

ACHIEVING FULL COVERAGE AND SUSTAINABLE WATER SERVICE PROVISION: THE NEEDS AND THE GAPS

BONGO, EAST GONJA AND WA EAST DISTRICT ASSEMBLY



NOVEMBER 2017





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EXECUTIVE SUMMARY

The District Strategy for achieving full water coverage (2017 to 2025) provides the framework for the implementation of water activities and services in the districts using the Life Cycle Cost Approach (LCCA). The report seeks to provide framework in policy planning and estimating the quantum of funds that needs to be injected into the construction, operation and maintenance of water facilities in order to achieve full water coverage in the district by 2025 and sustain the existing ones.

Preparation of the strategy was done through a participatory process with the districts and community Water and Sanitation Agency using the Resources, Infrastructure, Demand and Access (RIDA) strategic planning tool.

Assessments conducted on water facilities have shown that service levels provided by water facilities in the districts are very low. Less than 10% of handpumps provided basic services when they were assessed on national recommended indicators such as quantity, quality, distance and reliability. One of the reasons for the low service levels was that people travel more than 500 meters to access potable water in the northern part of Ghana. The Water and Sanitation Management Teams in rural communities performed abysmally in relation to service indicators such as governance, operations and financial management.

Furthermore, the activities of water provisions has been donor driven with significant concentration on investment of new infrastructure. This has however not translated to filling the gap of the underserved. It is therefore imperative that attention is focused on the gaps to ensure the attainment of universal water coverage by 2025.

The interventions in the report are aimed at strengthening policies, institutional, regulatory and financial frameworks for effective service delivery including operation and maintenance of water services in the districts. The total cost of implementing the strategy for the full water coverage in the three districts is estimated to cost **One Hundred and Thirty-Three Thousand, Three and Fifty Six Thousand Four Hundred and Thirty Ghana cedis three pesewas (GHS 133,356,430.03)**. Bongo district will require GHS 45,502, 707.03, East Gonja GHS 50,548,033.00 and Wa East GHS 37,305,690.00 for the implementation of water coverage and sustainability activities spanning from 2017-2025.

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ABBREVIATIONS

CapEx	Capital Expenditure
CapManEx	Capital Maintenance Expenditure
COM	Community Ownership Management
CWSA	Community Water and Sanitation Agency
DAs	District Assemblies
ExpDs	Expenditure Direct Support
GOG	Government of Ghana
GSGDA	Ghana Shared Growth and Development Agenda
GSS	Ghana Statistical Services
GWCL	Ghana Water Company Limited
JMP	Joint Monitoring Programme
LCCA	Life-Cycle Cost Approach
LMS	Limited Mechanized System
MDGs	Millennium Development Goals
NCWSS	National Community Water Sector Strategy
NGOs	Non-Governmental Organization
OAU	Organization of African Union
Opex	Operational and minor maintenance
PHC	Population and Housing Census
PPPs	Public Private Partnership
RIDA	Resources, Infrastructure, Demand and Access
SCPS	Small Community Piped Schemes
SDGs	Sustainable Development Goals
UN	United Nation
UNICEF	United Nations Children Emergency Fund
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WSSDP	Water Sector Strategic Development Plan

1.0 INTRODUCTION

The Millennium Development Goals (MDGs), agreed in 2000, aimed to halve the proportion of people without sustainable access to safe drinking water and basic sanitation between 1990 and 2015. Between 1990 and 2015, the proportion of the global population using an improved drinking water source has increased from 76% to 91%, surpassing the MDG target, which was met in 2010. Of the 2.6 billion people who have gained access since 1990, 1.9 billion use a piped drinking water supply on premises. Over half of the global population (58%) now enjoys this higher level of service. During the same period, the number of people using surface water fell by more than half, from 346 million to 159 million (UN, 2015).

Sub-Saharan Africa fell short of the MDG target but still achieved a 20-percentage point increase in the use of improved sources of drinking water. In 2015, it is estimated that 663 million people worldwide still use unimproved drinking water sources, including unprotected wells and springs and surface water. Nearly half of all people using unimproved sources live in sub-Saharan.

The proportion of the global rural population without access to improved drinking water has declined by more than half since 1990, from 38 % to 16% in 2015. Currently, in Ghana 96% of urban populations use improved drinking water sources, compared with 84% of rural populations. Similarly, four out of five people living in urban areas have access to piped drinking water compared with just one in three people in rural areas (GOG, 2015).

The 17 Sustainable Development Goals (SDGs) form a cohesive and integrated package of global aspirations the world commits to achieving by 2030. Building on the accomplishments of their predecessors the MDGs, the SDGs address the most pressing global challenges of our time, calling upon collaborative partnerships across and between countries to balance the three dimensions of sustainable development; economic growth, environmental sustainability, and social inclusion. (SDSN,2015)

The MDG framework did not address the full water and development agenda, nor fully recognize its synergies with other areas and concerns. Emphasis on ‘Sustainability’ was not included and human rights and inequalities were also largely ignored in the MDG framework. Subsequently, member states have agreed that human rights, equality and sustainability should form the core of the development agenda and be recognized as critical for true development.

UN-Water’s overarching goal is “Securing Sustainable Water for All”. The water goal and targets directly address the development aims of societies, promote human dignity and ensure achievements are sustainable over the long term leading to the following

development outcomes, amongst others. In order to achieve a sustainable water future as well as to secure the key contribution of water to sustainable development, the following have been proposed:

- There needs to be a concerted effort of all stakeholders to ensure that we implement the new post 2015 water agenda.
- While the design and implementation of sustainable development policies will be at the national level, achieving sustainable development will require international support and cooperation.
- The challenge for policymakers is to channel and incentivize more of the diverse sources of financing into desired investments in sustainable development.
- Transparency and accountability must underpin all financing to enhance legitimacy and effectiveness.

Fortunately, the MDGs have dovetailed into the SDGs and any unfinished business can be addressed within the new context. Furthermore, the implementation and monitoring of the SDGs can be localized to address issues of inequality and socio-economic disparities more effectively as well to ensure broader ownership and facilitate the achievement of SDGs in record time.

Agenda 2063 on the other hand is a strategic framework for the socio-economic transformation of the African continent over the next 50 years. Developed by the Organization of African Union it envisages “An integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in International arena” In operational terms, the Agenda 2063 would be a rolling plan of 25 years, 10 years, 5 years and short term action plans. The Agenda 2063 which finds expressions in the SDGs has 7 aspirations. The choice of a 50-year time must be understood within the context of the 50th Anniversary of the establishment of the OAU; and the need for the continent to take stock of achievements, successes/ failures and map out a long-term vision as well as set goals and targets. Targets on water, sanitation and hygiene include:

- Reduce 2013 level of proportion of the population without access to safe drinking water by 95%.
- Reduce 2013 level of proportion of the population with poor sanitation facilities by 95%
- At least 5% of the budget is allocated to water and sanitation by 2016. Agenda 2063 is expected to be a source of inspiration for development of national and regional sustainable development plans.
- Increase 2013 levels of water demand satisfaction by 25%
- At least 10% of rain water is harvested for productive use

- At least 10% of waste water is recycled for agricultural and industrial use
- At least 70% of the population indicate an increase in access to quality basic services (water, sanitation, electricity, transpiration, internet connectivity).

The Ghana Shared Growth and Development Agenda (GSGDA) II, 2014-2017, is the fifth in the series of medium-term national development policy frameworks prepared over the past two decades. To ensure continuity in overall national development, however, the GSGDA II also builds on the predecessor framework, GSGDA I (2010-2013), drawing lessons from its successes and challenges to enhance overall development management and the transformation agenda.

The GSGDA II provides a consistent set of policy objectives and strategies to guide the preparation and implementation of medium-term and annual development plans and budgets at sector and district levels. It also serves as a platform for donor coordination.

The medium-term policy interventions to be implemented are aimed at accelerating the provision of adequate, safe and affordable water at all levels. To improve access to adequate, safe and affordable water in the rural areas, the strategies to be implemented include: ensuring sustainable funding for rural water delivery; developing and managing alternative sources of water including rain water harvesting; adopt cost effective borehole drilling technologies; establish cost effective mechanisms for water quality monitoring and purification schemes including the use of ultraviolet technology; strengthen Public Private Partnerships (PPPs) in rural water provision; and implement measures for effective operations, maintenance and systematic upgrading of water facilities (GSGDA II).

Ghana Government's vision of the water sector is "sustainable water and basic sanitation for all by 2025" is articulated in the Water Sector Strategic Development Plan (WSSDP) focused on "all people living in Ghana having access to adequate, safe, affordable and reliable basic water service, practice safe sanitation and hygiene and that water resources are sustainably managed". The overall goal of WSSDP "to contribute to improvement in the living standards of Ghanaians through increased access and use of safe water, sanitation and hygiene and sustainable management of water resources". This goal is expected to be achieved by 2025 through the implementation of an investment programme from 2012 to 2025 divided into two (2) main packages of i) service delivery and ii) cross cutting issues. The interventions are aimed at strengthening the policy, institutional, regulatory and financial framework for effective services delivery including operation and maintenance of water and sanitation services in Ghana (WSSDP, 2015).

1.1 Background to the study

The rural water subsector in Ghana has seen some rapid increase in coverage from about 29% in 1990 to about 62.03% at the end of 2016 (CWSA, 2017). Several rural-based water facilities namely hand dug wells with or without handpumps, rainwater harvesting systems, boreholes with handpumps, limited mechanized piped water systems and small to large piped water systems have been provided within the period to communities. According to the CWSA 2017 rural water data, 3,994 hand dug wells, 28,267 boreholes, 107 rainwater facilities, 359 limited mechanized systems and a total of 487 piped systems have been provided in 27,353 communities, including connections to Ghana Water Company Limited water supply pipelines (495). Additional data collected on the SMARTerWASH¹ Project in six regions also provided ample information on broken down water facilities across the country which suggests that additional efforts are needed to achieve and sustain the desired full coverage anticipated in the subsector by 2025.

Under this research, issues to be investigated will focus on what interventions and measures are needed to achieve full coverage that can be sustained to deliver the expected services to communities. Work done under WASHCost² also provided plentiful information on unit costs required for estimating how much resources are needed to cover infrastructure deficit. Deficiencies related to institutional capacities, necessary to deal with technical, management and operational issues at district and community level are becoming very significant in determining what resources are needed to sustain full coverage when achieved. Private sector capacities and availability to support service delivery also needs to be assessed within the full coverage targets. It is worth noting that substantial work has been done under Triple-S initiative³ on service monitoring, asset management, district budget tracking and determining ideal direct support costs. Bringing the findings from these experiments together and building on them can provide useful input into determining the gaps and what is required in order to achieve full coverage and sustain it.

1.2 Problem Statement

According to the Joint Monitoring Programme (JMP), Ghana has 81.3%⁴ of the rural population estimated to be using improved water sources as of 2015 (WHO/UNICEF 2017).

¹ The SmarterWASH initiative (2013-2016) mapped all water facilities in 119 districts in six regions in Ghana. It collected data on the number of water facilities in the regions, their functionality and the level of service they provide. It also assessed the performance of community-based service providers (Water and Sanitation Management Teams) and service authorities (MMDAs) in the regions.

² The WASHCost research project (2008-2012) sought a much better understanding of the life-cycle costs of different assets across different countries. To do this the project developed a comprehensive methodology to collect, analyse and understand the different costs associated with the different phases of WASH asset life.

³ The Sustainable Services at Scale (Triple-S) (2009 - 2014) was a multi-country learning project aimed at improving rural water by transforming the current piecemeal approach into the provision of planned and integrated water services. It's aim was to move from project based, one-off construction of water supply systems to indefinitely sustainable rural water services delivered at scale through action research, working with government and sector stakeholders, research, documentation and dissemination and international partnerships and advocacy.

⁴ User provider data on coverage (WHO/UNICEF)

However, it is becoming evident from recent studies that about 30% of installed facilities have either broken down or are no longer functioning properly. Sustainability in the WASH sector is critical to the realization of the positive health outcomes expected from investments made in the sector.

In the Northern and Upper West Regions, approximately 38% and 24% respectively of the population do not have access to safe water supplies as at the end of 2014. Additionally, an estimated 30% of installed water facilities are either non-functional or functional but below acceptable. Definite answers to how these gaps can be filled and the services sustained are the outcomes expected in this study.

As indicated in the National Community Water Sector Strategy (NCWSS) (2014), to reach 100% coverage, there is the need to address potential stumbling blocks, which include:

- Community management issues – the NCWSS recognizes that the Community Ownership Management (COM) alone cannot effectively ensure sustainability of WASH service delivery. The challenge is to bring about policy clarity and institutionalize a reliable robust mechanism for post construction support – trained professionals to provide professional support; capacity and financial challenges associated with not carrying out routine maintenance; limited resources for post construction support and technical backstopping and weak supply chain mechanism to support services.
- Financial sustainability issues – challenges to do with accountability, willingness to pay, and managing expensive interventions for difficult to reach areas, which come at a higher cost, and therefore economically unattractive.
- Poor records on existing systems
- Demand and pro-poor issues (equity and inclusion) – the challenge is to evolve strategies that ensure reliable income for Operations and Maintenance (O&M) of existing facilities to free funds of government to address unserved areas.
- Inadequate post construction support
- Difficult hydro-geological formation and water quality issues
- Effects of climate change

1.3 Objective of this research

To provide insight in what resources, institutional capacities and commitments are required to ensure full water supply coverage and sustainable water service provision to all in a district in Ghana.

1.4 Specific objectives

The research will seek to:

- Identify the challenges of going towards ensuring full coverage and sustained WASH service delivery
- Identify and prioritize the most promising strategies towards full coverage and sustainable service delivery in three districts
- Identify the required resources (financial and human, institutional arrangements, capacities etc.) for putting in place these strategies.

1.5 Research questions

- What factors have characterized the progress made in the WASH subsector that requires strengthening?
- What are the emerging challenges and prohibiting factors likely to prevent reaching full coverage?
- What are the most promising / effective strategies (technologies, management models etc) for achieving full coverage?
- What is the capital expenditure and capital maintenance expenditure needed to achieve full coverage?
- What is the future capital expenditure and capital maintenance expenditure needed to ensure that full coverage is maintained?
- What are the operational and minor maintenance costs and direct support costs (including human resources / salary costs) needed to ensure sustainable service provision at scale?
- What mechanisms are in place to cover these costs?
- Which gaps are there and how could these gaps be filled?

2.0 METHODOLOGY

In order to get insight into what is needed to go to full-scale sustainable water service provision, a number of methodologies will be used:

1. Interviews on opportunities and barriers for going to full scale
2. Participatory strategic planning
3. Determining required Capital Expenditure (CapEx) and Capital Maintenance Expenditure (CapManEx) for ensuring full coverage: Asset management tool development
4. Life-cycle costing: study into required and current Operational and Minor Expenditure (Opex), CapManEx and Expenditure Direct Support (ExpDS).

Here below we describe the methods and activities in more detail.

2.1 Interviews⁵ on opportunities and barriers for going to full scale

Semi-structured interviews were developed, pre-tested in Wa West district and refined (Figure 1). Two set of survey instruments were designed and administered to households and organizations such as district and NGOs from February-April, 2016. The surveys sought to ascertain the major opportunities and barriers for going towards full coverage of sustainable water services in the districts. It explored availability of water resources (including hydro-geological formation and water quality), demand for water services from users / communities, presence of mechanisms for post construction support, financial, technical issues and others factors. These issues were synthesized in to organizational status, background of community water supply services, existing water supplies/sources and water management and service sustainability themes.

2.2 Participatory strategic planning

This study used participatory strategic planning which is useful for the development of strategies rooted in the reality for going towards full coverage and sustainable service provision. It consisted of visioning, a situational analysis, scenario building and strategy development. The district staff participated in a series of facilitated workshop to develop visions, scenario building, and strategies development for their respective districts. The process was participatory and iterative.

2.2.1 Visioning

The visioning session focused on where the districts will want their water services to be in the future. As part of the visioning exercise, the district staff came to a clear joint future vision. In developing a vision, they were tasked to interrogate; what does it mean to have full

⁵ The results from the interviews on opportunities and barriers to going into full scale was analyzed and the findings used to inform the participatory strategic planning of the study. Due to quantum of results, it is not presented in this report.

coverage and sustainable services? What level of service are desired (no service, substandard, basic service) for the district? And what are the institutional, technical, private sector participation required, capital invest and various shades of commitments required?

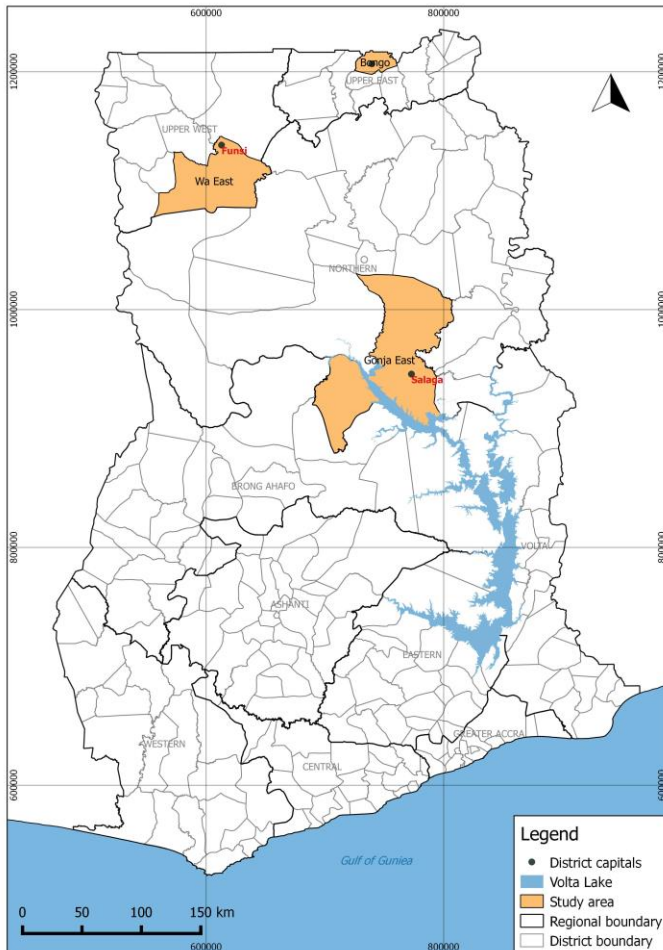


Figure 1. Map of study districts

The districts were coached on the use of problem tree analysis to unearth key water related problems affecting their districts; their causes and effects. The intent was to enable the districts find solutions, which will adequately address the root cause of water related problems. It also challenged the districts to think beyond the day-to-day reality of problem solving, and to imagine an achievable medium to long-term future for which they can plan.

Table 1: District water vision developed

District	Water Vision developed
Bongo	To increase the coverage of sustainable, reliable, safe and accessible water services from 64% to 100% by 2025 in line with the national vision of achieving 100% by 2025.
East Gonja	To provide quality water service delivery to all communities and citizens of the district by 2025.
Wa West	To provide and sustain affordable, reliable accessible and safe water services to all communities in Wa East district to improve water coverage from 65% to 100% by 2025.

2.2.2 Situational analysis

In addition to knowing where you want to go, it is important to know where we are right now. This was done through a **situational analysis**. A useful framework for doing such a situational analysis is the RIDA framework, which helped to assess water resources, infrastructure, demand for water services and access to these water services. The RiDA analysis brings together different research elements within the “Strengthening Local Government Capacity to deliver Water Services” Project, including:

- **Resources:** Current situation related to water resources in the district (rainwater, groundwater, surface water) and the challenges and opportunities these offer for achieving the vision.
- **Infrastructure:** Current water supply facilities (and planned infrastructure development) and the management of the facilities. Sources of information: CWSA service monitoring data; GWCL data (if relevant)
- **Demand:** Current and projected population. Other sources of water demand (e.g. commercial use, (small-scale) industry, livestock etc.). Sources of information: GSS 2010 census and information from the DA

- **Access:** Current level of access to different facilities and the barriers that different people face accessing these. Sources of information: GSS 2010 census; user satisfaction study 2015; full coverage household survey 2016

Prior to the workshop on visioning and scenario building secondary and primary data aforementioned were reviewed and compiled into district situational analysis. The tentative findings from the situational analysis/RIDA analysis were presented to the district staff for their input and validation.

2.2.3 Resources, Infrastructure, Demand and Access to water in the districts

Water Resources

2.1.1 Rainwater:

Bongo district has an annual rainfall ranging between 600mm and 1400mm. The amount of rainfall in the district is offset by the intense drought that precedes the rain and by the very high rate of evaporation that is estimated at 1680 mm per annum (GSS, 2014).

The rainfall pattern in East Gonja is characterized by irregularity and variability in terms of duration and total amount of rainfall. However, the district has one main rainy season (May-October) which is sufficient to support and sustain plant life. The total annual rainfall ranges between 1050mm to 1500mm, with an average of 1250mm.

Wa East district has a single rainfall regime, from May to October. The average annual rainfall is about 1,200 mm per year and they are torrential, erratic and stormy. The torrential and stormy nature of the rain at the beginning and ending of the raining season normally destroy buildings and farmlands (GSS, 2014).

2.1.2 Surface water:

The Veia dam is the only surface water in the Bongo district and serves as the raw water source for treatment for water supply to the regional capital.

The East Gonja district falls within the sub-basins of the Black and White Volta Rivers. Other rivers and seasonal tributaries form a network with some important valleys such as the Katanga, Silmunchu and Chambugu (GSS, 2014). The major perennial streams and rivers include the Daka that flows in the north-south direction into the main Volta, Jebo flows in north south direction into the Daka. Benyo, Jalo and Mawli flow approximately in northwest south and northeast-south direction into the Kulurakun River that drains into the main Volta

south of the confluence of the Black and White Volta. Pasa flows in the northeast-southwest direction into main Volta. The Manwongo River flow in the north-south direction into the Main Volta River. Other rivers include Loribong and Bunjari that flow in approximately west-east direction to join the main Volta.

The Kulpawn River and its tributaries (Kulung, Wahabu and Ambalara) drain the Wa East district. Most of the rivers overflow their banks during the raining season and render most parts of the district inaccessible during this period. However, they dry up during the dry season (GSS, 2014).

2.1.3 Ground water:

Granitic rocks underlie a large part of the Bongo District (GSS, 2014). However, high fluorine concentrations in the Granites have created localized contamination of high fluoride concentrations in groundwater sources. These granite formations contain from 2 to more than 20 times the amount of fluorine in the surrounding Birimian and its associated rock formations. The area covered by the Bongo Granites is a considerable portion of the entire district, limiting the possible solution of piping groundwater from a low-fluoride area to areas with high fluoride (Alfredo, 2014). In 2009, 278 boreholes in the District were sampled and tested for water quality. Out of the number, 46% exceeded the 1.5 mg/L fluoride limit (Alfredo, 2014).

The Geological unit underlying the East Gonja district is mainly the Obosum Beds consisting of argillaceous sandstones, arkose, siltstones interbedded mudstone, sandy shales and conglomerates. About 170 boreholes with handpumps (as at June 2016) are found in this area, the drilling depth rarely exceed 80m. The yields of successful boreholes ranges from 10l/min to about 1000l/min. Most boreholes with handpumps have low yields while some of the mechanised boreholes for small towns have high yields. The success rate is among the lowest in the region estimated to be about 35%.

Wa East district is underlain mainly by igneous and metamorphic rocks that are noted for deposits of gold, iron and bauxite (Bulenga, Duu, Manwe, Goripie, Bonaa, Johnfia and Danyokura). The North Eastern part of the district is characterised by low water table. Generally, borehole drilling success rate in the district averages 62% with an average drilling depth of about 50m. The yield of the boreholes ranges from a low of 5l/min to a high of 150l/min with an average of about 50l/min (CWSA, Service Monitoring data, 2015).

Water Infrastructure

As at September 2016 there were 463 handpumps, 3 Small town water schemes in Bongo, Zorkor and Bongo-Soe and 7 Limited Mechanized Water systems at Beo, Vea Clinic, Zorko Clinic, Namoo Clinic, Namoo Primary B and Bongo Hospital (DWST, 2016). About 81% of hand pumps were functional with 91 percent providing reliable services (breakdowns of less than 18 days per year). Nevertheless, 64% of households using hand pumps reported that breakdown repairs took 4 days or longer (CWSA, Service Monitoring data, 2015).

During the CWSA water service monitoring exercise in 2016, 170 handpumps were mapped and assessed in East Gonja. The majority of handpumps (82%) in the district are of the Afridev type. Handpump functionality is however an issue, and about 55% of handpumps are functional, 72% provide reliable services with breakdowns of less than 18 days per year. The only small town piped scheme in the district can be found in Salaga town. This system is supplied by surface water, supplying 45 standpipes and 560 household connections. This scheme was considered to be partially functional at the time of monitoring data collection in 2016, 4 out of 45 standpipes were functional. There are 5 limited mechanized systems: one each in Bunkwa, Talkpa and New Makango, and two in Salaga. There are two small community piped schemes, in Kpalbe and Old Makango, each supplied by surface water. A Limited mechanized system funded by Water Health located in Kpembe was fully functional and provided reliable services at the time of data collection.

During the CWSA water service monitoring exercise in 2014, 276 handpumps were mapped and assessed. Majority of handpumps (71%) in the district are of the Afridev type. 18% of the Ghana modified India Mark 2 type and the remaining 11% of the Nira AF-85.

The 2015 User Satisfaction survey in the district reported 75% of households using handpumps as their main source of drinking water provided water throughout the year. About 70% of handpumps were functional of which 81% provided reliable services with breakdowns of less than 18 days per year. However, 58% of households using handpumps reported that breakdown repairs took 4 days or longer. The majority of households (90%) identified mechanical failure as the main course of breakdowns. Only 7% of the handpumps in the district were providing basic service. The district has six (6) piped schemes with forty-two (42) standpipes. These are located in Funsi Area Council, one (1) piped scheme with twelve (12) standpipes and Bulenga Area Council, five (5) piped schemes with 30 standpipes.

Demand

According to the 2010 Population and Housing Census (PHC) Bongo District had a population of 84,545 and 15,188 households with an average household size of 5.5 persons per household. The District as at September, 2016 had 1 Private University, 4 public Senior

High Schools and 3 private Senior High Schools, 1 Vocational School, 47 public and 3 private Junior High Schools, 72 public and 4 private primary schools and 71 public and 4 private kindergartens.

The population of East Gonja which is predominantly rural is estimated at 135,450 during the 2010 National Census (GSS, 2014). The district has a total household population of 133,139. There are 17,818 houses comprising 3,383 rural and 14,435 urban houses. The average population per house is 7.5.

Wa East District has water facility needs gap of hundred and six (106) new boreholes, forty three (43) boreholes for rehabilitation, six (6) Small Town Pipe schemes construction and twelve (12) Limited Mechanised Systems in order to achieve full water coverage by 2025.

Access

According to the 2010 PHC, 80% of the people rely on handpumps as their main source of drinking water supply. In Bongo town, 19% of the people reported to have access to piped water supply. During the 2010 PHC, 12,203 households reported to use handpumps as their main source of drinking water supply. With an average household size of 5.5 people, this would imply a hand pump population of 67,117 people. According to the CWSA service monitoring data, 2015 the handpumps in the region serve about 128,181 people, which is almost double the 2010 population of 84,545 people.

Over 30 percent of the households in East Gonja district get their drinking water from rivers and streams. This is closely followed by protected wells, which also accounts for 23.8 percent of households with drinking water. Other sources include borehole/pump or tube/well, 15.8 percent while dugout/pond/lake/ dam/canal constitute 19.6 percent. Pipe-borne water inside dwelling, one of the improved water sources is less than two percent and; pipe-borne outside dwelling accounts for 1.6 percent while public tap/Stand pipe is less than one percent.

In Wa East District, more than a quarter of the population (27.1%) still relied on unimproved sources for their drinking water supply. The main safe source of water supply is boreholes with handpumps (55.6%). In addition, 9.1% of households reported to depend on standpipes.

2.2.4 Scenario building

There are different possible scenarios of factors beyond the control of the WASH sector, which will have influence on the viability of different strategies to go towards achieving the vision. Important factors can be population growth, urbanization, economic growth (and the rise in higher service levels that comes with that), etc. Different scenarios for future developments of these external factors will have to be considered when coming up with

possible strategies for going from the current situation (situational analysis) to achieving the vision.

2.2.5 Strategy developments

Strategic directions are developed and assessed according to their technical viability, financial, environmental (related to water resources), managerial and institutional viabilities. An important strategic consideration in this case would be the implementation of handpumps or extension of piped schemes to reach the unserved.

Strategic planning can be done at different levels, with different levels of detail. At national level, more general strategic directions can be formed using the strategic planning process, while at district level, more detailed strategies can be developed, based on more accurate and detailed data on the current and perceived future situation. The different activities of the strategic planning process will first take place at national level, after which they will be replicated at district level in the 3 pilot districts. The national level activities thus function as well as training opportunities for the staff responsible for facilitating the process at district level.

In addition to CWSA and the project partners, the Ministry of Water Resources, Works and Housing and the GWCL will have to be closely involved in the participatory strategic planning process (at national level).

Table 2: Strategies developed by districts to achieve full coverage

Districts	Strategies developed
Bongo	<ol style="list-style-type: none"> 1. Mechanize fluoride free boreholes in near communities to serve the fluoride communities 2. Installation of fluoride removal treatment plant in fluoride borehole 3. Distillation Filtration <p>Adequate budgetary allocation by the Assembly in WASH service delivery</p> <ol style="list-style-type: none"> 4. Proper co-ordination between the Assembly and its Partner in WASH 5. Intensify supervision and monitoring of WASH service delivery 6. Re-constitution and formation and capacity building of WSMTs 7. Recruitment and training of new Area Mechanics 8. Establish linkage between WSMTs and spareparts dealers 9. Refresher training of existing Area Mechanics
East Gonja	<ol style="list-style-type: none"> 1. Providing boreholes, piped schemes and rainwater harvesting facilities to all communities in the district. 2. Organizing periodic training/workshops for D/A and other stakeholders to enhance their capacity in water delivery. 3. Formation and training of WSMTs for effective management and operation of their facilities. 4. Providing support for the Area mechanics and pump caretakers to monitor point source communities for sustainability of the handpumps.
Wa East	<ol style="list-style-type: none"> 1. Private sector management 2. Provide capacity building training 3. Zoning the District into six parts and each zone should have

	one Area Mechanics 4. Liaising with the private sector for reliable spare parts supply
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3.0 RESULTS AND DISCUSSION

3.1 Water Facilities Required

This chapter summarises the types of infrastructure and resources required to achieve full coverage by 2025. This was determined using the following process

- Population projection from 2010 using the CWSA DIMES population data and an annual growth rate for each district.
- CWSA guidelines for allocation types of facilities based on population thresholds

Table 3: Summary of facilities required to achieve full coverage in the districts

District	Year/	Borehole (New)	Borehole Rehab.	LMS	SCPS	STPC
Bongo						
	2016	0	0	0		0
	2017	63	80	6		0
	2018	20	75	6		0
	2019	15	69	2		0
	2020	10	75	0		1
	2021	9	43	0		1
	2022	5	17	1		0
	2023	4	2	1		0
	2024	16	5	1		0
	2025	72	5	11		0
	Total	214	371	28		2
East Gonja						
	2016	307	0			0
	2017	4	0			2
	2018	3	2			0
	2019	23	11			0
	2020	13	4			0
	2021	13	38			3
	2022	5	11			2
	2023	9	5			3
	2024	32	68			7
	2025	44	281			63
	Total	452	420			80
Wa East						
	2016	58	0	0	0	0
	2017	1	0	0	0	0
	2018	1	0	1	0	0
	2019	9	0	1	0	0
	2020	3	0	1	0	0
	2021	5	8	1	0	0
	2022	1	4	1	0	1
	2023	2	0	2	0	0
	2024	20	8	2	0	2
	2025	6	23	3	0	3
	Total	106	43	12	0	6

3.2 Financial Resources Required

The financial resources required to achieve full coverage and sustain it was determined using the Life-Cycle Cost approach (LCCA). The CapEx has been determined by multiplying the

unit cost of the facility (Table 4) by number required for each year. The operation and maintenance expenditure was estimated using similar data from studies carried out by WASHCOST. Capital maintenance expenditure has been estimated using the asset management plan for the district, their life span and remaining useful life of key components of existing and new facilities to be provided and estimated costs of the components. Direct support cost which is to be provided by the district for monitoring and supervision of WASH activities was determined from experience by the district team. Table 5 presents the summary of the financial requirements.

Table 4: Unit Costs of Facilities

	<i>Bongo</i>	<i>East Gonja</i>	<i>Wa East</i>
UNIT COST			GH¢
New Borehole(Includes siting, supervision, software, procurement, Installation)	50,000	50,000	80,000.00
Borehole Rehabilitation	15,000	15,000	22,000.00
Limited Mechanised Schemes	250,000	250,000	700,000.00
Small Community Piped Scheme		500,000	800,000.00
Small Town Piped schemes Rehabilitation	100,000.00	8,000,000 for Salaga system and 100,000 for others	1,500,000.00
Small Town Piped Scheme (NEW)	1,500,000.00	1,500,000	1,850,000.00
Monitoring & Evaluation (WATER)			40,000.00
Monitoring & Evaluation (SANITATION)			200,000.00

For the calculation of OpEx, the following per capita costs were used;

- Borehole with handpump: US\$1.00 (GHc 4.3)
- Limited Mechanised System: US\$ 2.5 (GHc 10.76)
- Piped System: US\$ 5.0 (GHc 21.5)
- CapManEx: (Boreholes and handpumps) US\$ 2.0 (GHc 8.6)
- CapManEx: (LMS) US\$3.5 (GHc15.50)
- CapManEx: (STPC) US\$ 7.00 (GHc 30.1)
- Direct Support: (Boreholes with handpumps); US\$ 2.00 (GHc 8.6)
- Direct Support (Piped Scheme) : US 3.0 (GHc 12.9)

Source: WASHCost Infosheet, October 2012

Table 5: Summary of financial resources for the districts to achieve full coverage from 2016-2025

Districts (GHC)	CapEx⁶	OpEx⁷	CapManEx	Direct Support	Total
Bongo	23,465,000.00	6,778,860.17	4,254,840.00	11,004,006.86	45,502,707.03
East Gonja	49,100,000	57,708.00	1,089,650.00	300,675	50,548,033
Wa East	34,160,000.00	1,118,670.00	946,000.00	1,081,020.00	37,305,690.00
Total	106,725,000.00	7,955,238.17	6,290,490.00	12,385,701.86	133,356,430.03

3.3 Human Resources Required

The human resources needed for the implementation of the strategy in achieving full coverage of water services in the districts cut across both the public sector (DA, CWSA), civil society and development partners:

3.3.1 Community Water and Sanitation Agency

The Community Water and Sanitation Agency is the Regional Directorate for coordinating and implementing Water and Sanitation activities in the region. They design and supervise the construction of water and sanitation project, They provide technical support to the District Assembly (District Water and Sanitation Team) in implementation of Water and Sanitation project. Chief Executive Officer heads the Agency, the Regional Directors superintend over Engineers, Extension Specialist, hydrogeologist, IT Managers and Accountants. The Community Water and Sanitation Agency is committed to effective facilitation of the provision of sustainable potable water to rural communities and small town through resource mobilization, capacity building and standard setting with the active participation of major stakeholders.

3.3. 2 District Assembly

The District Assembly are the highest political Authority at the local level and they have considerable responsibility in ensuring that water delivery is sustainable. District Chief

⁶ CapEx includes software related costs such as community mobilisation, siting and drilling supervision, design and construction supervision.

For example if in 2016 19 boreholes, 5 LMS, and 2STPC are to be constructed the CapEx for 2016 is $19 \times 80,000 + 5 \times 70,000 + 2 \times 1,850,000$

⁷ OpEx is(number of people to be served by the boreholes)* GHc 4.3+ (number of people to be served by LMS)* GHc 10.7+ (number of people to be served by STPC)*GHc 21.5etc

Executive who is political and Administrative head and manages the district. The Chief Executive Superintendent for Water and Sanitation activities implementation.

District Co-Ordinating Director:

He is the Administrative Secretary to the District Assembly. He is the head of bureaucrats and his main role is to organize and implement government policies and programmes. He also co-ordinate the activities of all Decentralized Departments. For the purpose of Water and Sanitation, the following unit/departments –District Works Department (DWST) , the Planning Unit and the Schedule Officer-WASH work up to District Chief Executive and the District Coordinating Director.

District Project Co-Ordinating Unit (DPCU) /Planning Unit:

Periodically monitor development of projects/programmes of water and sanitation activities with other staff members (DWST) and submit progress report to the DPCU. An Assistant Development Planning Officer is attached to the DWST. They conduct District profiling, development, manage database on water and sanitation, guide, support the DWST, and assist in the preparation of DWSP and annual plans. They are responsible for the monitoring and evaluation of all development projects in the District.

District Works Department/DWST:

The District Water and Sanitation Team consist of an Environmental Health and Sanitation Officer, a Social Welfare and Community Development Officer and an Engineer. They are responsible for daily technical supervision of all projects/programmess and submit technical reports to the DCE/DCD for further action.

Schedule Officer-WASH/DWST Team leader

Schedule Officer-WASH/DWST Team leader co-ordinate and liaise with CWSA, NGO's and other developmental partners. The officer also co-ordinates the activities of the DWD/DWST and other decentralized Departments (Ghana Education Service, Ghana Health Service etc.) activities on WASH.

3.2.2 Private Sector

The private Sector play an important role in the delivery of water service in the District. They provide key essential services in water service delivery. The private sector includes the following:

Partner Organization (POs): There are other Partner organization in the District who are into WASH service delivery. They undertake data collection and documentation, group formation/dynamics, participatory planning techniques and monitoring/evaluation. Classical example of such POs are Intergrad Ghana, Spring Ghana, Tree Aid and etc.

Consultants: Consultants are group of individuals with specialized knowledge in a particular field. They provide technical and managerial services to contractor undertaking construction of water projects. They design and supervise project as per specification.

Contractors: The contractor is the main executor of water and Sanitation project. They are contracted to construct physical project as per building. They are responsible for providing all the material, labour, equipment (such as engineering vehicle and tool) and services necessary for the construction of the project. The general contractor hires specialized subcontractor to perform all or portion of the construction work. There are numerous contractor undertaking WASH projects in the District.

SpareParts Distributors: Accessibility and availability of spare shops in the districts is challenging, this situation makes repairing of broken down of WASH facilities to take a long period.

Area Mechanics: An Area Mechanics is a specialized trained person who undertaking repairing of broken down boreholes. The small number of area mechanics affects service delivery in the districts.

3.2.3 Community / Small Town (WSMTs)

There are Water and Sanitation Management Teams overseeing the day to day management of WASH facilities. They ensure the facility operates throughout the year. They ensure that qualified operational staff are employed and well paid. Some of the staff shall include the Systems Manager, Standpipe Attendant, Revenue Collectors, Accounts Officer/Clerk, Technical Operators, Sanitation workers and Security Personnel. Some of the Water and Sanitation Management Teams are operating very well in various communities. Others are not functioning which affects service delivery. There are also capacity challenges in managing and funds mobilization.

3.5 Institutional Capacity

There should be periodic capacity building for the above human resource in WASH service delivery. The world is changing and the various WASH service facilitators need to be abreast with modern ways of doing things. This capacity building should cover financial management, records keeping and report writing.

3.5 Assumptions

For the districts to achieve full coverage by the year 2025, the following under listed assumptions must be taken into consideration;

1. The population of the communities/area councils projected will continue to grow at the existing grow rate.
2. There will be political stability and continuity of projects by successive governments. Political stability is key to the development of a country in all sectors including the water and sanitation sector. If there is peace and stability in the country, development activities or projects will be embraced by both internal and external donors to enable us achieve full coverage. In addition, if change of government will lead to the discontinuity of programmes and projects, then achieving full water coverage will be very difficult.
3. There will be adequate and regular inflow of funds for the implementation of WASH programmes and projects. If funds are released on time and enough allocation are given to the WASH sector for the implementation of programmes and projects by the District and Donor Partners, then full coverage can be achieved. There should be equity in the funds allocation for programmes and projects at the District level.
4. There will be Human Resource with capacity for the WASH programmes and projects implementation. Implementation of programmes and projects goes with adequate Human Resource capacity to manage programmes and projects to it successful completion. Refresher courses should be organized periodically for the key actors in water service delivery at the district level.
5. There will be bye-laws on water and Sanitation approved, gazetted and enforced by the District Assembly. This will force people to comply with rules and regulation related to water and sanitation in the district.
6. Assembly will form and enforce the COM in the District. Provision of water facilities without provision for sustainability will create the same vacuum that

existed before. The District should make efforts to form WSMTs in facility communities who will take responsible for the sustainability of water facilities to achieve full water coverage.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The total cost of implementing the strategy for the full water coverage in the three districts is estimated to cost **One Hundred and Thirty-Three Thousand, Three and Fifty Six Thousand, Four Hundred and Thirty Ghana cedis three pesewas (GHS 133,356,430.03)**. Bongo district will require **GHS 45,502, 707.03**, East Gonja **GHS 50,548,033.00** and Wa East **GHS 37,305,690.00** for the implementation of water coverage and sustainability activities spanning from 2017-2025.

The sustainability of water service infrastructure would propel the achievement of Full Water Coverage by 2025. The objective of this report is to provide potable drinking water, therefore if funds are allocated for the operation and maintenance of water facilities and new facilities being added, it would increase water coverage in the district. This sustainability of water service delivery goes with adequate human resource to manage such water facilities, which requires regular capacity building for WASH actors at the District level. The implementation of the strategy will contribute significantly to achieving full coverage in the District. It is hoped that, with the commitment of all identified stakeholders in the water and sanitation sector in the district, the implementation of the strategy activities will enhance the living conditions of the people.

It is also essential for strengthening the capacity of these stakeholders to carry out their expected roles and responsibility towards the sustainability of the provided facilities. This can only be possible with guaranteed financial support from the government, development partners and donor agencies.

4.2 Recommendations

For the District to achieve full water coverage by the year 2025 the following recommendations are made for consideration to be adopted as a national strategy for water services;

- The need for the establishment of a dedicated fund for WASH activities at the national level with clear policy guidelines for accessibility and utilization by district assemblies will ensure reliable source of funding towards achievement of full water coverage.

- To ensure full water coverage requires the enhancement of the capacity of the WASH Unit in the district in the areas of logistics and human resource for effective implementation and monitoring.
- There are existing Assembly sub-committees whose mandate include the implementation of WASH activities in the district; however, WASH activities have not had the needed attention that it requires. Hence, the need to establish and institutionalize statutory WASH sub-committee to focus on WASH activities in the district to achieve full water coverage.
- Establishment of mandatory Water and Sanitation funds which would be binding on government to be released every quarter for funding of WASH projects at the district level
- Establishment of WASH Consortium at the District level which serve as platform for stakeholders/ Development partners in WASH to meet quarterly to review WASH activities and to formulate policies for implementation.

4.3 Emerging issues and the way forward

The projections and costing was unable to take into consideration the cost of yard taps, this is because of the lack of information/ data to ascertain the profile/ outlay/distribution of the water systems to estimate the cost of yard taps. Furthermore, it is important to note that the cost of tapping water to a household are borne by the water users and not the district.

Bongo district is characterized by high concentration of fluoride in some areas. The study has not concluded on the type of treatment to use to treat the fluoride issues. It is proposed that the Capital Expenditure makes room for some percentage increase in cost to offset any unforeseen water quality testing.

REFERENCES

Alfredo K. A. Lawler D. F. & Katz, L. E. (2014). Fluoride contamination in the Bongo District of Ghana, West Africa: geogenic contamination and cultural complexities. *Water International*, 2014 Vol. 39, No. 4, 486–503, <http://dx.doi.org/10.1080/02508060.2014.926234> Accessed 10 May, 2017

CWSA, Service monitoring data (2015) <http://cwsawateratlas.org/data/> Accessed 20 January 2017

CWSA (2014). National Community Water and Sanitation Strategy, CWSA, 2014

DiMES (2017). CWSA District Monitoring and Evaluation System report

DWST Quarterly Report (2016). Bongo District Assembly

GOG (2015). The Ghana Millennium Development Goals reports, September, 2015

Ghana Statistical Service (2014). Ghana Living Standards Survey: Report of the Sixth Round (GLSS 6). Accra: GSS.

Ghana Statistical Service (2008). Ghana Living Standards Survey: Report of the Fifth Round (GLSS 5). Accra: GSS.

Ghana Statistical Service (2006, 2007). Pattern and Trends of Poverty in Ghana (1991-2006).

SDSN (2015). Getting Started with the Sustainable Development Goals A Guide for Stakeholders December 2015, Sustainable Development Solutions Network

WHO/UNICEF (2017). Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG Baselines. Geneva: World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), 2017. Licence: CC BY-NC-SA 3.0 IGO.

