



## Yaase community report

### Cost of water and sanitation services in Yaase, Bosomtwe District of Ashanti Region, Ghana

*The community of Yaase with a population of 897 has four (4) water points. Majority (75%) of the respondents received acceptable water service levels in accordance with CSWA norm for rural water supply. A majority of the population (58%) have access to acceptable (improved) sanitation service with 42% of the population having unacceptable sanitation service and no access to improved sanitation service due to the unimproved sanitation practices.*

October 2012

## Acknowledgement

This report acknowledges the effort of the following groups and persons in contributing to the research work both on and off the field:

The writing team for the WASHCost community reports consisted of: Eugene Appiah-Effah, Bernice Donkor-Badu, Kwabena B. Nyarko, Bismark Dwumfour-Asare, Patrick Moriarty, Alex Obuobisa-Darko, Victor Narteh Otum, Nick Dickinson and Kwaku A. Adjei

The following people contributed to the field work and are gratefully acknowledged below:

WASHCost Research Assistants: Dwuodwo Yamoah-Antwi, Philip O. Banahene, Samuel Asare-Adjebeng, Catherine Oduro Agyarewa; and Emmanuel Oppong Antwi

Bosomtwe District:

Mr. Mark Tachie, District Water and Sanitation Team Leader and Planning Officer

Mr Kune, Handpump Area Mechanic

Yaase WATSAN committee and community members

KNUST Drivers:

Mr. Samuel Ansere and Mr. Edward Addai

### **Lead author's contact details:**

Dr. Kwabena B. Nyarko

Civil Engineering Dept, KNUST, PMB UP, Kumasi-Ghana.

T: +233(0)322064396; M: +233(0)208165515;

Email: nyarko.k.b@gmail.com

### **Front page photo credit**

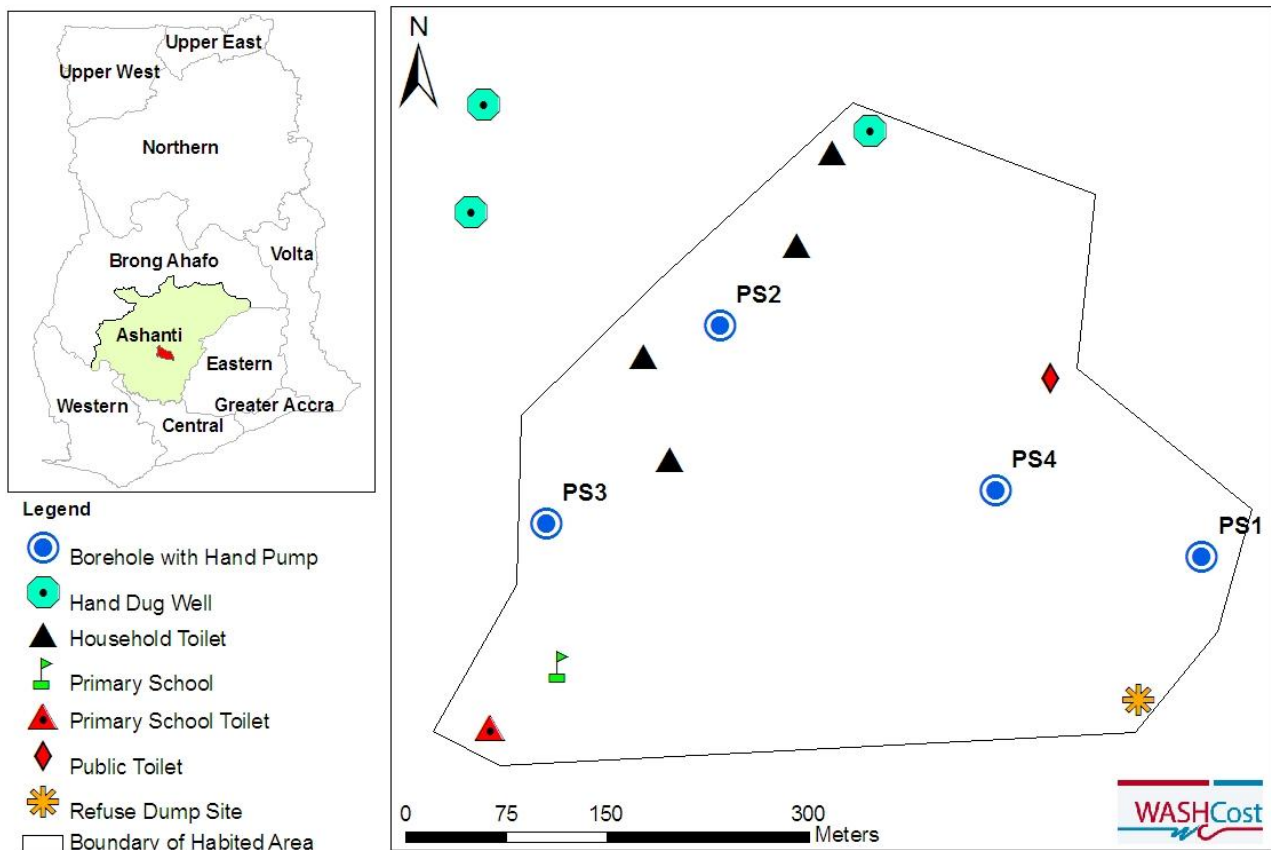
WASHCost Ghana



WASHCost is undertaking an action research focusing on quantifying the cost of providing sustainable water, sanitation and hygiene (WASH) services in rural and peri-urban areas in Ghana. This community report presents findings of research carried out in the community of Yaase in Bosomtwe District of Ashanti region.

The WASHCost team visited the Yaase community in February 2010 to collect data on the WASH services received by the inhabitants and the cost of providing the services. The community has a population of 897 people according to the regional Community Water and Sanitation Agency (CWSA) records (CWSA, 2009). The inhabitants are mostly of the Asante ethnic group and their main occupation is agriculture (food-crop farming).

**Map of Ghana showing the Ashanti Region. The insert shows Yaase community in the Bosomtwe District**



**Figure 1: Map of community with water and sanitation facilities**

## WATER SUPPLY

Before the year 1995, the inhabitants of Yaase relied on informal water sources mainly a river and a stream as their main water sources. Due to the unreliable nature of the informal sources, especially in the dry season, the community requested for the provision of a formal water source

to solve this perennial problem. The history of the development of Yaase’s water supply is summarised in Table 1 below.

Currently there are four (4) formal water point systems available to the community. PS2 is a mechanised borehole with a limited pipe network whiles PS1, PS3 and PS4 are boreholes fitted with handpump. All the formal water point systems except PS1 were functional during the time of visit. The PS1 had broken down.

**Table 1: The history of the construction and replacement of formal water supplies**

Pre-1995	1995	1999	2009
River and stream for all purposes: domestic, non domestic and productive uses.	One borehole with handpump (PS2) provided by Government of Ghana (GoG) with support from the District Assembly.	Three boreholes fitted with handpumps, PS1, PS3 and PS4 provided by GoG with support from the District Assembly are fitted with handpump. Community contributed 5% to the capital cost.	PS2 was upgraded to a mechanised system with limited distribution. Water is pumped into an overhead storage tank connected to standtaps.

### Water consumption from formal and informal sources

Average water consumption showed no seasonal variations for the formal and informal water sources. Water consumption was the same throughout the seasons. Much of the informal use of water in the wet season, particularly for productive use, is not captured in this data. People found it difficult to estimate their use of water from informal water sources e.g. rainwater harvesting in the wet season.

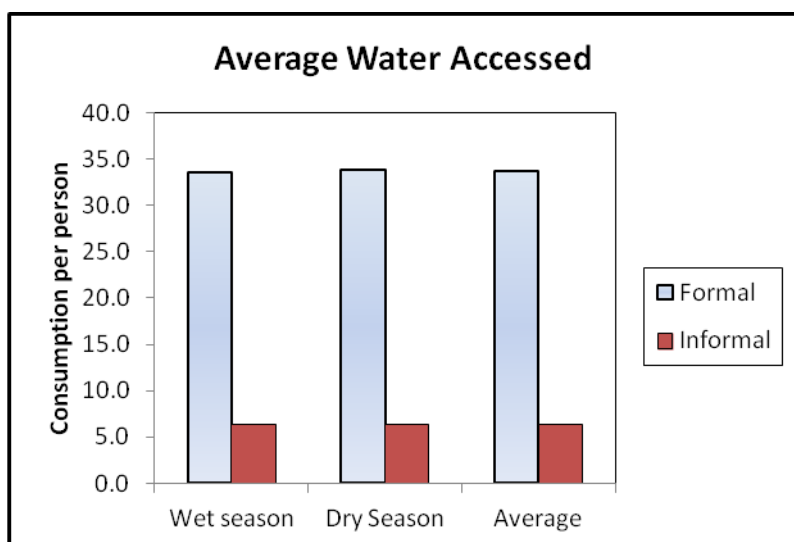


Figure 2: Average water accessed per person.

### Water service levels in Yaase

Generally, what matters most to people is how much water they can get, how far they have to travel to get it, the quality of the water and how often the service is available. These form the basis for indicators expressed as service levels – high, intermediate, basic, sub-standard (“limited”) and ‘no service’ as shown in Table 2 below (where all indicators are treated as equally important). A basic service is one that meets the guidelines set by the Community Water and Sanitation Agency (CWSA). According to CWSA guidelines, a basic level of service entails receiving at least 20 litres of water a day and having a water point within 500 metres, which is shared with not more than 300 people. The service level is the service actually received by users, not what is supposed to be delivered to users. Table 2 is the WASHCost service levels based on these norms.

Table 2: WASHCost Ghana service levels according to national norms.

Service Levels	Indicators		
	Litres per person per day	Distance to water source	Crowding with reliability
High	More than 60	500 meters or less	300 people or less per reliable water point system
Intermediate	40 to 60		

Basic	20 to 40		
Sub-standard	5 to 20	More than 500 meters	more than 300 people per reliable water point system
No service	0 to 5		

\* Reliability means working at least 95% of the time

### Service level by quantity

The result of the survey revealed that majority (75%) of people actually use sufficient water according to national guidelines. Out of this, 11% of respondents had a high service level (> 60 lcpd) in terms of quantity of water received, which is a very positive consumption distribution for a rural community.

Figure 2 shows the water consumption service levels from users of formal water sources.

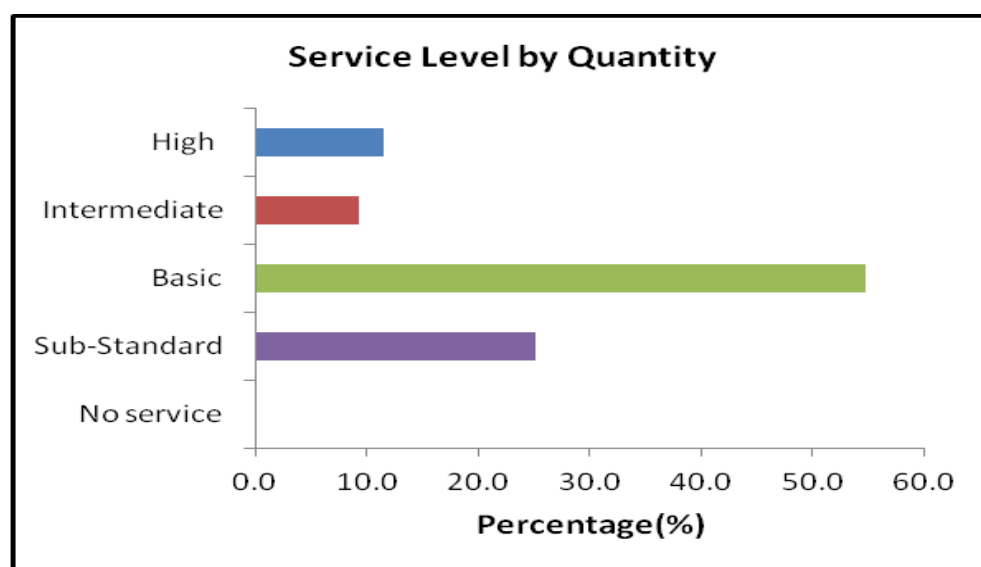


Figure 2: Water service level by quantity or consumption

### Quality and Use

All the respondents (100%) perceived the quality of water from the formal sources to be good. However, no water quality test was carried out to confirm their perception.

Water from the formal sources is used for domestic activities (drinking, cooking, washing, bathing) and productive (mainly catering services) activities. Although the informal water sources are not acceptable for domestic use, users use them for same purposes as water from formal sources.

## Reliability

The community had been relying on three (3) functional formal water systems (2 boreholes fitted with handpump and limited mechanised system connected to stand taps). Since all the facilities are reliable, (i.e. working 95% of the time) it means that close to 900 inhabitants are adequately served with the expected number of reliable or functional water facilities. Thus the community meets the crowding with reliability criteria.

## SANITATION

A majority of the respondents (62%) have household toilet facilities which were mostly Ventilated Improved Pit latrines (58%) and traditional pit latrines (4%) There is one (1) public toilet facility which is a Kumasi Ventilated Improved Pit latrine (VIP) used by some inhabitants without household toilet facilities. Some households however, also resort to their neighbours toilet facilities. None of the respondents' households resort to open defecation or dig and bury. About 58% of the respondents have access to acceptable (improved) sanitation service based on the WASHCost sanitation service ladder.

## Costs and finances

Cost figures were collected where these were available, to cover capital investment, operational expenditure and capital maintenance expenditure (that is larger repairs and rehabilitation), and were adjusted for inflation to a base year of 2009.

### Capital investment costs

Capital investment costs are calculated using a regional average as actual costs were not available for all boreholes surveyed. The average regional cost of developing a borehole with handpump excluding the mechanization, is US\$ 7,121. This implies that a total investment of US\$ 28,484 has been made in Yaase for the 4 boreholes with handpump without the cost of upgrading one of the wells later to a mechanised facility. Using the actual and design populations therefore gives a unit cost around US\$ 32 and US\$ 24per person respectively (see Table 3).

### Operational and minor maintenance costs

Operational and minor maintenance for the four formal water systems reported over five (5) years period during which each water facility had been repaired at least once.

Operation and minor maintenance cost per capita based on design and actual population, were reported to be US\$ 0.11 and US\$ 0.32 respectively (see Table 3).

### Capital maintenance

Capital maintenance has never occurred. The reason is that there has never been any major rehabilitation and/or replacement of a hand pump. This means that capital maintenance



expenditure is US\$ 0. The conversion of handpump facility to mechanised system can be considered as capital investment enhancement and not capital maintenance though the cost data was not available.

**Table 3: Cost of providing WASH services**

Cost Components	Current Cost (2009) in US\$	
	Observed pop	Design pop
Capital investment (US\$/person)	32	24
Operational and minor maintenance expenditures (US\$/person/year)	0.11	0.32
Capital Maintenance Expenditure (US\$/person/year)	0	0

## TARIFF

According to the WATSAN committee, the water tariff is set by all members in an open forum at any time deemed appropriate. The water tariff is collected and kept by the WATSAN committee. A tariff of GHp 5 is charged for 36 litres of water fetched from the limited mechanised water point system and 72 litres for water fetched from boreholes fitted with handpump on pay-as-you fetch basis. About 69% of respondents considered the water tariffs as acceptable, 18% said they are high and the remaining 13% described the tariffs as low. A focus group discussion with the WATSAN committee revealed occasional breakdowns of the formal water point systems. Repairs are carried out with the revenue accrued from tariffs.

## SUSTAINABILITY

The study revealed that the water point systems (PS3 and PS4) have never been down for more than a week due to the availability of funds for operation and maintenance activities. However, PS1 has been down for more than one year and has since not been repaired due to the poor water quality of the system.

## CONCLUSION

Majority (75%) of the respondents received service levels that are within the CSWA criteria for rural water supply. Despite the capital investment in three boreholes with handpump and a limited mechanised pipe which should theoretically be adequate for a population of 1200 – the reality is that the current population of 897 rely on the four (4) water points. This means that the

entire community is over served in terms of overall service if all the four (4) of the water points are functional, reliable 95% all the time and located within a distance of 500 meters.

Reported use from the water point systems showed no seasonal variation. It was also clear that only 25% of the population of Yaase were using quantities below the national norm of 20l/cd, with 75% reporting use of 20l/c/d.

A little over half (58%) of the population of Yaase is covered in terms of sanitation with 42% of the inhabitants having unacceptable and no access to improved sanitation service due to the unimproved sanitation practices.

The data collected on operation and maintenance for the water points showed the community practiced break down maintenance but not preventive maintenance. This means they only repair any of the water point system's parts when there are break downs. Communities should therefore be encouraged to have a systematic approach to maintenance where some parts of the water point systems are changed periodically to ensure their sustainability.

The WATSAN committee believes that the pay-as-you fetch tariff payment system and the willingness (general perception on affordability) of the water users to pay the tariff has enabled the WATSAN to accrue enough money to repair their water facilities which if continued will make the system sustainable.