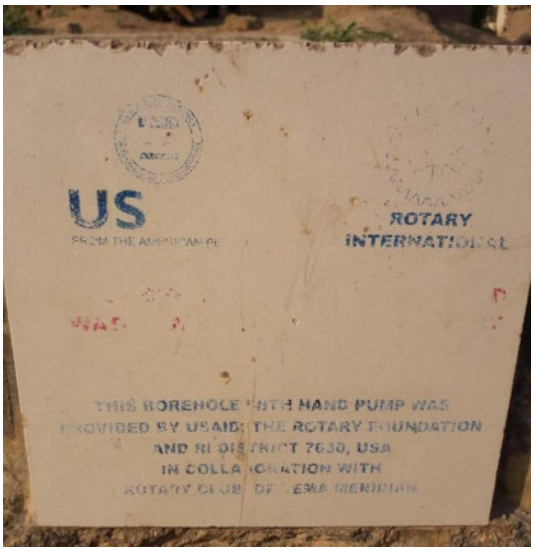
Retrospective assessment of the sustainability of Rotary International and USAID's Phase One International H_2O Collaboration interventions in Ghana



Final Report

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AGUA CONSULT

MAPLE CONSULT
MANAGEMENT PLANNING & ENVIRONMENT

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This report is the primary output of the retrospective assessment of Rotary International and USAID's Phase One International H_2O Collaboration interventions in Ghana, which was conducted by Aguaconsult and MAPLE Consult. The report was researched and written by Bill Twyman, Harold Lockwood and Delia Sanchez Trancon of Aguaconsult and Christopher Sackeyfio and Kwaku Kwarteng of MAPLE Consult.

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EXECUTIVE SUMMARY

Between December 2018 and May 2019, Aguaconsult and MAPLE Consult conducted a retrospective assessment of the sustainability of Rotary International and the United States Agency for International Development's (USAID's) Phase One International H_2O Collaboration (IH_2OC) interventions in Ghana, which were implemented between 2011 and 2013. The study's objective was to determine the key drivers of sustainability for these interventions and to utilize these findings to formulate recommendations for ongoing and future IH_2OC interventions in Ghana. The study involved assessing 12 community hand pumps, three community mechanized boreholes, two community reticulated systems, eight school latrine blocks and hygiene and hand washing promotion activities in 17 communities.

While the study involved assessing the functionality and service levels of these interventions, the primary focus was on evaluating the capacity and performance of actors and organizations at the national, district and service provider levels across five factors: institutional, management, financial, technical and environmental. Additionally, 343 household surveys were conducted to establish household water and hygiene practices, as well as to determine the service levels provided by the water facilities and to solicit views on service provider performance.

After between seven and eight years of operation, the assessment of the Phase One IH2OC program found a mixed picture in terms of the on-going functionality and likely sustainability of WASH interventions. Community hand pumps had the lowest functionality rate, whilst all the assessed community mechanized boreholes and reticulated systems were functional. Of the eight school latrine blocks, six were found to be fully functional, and two were only being partially used. Regarding service levels, all of the water supply interventions provided moderate to high service levels; however, school latrine blocks provided poor service levels, reflecting their poor management.

The overarching finding from software component of the retrospective sustainability assessment was the largely projectized nature of the interventions, which reflects a broader trend in Ghana's rural water, sanitation and hygiene sector. Critically, although key policies, guidelines and institutional frameworks are well-established for each of the five intervention types assessed, when most externally funded aid projects close, Municipal and District Assemblies have very little in terms of resources for follow-up and sustaining key aspects such as monitoring, technical support or repeat hygiene and health promotion. This is not surprising considering that only four percent of WASH sector investment is derived from domestic public funding (government) (UN Water and World Health Organization, 2017, p.51).

Although assessed interventions were largely built in line with national guidelines and there were some instances of good management of the facilities by service providers, the insufficient support provided to service providers from Municipal and District Assemblies had a significant negative impact on the management and financial performance of the assessed interventions. A primary area of concern was for community hand pumps, where there was an inability to raise sufficient tariff revenues to repair broken down hand pumps. Noteworthy, issues were also found for the school latrine blocks, with schools struggling to manage the facilities properly and there being a lack of funding to cover the major operational and capital costs. Hygiene messaging and knowledge of positive behaviors was found in two-thirds of households surveyed, but translation of these into sustained, safe hygiene practices appears to be undermined by the lack of active community-based hygiene promoters. Community mechanized boreholes and reticulated systems performed notably better; however, the impact of the lack of support and monitoring from Municipal and District Assemblies are, nevertheless, still being felt.

The study's findings were used to formulate recommendations for future and ongoing IH_2OC interventions in Ghana. These include carrying out more in-depth assessments prior to program design (e.g. water point mapping and analysis of economic and demographic profile), adopting a flexible implementation program that responds to different communities' needs by enabling them to select desired service levels (e.g., a mechanized borehole over a hand pump), for school sanitation interventions to involve the signing of facility management plans and for Rotary Ghana to enhance its advocacy efforts at the district and national levels.

CONTENTS

ACRONYMS

BCC	Behavior Change Communication
CWSA	Community Water and Sanitation Agency
EHSU	Environmental Health and Sanitation Unit
IH_2OC	International H_2O Collaboration; a global partnership between Rotary and USAID
MMDA	Metropolitan, Municipal and District Assembly
MSWR	Ministry of Sanitation and Water Resources
NGO	Non Governmental Organization
SHEP	School Health Education Programme
SIT	Sustainability Index Tool
USAID	United States Agency for International Development
WASH	Water, Sanitation and Hygiene
WSMT	Water and Sanitation Management Team

1. INTRODUCTION

1.1 THE INTERNATIONAL H_2O COLLABORATION'S PHASE ONE INTERVENTIONS IN GHANA

The International H_2O Collaboration (IH_2OC) is a global partnership between Rotary International and the United States Agency for International Development (USAID). The IH_2OC was formalized in 2009 and supports lasting, positive change in water, sanitation and hygiene (WASH) through combining the business skills and leadership of Rotarians with USAID's technical expertise and government relationships. Ghana was one of three countries where the IH_2OC was piloted, and between January 2011 and January 2013 a series of WASH interventions were implemented.

The Phase One IH_2OC interventions in Ghana were implemented in six Municipalities and Districts (Ga West Municipality, Abuakwa South Municipality, Awutu Senya West District, Agona East District, Ho Municipality and Ho West District) across four regions (Greater Accra, Eastern, Central and Volta). The objective of the interventions was to meet and sustain crucial WASH needs through the construction of:

- 77 community hand pumps;
- Three reticulated (piped) systems; and
- 44 institutional latrine blocks (40 of which were in schools).

The majority of these interventions were implemented in rural areas. To increase the intervention's sustainability – and maximize their impact – several software activities were undertaken. These included:

- Building the capacity of beneficiary communities to manage the interventions through setting-up and training Water and Sanitation Management Teams (WSMTs);
- Training school-based health coordinators in their roles and responsibilities, the national School Health Education Program (SHEP) strategy and policy and the proper operation and maintenance of latrine blocks;
- Training community-based hygiene promoters to convey key Behavior Change Communication (BCC) messages; and
- Development and promotion of BCC messages.

Rotary partnered with the Community Water and Sanitation Agency (CWSA) to construct the water and sanitation infrastructure in the Volta and Eastern Regions, as well as water infrastructure in the Central Region. USAID was responsible for water and sanitation infrastructure in the Greater Accra Region and sanitation infrastructure in the Central Region. Additionally, USAID oversaw capacity building and BCC activities in all four regions. To execute these activities, USAID partnered with Relief International, which, in turn, operated through several local non-governmental organizations (NGOs) that conducted program activities at the community level.[1]

In 2016, Phase Two of the IH_2OC in Ghana was initiated in partnership with Global Communities and CWSA. This program involves the construction of 89 community hand pumps, six mechanized boreholes, 130 institutional latrines (most of which are in schools), eight water closet toilets and six micro-flush toilets for institutions as well as capacity building and BCC activities. These interventions are being implemented in 13 Municipalities and Districts across the Greater Accra, Eastern, Central, Volta, Western and Northern regions.

1.2 DEVELOPMENT OF THE SUSTAINABILITY INDEX TOOL

Ensuring the sustainability of WASH interventions is a pressing challenge, and non-functionality rates of between 30 and 40 percent are consistently cited for hand pumps in developing countries (Lockwood et al., 2003; RWSN, 2009; Lockwood and Smits, 2011; World Bank, 2017.a). In 2012, aware of the threats posed to the sustainability of IH_2OC interventions, the partnership commissioned the UK-based firm

[1] Development fortress was contracted for the implementation of activities in Agona East District (Central Region), Impact for Awutu Senya West District (Central Region), CRED for Abuakwa South Municipality (Eastern Region), RAF for Ga West Municipality (Greater Accra Region) and EDSAM for Ho West District and Ho Municipality (Volta Region).

Aguaconsult to undertake a strategic evaluation of the likely sustainability of the Phase One IH_2OC interventions and provide recommendations for future IH_2OC programs.

To conduct this evaluation, the Sustainability Index Tool (SIT) was developed.[2] The SIT assesses the extent which crucial sustainability criteria are being met at the household, service provider, district and national levels across a range of indicators and sub-indicators that are grouped under five factors: institutional, management, financial, technical and environmental. By focusing on these factors, the SIT expands the assessment of WASH interventions beyond the hardware components of infrastructure (pumps, latrines and pipes, etc.) to also include critical software components (e.g., reliable management entities, sufficient and sustainable financing, and long-term external support and monitoring), which are required to keep the infrastructure working.

The 2012 application of the SIT to the Phase One IH2OC interventions provided critical insights into factors that would likely undermine or contribute to the interventions' sustainability. This information was used to develop operational and advocacy recommendations for improving the sustainability of future IH_2OC interventions.[3]

1.3 2019 RETROSPECTIVE APPLICATION OF THE SUSTAINABILITY INDEX TOOL

In December 2018, Aguaconsult and MAPLE Consult were contracted to undertake a retrospective assessment of the sustainability of Rotary International and USAID's Phase One IH_2OC interventions in Ghana by re-applying the SIT. The study's objectives were to identify the functionality and service levels of the Phase One IH2OC interventions seven to eight years following their implementation, to use the SIT to highlight the likely threats to the sustainability of existing – and future – IH_2OC interventions, and to develop practical recommendations for future IH_2OC programs. The study's findings and recommendations were presented at a validation meeting of project stakeholders at the end of April 2019. The information and feedback provided during this meeting has been incorporated into this final report.

1.4 STRUCTURE OF THE REPORT

This report is the primary output of the retrospective assessment of the sustainability of Rotary International and USAID's Phase One IH2OC interventions in Ghana. The report is structured as follows and contains six further sections:

- Section Two provides an overview of Ghana's rural WASH sector;
- Section Three provides an overview of the SIT and outlines the study's methodology;
- Section Four details the functionality and service level of the assessed interventions as well as the findings from the 2019 retrospective application of the SIT;
- Section Five outlines the conclusions that have been drawn from the application of the SIT;
- Section Six compares the results of the findings from the 2012 and 2019 applications of the SIT to the Phase One IH_2OC interventions in Ghana, looks at the predictive value of the SIT and details lessons learnt about retrospectively applying the SIT; and
- Section Seven provides recommendations for future IH_2OC programs in Ghana as well as possible advocacy efforts for Rotary Ghana to adopt alongside WASH investment programs.

[2] The Sustainability Index Tool is free to use and comes with an in-depth guide on how best to use it. This can be downloaded at: http://washplus.org/rotary-usaid.html

[3] The report on the Sustainability Index of WASH interventions: Global Findings and Lessons Learned can be accessed at: http://www.washplus.org/sites/default/files/WashSustainabilityIndex.pdf

2. RURAL WASH SECTOR OVERVIEW

2.1 INTRODUCTION

Ghana's rural WASH sector has undergone significant changes in recent years. Notably, in February 2017, the Ministry of Sanitation and Water Resources (MSWR) was established. Additionally, in recent years, Ghana's national budget for WASH has nearly halved (in 2018 it was just GHC 189 million or equivalent to USD 35.09 million), and according to UN Water and the World Health Organization, in 2017 the Government of Ghana now provides just four percent of total WASH expenditure in the sector. This section details the institutional arrangements and, where data exists, discusses current coverage levels for water supply, school sanitation and hygiene and hand washing promotion.

2.2 WATER SUPPLY

The MSWR is the lead government institution for the rural water sub-sector; it is responsible formulating policies, legislation, and strategies as well as resource mobilisation, sector coordination and monitoring and evaluation. Ghana's rural water sector is guided by the 2007 National Water Policy and the 1994 National Community Water and Sanitation Programme, which is to be achieved through the 2014 National Community Water and Sanitation Strategy.

The 1994 National Community Water and Sanitation Programme empowers communities to manage water systems through WSMTS, which are responsible for the day-to-day management of water systems, tariff proposal, operations and maintenance, and tariff collection. This approach creates a key role for community members; who are responsible for expressing an initial demand for services, paying a tariff and ensuring accountability from WSMTs and Metropolitan, Municipal and District Assemblies (MMDAs) when services are not adequately delivered.

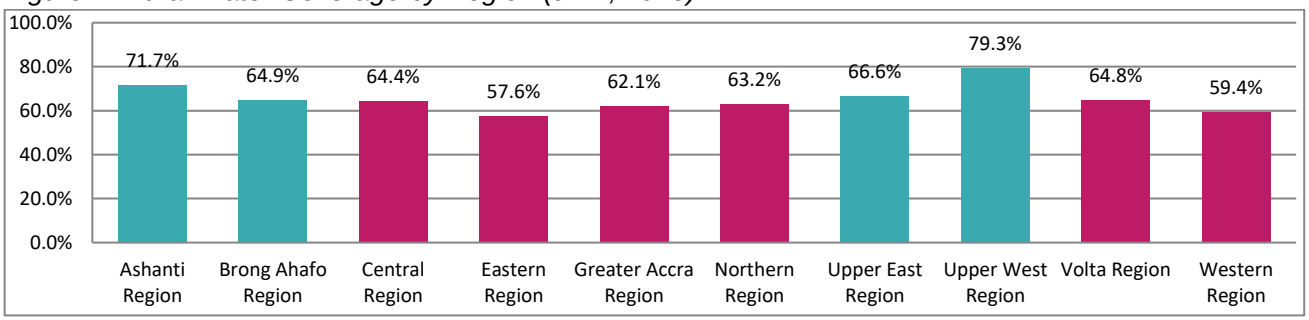
The CWSA is responsible for facilitating and coordinating the execution of the 1994 National Community Water and Sanitation Programme. CWSA's primary roles involve facilitating the construction and development of safe water and related sanitation and hygiene services to rural communities and small-towns and improving the capacity of Ghana's 254 MMDAs to deliver WASH services. CWSA is undergoing a process of re-orientation, through which it has begun piloting the direct management of 89 reticulated (piped) systems in rural areas (as of December 2018).

Legal ownership of water supply systems is vested upon MMDA's, which hold a variety of responsibilities including tariff approval, monitoring and auditing WSMTs and (major) maintenance support. The decentralisation process is ongoing, and Assemblies' Water Units remain weak – the Office of the Head of Local Government Service estimated that around 80 percent of Water Units are un-staffed or have sub-professional officers in place (Lockwood et al., 2017).

The 1994 National Community Water and Sanitation Programme also outlines a role for the private sector private actors can be engaged to play a variety of roles such as infrastructure construction and rehabilitation, the one-off repair or maintenance of broken-down infrastructure, capacity building of WSMTs and sanitation and hygiene promotion.

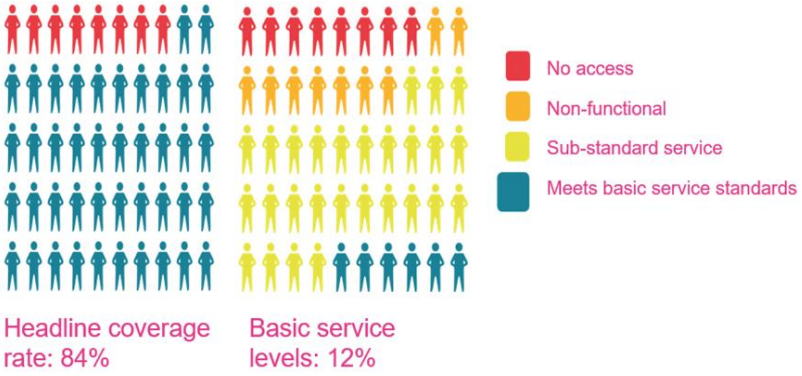
Access to improved water sources has increased substantially; Ghana achieved its Millennium Development Goal target for water ahead of schedule and between 1990 and 2015 access to an improved water source rose from 56 to 89 percent (JMP, 2015). Nevertheless, as Figure 1 illustrates, significant improvements are still required if the Sustainable Development Goals' ambitious target of universal and equitable access to safe and affordable drinking water for all is to be met in rural areas.

Figure 1: Rural Water Coverage by Region (JMP, 2015)



Looking beyond headline coverage figures, significant sustainability issues undermine access to improved water sources. Notably, as Figure 2 highlights, the service levels that users receive for drinking water are far lower than coverage rates indicate. Critically, of the assessed water points, 18 percent were non-functional, 54 percent provided a sub-standard service (for instance, failing CWSA criteria for reliability, crowding and accessibility) and just 12 percent provided users with a service in line with CWSA standards. Similarly, in some of Ghana's Districts just 2 percent of point source water supplies meet CWSA standards and between 22 and 30 percent of water points are non-functional (Adank et al., 2012).

Figure 2: Service levels of Hand Pumps and Piped Systems (IRC, 2015)



2.3 SCHOOL SANITATION

The software components of school sanitation and hygiene promotion are implemented under the School Health Education Programme (SHEP), the primary objective of which is ensuring the availability – and proper use – of improved water and sanitation facilities in schools. There is a National SHEP Coordinator that is responsible for the overall coordination of the SHEP programme, providing requisite financial and administrative support, as well as the development of strategies and interventions. Below this, there are Regional SHEP Coordinators (in the Regional Education Directorates) and District SHEP Coordinators (in the District Directorate of Education), who are responsible for stimulating and supporting WASH activities in schools, prioritising the selection of schools for WASH activities and ensuring effective implementation and dissemination of relevant policies and information within schools. In turn, every school should have a designated school-based health coordinator, who leads the planning and implementation of SHEP activities.

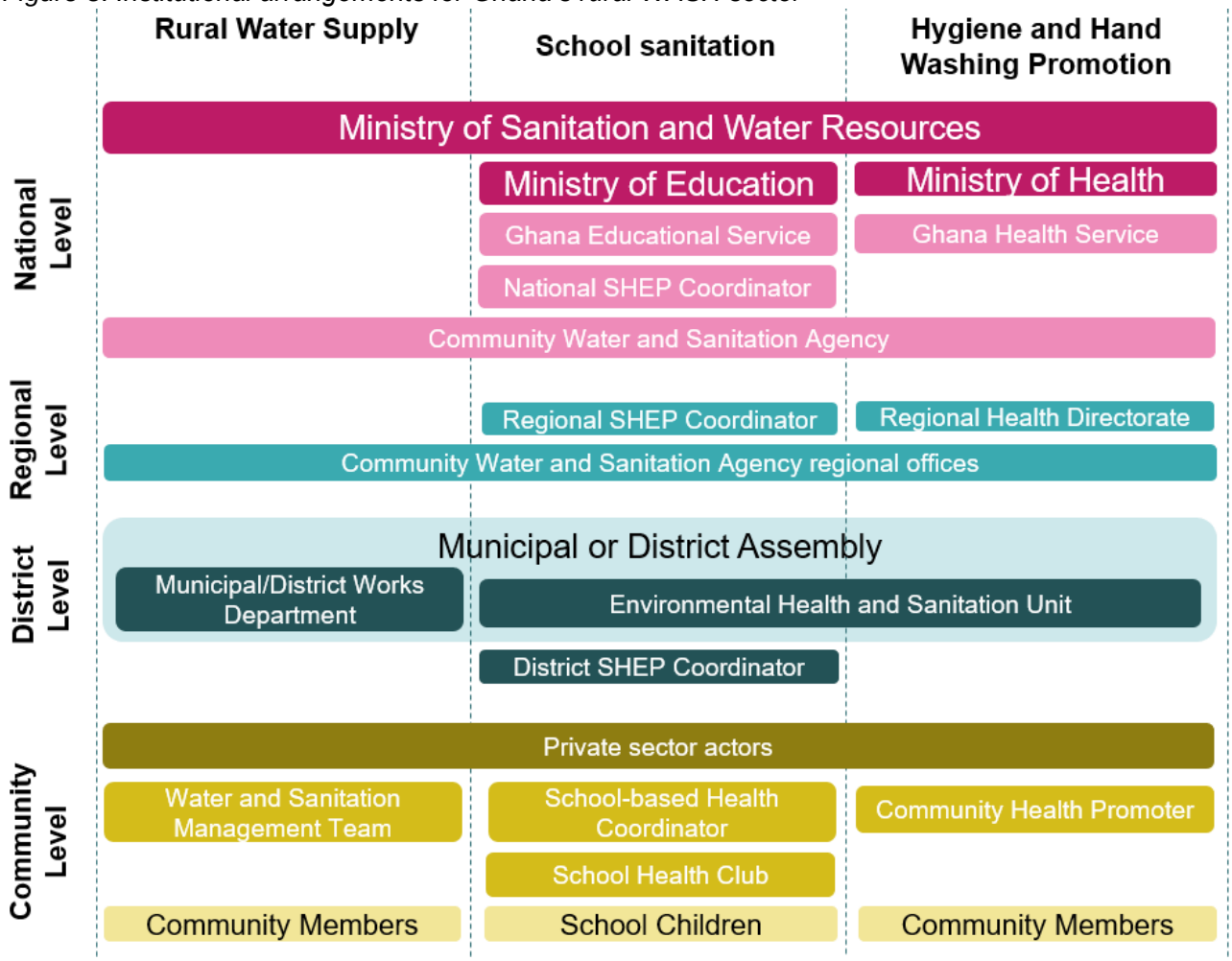
MMDAs also play an important role in school sanitation, and their activities are conducted through their Environmental Health and Sanitation Units (EHSUs). MMDAs' responsibilities include the initial construction of facilities, monitoring the use and maintenance of facilities, provision of desludging services and conducting/facilitating major repairs and rehabilitation.

Ensuring that sanitation facilities exist in Ghana's schools remains a pressing challenge – 31 percent of Ghanaian schools have no sanitation service (JMP, 2018). Additionally, substantial discrepancies exist in the coverage of sanitation facilities in private and public schools – while 79 percent of private schools have a sanitation facility only 56 percent of public schools do (JMP, 2018). The percentage of schools with properly functioning toilets is undoubtedly far lower than these figures suggest.

2.4 HYGIENE AND HAND WASHING PROMOTION

Responsibilities for hygiene and hand washing promotion are fragmented. The Ministry of Health, through the Health Education Unit of the Ghana Health Service, has traditionally been at the forefront of health education. The unit designs and produces various visual and audio-visual support materials to complement the health education activities of the Ghana Health Service, and typically provides support to national campaigns. Additionally, MSWR's Environmental Health and Sanitation Directorate oversees all environmental health workers, with 10 Regional EHSUs that provide direct facilitation and supervision of staff within MMDAs. At the MMDA level, the EHSU is responsible for environmental health education and related enforcement functions. CWSA also facilitates hygiene and hand washing promotion as a basic requirement for all water and sanitation projects. MMDA's Environmental Health Officers typically conduct BCC with facilitation support offered by the extension support staff of CWSA.

Figure 3: Institutional arrangements for Ghana's rural WASH sector



3. METHODOLOGY

3.1 THE SUSTAINABILITY INDEX TOOL

The SIT assesses the extent to which critical software elements of WASH interventions are being met through providing a framework for the collection of quantitative and qualitative data on a range of indicators and sub-indicators that are grouped under five factors:

- *Institutional* indicators look at the quality and extent of national policies and guidelines for the WASH intervention, whether institutional frameworks have been implemented at the District level and that service providers (WSMTs, school-based health coordinators and community-based hygiene promoters) are in place and constituted in line with national guidelines;
- *Management* indicators focus on whether there is a national level monitoring database, if Assemblies receive enough support in areas such as training, if WASH services are monitored and whether service providers understand and perform their functions;
- *Financial* indicators probe whether service providers have enough financial resources to sustain desired service levels, whether there are mechanisms to support service providers in meeting these costs and if Assemblies have sufficient human and financial resources to fulfil their functions
- *Technical* indicators primarily focus on the functionality and service levels provided by the WASH; facility; however, this factor also look at the availability of spare parts and technical support from private suppliers and whether Assembly staff can support service providers in repairing their WASH facilities; and
- *Environmental* indicators look at national environmental protection standards and whether natural resources are managed to support sustainable WASH services.

The SIT does not just look at the extent to which sustainability criteria are being met at the household and service provider levels, it also looks at the wider enabling environment that the WASH interventions exist within by assessing the district and national levels:

- At the *household* level, the SIT assesses the services that households are receiving, households WASH habits and practices, as well as their assessment of service providers' performance;
- At the *service provider* level, the functionality and service level of the infrastructure is assessed, and the capacity and performance of the service provider is evaluated;
- At the *district* level, the conditions and capabilities of local government actors responsible for providing important oversight and support functions are assessed. Local government is the central actor evaluated at this level, but the assessment also looks at the performance of District SHEP coordinators and local private sector actors; and
- At the *national* level, the SIT assesses the policies, institutions and functions termed the 'enabling environment'.

In Ghana, a variety of organizations play an important role at the regional level. For instance, CWSA and regional SHEP coordinators are responsible for providing support to the district level. The SIT does not assess the capacity and performance organizations at the regional level in isolation; however, their capacity and the performance of their functions has a significiant bearing on the national level scores.

The SIT is used to analyze a set of specific WASH interventions. For each WASH intervention being assessed, the SIT provides a framework made up of a set of indicators that are grouped under the five factors. These indicators are, in turn, made up of several sub-indicators that directly relate to questions to be asked to relevant stakeholders at the household, service provider, district and national levels. In total, the community hand pump and community mechanized borehole SIT frameworks was made up of 82 sub-indicators, the community reticulated system framework was made up of 83 sub-indicators, the school latrines framework was made up of 66 sub-indicators and the hygiene and hand washing promotion framework was made up 37 sub-indicators. Each set of answers against sub-indicator questions are then scored based on either qualitative or quantitative data.

At the highest level, the outputs of the SIT are sustainability scores for each of the five factors, for each type of intervention assessed. The factor scores for each intervention type are formulated by averaging

the scores for each of the indicators that make up the factor. The indicator scores are arrived at through adding up the scores for the sub-indicators that make up that indicator (for instance, if three of an indicators four sub-indicators scored positively it would receive an indicator score of 75 out of 100). Annex 1: SIT Example Scoring provides outlines how the scoring system works for the institutional factor for community hand pumps. Scores can be viewed for each individual intervention (e.g., a score for a specific community hand pump or school latrine block), or scores can be aggregated to the service provider, district or national level to establish how well each of these levels is performing. From these scores, it is possible to identify the specific issues that pose the greatest risk to the sustainability of a set of WASH interventions.

3.2 CONTEXTUALIZATION OF THE SIT

A key step in applying the SIT is contextualizing the generic frameworks that come with the Tool to the country and areas within which it is being applied. This contextualization is critical as it ensures that the frameworks are in line with Ghana's WASH sector in 2019 and, therefore, accurately probe the key factors that have undermined or contributed to the sustainability of the interventions.[4] It is important to note that by using recent documents to contextualize the frameworks, some of the criteria against which the indicators are being judged were not in place when Rotary International and USAID's Phase One IH_2OC interventions were implemented. For instance, requirements on the inclusion of a changing room for girls have changed as part of new policy. Where these changes have occurred, they are highlighted in the text.

3.3 SAMPLING PROTOCOL

Because this retrospective application of the SIT to Rotary International and USAID's Phase One IH_2OC interventions required returning to the same communities and interventions that the SIT was applied to in 2012, the sampling protocol for the 2019 retrospective application is the same as for the 2012 application.

In 2012, stratification of the communities and interventions to be sampled was based on regions (Greater Accra, Central, Eastern and Volta). The sample frame selection was carried out independently for each type of intervention (excluding hygiene and hand washing promotion, which was included with all water supply interventions), and within each region, communities were randomly selected. Four communities with water interventions were randomly selected per region, except for the central region where five communities were selected. Two schools with completed latrine blocks were chosen randomly in each region. This resulted in a geographically representative list of interventions and communities (sample frame), which included interventions from each of the six Municipalities and Districts that Phase One IH_2OC interventions occurred in. Table 1 details the interventions assessed (assessment of the Hygiene and Hand Washing interventions occurred in all instances where community hand pumps, community mechanized boreholes and community reticulated systems were assessed).

Table 1: Summary of assessed interventions

District/Region	Community Hand Pump	Community Mechanized Borehole	Community Reticulated System	School latrine
Greater Accra, Ga West Municipality	Ahasowudie Ebenezer, Kutunse, Kpanalfia,	Abensu		Nsakiana DA Primary, Manheam MA Primary
Eastern Region, Abuakwa South Municipality	Pano, Abokobi (Hoese), Amanfrom	Apedwa Tema		Asafo Secondary School, Akwadum RC Primary
Central Region, Awutu Senya West District	Afadjator, Kweshi Abe, Anomawobi			
Central Region, Agona East District	Kofi Tabilkwa, Oboyambo			Nsaba AMF Primary/ SHS, Aboana ADA Primary

[4] The generic frameworks were contextualized to Ghana's WASH sector by reviewing key sector documents such as the 2007 National Water Policy, the 2010 Environmental Sanitation Policy, the Local Governance Act (936), 2016, CWSA's 2014 Project Implementation Manual, CWSA's 2014 Framework for Assessing and Monitoring rural and small-town water supply services in Ghana, CWSA's 2014 District Operating Manual, the 2015 Rural Sanitation Model and Strategy and the 2014 School Health Education Programme Policy Guidelines.

Volta Region, Ho Municipality		Lume Atsyame	Nyive	Nyive LA Primary School
Volta Region, Ho West District	Avenui Camp		Abutia Teti	Tsito EP Primary School
Total	**12**	**3**	**2**	**8**

Three of the assessed interventions believed to be community hand pumps prior to the field work were subsequently found to be mechanized boreholes. In two instances (Lume Atsyame and Apedwa Tema), the community hand pump was upgraded to a mechanized borehole by the WSMT, while in one case (Abensu) a mechanized borehole, not a hand pump, was constructed by the NGO (RAF) in 2011.

Figure 6 shows the location of the six Municipalities and Districts that the study worked in and the interventions assessed. Systematic random sampling was used for the selection of households to complete the household surveys for the community hand pump, community mechanized borehole, community reticulated system and the hygiene and hand washing promotion interventions. Seventeen household surveys were conducted for interventions located in rural areas, 27 for interventions in peri-urban areas and 35 for the community reticulated systems located in small-towns/rural growth centers. Because all the household surveys included the appropriate hygiene and hand washing promotion questions, a statistically significant number of these surveys were conducted (97.5 percent confidence interval, seven percent margin of error and a population distribution of 0.5 percent). Additionally, a statistically significant number of household surveys were conducted for the community handpumps (90 percent confidence interval, seven percent margin of error and a population distribution of 0.5 percent); however, the number of household surveys for the community mechanized boreholes and community reticulated systems was not statistically significant.

Figure 4: Map of assessed interventions

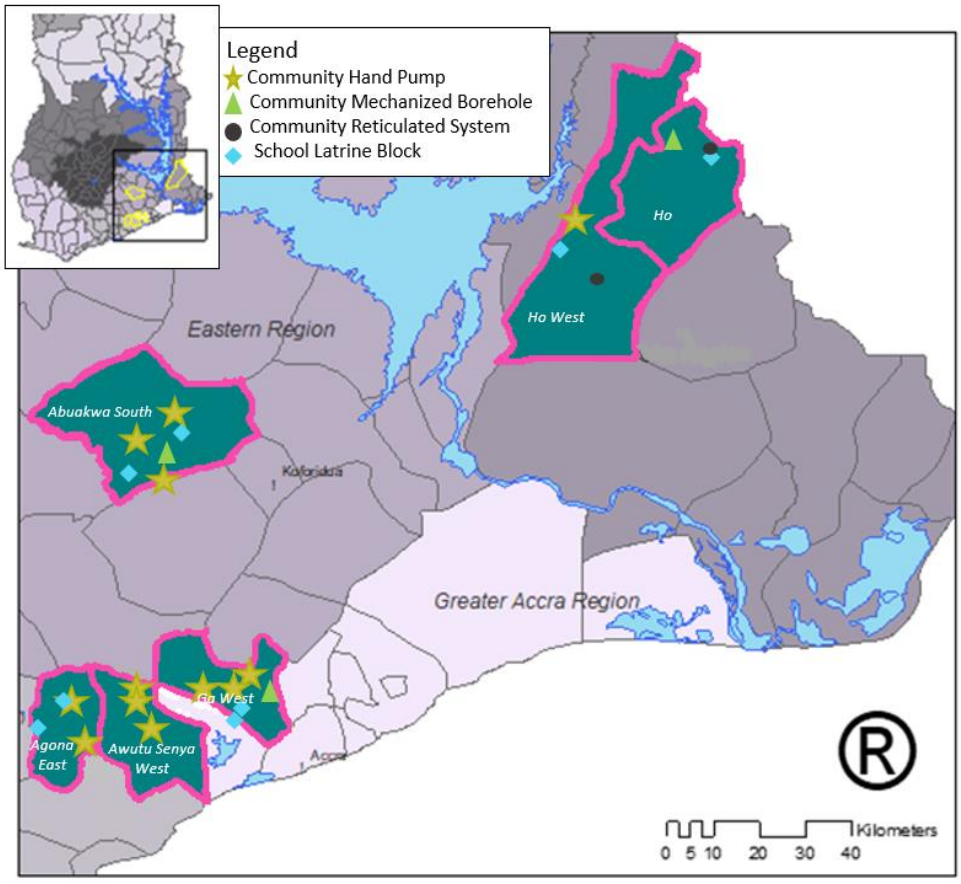


Table 2 outlines the population, the percentage of the population that live in rural and urban areas and the main sources of drinking water for the six Municipalities and Districts that the Phase One IH_2OC interventions were implemented within.

Table 2: Municipalities and Districts: Background Information

Muncipality/ District	Population	Percentage of the population living in rural areas	Main soruces of drinking water
Ga West Municipality	262,585	36.9%	Sachet (63.2%); pipe borne outside dwelling (10.5%); pipe borne inside dwelling (8.5%)
Abuakwa South Municipality	203,403	40%	Borehole/ pump/ tube well (30.4%); river/stream (15.9%); protected well 13.7%)
Agona East District	100,735	56.7%	Public tap or stand pipe (38.3%); borehole/ pump/ tube well (19%); pipe-borne outside dwelling (16.9%)
Awutu Senya West District	101,631	52.9%	Pipe-borne outside dwelling (25.6%); public tap/stand pipe (19.1%); river/stream (17.1%)
Ho Municipality	213,960	37.9%	Pipe-borne outside dwelling (33%); pipe-borne inside dwelling (25.6%); public tap/ stand pipe (18.6%)
Ho West District	114,586	New district (2016) – no data	New district (2016) – no data

3.4 STAKEHOLDERS AND INSTITUTIONS CONSULTED

Table 3 outlines the stakeholders consulted for each type of intervention assessed at the household, service provider, district and national levels.

Table 3: Stakeholders and institutions consulted at each level of investigation

Type of intervention	Household	Service Provider	District	National
Community Hand pumps	235 heads of household	WSMTs	MMDAs	CWSA
Community Mechanized Borehole	38 heads of household	WSMTs	MMDAs	CWSA
Community Reticulated Systems	70 heads of household	WSMTs	MMDAs	CWSA
Hygiene and hand washing Promotion	343 heads of household	Community-Based Hygiene Promoters	MMDAs	MSWR
School Latrines	No consultation	School-Based Health Coordinators	MMDAs/ District SHEP Coordinators	MSWR

At the national level, key sector documents related to the five types of interventions assessed were reviewed to obtain the required data for the SIT,[5] and this information was then validated by MSWR and CWSA. At the district level, relevant Assembly personnel including District Planning Officers, District Engineers, Community Development Officers and Environmental Health Officers and Assistants answered the surveys. For the school latrines the District SHEP Coordinator was also consulted. Annex 2: Official Consulted at the District Level details the individuals consulted in each of the six Municipalities and Districts that the project operated in.

At the service provider level, data was collected for the community hand pump, community mechanized borehole and community reticulated system interventions from all available WSMT members. For the school latrines, data was collected from school-based health coordinators and for the hygiene and hand washing promotion interventions data was collected from every available community-based hygiene promoter within the community. For the community hand pump and mechanized borehole interventions, the service provider data collection also involved the use of Aquagenx CBT *E. Coli* kits.[6] Data was collected at the household level from household heads.

[5] The documents reviewed included the 2007 National Water Policy, the 2010 Environmental Sanitation Policy, the Local Governance Act (936), 2016, the Community Water and Sanitation Agency's (CWSA's) 2014 Project Implementation Manual, CWSA's 2014 Framework for Assessing and Monitoring rural and small-town water supply services in Ghana, CWSA's 2014 District Operating Manual, the 2015 Rural Sanitation Model and Strategy, the 2014 School Health Education Programme Policy Guidelines and the Ghana Education Service's 2013 WASH in Schools Facilities Planning and Management Guide.

[6] Aquagenx CBT *E.Coli* kits are World Health Organisation Certified, and detect and quantify the Most Probable Number of E.Coli in a 100 ml sample of water. More information on the Aqugenx CBT *E.Coli* kits is available at:

3.5 DATA COLLECTION

A total of ten enumerators collected the required data at the household and service provider levels. To ensure the enumerators had the requisite skills and training, a pilot was undertaken along with two-day training sessions that were arranged in each of the four regions that the study operated in. Members of the core project team collected data at the district and national levels and visited all of the water supply interventions. Data was collected and subsequently logged at the household, service provider and district level using AkvoFLOW, a mobile data collection software used by actors and organizations around the world to collect data for WASH projects. The collected data for all of the assessed interventions is presented in the project's Data Analysis Report.

https://www.aquagenx.com/e-coli-test-kits/

4. FINDINGS

This section details the findings from the 2019 retrospective application of the SIT to Rotary International and USAID Phase One IH_2OC interventions. The functionality and service levels of the physical infrastructure are shown first, followed by the results of the 2019 retrospective SIT application. When viewing these findings it is important to remember that seven to eight years has paced from when the assessed interventions were implemented (2011-2012), and high non-functionality rates are commonly cited for WASH interventions in Ghana.

4.1 FUNCTIONALITY AND SERVICE LEVELS

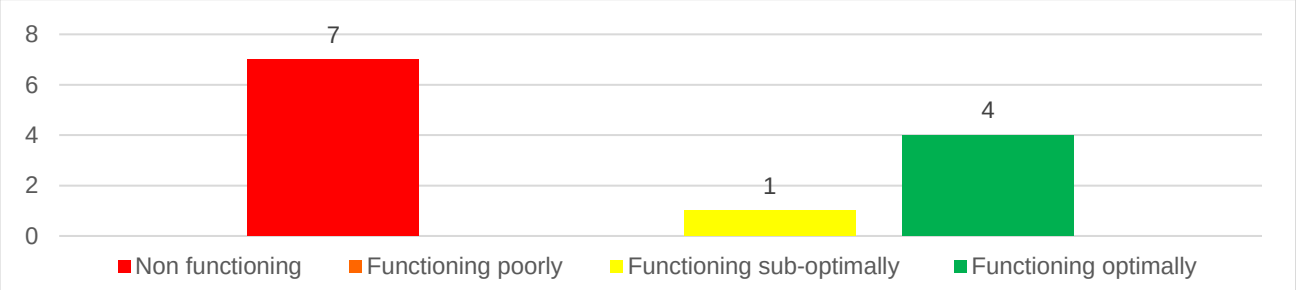
4.1.1 Community Hand Pumps

The study assessed 12 community hand pumps. The functionality of these hand pumps was evaluated based on whether they provided water and through conducting stroke and leakage tests.[7] [8] The community hand pumps were categorized into four groups, as detailed below:

	Non-functioning: The hand pump does not provide water
	Functioning poorly: The hand pump provides water but failed both the stroke and leakage tests
	Functioning sub-optimally: The hand pump provides water but failed one of the stroke or leakage tests
	Functioning optimally: The hand pump provides water and passed both the stroke and leakage tests

As Figure 5 below shows, four of the community hand pumps visited were functioning optimally, one was functioning sub-optimally and seven were non-functional. Of the seven non-functional community hand pumps, one suffered a catastrophic failure (i.e. the flooding of Kutunse community hand pump in Ga West Municipality), while six of the seven were non-functional as a result of a failure to replace broken down parts. All of the non-functional hand pumps had been non-functional for a sustained period and can, therefore, be classified as abandoned.

Figure 5: Community Hand Pumps: Functionality



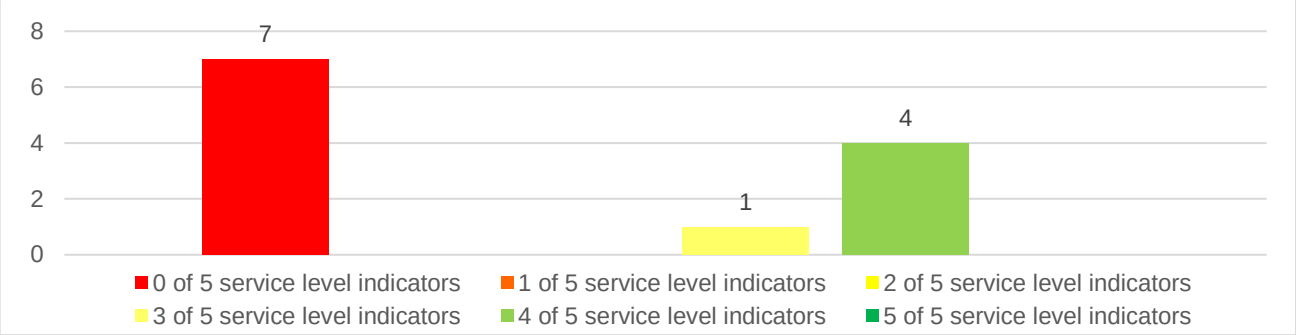
The service level provided by the community hand pumps was judged against five criteria that were taken from CWSA guidelines:

i. Hand pump was functional 95 percent of the time (347 days) throughout 2018
ii. Hand pump provides 20 liters of water per capita per day
iii. Water from the hand pump is not contaminated with *E. Coli*
iv. Hand pump does not serve more than 300 people
v. Less than 25 percent of the users are located 500 meters or more from the hand pump

As Figure 6 details, seven of the community hand pumps met none of the service level indicators (due to the fact that they were non-functional), one met three of the five service level indicators and four met four of the service level indicators. Common issues were a failure to meet the accessibility criteria. A particular cause for concern was Abokobi (Hoese) community hand pump in Abuakwa South Municipality that failed the *E. coli* water quality test (Most Probable Number of *E. Coli* equaled 3.2 out of 100, which classified as an intermediate risk). More information on the functionality and service levels of the community hand pumps is available as Annex 3: Community Hand Pumps: Functionality and service level.

[7] For the stroke test, the number of hand pump strokes needed to fill a 18-20-liter bucket is determined. For an Afridev hand pump to pass the stroke test, it must take a maximum of 40 stokes, administered within one minute, to fill the bucket.
[8] For the leakage test, pumping is resumed after five minutes rest following the stroke test. If water flows from the hand pump within five strokes, the pump has passed the leakage test.

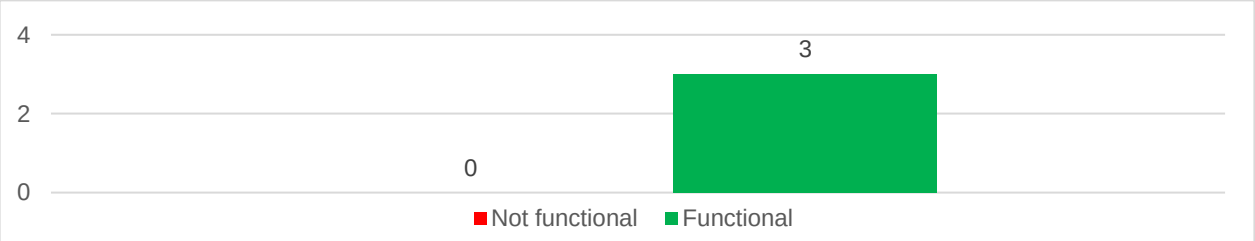
Figure 6: Community Hand Pumps: Service level



4.1.2 Community Mechanized Boreholes

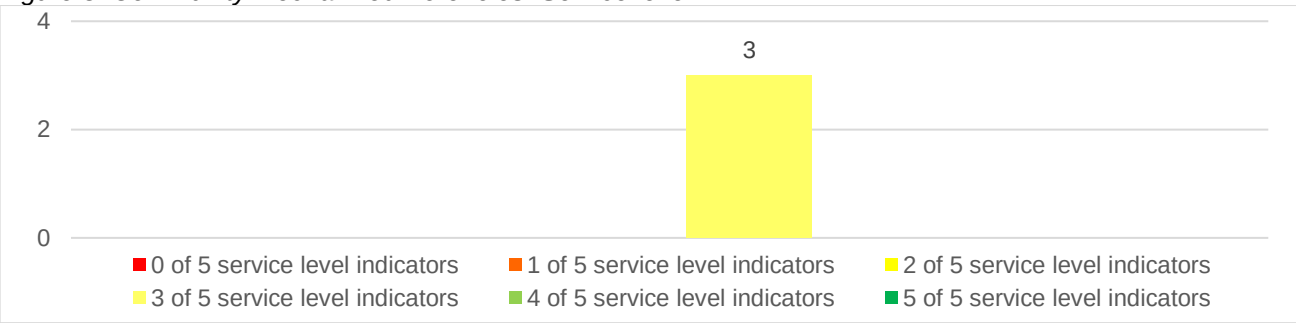
The functionality of the three assessed community mechanized boreholes was judged by whether they provided water at the time of the enumerators' visit. As Figure 7 highlights, all three mechanized boreholes were functional.

Figure 7: Community Mechanized Boreholes: Functionality



The service level provided by the three mechanized boreholes was judged against the same five criteria as the community hand pumps, and the mechanized boreholes have been classified into the same six service level categories. As Figure 8 details, the three mechanized boreholes all passed three of the five service level indicators. Water quality tests carried out showed E. Coli contamination in all three mecahanized boreholes (Most Probable Number of E. Coli of 32.6, 48 and 100 out of 100, these are classified as high risk, high risk and unsafe, respectively), and issues with the accessibility of the mechanized boreholes were also found. More information on the functionality and service levels of the three community mechanized boreholes is available as Annex 4: Community Mechanized Boreholes: Functionality and service level.

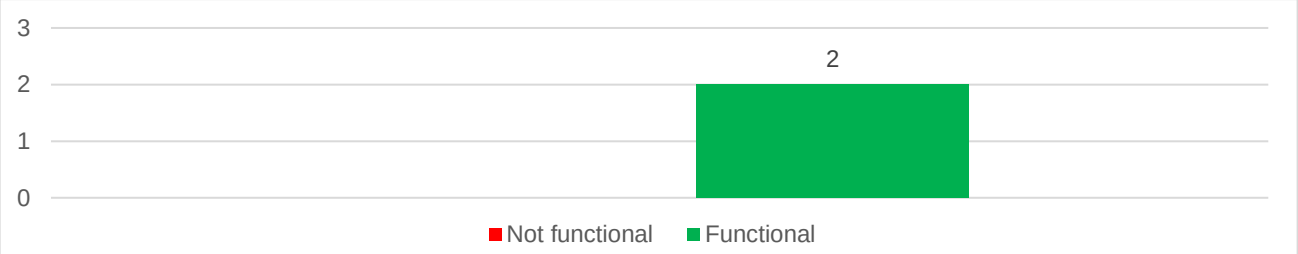
Figure 8: Community Mechanized Boreholes: Service level



4.1.3 Community Reticulated Systems

The functionality of the two assessed community reticulated systems was judged by whether the system provided water at the time of the enumerators' visit. Figure 9 nine highlights that both community reticulated systems are currently functional. Although Abutia Teti reticulated system is currently functional, several of the taps of its 10 standpipes leak and some of the valves and chamber covers are corroded.

Figure 9: Community Reticulated Systems: Functionality

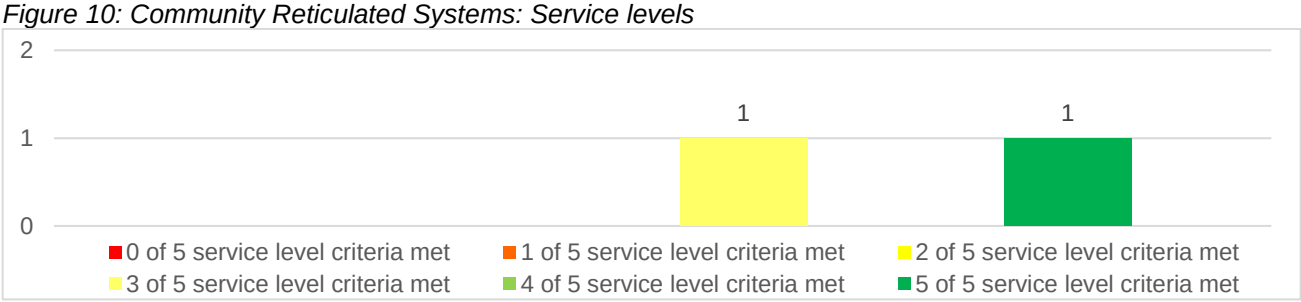


The service level provided by the community reticulated systems was judged against five criteria taken from CWSA guidelines:

i. The community reticulated system was functional 95 percent of the time (347 days) in 2018
ii. The community reticulated system provides 60 liters of water per capita per day
iii. Water is acceptable to users in terms of taste, color and odor
iv. Each standpipe does not serve more than 300 people
v. Less than 25 percent of users are located more than 500 meters from a standpipe

Figure 10 details how many of these criteria the two community reticulated systems passed. Both systems had relatively high service levels. Nyive community reticulated system passed all the service level indicators, while Abutia Teti community reticulated system did not pass the reliability or accessibility indicators because it was non-functional for 240 days in 2018 and a large majority of household users are more than 500 meters from a standpipe. More information on the functionality and service levels provided by the two community reticulated systems is available in Annex 5: Community Reticulated Systems: Functionality and service level.

Figure 10: Community Reticulated Systems: Service levels



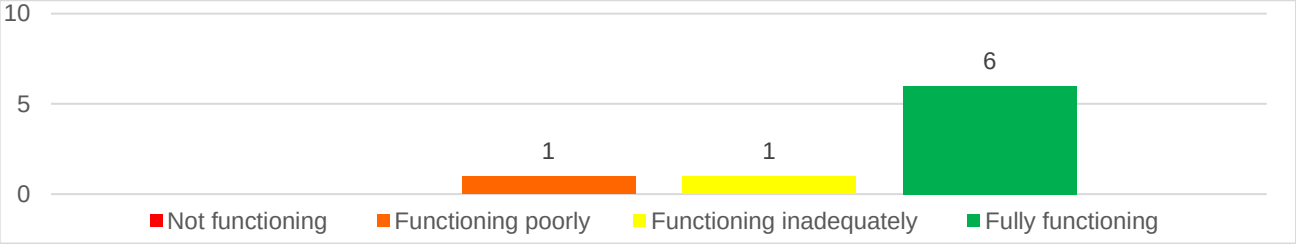
4.1.4 School Latrines

The functionality of the school latrine blocks was assessed according to the percentage of latrine blocks' drop holes that were functional. The latrine blocks were then grouped into one of the four categorizes below.

	Non-functioning: None of the latrine blocks' drop holes are functional
	Functioning poorly: Less than half of the latrine block's drop holes are functional
	Functioning inadequately: Half or more of the latrine block's drop holes are functional
	Fully functioning: All the latrine blocks' drop holes are functional

As Figure 11 details, six of the eight school latrine blocks were found to be fully functioning, one was functioning poorly with four of its six drop holes not being usable and one was functioning inadequately with three of its six drop holes not being usable. The superstructure of the facility at Akwadum RC Primary has substantial cracks, it is sinking and 4 of the 6 cover slabs are broken. Manheam MA Junior High School latrine blocks' roof has come off and 3 of the 6 latrines were abandoned because they were in such an unsanitary condition as a result of community members using the latrines after school hours.

Figure 11: School latrine blocks: Functionality

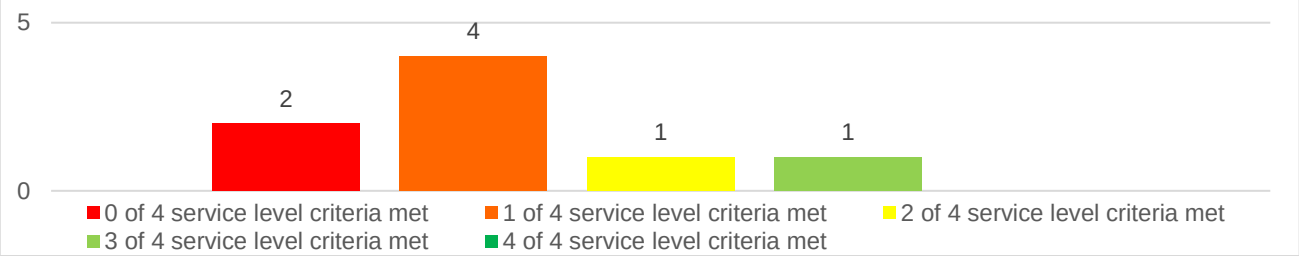


The service level provided by the eight school latrine blocks was assessed against four criteria:

i. Facility has a hand washing station with a dedicated cleansing agent (e.g., soap) available
ii. Facility considers special needs users (a changing room for girls and disabled access)
iii. Facility complies with crowding regulation (one drop hole per 50 school children)
iv. Facility is in a sanitary condition with anal cleansing material present

Figure 12 highlights that the service level of the eight assessed school latrine blocks was poor.

Figure 12: School latrine blocks: Service levels



Common issues found across the assessed school latrine blocks were:

- Lack of a private changing room for female school children to use during menstruation (this was not a requirement in 2011 when the facilities were constructed) and inaccessibility of facilities for persons with disabilities (eight of eight assessed school latrine blocks)
- General unsanitary condition of the latrine blocks (six of eight assessed school latrine blocks)
- Overcrowding of facilities (five of eight assessed school latrine blocks)
- Broken down hand washing station (three of eight assessed school latrine blocks)

More information on the functionality and service levels of the eight assessed school latrines is available as Annex 6: School Latrines: Functionality and service level.

4.2 2019 RESTROSPECTIVE SIT APPLICATION RESULTS

This sub-section outlines the results of the SIT application for each of the five interventions types: community hand pumps, community mechanized boreholes, community reticulated systems, school latrines and hygiene and hand washing promotion.

4.2.1 Community Hand Pumps

Figure 13 details the top-level scores for each of the five factors from the application of the SIT to the 12 assessed community hand pumps. It shows that the institutional factor scored highest (81.25), followed by the technical factor (69.10). Management (37.29), financial (52.49) and environmental (47.50) factors scored poorly, highlighting that sustainability challenges exist in these areas.

Figure 13: Community Hand Pump: Factor Overview

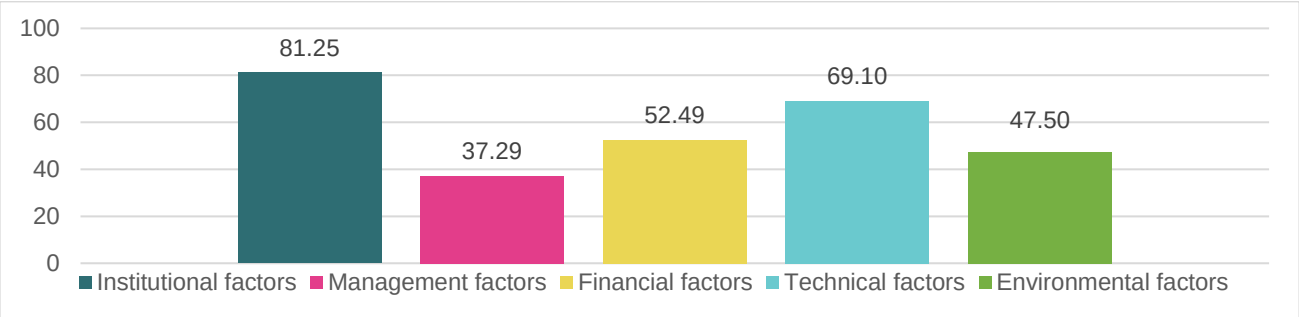


Figure 14 plots the scores for each of the five factors for each of the 12 specific community hand pumps that were assessed. It indicates variable scores for many of the factors, which is partially explained by the non-functionality status of many of the hand pumps.

Figure 14: Community Hand Pumps: Factor overview for each intervention

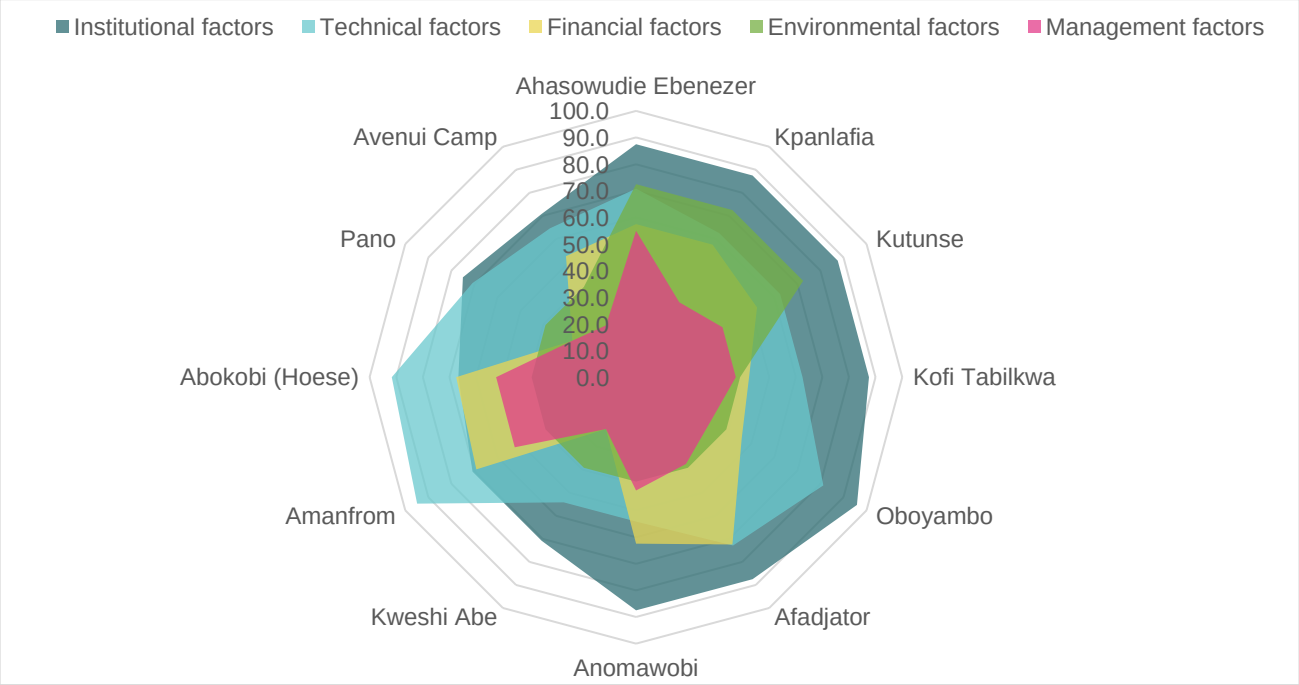


Figure 15 details the results of the SIT application for community hand pumps according to the national, district and service provider levels for each of the five factors. In doing so, it highlights the areas performing best and those that represent the greatest threat to the sustainability of both the current and future IH$_2$OC implemented community hand pumps.

Figure 15: Community Hand Pumps: National, District, Service Provider

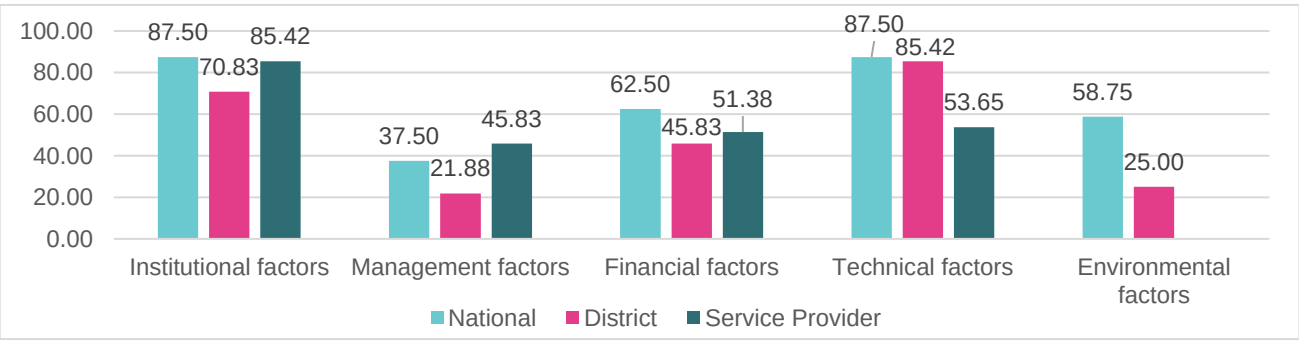


Figure 15 highlights that the institutional and technical factors scored highly at the national and district levels. Regarding the high score at the national level for the institutional factor (87.50), this reflects the fact that the 1994 National Community Water and Sanitation Programme and the 2007 National Water Policy are well-established sector policies that give community-managed water supply legal standing. Moreover, the 2014 National Community Water and Sanitation Strategy provides a framework for meeting the policy objectives outlined in these documents and the 2014 CWSA Framework for Assessing and Monitoring rural and small-town water supply services in Ghana outlines the standards for the constitution and governance of WSMTs. Similarly, the high score at the national level for the technical factor (87.50) is caused by the availability of the 2014 CWSA Framework for Assessing and Monitoring rural and small-town water supply services in Ghana that specifies service level standards (water quality, accessibility, crowding, reliability, quantity) and the Small Communities Sector Guidelines (Design Guidelines) developed by CWSA that outline guidelines for constructing water points.

At the district level, the institutional factor scored high (70.83) because Municipal and District Assemblies hold a range of clearly defined service authority responsibilities (monitoring WSMTs' performance,

providing refresher training and support with major maintenance and repairs, approving user tariffs in accordance with tariff-setting guidelines and auditing the operations of WSMTs). With the exception of Abuakwa South Municipality, the other Municipal and District Assemblies visited understood these responsibilities. The high score for the technical factor at the district level (85.42) is because most Municipal and District Assemblies reported that they have the technical capacity to provide maintenance and repair support to WSMTs. However, this is largely undermined by the fact that all six Municipal and District Assemblies reported that budget allocations are not released when requested for supporting WSMTs.

While these important policies and guidelines are in place and roles and responsibilities are understood at the Assembly level, Figure 15 details substantially lower scores for the management, financial and environmental factors at the national and district levels. The significant contrast between the scores for the institutional and technical factors and the management and financial factors is illustrative of the largely projectized nature of Ghana's rural water supply sector. While the policies and institutional arrangements are in place, organizations do not have the necessary capacity, nor financing to provide the required resources and support downwards from the national to the district level and from the district level to WSMTs.

The low score at the national level for the management factor (37.50) is partly caused because although the District Monitoring and Evaluation System details the number of water points in each district, data is not systematically collected on key indicators such as the functionality of water points or WSMTs' performance. An even more pressing concern at the national level for the management factor is the insufficient support from the national level to Municipal and District Assemblies. Significantly, two of the six Municipal and District Assemblies reported that some of their staff responsible for supporting community-managed water supplies had not received any training and there is a complete lack of refresher training, which should occur on an annual basis. Figure 15 outlines the lowest score for the management factor at the district level (21.88). This particularly low score occurred because only four of 12 WSMTs consulted with reported that their Municipal or District Assembly monitored their financial, technical and administrative performance (let alone on a regular basis – four times per year) and because only one WSMT reported that monitoring led to follow-up support from the Assembly when required.

Financial scores were moderate at the national level (62.50). This is because although there is a line item for rural water supply in the 2019 budget, it was not formulated by considering all life-cycle costs: capital expenditure, operation and minor maintenance, capital maintenance, cost of capital, expenditure on direct support, expenditure on indirect support. The district level scored poorly for the financial factor (45.83). Significantly, this low score was because all six Municipal and District Assemblies reported that the number of staff available in the Water Section of their Works Department did not meet the number required by government standards and that budget allocations are not released when required for supporting WSMTs.

While national environmental protection standards are in place, moderate and low scores were found for the environmental factor at the national (58.75) and district (25.00) levels. This is because integrated water resources management is not carried out systematically and Assemblies acknowledged that natural resources were generally not managed to support sustainable water supply service delivery.

Given the limited support provided to WSMTs, it is unsurprising that Figure 15 details low scores at the service provider level across the management, financial and technical factors. Nevertheless, the institutional factor is an exception, and scored highly at the service provider level (85.42). The high score for the institutional factor at the service provider level came about because all 12 WSMTs for community hand pumps that were initially trained under the Phase One IH_2OC program had stayed in place and because the WSMTs were largely constituted in line with CWSA guidelines (number of members and key positions being filled by separate WSMT members). Moreover, 11 of the 12 WSMTs had a gender balance (at least 30 percent of members were female) and 10 of 12 WSMTs were elected by the entire community – indicating limited political interference in the management of hand pumps.

The lowest score at the service provider level was for the management factor (45.83). This is because of the disconnect between WSMTs and the communities that they represent. Only four out of the 12 WSMTs managing community hand pumps held quarterly meetings and shared technical, administrative and financial records with community members regularly (every six months). Linked to this, a majority of

community members for only two of the 12 community hand pumps believed that the WSMT carried out their technical, administrative and financial management responsibilities. On a positive note, all WSMTs understood their roles and responsibilities, indicating that these were accurately conveyed during their training.

The financial factor had the second lowest score at the service provider level (51.38). This factor was closely connected to the high non-functionality rate (58 percent) of the 12 community hand pumps. This is because six of the seven non-functional community hand pumps did not suffer an unrepairable break down; instead, the WSMT was unable to raise sufficient revenue to purchase the required spare parts and hire the services of an area mechanic. While 11 of the 12 WSMTs had set tariffs, amounts generated were often not sufficient to repair breakdowns when these occurred. Further, only three of the 12 WSMTs' had revenues greater than their expenditure for 2018. The main issues identified relating to the tariffs were:

i. Tariffs were largely not set in line with CWSA guidelines for covering operation and maintenance costs while enabling 20 percent of funds to be reserved for future repairs)
ii. Tariffs were largely not collected on a regular schedule (pay-as-you-fetch or monthly household levies)
iii. Many households did not pay the tariff

Box One: Oboyambo Community Hand Pump provides a case study that is illustrative of many of the issues that plagued community hand pumps and management entities (WSMTs) and which typically meant that these schemes could not be repaired when breakdowns occurred.

Box 1: Oboyambo Community Hand Pump: Common challenges to sustainability

The WSMT for Oboyambo community hand pump was unable to repair the hand pump when it broke down in 2018 due to a lack of funds. A pay-as-you-fetch tariff had been set when the hand pump was installed. However, because the hand pump had multiple vendors the community struggled to account for water sold and the vendors were perceived to be mismanaging funds. As a result, it was decided that the water would not be sold but when the pump breaks downs each household pays a levy of GHC 5.00. However, when the hand pump broke down in 2018, irregular payment of this levy meant that the WSMT could not raise the funds required to repair the facility.

Fortunately, through the benevolence of a Turkish philanthropic group known as *Hasene*, the hand pump has been repaired and is currently functioning. The WSMT indicated that despite the previous challenges with raising funds towards operation and maintenance of the hand pump, the community is unwilling to adopt a pay-as-you fetch or monthly household levy tariff system as the facility was repaired 'free of charge'. It is, therefore, feared that if the facility breakdowns again, the WSMT will again be unable to raise the raise the required funds to repair it.

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The technical factor scored moderately (53.65) at the service provider level for community hand pumps. This score for the technical factor is caused by the high non-functionality rates for community hand pumps, which drag down the score for this factor significantly. The five functional community hand pumps scored highly for the technical factor as they met the majority of the service level indicators set by CWSA (reliability, accessibility, crowding, water quality, quantity, siting), highlighting that community hand pumps were well constructed and met the majority of relevant CWSA guidelines. The technical factor also considered whether WSMTs had the requisite knowledge and access to available spare parts and the services of an area mechanic or the local private sector required to maintain and repair community hand pumps were available to WSMTs. 11 out of the 12 WSMTs noted that the local private sector or an area mechanic was available to support them; seven indicated that spare parts and the services of the private sector could be obtained within three days. A close association was found between the ability of a WSMT member to conduct basic repairs (preventative maintenance and minor above ground repairs) and the functionality of the community hand

pump. Of the seven non-functional hand pumps only one had a WSMT member that could conduct basic repairs; while of the five functional hand pumps four had a WSMT member that could do this.

4.2.2 Community Mechanized Boreholes

Figure 16 details the aggregated scores for each of the five factors for the three community mechanized boreholes that were assessed. Similar to the assessed community hand pumps, institutional (72.92) and technical (77.78) factors scored highest. However, the scores are notably higher for community mechanized boreholes than the community hand pumps for the management (51.67 compared to 37.39), financial (63.60 compared to 52.49) and technical (77.78 compared to 69.10) factors.

Figure 16: Community Mechanized Boreholes: Factor Overview

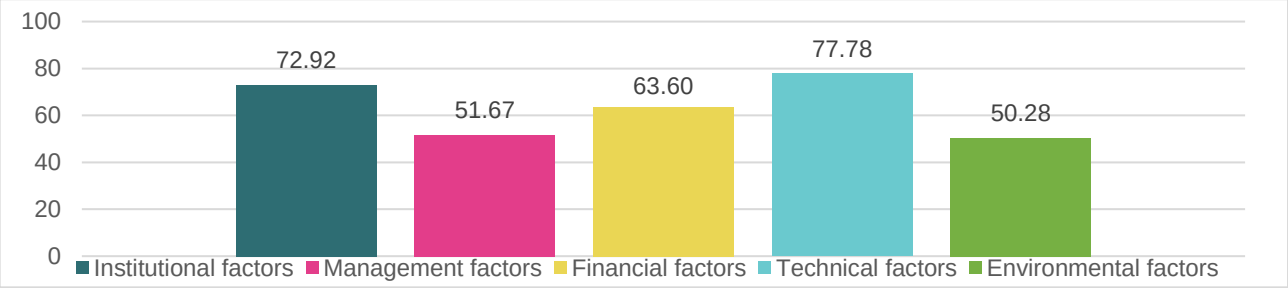


Figure 17 plots the scores for each of the five factors for each of the three mechanized boreholes. Notably, the score for Apedwa Tema community mechanized borehole is the highest, while Lume Atsyame community mechanized borehole scored poorly – dragging down the overall results.

Figure 17: Community Mechanized Boreholes: Factor overview for each intervention

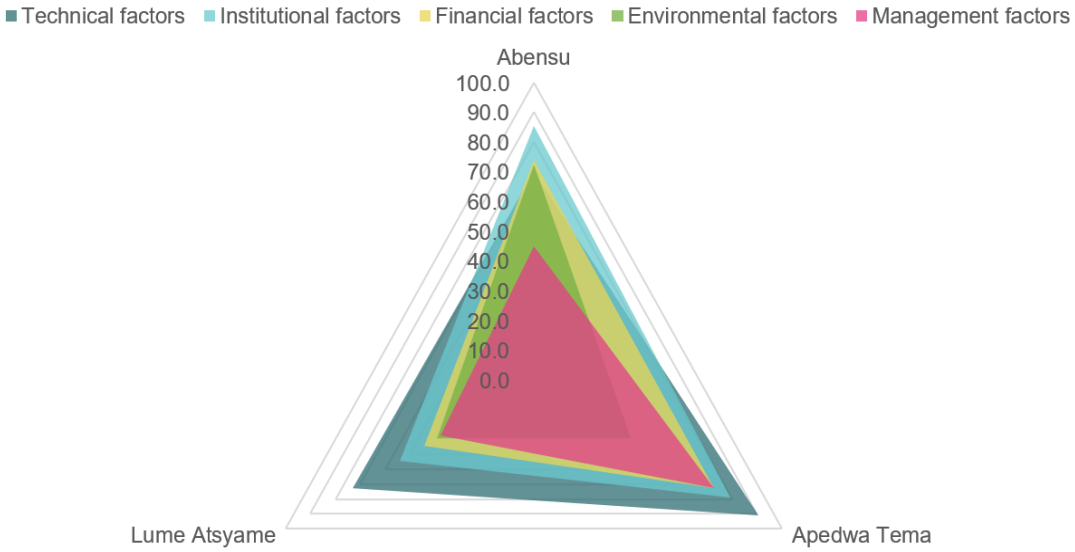
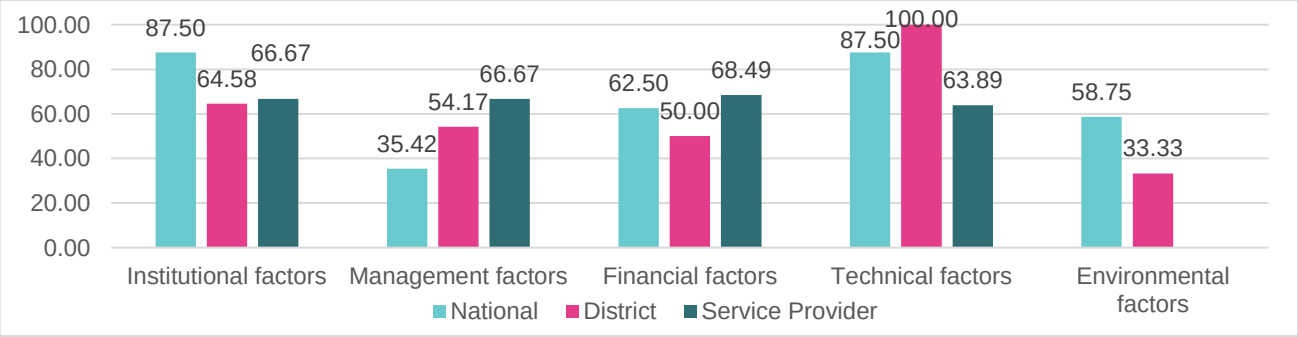


Figure 18 provides the results of the SIT application for community mechanized boreholes at the national, district and service provider levels for each of the five factors. Similar positives and negatives are shown at the national and district levels for each of the five factors; however, notably higher scores are evident at the service provider level for the management, financial and technical factors.

Figure 18: Community Mechanized Boreholes – National, District, Service Provider



Regarding the scores at the national and district level, the same analytical framework was used for assessing the performance and capacity of organizations at these levels as was used for the community hand pumps. Accordingly, the scores at the national level are the same, while there are some slight differences in the scores at the district level. These small differences in the district level scores are caused by the smaller sample size (three Municipalities and Districts being assessed compared to six for community hand pumps). With this in mind, this sub-section focuses on the notably higher scores found at the service provider level for community mechanized boreholes compared to community hand pumps.

The largest increase between the scores for community mechanized boreholes and community hand pumps at the service provider level were for the management factor (66.67 for community mechanized compared to 45.83 for community hand pumps). Community member's satisfaction with WSMTs' performance brought about this notable improvement. For Apedwa Tema and Lume Atsyame community mechanized boreholes, 100 percent of community members asserted that the WSMTs performed their technical, administrative and financial management functions. For Abensu community mechanized borehole, community members reported that the WSMT performed its technical and financial management functions. Except for Apedwa Tema community mechanized borehole, like with many of the WSMTs for the assessed community hand pumps, the WSMTs for the mechanized boreholes did not share technical, administrative and financial records regularly. The WSMT for Lume Atsyame did not keep technical, financial or administrative records while the WSMT for Abensu community mechanized borehole only shared these on a yearly basis.

Box 2: Success story of Apedwa Tema Community Mechanized Borehole

The hand pump constructed for the community as part of the Phase One IH2OC program has been mechanized by the WSMT through the dynamic leadership of its chairman. Initially, when the facility was mechanized, it was connected to electricity in a nearby house. With this arrangement, the WSMT had to pay high electricity bills each month; however, the WSMT have managed to install an electricity meter solely for the facility.

A tariff of GHC 5.00 has been set and, as indicated by the picture in the bottom right of this box, this is collected monthly with proper up to date records of payments kept by the WSMT. The WSMT has a bank account with annual revenue for 2018 (GHC 950.00) higher than annual expenditure (GHC 350.00).

The revenue from the tariff is used to carry out the periodic maintenance and minor repairs of the facility as well as the payment of electricity bills. Moreover, the WSMT is cognizant of its technical responsibilities, and has been carrying out periodic cleaning of the iron removal plant (tank and filter media) attached to the facility.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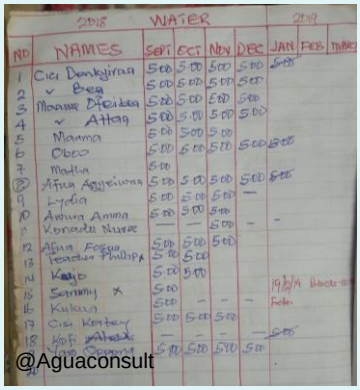

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Another area where community mechanized boreholes scored higher than community hand pumps at the service provider level was for the financial factor (68.49 compared to 51.38). This is significant as poor tariff collection was the critical factor in the non-functionality of six of the seven non-functional community hand pumps. Notable areas that the assessed mechanized boreholes scored better on than the assessed community hand pumps include:

i. The tariff is set in line with national guidelines covering major operation and maintenance while setting aside some revenue for future repairs.
ii. The tariff makes provision for the poorest within the community (i.e., social tariff).
iii. The tariff is collected on a regular schedule.
iv. A majority of households pay the tariff.

As a result of these higher scores, two of the three mechanized boreholes had substantially greater revenue than expenditure for 2018 (Abensu: GHC 2,421.00 and Apedwa Team: GHC 600.00. Equivalent to USD 484.00 and USD 125.00, respectively).

The technical factor also scored higher at the service provider level for community mechanized boreholes than community hand pumps (63.89 compared to 53.65). This is because of the higher functionality rates for mechanized boreholes (100 percent compared to 58 percent), WSMTs better capacity to perform preventative maintenance and above ground repairs as well as their knowledge of how to access spare parts and the services of area mechanics.

Overall, there is a clear picture of mechanized boreholes performing better than community hand pumps – they have higher functionality rates, provide users with greater amounts of water with less effort and are significantly better managed by their WSMTs. Box 2: Apedwa Tema Community Mechanized Borehole details the impressive management of this facility this by its WSMT.

4.2.3 Community Reticulated Systems

Figure 19 details the scores for each of the five factors for the community reticulated systems. As with the community hand pumps and community mechanized boreholes, the technical factor (90.63) scored highly. However, for the community reticulated systems, only a moderate score was achieved for the institutional factor (59.17). Additionally, the figure shows that, similarly to the community mechanized boreholes, the community reticulated systems scored higher than community hand pumps for the management (50.00 compared to 37.39) and financial (56.65 compared to 52.49) factors.

Figure 19: Community Reticulated Systems: Factor Overview

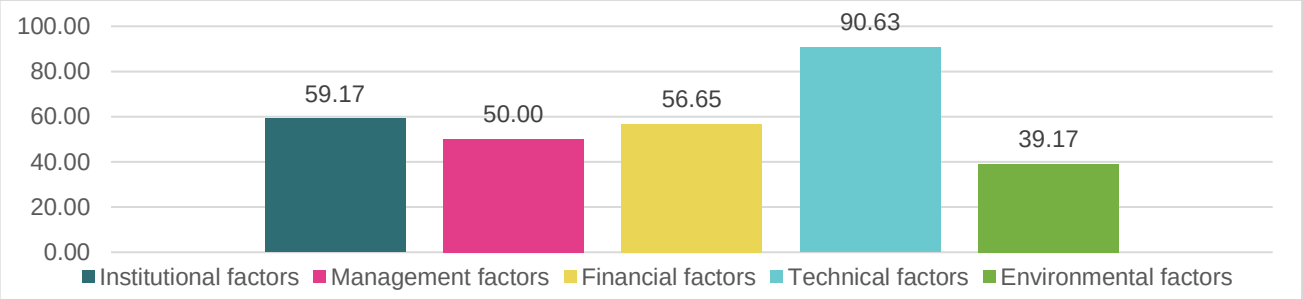


Figure 20 details the scores for the five factors: institutional, management, financial, technical and environmental for the two community reticulated systems that were assessed. It highlights a higher score for Abutia Teti community reticulated system for the management and technical factors and a higher score for Nyive community reticulated system for the financial factor.

Figure 20: Community Reticulated Systems: Factor scores for each intervention

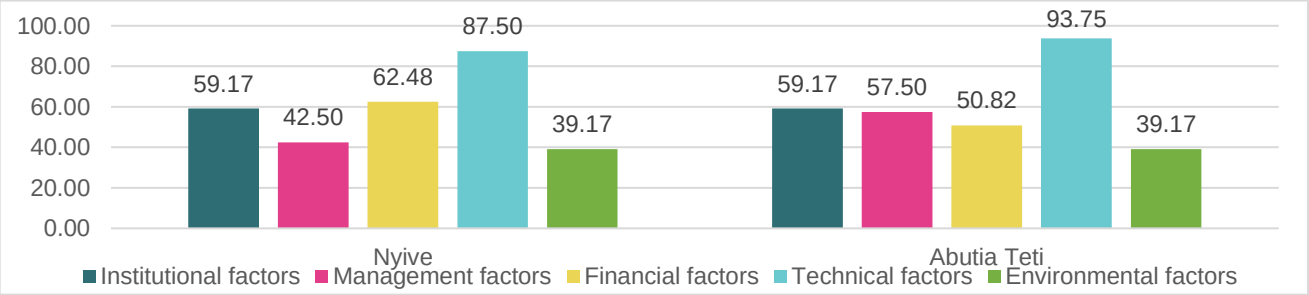
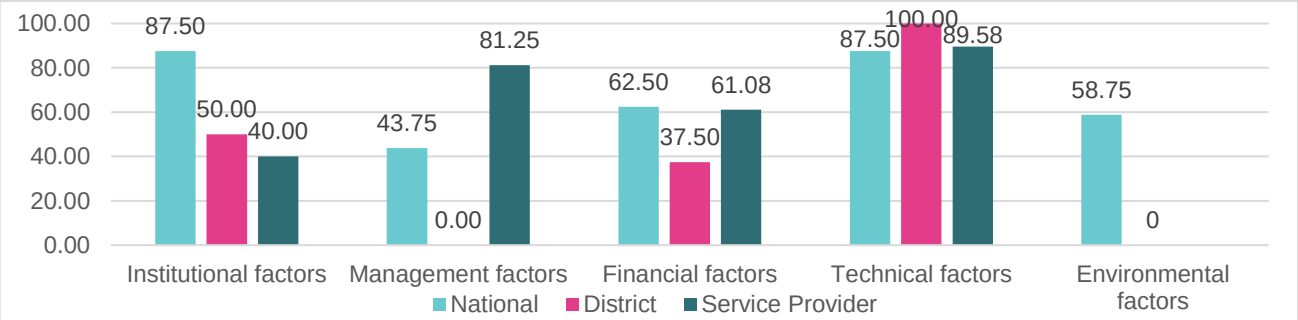


Figure 21 provides the scores at the national, district and service provider levels for the five factors. Very low scores at the district level for the management and environmental factors stand out as well as very high scores for the management and technical factors at the service provider level.

Figure 21: Community Reticulated Systems: National, District, Service Provider



The lowest score at the service provider level was found for the institutional factor. This score is notably lower than for the assessed community hand pumps and community mechanized boreholes. For both community reticulated systems, the low score was because the WSMTs were recently re-constituted by community leaders and this was largely not done in line with CWSA guidelines. For Nyive community reticulated system, the WSMT that was re-constituted in January 2017 was not democratically elected by the entire community, the WSMT only has five members, and a staff member of Ho Municipality is not actively involved in the WSMT (e.g., attending every meeting). The WSMT for Abutia Teti community reticulated system that was reconstituted in February 2018 scored poorly because it does not have a chairman, there is again no Assembly staff member actively involved in the WSMT and, although the WSMT has 15 members, none are female – causing the WSMT to lack a gender balance. For more detail on the situation that occurred at Abutia Teti community reticulated system and why the WSMT was re-constituted see Box Three: Abutia Teti Community Reticulated System.

Both community reticulated systems scored highly for the management (81.25) and financial (61.08) factors at the service provider level. Abutia Teti's WSMT met all of the management sub-indicators that were included as part of the assessment:

- The WSMT understood its roles and responsibilities;
- Community members asserted that the WSMT performed all of its technical, administrative and financial management functions;
- WSMT meetings were held on a regular basis (every two weeks); and
- Technical, administrative and financial records were shared with community members on a regular basis (quarterly).

Concerning the financial factor, similar positive results were found for the community reticulated systems as was for the community mechanized boreholes. Tariffs were collected on a regular schedule (Nyive: pay-as-you-fetch and a monthly billing system for metered household connections; Abutia Teti: a mix of pay-as-you-fetch and monthly household levies) and a larger proportion of households pay the tariff (Nyive: 80-99 percent; Abutia Teti: 50-79 percent). However, tariffs were not set in line with CWSA guidelines for covering operation and maintenance costs and enabling revenue to be reserved for future repairs. Instead, they were set in view of being affordable for residents, and this was to prevent residents from sourcing water from unimproved sources such as a river in the community. Nevertheless, both community reticulated systems WSMT's had surplus revenue for 2018 (Nyive: GHC 2,000.00; Abutia Teti: GHC 254.50).

In addition to this, a higher score was achieved at the service provider level for the technical factor for community reticulated systems (90.63) than for both community hand pumps (53.65) and community mechanized boreholes (63.89). This is in part because of the high functionality rate of community reticulated systems (100 percent), but also because the community reticulated systems were found to be particularly well constructed and maintained and meeting key CWSA criteria. Moreover, the WSMTs for both community reticulated systems had a member that could undertake repairs and preventative maintenance and understood how to source spare parts and the services of an area mechanic if required.

Overall, the high scores for the management, financial and technical factors fit with the broad trend identified for the community mechanized boreholes; namely that these facilities provide a higher level of service, are better managed by their WSMTs and community members are more willing to pay for water from these facilities.

Box 3: Abutia Teti Community Reticulated System: youth leading the way

The visit to Abutia Teti revealed that the democratically elected WSMT has been dissolved with the youth of the community taking over the management of the water system. This take over was necessitated by perceived poor management of the system by the WSMT. The major issue raised against the WSMT was mismanagement of funds which had led to the facility being disconnected from the national grid and break down of the pumping station as there were not enough funds to fix it. The WSMT owed electricity bills to the tune of about GHC 7,000.00. The new WSMT have taken steps to pay part of the debt owed on electricity. Power has been therefore been restored to the facility. The pumping station has also been refurbished. The facility is currently functioning and providing water to the community, and the new WSMT is performing its management functions admirably.

The scores for the management and environmental factors at the district level were very low. The score of zero for the management factor for Ho West District Assemlby and Ho Municipal Assembly indicates that there is no monitoring of the community reticulated system. Further, it is indicative of the Assemblies' ineffectiveness in providing follow-up support to the WSMTs, which is a major threat to the sustainability of these water facilities and helps to explain why the erroneous situation concerning both WSMTs (that were each eventually re-constituted) was allowed to occur. The illegal re-constitution of the WSMTs in these communities can largely be attributed to the ineffective monitoring of the Assemblies. The low score for the management factor is particularly alarming considering the size of the reticulated systems (each serve over a 1,000 people). While perhaps not as troubling, the environmental factor also scored zero at the district level. This shows that although environmental protection standards exist at the national level, they are often not implemented at the District level resulting in natural resources not being managed to support sustainable WASH service delivery.

While some national level indicators used in the assessment of community reticulated systems were slightly different for the community hand pumps and community mechanized boreholes (e.g., looking at whether separate guidelines existed for piped systems than community hand pumps) similar scores were found. Accordingly, the positives regarding the existence of policies, guidelines and institutional frameworks as well as the negatives concerning the highly projectized nature of the rural water sub-sector that were found for community hand pumps, also apply to community reticulated systems.

4.2.4 School Latrines

Figure 22 details the scores for the institutional, management, financial, technical and environmental factors for the assessed school latrine blocks. It highlights high scores for the institutional (78.33) and environmental (83.30) factors but low scores for the management (47.66), financial (31.25) and technical factors (47.19).

Figure 22: School Latrines: Factor Overview

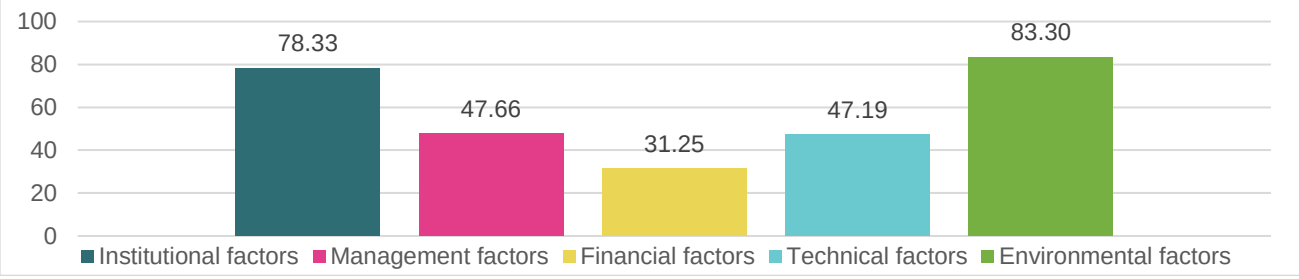


Figure 23 plots the results for each of the five factors for each of the eight school latrine blocks that the study assessed.

Figure 23: School Latrines: Factor scores for each intervention

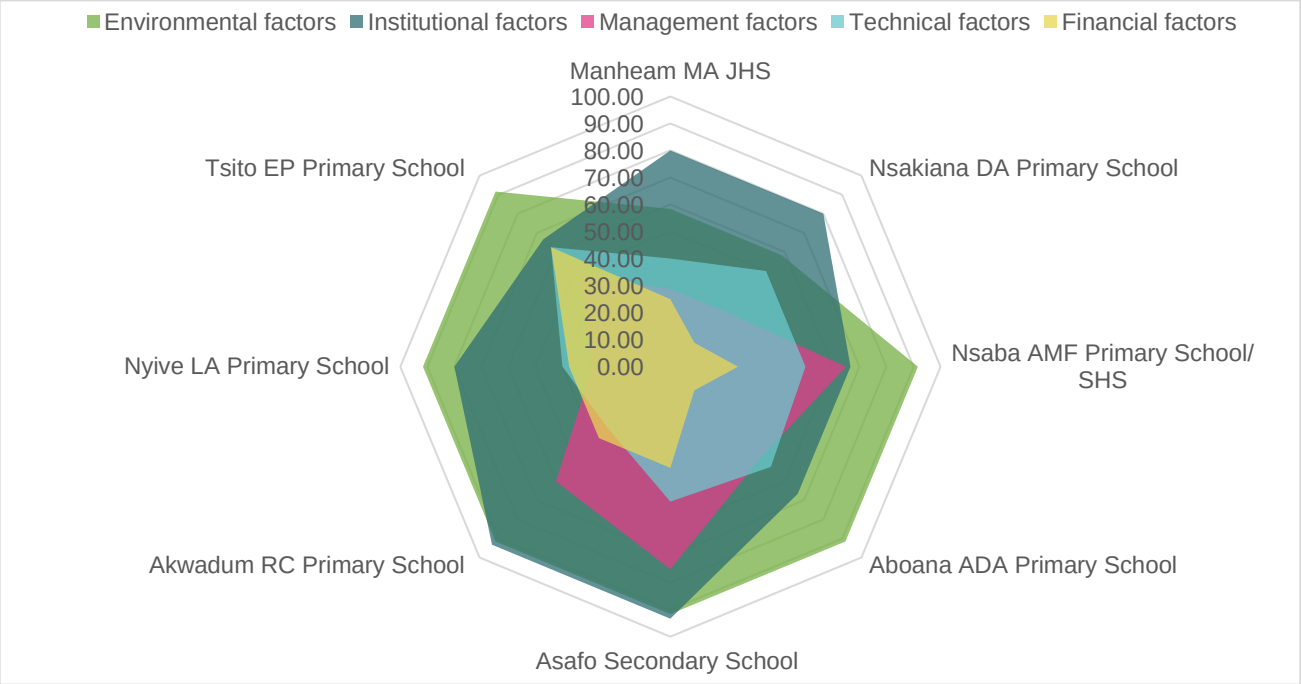


Figure 24 shows the scores for the institutional, management, financial, technical and environmental factors for the national, district and service provider levels. Similar to the results for the three water supply interventions presented above, high scores are displayed at the national and district level for the institutional factor, however, significantly lower scores are evident for the management, financial and technical factors.

Figure 24: School Latrines: National, District, Service Provider

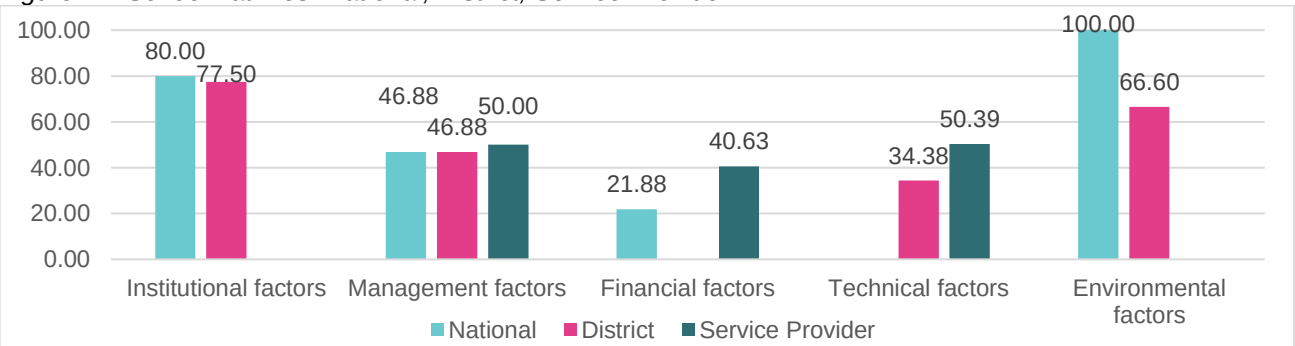


Figure 24 highlights high scores at the national and district levels for the financial and environmental factors. Concerning the institutional factor, the high score at the national level (80.00) is because of the existence of the SHEP unit of the Ghana Education Service, which is the dedicated institution for school sanitation promotion with a clear mandate and responsibilities. Moreover, a policy framework is in place for school sanitation; with the WASH in Schools National Implementation Model (2014), which 'serves as a reference for all Schools project/interventions in Ghana' and defines clear institutional mandates at the national, regional, district and school levels. Importantly, the structures outlined in this document are implemented at the District level – District SHEP coordinators were in place in the five Municipalities and Districts visited for the school latrine block interventions and the EHSUs within Assemblies also support school sanitation. However, despite these positives, MSWR and SHEP acknowledged insufficient and often ineffective coordination between MSWR, CWSA, Ghana Health Service and Ghana Education Service and insufficient coordination was evident at the district level between Assemblies' predominantly hardware functions and the District SHEP coordinators' software functions.

The very high score at the national for the environmental factor (100.00) was brought about by the existence of environmental protection standards for school sanitation facilities that are disseminated to

relevant actors and outline organizations' respective roles and responsibilities. Moreover, the environmental factor scored relatively highly (68.60) at the district level because four of the five Municipalities and District reported that climate-related adaption measures had been incorporated into the design, sizing and siting of school sanitation services.

Significant issues were identified at both the national and district levels for the management, financial and technical factors. The financial factor had the lowest overall score (31.25) and this scored particularly poorly at the national level (21.88), where several critical issues were identified. These issues included the lack of funds available to support school sanitation costs beyond what schools can provide, and the inadequacy of the Capitation Grant[9] as well as the failure to provide sufficient resources to the district level to support school sanitation through Assemblies' EHSUs and the District SHEP coordinators.

Concerning the management factor, similar issues regarding the lack of support that Assemblies receive from the national level were identified, as well as the national level scoring poorly for the management factor (46.88). While four of the five visited Assemblies reported that relevant staff were trained to support school sanitation services, all six of the Municipal and District Assemblies noted that sufficient financial and human resources are not provided to ensure that the training Assembly staff receive is sufficient. This is reflected in the fact that in only two of the five Municipal and District Assemblies visited did relevant staff receive refresher training on an annual basis.

The consequences of the issues outlined above for the financial and management factors at the national level are seen in the low score for the management factor at the district level (46.88). Significantly, five of the eight schools visited asserted that there was no monitoring of sanitation facility use by the Assembly or District SHEP coordinator (let alone that this occurred on regularly – every six months), and all eight of the schools visited asserted that support could not be provided at the district level if required.

Overall, similarly to the assessed water supply interventions, the high score at the national and district levels for the institutional factor and the low scores for the management and financial factors highlights the largely projectized nature of school sanitation services. While the policies are well established and institutional frameworks are in place, actors at the national and district level are heavily dependent on project funding to provide the required support downwards from the national to the district level and from the district to the service provider/school level.

In addition to the above-cited lack of supply-driven support (unsolicited support in areas such as refresher training, troubleshooting and preventative maintenance) to schools for the operation and maintenance of their sanitation facilities, the technical factor also uncovered serious issues with demand-driven support (solicited support that is requested or purchased by the service provider when required – i.e., after a breakdown). With the exception of Ho West District, Assembly staff stated that consumables and equipment for repairs for sanitation facilities are not available at the district level and only one school-based health coordinator said that these were affordable and accessible to the school. Moreover, in only two of the five Districts and Municipalities were private sector actors involved in providing support to sanitation services in schools and only one school-based health coordinator stated that their services were affordable.

Given the insufficient support that schools are receiving in the operation and maintenance of the sanitation facilities, it is not surprising that low scores were also found at service provider level for the management, financial and technical factors; with the financial factor scoring the lowest (40.63). This low score was brought about by the fact that although schools are able to meet short-term operational costs (e.g., purchasing anal cleansing material and cleaning supplies), they are unable to save for long-term maintenance and repair costs. When coupled with the difficulties Assemblies face in supporting the maintenance and repair of school sanitation facilities, this creates a situation whereby facilities are left in a state of disrepair if an issue arises.

The management factor scored moderately low than the financial factor at the service provider level (50.00). The main issue identified was that although all eight of the assessed schools had a dedicated

[9] The Capitation Grant is a subsidy paid by government per student per term.

school-based health coordinator that manages sanitation issues, only two of these knew that the pits of the Kumasi Ventilated Improved Pit facilities required emptying. Additionally, there was varied understanding of which actor (the school itself or the Assembly) was primarily responsible for organizing this and only one school (Asafo Secondary School in Abuakwa South Municipality) had a plan in place for emptying the facilities.

On the technical factor, the school latrine block interventions remain well constructed with all the key components (slab with cover, vent, pipe) in place. This excludes the two partially functional school latrine blocks at Manheam MA Junior High School in Ga West Municipality and Akwadum RC Primary School in Abuakwa South Municipality. Poor management of the school latrine blocks meant that they typically provided a low service level, and overall the technical factor scored just 50.39 at the service provider level. Of the eight school latrine blocks assessed, three had not maintained their hand washing station in working order, and seven were in an unsanitary condition. In most instances, the unsanitary condition of the school latrine block was linked to the school's failure to implement a regular cleaning program, to have cleaning supplies readily available and for the cleaning program to include the replenishment of anal cleansing materials. Despite these challenges, Box 4: Tsito EP Primary School, details an example of a particularly well managed school latrine block.

Box 4: Tsito EP Primary School – success through school leadership

While schools face many challenges in maintaining the desired service levels for their sanitation facilities. Tsitto EP Primary School in Ho West District highlights that with strong, proactive leadership they can be well-maintained. All eight of the Tsito EP Primary School's latrine blocks' drop holes are in working order, the hand washing station also works and has soap available and, as the photos below highlight, the latrine block is in an immaculate condition. Significantly, Tsito EP Primary School was one of the few schools where there is a documented cleaning schedule that includes the replenishment of anal cleansing materials and cleaning supplies are readily available.

4.2.5 Hygiene and Hand Washing Promotion

Figure 25 details the aggregated scores for the management, institutional, financial and technical factors from the 17 communities where the SIT was applied to the Phase One IH_2OC hygiene and hand washing promotion activities. The figure shows a high score for the institutional factor (76.84) and moderate scores for the management (59.19), financial (68.34) and technical (62.35) factors.

Figure 25: Hygiene and Hand Washing Promotion: Factor Overview

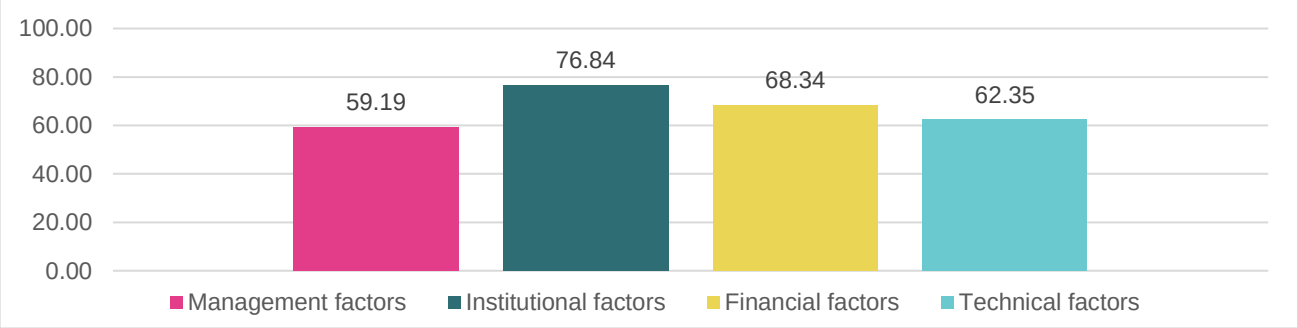


Figure 26 plots the scores for each of these four factors for each of the 17 communities. It highlights highly variable scores for the management and technical factors.

Figure 26: Hygiene and Hand Washing Promotion: Factor overview for each intervention

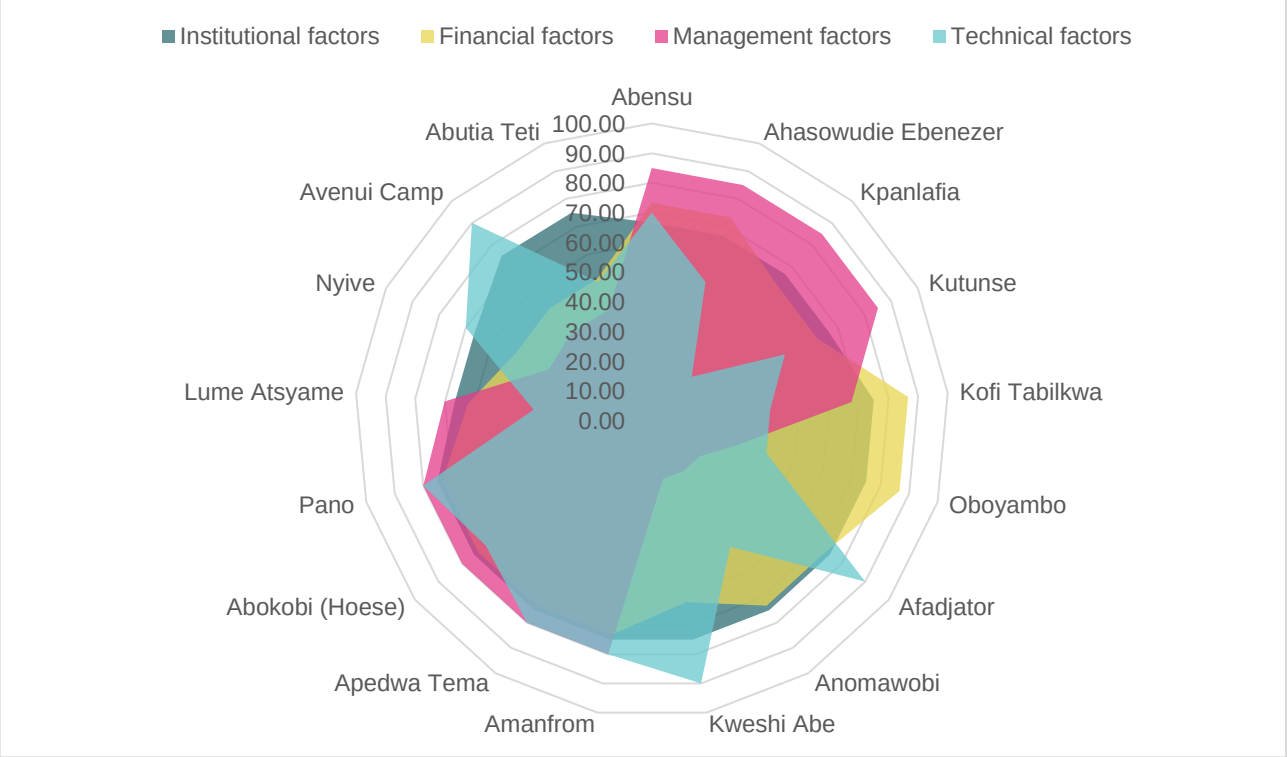
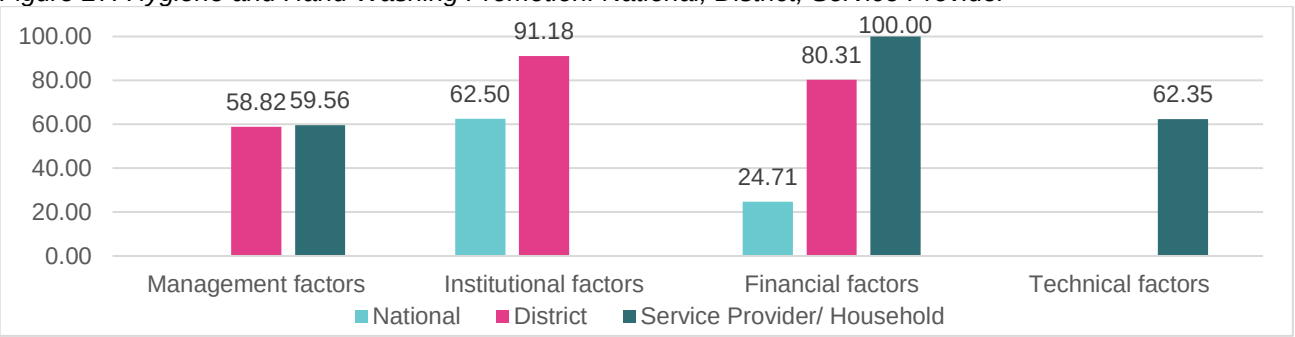


Figure 27 provides the scores at the national, district and service provider levels for each of the four factors. It shows that the highest scores were at the district level for the institutional and financial factor and at the service provider/household level for the financial factor. The financial factor at the national level was by far the lowest score. Many sections of the graph are blank. This is not because they scored zero but because questions were not asked for these factors at those levels of analysis.

Figure 27: Hygiene and Hand Washing Promotion: National, District, Service Provider



The technical factor was only measured at the service provider/household level. It assessed household hygiene and hand washing practices. Of the 343 heads of households that were interviewed for the hygiene and hand promotion surveys, 69.7 percent understood the critical times for hand washing (after using the toilet, before eating, before feeding infants, before preparing food, after social gathering, after cleaning baby's bottom, when hands get dirty), and 64.7 percent stated that they washed their hand at these critical moments. Additionally, in all communities, a majority of the household heads interviewed actively promoted good hand washing practices amongst household members. However, just 24.5 percent of household heads consulted with stated that their children washed their hands at the critical moments. Another pressing issue identified was that in only 18 percent of communities did a majority of household heads wash their hands with soap. Safe water storage was practiced in 12 of the 17 communities.

Figure 26 highlights that while, overall, the management factor scored moderately at the district (58.82) and service provider/household levels (59.56), the scores were highly variable. At the district level, all six of the assessed Municipal and District Assemblies had an EHSU that supports and manages the hygiene promoters trained by the Phase One IH_2OC program. However, there was a significant variation between

the six Municipal and District Assemblies regarding whether support is available to hygiene promoters when requested, whether the activities of the community-based hygiene promoters are monitored and whether they receive refresher training. Moreover, just one Assembly (Ho West District Assembly) provided community-based hygiene promoters with refresher training on an annual basis. There was a link between the Assemblies that monitored and provided support to the community-based hygiene promoters and the hygiene promoters that stayed in their posts. At the service provider and household level, of the 11 community-based hygiene promoters that remained in their post, nine indicated that they monitored households' hygiene practices, provided support, including refresher training to households and considered gender-specific messages related to hygiene promotion. Most community-based hygiene promoters cumulatively spent between one and five days performing their functions each month, while two stated they spend more than five days each month working as a community-based hygiene promoter.


@USAID, Ghana, 2016

Figure 27 shows that the lowest performing area for hygiene and hand washing promotion is for the financial factor at the national level (24.71). None of the six Municipal and District Assemblies surveyed asserted that they have sufficient resources (personnel and educational materials) to effectively conduct hygiene promotion and only Agona East District Assembly reported that it received national funds to support BCC activities for hygiene and hand washing promotion. Moreover, a social program is not in place at the national or district level to provide low-income households with hygiene products and there are not supplementary national funds available for hygiene and hand washing promotion. Conversely, at the district (80.31) and service provider/household (100.00) levels, high scores were found for the financial factor. At the district level, this reflects the fact in all communities, household heads stated that soap was available and affordable in the local market, that, except for in Nyive, household heads reported that anal cleansing material was available and affordable and that menstrual hygiene products were locally available and affordable in 11 of the 17 communities. At the service provider/household level, a score of 100 was achieved as in all 17 communities as a majority of households were able to show the enumerators that they had a cleansing agent (typically soap, but also other cleansing agents such as ash) available.

Figure 27 details a moderate score at the national level for the institutional factor and a high score at the district level. The institutional factor only scored moderately (62.50) at the national level because although MSWR overseas the implementation of the Environmental Sanitation Policy (which has hygiene and hand washing promotion embedded throughout), MSWR acknowledged that data collection on hygiene promotion is poor and can therefore not be comprehensively analyzed for decision-making. Moreover, while MSWR developed a BCC strategy, it does not currently make use of coordinated mass media messages and does not provide training for regional staff in their surveillance roles for hygiene and hand washing promotion. The high score (91.18) at the district level for the institutional factor was because all six Municipal and District Assemblies reported that they work with field staff from different agencies active in the local communities, coordinate hygiene education, training, support and the distribution of educational materials and that they liaise with relevant organizations such as MSWR, Ministry of Health, CWSA, Ghana Health Service and Ghana Education Service. However, two of the six Municipal and District Assemblies asserted that neither they, CWSA or MSWR provided resources (e.g., personnel or educational) for hygiene promotion in the local communities.

5. CONCLUSIONS

After between seven and eight years of operation, the assessment of the Phase One IH2OC program has found a mixed picture in terms of the on-going functionality and likely sustainability of WASH interventions. This section presents the conclusions from the retrospective assessment of Rotary International and USAID's Phase One interventions in Ghana, based on the preceding findings. This starts with cross-cutting conclusions that apply to all of the intervention types across the program and goes on to set out conclusions relating to each of the specific interventions.

5.1 CROSS CUTTING

Phase one WASH interventions were well executed. Functioning water supply interventions provide a moderate to high level of service level (as judged against CWSA guidelines) to their users, and there were only two instances of water supply infrastructure being poorly located or constructed; Kutunse community hand pump that flooded and Lume Atsyame community mechanized borehole that was built for a spiritual healing camp and not the community itself. Moreover, WSMTs were constituted in line with CWSA guidelines, understand their roles and responsibilities and the overwhelming majority of WSMT members have stayed in their posts. Although the school latrine block interventions would have been improved by having a private changing room with a water supply for female school children to use during menstruation, this was not a requirement for the construction of school sanitation in 2011 and therefore cannot be seen as a failing.

Sector policies and guidelines are extensive and set out clear frameworks for community-managed water supply in rural areas, school sanitation services and hygiene and hand washing promotion. Moreover, the institutional frameworks for the implementation of these policies are in place at the national, regional and district levels, and Municipal and District Assemblies, as well as District SHEP coordinators, understand their roles and responsibilities. However, coordination between MSWR, CWSA, Ghana Education Service and Ghana Health Service and different levels of government is not sufficient, and this undermines their ability to collaborate effectively and maximize resources. MSWR and SHEP acknowledged this.

However, the sustained impact of all of the interventions funded by the partnership appear to have suffered from the largely projectized nature of the WASH sector in Ghana. With only four percent of the total WASH sector investment being derived from domestic public funding (government), it is no surprise that when most externally funded aid projects close, there is very little in terms of resources at the Assembly level for it to perform its key service authority functions. Consequently, functions that are essential to maintaining desired service levels for WASH facilities, such as the monitoring of WSMTs, school-based health coordinators as well as the provision of supply- and demand-driven follow-up support, were, therefore, wholly non-existent or inadequate. As a result, this means many service providers are left without external help to manage what can be at times complex WASH facilities.

5.2 WATER SUPPLY

WSMTs' failure to collect sufficient tariff revenues was the primary driver of the high non-functionality rate of community hand pumps. This is because community members are often unwilling to contribute towards the cost of repairs when breakdowns occur, and WSMTs are, accordingly, unable to purchase spare parts or hire in the services of specialist area mechanics. Of the 12 community hand pumps that were assessed, in nine instances the WSMT did not collect the tariff on a regular basis (pay-as-you-fetch or monthly household levies), and in 10 cases less than 80 percent of community members paid the tariff.

Location matters: more hand pumps were found to be non-functional in peri-urban, small-town and rural growth center contexts where people have access to other improved sources nearby. Individuals in larger communities value – and often expect – the higher level of service that can only be provided by mechanized boreholes or reticulated systems and they were less willing to pay for water from community hand pumps where they have to use their own 'manpower'. Moreover, individuals in these larger communities usually have ready access to other improved water supplies, thereby disincentivizing community members from contributing towards repairing a handpump facility when a breakdown occurs. Conversely, community hand pumps in truly rural areas had a lower non-functionality rate and these

community hand pumps appeared to be more valued by communities that often have no other improved water sources in the immediate area.

All assessed community mechanized boreholes and community reticulated systems were functional, provided a moderate- to high-level of service and tended to be managed significantly better than community hand pumps. Community members and WSMTs valued the higher service levels provided by mechanized boreholes and reticulated systems and, while challenges were still evident, these interventions scored notably higher than community hand pumps in several critical areas. These include:

- Community members are more likely to assert that WSMT members carry out their technical, administrative and financial management responsibilities well;
- WSMT meetings are more likely to be held regularly;
- Tariffs are more likely to be set in line with CWSA guidelines (covering the main operation and maintenance costs while enabling a proportion of tariffs to be reserved for repairs) and to make provision for the poorest community members;
- Tariffs are more likely to be collected on a regular schedule and to be paid by households; consequently, in 2018 revenue was greater than expenditure for four of the five community mechanized boreholes and community reticulated systems assessed; and
- It is more likely that a member of the WSMT could conduct preventative maintenance and basic above ground repairs.

5.3 SCHOOL LATRINE BLOCKS

School latrine blocks continue to function. However, in most instances, school-based health coordinators are unaware of important management responsibilities (e.g., responsibility for emptying the KVIP facilities) and the facilities are being poorly managed. For example, many schools have not implemented a regular cleaning schedule, do not have cleaning supplies readily available and do not provide anal cleansing material. This poor management is reflected in the very low service levels for school latrine blocks, with hand washing stations often not being in working order and seven of the eight assessed latrine blocks being in an unsanitary condition. Insufficient monitoring of the use and management of the school latrines by Municipal and District Municipalities, means that the poor management of these facilities appears to not have been rectified.

Financial resources are not available for the maintenance and repair of school sanitation facilities. Schools reported that the materials and services required to repair broken down school sanitation facilities are too expensive. This is because the Capitation Grant is insufficient, and schools are unable to set aside financial resources for maintenance and repairs. Moreover, funds are available to support school sanitation beyond what schools can provide in only two of the five assessed Municipalities and Districts. Consequently, if a breakdown occurs, it is unlikely that the necessary financial resources will be mobilized to repair the facility.

None of the eight assessed school latrine blocks suffered from community vandalization. However, many District SHEP Coordinators raised this as an important issue, and this represents a threat to the sustainability of IH_2OC school latrine block interventions.

5.4 HYGIENE AND HAND WASHING PROMOTION

Most household heads understand the critical times to wash their hands, encourage good hygiene behavior to be adopted by family members and practice safe water storage. However, children have bad hand washing practices and a majority of community members wash their hands with soap in only 17% of communities.

The monitoring and follow-up support available to community-based hygiene promoters from Assemblies is variable. There is a link between the level of support Assemblies provide and the performance of community-based hygiene promoters and their decision to stay in their posts. Unfortunately, this support is often not provided and many of the community-based hygiene promoters trained as part of the project have subsequently left their post since the first round of investment by USAID and Rotary.

6. COMPARISON OF 2012 AND 2019 APPLICATIONS:

This section compares the results of the 2012 SIT application for the Phase One interventions with the results of this 2019 retrospective SIT application. This identifies areas that have improved over the last seven years and those that have declined. The functionality of the assessed community hand pumps is also compared with the results of the 2012 SIT application to determine the predictive value of the SIT as a tool. Moreover, several lessons that have been learnt about retrospectively applying the SIT are provided.

6.1 COMPARISON OF 2012 AND 2019 SIT RESULTS

The four tables presented below provide the national, district and service provider scores for the institutional, management, financial, technical and environmental factors for the four intervention types that were assessed in 2012: community hand pumps, community reticulated systems, school latrine blocks and hygiene and hand washing promotion. These scores were classified into four groups using the color-coded classification outlined below. Several of the tables blocks are filled NA. This is because the SIT did not assess the factor at that level of analysis.

0-24	25-49	50-74	75-100

Table 4 documents the comparative scores for the assessed community hand pumps from the 2012 and 2019 SIT applications. It highlights that four aggregated scores have improved, four have remained the same and that three have gotten worse. The most significant drop was found for the management factor at the district level, which indicates a clear reduction the in monitoring of WSMTs as time passes following the implementation of a water intervention.

Table 4: Comparison of 2012 and 2019 results: Community Hand Pumps

	Institutional		Management		Financial		Technical		Environmental	
	2012	2019	2012	2019	2012	2019	2012	2019	2012	2019
National	66.67	87.50	54.17	37.50	NA	62.50	50	87.50	NA	58.75
District	72.92	70.83	42.17	21.88	12.50	45.83	50	85.42	NA	25
Service Provider	78.33	85.42	50	45.83	52.78	51.38	61.94	53.65	NA	NA

Table 5 outlines the scores from the 2012 and 2019 applications of the SIT for community reticulated systems. It highlights that four aggregated scores have gotten better, that three have remained the same and that four have gotten worse. Notably, a significant increase in the score for the management of the community reticulated system from 2012 and 2019 is shown. This reflects the improved performance of the new, re-constituted WSMTs in both Nyive and Abutia Teti.

Table 5: Comparison of 2012 and 2019 results: Community Reticulated Systems

	Institutional		Management		Financial		Technical		Environmental	
	2012	2019	2012	2019	2012	2019	2012	2019	2012	2019
National	100	87.50	54	43.75	NA	62.50	50	87.50	NA	58.75
District	63	50	25	0	17	37.50	50	100	NA	0
Service Provider	80	40	68.75	81.25	71	61.08	85	87.50	NA	NA

Table 6 highlights that three of the aggregated scores have gotten worse, that three have remained roughly the same and that three have improved for school latrine blocks. The increased score for the management factor at the service provider level highlights that schools currently have a greater understanding of their roles for pit emptying than in 2012; it is postulated that this was likely learnt as the need arose.

Table 6: Comparison of 2012 and 2019 results: School latrines

	Institutional		Management		Financial		Technical		Environmental	
	2012	2019	2012	2019	2012	2019	2012	2019	2012	2019
National	100	80	13	46.88	33	21.88	NA	NA	NA	100
District	50	77.5	29	46.88	NA	NA	100	34.38	NA	66.6
Service Provider	NA	NA	11	50	28	40.63	73.51	50.39	NA	NA

Table 7 is for hygiene and hand washing promotion, it shows that one score has improved, five have remained roughly the same and that two have worsened. This shows the least overall movement of the interventions, and the largely similar score for the financial and technical factors at the service provider and household level reflect the fact that the availability of hygiene products and individual's hygiene practices are largely unchanged from 2012.

Table 7: Comparison of 2012 and 2019 results: Hygiene and Hand Washing Promotion

	Institutional		Management		Financial		Technical		Environmental	
	2012	2019	2012	2019	2012	2019	2012	2019	2012	2019
National	100	62.5	NA	NA	33	24.71	NA	NA	NA	NA
District	25	91.18	62	58.82	91	80.31	NA	NA	NA	NA
Service Provider	NA	NA	57	59.56	91	100	59	62.35	NA	NA

6.2 PREDICTIVE VALUE OF THE SIT

While not an exact science, comparing current functionality and service levels of the 12 assessed community hand pumps with the results from the 2012 application of the SIT can serve to highlight the predictive value of the tool itself. Notably, the community hand pumps with the three lowest SIT sustainability scores from the 2012 application of the Tool (e.g. Kutunse, Anomawobi and Kweshi Abe) had all broken down and were all found to be non-functional by the 2019 SIT application. The prediction of likely sustainability for the financial factor proved to be a particularly accurate projection of the sustainability of the community hand pumps, and the community hand pumps with four of the five lowest scores for this factor were also found to non-functional in 2019. Moreover, there was a limited link between the performance of assessed Districts and Municipalities and the functionality of community hand pumps. Significantly, this study found that one-third of community hand pumps are non-functional in Abuakwa South Municipality, which had the highest district score from the 2012 SIT application. Conversely, across the rest of the project, two-thirds of hand pumps were found to be non-functional in 2019.

6.3 LESSONS LEARNT ABOUT RETROSPECTIVELY APPLYING THE SIT

As this was the first retrospective application of the SIT to a set of WASH interventions and with a substantial time period between the two applications of the SIT (seven years), several lessons have been learnt on how best to apply the SIT within this context.

6.3.1 Seven years is too long

Ideally, future retrospective SIT applications should take place less than seven years following the first application. Significant changes in the management of WASH interventions can occur in this period and, accordingly, challenges exist in capturing all of the factors that brought about the functionality of an intervention or particularly low or high service levels. Although there are no hard and fast rules, when the SIT was initially designed, it was envisioned that retrospective applications of the Tool would occur at intervals of three and five years.

6.3.2 Larger sample size

While the number of data points that need to be collected when applying the SIT means that financial constraints often limit the possible sample size, a larger sample becomes more pertinent when applying the Tool retrospectively. This is because, if high non-functionality rates are found (as was the case for the community hand pumps in this study), the resulting reduction in the remaining sample group of functioning interventions is too small and the statistical significance of the findings are correspondingly reduced. While clear trends in the factors that caused the high non-functionality of community hand pumps nevertheless emerged for this study, this could cause issues when analyzing the data for other retrospective applications. To account for this, when high non-functionality rates can be predicted (as is the case community hand pump interventions in developing country contexts), future retrospective applications could consider including additional interventions that were not part of the original SIT application.

6.3.3 Enable members of the assessment team to visit each intervention community

The SIT process involves gathering information on as many as 83 sub-indicators for each specific intervention assessed. Nevertheless, given the long time period that will likely elapse between applications of the SIT, there will undoubtedly be contextual factors that can impact or have impacted the sustainability of these interventions that are not explicitly captured by the SIT. Moreover, the SIT focuses on the current performance at the national, district, service provider and household levels, with just a few sub-indicators addressing issues of the previous year (e.g., the amount of tariff revenue collected the previous year). The assessment teams found that having members of the assessment team visit every water supply intervention site and talk with service providers was a critical factor in establishing important contextual factors that impacted the sustainability of the interventions as well as how the management of the facility may have changed over time. It is recommended that future SIT applications also adopt this strategy.

7 RECOMMENDATIONS

This section sets out operational recommendations, as well as potential advocacy efforts for future USAID-Rotary programing. While the recommendations are geared towards the IH_2OC, as with the study's wider findings, they are also applicable to other organizations and actors operating in Ghana's WASH sector. The section first outlines cross cutting recommendations that are applicable to all of the assessed intervention types, before detailing specific recommendations for the water supply, school latrine block and hygiene and hand washing promotion interventions.

7.1 CROSS CUTTING RECOMMENDATIONS

7.1.1 Reserve a proportion of IH_2OC program budget for supply-driven post-construction support to service providers

The assessed Municipal and District Assemblies lack the resources to perform supply-driven post-construction support in key areas such as refresher training, community education, preventative maintenance and repairs. A portion of future IH_2OC program budgets should be reserved to cover the costs of facilitating Municipal and District Assemblies to provide supply-driven post-construction support to service providers. It is important to note that this recommendation is not for any future IH_2OC project to carry out these tasks, but rather to support MMDAs in this role. This could be arranged to occur one year after service providers' initial training. Post-construction support not only ensures that service providers have the required skills – these follow-up visits also provide the opportunity to troubleshoot and rectify issues such as tariff structure and insufficient tariff revenue before they become major issues, that may stop the service provider from being able to repair broken down infrastructure.

7.1.2 Focus future IH_2OC programs in a smaller number of Districts and Municipalities

Many District and Municipal Assembly staff were not aware of the Phase One IH_2OC program and that there were Rotary International and USAID constructed facilities within their jurisdiction. This was even the case for the larger community reticulated systems that serve thousands of people. Future IH_2OC programs in Ghana could minimize this problem through concentrating operations in a smaller number of Municipalities and Districts and ensuring that these Districts and Municipalities are located within the same region. By focusing interventions in fewer Municipal and District Assemblies that are located within the same region, stronger and more permanent relationships can be formed with Municipal and District staff (as well as pertinent regional staff) and therefore help to ensure the institutional memory of the project.

7.1.3 Increase advocacy efforts for improved WASH services

Rotary Ghana should continue to utilize their valuable individual and collective status and connections to advocate for improved WASH services as well as measures to rectify the specific issues identified throughout this report. At the national level, potential advocacy could focus on increasing national budget lines for school sanitation serves and hygiene and hand washing promotion, as well as urging enhanced co-ordination and collaboration between key sector organizations such as MSWR, CWSA, Ghana Education Service and Ghana Health Service.

Rotary Ghana probably stands the greatest chance of successfully influencing decision-makers at the Municipal and District Assembly level. One avenue for doing this is through General Assembly meetings that provide Rotarians with the opportunity to raise concerns about budget allocations for WASH services, as well as to hold Assembly staff accountable if these budget allocations are not disbursed fully and the Assembly is not sufficiently performing its various service authority functions.

7.2 WATER SUPPLY RECOMMENDATIONS

7.2.1 Involve Municipal and District Assemblies in the hardware and software components of all water interventions

A majority of the WSMTs in the case of non-functional community hand pumps had not notified their respective Assembly of the breakdown. A key opportunity was therefore missed for facilitating the repair of these community hand pumps. To help rectify this, Assembly staff should, as much as possible, be incorporated in both the processes for hardware (construction of physical infrastructure) and the software (sensitization of community members and training of WSMTs) components of water interventions. Ideally,

the involvement of Municipal and District Assemblies would culminate with the signing of a facility management plan between the WSMT and Assembly that clearly articulates:

- Roles and responsibilities of the Assembly and the WSMT;
- WSMT members and each of their roles;
- Overview of organizational procedures for the facilities administrative and financial management; and
- A financing plan for a tariff towards operations, maintenance and repair of the facility.

7.2.2 Adopt a truly demand-responsive approach to constructing water facilities

Continued economic advancement, rapid population growth and urbanization trends mean that rural Ghanaians are becoming richer and many rural areas are transitioning into rural-growth-centers and small-towns. Consequently, the beneficiaries of water interventions are often willing – and able – to pay more to access higher service levels, generally deriving from water from a mechanized borehole and/or reticulated networks as compared to a hand pump. Future IH_2OC programs in Ghana should be more aware of these changes and match their investments with the demographic profile of the recipient communities. This means having flexible implementation programs, which enable mechanized boreholes with piped supplies to be built over a community hand pump if the community requests this, available evidence highlights that they will be able to afford the additional operation and maintenance costs.

7.2.3 Conduct thorough water point mapping prior to constructing water facilities

Communities that have several water points are not as likely to value an additional community hand pump as much as truly underserved or unserved rural communities. Accordingly, future IH_2OC programs should conduct water point mapping (e.g. gathering of information on the geographical position of all improved water points within a community, sub-district or even entire district) of all communities that interventions are implemented within. This information can subsequently be used to target future community hand pump interventions to the most underserved or not served communities. This information may already be available from MMDA monitoring and planning data or from CWSA. Future programming should account for this information and remain closely engaged with CWSA at regional level (and with the newly piloted Community Relations Officers). Any future program is also strongly encouraged to engage and share information with the National Development Planning Commission about its intention to invest in WASH.

7.2.4 Seek to include a community member with mechanical experience in each WSMT

A close link was found between the presence of a technically competent or qualified member of an WSMT and the functionality of the water supply interventions. Accordingly, where possible, when WSMTs are being constituted and trained the community should seek to include somebody that can be expected to conduct preventative maintenance and basic above ground repairs on the water point (e.g. any skilled car mechanic, plumber, local artisan etc.).

7.2.5 Emphasize the importance that tariffs are set based on full life cyclecosts and are collected regularly

Limited tariff collection was a critical factor in high non-functionality rates, especially for handpumps. Tariff collection is dependent on many factors and often requires that Assembly staff follow-up on the performance of WSMTs and the behavior of community members to ensure that tariffs are sufficient, collected on a regular basis and paid by most users. Nevertheless, as a first step, future programs should ensure WSMTs set a tariff that covers key projected life-cycle costs: operation (water quality, tariff collection expenses, allowance for WSMT members, electricity) and maintenance (cost of spare parts, services of an area mechanic), and, as per CWSA guidelines, enable 20 percent of revenue to be set aside for future repairs.

7.3 SCHOOL LATRINES RECOMMENDATIONS

7.3.1 School latrines – construction

Future IH_2OC school sanitation interventions should provide, at the minimum, at least one drop hole per 50 school children. When calculating this it is important to ‘future the proof’ the facility design and consider the impact that Ghana’s very high birth rate will have on the number of attendees at the school in five to

ten years' time. It is also important to fully consider the needs of female schoolchildren, and future school sanitation facilities should include a private changing room for girls with a water supply and covered container for use during menstruation. Additionally, the design of future school latrines should also meet the special needs of children with disabilities: for example, ramps, and a wider door for at least one cubicle and hand rails to enable ease of movement.

When properly guided, teachers and children can provide helpful information on the specific requirements of their school and ensuring their involvement during the design of latrine blocks will lead to more informed solutions that the schools have a greater ownership of and stake in maintaining. Part of the increased cost of constructing more inclusive facilities can be countered by constructing some urinals instead of drop holes.

7.3.2 School latrines – management

Future IH_2OC school sanitation interventions should involve the signing of facility management plans just prior to completion of the physical infrastructure. The signing of the facility management plan should be an open event attended by school children, teachers, parents and, if possible, prominent members of the community. The facility management plan should:

- Invite children, teachers and parents to partake in the ongoing process of monitoring and improving sanitation and hygiene practices within the school;
- Outline an active role for children through establishing or strengthening school health clubs;
- Provide an estimated timespan for when the latrine pits will require emptying and detail the process and responsibilities for doing so;
- Specify management responsibilities for the sanitation facilities as well as best practices that should be adopted
- Estimate major operational and maintenance (minor and major) costs of running the facility as well as the responsibilities of different actors/revenue sources; and
- Include arrangements for how the school can receive support from their Municipal or District Assembly and the District SHEP coordinator.

7.3.3 School latrines – community mobilization

Future IH_2OC programs should consider conducting household latrine promotion activities in the communities where schools are receiving latrine interventions to ensure that the project's benefits are spread to the wider community and therefore reduce the chances of resistance from community members and possible vandalization of the new school sanitation facilities.

7.4 HYGIENE AND HAND WASHING PROMOTION RECOMMENDATIONS

7.4.1 Incentivize community health promoters to stay in post

Future programming should consider incentivizing and formalizing the roles of community-based hygiene promoters. This could be done cost-effectively by providing them with basic hygiene promotion materials such as laminated training guides, stickers and posters that they can use in their work. Additionally, accessories such as hats and T-shirts that are branded with a hygiene and hand washing promotion slogan and image (as well as Rotary International and USAID's logos) would increase the pride that community-based hygiene promoters take in their work and may help in retention of these important stakeholders.

7.4.2 Support long-term and repeated hygiene messaging campaigns

One-off hygiene messaging campaigns rarely have a long-term impact. Changing hygiene and hand washing practices requires consistent exposure to consistent messaging on appropriate hygiene practices and their significant health benefits. Rotary Ghana should support long-term and repeated hygiene messaging campaigns. This could be done through individual Rotary Clubs regularly organizing localized campaigns and events. Alternatively, it could be done on a larger scale through supporting lobbying for national level hygiene and hand washing campaigns that utilize appropriate mass media to undertake improved hygiene practices.

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ANNEX 1: SIT EXAMPLE SCORING

This annex uses the institutional factor for community mechanized boreholes to provide illustrate how sustainability scores were calculated.

Primary Investigation Method	Triangulation		Abensu	Apedwa Tema	Lume Atsyame	National average	
		National policy, norms and guidelines for community-managed water supply and enabling legislation is in place					
Score out of 100 (25 per positive answer)			**87.5**	**87.5**	**87.5**	**87.50**	
CWSA		a) Does national policy for water supply recognize community management?	1	1	1	**1.00**	
CWSA		b) Have national norms and standards been set for the constitution and governance of community-based service providers (Water and Sanitation Management Teams)?	1	1	1	**1.00**	
CWSA		c) Is legislation in place that gives community management legal standing (e.g. by-laws formalizing water committees)?	1	1	1	**1.00**	
CWSA		d) Is there a national registry of the water systems/points that are managed by community-based organizations?	0.5	0.5	0.5	**0.50**	
		Roles and responsibilities of district (service authority) and ownership arrangements are clearly defined					**72.92**
Score out of 100 (25 per positive answer)			**100**	**50**	**50**	**66.67**	
District/Municipal Assembly		a) Are there formalized roles and responsibilities for the Assembly?	1	1	1	**1.00**	
District/Municipal Assembly		b) Are the roles and responsibilities of the Assembly written down and accessible? (*Verify)*	1	0	0	**0.33**	
District/Municipal Assembly		c) Are the roles and responsibilities of the Assembly understood by all in the Assembly involved in overseeing the water system?	1	0	0	**0.33**	
WSMT	District/Municipal Assembly	d) Are the roles and responsibilities of the Assembly understood by the service provider?	1	1	1	**1.00**	
		There is a water committee which has been constituted in line with national norms and standards					
Score out of 100 (25 per positive answer)			**75**	**100**	**25**	**66.67**	
WSMT		a) Is there a Water and Sanitation Management Team?	1	1	1	**1.00**	
WSMT		b) Is the Water and Sanitation Management Team constituted in line with national guidelines: between 5 and 9 people, including a chairman, administrative/financial clerk, caretaker or system operator and the three positions are fulfilled by three different persons	1	1	0	**0.67**	
WSMT		c) Is the WSMT constituted in line with the national norms and standards, in terms of gender (minimum 30% female)?	1	1	0	**0.67**	
WSMT	Head of Household	e) Has the Water and Sanitation Management Team been democratically elected with the involvement of the entire community?	0	1	0	**0.33**	

At the lowest level, qualitative and quantitative data is coded as a 1 (positive), 0 (negative) or 0.5 (sometimes/in between) depending on the respondent's response to each sub-indicator.

To calculate the indicator score for each specific intervention (i.e., an individual mechanized borehole), the sub-indicator scores are added up and multiplied by 25 to provide a score out of 100.

The scores in the national average column are simply the average from the scores for each specific intervention. This either an average for the individual sub-indicator (a score ranging from 0 to 1) or the overall score for the indicator (a score ranging from 0 to 100).

The overall factor score is calculated by averaging the national average scores for each indicator. Factor scores are calculated for each level (national, district, service provider) by averaging the scores from the indicators that focused at that level of analysis.

ANNEX 2: OFFICIALS CONSULTED AT THE DISTRICT LEVEL

Name	Position
Ga West Municipality	
Sani Yusif	Technician Engineer
Juliet Botwey	Environmental Health Officer
Veronica Opoku	Environmental Health Officer
Margaret Akpebi	SHEP Coordinator
Abuakwa South Municipality	
Emmanuel Buamah	Municipal Environmental Health Officer
Gabriel Nartey	Chief Environmental Health Assistant
Maxwell Kofi Amoah	Senior Technician Engineer
George Addo	Community Development Officer
Afua Amponsah Addo	SHEP Coordinator
Awutu Senya District	
Sagito Musah Issakah	District Planning Officer
Dr. Isaac Nyarko	Head, District Works Department
John Kwaku Gavi	District Environmental Health Officer
George Doughan	WASH Engineer
Akpene Gbemou	Development Planning Officer
Gifty Brebu	SHEP Coordinator
Agona East District	
William Freeman Goku	District Environmental Health Officer
Simon Aziabah	District Planning Officer
Dora Tawiah	Community Development Officer
Emmanuel Sertodzi	District Budget Officer
Felicia Acheampong	SHEP Coordinator
Ho Municipality	
Francis Geye	Chief Technician Engineer
Aaron Kofi Amedzo	Municipal Environmental Health Officer
Evelyn Vuvor	SHEP Coordinator
Ho West District	
Emmanuel Doh	District Planning Officer
Richard Degboe	Environmental Health Officer
Emmanuel Dobgevia	WASH Engineer
Peace Kudorwu	SHEP Coordinator

ANNEX 3: COMMUNITY HAND PUMPS: FUNCTIONALITY AND SERVICE LEVEL

Community	Currently functioning	Stroke Test	Leakage Test	Functionality Score	Functional 95% of the time in 2018	Quantity (20 litres daily per capita)	Water Quality Test	Crowding (300 people or fewer)	Accessibility (75% of users within 500 meters)	Level of service score
Kpanlafia, Ga West	No	No	No		No	No	N/A	No	No	
Ahaso-wudie Ebenezeer, Ga West	No	No	No		No	No	N/A	No	No	
Kutunse, Ga West	No	No	No		No	No	N/A	No	No	
Abokobi (Hoese), Abuakwa South	Yes	Yes	Yes		Yes	Yes	No	Yes	Yes	
Amanfrom, Abuakwa South	Yes	Yes	Yes		Yes	Yes	Yes	Yes	No	
Pano, Abuakwa South	No	No	No		No	No	N/A	No	No	
Kweshi Abe, Awutu Senya West	No	No	No		No	No	N/A	No	No	
Anomawobi Awutu Senya West	No	No	No		No	No	N/A	No	No	
Afadjator, Awutu Senya West	Yes	No	Yes		Yes	Yes	Yes	No	Yes	
Oboyambo, Agona East	Yes	Yes	Yes		Yes	Yes	Yes	Yes	No	
Kofi Tabilkwa, Agona East	No	No	No		No	No	N/A	No	No	
Avenui Camp, Ho West	Yes	Yes	Yes		No	Yes	Yes	Yes	No	

ANNEX 4: COMMUNITY MECHANISED BOREHOLES: FUNCTIONALITY AND SERVICE LEVEL

Community	Currently functioning	Functionality Score	Functional 95% of the time in 2018	Quantity (20 litres per capita per day)	Water Quality Test	Crowding (300 people or fewer)	Accessibility (75% of users within 500 meters)	Level of service score
Abensu, Ga West	Yes		Yes	Yes	No	Yes	No	
Apedwa Tema, Abuakwa South	Yes		Yes	Yes	No	Yes	No	
Lume Atsyame, Ho	Yes		Yes	Yes	No	Yes	No	

ANNEX 5: COMMUNITY RETICULATED SYSTEMS: FUNCTIONALITY AND SERVICE LEVEL

Community	Currently functioning	Functionality score	Functioning 95% of the time (347 of 365 days) in 2018	Quantity (60 litres per capita per day)	Is the water acceptable in terms of colour, taste, odour	Crowding (one stand pipe per 300 beneficiaries)	Accessibility (75% of users within 500)	Level of service score
Nyive, Ho Municipality	Yes		Yes	Yes	Yes	Yes	Yes	
Abutia Teti, Ho West District	Yes		No	Yes	Yes	Yes	No	

ANNEX 6: SCHOOL LATRINES: FUNCTIONALITY AND SERVICE LEVEL

School	Currently functioning	Functionality Score	Hand Washing Station (located within 10 meters of latrine block and with cleansing agents)	Appropriate facilities for special needs users (changing room with door for female users and accessible for disabled users)	Crowding (one pit/latrine per 50 users)	Sanitary condition (wall and floor free of urine, faeces and used toilet paper) and toilet paper present	Level of service score
Manheam MA JHS, Ga West	Partial, 3 of 6 toilets function		No	No	No	No	
Nsakiana DA Primary, Ga West	Yes		No	No	Yes	No	
Asafo Secondary, Abuakwa South	Yes		Yes	No	No	No	
Akwadum RC Primary, Abuakwa South	Partial, 2 of 6 toilets function		No	No	No	No	
Nsaba AME Primary/ SHS, Agona East	Yes		Yes	No	No	No	
Abona ADA Primary School, Agona East	Yes		Yes	No	Yes	No	
Nyive LA Primary, Ho Municipality	Yes		Yes	No	No	No	
Tsito EP Primary, Ho West	Yes		Yes	No	Yes	Yes	