



GHANA **WASH** PROJECT
Lessons Learned: Manual Drilling and
Borehole Repairs Initiatives



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GHANA **WASH** PROJECT



LIST OF ACRONYMS

CWSA	Community Water and Sanitation Agency
EHA	Environmental Health Assistant
GWASH	Ghana Water, Sanitation and Hygiene Project
LNGO	Local Non-Governmental Organization
M/DWST	Municipal and District Water and Sanitation Team
USAID	United States Agency for International Development
WASH	Water, Sanitation and Hygiene
WatSan	Water and Sanitation
WSDB	Water and Sanitation Development Board

INTRODUCTION

Over a period of approximately one year, the Ghana Water, Sanitation and Hygiene Project (GWASH) constructed 60 manually drilled boreholes and repaired 72 boreholes as part of its innovative activities in the water sector. The initiative was focused in communities in Assin North Municipality, Assin South District and Asikuma-Odoben-Brakwa District in Central Region. The project also provided software support, in the form of Water and Sanitation (WatSan) Committee formation and training, to put in place sustainable management capacity for the new WatSans.

This lessons learned document explores the following questions in examining these initiatives' impact:

Part 1: Manually Drilled Boreholes as Innovation

- In what ways is manually drilling of boreholes more "innovative" compared to existing approaches?
- Does manual drilling of boreholes address communities' water, sanitation and hygiene (WASH) needs?
- What difference has the manual drilled boreholes made in contributing to increase in access to potable water in deprived communities?
- Have there been modifications to the manual drilling initiative to make it more appropriate for the local context?
- Is manual drilling potentially the way forward for the poor in deprived areas?

Part 2: Borehole Repairs as Innovation

- In what ways is borehole repair more "innovative" compared to GWASH's other approaches?
- Does borehole repair address communities' WASH needs?
- What difference has the borehole repairs initiative made in contributing to increased access to potable water in deprived communities?
- Have there been modifications to the borehole repair initiative to make it more appropriate for the local context?
- Is borehole repair potentially the way forward for the poor in deprived areas?

Part 3: Sustainability and Community Management of Manually Drilled and Repaired Boreholes

- Are the receiving communities enthusiastic and using the innovative facilities?
- How does the initiative support long-term sustainability, in terms of operations and management of the borehole facilities?
- What are the challenges encountered and/or anticipated in terms of performance, usage and sustainability? Are communities now well equipped to address these expected future challenges?

PART 1: MANUALLY DRILLED BOREHOLES AS INNOVATION

Mechanically drilled boreholes and hand-dug wells have been the prevailing options in Ghana. Large rigs are used to dig mechanically drilled boreholes, and so accessibility and community demand (community population size) are key considerations taken into account before considering this type of well. Natural terrain (including forest cover, narrow and winding roads and streams) makes it virtually impossible for large drilling rigs to reach some communities. In addition, there were a limited number of machines available to perform the drilling, slowing down project progress. Compared to hand-dug wells, boreholes provide for larger populations (an estimated 300 per facility).

The project constructed hand-dug wells mainly in cocoa-growing areas in Western and Central Regions, where the population sizes were smaller with lower water usage. Hand-dug wells are large diameter and

generally shallow (less than 15 meters in depth, on average) that can be dug without the use heavy machinery; while it is possible to dig a well as far down as 20 meters deep, it is time consuming. Hand-dug wells are mainly for small communities with population size of less than 150. However, these water facilities threaten to dry up during the dry season because they cannot penetrate very far into the aquifer. They can easily become contaminated with the runoff of pesticides or fertilizers from farming activities and other contaminants in surface runoff. The result is that such “improved facilities” are inconsistent in terms of both quality and quantity of water supplied, and community residents are often forced to return to their traditional and often polluted water sources. As a result, hand-dug wells have steadily fallen out of favor in the WASH sector.

Given this context, the project began to explore alternative options for providing improved water facilities. GWASH became interested in manual drilling due to the constraints identified above for both mechanically drilled boreholes (cost and availability of equipment) and hand-dug wells (limited yield and time to construct).

In undertaking lessons learned fieldwork, interview surveys were developed and administered to GWASH staff and Relief International/EnterpriseWorks/private consultant managing the manual drilled borehole initiative, GWASH staff managing the WatSan training initiative, two District and Municipal Assemblies and community WatSan Committee leaders in three communities that had received manually drilled boreholes:

TABLE 1: MANUALLY DRILLING COMMUNITIES VISITED

COMMUNITY	COMMUNITY SIZE	WATER SOURCE (BEFORE)	FACILITY RECEIVED
Awutu Breku (Assin South District, C/R)	60	Hand-dug well	Manually drilled borehole
Seseko (Assin South District, C/R)	400	Hand-dug well	Manually drilled borehole
Bueko Junction (Assin North Municipality, C/R)	350	Hand-dug well Standpipe (from a nearby community)	Manually drilled borehole

In what ways is manually drilling of boreholes more “innovative” compared to existing approaches?

The manual drilling initiative introduced a new technology and adapted it to the local context: In the past, Relief International, the lead implementing agency for GWASH, has had successful experience with manual drilling programs in Niger, Nigeria and Senegal. Although conditions in some areas of Ghana are challenging for manual drilling (due to rocky terrain and the depth to the water table), in many areas where hand dug-wells are feasible, manual drilling is not only feasible, but also provides a more innovative option – it is expected to be lower cost, faster and better alternative. The provision of manually drilled boreholes marks a new initiative for GWASH, with the aim to venture beyond the project’s traditional water interventions. Overall, the initiative, which included a total of 60 boreholes, was sufficient to provide water access for an estimated 18,000 new beneficiaries.

The manual drilling initiative aims to provide quality wells that are either equal or higher quality than machine-drilled boreholes, using locally available tools and equipment, enabling access to more remote sites where machine-drilled boreholes, reliant on large rigs, cannot pass. GWASH worked with 19 trainees from two local well construction and pump installation businesses and three trainees from a Local NGO (LNGO) in Ghana, providing a five-day theoretical training and hands-on field experience drilling five manual boreholes and starting four more.

The introduction of manual drilling in the southern region of Ghana was a new technique that also had the following favorable aspects:

- **Ability to access more remote locations:** Tools are lightweight and can be carried by head load to previously inaccessible locations. Manual drilled wells can be drilled even in the rainy season when access for large rigs would be impossible. The result is that trained drilling businesses can reach more remote areas including communities that were previously excluded from improved water access.
- **Favorability to local terrain:** Compared to hand-dug wells, manually drilled boreholes are faster to drill, penetrate deeper into the aquifer, easier to protect from contamination. the 40 meter maximum depth is adequate for many locations in Ghana and the penetration of 4-6 meters or more into the aquifer results in wells that do not go dry and that have better quality water than hand dug wells. The shortcoming is that manually drilled boreholes cannot penetrate certain hard formations and cannot reach the deeper depths that can be reached by machines. There is also still a need for training in techniques that are suitable for harder formations and ongoing follow-up and quality control.
- **Water quality:** Manually drilled boreholes undergo the same testing as mechanically drilled boreholes, including water quality testing. In the communities visited and according to the assemblies, there is a high approval of the water quality produced by the manually drilled boreholes, with only a few exceptions.
- **Lower costs:** Manual drilling provides a cheaper technology for improving rural water access. Comparing the costs of available technologies demonstrates that with manual drilling, communities will have access to potable water at lower cost:

TABLE 2: COSTS OF VARIOUS WATER FACILITY TYPES

FACILITY TYPE	COST (ESTIMATED)
Mechanically Drilled Borehole with Hand Pump	US\$ 8,500
Manually Drilled Borehole	US\$ 3,900
Hand-Dug Well with Hand Pump	US\$ 2,600

Locally available tools, methods and experts all contribute to providing manually drilled boreholes at a price far lower than mechanically drilled boreholes. In terms of tools, there would be no delays waiting for importation of spare parts; they can all be manufactured or purchased in Ghana. Tools can be made in machine shops and the pumps, hoses and fittings can be purchased in the marketplace. In terms of experts, as part of its initiative, GWASH trained and worked with two local businesses in this initiative, supporting the creation of local capacity and experts to continue this work.

- **Supports new business opportunities:** Manually drilled boreholes require a lower capital investment to start businesses, permitting a larger potential increase in overall capacity in the country. As mentioned above, there are a number of aspects favorable and supportive as a business environment for this innovation: The high demand for improved rural water access, cheaper tools and equipment, and local expertise.

As expected and demonstrated in other parts of West Africa, the manual drilling technology is lower cost and more easily transportable than traditional mechanical drilling. The provision of manually drilled boreholes was accompanied by the key software component of formation and training of WatSan Committees in each of the communities where a borehole was provided.

Respondents made the following additional comments:

- “Most of the communities are not accessible, so you cannot go and drill using the mechanized drilling unless you drill using the manual style.”- *Assin South District Assembly*
- “Apart from GWASH, no project has done the manual borehole drilling [in Assin South].”- *Assin South District Assembly*
- “This is the first time the assembly is benefitting from the manually drilled borehole from GWASH. It hasn’t been done before. Apart from GWASH introducing it, it hasn’t been done before [in our assembly].” - *Assin North Municipal Assembly*
- “Manually drilled wells are not constrained by poor road networks or weather patterns and therefore can be done anywhere as long as the targeted drilling location is not of hard rock... Unlike identifying locations for mechanically drilled wells, accessibility was not a determining factor because the light weight manual drilling equipment can be carried as head loads by community members who are always willing to assist”- *GWASH M&E Specialist*
- “They can all be manufactured or purchased in Ghana. Tools can be made in machine shops and the pumps, hoses and fittings can be purchased in the marketplace.”- *Manual Drilling Consultant (former RI/EnterpriseWorks Technical Director)*

Does manual drilling of boreholes address communities’ WASH needs?

The initiative reaches more communities in need of improved, sustainable water facilities: The initiative aimed to address communities’ WASH needs by provided the physical facility and supporting community management structure to keep these facilities sustainable in the long term. Overall, GWASH provided 40 manually drilled boreholes to individual communities during the year four period of the project; it provided an additional 20 manually drilled boreholes to individual communities during the six-month extension period.

In selecting communities for the initiative, GWASH worked with the assemblies to identify deprived communities without access to potable water, farming communities situated at lower elevations and with poor road access or where the only access to the community is via footpath. This was the case in all three communities visited, such as Awutu Breku, a community of 60 residents in Assin South district that received a manual borehole nine months ago. The community’s main water source was a hand-dug well susceptible to rainfall washing into it. The community of Seseko, in the same district, experienced the same challenges, but in addition it had a population of 400, much larger than the output available from the community’s hand-dug well. Now both communities have manual boreholes, which they say has never had a breakdown, and provides quality water for their drinking and household uses.

In Bueko Junction, the community had only been able to access water via a hand-dug well and standpipe from a nearby community, despite a sizeable population of 350. “The only [community] water source, which was the hand-dug well, was not supplying enough water for us,” said the community members.

The communities confirm that the manually drilled boreholes provided by GWASH provide clean water and are more accessible than the other sources of water they were previously using. In each of the three communities visited, the WatSan Committee and community leaders said that fetching water now takes only about 5 to 10 minutes (round trip), that the facility provides water throughout the year, including the dry seasons, that the water is high quality (in terms of taste, color and odor) and that the amount of water produced is sufficient to provide for the needs of their households.

Respondents made the following comments about their reliance on hand-dug wells and their experiences before they received the GWASH-provided manually drilled boreholes:

- “It is very appropriate because when you look at the hand-dug wells it is opened and everybody uses anything to fetch, but when it comes to manual drilling you will not see the water it cannot be compared to a mechanized borehole but it is still better because you cannot see the water and it has a pump fitted on it so it is better.” - *Assin North Municipal Assembly*
- “When it rains, it washes sand into the water source (hand-dug well), making it dirty. The manual borehole has really helped the community.” *Awutu Breku community*
- “The new facility has lessened our burdens. We do not have to walk long distances.” - *Bueko Junction community*

What difference has the manual drilled boreholes made in contributing to increase access to potable water in deprived communities?

In providing 60 boreholes across individual communities, GWASH has made a difference in the lives of 18,000 people who were beyond the reach of the project’s originally envisaged facilities (mechanically drilled boreholes) for improved, sustainable potable water access.

The most significant improvement as a result of the manual drilling initiative is that in each of the communities visited, residents have seen a quality of life improvement thanks to improved water access. They have moved from relying on possibly contaminated, unreliable water sources (streams, hand-dug wells) to an improved, and reliable water source in the form of manually drilled boreholes. Now, they are able to use the GWASH-provided facility for their drinking and household needs. At times, they rely on alternative sources for other household needs.

All the community respondents said that they desired improved water facilities even before GWASH’s intervention, and in two communities, they had made attempts to mobilize funds to acquire their own borehole. Bueko Junction and Seseko communities both appealed to their assemblies for support in acquiring a borehole. In Awutu Breku community, the community members said they had not appealed to the assembly for support but rather “were planning on contributing some money to dig a borehole for the community.” In Seseko community, respondents said: “We wanted a borehole but we did not have money, so we tried mobilizing some funds but the people in the next town did not really support the idea because they had a borehole already, so we gave up.”

The community respondents also made the following comments relating to improvements in their lives thanks to the manually drilled boreholes:

- “It has lessened our burdens. We do not have to walk long distances. I used to fall sick but now I am very healthy because of the water that has been provided to us. The children are even healthy.” – *Bueko Junction community*
- “We do not struggle too much in terms of walking distances to get water. We now get water to bath, to cook and to wash.” – *Awutu Breku community*
- “The water has really helped us...We use it to prepare kenkey. Even at first I used to walk long distance in the night to get water to make my kenkey, but now I do not do that again, because we have a source of water close by.” – *Seseko community*

Have there been modifications to the manual drilling initiative to make it more appropriate for the local context?

The manual drilling method has been implemented before by Relief International/EnterpriseWorks in the region, but in initiating the technique in Ghana, GWASH made some modifications, in terms of specific technique and working with local expertise, in order to adapt the strategy to the local context:

- **Manual drilling method:** There are a number of techniques for manual drilling; in Central Region, GWASH used the rotary mud jetting technique. It was selected because it has evolved as the preferred drilling method in much of West Africa. It is fast and less labor intensive than other manual methods. It is limited to sedimentary formations, but under suitable conditions it is very effective. The main drawback is that it requires a lot of water for the drilling operation and the use of a drilling polymer, and it is not possible for rocky terrain. Although the manual drilling method in general allows for access to more remote communities, GWASH was unable to drill boreholes in rocky areas, due to the limitations of their equipment.
- **Locally available expertise and tools:** Local expertise, manufacture of tools and local repair increase the potential for long term sustainability this applies to drilling equipment and pumps. Tools were acquired from Niger and copied locally. Importantly, many of the tools required for manual drilling can be purchased on the local market or made in local metalworking and machine shops. The trained manual borehole drillers were selected from the region and they have the theoretical knowledge and strong practical experience of drilling locally, and are now available locally to continue to do so.

Is manual drilling potentially the way forward for the poor in deprived areas?

The success of the manual drilling initiative demonstrates its immense potential as a new approach to reaching remote areas and providing improved water access at a lower cost than traditional interventions. It provides local economic opportunities for local businesses, who now have new skills to market in their communities; communities previously unable to receive boreholes because of the terrain and remoteness of their location can now likely be supported and can obtain an improved water facility at low cost. Already, other organizations are looking into and planning manual drilling initiatives, demonstrating that this is a strong way forward.

“CWSA [Community Water and Sanitation Agency] started with hand-dug wells with pump, and then later, they abandoned the hand-dug wells because of high possibility of contamination. The manual drilling has been very helpful to the communities. So CWSA will see what GWASH has done.”- *Assin South EHA*

PART 2: BOREHOLE REPAIRS AS INNOVATION

In undertaking lessons learned fieldwork, interview surveys were developed and administered to GWASH staff managing the borehole repairs initiative, GWASH software (hygiene education and capacity building) staff managing the WatSan training initiative, two District and Municipal Assemblies and community WatSan Committee leaders in three communities that had received repaired boreholes:

TABLE 3: BOREHOLE REPAIR COMMUNITIES VISITED

COMMUNITY	ASSEMBLY	EXTENT OF REPAIR NEEDED	REPAIR PROVIDED
Tumfokor	Assin South	Major borehole repair	New pump installed (2)
Corner Boy	Assin North	Major borehole repair	Old pump repaired (1)
Sikan Bodua	Assin North	Major borehole repair	Old pump repaired (2)

In what ways is borehole repair more “innovative” compared to GWASH’s other approaches?

According to data provided from CWSA, a large proportion of existing community water facilities are non-functional; 23 percent (18 facilities) of listed facilities in Assin North Municipality, 38 percent of listed facilities

in Assin South District (30 facilities) and 12 percent (20 facilities) of facilities listed in Asikuma Odoben Brakwa District were recorded as nonfunctional. Overall, this accounts for 21 percent of borehole facilities provided (approximately one in five boreholes) in the three districts that is broken-down and non-functional. In addition to providing new water facilities, there is deep need for sustainable initiative to repair the broken-down facilities and explore new options for keeping existing boreholes functional.

The M/DWSTs mentioned that their assemblies neither provide nor repair boreholes, highlighting the critical aspect of community management. The breakdown of boreholes is common, and promoting well-functioning boreholes in the long-term supports sustainability. The threats to sustainability include the physical challenges (breakdown of borehole and need for repair), economic challenges (the cost of repairs and whether community can afford it) and the underlying foundation of community sustainability (having a strong WatSan/management committee in place to assure regularly collected funds, proper use and care of the borehole, and liaising with borehole mechanic when repairs are needed, as discussed in Part 3).

The project's borehole repairs initiative was a pilot initiative and an attempt to address existing issues and access in the water sector in a new way. The initiative included the training of borehole mechanics, provision of tool kits and spare parts, refurbishing broken-down boreholes, building the capacity of WatSan Committees and strengthening communications between the WatSan Committees, the borehole mechanics and the Municipal and District Water and Sanitation Teams (M/DWST). In detail:

- **Refurbishing existing broken-down facilities as a cost-effective improvement:** Rather than provide completely new boreholes, GWASH obtained a list of communities in needs of borehole repair in collaboration with CWSA and the municipal and district assemblies, and then refurbished 72 broken-down boreholes in these communities.
- **Building local expertise in borehole repairs:** In order to adapt to local market and community needs, GWASH trained borehole pump mechanics. The initiative provided training and future employment for these mechanics, and it included training 21 borehole mechanics in three regions (Western, Central and Greater Accra regions). This included two trained borehole mechanics each in Assin North, Assin South and Asikuma-Odoben-Brakwa districts of Central Region, the same districts where GWASH initiated repair activities and provided toolkits. The borehole mechanics signed contracts and were provided tools with the express purpose of repairing hand pumps for boreholes and hand-dug wells in the district and/or region where the applicant is based, with oversight responsibility of the M/DWST and GWASH.
- **Strengthening communications between WASH stakeholders:** With assigned borehole mechanics to each district, both communities and assemblies have the contact information of the borehole mechanics in their area and can reach out to the mechanics for repairs. In some cases, the communities reach out directly to the assembly, and the assembly can contact the borehole mechanic on behalf of them. If the community experiences any issues with the borehole mechanic, they can also appeal to the assembly to provide support on addressing issues. This includes borehole mechanics who might attempt to charge exorbitant prices, a key challenge for communities in the past, since the prices of tools are often not regulated.
- **Forming and strengthening community management:** In line with GWASH's approach to improving water access and providing complementary software support (community management capacity building and hygiene education), GWASH's software team formed and trained new WatSan Committees (and retrained existing ones) to strengthen community-level management of the repaired boreholes.

Does borehole repair address communities' WASH needs?

The community of Cornerboy, with a population of 500, had two boreholes, one of which was recently repaired by GWASH. Both boreholes were broken down; one had been broken down for nearly three years.

With only one functioning facility, the community resorted to using a nearby stream for other household uses. The community also before the intervention by GWASH had no functioning WatSan Committee. "We had no WatSan before," the community respondents said. GWASH repaired the community's borehole working with the district-trained borehole mechanics, formed and trained the community's WatSan Committee.

The community of Sikan Bodua has a population of 700 people and had two boreholes, one provided in 1992, which were broken-down before GWASH's intervention. The community had relied on two existing open hand-dug wells for all of their water needs. GWASH repaired the two boreholes using the district borehole mechanics and reconstituted and retrained the existing WatSan Committee.

The community of Tumfokor has a population of 950 people and before the GWASH intervention, had two broken-down boreholes, and another one at a nearby school. The community relied on the borehole for the school and its nearby stream for water for drinking and household uses. GWASH repaired the two boreholes and retrained the existing WatSan Committee.

The GWASH initiative worked to address these communities' water improvement needs holistically, by not only providing improvements to their water facilities, but also training their community management bodies (WatSan Committees) and putting them in touch with the district borehole mechanics and assemblies who would be available to support when eventually, future repairs are needed.

What difference has the borehole repairs initiative made in contributing to increased access to potable water in deprived communities?

According to community respondents, the improvements are clear and definite. The communities are now able to have access (again) to improved water facilities, and the community management issues that existed in the past, such as the lack of a WatSan Committee or a non-functional WatSan Committee to collect fees, enforce proper usage of the facility and address needed repairs, has been addressed. Community respondents mentioned the improvements in their communities as a direct result of the borehole repairs:

- "Before the borehole was repaired, we used the hand-dug well and the stream. The water sometimes would get finished in the hole while we are fetching, so we have to wait for a while before we continue fetching."- *Tumfokor community*
- "The water is clean, and we are now healthy. We do not go to the hospital like we used to. There were some organisms in the stream." – *Cornerboy community*
- "We learned the proper means to handle the borehole. We now use clean containers. We have also learnt to keep our immediate surroundings clean. Now our communities are clean... We do not fall sick anymore, the children do not fall sick, too. The schoolchildren have stopped rushing for the water. We even need more."- *Sikan Bodua community*
- "We used to fetch water from the stream and while we are doing that we fear an epidemic but now because our borehole has been repaired we do not fear anymore ... Now, nobody falls sick. The schoolchildren have also learned to wash their hands and they keep themselves [clean]. Some of the ladies who sell food in the school have also learned."- *Tumfokor community*

Have there been modifications to the borehole repair initiative to make it more appropriate for the local context?

Borehole repairs, training of borehole mechanics and forming and training WatSan Committees are not in themselves innovative activities, but the GWASH approach to address all these needs as part of a holistic strategy to sustainably improve water access marks a new direction for the project in the final year of implementation.

Is borehole repair potentially the way forward for the poor in deprived areas?

This pilot initiative has demonstrated the potential for borehole repair as a way forward, and there are still a number of broken-down borehole facilities in these three districts in the Central Region and throughout Ghana that could be rehabilitated.

PART 3: SUSTAINABILITY AND COMMUNITY MANAGEMENT OF MANUALLY DRILLED AND REPAIRED BOREHOLES

Are the receiving communities enthusiastic and using the innovative facilities?

From the beginning, communities' opinion leaders were involved in the process to ensure enthusiasm for the manual drilling and borehole repair initiatives. In both cases, GWASH collaborated with M/DWSTs at the municipal and district assemblies to identify a list of deprived communities; GWASH followed up with site visits to the communities and met with the opinion leaders and community members to introduce the project, gauge their enthusiasm, and set timelines for the drilling, construction and repair.

On the whole, the M/DWSTs and the municipal and district assemblies are satisfied because the initiative was geared towards remote communities where they themselves were unable to provide support. Community residents and leaders were enthusiastic and receptive, local contractors were pleased with the ease, speed and cost of the manual drilling initiative, and members of nearby communities also sought out assistance: "They saw the manual drilling as the surest way of getting water," says the GWASH Water Coordinator, "and also they will not cut their cocoa trees to pave way for a drilling machine." In providing mechanically drilled boreholes, some communities would have to clear portions of their cocoa trees and farms to create a path for the rigs; this was not required for the manually drilled boreholes.

In all cases, it has been less than a full year since the manually drilled boreholes were provided to the communities. All facilities are operational, have been handed over to communities and community WatSan Committees are in place and functional.

Communities and the M/DWSTs also made the following reinforcing comments:

- "The water has really helped us. We use it to mix the pesticide to spray our cocoa. We also use it to prepare kenkey. Even at first I used to walk long distance in the night to get water to make my kenkey, but now I do not do that again because we have a source of water close by." - *Seseko (Manual Drilling)*
- "The education they have provided for us has been very helpful. We do not fall sick like the way we used to before. We are all healthy especially those of us who follow what they have been teaching." - *Seseko (Manual Drilling)*
- "A community's borehole has been spoilt for so many years and they are not getting potable water to drink and somebody has come, with his or her full money and the community did not pay anything. So if you have starved for a very long time, and somebody has given you some seeds to plant, you take good care of the plants, so that always you will get food to eat. As GWASH has done it for the community, they will also take good care of it to sustain the water. So I am sure it will be different from the last time." -- *Assin South District Assembly*
- "We do not struggle too much in terms of walking distances to get water. We now get water to bath, to cook and to wash." -- *Awutu Breku (Manual Drilling)*

Communities patronize repaired boreholes and manually drilled boreholes mainly for drinking water and they use their other water sources (hand-dug wells, streams) for other household activities:

Most of the communities still use the old sources of water in addition to the GWASH facilities, especially for their house chores and for bathing. These sources of water are mainly the hand-dug wells, with or without a pump, and the surface water. The community respondents mentioned the various activities for which they use these sources:

- "Sometimes we go there to get some water to make bricks." -- *Awutu Breku (Manual Drilling)*
- "We still use it to wash and to make bricks" - *Seseko (Manual Drilling)*
- "We use the stream to wash our clothes and other chores." - *Tumfokor (Borehole Repairs)*

In some cases, the borehole repairs and manually drilled boreholes are not sufficient in the community to meet the community water demand for its population size. In these instances, community respondents said they still rely on their other water sources for their needs. One example is Sikan Bodua community, with a population of 700 and two repaired boreholes provided, which would provide water for an estimated 600 people:

- "We are too many in the community as compared to the water facilities in the community. So we still use the hand-dug well without pump." - *Sikan Bodua community (Borehole Repairs)*

How does the initiative support long-term sustainability, in terms of operations and management of the borehole facilities?

As part of the provision of water facilities (both manually drilled boreholes and borehole repairs), GWASH provided hygiene and behavior change education as well as retrained/facilitated the formation of and trained WatSan Committees in every community supported. The trainings provided to the WatSans and the community members have empowered them. The WatSan Committees believe that they are now better equipped and now know the importance of taking levies for the maintenance of the water facilities. In addition, the GWASH software team who lead the trainings say that overall, communities' management abilities and performance have improved.

In Cornerboy, a community that received a major borehole repair, the community's WatSan Committee has been trained two or three times, and respondents said although the community has always had a committee, at first it was "too relaxed" and its role wasn't taken seriously. Now, in addition to monitoring the collection of funds (managing a pay-as-you-fetch system of collection to generate funds for future repairs), the committee ensures that people in the town keep the vicinity around the borehole clean, scrubbing the area around the facility two days a week, on Tuesdays and Thursdays.

The community of Tumfokor, another community that received borehole repairs, has had an existing WatSan Committee that was refreshed with GWASH support. "We went through some training, especially the WatSan and other members of the community," the respondents said. With the repaired boreholes in place and functioning, the community has plans to (but has not yet) set up a pay-as-you-fetch water payment system. They've opted for this method, respondents said, "because the town is big and it is still expanding, and we cannot use any other method."

The community of Sikan Bodua, another borehole repair community, had an existing WatSan Committee that was retrained by GWASH. The committee is in charge of ensuring that the area around the borehole is kept clean, that community members do not wear slippers on the borehole platform, collects monthly levies to support future maintenance of the borehole and also ensured that young children do not fetch water from the borehole, for fear of misuse.

WatSans have improved in management, performance and funds collection: Before, many of the communities had poor ("bad") community management structures in place, but now they are rated as

“average” by GWASH’s software team. One example cited was Cornerboy community: “Their work so far is good,” says GWASH Behavior Change Agent for Assin North.

Before, some communities were not collecting funds for water usage. “But we emphasized on this in the training, they should focus on ways to be getting money,” says GWASH Behavior Change Agent for Assin North. “They should bring their passbook to show that ... they are now putting money in their accounts. The need to make them see this is important.”

In addition, community members and WatSans gained proper knowledge and appear to be properly using their facilities. The first step is to “make sure that everyone use the borehole,” says the Behavior Change Agent for Assin North. “If it’s functioning, people will generally be using it.”

The timing of the manual drilling and borehole repair initiatives limited the extent of software support provided to communities: Behavior change and building the capacity for community management is an ongoing activity. Typically, GWASH’s software team’s support to form, train and refresh WatSan Committees spans a year or more. “Typically, we would visit the community about four or five times, then after a year there was another refresher training until we hand everything over to the assemblies,” says the Behavior Change Agent for Assin North.

In the case of these new initiatives, less than a year was spent supporting the communities on software activities due to the time in the project (the initiatives started towards the end of the project timeline). This was generally less than the length of software support provides to communities that received water facilities earlier in the project. The timing of the initiative therefore negatively impacted the ability of GWASH’s software team to provided needed capacity building and hygiene education to sustainably strengthen community management and change behaviors in the long term to support the new and repaired facilities. “This was different because of the timing – the time that we started with the repairs, it was late in the project.” The Behavior Change Agent pointed out that typically, the software team would continue work in communities starting before the facility is provided, and spanning well after the facility is completed. “Some boreholes were still being finished, [but] WatSan formation was done.” we should go [again] after the platform is done, but our work there was done.”

“We didn’t even spend a year with the communities; after the WatSan training, just a follow-up, that’s all,” says the Behavior Change Agent for Assin North. “After the follow up, nothing else was done, and the district doesn’t have any planned program. There should be annual refresher trainings for WatSan Committees. They change membership (someone will travel, die, somebody may resign, some people may leave the community for opportunities elsewhere), so there should have been something there [such as ongoing refresher trainings lead by the Municipal or District Assembly], but there’s nothing like that. So the short time that [GWASH] has spent with them is not the best.... Every year, people leave and have to be replaced – no one trains these new people. How are they [WatSan Committees] to continue with the work?”

GWASH provided some traditional options for funds collection, but in the future, a key component of support should be developing and identifying locally tailored funds solution that work for communities: “Collecting funds – that depends on the trust that the community people have for the WatSan Committee members,” says the Behavior Change Agent for Assin North. “During the training, we really hammer on that – whatever money you take from the community, be accountable. If you do that, next time they will pay.”

GWASH typically suggested a few options to the communities and their WatSans, such as pay-as-you-fetch, household levy, kilo deduction and communal weeding. There are other options available, and other consid-

erations, such as timing of payments and incentives for those managing the facilities, as indicated by the GWASH Behavior Change Agent for Assin North:

- **The timing of the funds collection and incentives for funds managements should be key considerations as part of facilities management:** Charging according to the harvesting seasons and farmers' production is one way to collect funds in a means acceptable for communities in the region, such as charging more in the major season, and less during the minor season. "For many cocoa farmers, [providing contributions] depends on the harvest. If they don't get enough [harvest], they will tell you that they don't have money. During the main harvest time, they should charge higher. During the minor season, they charge lower. In that way, we should look at the ways that the WatSan Committees are using to mobilize funds. In some of the communities, we realize that they do communal weeding, community labor (to go to someone's farm to weed). During minor season, do it on credit. During the main harvest time, they go for the money and then put it in the account. They should continue with that practice. Everybody is involved in the weeding, so you get money. In this area, that practice is really working in some of the communities. They have to be innovative. In the [Western Region], kilo deduction was the best. Here [in Central Region], they don't trust the deduction at all, they believe in the weeding on credit."
- **In smaller-sized communities, WatSans must devise creative, yet feasible, means of collecting funds:** In small communities, WatSans Committees remain a powerful structure for community management, unlike in peri-urban communities, which tend to be larger, with a more diverse population. However, because of their small size, a system like pay-as-you-fetch in a small-sized community would not raise the necessary amount of funds to cover future borehole repairs. Such communities could consider such options in addition to or instead of that system: "If they do the communal weeding on credit, I think that helps."
- **In larger-sized communities, management through private organizations may be an option to explore:** An example of this is Abutia Teti, in Volta Region, where the Water and Sanitation Development Board (WSDB) pays itself a proportion of the funds raised through the funds collection. "In the big towns [peri-urban communities], I would recommend that instead of thinking of the communal [option], maybe they keep a percentage....For the bigger communities like Nyamebekyere, instead of WatSan, they should try a private organization to do the management for them then render accounts at the end of the year. We saw this in the Ashanti Region ... there was a private organization managing their water facility for them – a small town piping system that was being managed by a private company. Less likely to be voluntary when they could easily work in town and be making money. They will pay the private person."
- **Creatively explore incentives to reward WatSan Committees for their work:** Communal weeding (of a WatSan Committee member's farm) is one option. It could be structured as a communal labor day, where community members go to the individual's farm and support weeding. "It's not about cash, but so far as the person is seeing that the community realizes what they are doing for them." Another option is using community durbar-type celebrations and festivals to recognize the WatSan Committee members for their hard work. Another option is printing a certificate for them. "They can now boast of that certificate, the person will be very happy."

What are the challenges encountered and/or anticipated in terms of performance, usage and sustainability? Are communities now well equipped to address these expected future challenges?

The innovative facilities have proved favorable to some extent, but some communities are having a few challenges with the facilities that have been provided.

Performance: Communities expressed their challenges using the pumps and with the water quality

of some facilities:

- "Pumping the water is a bit hard. When we fetch and it gets to a point, it becomes difficult to fetch so you would have to wait a while before you continue."- *Cornerboy (Borehole Repairs)*
- "The water sometimes gets finished while we are fetching, so we have to wait for a while before we continue fetching... [pumping] becomes hard, then you would have to wait for a while before you continue pumping. Sometimes there are particles in the water."- *Sikan Bodua (Borehole Repairs)*
- "Some of the communities complain of the color of the water. Some communities have brought some samples of the water. Either the pipes are not up to the level of the water or they way below the level. About three communities brought up the complaints."- *Assin North Municipal Assembly*
- "With the borehole repairs, just one community has come to complain that the water does not flow, especially, in the dry season, but when in the wet season they have enough water."- *Assin North Municipal Assembly*

The roles of the community leaders, WatSan Committees, community members and Assemblies all play a role in supporting sustainability of water improvements: Most of the challenges that are likely to be encountered border on the leadership at the community level, the level of dedication of the WatSan members and the support of the Watsan by community members, the availability of the spare parts, and the role of the Assembly.

Leadership: At times, you enter the communities, and the leaders are not supportive, you will go up and down and then you will give up. The leadership at the community level is one of the most challenging things," says the Assin South District Assembly.

Community members' attitude and support of the WatSan Committee and community leadership affects sustainability. Cornerboy's WatSan Committee says that in general, it is able to generate funds for future repairs through a pay-as-you-fetch system. "Everybody buys the water. There is no problem with the selling. There is that understanding among the community," they said. However, the committee members admitted that on some occasions, people are able to break the padlock on the borehole pump and fetch water without paying.

WatSan Committees, among their other responsibilities, are in charge of collecting fees for future repairs. This appears to be one of the most challenging responsibilities, as some community members are not supportive:

- "Most of the people in the communities do not want to pay water tariffs, so they fetch the water free and when the hand pumps break down, they abandon the borehole, because they cannot bear the cost."- *Assin South District Assembly*
- "The challenge is the fetching and payment for the water. We sometimes go to the people about six times before they give us one cedi. But they are not paying the monthly levies willingly. We always have to follow them around. Some mothers even send their underage children to fetch, contrary to the laid-down rules. When you say [something] then they start insulting you."- *Sikan Bodua (Borehole Repairs)*

Both GWASH and assembly remarked on the importance of regular, follow-up refresher trainings for the WatSans, but with the project coming to an end, there is no system in place to ensure this for the receiving communities.

The WatSans Committees continue to rest at the core of the sustainability of these interventions and unfortunately, despite the software and capacity building support provided, the authority, recognition and agency

of these committees continues to be called into question at the community level. In some cases, the WatSan Committee itself is less than optimally performing; in many cases, even when the WatSan Committee is committed and aims to be operational, lack of community support undermines their potential:

- “For sustainability, everything depends on the WatSan; the WatSan need to be active.” - *Assin North Municipal Assembly*
- “But I think now due to the series of trainings that the WatSans have been receiving, they are now up and doing. They have even seen the need to take good care of the borehole. Also mobilize funds for future repairs. And now I think training of the WatSans Committees and how they suffered to even get their borehole repaired; now most of the communities have put systems in place to raise funds for the borehole repairs.” - *Assin South District Assembly*
- “We have a WATSAN Committee. We have 200 cedis. We take levies. Each person pays 5 cedis.” - *Seseko (Manual Drilling)*
- “The WatSan went down after the borehole broke down but now we are vibrant. We are working. The new thing that we have learnt is that it is important to take contributions for the borehole is very important” - *Sikan Bodua (Borehole Repairs)*
- “I was trying to teach them some of the things we the WatSan had gone to learn but one boy rudely passed a comment and everybody got up from the meeting. Ever since, we haven’t had a meeting with the community members.” - *Tumfokor (Borehole Repairs)*
- “They also do not meet but meetings are also key because it is at the meetings that you are also able to plan, share information and duties among yourselves. So if you don’t meet there is no way you can plan or you can share information and there is no way you can share responsibilities.” - *Behavior Change Agent for AOB*
- “The leadership/management, for e.g. some people sell the water and get a lot of money but an individual spends it so sometimes it is about the individuals in the committee. But if there is a system where people volunteer willingly and the process itself is transparent, there will not be such issues.” - *Behavior Change Agent for AOB*
- “Some also complain of insults and threats from the community members. Some of the WatSan members get fed up. Because when you go to community members and you tell them to contribute monies towards the maintenance of the facilities, they rain insults on them. Or go to the extent of even threatening them. So they also quit because the job is based on pure voluntary service.” - *Behavior Change Agent for AOB*
- “We had no WATSAN before. Some people were selected to go for the WatSan Training when GWASH came to repair our borehole. We do the pay-as-you-fetch. We have undergone training about 2-3 times. We had a WatSan Committee at first but it was not vibrant. At first, we were relaxed. Everybody buys the water. There is no problem with the selling. There is that understanding among the community members.” - *Cornerboy (Borehole Repairs)*
- “The issue is the assembly’s fault – if someone (donor) is giving you the facility and you are just doing the annual training, it would have sustained it, but the district isn’t doing that.” - *Behavior Change Agent for Assin North*

Cost and Availability of Spare Parts and Repairs: One continuing challenge is the prohibitive costs of borehole repair. Almost across the board, community respondents referenced the high prices of spare parts and borehole repairs as a prohibitive challenge to fixing their facilities. “The cost of repairing [the facility] was high. There is a river close by, so that is where we [used to] get the water,” said community respondents in Cornerboy community. Before repairs from GWASH, the community had one broken-down borehole, for close to three years. The community relied on one borehole and the nearby stream for its water needs. GWASH repaired the broken-down borehole, and the project retrained the WatSan Committee to strengthen its management role.

- The community of Sikan Bodua also lacked the funds to fix their broken-down boreholes. When asked why they community had not fixed the borehole earlier, they cited lack of funds as a factor: "The parts were spoilt and expensive and we could not afford it," they said.
- "Sometimes they don't even care about the quality...When the community members hear the cost [required for] the repair, they think the cost involved per head is very high...[whereas] when they go to the river or stream, it's free."- *Behavior Change Agent for Assin North*

"I think for the hardware, one relates to availability of the spare parts. The cost charge by the area mechanics...you know they don't have fixed amounts there, the individual mechanic can determine how much he will charge, normally the cost is very high, much higher than the market rate."- *Behavior Change Agent for AOB*

As part of the borehole toolkits provided to trained borehole mechanics, the Ghana WASH Project estimated the prices of more than 20 tools and spare parts provided to the borehole mechanics. The mechanics would have some extra parts, such as pumps, and when they used these spare parts to fix a borehole, they could easily replace it to keep their stock up to date. GWASH worked in close association with the assemblies to attempt to regulate the borehole mechanics' work – on the one hand, to provide support to the communities in contacting the mechanics when needed, and also in case the mechanics attempt to quote exorbitantly high prices for spare parts.

MOVING FORWARD: LESSONS LEARNED FROM GWASH'S MANUAL DRILLING AND BOREHOLE REPAIR INITIATIVES

- Manual drilling and borehole repairs both provide key opportunities to expand the options of improved water facilities for communities. Both are lower cost methods of improving water access, and both initiatives have built local expertise in these sectors to support sustainability. Future WASH projects should continue and build upon this initiative, collaborating with existing local expertise when possible and building new local expertise in different regions.
- Timing of these interventions is critical and in future projects, these types of initiatives should be planned earlier to allow the full extent of software support, in the forms of capacity building and hygiene education. For example, all such water facilities should be completed in the penultimate year of the project, to allow software follow up, refresher training and ongoing support in the project's final year.
- There is a strong need for the assemblies to continue on playing a role in communities, through the provision of refresher trainings for WatSan Committees. Future projects should consider not only the long-term sustainability of at the community level, but also at the Assembly level, and integrate supporting the sustainability of the assembly to support the communities into its objectives. Monitoring the facilities occasionally will continually remind the communities of their duties in paying for the water. The District and Municipal Assemblies should organize periodic refresher courses for the WatSans. This will serve as platform for the communities to share ideas and learn from one another. It will also be an opportunity for the DWSTs to address the challenges that come up with serving on the committees.
- Education should be provided for members of the community on how to handles water from other sources, by the WatSan committee members and the Environmental Health Agents (EHAs) from the Assemblies.
- Just as the construction/repair initiative relies on financial incentives, future projects should look into financial incentives and strategies for securing the functioning of WatSan Committees, including fee collection methods as well as manners of providing tokens of appreciation to the committee mem-

bers to keep them motivated in their work. This can be in the form of certificates, some services, for example the town weeding for members of the WatSans, recognition during festivals and other durbars.

- Future projects should work with community members to ensure they understand the expected costs of repairs, fee collections to the sustainability of their boreholes. The communities could collaborate with their WatSan Committees to set agreed financial targets and plan financially how to reach their goals.
- The Assembly should regulate the area mechanics' service charges and fees for spare parts. Faults should always be reported to the assemblies as well as the performance of the area mechanics.
- The capacity of the WatSans should also be built towards water quality issues, where the communities should be responsible to periodically initiate water quality testing for their facilities to ensure that the water they consume is free of both underground and surface pollutions especially in this era of illegal mining activities that involves the use of toxic chemicals. This can be done using funds mobilized at least once in a year.



GWASH-trained artisans conduct a major borehole repair on broken-down facility in Nyamebebu in Central Region.



A minor borehole repair on broken-down facility in Kruwa community in Central Region.



Demonstrating the strength of a repaired borehole facility.



WatSan Committee discusses their role in managing their newly repaired borehole.