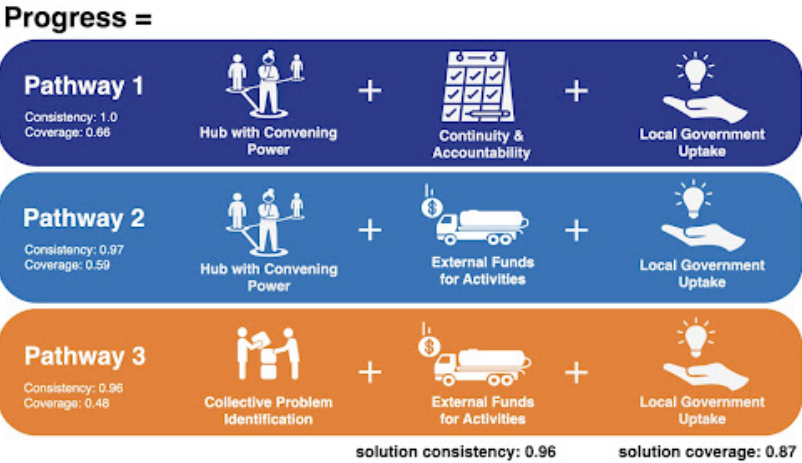
number of learning activities over the course of the project

external funds, and local government buy-in.

5. Collective action approaches require resources. Collective action approaches require extensive staff time, as well as direct cost investments (i.e., logistics, travel, and other operational costs). SWS partners' estimates of necessary resources to implement collective action ranged from 540 to 760 days of staff time and between $142,000 and $222,000 in direct costs. Other major costs included efforts to monitor progress of the coalition and document its activities as well as initial systems analysis. Smaller costs included conducting learning exchange visits and occasional multidistrict meetings.

RECOMMENDATIONS

Through strategic combinations of factors, including hub structure, continuity and accountability, external funds for activities, and local government uptake, collective action approaches can make progress on shared, complex problems. At the same time, they require significant resources and long time frames. While many of the cases achieved important outcomes in the 3-year study, implementation teams acknowledged that several more years would be required to fully achieve a coalition's vision. Moreover, every coalition struggled with common challenges such as turnover of key representatives, changing priorities, and political dynamics. Many of these challenges arise from factors outside program control, and implementing organizations can only partially mitigate them.

While no cut-and-paste strategies exist for collective action approaches due to their complexity and sensitivity to local conditions, SWS research presents a wide experience base to draw on and clear lessons that can be used to design and/or implement collaborative approaches. Collective Action in WASH: Lessons and Findings from 11 Collaborative Approaches provides details on SWS collective action research and cases.

Progress =

Pathway 1
Consistency: 1.0
Coverage: 0.66
Hub with Convening Power + Continuity & Accountability + Local Government Uptake

Pathway 2
Consistency: 0.97
Coverage: 0.59
Hub with Convening Power + External Funds for Activities + Local Government Uptake

Pathway 3
Consistency: 0.96
Coverage: 0.48
Collective Problem Identification + External Funds for Activities + Local Government Uptake

solution consistency: 0.96   solution coverage: 0.87

PROFESSIONALIZED MAINTENANCE

Photo credit: Whave

OVERVIEW

Despite significant progress expanding first-time access for rural water, the sector has struggled to provide reliable services in many contexts. Non-functionality rates hover between 30 percent and 40 percent. Conventional approaches to maintenance are largely based on voluntary arrangements, with communities taking on the burden of maintenance themselves. This model has often proven ineffective, with small technical problems becoming more complex and costly to repair. This results in unnecessary downtime and service disruption and a culture of "fix on failure."

The inability to provide long-term, sustainable services is not due to inadequate technology, spare parts supply chains, or only poor management; it is a systems failure. This is to say a failure of institutions, policies, and regulation — and their application through financing, laws, actors, politics, and incentives — to allow for effective functioning of rural water services.

To improve our understanding of how to tackle this entrenched problem, SWS has researched system-strengthening approaches that can best support professionalized maintenance. This involves qualified personnel, often from private enterprises, to maintain, support, and repair rural water systems and infrastructure under contracts that outline who pays for what and who is responsible for keeping the pumps and pipes functioning.

Three SWS partners — Whave in Uganda, FundiFix in Kenya, and IRC in Ethiopia and Uganda — implemented different approaches to professionalizing maintenance over the last 5 years. Each has demonstrated that by providing scheduled maintenance and repairs to infrastructure, rural water services can be substantially improved, with high levels of functionality

and reduced time to repair breakdowns when they happen. All partners used collaborative approaches involving multiple local stakeholders to develop and strengthen the local system required to test and sustain different maintenance approaches.

SWS PARTNERS

Whave: Uganda

Whave is a rural water maintenance social enterprise, or Area Service Provider. It currently serves more than 160,000 people across four regions, contracting mechanics to provide maintenance services and incentivizing hand pump repairs with performance-based payments. Whave's functionality rate is over 98 percent with a 100 percent 5-day fix rate and an average repair time of less than 2 days. Customer satisfaction is 91 percent.

Local governments designate the Area Service Providers and sign contracts for exclusive maintenance provision within their geography; Whave also signs agreements with each community, outlining roles and responsibilities, price plans, and service guarantees. Read more about Whave's work on page 28.

FundiFix: Kenya

FundiFix operates as a franchise with two local companies that provide maintenance services to communities and schools in Kitui and Kwale counties, each paying a monthly fixed fee regardless of tasks. Combined, the companies service 108 hand pumps and 24 piped schemes supplying 79,000 people across Kitui and Kwale counties as of 2020. FundiFix signs a contract with communities or institutional customers and the county government, stipulating performance targets that are monitored and reported to the county government for oversight. They average 98 percent functionality rates and repair times of under 2 days. Read about SWS's work in Kitui County on page 30.

IRC: Uganda and Ethiopia

IRC promotes local innovation to strengthen maintenance systems through multistakeholder partnerships referred to as learning alliances. Working with governments, IRC supports local stakeholders to develop a better understanding of their system and execute a shared action agenda for maintenance approaches across geographic regions. In Uganda, IRC focused on operationalization of the government's new O&M Framework in Kabarole District, currently supporting more than 1,000 water points serving some 300,000 people. In Ethiopia, IRC established a digital water monitoring system with the Afar regional government to enable local decision-makers and stakeholders to make more informed decisions around professionalized maintenance. Read about IRC's work under SWS on page 18.

FINDINGS

Government Support

In all instances, SWS partners applied a system assessment as the starting point of any professionalized maintenance intervention to fully understand local contexts, incentives, and policy environments. Such assessments highlight that government support is pivotal to establishing and sustaining professionalized maintenance. Local governments can develop public-private collaborations and structure the operating environment, which allows for the delivery of water, for example, by creating exclusive service areas for maintenance provision.

Leadership and Accountability

Support from public officials and elected leaders is critical to legitimize professionalized maintenance. They can build trust and ensure that policies and regulatory frameworks are applied and enforced so that maintenance contracts can be upheld, and parties made accountable to one another. Facilitating and

investing in collective accountability platforms at the local level, such as regular WASH forums, have shown to be invaluable to institutionalizing and scaling professionalized maintenance provision.

Financing

SWS experience demonstrates that supplemental financing is needed to bridge the gap between tariff revenues and operational costs of delivering professionalized maintenance services. Governments can play an instrumental role in directing aid funding, public subsidies, and creating transparent financing mechanisms that are required to enable professional providers to survive financially.

RECOMMENDATIONS

SWS experience shows that well-structured and adequately financed professionalized maintenance provision is a viable means of improving current challenges with poor infrastructure performance and can reverse the "fix on fail" paradigm. Professionalized maintenance delivers improved service outcomes and can make more efficient use of scarce financing to the sector. To scale up this model, governments, political leaders, and WASH decision-makers need to strengthen the local system, including establishing policies and regulations to institutionalize professionalized maintenance practices.

These leaders should also establish subsidy mechanisms or pooled funds to ensure professionalized maintenance enterprises remain viable and sustainable. The rules that govern funding mechanisms should be clear and transparent, and payments linked to measurable performance indicators. This type of supplemental funding will help enterprises scale up their maintenance services and increase revenues and operational efficiencies, potentially reducing the need for external funding in the long term.

Revenues from more than 58,000 rural consumers in Kitui County, Kenya, reached $19,000 during 2019–2020. But this income was inadequate to pay all costs of FundiFix's operations. For example, average direct working ratios from user payments ranged from 16 percent to 21 percent in 2019. To close this financing gap, a Water Service Maintenance Trust Fund (WSMTF) was established to pool funds from donor organizations, county governments/public funders, and private sector funders. Each FundiFix enterprise applies annually to the fund for O&M financing. The WSMTF releases funds based on pre-identified performance targets. The shortfall in revenue in Kitui has been made up with funding via the trust fund and other external grants totaling around $132,000 over the same period.

One of the aims of the WSMTF is to demonstrate that funding for rural water maintenance, including subsidies, can be channeled in a transparent and accountable way, and can be linked to performance-based outcomes that are carefully monitored and verified, including by county governments. Kitui County is in the process of passing the Kitui County Water Services Bill and Policy that would institutionalize this fund.

SOCIAL NETWORK ANALYSIS

OVERVIEW

The relationships and interactions that drive the flow of information, resources, and technical skills among stakeholders are critically important for improving and sustaining WASH services. Social Network Analysis (SNA) is a powerful tool for understanding those relationships.

SWS used SNA to analyze eight networks in Ethiopia, Kenya, Uganda, and Cambodia. The SNA visualizations and metrics allowed field teams and network members themselves to identify opportunities to improve cooperation and collaboration, network cohesion, and WASH results. The diverse experience of applying SNA in different contexts over the past 5 years enabled SWS researchers to identify practices for effective SNA and valuable uses of the tool for WASH practitioners in low- and middle-income countries.

FINDINGS

SWS conducted SNA in Ethiopia (four locations), Uganda (two locations), Kenya (one location), and Cambodia (one location). Researchers reviewed the study plans, methods, implementations, and results for each SNA over the course of 5 years. Key takeaways from SWS application of SNA are listed below. The flagship report, Using Social Network Analysis in WASH Programs, provides more details.

1. There is no single way to conduct SNA that produces the most valuable results, but important considerations should be taken into account based on the context and the intended use of the analysis.

2. A variety of potential purposes for the use of SNA in WASH include: (1) identifying relationships that inform program design, strategy, and interventions; (2) monitoring, evaluating, and measuring network cohesion and power shift dynamics over time; and (3) engaging stakeholders to take action with a better understanding of their network.

3. Both program stakeholders and field staff expressed the value of SNA and offered constructive critiques. SNA results sparked discussions and action with and among network members who reported that these analyses are most effective when the study process is participatory and findings are implemented into WASH programs and contexts.

Legend: ● Local NGO ● Private sector ● International NGO ● Development Partner ● Other ● Government ● Academic
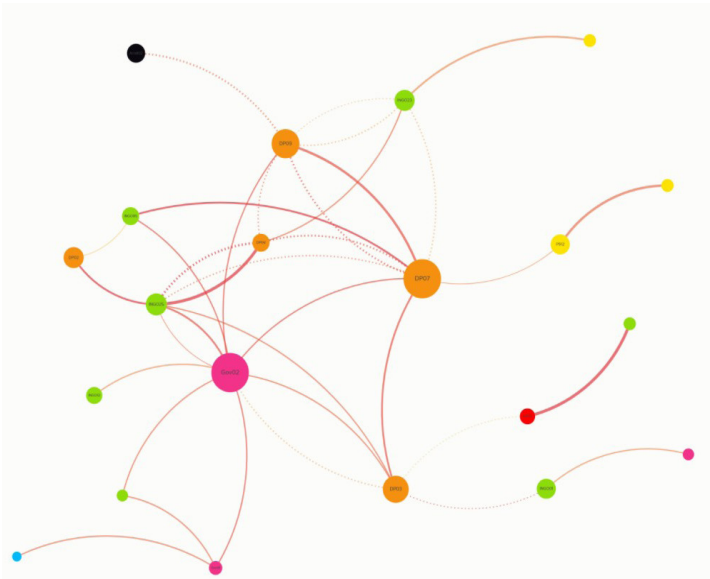
SWS conducted a network analysis in Cambodia that found female-run organizations are significantly less connected and central to the rural sanitation and hygiene network than male-run organizations.

4. SNA resource requirements varied by context and were relatively high, but manageable. Level of effort drivers included network size, data collection methodology, frequency of repeated analyses, and stakeholder validation.

RECOMMENDATIONS

To start, choose the right systems analysis tool for the WASH program's needs. Other systems-understanding tools exist that may be more appropriate for some programs and interventions. SNA is ideal in scenarios where it is critical to understand relationships and interactions among many, multisectoral stakeholders, such as when collective action or collaborative approaches will be used.

Be clear on the SNA purpose and continually articulate and revisit that purpose with implementation teams, partners, and stakeholders throughout the program cycle. Align the SNA design to the SNA and intervention purposes. For example, a network analysis boundary should align with whether the program will work with existing coalitions and collectives, form new ones, or work within informal networks. When presenting SNA findings, consider the audience. Also consider presenting qualitative results, visuals, and "big picture" takeaways to local stakeholders, rather than quantitative metrics.

Engage the program implementation team in the SNA research, analysis, and validation. This requires training and time, but will vastly improve the value of the SNA and can help integrate findings into program interventions and overall execution. At the same time, beware of information overload and research fatigue, especially at the start and end of a program when there are often rushes to conduct studies and collect data in short time spans.

Consider ethical and personal reputations during data collection, use, and sharing. Network data can include sensitive stakeholder information. Mitigate this by providing preliminary presentations of results to specific actors or smaller groups for feedback, and anonymizing actor names when possible.

Establishing sustainable WASH services is complex and requires engaging a variety of stakeholders willing and able to collaborate and commit to a common WASH goal. SWS experience using SNA to accomplish this has improved stakeholders' systems understanding. Also, although SNA can help to describe and track networks over time, it cannot indicate why a network is structured in a certain way; other analysis tools and contextual understanding are necessary to fully interpret SNA results.

Ethiopia Systems Data Collection Findings

The network analysis baselines, midlines, and endlines in 2017, 2019, and 2021, respectively, provided unique insights into the inner workings of the four learning alliances in Ethiopia.

Overall network connectivity improved in Debre Birhan (small town sanitation) and South Ari (rural water), which indicated increased sharing and coordination over the SWS program. Losing (and/or gaining) key members affected some alliances, notably NGOs and projects.

Results revealed how all four learning alliances faced common issues, including questions about their sustainability going forward, turnover of government officials and representatives, delays in delivering agreed-upon action items, and decision-making. Sharing these results back with the learning alliances themselves sparked conversations around strategies to reduce turnover, handover, and sustainability after the end of the SWS program, and the unique coordination needs of each platform.

1,105
number of actors reached with findings from systems analyses

STAKEHOLDER UNDERSTANDING

OVERVIEW

SWS sought to build evidence on the impact systems approaches can have on local stakeholders' ability to conceptualize the interaction of factors that influence WASH service delivery systems in Ethiopia, Kenya, and Uganda. Specifically, researchers explored how the use of professionalized maintenance and facilitated collective action — the two main approaches SWS applied — affect stakeholder understanding of complex, local WASH system factors and interactions.

SWS exploration involved seven study regions: Ethiopia (four locations), Uganda (two locations), and Kenya (one location). Across the seven study regions, SWS researchers interviewed 228 stakeholders including: government officials (67 percent), NGOs (12 percent), service providers (12 percent), service users (7 percent), and local academic institutions (3 percent). To infer shifts in how stakeholders conceptualize local WASH systems, researchers asked them to respond to the following interview questions:

- *What do you think are the main challenges impacting sustainable water or sanitation service delivery in your area?*
- *What are some solutions to these challenges?*
- *Of these solutions, which do you think are the most important and why?*
- *If these solutions were implemented, how would they lead to improvements in water or sanitation services?*

Evaluation of stakeholder understanding focused on three improvement areas that emerged from the analysis of this data: (1) how professionalized maintenance and collective action approaches influence stakeholder understanding of WASH system factors and interactions, (2) shifts in

understanding toward the core tenets of WASH service delivery approaches, and (3) stakeholder understanding and alignment to factors and interactions within their WASH systems context.

FINDINGS

Improvement Area 1: Conceptualization of Complexity

The findings show a general increase in stakeholders' understanding of water and sanitation service complexity, with five out of the seven regional stakeholder groups mentioning more unique factors and four out of seven groups mentioning more unique interactions between the baseline and endline surveys. These results reveal an increased awareness and improvement in understanding the causal complexity of delivering sustainable water and sanitation services.

"…if the funds are managed well, approaches can [develop] pipeline extensions and establish more water points…this would increase water coverage and access to the population. They would also have enough money to do repairs and this would mean that water services would be reliable."

— NGO INTERVIEWEE IN KITUI COUNTY, KENYA, DESCRIBING INTERACTIONS BETWEEN KEY FACTORS IN AN ENDLINE INTERVIEW

Improvement Area 2: Shift Toward Service Delivery Approach

Results show a shift in stakeholders' understanding toward causal factors that closely align with the objectives and tenets of a service delivery approach, where decision-makers begin to focus more on factors for sustaining services and move away from the traditional emphasis on hardware and community-based management. For example, interview analysis indicates that stakeholders that engaged with preventive maintenance approaches developed a better understanding of the link between O&M and service delivery, seeing that increased engagement with the private sector and decreased community-based management can improve water service delivery within complex contexts.

Improvement Area 3: Stakeholder Alignment

This examination revealed that stakeholder turnover had a substantial impact on local WASH systems understanding. Coalitions with high and/or unmanaged turnover had a general decrease in alignment on factors for sustaining WASH services, whereas groups with low turnover had a general increase in alignment over the 5-year project duration. These findings provide further evidence on how turnover impacts program focus and efficiency related to the interconnected factors that influence service sustainability.

Overall, the research detailed in the flagship report, Assessment of Shifts in Stakeholder Understanding of WASH Systems, showed that SWS partners were able

to shift stakeholder understanding on key WASH system components, while also demonstrating the value of investing in approaches that impact stakeholder understanding of WASH system interconnections.

RECOMMENDATIONS

First, the findings provide evidence for approaches focused on convening stakeholders in structured settings to discuss the factors and their interconnections that influence WASH service delivery. The work of SWS partners shows that engaging stakeholders within collective action and professionalized maintenance approaches helps facilitate group consensus and promotes shared strategies for future WASH actions and initiatives. While the findings presented in the flagship report are the result of a rigorous research process, SWS's partners also showed that there are multiple ways to assess stakeholders' understanding of complex issues that require lower levels of effort using lighter-touch approaches such as focus groups, surveys, semi-structured interviews, and observations.

Second, a key way to promote and retain stakeholder knowledge and alignment on WASH system complexity is to maintain consistent coalition membership with minimal member turnover. Because some coalition member turnover is unavoidable, it is also important to develop mechanisms for efficient knowledge transfer between old and new coalition members and representatives.

Lastly, the work demonstrates the importance of assessing stakeholder understanding of any program intervention or initiative seeking to tackle a complex problem.

Photo credit: Tetra Tech

64
of analyses conducted to improve stakeholder understanding of WASH systems

RURAL WATER ACTIVITIES IN ETHIOPIA AND UGANDA (IRC AND LINC)

In rural areas and small towns in Africa, water facilities are often managed by community volunteers that have few resources to maintain and operate them. Formal government budgeting and support systems are sometimes in place to improve these services, but these typically have inadequate resources, capacity, and staffing. While current systems have led to a gradual improvement in services over the past decade, realizing the goal of universal and safe supplies requires a transformational change in local, national, and global systems. Convening actors to jointly discuss problems and develop a vision for an alternative future can influence systems change for the better.

LOOKING FOR NEW SOLUTIONS IN SOUTH ARI AND MILLE, ETHIOPIA

Challenge

Beginning in late 2016, SWS worked alongside stakeholders to jointly develop and test possible solutions to address the frequent failures in managing services from rural water supply schemes in two woredas (districts) in Ethiopia — Mille in Afar and South Ari in Southern Nations, Nationalities, and People's Region. Woreda governments in both areas expressed interest in improving rural water management arrangements along with their collaboration with the USAID Lowland WASH Activity to construct and rehabilitate water infrastructure. Community management is the main model for service delivery in this area, with back-up support from government when facilities fail. In South Ari, springs and boreholes with hand pumps tap shallow groundwater. In Mille, deep boreholes and motorized pumps are required to access deeper aquifers in a more arid area with a partially nomadic settlement.

Approach

SWS partner IRC served as the lead implementer and facilitator of activities in the two Ethiopian districts. Working with woreda governments and national and regional officials,

the activity set forth plans for collaboration, including the creation of learning alliances intended to drive the search for locally rooted solutions. Learning alliances are multisectoral, volunteer committees that regularly meet to plan, reflect, course-correct, and collaborate to address major social issues. The team established these alliances to build local interest and engagement in change (around the sustainability of rural water supplies) and develop and test some possible solutions.

Extensive baseline activities included an asset inventory of all water supply schemes in each woreda and their functionality. Woreda staff collected the data, which provided a much-improved basis for discussing challenges in rural water

supply, and ways to make improvements. The activity also conducted a life cycle cost analysis, a sustainability check, and an organizational network analysis (ONA) and shared the results and recommendations during the first learning alliance meetings. The ONA showed limited connection between WASH stakeholders working in the woredas and recommended supporting coordination.

In the first meeting learning alliance participants developed a list of additional stakeholders to invite as formal members. Members of the learning alliance also shared their different perspectives on problems, then discussed and agreed on root causes and priorities.
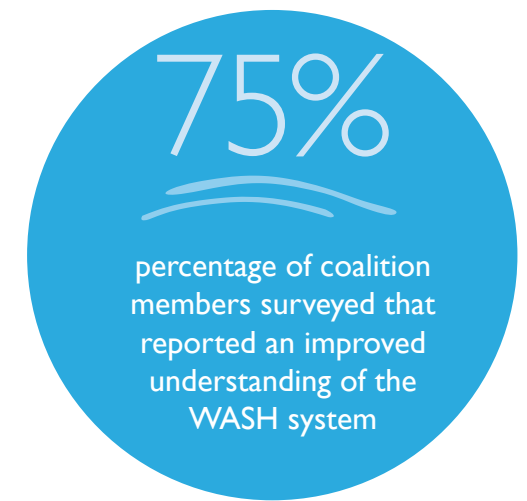
Subsequent meetings planned for and found solutions to these issues. Agreed upon actions and responsibilities included organizing capacity building trainings for woreda technicians, Water User Associations, and caretakers; procuring maintenance hand tools for trained caretakers; conducting Woreda Water Office and SWS local facilitator joint scheme management support; facilitating the establishment of maintenance and spare parts supply enterprise and refresher training; and organizing learning visits both abroad (between Uganda and Ethiopia) and in-country.

Results

Strengths and limitations: A learning alliance can create conditions for dialogue among stakeholders and strengthen linkages across governance levels (e.g., woreda-region-national), which is critical for finding solutions and directions to the challenges of the WASH sector. It takes time, effort, and good facilitation to encourage active participation in such activities. It also takes a long time to create the space for innovation in

75%

percentage of coalition members surveyed that reported an improved understanding of the WASH system

some areas, with strong conventions for example around how maintenance should be strengthened. High turnover of local staff and representatives from the different organizations limits progress and needs constant reinvention with some external support.

Participation: The presence of community representatives in the meetings provides an opportunity to discuss the actual service delivery challenges on the ground. Participation of woreda-level officials is important to implement the agreed action points and increase ownership.

Context: While steps to establish learning alliances and the process used to facilitate them in Mille and South Ari woredas were the same, outcomes achieved have been very different. In Mille, woreda officials' participation in meetings was lower and member organizations have shown low commitment to implement action points between meetings. On the other hand, South Ari Learning Alliance members are committed to implementing action plans. This can partly be explained by context. Mille, for example, had a lower level of capacity, which affected its ability to undertake additional research that could lead to improvements in monitoring and maintenance. The full research report goes into more details on SWS findings.

Tools: The asset inventory and life cycle costs analysis showed high non-functionality levels and low spending on costs that may contribute to sustainability, revealing a clear need for increased support and spending on O&M. Doing the analysis jointly with the Woreda Water Office and presenting results quickly led to local decision-makers increasing budget allocations at the woreda level in both South Ari and Mille. Increasing finance for O&M was identified as a key issue in systems strengthening and can be influenced through activities such as long-term planning that seeks to improve overall financing of all cost components.

STRENGTHENING MONITORING IN AFAR REGION, ETHIOPIA

Challenge

The SWS and USAID Lowland WASH collaboration on an asset inventory in Mille led to the realization that the district level was not the right level to innovate monitoring systems. A collaboration emerged among regional stakeholders seeking to strengthen the regional-level, government-led monitoring system with the ultimate objectives of increasing investment in and provision of maintenance.

Approach

USAID Lowland WASH with SWS support introduced a distributed data collection platform, mWater, which allows data to be collected and accessed by multiple people via smartphone without the need for reliable internet. The team initially focused monitoring efforts in Mille. At the start of the project, the woreda lacked data on the status of its water assets, which the collaboration assumed hindered preventive maintenance, planning, and general management of existing assets. SWS hypothesized that better data on service delivery would provide insights into critical gaps and enable management and technical staff to more effectively plan and manage the equitable extension of services and respond to breakdowns. Increased availability of data could be used to advocate for greater financing for water supply in the woredas. Overall, the data would be more organized, useful, and available to share and utilize.

The team also developed an online dashboard (monitoring portal) available to Woreda Water Office staff for accessing baseline data and analysis and results. The activity provided multiple trainings and developed a process for monitoring and documenting actions, discussions, and challenges to inform reflection and adaptation.

Building upon the existing data that SWS collected, USAID Lowland WASH developed a regional Asset Management System (AMS) in Afar with more advanced features to document and manage repairs. To encourage system uptake, the team embedded a local facilitator in the region. Day-to-day interactions enabled the facilitator to understand and explore user challenges and complaints and address these on a real-time basis. An additional component included installing cellular- and satellite-connected sensors at water supply installations. The sensors provide operational insights that can inform improved management practices.

Results

Data management and use: The team successfully documented all assets in Mille and shared results with the woreda and to other offices and stakeholders during learning alliance meetings. Following initial data collection, SWS expected the woreda to operationalize the tools — using the data insights to inform immediate actions, plan for and request additional finance, add new water schemes, and collaborate with development partners. Unfortunately, limited resources for maintenance at the regional level meant that data had little impact. Data management did not significantly improve, and the woredas relied on SWS to facilitate updating from existing, paper-based sources such as handover documents.

While understanding of functionality issues at the local and regional level increased, the use of this data in formal planning processes has been limited, and most applications of it have been led by SWS project partners, not regional authorities. SWS partners used the data to demonstrate that the O&M team's budget request for operations should be doubled to meet the maintenance needs. The monitoring systems have not been fully operationalized, leading to a still incomplete dataset and challenges using data for long-term decision-making or to achieve increased funding. Arguably, the initiative was ahead of its time, with much greater resources needed for maintenance than data to optimize the use of (scarce) resources.

Shifting management to zones or regions: Because managing capacity and digital infrastructure presented challenges at the woreda level, the data collection and analysis may be better managed at higher levels. And in moving to higher levels of government, the team found synergies with other development actors working in the zone and region.

Local facilitators: The SWS experience demonstrated how monitoring can be designed and implemented to better meet local needs and support users through more engagement and collaboration led by a local facilitator.

For more details on these experiences and results, read the Afar Asset Management System Uptake and Use and Near Real-Time Borehole Functionality Monitoring.

Ethiopia
● Afar

Photo credit: Anna Libey

SUPPORTING THE DISTRICT WASH TASK TEAM IN KABAROLE DISTRICT, UGANDA

"If water is life, then how do we expect the 24 percent of the people with no access to safe water to survive for the next 14 years [until 2030]?"

— KABAROLE DISTRICT CHAIRPERSON RICHARD RWABUHINGA

Uganda
◉ Kabarole District

Challenge

Kabarole District faces steep challenges to provide sustainable drinking water services. Many households are more than 1 km from a safe water point. Twenty-eight percent of water points in the district are non-functional at any given moment, and only 20 percent have a management system in place to prevent breakdowns, collect fees, and perform timely repairs. IRC has worked in Kabarole since 2010. Under SWS it served as a hub for the learning alliance, which is known locally as the District WASH Task Team, and supported the district to develop its systems to deliver universal, sustainable, and safe WASH services.

In 2017, the activity organized a meeting with the local government to agree on attainable water and sanitation goals and targets, including ideas for both immediate improvement and longer term goals to reach the Sustainable Development Goal 6 target of universal access to sustainable services by 2030. At the time, Kabarole's water coverage reached 76 percent of the population. It became clear that the 2030 goals could not be achieved simply by revamping current efforts — instead the district needed a complete overhaul.

Approach

Several stakeholders had been members of an informal learning alliance for improving water and sanitation. However, the magnitude of change called for in Kabarole necessitated a more intensive approach: a formalized group who could take these issues head on and identify opportunities and pathways for a larger change. SWS provided the support needed to catalyze the process.

The newly constituted task team consisted of 16 members selected from NGOs, local government, technical and political teams, religious institutions, ministries, the private sector, and the media. It eventually expanded to 25 members. The task team elected the Secretary for Works and Technical Services as the chairperson. The choice of a politician as the leader was deliberate to ensure continuity.

SWS conducted a local systems analysis of water services delivery in 2018. It included a context analysis to understand the environment in which water services are delivered, managed, and supported at district and community levels. The assessment looked at political, socio-economic, financial, institutional, and environmental issues and technically

evaluated the status of rural water supply infrastructure. The process, though slow, was participatory at each stage.

The activity also performed a network analysis and a qualitative analysis of the different systems factors contributing to the observed water service problems. The District WASH Task Team coalesced around four priorities: building local government capacity, involving communities, increasing political involvement and engagement, and strengthening management systems for rural water points.

Results

WASH master plan: One key result from the task team is the development of the Kabarole District WASH Master Plan, a detailed vision, strategy, and agenda to achieve the 2030 targets. The plan is aligned with Uganda`s National Development Plan II and sets out how national and international targets are to be achieved in the district through coordinated investments and stakeholder activities.

Sanitation improvements: A technical operations and management unit, called the Kabarole Hand Pump Mechanics Association, sought training from the task team, with financial support from SWS, to extend its business model to include maintaining sanitation facilities. The

association is now active in safely collecting, transporting, and disposing of fecal sludge, leading to better sanitation services in the district's urban areas. In addition, the task team has drafted a sanitation ordinance that will provide a legal framework for improving sanitation at the district level.

Data for decision-making: The task team has strengthened the District Water Office's capacity with information, staffing, and opportunities to learn about new approaches to water and sanitation service provision. The District Water Office now has accurate financial data and service delivery assessments as well as sufficient staffing.

Continuity of task team: While IRC still plays a key role in facilitation, government staff regularly convene the learning alliance platform. It is seen as having a key role in planning for and implementation of district WASH activities. The task team has a permanent location for meetings and ''recommendations from the task team'' is a permanent agenda item in key district meetings.

For more details on the Kabarole experience and for insights, tips, and advice for improving public services like water and sanitation through multistakeholder collective action read Driving Change: Strengthening Local Systems in the Water and Sanitation Sectors.

ENCOURAGING BOREHOLE MAINTENANCE IN KABAROLE, UGANDA

Challenge

The community-based management system, where water is provided — usually free of charge — to communities who manage the sources as volunteers, has been institutionalized in Uganda since 1972. It is widely understood to be unreliable, with frequent breakdowns, despite many efforts to improve its performance. During its initial studies of rural water services, the task team identified the low engagement of communities and the poor sustainability of rural water services as interconnected factors. At the national and district level, officials had been promoting Pay-As-You-Fetch (PAYF) as a potential solution to the sustainability challenges for rural water services. However, more evidence about its potential is needed to show if or how the payment model would actually improve water service reliability and sustainability.

Uganda

Kabarole District

Approach

The PAYF concept is simple. Each time a person fetches water from a community water point, he or she pays a set price (tariff) for each container of water collected. The aim of PAYF is to ensure water points function continuously, by in turn ensuring that money is collected and used for routine maintenance and repairs. By testing PAYF as

action research, together with a learning alliance, SWS intended to accelerate the pace and scope of learning and adaptive improvement of the approach. With task team members committed to help document, analyze, and study its effectiveness, promising aspects as well as problems or inadequacies of the model could be highlighted and shared with decision-makers.

The task team members wanted to know: *Does the PAYF model improve preventive maintenance? How can it be strengthened to do this better? And does charging for water lead to exclusion of households and people who cannot afford to pay each time they collect water?*

The SWS team collected data to provide insight into the model's performance and its potential feasibility, sustainability, and effectiveness in 16 communities. This included meter readings, downtime and repair costs related to breakdowns, financial information, stakeholders' visits to the water point in the previous month, and cleanliness of the water point.

Results

Maintenance: The implementation of the PAYF model did not encourage preventive maintenance. Water source

committees and hand pump mechanics did not (yet) adopt a system for ensuring that preventive maintenance was performed consistently.

Willingness to pay: Accountability of water user fees affected users' willingness to pay. Users cited safe custody of funds as a major concern when committees had no bank accounts.

Research confirmed community acceptance of paying for higher levels (more convenient) water services; the study showed that 70 percent of the users are still willing to pay at least 50 Ugandan shillings (UGX) per jerry can, and 30 percent are willing to pay up to UGX 200.

Metering technology: While functionality of the prepaid meters is a critical factor in the model's success, district and sub-county staff felt that the technology used to meter the hand pumps was either not appropriate or improperly installed. This failure created a big problem for the PAYF approach.

Based on the reflections of task team members, the PAYF model needed to be adapted to further test its effectiveness, and to explore the implications on exclusion. The SWS team developed recommendations with the task team,

RURAL AND SMALL TOWN SANITATION ACTIVITY IN ETHIOPIA (TETRA TECH AND LINC)

STRENGTHENING LOCAL WASH SYSTEMS TO IMPROVE SMALL TOWN SANITATION

Challenge

SWS works in two rapidly growing Ethiopian towns: Woliso and Debre Birhan. Woliso is the capital of the Southwest Shewa Zone, with an estimated population of 100,000. Debre Birhan has a population of approximately 117,000; it is located in the North Shewa Zone.

SWS selected Woliso to represent towns of similar size and sanitation context. SWS selected Debre Birhan because of its advanced sanitation services relative to towns of similar size.

Woliso has fewer sanitation services than Debre Birhan, with no permanent private operators and one vacuum truck that remains idle for long periods. In comparison, Debre Birhan operates mechanized fecal sludge emptying services in cooperation with local government and private entities. The World Bank's Second Ethiopia Urban Water Supply and Sanitation project also provides support to the town.

SWS partners sought to engage with, understand, and strengthen decentralized WASH delivery systems in each town in the form of:

- Informing and influencing stakeholders to improve decentralized sanitation service delivery
- Developing a locally led coalition to coordinate sanitation sector activities, particularly financing, and to implement action plans
- Testing, revising, and scaling up public-private partnership (PPP) models to improve the management of public and communal latrines

Ethiopia

Debre Birhan

Woliso
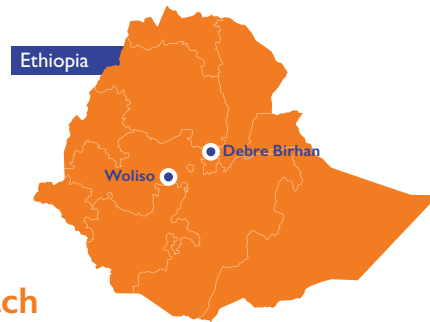
Approach

To accomplish this, partners first conducted a baseline assessment of service delivery that focused on the factors and actors throughout the local sanitation value chains and dialogue with local stakeholders about the results to identify common needs and ways to collectively address them.

Critical to SWS programming is the creation of learning alliances to foster collaborative action. Debre Birhan and Woliso formed these coalitions, and both learning alliances decided to focus on securing a complete town sanitation service system, from capture to disposal or reuse, and to improve management of communal and public latrine facilities in their respective towns.

SWS provided technical and coordination/communications training, along with learning visits, to learning alliances, decision-makers, and community representatives throughout the program cycle. Partners also documented the process to provide stakeholder feedback and accountability as part of the overall SWS learning initiative. They conducted an endline analysis to measure changes in these initiatives.

Results

Establishing learning alliances: The learning alliance approach in Woliso and Debre Birhan allowed SWS to continually engage with these coalitions so they could improve their local sanitation systems, develop a shared vision and joint action plan to address sanitation challenges, and carry out action research to improve sustainability around their two

shared goals: improve town fecal sludge disposal (FSD) sites and better manage communal and public latrine facilities.

The endline analysis found that the learning alliances succeeded in advancing systemic change and collective coordination among sanitation stakeholders and decision-makers. They developed annual plans, implemented agreed-upon action points after quarterly meetings, and organized working groups to strengthen systems around the two action areas. The learning alliances also organized community awareness workshops to provide selected community members with basic knowledge and skills to address sanitation challenges. A total of 363 people from Debre Birhan and 254 people from Woliso participated in the workshops. At the same time, positive changes happening at the town and district levels have yet to benefit town residents as fecal waste is not consistently reaching a dedicated disposal site in either locale.

Learning alliances gave members a platform to engage with each other and decision-makers in a collaborative manner, allowing them to identify and overcome challenges, iteratively, in an ongoing process. Repeated discussions with alliance members about systems strengthening helped to internalize the concept and model it for local WASH decision-makers.

Communal and public latrines: The learning alliances in each town developed guidelines and translated these into local language manuals; trained communal latrine management committees; began collecting water fees; and developed a water monitoring template to facilitate communication among institutions. The Debre Birhan government constructed two new communal latrines and the Debre Birhan University

Photo credit: Maheder Hailesalassie

constructed three communal latrines worth $9,000 total. In collaboration with the Woliso Catholic development organization, the municipality identified four sites to construct public latrines. In addition, the Woliso town water utility allocated $10,837 for handwashing facilities to mitigate COVID-19.

Securing additional funding for FSD: Learning alliances in both towns proved highly influential in securing more public and private spending and construction for FSD. In Debre Birhan, the learning alliance mobilized $27,570 from the town utility and $64,427 from the Habesha and Dashen breweries for FSD site land procurement, construction of FSD ponds, and construction of an access road, built in March 2020. This learning alliance is also pushing the administration to build an additional FSD site, and it is currently identifying land to do so. The municipality allocated nearly $1.2 million from its World Bank Urban Local Government Development Program (ULGDP) funds to procure a solid waste landfill, construct one solid waste transfer center, purchase a lift truck for solid waste, and to develop town green spaces. In Woliso, the town mobilized $13,445 for an FSD land site, allocated $7,620 for site fencing, and reached an agreement to allocate funds and mobilize machinery to construct a road to the site. The municipality allocated $118,512 from its ULGDP budget for sanitation services, solid waste transportation, and town greenery development.

Strengthened stakeholders: Environmental protection awareness and enforcement among relevant sanitation stakeholders at the kebele (neighborhood) level increased. Stakeholders and institutions also began to understand and operationalize their roles and responsibilities around policy, strategy, and regulatory sanitation frameworks, prioritizing sanitation planning and funding. Technological and social sustainability increased some in both towns, but more so in terms of awareness than materially.

Next steps: Learning alliances will continue to focus on research and technical training for communal and public latrine maintenance and build consensus among stakeholders on fecal sludge management while the Woliso and Debre Birhan governments take full ownership of their respective alliances. In a promising sign of continuity and sustainability, the learning alliance held its first meeting without SWS support in October 2021. All the original members participated, including the town land administration head who had only sent a representative to the previous meeting.

RURAL SANITATION ACTIVITY IN CAMBODIA (WATERSHED AND LINC)

As a result of participation in the Fostering Civic Champions program, participants indicated they are starting to think and act differently from one conference to the next. For some participants, public recognition and kudos create a strong sense of pride and promote a willingness to do more to improve sanitation in their communities.

"It is the first time in my life to get a medal. I have worked for more than 40 years and never got any recognition. Thanks so much ... for this great event. It inspired me to work more." — Medalist, Kampong Cham

SYSTEMS THINKING FOR COLLECTIVE ACTION FOR SUSTAINABLE RURAL SANITATION AND HYGIENE

Challenge

Cambodia has implemented several wide-scale WASH initiatives since the early 1990s, including national subsidy and behavior change campaigns. In 2016, the government implemented its National Action Plan, setting a clear vision for the sector: "Every person in rural communities has access to safe water supply and sanitation services and lives in a hygienic environment by 2025." Yet, significant gaps remain in rural Cambodia's sanitation services and hygiene practices, preventing the country from reaching these goals. Lack of coordination between institutions and actors is rampant, along with low government WASH capacity and funding. In addition, key demographics — women and the private sector — have been left out of sector decisions, and no uniform system is in place to implement and track WASH activities and outcomes.

In 2018, SWS saw the opportunity to help the Cambodian government achieve its recently launched National Action Plan to align and coordinate WASH goals and agendas. The timing of the two programs also coincided with funding and support from The World Bank, Asian Development Bank, and The Stone Family Foundation.

Approach

WaterSHED, a local NGO that has conducted formative research and development of the nation's hygiene and sanitation systems, led SWS activities in Cambodia. After

Cambodia
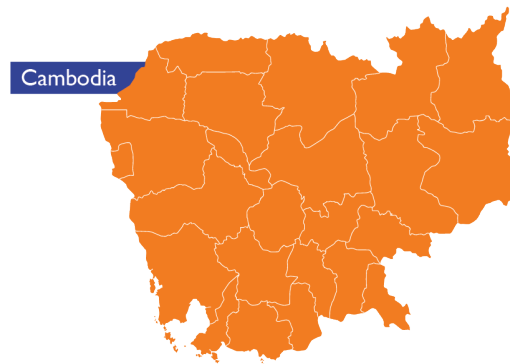
nearly two decades of innovation, WaterSHED had the knowledge, networks, and government trust to oversee this program aimed at sector-wide integration and coordination at the national and rural levels.

WaterSHED developed a collaboration-focused, iterative three-part plan to enhance and better coordinate national sanitation and hygiene outcomes that included:

Photo credit: WaterSHED

- With partner LINC, conducting an ONA and constituent-driven systems assessment (CDSA) to visually map and analyze Cambodia's rural sanitation and hygiene systems and networks, in particular the rural WASH network named RuSH, to identify potential leverage points for further discussion and to help actors recognize their role in the system
- Using collective action methods to develop a locally led collaborative platform, or backbone committee, to include NGOs, academics, and the public and private sectors, which would collectively identify and align national and sub-national sector goals, identify and prioritize leverage points for coordinated investments and efforts, and monitor progress
- Transferring this platform to the Ministry of Rural Development (MRD) to facilitate and coordinate

Additionally, SWS implemented a leadership development program, entitled Fostering Civic Champions, to build local WASH leadership and advocacy systems across the country.

Results

This particular SWS initiative ended before program closeout. These are the lessons gleaned from SWS's experience in Cambodia between 2016 and 2018.

Emphasizing the utility of analyses: The ONA and CDSA results indicated network disparities exist based on gender and language, disfavoring women-majority and Khmer-speaking organizations. These potential leverage points pushed subsets of the network to act, including the development of a Women in WASH community of practice and increased investment in Khmer language reports and simultaneous translation at meetings. Results also showed that the MRD was well positioned to lead improved coordination and collaboration and that international NGOs and donors were well positioned to provide advice to further facilitate government leadership. Several themed

RuSH sub-groups, such as the Sanitation in Challenging Environments working group and the Fecal Sludge Management Fan Club, highlighted a potential model for effective collaboration and structure for the whole network. The sub-groups were highly coordinated and expressed more interest in collaboration as a priority for the sector. More input and conversation with ONA participants on the activity's utility would have benefited the process because many of them found the effort to be repetitive of another recent, major network mapping activity of RuSH conducted by an international organization.

Government buy-in: Overall, SWS partners learned that systems can be better understood, but strengthening them through collective action requires mutual trust, ample communication, and frequent acknowledgment of wins. It seems WaterSHED did not provide stakeholders with several important details on the design, implementation, and specific responsibilities of a backbone organization. This lack of clarity created uncertainty for MRD, which had initially agreed to gradually take over this role from WaterSHED once a more full plan of action for the sector had been established. These factors also indicate that strong support, buy-in, and coordination with the necessary government agencies are critical for sustainable WASH systems from launch, to implementation, and beyond. Lack of clarity over funding also contributed to program termination.

Building leadership capacity: Fostering Civic Champions activities enabled participants to better understand their local sanitation scenarios and how to influence and advocate for community WASH improvements.

For more details on SWS work in Cambodia read: Network Analysis and Systems Assessment in the Rural Sanitation and Hygiene Sector in Cambodia.

RURAL WATER ACTIVITY IN UGANDA (WHAVE)

DELIVERING SUSTAINABLE WATER SERVICE THROUGH PROFESSIONALIZED MAINTENANCE

Challenge

The principal water supply technology for most sub-Saharan rural families is the hand pump. Although transition to piped water is the goal, the hand pump will likely supply most rural families for the next 30 years or more. In this situation of high dependency, it is important that hand pumps remain operational. However, despite significant investment in refurbishment, their functionality remains highly unreliable. A recent 10-district survey across rural Uganda found less than 30 percent of hand pumps functioned.

The key causes of this lack of functionality are weak financial accountability on the part of community water committees and local government departments — resulting in unwillingness among residents to pay for services — and not enough attention to putting long-term maintenance plans in place when infrastructure is newly constructed or refurbished.

Approach

Whave works as an SWS partner in four rural districts of Uganda with high poverty rates: Nakaseke, Kamuli, Kumi, and Serere. Whave also works in six other districts. SWS's primary activities are (1) analyzing baseline conditions to determine root causes of endemic non-functionality, (2) developing and testing systemic solutions, and (3) communicating these solutions effectively to government and stakeholders.
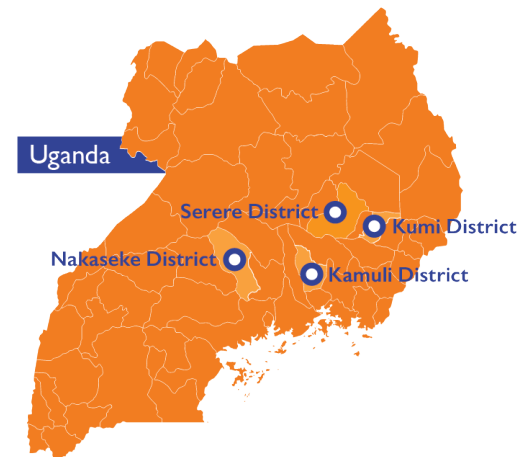
Since 2011, Whave has been working with the Ugandan government as a professional maintenance provider. A performance contract is signed with the district local governments regulating respective responsibilities, performance reviews, and tariff rates. Once a contract is in place, Whave promotes election of women into community water committees and signs service agreements with the committees to define its responsibilities with respect to security, welfare, and fee payment, while Whave commits to functionality assurance. Annual fee collection allows the committee to collect at harvest time and to allocate fees according to welfare needs. Whave has developed a performance-pay approach for management of local technicians. It contracts with local technicians and trains them to provide monthly preventive maintenance and rapidly respond to breakdowns. It also provides them with quality spare parts to make all necessary repairs.

As of September 2021, in the four districts under the SWS project, 366 communities paid for this service. Of these, 95 percent reported that they were happy with the service.

The number of paying communities has grown steadily, with the majority renewing their contracts each year. In all of the 10 districts where Whave is working, 806 communities are paying for service.

SWS monitors functionality, repair time, number of breakdowns, customer satisfaction, and payment compliance. Detailed records are collected to build a comprehensive evidence base. Each quarter, performance data are reported to the local government and the Ministry of Water and Environment. SWS also helps local governments to convene stakeholder performance review meetings and encourage voluntary agencies undertaking construction and rehabilitation work to participate.

In 2019, the Ministry of Water and Environment introduced a national O&M Framework that requires local government water authorities to contract a professional maintenance entity, known as an Area Service Provider (ASP), to take responsibility for functionality assurance and maintenance services. Whave's collaboration with the ministry since 2011 to test the professionalized maintenance model served as a major influence on the design of the national policy. SWS worked with a group of NGOs to contribute to both the policy outline and to implementation guidelines. While the O&M Framework has not been fully disseminated in Uganda, Whave's work is recognized as a pilot operation generating practical experience for all stakeholders.

Results

Functionality and payment compliance: In the 366 communities Whave services in the SWS districts, performance ratings are as follows: functionality remained above 97 percent consistently each quarter since 2018 (in the July–September quarter it measured 100 percent in both Kumi and Serere, 98 percent in Nakaseke, and 98 percent in Kamuli). Payment compliance varied from 57 percent to 86 percent in the three districts of Kumi, Nakaseke, and Kamuli, but measured 94 percent in Serere, or a 76 percent average in the four districts.

The district of Serere appointed Whave as its Area Service Provider in early 2021, and community engagements started in June. This represented an expansion under SWS in context of the new national policy for O&M and followed ministry guidance that ASPs work in clusters of districts. (Serere is an extension operation area for Whave's Kumi team.) The expansion to Serere allowed SWS to assess demand levels for the new O&M Framework. As of September 2021, 35 communities had signed service agreements and paid their initial deposits (94 percent of annual fees deposited on day of signing).

Pre-infrastructure maintenance investment procedures: SWS assisted local government officers in several districts, including Serere and Nakaseke, to develop and test a pre-infrastructure maintenance protocol requiring entities that invest in construction or refurbishment of hand pumps, typically local government water departments and NGOs, to ensure O&M agreements are signed with the appointed ASP (as is national government policy), and communities pay their deposits prior to construction or rehabilitation work. In Nakaseke District the government has already complied with the protocol. In Mityana District, Whave and a major capital investment NGO, Wells of Life, have followed the protocol, resulting in 80 rural communities already benefiting from coordinated and regulated assistance.

Guidance to international aid donors: SWS has built an evidence base to identify and enumerate the activities and budgets needed to secure reliable water service delivery. The outcomes of this research are summarized in Ten Factors for Viable Rural Water Services. The guide is intended to help bilateral and multilateral aid donors, governments, consultants, and NGOs achieve human and economic development cost-effectively through safe water service delivery.

Uganda

Serere District
Kumi District
Nakaseke District
Kamuli District

Photo credit: Whave

RURAL WATER ACTIVITY IN KENYA (UNIVERSITY OF OXFORD)

Kenya

Kitui County

ADOPTING A RISK-BASED APPROACH TO RURAL WATER SUSTAINABILITY

Challenge

In 2013, the Kenyan government mandated that its 47 counties take responsibility for delivering reliable water services to their residents, including Kitui, the country's sixth-largest county by area with 1.1 million residents. Despite trying to fulfill this obligation, county-run water utilities are able to provide consistent water service to only about 31 percent of residents.

The other 69 percent of Kitui's more rural and poorer populations depend on a combination of surface water, rainfall, and county-installed community groundwater hand pumps and small piped supplies. Hand pumps and piped supplies are poorly maintained and are dysfunctional 50 percent of the time. Increased equipment usage during the June to October dry season causes more pump and technology breakdowns, and water service becomes even less reliable for residents.

This precarious scenario leads to economic and social tensions, prompting the current Kitui County government to identify consistent access to clean water within 2 km of all households as one of its five county development priorities.

Approach

SWS conducted several audits of the current Kitui County WASH systems to gain a more complete understanding of their operations and strengthen the county's water supply and maintenance systems. These analyses included: a county-wide water supply audit of all health care facilities, schools, and community WASH facilities; a water-user behavior survey; and an ONA.
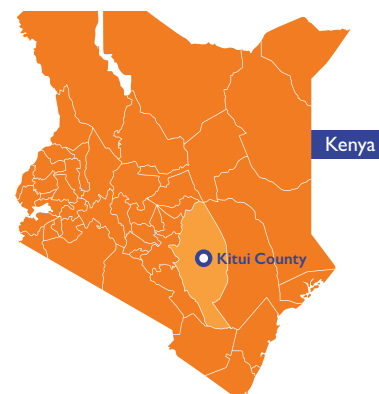
Later, SWS supported the existing Kitui County WASH forum formed to improve coordination among WASH donors, NGOs, government officials, academia, and the private sector. Partners also worked with the county government to develop a prototype data management system to monitor county water services and supplies.

In addition, SWS helped to demonstrate the effectiveness of FundiFix, a private-sector model for universal water service delivery in rural areas through professionalized maintenance, to Kitui County officials. Partners built government support for a WSMTF and support for policies that enhance monitoring, maintenance, funding, and enterprises in rural water service delivery. In addition, the county government requested SWS support to develop the first Kitui County Water Services Bill and Policy. For full details on SWS activities read Legal and Policy Change to Promote Sustainable WASH Services in Kitui County, Kenya.

Results

The SWS community facilities audit mapped 3,126 equipped and non-equipped water sources spread across Kitui County. Partners found that 60 percent of all sources were fully functional, 15 percent were partly working, and 25 percent were not working at all. The audit resulted in the establishment of a water service database to build upon this baseline information and creation of a cost-effective monitoring system of the county water sector.

School audit: The SWS audit of water infrastructure in 1,887 Kitui County educational facilities found a heavy reliance on poorly performing rainwater harvesting systems, which often resulted in schools with few options but to purchase water during the dry season. The audit revealed that 30 percent of school budgets did not include water service. School officials cited water availability, reliability, and cost as big concerns because they associated these factors with student and faculty absenteeism. The audit identified the need to clarify mandated school WASH service responsibilities and improve the county's ability to monitor and regulate water access at education facilities. This report details the school audit. SWS also completed a preliminary analysis of surveys of 122 Kitui County health care facilities.

ONA: The 2021 Kitui WASH network endline ONA indicated a fourfold increase in the number of network ties and/or relationships over the 2018 baseline ONA, including the county government becoming a skills-transfer authority that influenced network relationships. The endline ONA identified interest and opportunity among stakeholders to: (1) institutionalize the WASH forum network within the sector, (2) strengthen forum monitoring and reporting capacities, (3) streamline sector funding toward universal water access, (4) align water programming with funding, (5) influence other networks toward water access, and (6) improve access to professionalized maintenance service models. Read the full details in Understanding Changes in Coordination in Kitui County's Water Sector 2018–2021.

WASH forum support: Overall, the WASH forum became an increasingly central platform, allowing for WASH sustainability debates that improved sector coordination and strengthened government involvement in and influence on

relevant sector actors. Participant surveys also indicated its increased prioritization of water service maintenance. Formally institutionalizing the WASH forum could promote local sector planning, stabilize the sector from inevitable member and administration turnover, and further incorporate and align existing and new actors and programming in the sector.

mWater database: Delayed rollout of the water quality and service monitoring mWater database hamstrung its assessment. Initial insights showed the database was little used. Rollout of the mWater platform also revealed varying human resource capacities across the eight sub-counties requiring individualized support in each. Partners acknowledge that the county government needs a deeper understanding of the adaptability, resources, and budget necessary to implement and maintain an accurate county-wide online monitoring database.

FundiFix: SWS continued to support scaling the FundiFix model for rural water maintenance. Currently, Fundifix serves more than 58,000 people and its technical performance remains the sector benchmark, with more than 350 annual repairs, 95 percent of which are completed within 3 days. However, user fees are insufficient to cover FundiFix's direct maintenance costs, making its operations dependent on external funding. The success of FundiFix requires a policy that enables private sector enterprises in rural water — elements included in the Kitui County Water Services Bill and Policy. Government-led scaling up of professionalized maintenance proved more cost-effective and efficient than a "bottom-up" approach in which FundiFix engages individual communities.

Within Kitui, SWS observed a cautious acceptance of private sector models among local governments, NGOs, and leading donors. At the same time two PPP start-ups emerged within the county. In addition, the county government joined an EU–funded program to facilitate PPP management of community water supplies and another to install and operate desalination plants at community water schemes reporting high salinity.

Water bill and policy support: SWS supported the technical process of drafting the first Kitui County Water Services Bill and Policy jointly with the USAID–funded Kenya Integrated, Water, Sanitation, and Hygiene program. The WASH forum formed a 35-member technical expert working group that led the bill development. The bill is currently in debate with the county parliament and calls for institutionalizing and funding the WASH forum, rural PPPs, government incentives for rural water maintenance service providers, and the creation of a water services trust fund to finance service access and maintenance in rural and marginalized parts of the county.

Photo credit: Jacob Katuva

To learn more about the Sustainable WASH Systems Learning Partnership, visit: http://www.globalwaters.org/SWS