

BRIDGING WATER AND SANITATION INFRASTRUCTURE GAP IN GHANA

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ABSTRACT

The United Nations General Assembly has declared access to water and sanitation as a fundamental human right, yet development of infrastructure for the provision of water and sanitation is problematic in developing nations including Ghana. Water and sanitation infrastructure are local assets upon which national public interests for sustainable development rest. Investments in potable drinking water and sanitation may yield high economic dividends and improved health. It is globally recognised that water and sanitation improvements are critical in achieving the Millennium Development Goals (MDGs) on reducing child mortality, promoting gender equality and reducing endemic diseases such as malaria and diarrhoea. Ghana's population without access to improved water sources declined from 44 percent in 1990 to 16.2 percent in 2008. Thus, Ghana is on track to achieving the MDGs target of reducing the population without access to improved water and sanitation sources ahead of the target date of 2015. However, inadequate investment in water and sanitation infrastructure exists. Evidence shows disparities in improved water and sanitation access between urban and rural areas as well as between various regions in the country. This paper, which largely relies on secondary data, discusses water and sanitation infrastructure gaps in Ghana. It recommends the need for specific targeted interventions to address the water and sanitation infrastructure gaps, and calls on the central and local governments, private sector and civil society organisations to work in concert to address the problem in order to attain sustainable development.

Keywords: Ghana, Infrastructure, Finance, Water, Sanitation, Millennium Development Goals

INTRODUCTION

Provision of water and sanitation, coupled with health and educational services, is important as a means to achieving the broader goals of poverty reduction, economic growth and sustainable development. The World Commission on Environment and Development (1987, p.43) defines sustainable development as ‘development which meets the needs of the present without compromising the ability of future generations to meet their own needs’. In other words, sustainable development requires meeting the basic needs of all people and extending to everybody in both present and future generations a better quality of life (Mensah & Antwi, 2008). The MDGs enjoin countries to integrate the principles of sustainable development into their policies and programmes and reverse the loss of environmental resources (United Nations General Assembly, 2001).

Water supply and sanitation, which are components of MDG7 (i.e. ensure environmental sustainability) provide good health and ensure economic benefits. Safe drinking water and basic sanitation are of crucial importance to the preservation of human health. Water-related diseases are the most common cause of illness and death among the poor in the developing countries. Inadequate access to safe water and sanitation services, combined with poor hygiene practices, is the cause of at least one quarter of all child deaths and one fifth of the total childhood disease burden globally (Fewtrell, Prüss-Üstün, Bos, Gore & Bartram, 2007). Water, sanitation and hygiene are also linked to school attendance and performance (particularly among girls), safety and security of women and girls, and the economic and social development of communities and nations.

Machel (1996) cited in UNICEF (2009) examined water and sanitation from three perspectives: as a determinant of conflict, as a key prerequisite for reducing child mortality, and as a gender issue. Water as a factor in causing and exacerbating conflict arises due to increasing competition for dwindling freshwater supplies. According to the Intergovernmental Panel on Climate Change (IPCC) (2007), this is clear as evidenced by global warming in reducing the availability of water, and water-scarce regions in developing countries. At the same time, population growth, urbanization and intensive irrigation practices have significantly increased competition for water. This has further marginalized poor and vulnerable groups. Interruption of water, sanitation and hygiene services and destruction of facilities are all too common during conflict, in part due to the increasing value of water as it becomes scarcer. Secondly, both water and sanitation are key interventions for reducing child mortality in camps and emergency-affected communities because they are linked to disease and malnutrition. Thirdly, water and sanitation facilities should be carefully designed to avoid creating opportunities for gender-based violence against displaced women and children.

In Ghana, water supply and sanitation infrastructure is insufficient, especially in rural areas. In 2000, for instance, only 40 percent of rural population and 70 percent of urban population had access to safe water. However, only 40 percent of urban population had reliable water and 78 percent of urban poor rely on small-scale independent providers. Sanitation coverage is about 40 percent and 10 percent in urban and rural areas respectively. Only three cities are substantially sewered. Wastewater treatment is hardly ever accorded any resources. Wide disparities between regions and between urban and rural areas are evident (Trend Group, 2003).

Ghana faces several constraints to meeting the challenge of providing adequate water for rural and urban residents. These include the dire and worsening financial condition of the urban utility organisation – the Ghana Water Company Limited (GWCL) – due to insufficient sector investment over the last 10 years, weak implementation capacity caused by staffing problems and low salary levels (WaterAid, 2005).

Available data indicates that the proportion of the Ghanaian population that uses improved drinking water has increased significantly from 56 percent in 1990 to 83.8 percent in 2008. Similarly, the proportion of the urban population with access to improved drinking water increased from 86 percent in 1990 to 93 percent in 2008, while that for rural population increased from 39 percent in 1990 to 76.6 percent in 2008 (UNDP, 2010). However, only 17.8 percent and 8.2 percent of urban and rural population respectively had access to improved sanitation (toilet) facility in 2008 (WSMP, 2009).

The paper is organised into six sections. The next section reviews literature review while section three describes the study area and data sources. The fourth section presents results and discussion of the paper. Section five focuses on the promoting factors and challenges of water and sanitation infrastructure. The final section deals with conclusion and the way forward.

LITERATURE REVIEW

Review of literature covers the concepts of infrastructure and water and sanitation, as well as historical and institutional arrangements of water and sanitation delivery in Ghana.

The Concept of Infrastructure

Infrastructure is a broad concept that includes public investment in physical assets and social services. Generally, it refers to the basic facilities, services, and installations needed for the functioning of a community or society such as water and power lines, transportation and communications systems, and public institutions including schools, hospitals, and prisons. Infrastructure plays an important role in socio-economic development of every nation. In today's competitive world, modern infrastructure system plays a vital role in rapid development of an economy. Adequate, well maintained and efficient infrastructure is important to people, businesses and nations (Mensah & Antwi, 2011).

Infrastructure has different definitions. Since 1927 infrastructure has been used to refer collectively to roads, bridges, rail lines, and similar public works that are required for an industrial economy, or a portion of it, to function. Today, infrastructure is often used to refer to any sub-structure or underlying system. Thus, big corporations are said to have their own financial infrastructure of smaller businesses while political organizations have their infrastructure of groups, committees, and admirers. Terrorist organisations may have infrastructure of people sympathetic to their course.

In Economics, infrastructure is often used to refer to as the stock of fixed capital equipment in a country including factories, roads, schools, water, and utilities, considered as a factor of economic growth. Infrastructure is “a wide array of public facilities and equipment required to provide social services and to support private sector economic activity” (Vaughan & Pollard, 1984, p.1). Indeed, what is considered to be infrastructure depends heavily upon the context in which the term is used.

Water and Sanitation

At the basic level, every community and individual require access to clean water and sanitary waste disposal. Water and sanitation improvements, in association with hygiene behavioural change, can have significant effects on people's health by reducing a variety of disease conditions such as diarrhea, intestinal helminths, guinea worm, and skin diseases. These improvements in health can, in turn, lead to reduced morbidity and mortality and improved nutritional status.

Water and sanitation improvements affect health primarily by interrupting or reducing the transmission of disease agents. This occurs through a variety of mechanisms. Of primary importance is the safe disposal of human faeces, thereby reducing the pathogen load in the ambient environment. Increasing the quantity of water allows for better hygiene practices. Raising the quality of drinking water reduces the ingestion of pathogens. With fewer incidences of diseases, children can eat and absorb more food, thereby improving their nutritional status. Also, a healthier adult population is more productive, and improvements in water and sanitation can improve income and the capacity to acquire food. Other benefits associated with better water delivery include time savings for primary caregivers, which can result in the preparation of more or better food for children (Bergeron & Esrey, 1993).

Improvements in sanitation have been shown consistently to result in better health, as measured by less diarrhoea, reductions in parasitic infections, increased child growth, and lower morbidity and mortality. Modest improvements in sanitation (e.g. pit latrines) may result in better health but major improvements in sanitation (e.g. flush toilets) may lead to even larger health benefits (Anker & Knowles, 1980). These results have been reproduced consistently in a number of settings (e.g. Bateman & Smith, 1991).

Another potential benefit from increasing the quantity of water is the use of water for income generating (e.g. local industries) or food producing (e.g. gardening) activities, both of which could result in the intake of more and better food, improving the family's diet as well as child anthropometry. Thus, adequate and quality water supply has the potential to positively influence sustainable development.

A fourth benefit is a reduction in the time spent obtaining water. Studies suggest that when women have more time for other activities, they spend much of that time in food-related activities such as preparing food and feeding young children (Bergeron & Esrey, 1993). More time for women can also increase women's opportunities for generating income. However, improvements in water and sanitation do not automatically result in improvements in health. The addition of hygiene education is often required to see health impacts materialize. This concerns the basic issues of hand washing, proper disposal of faeces, and protection of drinking water (Environmental Health Project, 1999). Several studies in different parts of the world, in daycare centers, and in community settings, have indicated that frequent hand washing, with and without soap, results in less diarrhoea. Collectively, these studies report a 33 percent reduction in diarrhoea from hand washing alone (Esrey, Potash, Roberts & Shiff, 1991; Hutley, Morris & Pisana, 1997). Properly disposal of faeces is also critical for the potential benefits of sanitation to materialize.

The term ‘sanitation’ as used in this paper refers to ‘a toilet facility,’ as used in the indicator for measuring MDG progress for sanitation delivery. ‘Improved sanitation’ also implies use of an ‘improved toilet facility’ (MSWP, 2009). Basically, sanitation means being free from germs.

Historical and Institutional Arrangements for Water and Sanitation Development in Ghana

Ghana’s water and sanitation sector has a chequered history with key events and institutional arrangements as indicated in Table 1. In 1928, the first piped water supply system was constructed at Cape Coast, the first colonial national capital. The Water Supply Division of the Public Works Department was responsible for the service provision in rural and urban areas of Ghana. After Ghana's independence in 1957, the division was separated from the Public Works Department and placed under the Ministry of Works and Housing.

Table 1: Key events in Ghana’s water sub-sector

Year	Event
1928	First development of public water supply systems, operated by the Hydraulic Division of the Public Works Department
1965	Ghana Water and Sewerage Corporation (GWSC) established to be responsible for urban and rural water supply
1986	Removal of operational subsidy on water supply
1991	GWSC efficiency increased by cutting 1400 jobs and recruiting more qualified personnel
1994	The operation of rural and small town water supplies moved from GWSC to be community managed. Semi-autonomous Community Water and Sanitation Division established to be responsible for facilitating the community water supply management
1995	Stakeholder meeting selects the ‘lease option’ for restructuring the urban water sector
1996	Water Resources Commission established
1997	Public Utility Regulatory Commission established
1999	GWSC replaced with the publicly owned Ghana Water Company Ltd (GWCL) in urban areas and the Community Water and Sanitation Agency (CWSA) in rural areas. Responsibility for urban sanitation transferred to ministries of local government
2003	Modification of water sector restructuring project so that management contract option is also available to urban water project
2004	Preparation of a National Water Policy
2006	A five-year management contract signed between GWCL and Aqua Vitens Rand Limited (AVRL)
2011	Ghana Urban Water Limited takes over the management and operations of all the 81 Urban Water systems in Ghana for one year.

Source: WaterAid (2005); Ghana News Agency (9th June, 2011)

In 1965, it was transformed into the Ghana Water and Sewerage Corporation (GWSC), a legal public utility responsible for the provision of urban and rural water supply for public, domestic, and industrial purposes as well as the establishment, operation, and control of sewerage systems. Consequent upon the Structural Adjustment Programme adopted by the country in 1983, the operational subsidy on water supply was removed in 1986. Since 1993, various reforms have been introduced to

address the problems of the sector. The key objectives of the reforms were to separate rural and urban service, to introduce independent regulatory agencies, and to promote private sector participation.

In order to pay more attention to water supply and sanitation in rural areas, the Community Water and Sanitation Division was founded as a semi-autonomous division of GWSC in 1994. Four years later, it changed its name to the Community Water and Sanitation Agency (CWSA) and became fully independent. In 1999, the GWSC was replaced by the publicly owned GWCL. At the same time, the responsibility for rural water supply and sanitation was decentralized to the Metropolitan, Municipal and District Assemblies (MMDAs). MMDAs are the local government authorities charged with the responsibility of overall development of their respective areas. The number of MMDAs was 110 between 1988 and 2004, 138 in 2004-2008 and 170 by the end of 2008.

In addition, sanitation was separated from water supply and became a responsibility of the MMDAs in urban and rural areas. As a result, the GWCL remained responsible only for urban water supply, whereas more than 110 small towns' water systems were transferred to MMDAs, which receive support from the CWSA. A demand-driven and community-managed approach was introduced.

The regulation of water supply has been shifted from the government to independent agencies. Two commissions *viz.* the Public Utilities Regulatory Commission (PURC) and Water Resources Commission (WRC) were created in 1997 to regulate the sector. PURC is responsible for formulating and approving appropriate pricing mechanisms aimed at full cost recovery, since the government began to phase out the subsidization of water services in 2003. The PURC has no authority over community-managed water systems and only regulates GWCL services. Besides the provision of tariff guidelines and the examination and approval of tariffs, it protects the interests of consumers and providers, promotes fair competition, and initiates, conducts, and monitors standards concerning the provided service. Whereas the PURC takes responsibility for economic regulation of urban water supply, the WRC regulates water resources and is in charge of licensing water abstraction and wastewater discharges. MMDAs regulate water supply tariff in community-managed small-towns pipe systems and rural hand pump water supply systems.

To carry out the private sector participation of GWCL, originally a 10-year lease contract was envisaged. In 2000, a lease contract between GWCL and the US Company Azurix failed due to public opposition and accusations of corruption which led to the formation of the Coalition against Water Privatization. In October 2006, under the framework of the Urban Water Project, a five-year management contract was signed between the GWCL and AVRL.

The main objectives of this private sector participation are:

- Extending reliable water supply, especially to low-income areas;
- Making potable water affordable for low-income consumers;
- Increasing cost recovery;
- Ensuring investments based on low-cost and concession financing;

- Supporting further involvement of the private sector;
- Reducing non-revenue water; and
- Increasing water treatment.

The project was financed by the World Bank, the Nordic Development Fund and the Republic of Ghana. In March 2008, severe water shortages that hit the national capital (Accra) led the Ministry of Water Resources, Works and Housing (MWRWH) to review whether AVRL is working in compliance with the management contract. However, the reason for the shortages was unforeseen power outages at two water treatment plants in Weija and Kpong. It was envisaged that the overall situation would improve appreciably by the end of 2008 due to completion of several new boreholes and a more stable power supply. In 2011, the AVRL contract was not renewed based on allegations of non-performance from a cross-section of the public. A newly formed Ghana Urban Water Limited is to take over the management and operations of all the 81 Urban Water Systems in the country for the next 12 months (Ghana News Agency, 9th June, 2011).

To overcome the lack of coordination between the numerous institutions which were created since 1993, the government launched a National Water Policy (NWP) at the end of February 2008, which focused on the three strategic areas: (i) water resources management, (ii) urban water supply, and (iii) community water and sanitation. Although the water sector has made substantial progress, incoherence in policy formulation resulted in several implementation strategies which led to new problems. The NWP, therefore, aimed at formulating a comprehensive sector policy which includes all relevant actors in the sector. The NWP, prepared by the Ghanaian Water Resources Commission (WRC), could make it easier for development partners to provide the necessary support to the sector. The policy was based on the Ghanaian Constitution of 1992, the Ghana Poverty Reduction Strategy (GPRS), international agreements and conventions, and other national programmes.

The foregoing discussion clearly indicates that a number of institutions exist to supervise and regulate or deliver water and sanitation services in Ghana. The government is charge of policy and regulation while the private sector and communities play important roles in service delivery. Currently, the MWRWH is responsible for sector policy formulation and coordination. Its functions include developing policy framework for the water and sanitation sector; soliciting for funding from External Support Agencies (ESA), monitoring activities of water supply and sanitation sector, and advising cabinet on water and sanitation issues.

The Environmental Protection Agency (EPA), created in 1994 by an Act of Parliament, regulates and enforces environmental quality laws, including policies and regulations pertaining to control pollution of water resources. The WRC, established by an Act of Parliament in 1996, is responsible for regulation and management of utilisation of water resources and for the coordination of policy in relation to them. It grants water rights for abstraction and wastewater discharges. The Ghana Standards Board is responsible for the development of drinking water standards while the GWCL has ownership of urban water supply assets, monitoring of water supply operations, and development and expansion of urban water supply systems (AfDB & OECD, 2007).

In rural areas, the responsibilities for development of water and sanitation services rest on CWSA, MMDAs, communities and NGOs. The CWSA facilitates the development of water and sanitation services. Its roles include ensuring sustainability of water and sanitation systems provided through appropriate management models; maximizing health benefits through integration of health and hygiene, education and sanitation promotion interventions; and facilitating capacity building of sector practitioners. MMDAs are mandated to demonstrate commitment to the sector by setting up District Water and Sanitation Teams (DWST). The DWSTs select beneficiary communities and apply for national programme benefits on their behalf. They also manage implementation and approve tariffs set by Community Water and Sanitation Committees and Town Water and Sanitation Boards.

Communities apply for benefits available from the District Assemblies. Commitment is demonstrated by opening of a bank account and depositing funds towards the capital cost contribution (5%) for each facility and eventual collection for operations and maintenance and replacement. Communities make their own arrangements for payment of facilities and fully operate and manage its use. Community Water and Sanitation Committees (WATSAN) are established to set tariffs, maintain accounts, and manage day-to-day operations of water points.

NGOs provide not only technical assistance to communities during planning implementation and provision of facilities but also capacity building to community management groups. In some cases, NGOs provide water and sanitation facilities. The NGOs active in the water and sanitation sector include World Vision International, WaterAid, ProNet and several faith-based organizations. The Ghana Coalition of NGOs in Water and Sanitation (CONIWAS), created in 2001, works in partnership with sector players to influence policies, remove barriers and promote access to potable water, sanitation and improved hygiene for the poor and vulnerable. The coalition gives NGOs one voice for advocacy and lobbying as one of its major benefits.

STUDY AREA AND DATA SOURCES

Ghana is situated on the west coast of Africa with a total area of 238,540 square kilometres. It has a north-south extent of about 670 km and a maximum east-west extent of 560 km. It shares borders with Burkina Faso to the north, La Cote D'Ivoire to the west, Togo to the east, and Gulf of Guinea to the south (Figure 1).

The country has a warm, humid climate. Mean annual rainfall is estimated at 1187 mm. Mean annual temperatures range from 26.1^oC near the coast to 30^oC in the extreme north. Annual potential open water evaporation has been estimated as ranging between 135mm in the south to about 2000mm in the north. The actual amount of evaporation depends on several factors including water availability, vegetation cover and prevailing weather conditions (FAO, 2005).

Ghana is well endowed with water resources. The Volta river system basin, consisting of the Oti, Daka, Pru, Sene and Afram rivers as well as the White and Black Volta rivers, covers 70 percent of the country area. Another 22 percent of Ghana is covered by the south-western river system watershed comprising the Bia, Tano, Ankobra and Pra rivers. The coastal river system watershed, comprising the Ochi-Nakwa, Ochi Amissah, Ayensu, Densu and Tordzie rivers, covers the remaining 8 percent of the country.

Furthermore, groundwater is available in Mesozoic and Cenozoic sedimentary rocks and in sedimentary formations underlying the Volta basin. The Volta Lake, with a surface of 8,500 km², is one of the world's largest artificial lakes. In all, the total actual renewable water resources are estimated to be 53.2 billion m³ per year.

The main consumptive water uses in Ghana are for domestic, industrial and irrigation purposes. In 2000, about 652 million m³ were withdrawn for irrigation (66 percent), 235 million m³ for domestic purposes (24 percent) and 95 million m³ for the industry (10 percent), giving a total water withdrawal of 982 million m³. The combined withdrawal for domestic and industry is 95 million m³ for rural and 235 million m³ for urban areas. Current water use for hydro-electricity generation (only at the Akosombo Dam), which is non-consumptive water use, is 37.843 million m³/yr (FAO, 2005).



Figure 1: Regions, major towns and rivers in Ghana

Source: Department of Geography & Regional Planning, University of Cape Coast, Ghana (2011)

The sources of water supply in the country are surface water and groundwater. Groundwater is usually abstracted from boreholes for most rural areas. Some borehole supplies are also tapped to supplement urban water supplies. In 2000, 95 percent of the withdrawal for urban supply was from surface water and the remaining 5 percent from groundwater (FAO, 2005).

This study uses secondary data from various sources at local, national and international levels, and employs both content and in-depth analyses. The findings are derived from 1988, 1993, 1998, 2003 and 2008 Ghana Demographic and Health Surveys

(GDHS) and the 2006 Multiple Indicator Cluster Survey (MICS) reports, both published by the Ghana Statistical Service as well as Water and Sanitation Sector Monitoring Platform (2009) and other important documents.

RESULTS AND DISCUSSION

The water supply and sanitation sector in Ghana faces several challenges due to the neglect of the sector until the 1990s, rapid population growth of 2.6 percent per annum, management and technical inefficiency, and poor pricing policy. Tariffs were kept at a low level, which was far from reflecting the real cost of the service. Economic efficiency still remains below the regional average, resulting in inadequate financial resources to maintain and extend the infrastructure.

This section discusses evidence of water and sanitation infrastructure gap in terms of access to water supply and sanitation, improved sources of drinking water, improved water coverage by region, time used to obtain drinking water, improved sanitation, improved sanitation coverage by region, water and sanitation quality service delivery, financing and promoting factors and challenges.

Access to Water Supply and Sanitation

The water supply and sanitation infrastructure is insufficient in both rural and urban areas. Meanwhile, there are substantial discrepancies in accessing data from various sources, partly because of different definitions being used by several institutions that provide data. Available data from the WHO and UNICEF (2010a, b) suggest that urban population and rural population constitute 46 percent and 54 percent of Ghana's population respectively (Table 2). Using the broad definitions, 88 percent of the urban population and 64 percent of the rural population have access to water. However, only 37 percent of the urban population and 4 percent of the rural population have house connection to water supply. Thus, access to sanitation in terms of broad definition and house connections in urban and rural areas is even lower. The results imply that the majority of the Ghanaian population do not have access to house connections of both water and sanitation facilities.

According to the multi-donor Africa MDG assessment, access to improved water sources is much higher (56%) but access to improved sanitation is lower (35%) (AMCW, AfDB, EUWI, WSP & UNDP, 2006). The share of non-functional supply systems in Ghana is estimated at almost one third, with many others operating substantially below designed capacity. Domestic water supply competes with a rising demand for water by the expanding industry and agriculture sectors.

Table 2: Access to water supply and sanitation in Ghana

Item	Definition	Urban	Rural	Total
Water	Broad (%)	88	64	75
	House connections (%)	37	4	19
Sanitation	Broad (%)	27	11	18
	House connections (%)	13	2	7
Population (%)		46	54	100

Source: WHO and UNICEF (2010a,b)

Access to improved water declined by 9 percent from 1990 to 2000 while access to improved sanitation declined by 23 percent. Most of the decline in water supply access occurred in urban areas. This is consistent with a growing urban population in areas where the utility is insolvent and unable to expand services. “In order to achieve the MDGs, 13.6 million more people will need access to water and 18.2 million more to sanitation. This means an average annual increase of 9.9 percent for water and 2.2 percent for sanitation” (World Bank & African Development Bank, 2004, p.7).

According to UNDP (2010), the proportion of Ghana’s population without access to improved water sources reduced from 44 percent in 1990 to 16.2 percent in 2008. Ghana aims at achieving 85 percent coverage of water supply by 2015, which would exceed the MDG target of 78 percent. This suggests that Ghana is on track to achieving the MDGs target of reducing the population without access to improved water and sanitation sources ahead of the target date of 2015.

Information from Water and Sanitation Monitoring Platform (WSMP, 2009) indicate that water and sanitation sector monitoring systems in Ghana are inadequate in providing information for decision-making on national water and sanitation sector investments, sub-sector resource allocation, sub-national disbursing, accountability of funds and actual disbursement. Equally, civil society groups do not have ready access to user friendly, relevant data to support or challenge sector decisions. Generally, data streams are not harmonized and sector data literacy is low resulting in poor and limited interpretation and dissemination of sector related data and information to stakeholders. The potential for good sector monitoring impacting on resource allocation is therefore, lost at all levels. It is due to these challenges that the UNICEF and European Union agreed to support the MWRWH to establish the WSMP in Ghana as one of three pilot projects in Africa. The other two are in Mozambique and Nigeria.

Improved Sources of Drinking Water

The improved water sources include household connections, public standpipe, borehole and protected dug well. On the contrary, some of the unimproved water sources are unprotected well, rivers, ponds and vendor-provided water as shown in Table 3.

The proportion of the Ghanaian population that uses improved drinking water increased from 56 percent in 1990 to 68 percent in 2003 and 83.6 percent in 2008. Urban drinking water coverage also increased from 86 percent in 1990 to 94

percent in 1998 but declined to 83 percent in 2003 and 93 percent in 2008. Use of improved drinking water by the rural population increased from 55 percent in 2003 to 76.6 percent in 2008 (Table 4).

Table 3: Sources of drinking water

Improved water sources	Unimproved water sources
<ul style="list-style-type: none"> • Household connection • Public standpipe • Borehole • Protected dug well • Protected spring • Rainwater Collection 	<ul style="list-style-type: none"> • Unprotected well • Unprotected spring • Rivers or ponds • Vendor-provided water • Tanker truck water • Bottled (& sachet) water

Source: WHO and UNICEF (2010a)

Table 4: Percentage access to improved water sources

Year	1990	1993	1998	2003	2008
Rural	39.0	54.0	63.0	55.0	76.6
Urban	86.0	90.0	94.0	83.0	93.0
Total	56.0	67.0	70.0	68.0	83.8

Source: Ghana Statistical Service (1993; 1998; 2003; 2008)

Apart from 2003, coverage for improved drinking water in rural Ghana recorded consistent increase from 1993 to 2008 indicating that the gap between urban and rural coverage is gradually closing up. This finding is also supported by provider based data from the CWSA cited in WSMP (2009) where the rural drinking water coverage increased from 41.3 percent in 2002 to 57.1 percent in 2008 as illustrated in Figure 2.

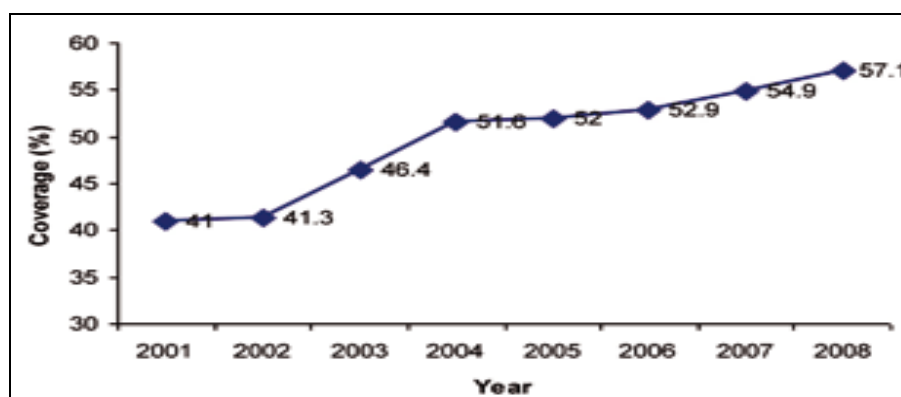


Figure 2: Provider-based improved rural water coverage

Source: Community Water and Sanitation Agency cited in WSMP (2009)

Despite the increasing trend in the use of improved drinking water by the urban population, the urban water coverage declined consistently between 2003 and 2006 but rose gradually thereafter (Figure 3). The GWCL was and is the main provider but not the only institution producing improved drinking water in urban areas in Ghana.

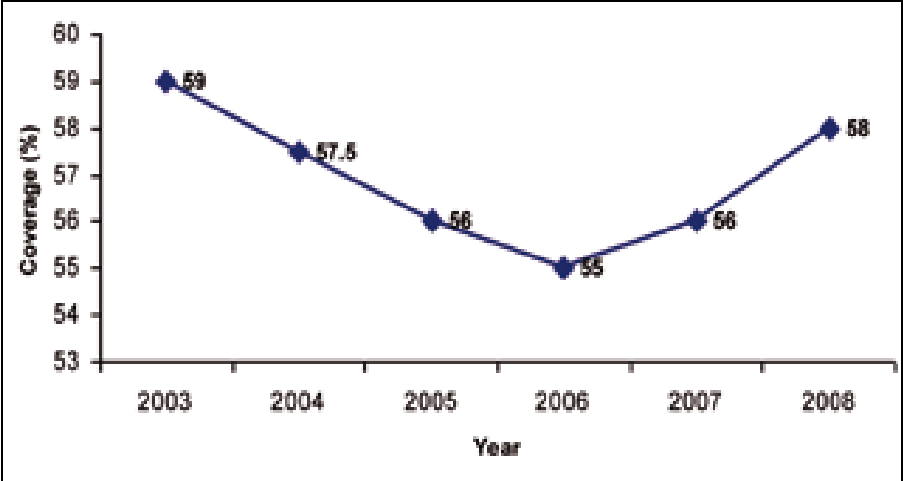


Figure 3: Provider-based improved urban water coverage

Source: Ghana Water Company Limited cited in WSMP (2009)

Improved Water Coverage by Region

Spatial analysis of available data shows disparity in improved drinking water coverage among the populations of the ten regions of Ghana. In 2008, the Upper West Region recorded the highest coverage of 97 percent while the Greater Accra Region recorded the lowest figure of 61 percent (Figure 4). The observed disparity favour the Upper West and Upper East regions which tend to have different land sizes and population densities. In 2010, the Upper West Region and Upper East Region had lower (37) and higher (117) population density than the national average (102) respectively as shown in Table 5.

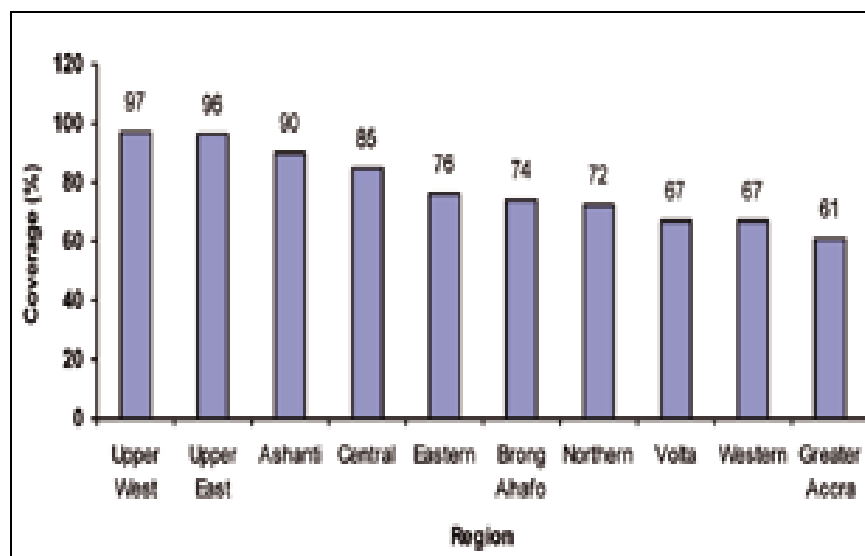


Figure 4: Regional improved water coverage

Source: Ghana Statistical Service (2008)

Table 5: Regional population densities in Ghana

Region	Area	Population density		
		1984	2000	2010
Western	23921	48	80	97
Central	9826	116	162	214
Greater Accra	3245	441	895	1205
Volta	2570	59	80	102
Eastern	19323	87	109	134
Ashanti	24389	86	148	194
Brong Ahafo	39557	31	46	58
Northern	70384	17	26	35
Upper East	8842	87	104	117
Upper West	18476	24	31	37
Ghana	238533	52	79	102

Source: Ghana Statistical Service (2011)

Time used to obtain drinking water

The amount of time spent (round trip) to obtain drinking water is an important measure in determining the ease or difficulty in gaining access to drinking water. Figure 6 shows that nationally, about 8 out of 10 households use less than 30 minutes to obtain their drinking water in a round trip. In the rural areas, more than 7 out of 10 households use less than 30 minutes whilst in the urban areas 91 percent of the households use less than 30 minutes.

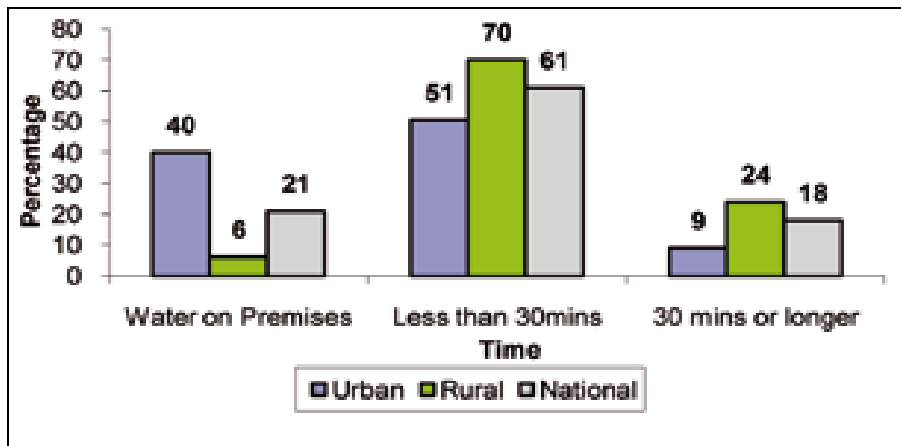


Figure 5: Time to obtain drinking water (round trip)

Source: Water and Sanitation Sector Monitoring Platform (2009)

Improved Sanitation

An improved sanitation facility is defined as one that hygienically separates human excreta from human contact. Thus, only users of improved sanitation facilities are considered as having ‘access’ to sanitation on condition that the facility is not shared by multiple households and the public (WHO and UNICEF, 2010b)). Facilities in the improved and unimproved categories are set out in Table 6.

Table 6: Types of sanitation facilities

Improved Sanitation Facilities	Unimproved Sanitation Facilities
<ul style="list-style-type: none"> • Flush or pour-flush to piped sewer system, septic tank and pit latrine • Ventilated improved pit latrine • Composting toilet 	<ul style="list-style-type: none"> • Flush or pour-flush to elsewhere • Pit latrine without slab or open pit • Bucket • Hanging toilet or hanging latrine • No facilities or bush or field (open defecation)

Source: WHO and UNICEF (2010b)

Time series data from the Ghana Statistical Service shows that national coverage for improved sanitation increased from 4 percent to 12.4 percent between 1993 and 2008. Improved sanitation coverage among urban populations, increased from 10 percent in 1993 to 17.8 percent in 2008 while for rural populations, improved sanitation coverage increased from 1 percent in 1993 to 8.2 percent in 2008. There was an appreciable increase of 6.2 percent in improved sanitation coverage for the rural

population between 2003 and 2008 as compared to 2.8 percent increase in coverage for the urban population during the same period (Figure 6). The gap between 2008 national coverage on improved sanitation of 12.4 percent and the 53 percent target by 2015 indicates that there must be approximately five times increase in coverage in order to achieve the set target.

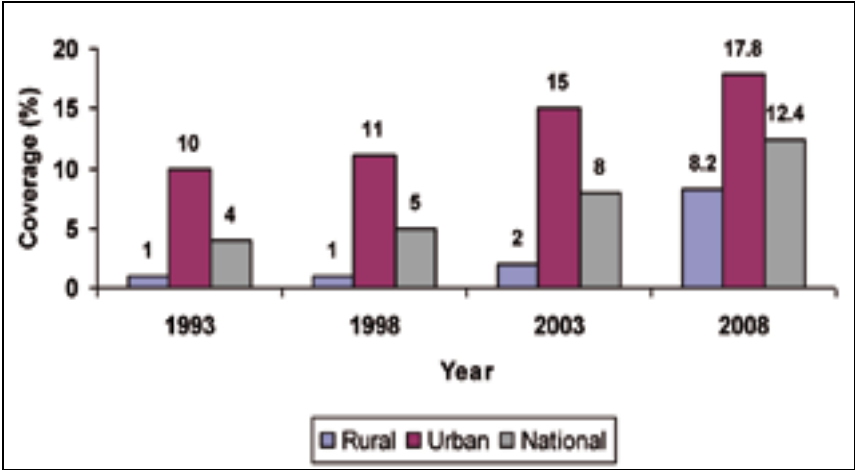


Figure 6: Sanitation coverage: 1993-2008

Source: Ghana Statistical Service (1993, 1998, 2003, 2008)

Improved sanitation coverage by region

The use of improved sanitation facilities at the regional level varies considerably as coverage is highest in the Greater Accra, Eastern, Western and Central regions. Residents of the three northern regions (i.e. Northern, Upper East and Upper West) are less likely than others to use improved facilities. For example, 3 percent of the population in the Northern Region use improved (not shared) sanitation facilities as against 25 percent in the Greater Accra Region in 2008 (Figure 7). Those in the Western Region (12%) and Central Region (11%) were slightly below the national average of 12.4 percent. Open defecation declined marginally from 24.4 percent in 2006 to 23.1 percent in 2008.

The foregoing results are consistent with that of AfDB and OECD (2007) that there is substantial variation in access to clean, affordable water and sanitation, depending on income, between rural and urban areas, and across regions in Ghana. Households without access to clean water use a variety of less reliable and hygienic sources, and often pay more. Pollution is the most serious threat to the sustainability of water resources. The rising demand for water resulting from the expansion of the chemical, oil, mining, and other water-consuming industries, along with urban growth and farming, threatens to outpace the available supply.

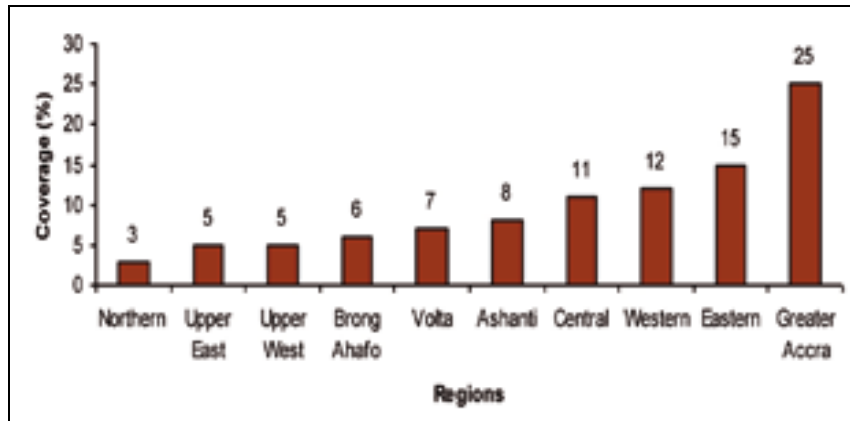


Figure 7: Access to improved sanitation in 2008 by region

Source: Ghana Statistical Service (2008)

Service quality

Service delivery is not keeping pace with population growth and demand. Service quality is analysed in terms of continuity of supply, drinking water quality, and wastewater treatment. WaterAid (2005) estimated that only 25 percent of the residents in Accra receive a continuous water supply while about 30 percent are provided for 12 hours each day, five days a week. Another 35 percent are supplied for two days each week while about 10 percent who mainly live on the outskirts of the capital are completely without access to piped water.

Some commentators have argued that the situation is even worse. For example, in the dry season, some communities within the major cities including Accra, Tema and Tamale are served either once per week or once in a fortnight. Inadequate potable drinking water and clean sanitation systems are of public health concern, given that they contribute to high morbidity and mortality rates in Ghana. In most urban areas, the service gap left by city-wide water agencies has been filled by independent small-scale providers (SSPs), mostly tanker services and domestic water vendors for their water supply. The role of this informal sector is even more significant in the sanitation sector where they provide services in latrine construction, manual latrine cleaning, septic tank emptying and management of public latrines.

In Accra, SSPs have since 1997 been legalised. GWSC has entered into contract with water tanker associations. The increased partnership between GWSC and SSPs has led to greater transparency in prices and improved quality of service. However, two main issues emerge from an analysis of informal service providers. First, despite the improved services, the costs of water sold by vendors are far more than the tariffs for piped water supply. Second, the effectiveness of self regulating and quality assurance mechanisms and its implication for public health and safety is a source of concern (Trend Group, 2003).

Wastewater treatment in Ghana is grossly inadequate. The urban areas generated about 763,698 m³ of wastewater each day in 2000, thereby resulting in approximately 280 million m³ over the entire year. Regional capitals accounted for another 180

million m³ (Agodzo, Huibers, Chenini, van Lier & Duran, 2003). Only a small share of the generated urban wastewater is collected, and an even smaller share is being treated. In Accra, only 10 percent of wastewater was collected. Less than a quarter of the 46 industrial and municipal treatment plants in Ghana were functional. Treatment plants for municipal wastewater are operated by local governments, and most of them are stabilization ponds (Environmental Protection Agency, 2001). Wastewater treatment infrastructure gap is evidenced by the practice whereby raw human waste is dumped into water bodies, especially the sea in Accra and Essipon near Sekondi.

Finance

The main constraint to the improved access to water and sanitation in Ghana is inadequate financial resources. The investment is estimated at \$1.3 billion for the rehabilitation and expansion of urban water infrastructure alone. As a result of inadequate funding, maintenance and expansion of water and sanitation services have not kept pace with population growth and increasing demand. Most of the existing network was installed at the time when cities and towns were approximately half their current population sizes (AfDB & OECD, 2007).

Estimates by WaterAid (2005) indicate that the water and sanitation MDG targets require spending of US\$85 million each year but actual expenditure is just US\$17 million. The huge gap of about US\$68 million per year far exceeds the financial commitments of both the government and donors to the sector.

Ghana still relies heavily on external donor support for the water and sanitation infrastructure development. From 1990 to 2003, the major donors contributed nearly US\$500 million for water and sanitation projects. Urban water received the highest single amount, mainly attributable to the World Bank's US\$120 million Water Sector Rehabilitation Project. In terms of volume, most donors focused on rural and small town water supply schemes together worth more than US\$270 million. Sanitation received significantly less attention.

Planned investment by some donors (excluding NGOs) is estimated at US\$185 million for the period 2004-2010, some 85 percent of the total planned finance. A multi-donor budget support (MDBS) system has been established where donors pool all of their funds. This enables the government to allocate the funds in line with its own development and sector priorities. The government and donors should close the annual water and sanitation finance gap (WaterAid, 2005). In a press conference, CONIWAS observed that although the 2011 budget statement gives recognition to the water and sanitation sector as a priority of government, funding does not reflect this commitment (Ghana News Agency, 2011).

Promoting Factors and Challenges of Water and Sanitation Infrastructure

The analysis and discussions thus far have established a number of promoting factors and challenges of water and sanitation infrastructure development in Ghana as presented in Table 7. The key issues border on infrastructure investment and corporate governance. Indeed, successive governments, public institutions, the private sector, communities and civil society organisations have contributed to the progress so far made in the sector. However, various challenges still remain to be addressed.

Table 7: Promoting Factors and Challenges of Water and Sanitation (2000-2010)

Item	Promoting Factors	Key Challenges
Water	<ul style="list-style-type: none"> • Increased investments in the construction and rehabilitation of water facilities in both rural and urban areas; • Construction of new water points and pipe systems; • Expansion projects to improve water supply in Greater Accra, Central, Ashanti and Northern regions; • Fully subsidizing the provision of safe water in guinea worm endemic areas; • Heavily Indebted Poor Countries (HIPC) funds directed towards the provision of safe water in guinea worm endemic areas. 	<ul style="list-style-type: none"> • Inadequate infrastructure, especially energy, water and sanitation; • Medium-term shortfall in infrastructure financing; • Power crisis and “silent crisis” in water and sanitation threaten economic activity and public health; • Competition between the CWSA and the private sector for technical expertise; • Inadequate finances required to undertake and maintain huge water projects; • Perennial water shortages continue to plague both the rural and urban areas; • Substantial regional variations in access to safe water.
Sanitation	<ul style="list-style-type: none"> • Preparation of draft National Environmental Sanitation Strategy and Action Plans and District Environmental Sanitation and Action Plans; • Introduction of Sanitation Guards under the National Youth Employment Programme; • Construction of additional storm drainage and community infrastructure upgrading in major towns and cities; • Completion of households, schools and public sanitation facilities; • Provision of training in supervisory management for Environmental Health Offices and Waste Management staff in MMDAs; • MMDAs are making effort to eliminate the use of pan latrines in every community by 2010. 	<ul style="list-style-type: none"> • Inability to effectively monitor environmental sanitation due to unavailability of accurate and timely data; • Disparity in access to improved sanitation between urban than rural areas; • Significant regional differences in access to improved sanitation; • Population pressures, poor sanitation and solid waste management; • Low level of investment in sanitation delivery; and • Rapid unplanned expansion of cities.

Source: Authors' compilation

CONCLUSION AND THE WAY FORWARD

The paper has drawn attention to the socio-economic importance of water and sanitation to national development. It has provided evidence that Ghana's population without access to improved water sources has reduced appreciably suggesting that the country is on track to achieving the MDGs target on by 2015. However, there are substantial variations in access to improved water supply between urban and rural areas and between regions. Perennial water shortages continue to hit both the rural and urban communities. The situation for improved sanitation is even worse despite some progress made so far. The results suggest that if the current trend continues, the proportion of the population with access to improved sanitation will not reach the level that can achieve the MDG7 target by 2015 in both rural and urban areas. The water supply and sanitation gap, which has the tendency to derail the attainment of sustainable development, is the result of inadequate investment in infrastructure and services, rapid population growth, management and technical inefficiency, and intra- and inter-regional disparities in access.

Bridging the current gap requires multi-level governance where the various stakeholders at different levels (e.g. central government, local authorities, public institutions, traditional leaders, development partners, private sector and civil society organisations) pull resources together to undertake efficient and effective management systems and responsibilities to address the needs of the people. This involves undertaking comprehensive baseline surveys to understand not only the critical supply and demand related issues but also the dynamics among the various stakeholders in both the rural and urban areas. The various stakeholders need to deepen and extend their competence in terms of knowledge, skills and attitudes by way of sharing their experiences that can substantially ensure cost effectiveness and building sustainable infrastructure in water and sanitation service delivery to the achievement of sustainable development.

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