THE WATER TRUST

Lasting Impact

EQUIPPING COMMUNITIES TO MAINTAIN WELLS AFTER CONSTRUCTION

THE PROBLEM

With more than a third of hand pumps not functioning in Africa at any given time, governments and international organizations are struggling with how to empower rural communities to take ownership and ensure regular, effective maintenance to sustain access to clean water. The sector's traditional approach — a short training of community volunteers — is not up to the task.

A REASON FOR OPTIMISM

The traditional approach for equipping rural communities to manage wells has clear weaknesses that can be addressed. Many organizations are now experimenting with new methodologies, and several pilots have demonstrated substantial improvements in well functionality and reliability.

OUR WORK

In 2016-2017, The Water Trust is conducting three pilot programs, each testing a different approach to equipping 20 communities to operate and maintain wells. These pilots are informed by formative research in Uganda and a review of the most promising pilots implemented by peer organizations.

OUR RESEARCH & LESSONS LEARNED –

The Water Trust has partnered with more than 300 communities in rural Uganda since 2008. We have implemented a demand-led approach with the hypothesis that greater community contribution (e.g., labor, materials) would result in greater ownership and sustainability. Yet poor financial management and maintenance practices continue to threaten long-term sustainability, and we have concluded that a new approach is needed.

To inform the design of new approaches, we consulted with peer organizations and researchers to review promising pilots recently completed and currently underway. We also conducted formative research with communities, mechanics, and government officials to understand opportunities and challenges in regards to effective management of wells.

COMMON APPROACHES

	STRENGTHS	WEAKNESSES	OPEN QUESTIONS
Forming and training village water and sanitation committee	Low cost, simple	Low willingness for users to pay for access, poor maintenance of wells	Can more robust, longer-term training and coaching build sufficient capability?
Capacity building of government and Hand Pump Mechanic Associations (HPMAs)	Institutional environment can better support communities for high-quality maintenance	Does not address community challenges in collecting fees and contracting maintenance	Does capacity building sustainably strengthen institutions? Does institutional strength translate into improvements in functionality?
Private service providers	Aligns profit incentive with providing access to water	Has not demonstrated sufficient profitability to sustain enterprises in rural context	Does a viable business and regulatory model exist for private, rural provision?
Remote sensor-led maintenance and/or accountability	Real-time communication of functionality can increase up-time and willingness to pay	Sensors are currently too expensive for communities to sustain	Could a community/government afford and maintain a sensor that results in high up-time?

BARRIERS TO SUSTAINABILITY

While communities in rural Uganda face a number of challenges in maintaining wells, our research suggests that one or more of the following challenges are most likely to be the binding constraint to sustainability:

MOTIVATION AND SKILLS. It is clear that the limited three-to-five day training and coaching provided to most communities is inadequate to change existing beliefs and behaviors. Further, the majority of wells depend on pumps that require maintenance beyond the skill level of community members, increasing dependency on distant mechanics.

ABILITY TO FINANCE REPAIRS. Traditionally, informal financial management of community maintenance funds has resulted in low trust and willingness for users to pay, as well as low capability to finance repairs.

FINANCIAL INCENTIVE. Traditional programs rely on volunteer caretakers who have the difficult, unpleasant job of collecting money from community members, maintaining the site, and contracting repairs. The lack of incentive to undertake this burden can result in underperformance.

OUR APPROACH 3 PILOT PROGRAMS

ADDRESSING THE BARRIERS

In October 2016, The Water Trust began implementation of three pilot programs, each focused on a different set of constraints (p.2). These pilots allow The Water Trust to test which constraints are binding in order to most effectively equip our growing network of communities to sustain access to clean water.

PILOT 1: EXTENDED COACHING

Communities will receive 20+ visits from The Water Trust staff over six months. Community members will participate in a process of analyzing and mapping community risks, vulnerabilities, and local capacities, resulting in action plans that focus on local solutions to mitigate hazards. The facilitated learning process aims to stimulate ownership and build skills to anticipate and plan for predictable risks (e.g., water pumps needing repair).

PILOT 2: COACHING + FINANCE

The Village Savings and Loan Association (VSLA) methodology has successfully brought safe access to savings and credit to millions of remote, rural villages around the world. Our pilot will work with existing VSLAs (or support the formation of new ones) in conjunction with the behavior change support in Pilot 1. VSLA members will be trained to maintain the wells, collect savings, and finance repairs through savings, credit, and/or interest earned on loans.

PILOT 3: PRIVATE ENTERPRISE

The Water Trust will support potential entrepreneurs and communities to develop viable business models and contracts that account for maintenance costs and connect payment with functionality of wells. This pilot will also explore whether remote sensors that collect well functionality data and verify the number of functional days can improve reliability of service by supporting performance-based contracts with entrepreneurs.

EVALUATION METHODOLOGY

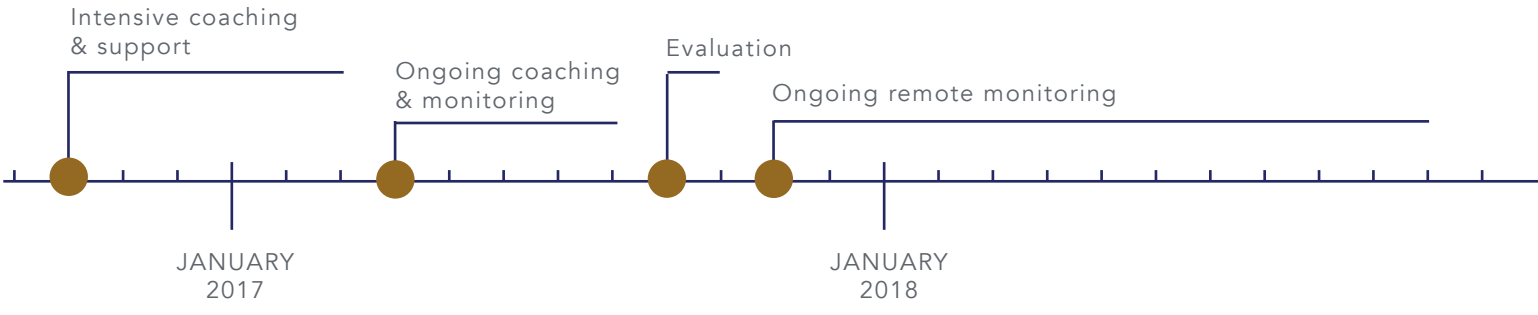
Data will be collected through household surveys, periodic inspections, and remote sensor monitoring of well use and functionality. Given our focus on equipping communities to sustain access to water, our evaluation focuses on key short-term proxy indicators for long-term sustainability.

WELL FUNCTIONALITY Wells are functional >90% of days

WELL RELIABILITY Maintenance issues are fixed within one week for >95% of wells.

FINANCIAL SUSTAINABILITY Associations have >$25 in cumulative savings for repairs in the first year, and an additional >$25 in credit available/accessible in the first year for significant repairs if needed. Financial targets escalate to a total of >$250 gross savings over a five-year period.

TIMELINE



TECHNICAL NOTES

The Water Trust pilots will be implemented in the districts of Masindi and Kiryandongo. Communities consist of 30 to 40 households with access to shallow hand-dug wells equipped with Consallen brand pumps. The communities have been selected due to a demonstrated inability to sustainably maintain the wells, evidenced by limited functionality and/or non-functioning management committees. The Consallen pump provides a notable advantage over more common pumps in terms of both maintenance costs and the ability for community members to perform basic maintenance. The tables below outline the relative costs of pump technologies, as well as the effect of different maintenance strategies on the cost of maintaining a Consallen pump.

ESTIMATED CAPITAL & MAINTENANCE COSTS BY PUMP

	Consallen	BluePump	Nira AF 85	Afridev	India Mark II
Capital costs	$2,500	$3,000	$700	$1,020	$1,200
Annual maintenance costs	$67 - $92	Unknown	$115 - $140	$108 - $133	$166 - $257
Spare parts	*$42*	*Unknown*	*$90*	*$83*	*$141 - $187*
Labor	*$25 - $50*	*$25 - $50*	*$25 - $50*	*$25 - $50*	*$25 - $70*
Annual maintenance cost per household	~$2	Unknown	~$3	~$3	~$5.5

NOTE: These estimates are based on an internal literature review. Real-world costs vary significantly by quality of construction and other variables. BluePump states that there should be no spare parts needed for first 3-5 years, but there is not available substantiating literature. The annual cost per household assumes 40 households.

ESTIMATED MAINTENANCE COSTS BY STRATEGY

	Six-year total	Average annual cost	Average max cost*
Handpump mechanic (HPM) performs maintenance	$252	$42	$73
Community member performs paid maintenance (HPM for major events)	$198	$33	$64
Community member performs unpaid maintenance (HPM for major events)	$120	$20	$51

*The maximum cost represents the additional cost of repairs in the event of an unusually significant issue.

MORE INFORMATION

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