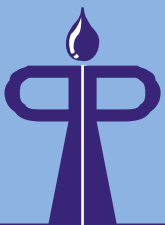


Case Study

January 2010

Tanker Services as an Alternative Model for Delivering water to the Urban Poor

Benedict Tuffuor
TREND Group



The TPP project

The Tripartite Partnership Project (TPP) aims to strengthen sector capacity for planning and delivery of pro-poor Water, Sanitation and Hygiene (WASH) services in Ghana, through the generation, packaging and dissemination of knowledge, especially with regard to sustainable and equitable Management Models, based on the partnership among public, private and civil actors.

Within the framework of this project, a number of sector studies have been executed. This included a review of global literature on pro-poor urban and small town WASH services, an institutional mapping of the small town and urban WASH sector in Ghana, and a GIS mapping of small town and urban Management Models in Ghana. A number of these Management Models identified in Ghana, was selected for further study through the documentation of case studies. The sector review and case studies have been published under the TPP Working Document series. TPP Working Documents should be considered work-in-progress. Comments and suggestions for improving the documents and enhancing understanding and further refinement of pro-poor urban Management Models are very welcome.

The first phase of the TPP Project, which concentrated on the sector review studies and the documentation of interesting models and best practices, was funded by members of the Netherlands Water Partnership NGO-Group: ICCO, Aqua for All and SIMAVI.

The best practices which were critically obtained from these studies will be applied to the design of tools and guidelines for replication within the Ghanaian WASH sector. In order to learn from real experiences and to fine-tune methods and tools, a number of pilot projects will be implemented in pro-urban areas and small towns. Three of these pilot projects are funded through an Africa Water Facility grant from the African Development Bank. The knowledge components continue to be supported by ICCO, Aqua for All and SIMAVI.

The project is co-ordinated by TREND Group, in a close collaboration with CONIWAS, CWSA, PRUSPA and IRC International Water and Sanitation centre.

Acknowledgements

The author would like to thank Eugene Larbi from TREND Group, Marieke Adank from IRC International Water and Sanitation Centre, Anne Barendregt of AVRL and Abu Wumbei of WASH Resource Centre Network (RCN) Ghana for their valuable inputs into the realization of this report.

TABLE OF CONTENT

Table of Content.....	i
List of Tables	iii
List of Figures.....	iii
1. INTRODUCTION AND METHODOLOGY	1
1.1 Introduction.....	1
1.2 Objectives and Scope of this case study	1
1.3 Approach and Methodology.....	2
2. The case study area and the INITIAL WASH CHALLENGE.....	2
2.1. The case study areas.....	3
3. THE MANAGEMENT MODEL	5
3.1. The development of the management model	5
3.2. Introduction of the management model in the case study area	6
3.3. Institutional arrangements under the management model	7
3.4. Tariff setting and cost recovery.....	8
4. ASSESSMENT OF THE functioning of the MANAGEMENT MODEL in reality 10	
4.1. Community Involvement in Management	10
4.2. Consumer Satisfaction	10
4.3. Tanker Operations.....	11
4.4. Financial Issues	12
4.4.1. <i>Financial management practices at selling points</i>	12
4.4.2. <i>Pricing Arrangements for Coordinators</i>	12
4.4.3. <i>Sales, Costs and Profits</i>	12
4.4.4. <i>Project Impact on Price of Water in the Communities</i>	12
4.5. Transparency and accountability.....	15
4.6. Special measure for ensuring pro-poor focus.....	15
5. CONCLUSIONS AND LESSONS LEARNED	16
5.1. It is highly expensive to serve the poor by Tanker Supply compared to water directly from Piped Sources	16
5.2. Low Level of Profitability.....	16
5.3. The management of Water Sales could be more Efficient.....	17
5.4. Access and Reliability of Service are key in Pro-Poor Delivery	17
Annex 1: Assumptions for Financial Sustainability and Profitability Analysis.....	19
Annex 2: Comparative Analysis of Piped Services and Tanker Supplies.....	20
List of TPP Working Documents.....	25

LIST OF TABLES

Table 2.1: Overview of the Project Areas

Table 5.1: Summary of Information on Selling Points per Community

Table 5.2: Cost-Benefit Scenarios for Different Demand Levels

LIST OF FIGURES

Picture 1: Water Tankers installed by AVRIL at a selling points

1. INTRODUCTION AND METHODOLOGY

1.1 Introduction

The Tripartite Partnership Project seeks to identify, test and promote innovative management models for the delivery of water, sanitation and hygiene (WASH) services to the urban poor in Ghana.

Within the framework of the project, various management models, both local and global, are reviewed and the most innovative ways of ensuring sustained delivery of WASH services to the urban poor are identified. The best practices gleaned from various studies will be applied in the design of various tools and guidelines for replication within the Ghanaian WASH sector.

A scoping of existing Management Models in Ghana, including a GIS mapping exercise, was carried out between April and November, 2008. At a Learning Alliance meeting on 12 November 2008, the tentative outcomes of the studies were presented and a number of case areas were identified for further documentation, covering a wide range of issues across the four main ecological zones of Ghana. This resulted in a series of 9 case studies on promising management models in the water and sanitation sector in Ghana conducted under the TPP Project.

1.2 Objectives and Scope of this case study

Bearing in mind the central theme of the TPP (innovative management models for services delivery to the urban poor), this case study presents the case of Tanker Service Supply as an alternative supply mechanism to the urban poor who are poorly or not at all served by the utility network. It presents the case of the Tanker Service Operations project implemented by Aqua Vitens Rand Limited (AVRL)¹ in parts of Accra in the beginning of the year 2008 as response to an acute water crisis in those parts of Accra. The project was planned as a short-term measure to deal with an emergency situation. However, one year after its inception, there is still high demand for the service. AVRL therefore commissioned an evaluation study which was executed by TREND Group, to assess the project's effectiveness and efficiency and provide recommendations for the way forward. This case study is based on this evaluation study.

The case study highlights the following issues:

- A comprehensive picture of the WASH situation within the areas served under the management model
- A description of the management model and its development
- An assessment of the functioning of the management model in reality
- An assessment of the application of the model at scale.

¹ AVRL is private company which has a five year (2006-2010) management contract with the national utility, Ghana Water Company Limited.

1.3 Approach and Methodology

The methodology adopted for the study included a desk study and extensive field work in the study area. The fieldwork involved consultations with relevant stakeholders of the project including consumers, Water Vendors, Opinion Leaders and Assembly Members, Tanker Drivers, Project Software Consultant, five AVRL Districts under whose jurisdictions the project was implemented, Accra East Regional Office of the AVRL and AVRL Head Office. A total of 320 households were interviewed.

2. THE CASE STUDY AREA AND THE INITIAL WASH CHALLENGE

AVRL distributes about 372,000m³ of water a day to the Accra-Tema Metropolitan Area (AVRL, 2009). Due to inadequate production levels, AVRL has resorted to rationing the available water to ensure equitable distribution. The inhabitants of Accra therefore do not receive water every day of the week. Households respond by storing water for later use. Intermittent supply has also led to a thriving business of water vending, which, whilst it is a support to households without connections, it also contributes to exploitation of the poor. These vendors mostly 'source' their water from the urban pipe-borne network. There are essentially 2 types: large scale enterprises requiring a capital outlay for purchase of tankers that supply water in large volumes to richer households situated in water scarce neighbourhoods, and small scale vendors who sell water in smaller volumes to individual households at the community level.

Despite the efforts of AVRL to manage the water supply in such a way that people receive a fair amount of water on designated days, locations in Accra and its peri-urban areas still do not receive water at all. This problem annually worsens during the dry season, when there is no rain water to complement the pipe water source. By March 2008, the problem in some areas had become very serious following the long spell of the dry season. The worse hit areas were the communities of La, Osu and Teshie. In these areas, water supply through the water mains was virtually non-existent. AVRL customers in these areas had to use various coping mechanism or relied on alternative sources for their supply.

In response to consumer and media outcries and the government's concern about the critical water challenges, AVRL, in collaboration with Ghana Water Company Limited (GWCL) and the Ministry of Water Resources Works and Housing, started to provide interim solutions to improve the water situation in various deprived communities. In April 2008, with fair publicity², AVRL undertook a Tanker Services Project where private tankers were resourced and commissioned to supply water as an interim and auxiliary measure to selected water-poor areas in Accra East Region³: Osu, La, Teshie-

² Daily Graphic, Thursday, April 3, 2008 and Ghanaian Times, Thursday, April 3, 2008

³ Accra East is one of the 12 Operational Regions in which AVRL operates. Each Region is divided into Districts. Apart from the Greater Accra Region, which is divided into 3 regions (Accra East, Accra West and Tema Regions), the AVRL regional boundaries are aligned with the National Regional boundaries. Boundaries of AVRL Operational Districts are not aligned with National District boundaries.

Zongo, Adenta-Ashalley Botwe, Dome-Taifa and Kwabenya and Dodowa. This case study focuses on the Tanker Supply Services to Osu, La Central, Dome, Taifa and Kwabenya. In these communities, a total of 20 Selling Points were established (see table below) and a total of 42 (9000-litre) poly tanks were installed at these selling points.

2.1. The case study areas

Osu is mostly a low income traditional Ga community surrounded mostly by administrative and commercial establishments/activities. In Osu Alata, the people are mainly petty traders and fisher folks with a section being government white-collar workers. The Kuku Hill and Old American Embassy populations are made up of mainly petty traders who man shops, self-employed persons and government workers. Aside from the Alata area, Osu is well planned but poorly organised, depicting a poor outlook.

La is an indigenous Ga community which is prominent in the traditional settings of the Gas. It is a community with low income earners engaging in fishing, carpentry, masonry and other petty trading. Most part of the area is unplanned. The community is rapidly growing and it is one of the densely populated areas in Accra. Most of the houses are not connected to the AVRL water mains. Those connected hardly get water.

Taifa, Dome and Kwabenya are new developing areas in Greater Accra Region where a lot of non-indigenes of Accra are settling. Akans dominate the ethnic groups in these areas. The ethnic groups also include Northerners and Ewes among others. The people in these areas are engaged in trading, artisanship, farming, services and white-collar employment.



Picture 1: Water Tankers installed by AVRL at a selling points

Table 2.1: Overview of the case study areas

AVRL District	Community	Selling Points
Accra Central	Osu	A total of four (4) selling points: Ebenezer Presbyterian Church area, Former American Embassy, Mandela Park -Bethlehem and Mandela Park – Castle gate
Accra East	La	Seven (7) selling points: CAC, New Road, Bola Junction, Oshiapem, Olympia, La Apapa and Adjei Tokota
Accra North	Dome, Taifa and Kwabenya	Nine (9) selling points <ul style="list-style-type: none"> ○ Dome: Dome Pillar 2, Ayigbetown and Grushietown ○ Taifa: Nkatie Borga, Presby Church and Halleluyah ○ Kwabenya: Opposite Regimanuel 1, Off Point One West and Point One

3. THE MANAGEMENT MODEL

The model of subsidised water tankers supplying water to community managed selling points was initially meant as an interim measure to deal with the water crisis in the affected poor urban communities. This section of the paper gives a description of the model and how the model was implemented in the projects areas.

3.1. The development of the management model

Water Tanker services in Ghana started in the 1980s to provide water supply to support the construction activity in Accra that was picking up in that period. Given the continuous decline in the reliability of supply by the GWCL, some domestic consumers installed tanks to store water as a measure to cope with the shortages and to resell to those who were not connected. The phenomenon developed to a stage where even those without connections installed tanks and relied on tanker supplies for water to resell. The activities of water tanker operators continued to grow over the years but did not have recognition from the GWCL. In the effort to supply potable water to their customers, therefore, some tanker operators started drawing water illegally from the utility's fire hydrants. This formed a challenge for the utility in its attempt to supply adequate and regular water to its customers.

The situation brought the utility and the tanker owners to a dialogue, which led to the authorization of water tanker operation and the establishment of designated tanker service points, where tanker operators could draw water legally to sell. These service points are metered and the operators pay GWCL based on the meter readings. The process led to the initial establishment of three tanker operators' associations to serve as the mouth piece of the operators and protect members' interest (Kariuki and Acolor 2000). Since then, tanker services in the water sector have picked up and according to

Sarpong and Abrampah (2006: p.47), the number of groups participating has increased to four associations, two independent companies and the utility's own tanker services (Annex 3). The associations are also responsible for ensuring that their members operate under hygienic conditions.

In Accra today, tanker services have become a key component of the water delivery system, especially in areas of low pressure and un-served areas. AVRIL adopted the Tanker Service Model as a response to the acute water shortages in various parts of Accra during the first half of the year 2008. It was developed along the lines of AVRIL's pro-poor initiatives to provide an interim solution to the water problem. The initial intention of the project was to run this service for a period of about six months, by which time the period of drought would have ended and the water supply situation would have improved. The decision at the time was that when the water supply situation improved, the tanker service would stop and the selling points would be all connected to the main lines of AVRIL. However, after one year (March 2008 - March 2009), the supply situation has not adequately improved and there is still high demand from the communities for the tanker service.

3.2. Introduction of the management model in the case study area

The project was an initiative of the AVRIL Head Office. However, the AVRIL Accra East Region, under whose jurisdiction the beneficiary communities fall, was given the responsibility of implementing the project. The beneficiary communities fall under five AVRIL Operational Districts within the region. The AVRIL Districts were however not given a direct implementation role in the project, except in the initial stages, where they were expected to assist the consultant in community entry and identification of sites for the installation of the water tanks. AVRIL contracted Youth and Social Enterprise Fund (Y-SEF) as a consultant on as-and-when-needed basis to facilitate the process in the beneficiary communities and to work with the stakeholders, including assembly persons, opinion leaders, landowners and the respective AVRIL District Offices, to identify locations for the installation of the poly tanks, identify coordinators to manage the points and vendors, and establish the local water management structures, among others. The consultant was in charge of reporting on the implementation process to the Head Office through the Accra East Regional Office. The consultant also played the lead role in handling post implementation issues on behalf of AVRIL, in terms of addressing community concerns about the project that are reported to AVRIL and monitoring of activities, as and when AVRIL makes a request.

The community members helped in terms of voluntary labour for the physical installation (constructing the platforms on which the tanks would stand) and prepared the various areas for the project to commence. This did not take the form of general communal labour, but the Assemblymen and the opinion leaders selected hands in the vicinity of the respective selling points to assist. All the funding for the project was provided by AVRIL.

At the community level, local leaders (Assembly Members and Opinion Leaders) mobilized labour to support AVRIL to install the poly tanks. For day-to-day administration of the project in the respective communities or selling points, the Y-SEF was responsible for building the necessary local structures for effective

management of the facilities including orientation for vendors on how to run the selling points.

At least one vendor was selected to man each selling point. The vendors were selected by the supervisors (Assembly members or the Coordinators), in consultation with opinion leaders. The selection process did not involve the participation of the entire community. Before operations started, all the selected vendors were given orientation and coaching on how to manage the selling points. This did not take a formal form and was delivered one-on-one at the selling points by the software consultant. The orientation included customer relations, communication, tariffs fixing and health and hygiene around the selling points among others.

A summary of roles and responsibilities for the implementation of the project, as captured by the Terms of Reference, is presented below:

- AVRL Head Office was to be in charge of the organisation and financing of the project.
- AVRL Regional Office Accra East was to be in charge of the supervision at the various locations and the construction of the selling points together with the various District Offices of AVRL.
- The selection of the community was done by GWCL, MWRWH, AVRL Head Office and Accra East Regional Office based on demands from communities and assemblymen.
- In the concerned areas, the communities and assemblymen were to be involved in the selection of the locations for the selling points, the construction of the platforms and the selection of the vendors.
- During the whole process a consultant from YSEF was contracted to be responsible for facilitating community involvement and education.

3.3. Institutional arrangements under the management model

Under this model, water is provided to water tanks at locations referred to as selling points through the tanker services.

Water is supplied by three **tankers**: two private tankers with the volume of 3500 gallons (15.75m³) each, hired by AVRL and one managed directly by AVRL (a truck fitted with 2 poly tanks). Before the tankers started operating, they were cleaned and disinfected by AVRL. The tankers are kept at the AVRL premises when they are not in use. This is to check abuse and ensure that they are readily available when needed. The tankers are tasked to fill all locations depending on the request of the coordinators of the selling points, which was found to be mostly daily or every other day.

The mandate of the tankers is to fill only the project selling points. The tankers have both day schedule and night supplies schedule (to Dome, Taifa and Kwabenya due to the vehicular traffic during the day). Under the agreement with AVRL, the tanker coordinators receive an average of 180 litres of fuel per truck for every week. In addition, they are paid GHC250 a day per tanker for their services. As a general rule,

the tanker drivers do not handle money. The water tankers make deliveries according to the orders placed by the coordinator of the selling point.

“**Coordinators**” were selected from the communities for the management of the selling points. The Coordinators are responsible for recruitment and supervision of vendors, financial management, arranging for supply of the water, among others. The coordinators of the selling points pay for the water directly at the AVRL Accra East District Office and are issued with waybills, with which they can order for tanker services. The coordinator then requests for water supply from the tanker operator/driver based on the waybill. The tanker driver presents the waybills before he is served at the filling point based on the quantities on the waybill. A record of the supply is kept to ensure that the quantity requested is delivered.

The **vendors** are basically, in charge of selling the water and cleaning the site. There are very few instances where the vendors are solely in charge, that is, the coordinators themselves do the vending. Payment arrangements for vendors vary in two ways: commission (average of GHC4) on each consignment of 15.75m³ or monthly fixed payments (average of GHC60).

AVRL funded the provision of the poly tanks and the raising of the platforms with communities providing labour at the various selling points. Even though the facilities are solely managed by people at the community level, the ownership of the poly tanks remained with AVRL and the tanks were labelled as such. The figure below gives a summary of the relationships.

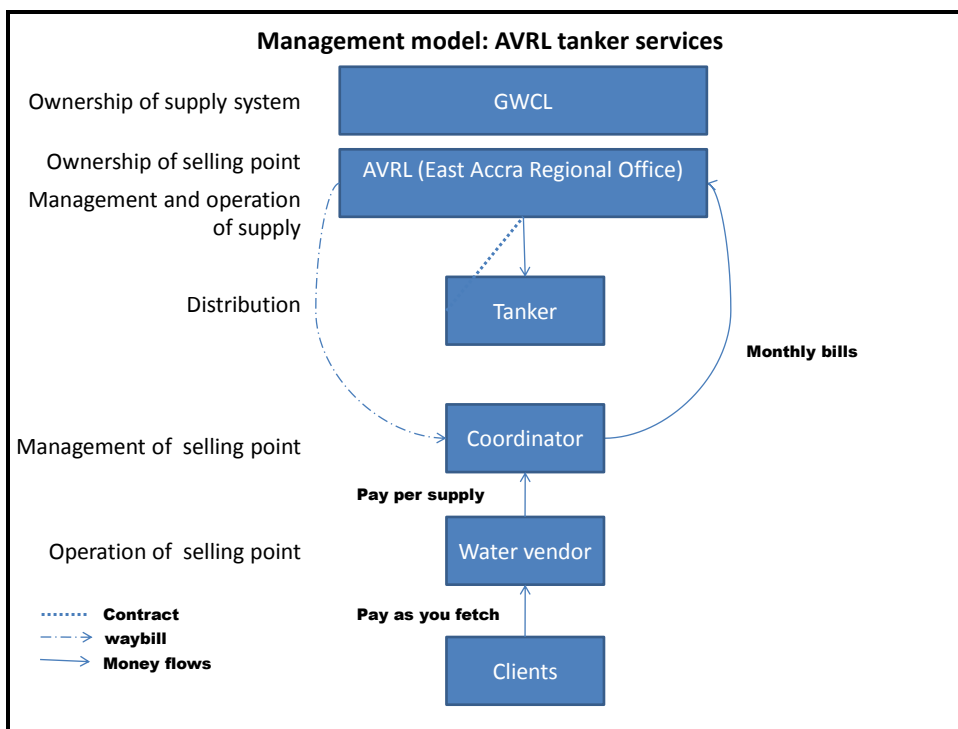


Figure 1: Management Model for AVRL Tanker Services Project

3.4. Tariff setting and cost recovery

In Accra, it is widely known that the poor generally pay up to 10 times the official rate for water. This model intends to ensure that the consumer pays not more than GHC0.05 per 20 litres of water (AVRL, 2009). The idea is that by ensuring low prices at the AVRL selling point, other private vendors in the community will be forced to lower their water prices which range between GHC0.10 and GHC0.20. This means that consumers will make savings of between 50% and 75% of the cost of water. This notwithstanding, the GHC0.05/20litres translates into $GHC2.50/m^3$ which is about 4 times the cost ($GHC0.66/m^3$) if consumers were directly connected to the distribution network and consumed within the lifeline tariff.

To achieve this and at the same time ensure that vendors and coordinators are able to make some profit, coordinators of the selling points pay for only the cost of water (GHC18.00) at the AVRL loading, without the cost of transporting it to the selling points. AVRL contracts and pays the private tankers at daily rate of GHC250.00 per truck from its own resources. Besides, AVRL provides for each tanker 180 litres of fuel per week. AVRL also pays the fees of the software consultant.

The proceeds from the sale of water at the selling points is to cover the commission to vendors where applicable and care of the selling points. Other expenses related to the points and surplus to the coordinators. The cost price of water to the selling points and the price of GHC0.05 per 20 litres to consumers ensures that coordinators make at least minimal profits. The project did not intend to recover the cost of establishing the selling points.

The AVRL selling points operate on pay-as-you fetch basis. The price of water at the selling points was based on AVRL approved price of GHC 0.05 per 20 litres for standpipe connections. Prices for other containers with different volumes were fixed by the vendor with reference to the 20 litre containers (e.g. 30l-40l container were sold for GHC 0.10 while 25l was sold for GHC 0.05).

4. ASSESSMENT OF THE FUNCTIONING OF THE MANAGEMENT MODEL IN REALITY

4.1. Community Involvement in Management

The responsibility of management after installation was left with the community. However the kind of community involvement in management varied from one area to the other, and generally differed from typical community managed schemes, where a body representing the community (except in the case of Kwabenya) is given the oversight responsibility and is expected to be accountable to the general community. These management arrangements, which centred on local champions who led the implementation process in the different communities, were identified as the most suitable at the time, according to the software consultant, given the challenges of community mobilization an urban setting. Four main management arrangements were identified:

- Where an Assembly Member is the coordinator. He exercises oversight responsibility over the running of the selling points including recruitment and supervision of the vendors. For example, all selling points at La and two at Osu areas were under the respective assembly members.
- Where an opinion leader who showed commitment to the project is the coordinator. This arrangement was identified at three selling points in Dome.
- Where the coordinator is also the vendor. This was found at three selling points in Taifa and at two at Osu.
- Where an identifiable local group or body is given the responsibility of coordinating. The Kwabenya Residents Association spearheaded the project for the affected areas of the community and was given the oversight responsibility.

The communities, vendors and assemblymen, in accordance with the project strategy, all perceived the ownership of the infrastructure to rest with AVRL. This was largely due to the fact that the tanks had all been clearly labelled as the property of the Government of Ghana. However, because the coordinators were responsible for operation and maintenance, AVRL had maintained little visibility in the project area in terms of monitoring and supervision. The coordinators played the oversight role over the selling points and were responsible for repairing faults when they occur. Overall, the general impression was that most of the community members did not place much importance on the question of who owned the facilities but more on the availability and quality of the service they provided.

4.2. Consumer Satisfaction

Generally, there was high patronage of the service especially in the dry season when there is no rain for consumers to harvest to supplement their water requirements. It was generally the view of the customers that the project brought a big relief to them in terms of distance and time used in search of water, price of water and quality of water. The following benefits have been identified:

- Time savings: The turnaround time which used to be a minimum of 30 minutes (more in the dry season), drastically reduced to an average of 15 minutes. Queues are now experienced only in the peak hours between 6am and 7.30am, and also between 5pm and 6pm. The perennial problem of carrying containers about in search of water had stopped.
- Cost saving: 20 litres of water which used to cost GHC0.1 to GHC0.20 when bought from private vendors, is now sold at GHC0.05 at the selling points. This means that the same amount of money that was used to buy a certain quantity of water can now buy 2 to 4 times the same quantity.
- Health benefits: Customers' widespread perception was that consumption of water from the AVRL sources will contribute to improved health of customers.

The demand in La is very high compared to the other areas. At each of the selling points in La, the demand is five to six supplies (15.75m³ each) in a week, while in Dome, Taifa and Kwabenya, the demand is three or less supplies per selling point in a week. At the time of the study, one selling point in Taifa and one in Kwabenya were not operating due to low patronage.

On the possibility of contamination, consumers are concerned about the practice of the off-loaders climbing and standing on the tanks to direct the discharge tube into the poly tank. The selling points are kept clean, in general. However, none of them have soak-aways.

Customer-Vendor relationship is cordial. Operation periods (hours) of vendors vary slightly among selling points and are generally suitable for consumers. The vendors have over time scheduled their operational hours according to the demand of the consumers in their areas.

4.3. Tanker Operations

The response to the request of the coordinators by the tanker operators is said to be fairly regular because they are designated solely for the project. There are however, occasional delays mainly due to water shortages at the AVRL hydrant.

Three main factors affected the regularity of the supplies by the tankers:

- Requests made by the selling points: The practice is that the managers of the selling points make bulk purchases from AVRL and use the waybills to make requests for water as and when they need it. So the promptness of the supply partly depends on the number of requests to be met by a particular driver.
- Availability of Water at the Service Hydrant: When there is a general shortage of water at the service hydrant, the tankers are not able to respond to the requests from the selling points.
- The number of trucks at the AVRL Service Hydrant: The service hydrants do not serve only the project tankers but also other tankers, and operate on first-come-first-serve basis. Therefore, more tankers at the hydrants means long waiting time leading to fewer supplies to the selling points.

4.4. Financial Issues

4.4.1. Financial management practices at selling points

None of the selling points has financial management records in place. At the selling points where vendors have been engaged, they hand over proceeds to the coordinators after selling one trip of water. The coordinators do not report to anybody on their operations. This is the same for selling points where coordinators double as the vendors.

4.4.2. Pricing Arrangements for Coordinators

The project tankers buy the 15.75m³ supply at GHC 18 (GHC 1.14/m³) from AVRL while non-project tankers buy the same quantity at GHC32 (GHC 2.03/m³). For AVRL selling points connected to the utility mains they are charged domestic rates (GHC 0.66/m³). This obviously shows that tanker supply is expensive with or without subsidy.

4.4.3. Sales, Costs and Profits

The amount of money realized from the sale of one tanker trip of water (15.75m³) vary from selling point to selling point and even for the same selling point from one trip to another. These range from GHC25 to GHC30 with a general average estimation of GHC26.50. However, given the quantity of water (15.75m³) and the selling price of GHC0.05/20litres, the average sales could be around GHC30, taking into account 20% for not accounted for water at the selling point. The variations are the result of water losses during sales, free water to the elderly and close relations, and losses during off-loading by tankers. If prudent measures are therefore put in place, sales could be improved.

Given the cost of one tanker (15.75m³) of GHC18, managers of the selling points earn a gross profit of between GHC7 and GHC12 for each tanker delivery. Commonly, the operation and maintenance costs consist of commission to vendors (where they exist) ranging from GHC3 to GHC4 per tanker trip, cleaning of the selling point, cleaning of the poly tanks (not regular), T&T to pay for supplies and telephone cost expended by the coordinator. Apart from the vendors' commission, other costs are irregular and on a monthly basis they would not exceed GHC10. Based on these figures, the profit one can make depends on the number of supplies one is able to sell within a period as shown in the table below. The assumptions for the analysis are presented in Annex 1.

4.4.4. Project Impact on Price of Water in the Communities

Even though one of AVRL's objectives was to use their intervention to bring prices of water in the communities down, the project failed to bring down prices of water in the communities which were twice or more than the project price. Two reasons were identified for this: Firstly, the private vendors who got their supply from private sources bought a supply of 15.75m³ at GHC32.00 or slightly higher (GHC18.00 in the case of AVRL supplies). Hence the private vendors felt compelled to stick to their pricing patterns in order to be in business. Secondly, there still is demand for the services of private vendors because the AVRL selling points are few with large distances between them and do not adequately meet the demand of the population of the communities. Therefore, supply from the selling points does not appreciably impact on the overall demand in the areas served both in terms of the volumes of

water and pricing. Hence there is still a huge unmet need in each area which the private sector have to cater for, though most of the private vendors noticed some “slowing down of business” in the sense that it now takes a little longer for them to sell the same quantity of water.

The continued viability of private vending has also to do with issues of accessibility and convenience in terms of water distance, the need to avoid queuing and timing of water sales. There is clear evidence that generally, the households nearer the AVRIL selling points are the greatest beneficiaries in terms of getting premium quality water at reduced prices. But a lot of community members do not consider the price reduction as a key issue and are quite happy to patronise private sources in order to avoid long walking distances, queuing and to enjoy fetching at own convenience. Clearly the ‘convenience’ factors in most cases out-weigh the price considerations.

Table 5.2: Cost-Benefit Scenarios for Different Demand Levels

SCENARIOS		Cost per Supply (GHC)	No. of Supplies per Month	Cost of Total Supplies per Month (GHC)	Vendor's Commission per Month (GHC)	Cost of Repairs per Month (GHC)	Others Cost per Month (GHC)	TOTAL COST per Month (GHC)	Total Proceeds per Trip (GHC)	Total Proceeds per Month (GHC)	Monthly Profits (GHC)
		1	2	3 (1x2)	4 (2xGHC4)	5	6	7 (3+4+5+6)	(Assumption) 8	9 (2x8)	10 (9+7)
1	Two Trips of 15.75m ³ per Month	18.00	2	36.00	8.00	3.00	3.00	50.00	26.50	53.00	3.00
2	Five Trips of 15.75m ³ per Month	18.00	5	90.00	20.00	3.00	3.00	116.00	26.50	132.50	16.50
3	Ten Trips of 15.75m ³ per Month	18.00	10	180.00	40.00	5.00	5.00	230.00	26.50	265.00	35.00
4	Fifteen Trips of 15.75m ³ per Month	18.00	15	270.00	60.00	5.00	5.00	340.00	26.50	397.50	57.50
5	Twenty Trips of 15.75m ³ per Month	18.00	20	360.00	80.00	5.00	5.00	450.00	26.50	530.00	80.00
6	Twenty-six Trips of 15.75m ³ per Month	18.00	26	468.00	104.00	5.00	5.00	582.00	26.50	689.00	107.00

4.5. Transparency and accountability

The institution of the waybill system where payments for water supplies to the selling points are made directly at the AVRIL District Office is laudable. This has helped to avoid financial malpractices that could occur when money has to pass through intermediate persons before being submitted to the AVRIL Office. However, at the selling point level no accountability measures have been put in place and therefore, the coordinators operate on their own and report to nobody. Whatever profits accrue from the operations, becomes their personal profit. In the case of La community, where all seven selling points with 17 poly tanks are under one coordinator, such profits could be high as the analysis shows. It was however, found that water is sold based on AVRIL approved rate of GH¢0.05/20litres.

Post construction management arrangements put in place involved the appointment of a coordinator (in the case of Kwabenya, the Residents Association) who in turn selected vendors to directly run the selling points. These coordinators have regular consultations with the AVRIL Accra East Regional Office and with the software consultant whenever they need technical or managerial support. However, they work independently and take decisions alone without any oversight from the community, though the model was intended as community-private partnership.

4.6. Special measure for ensuring pro-poor focus

In order to ensure water services to the poor, AVRIL absorbs the cost of services by the tanker operators and makes the selling points pay for only the cost of water to ensure that water can be sold at rates lower than that of the private water vendor to the consumer. It is worthy to note, however, that this lower rate of GH¢2.5/m³ is about four times the lifeline tariff of GH¢0.66/m³ for consumption within 20m³ through direct domestic supply. The selling points are located at areas where they were most needed. At the Old American Embassy selling point in Osu, some selling points at La, and at Dome-Kwabenya, aged persons who are without support, are allowed by the vendors to fetch water without paying.

Average monthly household incomes across the project communities ranges from GH¢120 to GH¢200. Average monthly expenditure on water consumed by households that rely on AVRIL selling points is between GH¢8 (which can buy 3.2 m³ at GH¢ 0.05 per 20 litres) and GH¢18 (which can buy 7.2 m³). This implies a percentage expenditure on water of between 4% and 15% of income.

5. CONCLUSIONS AND LESSONS LEARNED

The project was conceived as an interim solution to the acute water shortage and has continued to be of relevance to the beneficiary population. Generally, the project helped in meeting the real need of the people. However, AVRL had to absorb the cost of hiring and running the two tankers for the project to the tune of about GH¢ 14,000 Ghana Cedis every month. This is considered huge for a project that benefited just about 5000 people (less than 0.25% of the total population of Accra). The AVRL subsidy has thus been in the order of GH¢ 3 per person per month. This is not sustainable and replicable (unless there is substantial reliable source of funding for subsidy). The following conclusions have been drawn:

5.1. It is highly expensive to serve the poor by Tanker Supply compared to water directly from Piped Sources

In order to achieve one of the objectives of the project which was to ensure that consumers buy water at the rate of GH¢0.05/20litres, AVRL sold water to the vending points at GH¢18.00 per 15.75m³ of water. The price is however, much higher than the price of GH¢0.013 of the same quantity from direct piped sources. However, for this to be possible, AVRL had to subsidise the hiring and running of water tanker with an amount of GH¢ 14,241 per month.

A comparative cost analysis of tanker supply and direct piped supply presented in Annex 2 clearly establishes that generally, water tanker services are considerably more expensive than piped systems. Tanker service therefore, is not a feasible option for delivering water at official rate to the urban poor without huge subsidy support on sustainable basis. However, on the basis of the project's ultimate aim of connecting water selling points to piped systems and gradually phasing out the Tanker system in the short-term, the approach was laudable. In conclusion, it is recommended that, despite the fact that expansion in the supply system cannot be achieved in the short to medium term given the existing capacity situation of the utility, the results of the analysis provide a strong case for pursuance of the expansion of reticulation system in the city to all the poor areas in the quest to make water supply services more pro-poor.

5.2. Low Level of Profitability

The analysis of profitability of operations at the selling points (Table 5.2) shows clearly that with the pricing level set by the project, the project has a low level of profitability. Coordinators make some monthly profit on their activities depending largely on the quantity of water sold within the month. However a critical look at the profit margins shows that even at the subsidized selling price, the operation is not so profitable to an entrepreneur. Even in the extreme case of sale of 26 trips per month, the profit margin is just over GH¢100 (after vendors have been paid a commission of about GH¢ 100). Generally (apart from La), vendors are able to sell 10 trips and a little above, especially in the dry season which means that typically profit margins are very small. The low level of profitability does not make the venture attractive for entrepreneurs. This partly explains why the service has been difficult to sustain in parts of Kwabenya and Taifa. On the other hand, it could be highly profitable for an entrepreneur to operate five or above vibrant selling points.

5.3. The management of Water Sales could be more Efficient

Given the existing average revenue of GH¢26.50 and potential average revenue of GH¢30 per tanker trip, there is the need for improvement in the operations at selling points to ensure reduction in water losses. This will lead to improvement in profit margins. Besides, there is the need to put in place effective monitoring system for the management of the selling points to ensure accountability in operations. The level of community involvement for effective operation and maintenance could also improve.

5.4. Access and Reliability of Service are key in Pro-Poor Delivery

Impact of the system on prices of water within the target areas has been negligible. There is no evidence of prices of water sold by private vendors being reduced because of the introduction of the model. The demand for services of the private vendors is still substantial. This is because consumers generally prioritise access, reliability and convenience over price of services. In planning for a pro-poor intervention these expectations should be adequately catered for.

References

Kariuki, M. and G. Acolor (2000); Delivery of Water Supply to Low-Income Urban Communities through the Teshie Tanker Owners Association: a Case Study of Public-Private Initiatives in Ghana. Conference Papers for “Infrastructure for Development: Private Solutions and the Poor.” PPIAF, DFID and World Bank, Washington DC.

Sarpong, K. and K. M. Abrampah (2006); Small Water Enterprises in Africa 4: Ghana; A study of Small Water Enterprises in Accra, A paper for Water, Engineering and Development Centre (WEDC), Loughborough University, Leicestershire

AVRL (2009); Terms of Reference: Evaluation Study on Water Tanker Service Operations in Accra by Aqua Vitens Rand Limited (AVRL)

Annex 1: Assumptions for Financial Sustainability and Profitability Analysis

The community level cost benefit analysis is based on cash payments and receipts on the project at the community level with respect to cost of water supplies, commission to vendors, cost of repairs and maintenance and profits. Non-cash benefits had been discussed in other sections. The study showed varied demand and turnover levels for the various selling points, even within the same community. In addition, the study also identified inadequate or no record keeping at the selling points. However, notable issues that came to the fore regarding community level financial issues are as follows:

- The number of supplies range from a minimum of two (2) trips a month to twenty-six (26) trips a month;
- The estimated cost of each tanker trip (AVRL) of 3500 gallons (15.75m³) of water is Eighteen Ghana Cedis (GH¢18.00);
- The estimated proceeds realized by a vendor from each tanker trip are between Twenty-Five Ghana Cedis and Thirty Ghana Cedis (GH¢25.00 - GH¢30.00);
- This by extension means that for every trip of water, a gross profit of Seven Ghana Cedis (GH¢7.00) to Twelve Ghana Cedis (GH¢12.00) is made;
- The main expenditure the coordinators, Assemblymen and supervisors incurred is identified to be commission to the vendors, which is identified to range from Three Ghana Cedis (GH¢3.00) to Four Ghana Cedis (GH¢4.00) for each trip sold; and
- An estimated amount of Three to Five Ghana Cedis (GH¢3 to 5.00) is reported to be the average expenditure on repairs and maintenance per month. (Operators of the system reported that, they do not have regular maintenance and repair costs, probably due to the fact that the facilities are pretty new).

Using the above figures, monthly profit scenarios (table 5) can be captured based on different quantities of water sold in a month. These have been prepared based on the following assumptions:

- Average sales per trip of 15.75m³ quantity of water is GH¢26.50;
- Vendors' commission per trip of 15.75m³ quantity of water is GH¢4.00;
- Average cost on Repair and maintenance per month is GH¢ 3.00 for sales below 10 trips and GH¢5.00 for sales of 10 trips and above; and
- Allow another GH¢3.00 for sales below 10 trips and GH¢5.00 for sales of 10 trips and above for other costs including T&T for each month.

Annex 2: Comparative Analysis of Piped Services and Tanker Supplies

SCENARIOS		No. of Supplies per Month 1	TANKER SUPPLIES	SUPPLIES THROUGH MAINS		
			Cost of Total Supplies per Month (GHC) 2 (1x GHC18)	Total Monthly Supplies in m ³ 3 (1x15.75)	Cost of Total Supplies per Month at Domestic Rate (GHC) 4 (3xGHC0.66)	Cost of Total Supplies per Month at Commercial Rate (GHC) 5 (3xGHC1.10)
1	Two Trips of 15.75m ³ per Month	2	36.00	31.5	20.79	34.65
2	Five Trips of 15.75m ³ per Month	5	90.00	78.75	51.98	86.63
3	Ten Trips of 15.75m ³ per Month	10	180.00	157.5	103.95	173.25
4	Fifteen Trips of 15.75m ³ per Month	15	270.00	236.25	155.93	259.88
5	Twenty Trips of 15.75m ³ per Month	20	360.00	315	207.90	346.50
6	Twenty-six Trips of 15.75m ³ per Month	26	468.00	409.5	270.27	450.45

List of TPP Working Documents

Sector review papers:

Mechanisms to Ensure Pro Poor Water Service Delivery in Urban and Peri-Urban Areas

Global Best Practice in the Management of Small Town Water Supplies

Institutional Mapping of Water and Sanitation Services in Small Towns and Peri-Urban Areas in Ghana

Management Models in the Urban and Small Town Water Sector in Ghana

Case studies:

Direct Water and Sanitation Development Board (WSDB) Management without Watsans: The Cases of Small Town Water Supply in Asesewa and Asiakwa in Eastern Region

Direct Water and Sanitation Development Board (WSDB) Management with Watsans: The Cases of Small Town Water Supply in Abokobi and Pantang in the Greater Accra Region

Community – Utility Bulk Water Supply in Savelugu in the Northern Region of Ghana

Management Contract for Water Delivery in Tumu in the Upper West Region of Ghana

Tanker Services as an Alternative Model for Delivering water to the Urban Poor: a case from Accra

Public-Private Partnership (PPP) in Small Towns: the Case of Operation and Maintenance Contracts in Bekwai, Atebubu and Wassa Akropong

Community-Public-Private Partnership (CPPP) Model for the Management of a Multi-Town Scheme: The Case of Operation and Maintenance Contract in Three Districts Water Supply Scheme

Franchise Management of Sanitation in Kumasi