



## Grushie Zongo community report

Cost of water and sanitation services in Grushie Zongo in East Gonja District, Ghana.

*This community has to travel a long distance to access water.*

*They only use formal water sources when informal ones are not available. Community members' inability or unwillingness to pay for water use from the formal sources threatens their sustainability.*

*The community has no toilet facilities and everybody practises open defecation.*



## 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 Bernice Donkor-Badu, Eugene Appiah-Effah, Kwabena B. Nyarko, Bismark Dwumfour-Asare, Patrick Moriarty, Peter McIntyre, 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

Northern Region Community Water and Sanitation Agency (CWSA-NR) Team:

Mr. Naa Dogoli, Regional Director  
Mr. John Aduakye, Zonal Hydrogeologist  
Mr. Gaeten, Extension Service Officer

East Gonja District:

Mr. Charles Bawa Soale, District Water and Sanitation Team Leader and Planning Officer  
Amadu Ibrahim, Hand Pump Area Mechanic  
Grushie Zongo 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

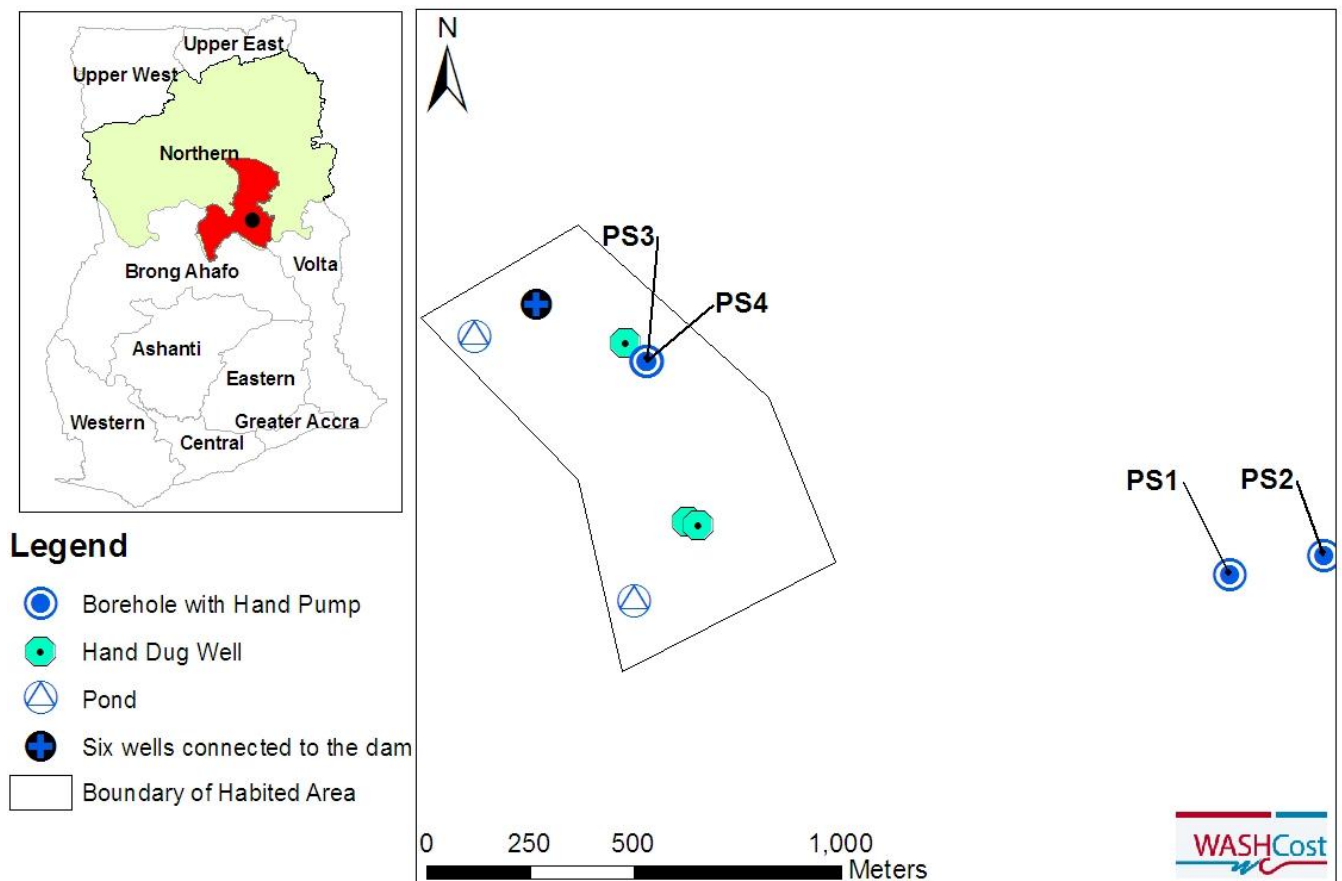
### Front page photo

Emmanuel Opong-Antwi / WASHCost

WASHCost is undertaking action research focusing on quantifying the cost of providing sustainable water, sanitation and hygiene services (WASH) in rural and peri-urban areas in Ghana. This community report presents findings of research carried out in the community of Grushie Zongo in East Gonja District of the Northern Region of Ghana.

The WASHCost team visited the Grushie Zongo community in September 2009 to collect data on the WASH services received by the inhabitants and the cost of providing the services. The community has a population of 410 people from regional Community Water and Sanitation Agency (CWSA) 2009 report and 56 households according to the WATSAN committee. The inhabitants, mostly Kokombas, with a few other minority tribes, are primarily farmers with a few of the women engaged in pito (local beer) brewing and petty trading.

Map of Ghana showing the Northern Region. The insert shows Grushie Zongo community in the East Gonja District



**Figure 1: Map of Grushie Zongo showing water sources**

*\*The boundary lines indicate only inhabited areas of the community and not the political boundaries of the community*

## WATER SUPPLY

Before 1984 Grushie Zongo relied on informal water sources which were of low quality and unreliable during the dry season. In some instances, inhabitants had to travel about 6 km for water. The subsequent history of the development of Grushie Zongo's water supply is summarised in Table 1 below.

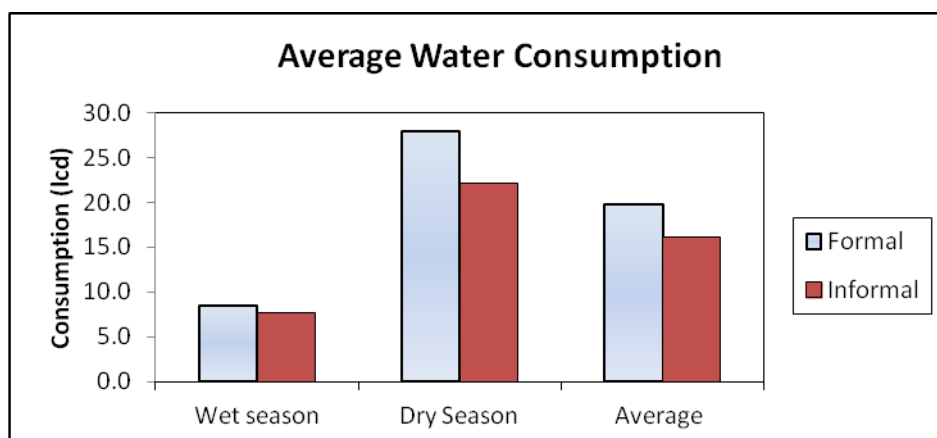
Currently there are four formal water point sources which should be available to the community; however, none of these were working at the time of the visit. One water facility (PS1 on the community map) had not been working for 2 years due to handpump breakdown. Two others (PS3 and PS4) had also been broken down for seven months while the last, PS2 had broken down two weeks prior to the team's field visit.

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

Pre-1984	1984	1988	2005
5 ponds for domestic and productive use	Three boreholes (PS1, PS2, and PS4) with handpumps provided by World Vision. No community contribution to capital cost.	Two reservoirs with five infiltration wells provided by the Catholic Church to purify the water.	New borehole (PS3) with handpump provided, and two handpumps replaced by Adventist Development Relief Agency (ADRA) and CWSA with 5% community financial contribution

## Water consumption from formal and informal sources

Average water consumption shows a strong seasonal pattern, rising sharply in the dry season and falling in the wet season when other sources are available. Much of the informal use of water in the wet season, particularly for productive use, is not captured in this data which explains why the wet season informal water use seems so low. People found it difficult to estimate their use of e.g. rainwater harvesting in the wet season.



**Figure 1: Average water consumption per season**

### Water service levels in Grushie Zongo

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). 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		
	Litres per person per day	Distance to water source	Crowding with reliability*
High	More than 60	500 metres or less	Less than 300 people per reliable point source
Intermediate	40 to 60		
Basic	20 to 40		
Sub-standard	5 to 20	More than 500 metres	more than 300 people per reliable point source
No service	0 to 5		

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

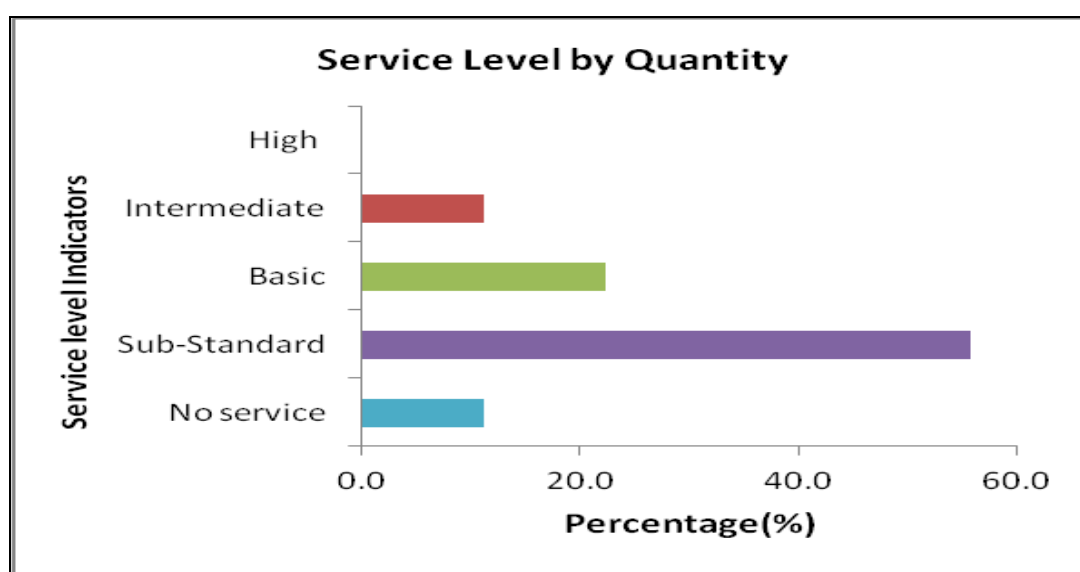
According to CWSA guidelines, a basic level of service entails receiving at least 20 litres of water a day and having a water point within 500 metres, which is shared with no more than 300 people.

In Grushie Zongo,

Only 1 in 3 people (33%) actually use sufficient water according to national guidelines.

The only reliable water point is shared by 410 people, which is more than the standard maximum of 300 people per water point.

Only 1 in ten (10%) of the population has access to a water source within 500 metres.



**Figure 2: Percentage of respondents receiving a particular service**

The result indicates that, a majority of the respondents, about 67% are not enjoying acceptable service. This means that, a majority of the people are not receiving the basic level of at least 20 litres of water per person per day as stipulated in CWSA guidelines.

### Accessibility

Only 10% of the respondents has access to a water source within 500 metres. Boreholes had to be drilled outside of the community due to geological constraints.



### Crowding and Reliability

Due to crowding of the only reliable<sup>1</sup> borehole, no-one in Grushie Zongo can currently be said to fully meet the basic standard for a rural water service.

The community had been relying on only one of the four water point sources (PS2) for at least the previous seven months, because the others had broken down. This last one broke down two weeks prior to the team's visit. Even if this facility was repaired quickly, that implies that there is only one reliable facility (working 95% of the time) for the entire population - resulting in 410 persons relying on a facility designed for 300.

### Quality and Use

All the respondents indicated that the quality of water from the formal sources was satisfactory and that the water is used for all purposes including drinking. However, no water quality tests have been carried out since construction.

Water from the formal sources is used for domestic activities (drinking, cooking, washing, bathing) and productive (livestock watering, irrigation, pito brewing) activities. Although the informal water sources are not acceptable for domestic use by CWSA norm, the community members use them for domestic as well as productive activities. The informal sources used are ponds, dug-out wells, hand-dug wells, dams, and rainwater harvested by households.

About 80% of respondents purchase sachet water from vendors (for drinking purposes), primarily during the dry season. The average consumption of sachet water is less than 1 litre per person per day.

## SANITATION

The community has no public, institutional, or (functional) household toilet facilities and all community members resort to open defecation. The Community Water and Sanitation Agency (CWSA), financed by the European Union and French Development Agency, promoted the Ventilated Improved Pit (VIP) latrine in 2005. WATSAN members and respondents told the team that some community members had constructed household latrines (VIPs) but they are not in use for reasons such as: flooding of latrines, latrines caving in, lack of funds for walls and roofs on toilets, etc.

---

<sup>1</sup> functioning for more than 95% of the time



## Costs and finances

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

**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 and handpump is US\$ 7,795. This implies that a total investment made in Grushie Zongo of US\$ 31,180. Using the design population of 300 people, this suggests a cost of US\$ 25.98 per person per year or US\$ 76 per person per year for the actual population of 410 people.

**Operation and maintenance costs** for the four boreholes with handpumps were reported to be US\$ 9 per-facility over the period 2004-2008, during which period each water facility had been repaired at least once. Part of the reason for this low figure is that several repairs were carried out for free using existing spare parts, and the area mechanic did not always charge for his work. Operational costs were therefore in the region of US\$ 0.02 per person per year. However, at least three of these four facilities were completely non-functional at the time of visit; this clearly shows that the operational expenditure is inadequate to maintain all four facilities.

**Capital maintenance expenditure** occurred when two handpumps (PS1 and PS4) were replaced after 21 years of operation. This expenditure was not planned but coincided with ADRA and CWSA projects from which the community benefited in 2005. This gives a cost of US\$ 0.44 person per year over the entire life-time of the boreholes - using the design population of 300 people per handpump and an assumed cost of US\$ 500 per handpump replaced every five to ten years. Calculated based on the actual population of 410 people, it gives a per-person figure of US\$ 0.32 over the same period.

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

Cost Components	Current Cost (2009) in US\$	
	Actual population	Design population
Capital investment (US\$/person)	76	26
Operational and minor maintenance expenditures (US\$/person/year)	0.02	0.03
Capital Maintenance Expenditure (US\$/person/year)	0.32	0.44

### 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 supposed to be collected and kept by the WATSAN committee. Each household in the community should pay a fixed monthly tariff of GH¢ 0.50 (US\$ 0.36) for water use from the formal water sources. All respondents said the monthly tariff was acceptable. However, in practice there are major problems with payment. Most of the community members have outstanding tariffs to settle. According to the committee, delayed payments and non payment are attributed to the seasonal nature of their income pattern as rural farmers.

An innovative way to address this problem came in 2008, when repairs were carried out on two of the handpumps at a cost of GH¢50 (US\$ 36). The money came from the proceeds of a community farming exercise (where the whole community is hired to work on farms) rather than from accrued tariffs.

The WATSAN feels that users are not really able to pay for the water and have largely stopped doing so. The lack of ability or willingness to pay for water use has, therefore, made the facilities financially unsustainable, which has in turn led to the observed sub-standard service delivery.

### Sustainability

If all the users were to pay the tariff of GH¢ 0.50 (US\$ 0.6) per household per month, the expected revenue would be GH¢336 (US\$ 240) per year, which would probably be largely sufficient to pay for operational expenditure and to also replace all hand pumps every 25 years. This suggests that the community should be able to maintain all the water facilities. However, according to the WATSAN, the targeted revenue has never been realised and it is therefore not surprising that at

the time of the field visit all the water point sources had broken down - with down time between 2 weeks and 2 years.

## Conclusion

The overall water service level received by respondents is sub-standard and does not satisfy the CWSA criteria. Despite a very large investment in four borehole systems, which should theoretically be adequate for a population of 1,200 the reality is that the current population of 410 rely on a single borehole. Even when all facilities are working, more than 90% of the respondents would still travel more than 500 m to access them, reflecting the difficult hydrogeology of the area.

Reported use from the systems showed strong seasonal variability. It was also clear that the majority of the population of Grushie Zongo were using below the national norm of 20 litres per person per day, with only 33% reporting basic or better daily use.

There is no sanitation coverage and all community members resort to open defecation. Previous attempts to build and use acceptable household toilets failed for several reasons.

The limited data that could be collected on operation and maintenance and major rehabilitation showed these to be largely ad-hoc, with the community only able to carry out the simplest and cheapest of repairs, and relying on outside help for large items such as handpump replacement. The amount spent on average per year by the community was trivial in comparison to the formal tariff – which in practice is not paid. The pattern of use suggests that for most of the people of Grushie Zongo the formal water supplies are at best a fall back – for use when other sources fail.

The issue of the unwillingness or inability of the residents of Grushie Zongo to pay for the water facilities that have been provided to them at such high cost would require further study to understand fully. It is clear that the current situation is completely unsustainable without outside help.