



Edwenase community report

Cost of water and sanitation services in Edwenase in the Bosomtwe District of Ashanti Region, Ghana

Edwenase community with a population of 442 has three formal water systems of which two are reliable. The water system delivers the basic level of service to 63% of the respondents and a higher level of service (intermediate) to 10% of the respondents. The community has one Traditional Pit Latrine (TPL) which is patronised by a majority (70%) of the respondents. The sanitation service level in Edwenase based on the WASHCost Sanitation Service ladder is 20% of the respondents receive basic sanitation service level which is relatively higher than the national sanitation coverage of 14%.

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 O. Antwi

Bosomtwe District:

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

Mr Kune, Handpump Area Mechanic

Edwenase 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

Bismark Dwumfour-Asare/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 present findings of research carried out in the community of Edwenase in Bosomtwe District of Ashanti region.

The WASHCost team visited the Edwenase community in February 2011 to collect data on the WASH services received by the inhabitants and the cost of providing the services. The community has a population of 442 according to the regional Community Water and Sanitation Agency (CWSA) records and 58 households according to the Water and Sanitation (WATSAN) committee. The inhabitants are mostly of Ashanti ethnic group and their main occupation is farming (cash and food crop farming).

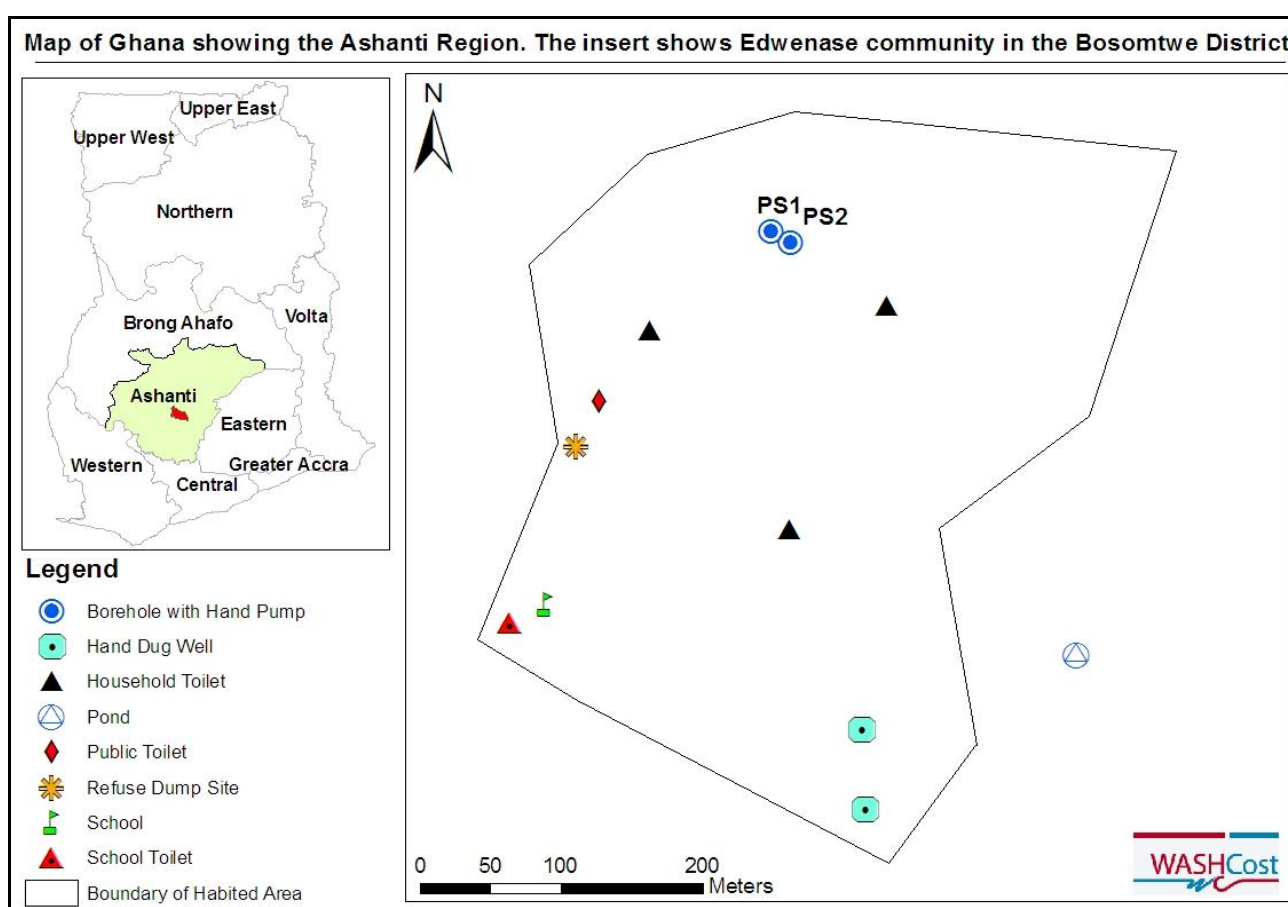


Figure 1: Map of community with water and sanitation facilities

WATER SUPPLY

Before the year 1981, the inhabitants of Edwenase relied on a river and a stream called Banko and Dwantoa respectively as their main sources of water for all purposes including drinking. Due to the unreliable nature of the river and the stream especially in the dry seasons, the community requested for the provision of a formal water source. The subsequent history of the development of Edwenase's water supply is summarised in Table 1 below.

Currently, there are three formal water sources available to the community. These water facilities were working at the time of visit although they have previously suffered some break downs.

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

Pre-[1981]	[1981]	[2008]
A river and a stream for domestic, non domestic and productive uses.	Two boreholes (PS1 and PS3) with handpumps provided by Government of Ghana (GoG). No community contribution to capital cost.	A borehole fitted with handpump (PS2) was provided by GoG through the District Assembly. Community made contribution of ¹ GH¢ 250 (US\$ 238) towards the capital cost.

Water consumption from formal and informal source

Average water consumption for the formal and informal sources did not show any seasonal variation, consumption per person per day was the same for formal and informal sources in both wet and dry seasons (See figure 2). The informal use of water in the wet season, particularly for productive use, was not captured in this data as people found it difficult to estimate their use of e.g. rainwater harvesting in the wet season.

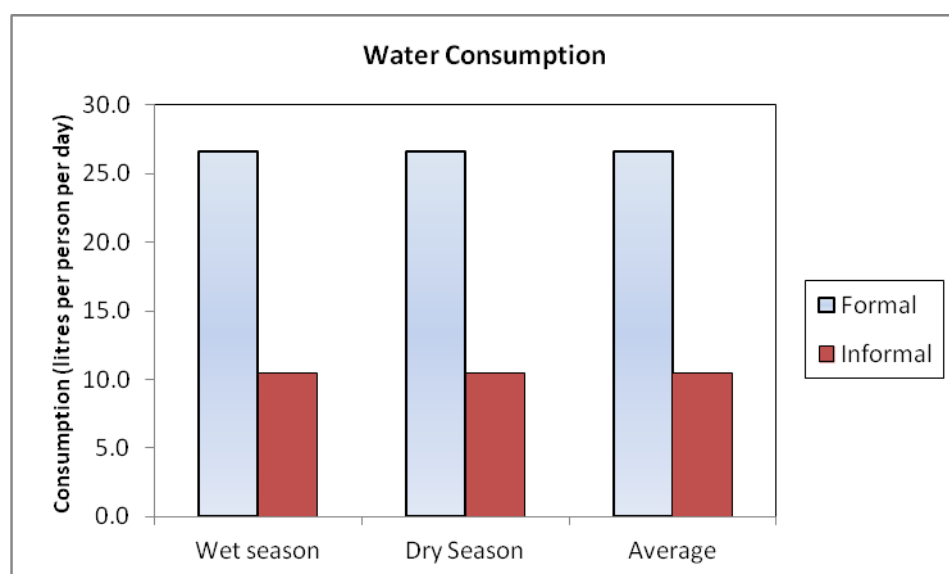


Figure 2: Average water consumption (l/c/d) per season

¹ From the World bank, GH¢ 1.05 was equivalent to US\$ 1 in 2008

Water service levels in Edwenase

What matters to people is how much water they get, how far they have to travel to get it, the quality of the water and how often the service is available. These indicators can be expressed as service levels – high, intermediate, basic, sub-standard and ‘no service’. A basic service 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 no 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: WASHCost Ghana service levels according to national norms.

Service Levels	Indicators		
	Quantity (Litres per person/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 water point working at least 95% of the time

The result of the survey for water quantity revealed that,

- A majority of the people (73%) actually use sufficient water according to national guidelines.
- Two out of three boreholes with handpumps were shared by 442 people (221 per water point), which is less than the standard of maximum 300 people per water point.

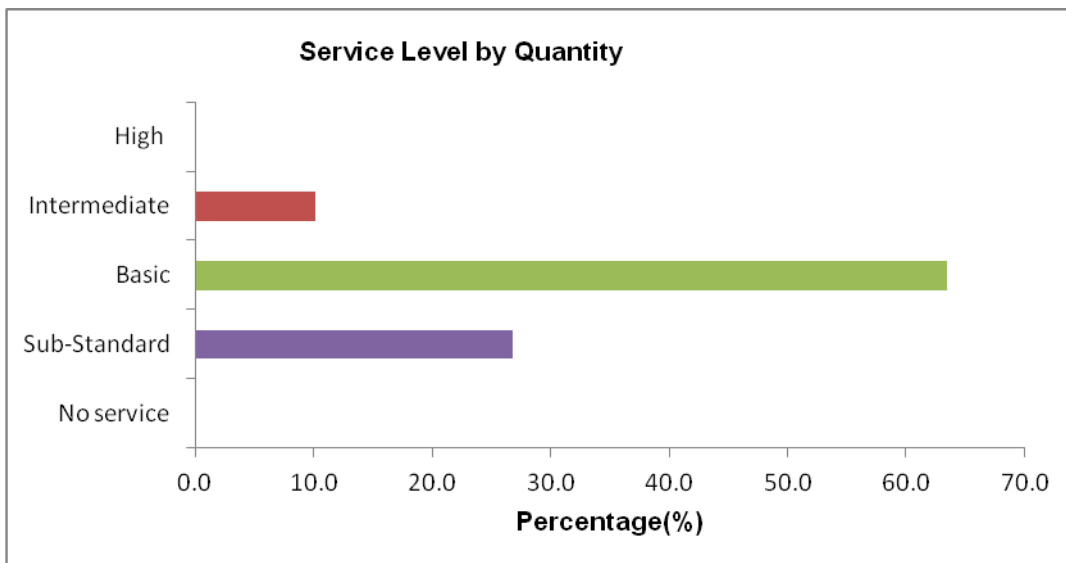


Figure 3: Water quantity service level

The result indicates that about 27% of the respondents are not receiving acceptable service by quantity (sub-standard level of service). This means majority of the respondents are receiving the basic level of at least 20 litres of water per person per day as stipulated in the CWSA guidelines.

Accessibility

All the respondents meet the accessibility criteria. This is because their maximum walking distance to the mostly accessed formal water facilities falls below the norm of 500 metres required by the CWSA guidelines.

Quality and Use

Majority of the respondents (73%) perceived the quality of water from the formal sources as satisfactory while a few (27%) were not happy with the quality. However, no water quality test was carried out to confirm their perception.

Water from the formal sources is used for all domestic purposes including drinking and also for productive activities (predominantly palm oil production). Although the informal water sources such as river, stream and non standardised household harvested rainwater are not considered improved for domestic use especially drinking, the community members use them for domestic as well as productive activities.

Crowding with reliability

The community has three water point systems and two out of the three facilities were reliable. Thus, working 95% of the expected time within the past 12 months. Due to this, everyone in

Edwenase fully meets at least the basic standard for rural water service in terms of crowding with reliability.

Based on the WASHCost Ghana service level matrix (see Table 2), the overall water service, putting all indicators together as equally important, give 73% of respondents standard service level (basic and high) and 27% substandard (limited) service. Clearly, respondents receiving the sub-standard service are those accessing water quantities below the basic otherwise all respondents would have standard water service.

SANITATION

The community has one Traditional Pit Latrine (TPL) which was provided by the community members through communal labour and community contributions. This facility is patronised by a majority of the respondents, about 70%, while 30% of them have household toilet facilities which are mostly Ventilated Improved Pits (VIPs). Due to the availability of the public toilet, none of the households without individual toilet facilities practised open defecation.

The results revealed that 20% of the respondents have improved sanitation service while 7% have sub-standard service and about 73% of the respondents have no sanitation service

COSTS AND FINANCES

Cost data were collected where 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 is US\$ 7,121. This implies that the total investment that has been made in Edwenase is US\$ 21,363 as they have 3 boreholes or water point systems. Using the design population of 300 people suggests a cost of US\$ 24 per person or US\$ 48 per person for the actual population of 442.

Operational and minor maintenance costs

Operational and minor maintenance for three boreholes with handpumps were reported over the period of their existence during which period each water facility had been repaired at least once.

Using the designed population of 300 people gives a cost of US\$ 0.64 per person per year and US\$ 0.44 per person per year for the actual population of 442.

Capital maintenance

These are occasional major repairs for which money has to be found, sometimes unexpectedly but in the long term these costs will always be needed. Capital maintenance expenditure occurred when two handpumps were replaced (PS1 and PS3) after 19 years of operation. This expenditure was not planned for but was paid by the WATSAN committee from revenue accrued from the sale of water. However, the cost of replacement could not be captured since there was no record available.

Table 3: Cost of providing WASH services

Cost Components	Cost in US\$ (2009)	
	Observed pop	Design pop
Capital investment (US\$/person)	48	24
Operational and minor maintenance expenditures (US\$/person/year)	0.44	0.64
Capital Maintenance Expenditure (US\$/person/year)	NA	NA

TARIFFS

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 5² (approximately US\$ 0.035) is charged for 36 litres of water fetched from the water point source on pay-as-you fetch basis. A focus group discussion with the WATSAN committee revealed frequent breakdowns of the formal water point systems. Repair works are carried out with monies accrued from sale of water and this affect the amount of money in their WATSAN account at any point in time.

All the respondents indicated that the water tariff of GHp 5 (US\$ 0.035) per 36 litres is acceptable.

² GHp is Ghana pesewa

SUSTAINABILITY

Data on the functionality and ages of boreholes with handpumps was gathered from an area mechanic. The breakdown of the water point system was mostly associated with the handpumps and two had been replaced since their installation.

If all users use an average of 27 litres of water per person per day (as noted in Figure 2) at GHp 3.75 (US\$ 0.02), the expected revenue would be GH¢ 6,050 (US\$ 5762) per year, which is largely sufficient to pay for operation and maintenance expenditure. Thus all operation and maintenance could be funded from the expected revenue.

Conclusion

Capital investments have been made in three (3) water facilities which should be adequate for a population of 900 – the reality is that, the current population of 442 relies on two boreholes with handpumps. The overall water service in terms of quantity accessed, accessibility by distance, and crowding-with-reliability gives is 63% basic, 10% intermediate and 27% sub-standard.

A majority (73%) of the respondents were receiving a good service (about 63% receiving basic service (20-40 litres) and about 10% receiving intermediate service (40-60 litres)). It was also clear that about 27% of the people were using quantity of water below the national norm of 20 litres per person per day.

The data on operation and maintenance and major rehabilitation showed that the community practice break-down (responsive) maintenance. This means that they only repair any of the parts when there are breakdowns and there was no systematic or regular preventive maintenance schedule for the systems. Communities should therefore be encouraged to have a systematic approach to preventive maintenance where parts of the water facility are changed or replaced periodically to ensure sustainability.

The pay-as-you fetch tariff system and the willingness of the water users to pay (demonstrated in the majority of responses that tariffs were acceptable) the agreed tariff has enabled the WATSAN to accrue enough money to repair their water point systems which if continued will make the systems sustainable.

The sanitation service level in Edwenase based on the WASHCost ladder is 20% which is comparatively higher than the national sanitation coverage of 13%.