

REVIEWED PAPER

33rd WEDC International Conference, Accra, Ghana, 2008**ACCESS TO SANITATION AND SAFE WATER:
GLOBAL PARTNERSHIPS AND LOCAL ACTIONS****Self supply schemes for community water supply in Ghana***K. Nyarko, E. Awuah & D. Ofori, Ghana*

Jachie and Esereso are communities in the Bosomtwi-Atwima Kwanwoma District in Ashanti Region located on the outskirts of Kumasi with poor access to improved water supply services. The acute water supply situation in the communities has led many individuals described in this study as 'Self Suppliers' to provide water to serve their families and other members of the community for free or for a fee. This study examined who the Self Suppliers are, how they operate, the quality of water supplied, their market share and coverage through a survey carried out with these service providers and consumers in both communities. The Self Suppliers are the main water service providers in the two communities. However, water quality from these providers did not meet the Ghana Standards Board's required quality levels. This paper highlights the role of these self-supply schemes in community water supply delivery in Ghana.

Introduction**Background**

Rural and Small towns water supply referred to as community water had a coverage of 51.7 % at the end of 2004 for a population of 15.8 million based on 15,910 functional point sources and a total of 254 small towns all under community management. Despite efforts by the Government of Ghana (GOG) and Non-Governmental Organisations (NGOs) that have increased community water supply coverage it is not yet at the desired level, as significant proportion of the population does not have access to improved water supply. The inability of government to provide universal water coverage has led to the proliferation of groups of individuals known in this study as "Self Suppliers", who provide water to serve their families and other members of the community for free or for a fee. In some of these rural and small towns these self supply schemes (SSS), (refers to water systems operated by the self suppliers) are the only source of water for the communities; yet they are not recognised in the water supply chain and have received comparatively little attention, much less regulation. As such the nature of the SSS and their extent of coverage and impact on the sector are not yet known. This study therefore seeks to find out who these Self Suppliers are, how they operate, their market share and extent of coverage, the quality of water they supply and the problems they encounter. The study began with a review of the policy, legal and regulatory framework for their implications on the self-supply operators. Questionnaires were then administered to 15 Self-Supply Scheme (SSS) owners (representing 37.5 %) and 65 customers (representing 1 % of the population) in Jachie and Esereso. In addition interviews were conducted with key informants of the District Assembly (DA) and 8 water samples from the various self-supply systems were analysed to assess the quality of water supplied.

Community water supply in Ghana

Water supply to rural and small towns, which is decentralised under the local government structures, constitutes the community water supply. Community Water and Sanitation Agency (CWSA) is the government agency responsible for facilitating community water supply delivery. The key elements of the national community water and sanitation strategy (CWSA, 2000) shall be supported through project interventions to provide improved water supply and sanitation facilities only if they are prepared to pay their share of the capital cost contribution and take up all operations and maintenance costs. District Assemblies shall be the focal point for delivery of water and sanitation facilities. Public sector agencies (CWSA, Water Resources Commission, etc.) play the role of facilitators and regulators. CWSA provide guidelines for designing water systems, operation and maintenance and providing back-up professional support to District Assemblies, while the private sector takes responsibility for the provision of goods and services. Districts selected and prioritised based on established need and evidence of demand e.g., letters of demand, poor public health status due to

prevalence of water borne diseases and inadequate water and sanitation facilities.

The relevant agencies for community water supply are Water Resources Commission (WRC) for regulating and managing water resources in Ghana. Environmental Protection Agency (EPA) for environmental regulations, Ministry of Water resources Works and Housing (MWRWH) with responsibility for policy formulation.

Study area

Bosomtwi-Atwima-Kwanwoma District is located at the eastern part of Ashanti Region. It lies within latitudes 6°24'N and 6°43'N and longitude 1°15'E and 1°46'W. The district capital is Kuntanase. The district falls within the forest belt of the Ashanti region. With the exception of the lake, the rest of the district cannot boast of any unique topographical features; the drainage pattern is dendritic. As regards its groundwater potential, the lower Birimian rocks have a higher groundwater potential, and the discharge could be as high as 200l/min.

Jachie and Esereso are two communities in the Bosomtwi-Atwima Kwanwoma District, Ashanti Region with a population of 7,368 and 4,871, respectively, during the 2000 population census and with a growth rate of 2.7% (GSS, 2002). The two communities are both along the Kumasi-Kuntanase road. The houses in Jachie are similar to that of Esereso "old town". The buildings are predominantly the compound or family type. Most of these compound buildings have pit latrines with the exception of a few who use the public toilet facilities in the community. However, there are a few modern buildings in Jachie. Esereso "new site" has modern buildings mostly storey, semi-detached or single household (bungalow) types with water closets and septic tanks. The two communities depend on hand-dug wells, boreholes, and rainwater. In addition Esereso inhabitants rely to a small extent on streams.

Policy, legal and regulatory framework review

Water abstraction policy

The Water Resources Commission (WRC) is an independent agency set up by the Water Resources Commission Act 522, 1996 for the regulation and management of the utilisation of water resources, and for the co-ordination of any policy related to its functions (GOG, 1996). The act empowers the WRC to carry out the following functions:

- Propose comprehensive plans for the utilisation, conservation, development and improvement of water resources,

- Grant water rights, initiate, control and co-ordinate activities connected with the development and utilisation of water resources.

Under the Act, the control of all water resources is vested in the Presidency on behalf of and in trust for the people of Ghana. No person shall divert, store, abstract or use water resources, or construct or maintain any works for the use of water resources except with the prior grant of a right by the commission. The WRC also levies charges for water abstraction. The procedure for granting abstraction licenses has been laid down in the Legislative Instrument (LI) 1692, which demands that all cases of abstraction be registered and licensed except abstraction below the minimum threshold of 5 litres per second (432 cubic metres in any period of 24 hours).

Environmental policy

The Environmental Protection Agency Act 490 of 1994 established the Environmental Protection Agency (EPA), as the principal environmental regulatory body in Ghana (GOG, 1994). In relation to water supply the role of EPA is to ensure that the operations and activities of the general population and the industries in particular do not cause any harm to the immediate environment, such as water catchment area. Also, the EPA carries out activities on water conservation. There is a requirement for all projects to comply with laid down environment impact assessment procedures in the planning and execution of development projects.

Monitoring drinking water quality

The Ghana Standards Board (GSB) has established drinking water quality standards. The Standards' Decrees 1967, 1973 of NRC 173, 199 empowers the Ghana Standards Board to set standards for drinking water quality, among others. For community water supply, the enforcement and monitoring is the responsibility of the District Assembly.

Government supported services

The formal and official arrangement for water supply in the two communities is just a borehole each serving Jachie and Esereso, with four additional boreholes under construction in Jachie. These facilities were provided under the National Community Water and Sanitation project where the funds are from the Government of Ghana, External Support Agency and community contribution. The community contributes 5% of the capital cost and pays all the operation and maintenance costs. However, as mentioned already this is woefully inadequate and has led to the development of Self-Supply Schemes.

Self supply service providers

Nature of water service

The response from questionnaires administered to both the SSS owners and customers revealed that the quantity of water from the government supported water facility was not enough to satisfy the water needs of the community. This was because there was one borehole each serving Jachie and Esereso, thus one has to form a queue before accessing water. It was therefore not surprising that 90% and 88% respectively of the respondents in Jachie and Esereso depended on the Self-Supply Schemes for their water needs. From the survey, 42% of the SSS owners were compelled to provide their own water facility because there was acute water supply in the community: 36% because the boreholes in both communities were far from their various households and 22% was because of both reasons above. The survey also revealed that some of these self suppliers have been supplying water for over 10 years thus helping in community water supply. There is no doubt that these self suppliers play a very vital role in Jachie and Esereso thus contributing to community water supply.

In Jachie, the survey revealed that 92% Self-Supply Scheme (SSS) owners supply water from hand-dug wells and the remaining 8% from rain harvesting system; none of the SSS owners supply water from boreholes. The hand-dug wells in Jachie have circular, square or rectangular head walls, aprons at the base with metallic lids. None of the hand-dug wells had pumps fixed to them; water was drawn by a rope and bucket manually or by pulley and no provisions was made for water storage (see Photo 2). The rainwater harvesting systems have pipes connected from roof gutters to underground or surface storage tanks. (see Photo 1)



Photograph 1. Rain harvesting system with tap connected to storage tank



Photograph 2. Hand-dug well with pulley system

In Esereso, SSS owners supply solely from hand-dug wells, water from these wells are drawn by rope and bucket or the water pumped into overhead storage tanks for supply. It was observed that those who pump water into storage tanks have filters fixed to the pipes connecting the storage tanks to other pipe network in the house. Averagely, each supplier can serve as many as 25 persons with at least 32 litres of water per day.



Photograph 3. Mechanised hand-dug well with pump, elevated storage tank, filter and a tap

Quality of watersupplied from self supply systems

From the survey, 26.3% and 30% of Jachie and Esereso SSS owners mentioned that customers do complain about the colour, and hardness of the water supplied. Contrary to the response from the SSS owners, the survey with the consumers revealed that 70% and 50% of Jachie and Esereso SSS customers respectively were dissatisfied with the quality of water. Unfortunately, most of these Self Suppliers simply have no idea about solving the water quality problem. The SSS owners mentioned that they treat their water often with naphthalene as and when required but could not specify the dosage.

From the water quality test performed on the samples from the hand-dug wells, it was realised that 75%, 50% and 33% of the samples respectively from Jachie were high in Nitrates, Nitrite, and Iron. All the samples were high in Salmonella, E-coli and Coliforms. The results suggest that the water sources are being contaminated by faecal matter thus probably because most of the Self Suppliers use pit latrines in their houses which are about 10m from the hand-dug wells.

In Esereso, 33% of the samples were high in Iron; probably because of the type of soil material, or the iron oxide particles were collected with the water sample as a result of the flaky of rust on the lid of the well cover or bucket holder. 67% of the samples had Salmonella and Coliforms but no E-coli, which signifies an advance warning of more serious pollution when there is more infiltration from faecal matter present in the surrounding soil after it rains. The absence of E-coli in the samples may be due to the presence of water closets and septic tanks in Esereso.

Surprisingly, none of the respondents from both communities complained of any form of illness resulting from the water they drink contrary to the laboratory results, which showed high levels of bacteria in the water. This is probably because they do not have immediate illness (though water is drunk without boiling) hence they do not attribute it to the water or possibly, residents have gained immunity to the bacteria in the water over the years.

Market share and cost

The Self-Supply Scheme is the main source of water for majority of the inhabitants (87.5% of the market share). There was no significant difference in price between the various types of SSS (i.e. hand-dug well with rope and bucket, hand-dug well with mechanised pump and rainwater harvesting) in both communities; however, there was varying price tags for the same type of SSS water facility in different locations. The average tariff of water from the SSS is US \$ 1.21/m³ of water compared to US \$0.91/m³ from the government system. The high market share of the SSS water services may be due to the following:

- The suppliers are very close to the (demand point) various houses;
- The differences between the tariffs are marginal;
- There is just a borehole serving each community.

Role of the District Assembly in self supply scheme

The Assembly admitted that water supply in the community was inadequate and they were also aware of activities of the Self Suppliers; nonetheless the Assembly had no influence on their activities and did not provide any support in terms of subsidy. The requirement from the WRC Act and the LI 1692 on the water use regulation, are clear on the procedures for water use. However in practice, the requirements were not even known to the SSS owners. The DA is aware of the need to comply with those provisions but was yet to implement it. With respect to water quality monitoring, there is no institution at the local level ensuring that water quality is acceptable. Under the Community Water Supply framework, responsibility for ensuring that water quality meets the Ghana Standards Board requirements is vested in the DA. However from the fieldwork routine water quality testing and monitoring was lacking for both the government provided systems and SSSs. In the case of the community water systems, water quality testing was done after construction. This however is not the case for the SSS. There is no mechanism for regulating water quality and the water price for the SSS. According to the Assembly however, there have been no reported cases of epidemic caused by the water supplied by the SSSs.

Conclusion

The self-suppliers play a significant role in Jachie and Esereso thus they are the main water providers in Jachie and Esereso; hence control a greater portion of the market because of the inability of the district assembly to provide the communities with adequate water to provide their basic water needs. The average tariff of water from the SSS is higher, US \$1.21/m³ compared to US \$0.91/m³ from the government-supported system. However, the quality of water supplied by most of the self-suppliers does not meet the standards set by Ghana Standards Board (GSB). There were no mechanisms for monitoring water quality at the local level.

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