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**TRANSFORMATION TOWARDS SUSTAINABLE  
AND RESILIENT WASH SERVICES**

## **Empowering schools to instil good hygiene habits in children and maintain infrastructure in rural Uganda**

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*In 2017, The Water Trust partnered with Mutunda sub-county in Kiryandongo district with the objectives of universal coverage of basic water, sanitation, and hygiene (WASH) across all 18 government primary schools, benefitting directly more than 14,000 children and indirectly the more than 40,000 people that live in the students' communities. The project employed user-centred design of handwashing facilities and invested in teacher training and coaching to improve school management and teaching practices. At the project's conclusion, 89% of students observed using the latrine were observed washing their hands with soap, and handwashing facility coverage in the area is estimated to have increased from 5% of households to 21%. Facility maintenance practices improved dramatically, however, in the one-year project period the challenge of establishing a clear revenue source for future repairs and pit emptying remained unmet.*

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### **Introduction**

In 2017, The Water Trust implemented a program in Mutunda sub-county in the Kiryandongo district in western Uganda to improve WASH in schools. More specifically, the program aimed to increase the proportion of students washing their hands with soap and improve school operations and maintenance practices. These focal points were informed by two underlying assumptions: (1) long-term hygiene and sanitation norms are shaped significantly by community members' experience and habits as children, and (2) the investment in new infrastructure is very likely to fall into disrepair without significant improvements in operations and maintenance.

Mutunda sub-county has an estimated population of 52,423, with 18 government primary schools serving 14,289 students. All 18 schools in the sub-county were selected for inclusion in the program to achieve the goal of universal access to water, sanitation, and hygiene within the sub-county's government primary schools. Prior to the intervention, 66% of schools had functional water point within 0.5 kilometres, 18% of latrines were broken, 33% needed de-sludging, and only a single handwashing facility in a single school. These gaps reflected inadequate investment as well as poor maintenance, with 33% of previously-constructed water points needing repair and 75% of latrines needing rehabilitation or emptying. In addition, only one of 14 rainwater harvesting tanks installed within the last five years was functioning.

With very limited budgets and competing priorities, operations and maintenance was not typically prioritized by school officials, nor were the eventual costs of future pit emptying or infrastructure repairs considered in the planning of revenue mobilization efforts. Teachers, each responsible for an average of 73 students, taught only conceptual knowledge on good hygiene (e.g., when to wash hands) through rote memorization, while just 17% of schools in our sample maintained an active school health club.

The inadequacy of WASH was particularly acute for girls. Only 17% of schools had safe, private spaces for menstrual hygiene management. Anecdotally, many teachers noted that girls' attendance was lower because they feared to defecate in the fields or use the boys' latrines.

While most stakeholders (district officials, teachers, and parents) desired water point and sanitation improvements, there was little to no explicit demand for improvements in handwashing facility coverage. There are budget allocations and standards for school water point and latrine construction, as well as

prescribed minimum latrine coverage standards of one latrine per 40 pupils. Government guidelines promote the use of handwashing facilities connected to rain water harvesting tanks despite several significant design flaws. Notably, the facilities are typically on the back of the latrines, requiring students to remember on their own to wash their hands and then walk out of their way to use the facilities. In addition, the 100-liter capacity of many tanks is often inadequate to provide water during dry periods. While handwashing with soap represents a significantly more cost-effective investment in health than latrines or household water supply interventions, there was little concern with the inadequacy of investment in handwashing as well as the inadequacy of the standard facility design.

### **Program intervention**

The program design was informed by a behavioral model that posits three essential conditions for behaviours: capability, opportunity, and motivation (Michie et. Al, 2011). This model, referred to as the “COM-B framework”, focuses on the individual’s capability (through knowledge and skills), opportunity (through an enabling environment), and motivation (through inspiration and reinforcement). These principles were primarily applied to the behavior change goal of student handwashing with soap:

- Increase capabilities through skill-building activities that equip children to build handwashing facilities at home, equip teachers to make liquid soap to sustain the school supply, and equip school leaders to plan for facility maintenance and management.
- Create opportunities to develop new habits by building handwashing structures in schools and ensuring adequate sanitation and water access.
- Motivate both students and teachers through hands-on, fun activities, including a competition to build handwashing facilities at home.

Construction activities included building and rehabilitating facilities to ensure that each school had a) a functioning water point within 0.5 kilometres; b) at least one latrine stance of five stalls for girls and a distinct stance for boys; c) a minimum of two handwashing facilities with a total of ten taps; d) durable hygiene promotion teaching supplies.

Training activities were primarily conducted by two staff trained and proficient in children's hygiene sanitation training, participatory hygiene and sanitation transformation, and basic financial planning and budgeting for operational maintenance. Training activities included a training-of-trainers of two teachers from each school, teacher training on making liquid soap for handwashing facilities, and periodic coaching visits over six months. The content of coaching visits included teacher support in forming and leading school health clubs. School health clubs were taught to take up several hygiene and sanitation promotion responsibilities, such as weekly hygiene and sanitation inspections during parades, pupil cleanliness inspections, and coordinating or performing WASH facility management.

In addition, staff worked with school management to improve financial planning, facility maintenance, and resource mobilization. Coaching visits incorporated teachers and parent teachers’ associations, as needed. Finally, staff also actively engaged leadership at the district education office (DEO), district health office (DHO), district water office (DWO), chief administrative officer (CAO), sub-county administrator (SCA), as well as community development officers. This work included both coordination of plans as well as joint troubleshooting (e.g., working with an uncooperative head teacher).

### **Evaluation methodology**

The primary outcome of interest – student handwashing with soap – was captured through observational assessments. Parents were recruited from neighbouring villages and paid a small stipend for their time. The parents were positioned at a distance from the latrines and handwashing facilities of the schools, and from there they observed how many children visited the latrine and how many washed their hands over the course of two two-hour blocks. Latrine walls shielded the interior stalls from view and observation was limited to students entering and exiting the structure. This process was implemented across all 18 schools. Given the lack of handwashing facilities prior to the project, no baseline observation was conducted.

Infrastructure condition and school management practices were assessed quarterly by The Water Trust staff. Within the treatment schools, teachers administered surveys across 2,178 students. Comparison data was captured from teacher-administered surveys across 513 students in five schools in an adjacent sub-county. Village-level outcomes in the intervention area were evaluated based on survey by a third-party

agency of 422 households in villages adjacent to the schools. Notably, there was a sampling error that led to this village-level survey being applied to households living disproportionately close to the schools.

In order to estimate one indicator of interest – the rate of handwashing facility coverage in the broader catchment area for the schools – the authors made conservative assumptions about the percentage of homes that live similarly close to the surveyed households, and then assumed that the impact of the program was zero for those households assumed to live further away. The details of this calculation are expanded on in the section on village-level results. Village-level comparison data was also collected by a third-party agency, which administered surveys to 1,135 households in nearby comparison villages that received no intervention.

## Results

Construction and rehabilitation efforts resulted in all 18 schools with access to functional water points, separate boys’ and girls’ latrines, and at least two sets of handwashing facilities. Training efforts resulted in two teachers per school trained as hygiene and sanitation champions, with an additional 217 teachers across the schools receiving support in regular coaching visits.

	<b>Baseline</b>	<b>End-of-project</b>
Schools with functional water points	12	18
Schools with boys’ and girls’ latrines in acceptable condition (i.e., not full or unsafe)	1	18
Schools with $\geq 2$ sets of functional handwashing facilities	0	18
Teachers trained as WASH champions	N/A	36
Teachers coached in WASH promotion	N/A	217

Sixteen school water points are within the school grounds. Two schools have water points within 0.5 kilometers of the school because the school grounds cannot produce a working borehole. The handwashing facilities include 36 facilities constructed by The Water Trust and 20 simple tippy taps constructed by students and teachers. The facilities constructed by The Water Trust are located near the boys’ and girls’ latrines. In the nine larger schools with high student populations, the hand washing facilities are square 1,000-liter tanks filled with soapy water and two taps per side. In the nine smaller schools, the handwashing facilities are cylindrical 220-liter tanks filled with soapy water and three taps. All facilities are standalone structures placed intentionally near the latrines with clear pathways to the classrooms to encourage use, unlike the previously-installed rain water harvesting tanks.

### School hygiene and sanitation outcomes

The program significantly improved observed handwashing with soap, student engagement in child-to-child hygiene promotion, menstrual hygiene management support, and self-reported student health. Notably, these improvements were entirely unrelated to conceptual knowledge, which was found to be very high in comparison school students as well. In Table 2, end-of-project outcomes are contrasted with the best comparative data point. Baseline data from the treatment schools is indicated with a (B) and data from comparison school is indicated with a (C). There is no comparison or baseline data for observed handwashing with soap as there was only one school with one tap prior to the intervention. The rate is likely close to 0%.

In addition, the project has influenced the goals and priorities of the DEO, which has promoted the example of Mutunda sub-county’s improvement in handwashing to head teachers across the district. Toward the end of the one-year project, the DEO passed an ordinance for all schools in the district to install hand washing facilities with soap and water. This decision was motivated by the DEO’s observation that handwashing with soap was not only important but financially feasible for schools. This policy change is a

significant victory, although additional support will likely be needed to support schools in mobilizing adequate funding to achieve more than nominal compliance.

<b>Table 2. School hygiene and sanitation outcomes</b>		
	<b>End-of-project</b>	<b>Comparison</b>
% of student latrine visits with observed handwashing with soap	89%	No data
Active school health club	100%	17% (B)
Schools with safe place for menstrual hygiene management	83%	17% (B)
Student knowledge of >3 times to wash hands	95%	98% (C)
Self-reported diarrhoea	18%	38% (C)
Students reporting missing school due to sickness	55%	94% (C)

### **Village hygiene and sanitation outcomes**

The program intended to improve village-level hygiene practices and health outcomes by instilling good hygiene practices in students as well as teaching older students to build tippy taps at home. The competition to build handwashing facilities at home had limited participation – similar to the number of school health club members. However, the increase in handwashing facility coverage in the neighboring areas was significant. In Table 3, end-of-project data is contrasted with data from comparison villages.

<b>Table 3. Village hygiene and sanitation outcomes</b>		
	<b>End-of-project</b>	<b>Comparison</b>
Average number of students participating in handwashing facility competition	17	N/A
Handwashing facility coverage in neighbouring community households	37%	5%
Estimated handwashing facility coverage in school catchment area households	21%	5%
Diarrhoea for children 6-17 reported in household surveys	9%	2%

Many of the facilities built in the project period were constructed before the handwashing competition began, which may explain the disparity with the competition results. Focus group discussions suggest that participation in the competition was limited by student perception that they lacked the materials to build handwashing facilities (e.g., jerrycans). This issue is expanded in the lessons learned section.

Due to a sampling error, the households surveyed for handwashing facility coverage were disproportionately from communities closer to the schools. It is reasonable to expect that the coverage rate in villages further away would be lower. To be conservative, we have calculated a lower estimate for the broader catchment area – population: 42,974. We estimate that only 49% of the households served by the schools would live in an area similar to those sampled in the household survey, and that there is no impact in the more distant 51% of households. Therefore, the handwashing facility coverage for these households is estimated at the baseline rate of 5%. In turn, our calculations estimate that 21% of 8,595 households have a handwashing facility, an increase from the baseline coverage rate of 5%, benefitting a total of 42,974 people.

We are unclear why the reported rate of diarrhoea in households is significantly higher than in comparison villages, and are currently conducting additional household surveys in the project area.

### **Operations and maintenance outcomes**

Results indicate that the program led to improved management and maintenance of WASH infrastructure. Improvements included the development and implementation of maintenance plans to regularly clean

facilities, purchase supplies, and fill up handwashing facilities with water and liquid soap. However, sustainability continues to be at risk as schools are not able to save and accumulate adequate capital to pay for eventualities such as pit emptying or water point repairs.

<b>Table 4. Operations and maintenance practices at end-of-project</b>	
	<b>End-of-project</b>
Schools with operations and maintenance plans	100%
Schools that have spent funds on infrastructure repairs	67%
Schools that have a reserve fund for future repairs and supplies	44%
Average expenditure on repairs (conditional on spending any funds)	\$33
Average reserve for future repairs and supplies (conditional on having a reserve)	\$29

The Water Trust’s collaboration with the DEO has, however, produced promising developments for long-term sustainability. The DEO’s enthusiasm for the project has led the office to prioritize school management training for teachers across the district in 2018. In addition, under the Uganda Multi-Sectoral Food Security and Nutrition Project, all 18 schools in Mutunda that were supported by The Water Trust will now receive additional resources to purchase handwashing supplies.

## **Lessons learned and conclusions**

### **Handwashing facilities designed for user convenience can change norms**

This project avoided the common practice of constructing handwashing facilities on the back of latrines with rain water harvesting tanks supplying the water. The abandonment of the previously constructed tanks suggested this approach would not be sustainable. In addition, the placement of these tanks – out of the normal pathway of students traveling to and from latrines – fails to follow basic principles of behavior change. In addition, mixing liquid soap in the tanks ensured users washed hands with soap without requiring additional thought or actions.

### **Put the DEO at the centre of the program**

The project’s success depended critically on collaboration with the DEO. Inadequate coordination prior to the project led to the unpleasant surprise that the district was moving most teachers to new schools, resulting in 65% of teachers in Mutunda sub-county transitioning to new schools at the project’s inception. Shortly after, The Water Trust held meetings with all key stakeholders, including the DWO, DEO, DHO, CAO, and the SCA. Significant collaboration continued with the DEO and the SCA.

The Water Trust staff were co-located with the sub-county government office to ease communication. This proved helpful when several education programs were introduced during the project period, competing with our project for the time and attention of school staff. The DEO also played a critical role in addressing an uncooperative head teacher. Through this experience, the DEO has become an active advocate for WASH in schools, notably handwashing, across the district. The office is now actively promoting head teachers to include WASH in their operating budgets and supporting schools in sourcing funds from education programs. It is worth noting, however, that the DEO benefited from the leadership of a highly-engaged, highly-motivated civil servant – key factors in the success of this collaboration.

### **Integrate student-led, school-wide drives to collect materials for handwashing facilities**

School-based programs can increase their impact by changing behaviors at the village-level. While the impact of this project on village-level handwashing facilities was significant, it could be increased. In our key stakeholder discussions, students often cited a lack of jerrycans as an obstacle to building their tippy taps. They were not aware that they could use alternatives, such as water bottles, although this concept was noted in trainings. In the future, rather than bring a limited amount of ideal supplies (e.g., jerrycans), it may be more effective to work with the teachers and students to collect materials, such as a school drive to

collect water bottles. It is critical to instill an understanding that handwashing facilities are feasible irrespective of funding in order to maximize the impact on household hygiene.

### **Dynamics between schools and villages often need improvement**

Theft and vandalism are threats to infrastructure sustainability, and poor community sanitation practices can limit the impact of hygiene promotion at school. In this project, several facilities were vandalized (and then repaired by the school management committees). In addition, focus group discussions suggest that students without latrines at home are less likely to build handwashing facilities there. In addition, it was necessary to help improve poor school communication on how school fees were spent to increase community willingness to contribute funds for school needs, including infrastructure maintenance. Relatedly, discussions also suggest that parental trust of head teachers varied. This project's efforts to improve the clarity of school budgets and plans for operations and maintenance resulted in an increased willingness to pay, although additional work is needed to mobilize adequate resources.

### **Deeper collaboration with education programs is an opportunity for scale and impact**

There are significant synergies with the education sector that can be harnessed to further both sectors' goals. Both education and WASH depend on school management, teaching, and curriculum quality. There is an opportunity to integrate hygiene promotion in a manner that improves student performance on exams, psychosocial-skill building, and behavior change, provided there is also an enabling environment to encourage behavior adoption. Menstrual hygiene, which was not an explicit focus of this project, likewise can be integrated. Looking forward, The Water Trust aims to collaborate and partner with education NGOs to build robust, scalable curricula that adequately addresses hygiene and sanitation, a school management training program that adequately addresses operations and maintenance, and stronger handwashing facility and menstrual hygiene support standards for schools.

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