

**DEMAND RESPONSIVE APPROACH AND ITS SIGNIFICANCE FOR
SUSTAINABLE MANAGEMENT OF WATER FACILITIES IN THE SHAI-
OSUDOKU DISTRICT**

BY

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON
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**Ghanaian-German Centre for Development Studies
Institute of Statistical, Social and Economic Research
University of Ghana
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DECLARATION

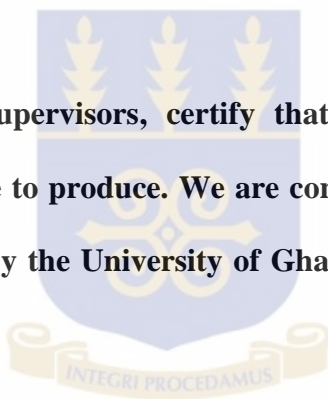
I, Daniella Delali Sedegah, do hereby declare that except for references cited, which have been duly acknowledged, this work, **‘Demand Responsive Approach and its Significance for Sustainable Management of Water Facilities in the Shai-Osudoku District’**, is the result of my own research. It has never been presented anywhere, either in part or in whole for the award of any degree.

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We, the undersigned supervisors, certify that this is an original work we supervised the candidate to produce. We are convinced that the thesis meets all required standards set by the University of Ghana for an award of a Doctor of Philosophy Degree.



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DEDICATION

This thesis is dedicated to my husband, Samuel Kwashie Sedegah and my children

Kimathi, Unathi and Akeelah Sedegah.



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ABSTRACT

Demand Responsive Approach (DRA), adopted as a policy for rural water delivery in Ghana, is an attempt within a decentralized programme to improve the efficiency of service supply and also to make users take key decisions about the service they want and are willing and able to pay for. This study was conducted in communities where the DRA had been applied under the National Community Water and Sanitation Programme (NCWSP) in the Shai-Osudoku District of Ghana. The aim was to examine the conditions under which DRA leads to improved functionality, the suitability of the approach for rural communities and the changes in the patterns of water usage. Data was collected using purposive sampling from two hundred households in four communities in addition to FGDs and key informant interviews. Descriptive statistics and probit regression was used to determine the socioeconomic factors influencing households' ability to pay for water and factors which affected the use of water. The study established among other findings that community members participated in the implementation of the facilities in various aspects: an expression of demand. Respondents indicated the water facilities were of good quality in terms of durability, flow and taste; however, financial management is a major setback. Generally the water needs of the communities are met. It was also realised households which were closer to the facilities in general used more of the water from the facilities. The study recommends an institutional coordination and collaboration among stakeholders, education and training for committee members, equity concerns should be addressed and external support to be factored in rural water delivery.

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LIST OF ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
AFRODAD	African Forum and Network on Debt and Development
CBO	Community-Based Organization
CM	Community Management
CONIWAS	Coalition of NGOs in Water and Sanitation
CWSA	Community Water and Sanitation Agency
DANIDA	Danish International Development Agency
DAs	District Assemblies
DDA	Demand Driven Approach
DfID	Department for International Development
DRA	Demand Responsive Approach
DWST	District Water and Sanitation Team
ECLA	Economic Commission for Latin America
ESAs	External Support Agencies
FGD	Focus Group Discussion
GSS	Ghana Statistical Service
GTZ	German Technical Corporation
GWSC	Ghana Water and Sewerage Corporation
HIPC	Highly/Heavily Indebted Poor Country
ICESCR	International Covenant for Economic, Social and Cultural Rights
IDWSSD	International Drinking Water Supply and Sanitation Decade
IMF	International Monetary Fund
IRC	International Water and Sanitation Center
KfW	German Government-Owned Development Bank
KII	Key Informant Interview
KVIP	Kumasi Ventilate-Improved Pit

Mgt	Management
MLGRD	Ministry of Local Government and Rural Development
MWH	Ministry for Works and Housing
MWRWH	Ministry of Water Resources, Works and Housing
NCWSP	National Community Water and Sanitation Programme
NDPC	National Development Planning Commission
O&M	Operations and Maintenance
OECD	Organization for Economic Co-operation and Development
PPP	Public-Private-Partnership
PURC	Public Utilities and Regulatory Commission
PWD	Public Works Department
RWS	Rural Water Supply
RWSN	Rural Water and Supply Network
SOD	Shai-Osudoku District
UDHR	Universal Declaration on Human Rights
UN	United Nations
UNECA	United Nations Economic Commission for Africa
WASH	Water, Sanitation and Hygiene
WATSAN	Water and Sanitation
WB	World Bank
WHO	World Health Organization
WRC	Water Resources Commission
WSDT	Water and Sanitation Development Team

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CHAPTER ONE

INTRODUCTION

1.1 Background

The early 1980s has seen many developing countries, Ghana inclusive, undergoing a process of policy reform largely associated with Structural Adjustment Programmes (SAPs) advocated and sponsored by the World Bank (WB) and the International Monetary Fund (IMF) (Ismi, 2004). Associated with SAPs have been, among others, two related shifts:

- i. A change in the role of the state from being a "direct provider" of goods and services to an "enabler" or "facilitator" which should concentrate on ensuring an "enabling environment",
- ii. A turn from "need-based" provision of goods and services, to "demand-based" provision (Ezati, 2001).

The latter of the two shifts is the concern of this study. As a result of these policy changes, public investments in water have declined with the expectation that the private sector would step in to fill the gap. In Ghana, "demand" has now become a popular condition attached to externally funded rural water and sanitation projects based upon the assumption that people better manage facilities that they pay for. The failure of the International Drinking Water Supply and Sanitation Decade (IDWSSD) of the 1980s has shown that achieving lasting benefits from water supply interventions involves much more than building facilities. It focused on the importance of involving the community in all aspects of service delivery, the use of appropriate technologies, and the role of governments as service promoters rather than providers. It also demonstrated the limitations of top-down and supply-driven approaches to delivering services. In many ways, the decade represented a transitional

period in the rural water and sanitation sector – moving from the traditional to a new approach (Sara *et al.*, 2000).

Following the 1992 Dublin meeting, the United Nations Conference on Environment and Development in Rio concluded that economics must play a role in the efficient management of water and allied services (Gleick *et al.*, 2002). In support were the Water Supply and Sanitation Collaborative Council's Global Water forums and the World Water Council's World Water forums as well as the United Nation's (UN) Earth Summits which led to a shift in water provision and management. Ahlers and Zwarteveen (2009) observed two principles in water management. The first is water commodification and the second is community management, which is promoted and practiced in Ghana as a national policy in the provision of water and sanitation systems in rural communities and small towns. Gbedema (2009) defines community management as the engagement of water users or communities in formulation, provision, management and use of domestic water facilities. The World Bank, through its assistance to the water sector in Ghana, based its argument on division of responsibilities in the water sector where public institutions are deemed more appropriate for managing water in a larger geographical area (urban setting) while the small geographical area (rural and small towns) facilities are to be managed by the community. The new Community Management (CM) concept is said to be demand-oriented, demand driven or demand responsive (Fuest, 2006).

The accurate definition of a “community management of water supply” varies. The WHO (1997) has indicated that while a definition based on population size or the type of supply may be appropriate under many conditions, it is often administration and management that makes a distinction, and this is especially true in developing countries. It is the increased involvement of ordinary, often untrained and sometimes

unpaid community members in the administration and operation of water-supply systems in small communities; this provides a clear distinction between community water supplies and the supply systems of major towns and cities. In some cases in developing countries, as is the case in Ghana, water supplies in peri-urban areas — the communities surrounding major towns and cities — are often organizationally similar to those of rural communities. However, these communities are not included in this study which is restricted to purely rural communities.

The Demand Responsive Approach (DRA) was developed after the failure of many different approaches, such as the supply-led approaches to increase sustainable water and sanitation coverage (Wright, 1997). Supply-driven approach interventions are when communities simply receive water and sanitation infrastructure and play a minor role in project implementation. Here, the role of the communities in development is limited to being mere passive recipients of development projects. Decisions are made for them and not with them. The result is that millions of dollars are wasted and fall in disrepair as communities watch schemes that they did not see themselves as having a stake in but implemented on their behalf become desolate (Breslin, 2002). The age old supply driven approach was traditionally centralized and top-down in the provision of water and sanitation systems. The recognition of these weaknesses prompted the move towards the DRA. The supply driven approach dominated in the planning and implementation cycles for a long time not only in Ghana but also in many other parts of the world in both government and donor funded programmes. According to Rudquist (1992), the main reason for the dominance of this approach is that it is seen to allow rapid, large scale spending of budgets in accordance with pre-established timetables. It is also a derivation from

technical people who tended to see technical solutions to every problem (Rudquist, 1992).

Also, to Bennett (1995), the shift in paradigm represents a movement “away from the concept of "services", delivered to all in need as of right, instead to a concept of demand as expressed through preferences revealed through meaningful judgments stimulated by realization of the costs involved (p. 13)” . It is anticipated that paying attention to consumer-demand will translate into efficient allocation of resources, and to the sustainability of the service which was hitherto not the case.

1.2 Problem Statement

The acknowledgment of the poor performance and periodic failures of water supply development projects around the world since the 1990s has increased interest among academics and practitioners who have become concerned with understanding the factors that support sustainable rural water supply systems (Sara & Katz, 1997; Kleemeier, 2000).

It is common knowledge that water and sanitation play an important role in ensuring good health. Fewtrell *et al.* (2007) states that water, sanitation and hygiene (WASH) are key elements in ensuring the health, development and welfare of children. Also, inadequate access to safe water and sanitation services, coupled with poor hygiene practices, is the cause of at least one quarter of all child deaths and one fifth of the total childhood disease burden globally (UNICEF, 2005). Water Partner International (2006) indicates the number of people who lack access to improved water supply could increase to 2.3 billion by 2025. In Ghana, data supplied by the Community Water and Sanitation Agency (CWSA) on rural and small town water indicates coverage as at 2010 at almost 62% which is an encouraging increase from about 59% in 2009. This, however, leaves about 38% of rural and small town population without

access to safe drinking water. Meanwhile only 8.2% of rural Ghana has access to improved toilet facilities (GSS, 2008).

In 2010, the total number of boreholes constructed by the CWSA rose from 12,954 in 2009 to 13,219 while two more small community piped schemes were installed. In terms of sanitation, the CWSA facilitated the construction of 5,384 toilets comprising 3,660 household ventilated improved pit (VIP) latrines, 1,430 household Kumasi ventilated improved pit (KVIP) latrines and 294 institutional latrines nationwide. An increase in the construction of water and sanitation facilities in rural area would definitely increase the access of the rural communities to potable water and good sanitation and contribute to the health of the citizens. However, as impressive as these figures are, this action alone is not enough to achieve the intended benefits. At least the International Water Supply and Sanitation Decade of the 1980s has shown that achieving lasting benefits from water supply interventions involves much more than building facilities (Sara *et al.*, 2009). One of the major challenges in the rural water supply efforts in developing countries is to ensure that the systems are adequate for community water use, and that communities manage their water sources in a sustainable manner (Demeke, 2009).

In recent years, there has been an increasing focus on, and understanding of, the design and implementation phases of rural water and sanitation (RWS) projects as part of efforts to make projects more successful and work more efficiently (Sara *et al.*, 1997). In Ghana, even though a sector wide data on functionality are not available (MWRWH, 2010), a study by the IRC/Triple-S project (2010) in 31 communities from three districts (one each from the south, middle and north) indicated a functionality rate of 71% , implying that 29% of facilities were non-reliable. There are, however, objections in the literature which indicate that these figures could be

underestimated (Carter, 2004). This means the situation could be far worse than the statistics seek to portray.

The United Nations Development Programme's (UNDP) Human Development Report (2006, p. 102) has stated that "*the decentralization of rural water supply in Ghana is a demand-responsive approach that is working*". Similar findings were presented by Sara and Katz (1998), Gross *et al.* (2001) and Kumar (2002), particularly mentioning that a demand-responsive approach (DRA) significantly increases the sustainability of water supply projects. However, Kleemeier (1995) argues that although supply-driven projects do experience most of the problems raised in the critique of the approach, the demand-driven approach risks its own set of problems.

DRA has undoubtedly brought many benefits, and studies (Bakalian and Wakeman, 2009) indicate that this approach has indeed improved the performance of water supply systems. In some cases, however, according to Davis and Iyer (2002), many communities kept on struggling with sustaining their water supplies, with some succeeding and others failing, giving rise to the notion of 'islands of success'. According to Whittington *et al.* (2008), "*there is little systematic evidence as to how the demand-driven, community management model is working in practice*" (p. 699). Nonetheless since the DRA for water and sanitation was operationalized in Ghana in 1994 there is no clear evidence on the functionality of the approach to sustainability, suitability and socio-cultural context that influence the approach. The question this study seeks to address is: does DRA have the capacity to deliver equitable and affordable access to water and also ensure the sustainable management of the facilities? It is on the basis of this that this study seeks to investigate how DRA is working in Ghana, using the Shai-Osudoku District as a case study.

1.3 Objectives

The main objective of this study is to analyse viability of the Demand Responsive Approach (DRA) and its significance for the sustainable management of water facilities in the Shia-Osudoku District.

The specific objectives of the study are:

- i. To assess the conditions under which DRA leads to improved functionality in a sustainable manner.
- ii. To determine the suitability of DRA for providing equitable and affordable water service.
- iii. To determine the change in the pattern of water usage with the introduction of DRA.

1.4 Justification of the Study

Despite progress that has been made to improve rural water and sanitation coverage in Ghana in the last few years, subsequent reduction in coverage levels due to non-functional systems is a serious threat. The level of non-functional systems in Ghana is around 30% (WASHCost, 2010; Braimah *et al.*, 2010). The Rural Water Supply Network (RWSN) estimated in 2007 that between 20% and 70% of installed hand pumps in Sub-Saharan Africa are not functioning (RWSN, 2010). This study is therefore in the right direction because it is important to assess the potential of the DRA to alleviate the weaknesses and shortfalls of the supply based approach in ensuring sustainability. It is equally important to find out whether the DRA possesses a greater efficiency.

This study will also provide useful information to stakeholders such as the district assemblies, community members, NGOs and other interested parties in the provision of water and sanitation. It will also impact on policy making. In addition, the study will

provide insights into theoretical and practical issues and solutions for water and sanitation in rural development in Ghana. The findings of this study will inform the academia of the preferences or priorities that rural residents have for their development while contributing to a better understanding of factors and problems related to the sustainable management of water supply and sanitation.

A study delving into the factors and problems associated with rural water and sanitation is relevant in tackling issues of poverty and health in rural communities. Oduro and Aryee (2003) specifically identified the lack of access to improved water and sanitation as a key contributor to chronic poverty. This is because if people are ill due to poor water and sanitation situations, they cannot be economically productive to cater for themselves and their dependants. Hulme *et al.* (2001), assert that low health status is a common attribute of the chronically poor. Arku (2010) concludes that a sustained water system reduces the time spent on fetching water. He noted that time saved was spent on activities women perceived would promote their well-being and that of their households.

Carter and Rwamwanja (2006) summarize the importance of sustainability in four aspects. First, however successful an intervention may be in the short-term, if its beneficial impact is not sustained over a long period of time, it cannot be deemed cost-effective since funds which have been invested by users and by donors, may not be accounted for, a few years later. Second, progress towards the Millennium Development Goals (MDGs) or any other service coverage targets is undermined by non-sustainable interventions. Third, non-sustainable interventions serve to discourage the households, communities and local government/NGO institutions which have seen some short-term benefits, only to be disappointed as hard-won gains are snatched away. On the other hand, sustainable outcomes build confidence, self-

reliance and self-esteem. Fourth, as confidence and self-esteem grow among communities and supporting institutions, possibilities for further self-help or locally initiated undertakings can emerge, creating a multiplicative effect.

1.5 Structure of the Study

The thesis is organized into eight chapters. Chapter one introduces the problems being investigated. It discusses the background of the study, the statement of the problem, objectives of the study, justification of the study and structure of the study. Chapter two is dedicated to the historical overview of the provision of water facilities in Ghana and the various reforms and policies that have taken place over the years. It also examines the different stakeholders involved in the sector at the local level and their roles towards sustainability of the facilities. Chapter three discusses the conceptual and theoretical frameworks and reviews literature regarding the policies and programmes aimed at improving water management. Chapter four looks at the methodology of the study while chapter five discusses the conditions under which DRA leads to improved functionality. Chapter six looks at the suitability of DRA in providing equitable and affordable water supply, and the seventh chapter looks at the change in patterns of water usage with the introduction of the DRA, its constraints and alternative strategies for a sustained water management. Finally, Chapter eight summarizes and concludes the study with policy recommendations and suggestions for future research.

CHAPTER TWO

DEVELOPMENTS IN THE WATER SECTOR OF GHANA

2.1 Introduction

During the pre-colonial and colonial days, most people in Ghana depended on natural sources of water like rainwater, rivers, lakes and ponds as well as dug-out wells for their domestic water uses (Gyau-Boakye & Dapaah-Siakwan, 1999). In present times most rural communities still resort to the use of rainwater, rivers, streams and lakes due to the unavailability of potable drinking water. The first public water supply system in Ghana, then Gold Coast, was established in Accra just before the First World War (Ministry of Water Resources, Works and Housing (MWRWH), 2010). According to Fuest (2006), since the institution of a formal government in the 19th century, social infrastructure services were introduced by colonial governments with a systematic concentration in the few urban enclaves, especially Accra, Kumasi and Sekondi-Takoradi (the "Golden Triangle"). These services were heavily concentrated in the resource rich areas such as the mining and cash crop production areas. During the colonial period, the water supply systems were managed by the Hydraulic Division of the Public Works Department (PWD) which was responsible for the planning and development of water supply systems in other parts of the country. In 1948, the Department of Rural Water Development was established to engage in the development and management of rural water supply through the drilling of bore holes and construction of wells for rural communities.

Major changes were undertaken after independence in 1957 with the establishment of a Water Supply Division under the then Ministry of Works and Housing (MWH) now Ministry of Water Resources, Works and Housing (MWRWH). Following a severe drought in Ghana in 1959, the Government of Ghana and the World Health

Organization (WHO) collaborated to conduct a study into the development of the water sector of the country. The focus of the study was technical engineering, organization of a national water and sewerage authority and methods of financing. The study recommended the preparation of a 20 year (1960 to 1980) Master Plan for water supply and sewerage services in the country. In line with the recommendations of WHO, the Ghana Water and Sewerage Corporation (GWSC) was established in 1965 under an Act of Parliament (Act 310) as a legal public utility entity. GWSC was responsible for water supply and sanitation in rural as well as urban areas. Additionally the GWSC was to conduct research on water and sewerage as well as to make engineering surveys and plans for the construction and operation of water and sewerage works, to oversee the setting of standards and prices and collection of revenues (MWRWH, 2010).

2.2 Operational Efficiency of GWSC

In 1957, there were 35 pipe-borne water supply systems in Ghana. The number of pipe-borne systems rose to 69 in 1961 and then to 194 in 1979. By 1979, there were 2,500 hand pumped borehole systems introduced by NGOs and the International Donor Organizations in the country and by 1984, additional 3,000 boreholes had been drilled and fitted with hand pumps. However, according to Fuest (2006), due to a historical bias in the provision of infrastructure, emphasis continued to be urban based. By the late 1980s and early 1990s, 33% of the water supply systems had deteriorated greatly or completely broken down due to inadequate funding to carry out maintenance and rehabilitation. A World Bank report on the Ghana-Water Sector Restructuring Project stated that “The water supply systems in Ghana deteriorated rapidly during the economic crises of the 1970s and early 1980s when Government’s

ability to adequately operate and maintain essential services was severely constrained” (World Bank, 1998, p. 1).

Until the early 1990s, the Ghana Water and Sewerage Corporation (GWSC) had been responsible for both urban and rural water supply since 1965. It was estimated that within this period only 2.2 million (28%) of the rural population had access to improved water whilst urban coverage was over 60%. Compared to matters of urban water supply, rural water had been neglected by the GoG, presumably for reasons of political expediency (Feust, 2006). According to Karikari (1996), of the GWSC’s staff of 4,500 in 1993, fewer than 50 were reported to have dealt with rural water although the corporation was responsible for maintaining 6,600 boreholes at the time. This led to the creation of the Rural Water Department within the GWSC in 1986 to focus more attention on the provision of water and sanitation to rural people. The few facilities provided could not be sustained due to non-payment of tariffs by beneficiary communities resulting in little or no maintenance of the facilities by the centralized maintenance units of GWSC. Bacho (2001) ascribes the deteriorating situation to Ghana’s economic crisis of the 1980s, “coupled with the high transaction cost of the over-centralized management system of the GWSC” (p. 191). Consumers therefore resorted to drinking water from unhealthy sources resulting in the resurgence of epidemics such as guinea worm in northern Ghana (Gyau-Boakye, 1999). The condition was worsened because the maintenance of traditional water systems had been neglected after the introduction of hand pumps. A lack of community participation was considered as the cause of poor operation and maintenance and subsequently the sustainability of the water projects (Karikari, 1996).

Though some interventions were made in the area of sector reforms and project implementation in 1970, 1981 and 1988 very few gains were made. These

interventions were undertaken by the World Bank, International Development Association (IDA), donor countries and other external support agencies such as Austrian Government, Italian Government, Nordic Development Fund, the African Development Bank, Canadian International Development Agency, Department for International Development (DfID), German Development Bank (KfW), German Agency for Development Co-operation (GTZ), Overseas Economic Cooperation Fund (OECF) and Export Credit Guarantee Department (ECGD). Owing to these failures, efforts were made to improve water and sanitation efficiency particularly during the period of Economic Recovery Programme from 1983 to 1993. Loans and grants were sought from the World Bank and other donors for the rehabilitation and expansion of water and sanitation services, training of personnel and purchasing of transport and maintenance equipment. As part of the conditionality attached to these loans and grants, user fees for water supply were increased and subsidies on water tariffs were gradually removed for GWSC to achieve self-financing (Gbedema, 2009).

2.3 Reforms in the Water Sector

Some organizational reforms were initiated in the early 1990s. The responsibility for water supply to small towns and rural communities were decentralized from the GWSC to the District Assemblies in 1993. The Water Resources Commission (WRC) and Public Utilities Regulatory Commission (PURC) were established in 1996 and 1997 respectively. The WRC is in charge of overall regulation and management of water resource utilization and the PURC was established with the purpose of setting tariffs and quality standards for the operation of public utilities (notably water and electricity). On 1st July 1999, pursuant to the Statutory Corporations (Conversion to Companies) Act 461 of 1993 as amended by LI 1648, GWSC was converted into a

100% state owned limited liability company – the Ghana Water Company Limited – with the responsibility for urban water supply only.

In 2003, the Coalition of NGOs in Water and Sanitation (CONIWAS) which comprise a membership of NGOs and Community Based Organizations (CBOs) in the Water Sanitation and Hygiene (WASH) sector, including some international NGOs was formed. The Coalition has contributed a lot in coordinating the activities of their members and also in playing a great advocacy role by constantly raising pro-poor issues for national attention.

In 2004, a Water Directorate was created within the MWRWH to oversee sector policy formulation and review, monitoring and evaluation of the activities of the agency and the overall co-ordination of the activities in the sector. The Environmental Health and Sanitation Department of the Ministry of Local Government and Rural Development (MLGRD) was also upgraded into a Directorate in 2008. The MWRWH in 2007 developed the first National Water Policy and launched it in 2008. This policy has since guided the sector in all its programmes and provides directions in all aspects of water from resources management to supply and services delivery, as well as monitoring and evaluation. The MLGRD had a sanitation policy since 1999 which was taken through a major review between 2007 and 2010 and launched in December, 2010. However, operational and investment strategies of both water and sanitation are yet to be launched (MWRWH).

Per the National Development Planning Commission (NDPC) annual report (2013) the percentage of the population with access to safe water in the urban areas declined marginally from 63.37% in 2011 to 62.9% in 2012, while in the rural areas there was a marginal increase from 63.34% in 2011 to 63.41% in 2012. At the regional level, efforts to bridge the gap with regards to access to adequate and affordable safe water

continued in 2012, with access ranging from a low of about 9% in the Upper West Region to a high of 74% in the Greater Accra region. The rural-urban water coverage by region for 2012 is presented in Table 1. Though data on the total number of communities served with safe water nationwide was not available in the report the number of districts benefiting from safe water increased from 145 in 2011 to 171 in 2012. Overall, the number of functional water systems including boreholes, hand dug-out wells, pipe water systems fitted with hand pumps or rehabilitated in 2012 was estimated at 783 compared to 537 in 2011. The data provided by the NDPC report shows that rural water coverage in Ghana has improved since the water reforms. The fact that a separate entity, CWSA is created with the sole responsibility to cater for rural water delivery has brought about an improvement in rural water coverage.

Table 1: Rural-Urban Water Coverage by Region, 2012

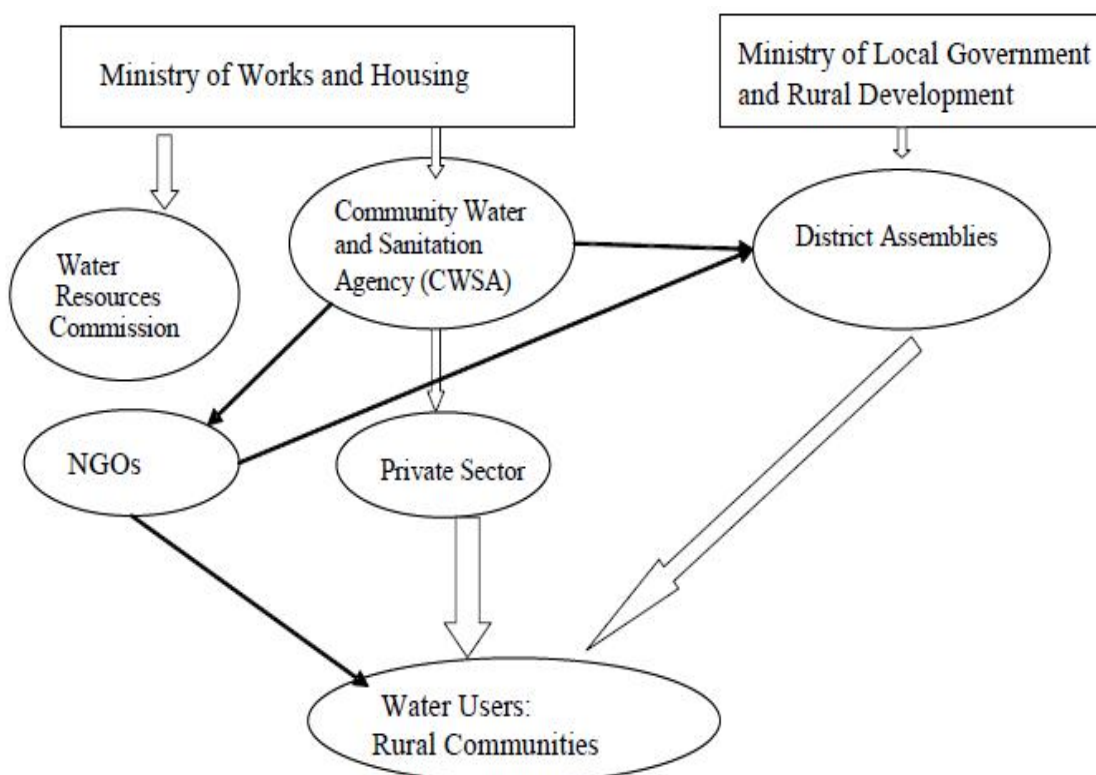
Regions	Estimated rural population	Percentage covered	Estimated urban population	Percentage covered
Ashanti	2,406,651	73.37	1,818,051	58.5
Brong Ahafo	2,045,223	59.82	614,184	27.23
Central	2,051,847	63.96	1,219,288	62.83
Gt. Accra	773,511	60.33	4,449,374	74.01
Eastern	2,136,893	57.81	770,488	33.74
Northern	2,338,597	62.38	612,658	60.06
Upper East	1,226,675	59.50	172,035	36.34
Upper West	662,239	76.38	100,705	8.97
Volta	1,978,557	64.12	646,215	39.74
Western	1,566,102	53.94	619,514	71.51
National	17,186,295	63.41	11,022,513	62.9

Source: CWSA/GWCL 2012

2.3.1 Structure of the Water Sector after the Reform

Figure 1 shows the new national program comprising the different levels of implementing bodies in the water sector. The ministries, private sector, District Assemblies and communities have emerged as important players with primary responsibility for planning and implementation (Kleemier, 2002).

Figure 1: Organizations of rural water sector in Ghana



Source: Baur and Woodhouse (2004).

Note: NGO refers to *nongovernmental organization*.

2.4 Community Water and Sanitation Agency (CWSA)

The Ghana Government, in line with the agenda for the decade (International Drinking Water and Sanitation Decade, 1981-1990), initiated a review of its policies on water and sanitation provision to keep pace with the changing conditions in the country and on the international scene. The agenda was to ensure that by the end of the decade, nations would have made significant strides in the delivery of water and

sanitation facilities to their populace. In 1987, a donor conference on water and sanitation was held at the Ambassador Hotel in Accra, at which pledges were invited from donors. Subsequently in February 1991, about sixty participants from Sector Institution and External Support Agencies (ESAs) met at Kokrobite for a workshop to prepare for a rural water and sanitation sector strategy. After four years of consultation, a National Community Water and Sanitation Programme (NCWSP) was launched in 1994, in line with the Government of Ghana's decentralization policy (retrieved from <http://www.cwsagh.org>).

The NCWSP constituted the first attempt in Ghanaian history to submit all international projects supplying water to rural and small towns to a national policy of community demand orientation (Feust, 2009). The NCWSP of Ghana has been cited as an example of a "client-based model" in the World Development Report 2004 (World Bank, 2003) and this programme has officially incorporated the 'design principles' of the DRA (Feust, 2009). The Community Water and Sanitation Division (CWSD) was carved out of the then Ghana Water and Sewerage Corporation (GWSC) now Ghana Water Company Limited and transformed into the Community Water and Sanitation Agency (CWSA) by an Act of Parliament, Act 564 in December, 1998 with the mandate to facilitate the provision of safe drinking water and related sanitation services to Rural Communities and Small Towns in Ghana. The CWSA has since been facilitating the implementation of the NCWSP using the decentralized structures at the district and community levels as prescribed in the Act. The objectives of the NCWSP are to improve access to water and sanitation services for rural communities and small towns in Ghana; ensure the sustainability of water and sanitation facilities provided; and maximize health benefits by integrating water, sanitation and hygiene promotion (RCN, 2006). The policy thrust of the national

program is the Community Ownership and Management (COM) of the water and sanitation facilities installed in the beneficiary communities and the use of the private sector to support the process. Among other key elements and principles of the NCWSP is the DRA. The NCWSP project cycle consists of community mobilization and sensitization, health and hygiene promotion, participatory planning, design & construction, operation and maintenance, and monitoring and evaluation.

The CWSA manages the programme in all 10 regions under the policy direction of the Ministry of Works and Housing (MWH) of Ghana and its functions as stipulated in Act 564 are to:

- provide technical support for District Assemblies;
- promote the sustainability of safe water supply and related sanitation services in rural communities and small towns;
- enable the Assemblies encourage the active involvement of communities, especially women, in the design, planning, construction and community management of water and sanitation projects;
- formulate strategies for the effective mobilization of resources for the execution of safe water development and related sanitation programmes;
- encourage private sector participation in the provision of safe drinking water supply and related sanitation services;
- provide District Assemblies with technical assistance in the planning and execution of water development and sanitation in the districts;
- assist and co-ordinate with Non-Governmental Organizations (NGOs) engaged in the development of water and sanitation and hygiene education in rural communities and small towns;

- initiate and pursue in collaboration with the Ministries of Local Government and Rural Development, Science and Environment, Health and Education and Sports , formal and non-formal education programmes for public awareness in rural communities and small towns of water related hazards;
- prescribe standards and guidelines for safe water supply and provision of related sanitation services in rural communities and small towns and support the District Assemblies to ensure compliance by the suppliers of the services;
- charge reasonable fees for services provided;
- collaborate with such international agencies
- and perform any other functions assigned to it by Act 564.

The CWSA, at its head office, recommends policies to the Sector Ministry and defines strategies, procedures and standards for community water supply and sanitation; sources funds both nationally and internationally for NCWSP; provides back-up support to regional CWSA offices for monitoring and evaluation; and disseminates sector policies to all stakeholders. As per the tenets of DRA, 85% water coverage is anticipated to be realized through comprehensive subsidies (90-95%) for investments in small-scale water supply infrastructure. This approach includes the selection of technologies and a clear commitment by communities (and in some project areas by DAs as well) to contribute 5% each of the investment cost. The CWSA ensures an equal gender representation in the planning, operation and maintenance of the water and sanitation facilities and promotion of sanitation and hygiene education in the delivery of water.

2.5 Challenges of CWSA

The CWSA is an autonomous entity and therefore possesses inherent accountability relationships with the actors and tariffs to cover operational cost. However, there are inadequate incentives to make the accountability relationships effective; the capacity of the Water and Sanitation (WSDB) and the operation team is low; tariffs to recover the full cost of water supply are inadequate; and there are inadequate administrative systems and procedures for the operations of the small towns and rural communities as they operate as a semi-formal organisation (Nyarko, 2007).

The CWSA seemed to be incapable of facilitating and regulating effectively the many components of the ambitious NCWSP (Feust, 2009). One of the reasons, according to Sarpong Manu (2001), was the lack of coordination and monitoring of the activities of the local organizations. A 2003 MWH/ CWSA report indicated that the failure to achieve targets and capacity building of WATSANs and WSDBs in 2002 was as a result of the inability of beneficiary communities to raise the capital cost, poor sensitization of communities, and failure of some projects to fulfil their investment commitments in good time. The Government of Ghana (GoG) was also reported to have either delayed payment or contributed insufficient funds in terms of salaries, utilities and consumables.

Per a WB directive, the Agency's total staff should not exceed 200 (ProNet, 2001). Staffing is therefore a major challenge to the realization of the ambitions of the NCWSP. The environmental sanitation agency has complained of over stretching of staff to meet the demands and requirements of the Agency. There also seems to have been considerable fluctuations of staff, and vacancies which could not be easily filled due to the general poor remuneration of employees in the public sector which results in movement of qualified persons to either the private sector or outside the shores of Ghana (ADF, 2003; CIDA & CWSA, 2003). Though the CWSA employees consisted

of technically trained staff, they lacked skills in sensitization work and the application of participatory methods to connect well with the beneficiaries. The rhetoric of participation that was contained in the NCWSP, conforming to the principles of the DRA, was counteracted by the strong persistence of a *de facto* supply-orientation and an undercurrent of hard-to-die top-down approach to development (Feust, 2009). The development planners of the CWSA held the paternalistic view that local people were incompetent and lacked the basic skills in the fields of market oriented management and technology of infrastructural services and therefore needed to be educated. This has led to the selection of borehole sites without much consideration to the socio-cultural setting of the beneficiary communities.

Another major challenge is the interference of political parties in the affairs of the Agency. Similar to the case of the MWH, high profile staff of the CWSA was reported of being afraid to insist on the implementation of its policies, if there was a risk that people of political importance would somehow be compromised by consequent implementation.

The capacity of the districts to effectively manage water and sanitation projects under their jurisdiction is still a challenge. Apart from the fact that the proposed Works Departments are not established in many DAs, the rampant transfer of trained staff on specific water and sanitation projects also immensely undermines the capacity of the DAs (MWRWH, 2009).

Hydro-geological challenges are more pronounced in the Northern Region where insufficient ground water leads to low drilling success rates. This makes the achievement of project targets difficult. In the Eastern and Volta Regions, the difficulty arises in abstracting water in the mountainous areas, whereas in the Brong Ahafo Region the challenge is mainly associated with mud drilling. There are a

number of water safety issues affecting the water delivery process. Other safety issues include high iron, fluoride and arsenic contents. Even in areas with reasonable drilling success rates, the chemical content in the water is normally higher than the recommended level, making it impossible to use for drinking purposes. A good number of high yielding wells have been capped, especially in the Northern parts of the country due to high levels of fluoride in these wells. In the coastal regions, salinity continues to be a constraining factor (MWRWH, 2009).

By its Establishment Act, CWSA should serve as the focal point of the community water and sanitation sub-sector. The Agency's role as the Government's Agency facilitating service delivery and regulating the sector further makes this inevitable. Of recent, however, some NGOs have been operating without any reference to CWSA or the NCWSP guidelines. As the Agency makes the effort to take command of the sub sector, weaknesses still remain in its operations in terms of effective coordination of sector practitioners. On the field, these weaknesses have made efforts at a fair distribution of resources difficult. Compilation of statistical data on provision of facilities has also suffered, as some NGOs still fail to report on their operations (MWRWH, 2009).

Some other prevailing problems of the Agency are:

- Inadequate funds and time lags in receiving GoG counterpart funds which cause delays in the takeoff of planned activities;
- Delays in the procurement of hand pumps spare parts for O&M and for the conversion of pumps in communities which had settled their arrears and paid their contributions; these delays caused undue worries and anxiety;
- Inability of some very poor communities to pay their capital contributions leading to delays;

- Poor quality and delay of work provided by some contractors;
- Construction of water facilities was also hampered by adverse ground conditions;
- Reluctance of some DAs to support the DWSTs to reach the rural communities for data gathering and programme promotion;
- Unsure institutional and legal framework for community based management

(MWH, 1999).

Evidence suggests that neither the MWH nor the CWSA were capable of coordinating the activities in the sub-sector of rural drinking water supply. Before 2004, clear policy guidelines concerning the organization of the local Boards and Committees, the responsibilities of the DAs, and the role of the private sector were non-existent (MWH & CWSA, 2004; Sarpong, 2001). There had been no initiative to develop a uniform policy on how the 5% contribution was to be applied by the various donor projects (CWSA, 2002).

In exercise of the power conferred on the minister responsible for the CWSA by Act 564 (1998) and in consultation with the Board of Directors, the CWSA regulations, 2011 (L.I. 2007), came into force on the 4th February, 2012. The regulations cover details on technical standards and acceptable practice for operators in the sub-sector. The L.I. also covers inspection of equipment for safe water supply and related sanitation facilities. It gives CWSA the authority to support DAs in the monitoring and enforcement of standards in the water sector for which sanctions have been proposed for non-compliance. Provisions have also been made in terms of general principles, standards, sanitation facilities for institutions, water safety, tariffs and miscellaneous (CWSA, 2012).

This L.I. has set the necessary legal and policy framework for the successful operations of the agency to provide adequate service in the area of water and sanitation for rural communities and small towns which otherwise were neglected.

2.6 Governance Arrangement of the Rural Water and Sanitation Service

Delivery

CWSA's national strategy promotes a "demand-driven" planning approach that emphasizes participatory project design and implementation (Komives *et al.*, 2008). The Agency's activities in rural water supply projects are expected to include consultation with communities about relevant technology and management choices. The participation of women is also valued and encouraged.

After the implementation of the water facilities, District Assemblies hold them in trust for the communities. It is the duty of the of District Assemblies to identify and promote development opportunities, mobilize human and physical resources, coordinate all development activities in the district, facilitate public participation in the development process and disseminate information on all matters related to development (WaterAid, 2009). They are, by law, the sole bodies responsible for the delivery of water and sanitation services at the local level. They act as the representatives of the CWSA in the district. Though service delivery for other social services such as health and education is undertaken through their various decentralized departments within the District Assemblies, water and sanitation delivery lacks its department at the assembly level. This responsibility lies with the District Water and Sanitation Team (DWST), made up of seconded staff from the Department of Community Development, Environmental Health Unit and Department of Public Works. The DWST is established at the district level of

governance to support local water governance structures – the water and sanitation (WATSAN) Committees, to have access to the capacity building they needed to operate their water systems and also equip them to be able to resolve any conflicts arising from people accessing water from the facilities (Adow, 2013).

The DWST are supposed to step in when communities request for help from the DA. They also establish and allocate facilities within the district and monitor water projects. The fact that DWST is not a department restrains it from planning and budgeting, mobilizing resources and advocating to the district assembly for increased allocation of funds for the delivery of water and sanitation services. Members of the DWST are not members of the social services or the works sub-committees where water and sanitation issues are discussed and recommendations sent to the General Assembly of the DA for consideration. This structural gap partly explains the low funding allocated to water and sanitation in the districts and the largely inactiveness of the DWST. Though the DWST is supposed to visit and monitor water facilities in communities, the role has been compromised due to lack of funds and transportation to enable them execute that function to foster effective water governance (Mays, 2007; Youkhana, 2004).

At the very local level, two management bodies can be distinguished. These are the Water and Sanitation Committees (WATSANs) being in charge of the daily operation and maintenance of either hand pumps or standpipes and the Water Sanitation Development Teams (WSDTs) which manage water systems in small towns. When water facilities are installed, the beneficiary communities are guided to establish community level Water and Sanitation (WATSAN) Committees. Local representatives are supposed to be elected by the respective water user groups to form the WSDT. Per the principles of the Dublin Conference, it is strongly encouraged that women serve as members, and the continual participation of women in decision-

making on these committees is considered quintessential for effective water governance (Mays, 2007). The five to seven members of the WATSAN/WSDT (with ideally 40 per cent women's involvement) contribute voluntary work towards the upkeep of their community water facility. WATSAN/WSDB members receive professional training from the DWST to protect water resources, to manage the systems, to fix tariffs and to ensure regular water supply. The WSDTs formulate by-laws for the use of the water facilities which are to be ratified by the DAs (Eguavoen, 2007).

2.7 Financial arrangement

At the inception of the NCWSP, a cost sharing arrangement stipulates that communities and DAs contribute 5% each of the capital costs of water facilities, with the remaining 90% provided by the CWSA (mostly donor funded) (Lane, 2004). The capital costs cover facility construction, the installation of an elected pump committee, water tariffs, and bookkeeping (Eguavoen, 2008). There were cases where wealthy individuals and politicians within the community paid a substantial share of the community contributions (Yan *et al.*, 2010). However, since 2011, the 5% contribution paid by the beneficiaries has been scraped off. Answering to a question on the floor of parliament on the 8th of November, 2011, regarding government policy on counterpart funding by beneficiary communities towards rural water supply, the then Minister for Water Resources, Works and Housing, Mr Alban S. K. Bagbin said, "Madam Speaker, Government policy regarding counterpart funding of the investment for the provision of water to rural communities is that beneficiary communities do not contribute towards rural water supply". Communities accept responsibility for operation and maintenance of their water supplies, including financing. Though CWSA advocates for a pay-as-you-fetch payment systems, some communities opt to collect fees on a monthly basis. The WATSANs appoint

caretakers/vendors who collect money for the use of the water facilities and are paid 20% of revenue generated on monthly basis.

2.8 Conclusion

The provision of potable water in Ghana was primarily the responsibility of the Ghana Water and Sewerage Corporation (GWSC) since it was established in 1965. Though the entity was charged to provide for both urban and rural areas, the corporation neglected the rural areas which necessitated the creation of a rural water department. The approach used in providing water infrastructure was supply-driven which resulted in most facilities not working. After series of stakeholder conferences between 1987 and 1991, the National Community Water and Sanitation Programme (NCWSP) was adopted and the Community Water and Sanitation Division (CWSD) was created in 1993 which became the Community Water and Sanitation Agency (CWSA) in 1998 with the mandate to oversee the provision of water and sanitation to rural and peri-urban areas. The CWSA is bedevilled with personnel, logistical, geological, financial and political interference hampering its smooth running to provide effective services.

CHAPTER THREE

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

3.1 Introduction

This chapter is dedicated to the review of relevant literature regarding water management through DRA and conceptual framework underpinning the study. It also shows how the study builds on and criticizes the present knowledge of DRA in the sustainable management of water.

3.2 Theoretical Framework

The theoretical framework informing this study draws on neoliberalism. Like a hurricane, neo-liberalism swept across the political landscape laying all before it waste and in its wake, it left demolished social infrastructure, polarization, fragmentation, inequality, poverty, rising crime and disorder (personal and social), collapse of confidence of progressive forces, privatization and individualization (MacGregor, 1999). It started off as a neo-monetarist solution to the problem of hyperinflation in many developing countries in the 1970s and gradually grew into a new development agenda.

Harvey (2005) opines that at the heart of neoliberalism lies the theoretical proposition that it is the liberation of individual entrepreneurial freedoms and skills, within an institutional framework containing strong private property rights, free markets and free trade. Neoliberalism, which is based on a public choice perspective, has established itself as the dominant paradigm in development theory for the past two decades. The central element of neoliberalism is the opening up of spaces for capital that were previously restricted, either for geographical reasons or through state involvement or regulation, coupled with the increased integration of the state with business around an agenda of increased competitiveness within these newly opened

spaces (Kilmister, 2004). Neo-liberal economics is based around three main principles.

The first principle is based on the role of the state. Governments should not be involved in the economy with the exception of four main functions: defence, law and order, the provision of the necessary public works that private enterprise does not find profitable to provide and the protection from members of the community who 'cannot be regarded as 'responsible individuals'. Government interfering in the market place will distort the balance of supply and demand. (E.g. the regular giving of aid upsets the price of goods and supply of labour). This principle holds that the production, distribution and trade of goods and services are best left to private (profit making) rather than public (government owned and regulated) organisations. The state is only justified to spend by the need to make capital more competitive. In terms of providing social services such as education, health and water, the role of the state is mainly to manage the awarding of the relevant contracts and ensuring that no single monopoly provider gains too much power in the market at the expense of other capitalists. So privatization is central to Neo-liberalism (Kilmister, 2004).

Second, Neo-liberalism strongly advocates the removal of capital and exchange controls and the opening up of financial markets to foreign investment. Additionally, controls on imports of goods and services, especially tariffs and quotas, on intellectual property rights, on the awarding of government contracts, and on productive investment are all to be removed and handed to international institutions, notably the World Trade Organization (WTO). Third, the regulatory role of the state is restricted to competition and anti-trust policy, in support of those competitors who might lose out if a monopoly becomes too strong, rather than providing a counterweight to the power of capital (*ibid*).

Supporters of neoliberalism have argued that markets are “a better way of organizing economic activity because they are associated with competition, economic efficiency and choice” (Larner, 2000, p. 5). It is believed that the state should be blamed for the failures of previous development projects and it is argued that the state should play as small a role as possible, with the laws of supply and demand now being the deciding factors for economic policy as well as development policy. After achieving independence, majority of developing countries such as Ghana and Nigeria were experiencing “a spiralling downward decline in economic growth” (Tar, 2008, p. 56). These countries out of desperation turned to the Bretton Wood institutions (WB and IMF) for solutions. The prescription of the Bretton Wood Institutions was to promote fiscal austerity and to reduce the public sector bureaucracy, regulatory ‘*red tape*’, barriers for businesses, government involvement in service delivery, and the power of unions (Harris 1994, World Bank, 1981).

These institutions presented neoliberalism as a solution in the form of Structural Adjustment Programmes (SAP) which will be later discussed in more detail. Neoliberal policies have been criticized as negatively impacting the already marginalized and susceptible members of society. According to Crotty (2000), unfortunately, global income growth has slowed; productivity growth has deteriorated; real wage growth has declined; and inequality has risen in most countries. The less developed nations outside East Asia have fallen even further behind the advanced countries, and average unemployment is higher. To Wilkinson (2007), neoliberalism can best be described as an apology of capitalism and a utopian vision of self-regulating markets transforming the inherent selfishness of individuals into general good. Its propagated benefits are unrealistic and not achievable.

The centrality of water to life places water at the heart of the controversy surrounding the merits of neoliberalism. Increasingly, International Financial Institutions (IFIs) and some governments' policies treat water as a commodity subject to the will of the global market, even as more citizens demand that governments develop and enforce policies that secure the sustainability of this public trust and basic human right (MacCuish, 2003). On water, the neoliberals argue that the regulation of water would be better orchestrated through the development of markets and the injection of private sector discipline. It is believed that private sector management of water supply would reduce costs, opportunistic management, and '*regulatory capture*' while increasing investment, transparency, and efficiency (Lee and Jouravlev, 1997). Ghana, based on neoliberal policies of the IFIs, has moved to decentralize and pass control and ownership of water delivery to private hands and local governments. To Petit (2009), the private monopolies of the multinationals have led to non-fulfilment of promised investments, non-improvement of the water quality and a disproportionate increase in the price of water. The common people are those who most suffer the increase, among other reasons, due to the fact that they are the ones who encounter more problems of access to public sources, and receive the poorest quality supply. The four main reasons for attempting to involve the private sector in water supply are: mobilizing financing for investment, need for technical expertise, increasing efficiency, and improvement of service quality.

The World Bank and other IFIs have acknowledged Ghana as one of the "success stories" of sub-Saharan Africa in terms of water provision. However, critics' analyses of interventions of the World Bank/IMF in nearly two decades of structural adjustment in Ghana have concluded that Ghana's development programmes have not been based on institutional development grounded in the indigenous understanding of

government and authority, which define roles for the state and public administration. Ghana has been found to be another case of the devastating impact of neo-liberal prescriptions on poor countries worldwide (Petit, 2009).

Opponents (Gleick, 1998; Trawick, 2003) (Rights-based theorists) of water supply privatization have frequently based their argument on a human right to water to support their assertion. There is also the argument that water is a non-substitutable thing (“*essential for life*”). But some authors (Bond, 2002; McDonald and Ruiters, 2005), who disagree with the “*right to water*” argument, are of the view that it is the lack of clear responsibility and capacity for implementation and potential abuse of the concept as governments could over-allocate water to privileged groups, at the expense of both people and the environment. They have also argued that the UN Conventions are predicated upon an assumed availability of water.

Another, more fundamental criticism is the argument that a human right to water does not foreclose private sector management of water supply systems (Bakker, 2007). Critics (Ignatieff, 2003; Mutua, 2002; Rorty, 1993) of human rights doctrines argue that “rights talk” stems from an individualistic, libertarian philosophy that is “Eurocentric”. In other words, private sector provision is compatible with human rights in most countries around the world. Therefore, a human right to water does not mean that water should be accessed for free.

The right to water is explicitly recognized as a fundamental human right by the Committee on Economic, Social and Cultural Rights in November 2002. It is understood to be an integral part of officially recognized human rights, a necessary precondition for the realization of the right to an adequate standard of living (Article 11, International Covenant Economic Social and Cultural Rights), the enjoyment of the highest attainable standard of physical and mental health (Article 12, ICESCR)

and the right to life (Article 6, International Covenant Civil and Political Rights) (Filmer-Wilson, 2005). In adopting General comment 15 the Committee also established that *'water is a precondition of all human rights and indispensable for leading a life in dignity'* and therefore entitles *'everyone, on the basis of non-discrimination, to sufficient, safe, physically accessible and affordable water, which is of an acceptable quality for personal and domestic uses'*. Gleick (1999) argues that water, like air, was seen as so fundamental to preserving a right to life that the drafters of the Universal Declaration of Human Rights (UDHR) did not consider it necessary to *'spell it out'*. Filmer-Wilson (2005), a Rights-Based theorist, has therefore argued that *"there is an explicit recognition that water is an essential social good, which takes priority over water as an economic commodity where conflicts may arise: for example, in the context of privatization of water services and the charging of user-fees"* (p. 228). Therefore, governments have a duty to respect, protect and fulfil this right and should not sub-contract their responsibilities in order that no person is deprived of minimum requirements simply because they are unable to pay.

According to Pearce (2000), globalization, driven by the values of neo-liberalism, has seriously harmed the anti-poverty and anti-exploitation struggle in the world today. The benefits to the few have not compensated for the increased poverty, inequality, and uncertainty which many have experienced. For municipalities (or District Assemblies), reduced transfers from national government, coupled with expanded responsibilities made cost-recovery and cost-cutting measures an almost inevitable choice and in most instances, the most direct and easiest methods were the harshest: cut-offs – either through direct administrative intervention or via installation of prepaid technology (McDonald and Pape, 2002). The long term effect of neoliberal policies on water include very high charges for water services and utilities cutting

down, or eliminating water service deliveries in areas which are not considered profitable or commercially viable.

In comparison to other areas, such as the urban sector or irrigation, drinking-water supply for rural areas has always played a secondary role in the World Bank's water policy. This is because rural areas are less attractive for investors. Hence most rural areas are not a target area for centralized, capital intensive water supply facilities with elaborate piping and pumping stations that private companies could make a profit with. What is being prescribed for rural areas is a decentralized approach called the Demand Responsive Approach (DRA) based on the World Bank's expectation that the costs of water supply are to be borne by the users. The decision making power will be transferred to the consumers and then the investment is initiated by the consumers according to their self-determined requirements. The World Bank wants to ensure cost recovery by the users as every water facility ought to be financially self-supporting, and subsidies should only be awarded on a short-term (World Bank, 2002). DRA is considered better than supply driven systems because the allocation process is demand driven by consumers. The international development experience is that service providers struggle to be effective when they ignore, or try to create demand, but they have a greater rate of success if services are tailored to local consumer realities, particularly in terms of cost and service level (Black, 1998).

3.2.1 Neoliberalism

Neoliberal programmes and initiatives such as SAP and HIPC led to the wholesale initiation of the Private-Public-Partnership debate (PPP) and Community Management (CM) of water and sanitation services in developing countries like Ghana.

Harvey (2005) in his definition of Neoliberalism sheds light on the kind of phenomenon it is: “Neoliberalism is in the first instance a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets and free trade. The role of the state is to create and preserve an institutional framework appropriate to such practices. The state has to guarantee, for example, the quality and integrity of money. It must also set up those military, defence, police and legal structures and functions required to secure private property rights and to guarantee, by force if need be, the proper functioning of markets. Furthermore, if markets do not exist (in areas such as land, water, education, health care, social security, or environmental pollution) then they must be created, by state action if necessary. But beyond these tasks the state should not venture. State interventions in markets (once created) must be kept to a bare minimum because, according to the theory, the state cannot possibly possess enough information to second-guess market signals (prices) and because powerful interest groups will inevitably distort and bias state interventions (particularly in democracies) for their own benefit” (p. 2).

The key points of Neoliberalism which serve as WB and IMF conditionalities are the rule of the market, cutting public expenditure for social services, deregulation, eliminating the concept of “the public good” and privatization. Amenga-Etego (2003) is of the view that, in Ghana, one obvious impact of these programmes and initiatives can be seen in the cuts in social spending on essential services like water facilities where the state institution was rolled back in water provision and the private sector is to manage the service. The community management concept appealed to many governments, who were already committed to decentralization and

overstretched in attempting to deliver and maintain rural services, as it relinquished them of their responsibility for operations and maintenance of the facility (IRC, 2003).

Sangameswaran (2003) discusses four strands of critique of Neoliberalism drawing partly on water-related and partly on the more general literature of the theory, though admitting the strands cannot be neatly separated. One strand is embedded to a large extent in Marxist and Neo-Marxist theoretical traditions that focus on the structural changes in different water related reforms such as privatization of drinking water systems and the emphasis on cost-recovery principles, and in geographical regions spanning Latin America, Europe, Africa, North America and Asia. These reforms have been viewed as one more instance of “accumulation by dispossession” and therefore feeding into a process of global accumulation. The second strand focuses on the concrete negative of what is perceived to be neoliberal changes in the water sector. The study cites Bakker’s (2005) analysis of the attempts in England and Wales to convert water into an economic good which brought out contradictions inherent in the introduction of competition and cost-reflective pricing and the mixed impacts of the subsequent (re) regulation of the water industry.

The third strand focuses on the interrelation between specific neoliberal policies, their underlying ideologies and how these policies encourage individuals and institutions to conform to certain norms. Implicit in this strand is a much more complex meaning of neoliberalism not only as one that goes beyond economic policies that aim to reduce the role of the state or to increase that of the market but rather, according to McCarthy and Prudham (2004), as a complex pool of “ideological commitments, discursive representations and institutional practices”. The final strand looks at the lack of consideration into the cultural constitution of the state in terms of how

people perceive the state, how their understandings are shaped by their particular locations and their encounters with state processes and officials, and how the state manifests itself in their lives.

Furlong (2010) summarizes literature (Barlow and Clarke, 2002; Hall and Lobina, 2007; Lobina and Hall, 2006; and Shiva, 2007) on those against neoliberal reforms but rather favor public sector management. These scholars have argued that:

1. The profit motive of private corporations leads to higher, not lower, prices, further marginalizing the poor;
2. Privatization is insufficient in the absence of strong regulatory institutions;
3. The environment will suffer, due to increased incentives for externalities;
4. Competition is limited to the contract, as water constitutes a ‘natural monopoly’ and only a few international firms control the market;
5. The state can access cheaper financing than the private sector; and
6. Water is a human right as opposed to a commodity.

To Furlong, others (Caincross, 1987) simply highlight the fact that, in many cases, too little was known to embark on such “wholesale national restructuring of a sector without prior experimentation (p. 182).

3.2.1.1 Structural Adjustment Programmes

Many developing countries continue to suffer from unsatisfactory and often dysfunctional governance systems including rent seeking and malfeasance, inappropriate allocation of resources, inefficient revenue systems and a weak delivery

of vital public services. This has led to unwelcome outcomes for access to public services by the poor and other disadvantaged members of the society such as women, children and minorities (Leautier, 2005).

The 1980s, often referred to as the “lost decade” for Africa, was a time of crisis due to rise in oil prices and a fall in primary products, such as cocoa for Ghana. The situation had a devastating toll on African economies as a result of their overdependence on a limited number of primary products (Castree, 2003). Compounding the already dire situation were other factors such as the burden of growing external debt, rapid population increases, continuous drought accompanied by desertification, and devastating internal conflicts. According to Weissman (1990), Ghana realized a fall in exports to about 52% and Gross Domestic Product (GDP) was at its lowest in the early 1980s. In addition to the decline in Ghana’s economy were the major drought during 1983 to 1985 and the repatriation of millions of Ghanaians from Nigeria (Weissman, 1990). As a result, the role of the state as the provider of social services such as free education, health, water and sanitation began to suffer. As Swartz (1996) puts it, the overextended state control of almost all sectors of the economy proved inadequate and inappropriate.

Against this background, it was difficult to find countries and institutions that were willing to finance these countries including Ghana. According to the African Forum and Network on Debt and Development (AFRODAD, 2007), this was because most of the countries that had been assisting were also in recession due to the oil crisis: the cold war was taking up a lot of resources and the financing from the Eurocurrency market which had become common in the early 1970s was becoming difficult because of deterioration in terms of trade. The concerned governments (from Africa) therefore looked to Bretton Wood Institutions (IMF and the World Bank) to finance

their economies. In response, the Bretton Woods Institutions came up with loan packages and some recommended reform called Structural Adjustment Program (SAP). A World Bank Study (1988) defines structural adjustment as “*a process whereby a national economy is opened by means of the depreciation of the real exchange rate through a combination of demand and supply side policies*” (p. 2). Ibhawoh (1999) adds that adjustment, in the view of the Bank, aims at setting the economy of a country back on a path of sustainable growth when it is faced with a macro-economic crisis characterized by unsustainable internal and external balances. Greenberg (1997) is of the opinion that, the neoliberal policies pursued under SAP were aimed at a wise and judicious financial management of borrowing countries to curtail the ill effect of subsidies and financial support on the economy of these countries.

These reforms sought to reduce the role of the State in production as well as service delivery and encourage the deregulation of public enterprises. To obtain financial assistance, African countries were required to carry out macro-economic and sector reforms such as reducing spending on public services such as education and health through cost recovery measures, among others. The emphasis was on maintaining macroeconomic stability, lowering inflation, cutting deficit spending, and reducing the scope and cost of government. Agyeman (2007) and Bakker (2007) have argued that the aim is to reduce public sector involvement in the delivery and management of essential public services like water. The effects of SAP and other neoliberal policies of the major International Financial Institutions (IFIs), particularly the World Bank and the International Monetary Fund (IMF), on social and political conditions in Africa have been the subject of extensive debates. While some have lauded them others have criticized them for rather further impoverishing the very countries they

sought to help. Owusu (2005) is of the view that even though SAP has restored some level of sanity at the macroeconomic level, it has come at a high social cost due to the fact that most vulnerable groups have been adversely affected both directly and indirectly by measures such as the withdrawal of subsidies on social services, retrenchment of labour, and the general increases in prices of goods or services.

At a conference in Khartoum on the *Human Dimensions of Africa's Economic Recovery and Development*, the United Nations Economic Commission for Africa (UN ECA, 1988) stated that “the overall assessment of the structural adjustment programmes has led to the conclusion that, although these programmes aimed at restoring growth generally through the achievement of fiscal and external balances, and the free play of market forces, these objectives cannot be achieved without addressing the fundamental structural bottlenecks of African economies” (p. 47). The frustrations and failures in SAP led to the UN ECA call for increased participation of community groups and individuals in the design, implementation and evaluation of development projects. The participation of people in the whole process was a central issue.

A common feature under both SAP and recently HIPC is turning water, which hitherto was accessed free or at highly subsidized rates, into a marketable commodity where cost recovery principles are applied. Indeed, under neoliberal reforms, water has been given a “price tag” termed “*water commodification*”. Castree (2003) defines commodification as a process where qualitatively distinct things are rendered equivalent and saleable through the medium of money”. Gleick *et al.* (2002) also state that it “is the process of converting a good or service formerly subject to many non-market social rules into one that is primarily subject to market rules” (p. 1). In Ghana, Eguavoen (2007) indicates that even though water was treated as a commodity before

the implementation of SAP, it applied to the urban areas where incomes were stable compared to rural areas. In the rural areas, huge subsidies were placed on water while some people did not pay for it at all because they viewed water as nature's gift. Even for urban dwellers, the price paid for water was so low that people do not regard it.

Following the 1992 Dublin meeting, the United Nations Conference on Environment and Development in Rio concluded that economics must play a role in the efficient management of water and allied services. In support were the Water Supply and Sanitation Collaborative Council's Global Water forums and the World Water Council's World Water forums as well as the United Nation's (UN) Earth Summits which led to a shift in water provision and management. Ahlers and Zwartveen (2009) observed two principles in water management. The first is water commodification and the second is community management, which is promoted and practiced in Ghana as a national policy in rural communities. Gbedema (2009) defines community management as the engagement of water users or communities in formulation, provision, management and use of domestic water facilities. The World Bank, through its assistance to the water sector in Ghana, based its argument on division of responsibilities in the water sector where public institutions are deemed more appropriate for managing water in a larger geographical area (urban setting) while the small geographical area (rural and small towns) facilities are to be managed by the community. The new Community Management (CM) concept is said to be demand-oriented, demand driven or demand responsive (Fuest, 2006).

Mulenga (2003) concludes that the DRA methodology appears to have been developed only for the rural areas and largely for the water sector ignoring sanitation. The question often raised is why the WB deems it appropriate that rural areas should apply the DRA approach. According to Hoering and Schneider (2004), the DRA has

its roots in privatization which are embedded in the Dublin conference on water as an economic good. The principle of cost recovery and the reduction of government spending for the sake of budget consolidation should be enforced. The idea is that taxes pay for social services such as education, health, water and sanitation and people who do not contribute to its funding should not be provided for. Taxation is an essential source of revenue generation by the state. Direct taxes are generally generated from the salaries of formal sector workers who are mainly in the urban centres. Agriculture is the leading economic activity as expected in rural Ghana. According to the GSS (2008), 75% of rural inhabitants work mainly in agriculture. Moreover, a greater proportion of urban workers (33.8%) are engaged in wage employment, while the corresponding proportion in rural areas (7.3%) is much lower. The majority of the informal sector are in the rural areas and therefore do not yield enough revenue to qualify for some government expenditure, water and sanitation inclusive. The essence therefore of DRA is to make the rural areas pay for their own services since they do not contribute significantly towards government revenue.

Hoering and Schneider (2004) opine that the main difference between the urban policy of Private Public Partnership and rural policy of DRA is that government responsibility is not being replaced by a private operator or investor as is the case in urban centres but by the rural community or water user groups. Fears have been expressed (*ibid*, 2004) that due to non-affordability or non-payment by users there is no sustainability. Also, marginalized groups or women are often excluded from decisions as well as from improvements. This is because, instead of “need”, the “demand” of consumers who can afford to pay for their supply becomes the criteria for the development of the supply system, very much like the profit motif of the private investor or operator in privatization schemes. They conclude that the WB is

only promoting a market driven commercialization that cannot guarantee the right to water or other basic services for everybody. It is their view that DRA-based water projects in relatively better-off communities or regions which are succeeding may very well become attractive for private investors later on, thus paving the way for privatization.

Gbedema (2009) argues that DRA is a means of removing government and donor responsibility for water provision and management because the managers of the community water devise their own strategy of collecting fees from water users (a form of water commodification) for daily operation and management of the system, which potentially drives the poor away from enjoying the facility. This is because demand-driven or community management model holds that much of the human resource costs of managing rural water projects should be transferred to village water committees. The Water Demand Research Team of the WB concluded in 1993 that the level of service and the level of cost recovery for rural water and sanitation can be adjusted to community characterization and ability to pay so that the long term sustainability of the system can be achieved.

A disturbing element of water provision in rural areas of Ghana is with regard to 'cost sharing, otherwise labelled 'community participation and management'. The system requires that beneficiary communities pay 5% of the initial capital cost of the facilities and bear all other operational, maintenance and repair costs of the facilities (Karikari, 1996; Schouten and Moriarty, 2003). This 5% payment of cost of the water and sanitation project, to fund water supply, may deter many rural communities who struggle to make ends meet. According to Eguavoen and Youkhana (2008), should a community decide to levy its people for the use of the service to generate income for maintenance and repair, the poor often revert to contaminated water sources like

rivers and streams. The problem therefore is that, the poor are not willing (cannot afford) to pay for water but the official policy is for communities to pay initial cost of water facilities and manage them after they have been constructed. This defeats the officially stated water facilities construction project objectives of increasing service coverage to achieve the MDGs of halving the proportion of people without access to hygienic sources of water.

The 21st century is likely to be mostly focused on issues concerning safe and adequate drinking water and sanitation (Lahiri-Dutt, 2008; Page, 2003), which can be seen in the increased spending and conferences on water. However, some authors (Asante *et al.*, 2002; Bour, 2004; Lane, 2004) are of the view that the dynamics and determinants following the reforms are only partly understood, resulting in the unsustainable management of most water and sanitation projects.

Owing to increasing evidence that development prospect of many developing countries suffer from unsustainable debt, most of them agreed to the HIPC initiative. The key slogan of the Heavily Indebted Poor Country (HIPC) initiative is that sustainable development requires sustainable debt and thus the goal was to reduce the HIPC's debt to sustainable levels (Gunter, 2002). However, critics (Goldman, 2007; Whitfield, 2006) have argued that the HIPC initiative, with its attendant conditionalities does not constitute a change from past initiatives like SAP of the WB and IMF. Goldman (2007) pointed out that "these days, a HIPC cannot borrow capital from the WB or IMF without a domestic water privatization policy as a pre-condition". Similar to SAP, some of the conditions that countries must meet include a range of reforms on public expenditure management, governance, health sector reforms, education targets, privatization or removal of subsidies on water, electricity, industries, and trade and financial sector liberalization through removal of tariffs or

deregulation. In Ghana, a loan of \$400 million was extended to rebuild the water system in urban areas but under a condition that the Ghanaian government must stop the practice of subsidizing the cost of water enjoyed by wealthy and industrial customers in urban areas. Also, the government was forced to engage the private sector in urban water management before a decision point was reached for the country to enjoy the HIPC status (Rahaman *et al.*, 2007). As many as 52 conditionalities were imposed on Ghana by the WB and the IMF to satisfy (EURODAD, 2006).

Harvey (2008) is pessimistic that HIPC will help the African continent to eliminate poverty through the provision of clean water, schools and health centres as outlined in the HIPC package. HIPC countries like Cameroon, Uganda, Mali, Tanzania, the Gambia and Ghana, Gbedemah (2009) notes, are using their share of the HIPC fund to provide education, health, transportation, water and sanitation facilities in deprived areas. However, water and sanitation does not enjoy much attention like education and health (Harvey, 2008).

3.3 Case Studies of DRA

Demand Responsive Approaches adopted in a number of countries reflect the priorities, policies and objectives of the implementing agencies and governments involved, as well as the practical difficulty of translating theory into practice (Deverill *et al.*, 2001). Many of the principles of the Community Management (CM) model are encapsulated in DRA, which is now widely accepted in planning and executing rural water supply projects. This study takes a look at how DRA has been applied in other countries. Community management (CM) as a demand driven approach incorporates participatory method and decentralization strategy to successfully deliver rural water supply services better than supply driven government-led models (Lockwood, 2004).

Mazongo and Munjeri (2009) have argued that CM can improve efficiency, meet the target of the project within planned budget, and enhance sustainability of rural water management.

Bakker (2007) argues that neoliberal reforms should be understood in terms of targets and types of reform. Bakker divides these reforms into issues pertaining to resource management institutions, resource management organizations and resource governance. She provides an explicit framing of the relationship and water management in Table 2.

Table 2: Neoliberal policy prescriptions for water reform—Reasonings and Critiques

Issue	Policy Prescription	Reasoning	Critique
Water scarcity/ allocation	Private property rights	Create the proper incentives for management and cost control while developing the necessary conditions for markets to evolve	Enclosure of the 'commons' (communal resources), resulting in marginalized access and the discounting of environmental uses
	Creation of water markets	This scarce resource will be allocated to its most valuable uses, avoiding the politicization of water resource development	Vital resources, which are essential for life, cannot be left to the vagaries of the market
Water scarcity/ underinvestment in infrastructure	Full cost pricing	Will lead to improved allocation and reduced wastage, as well as improved infrastructure and service delivery	Will reduce access by low-income users and may be unrealistic, given the investments required
	Reduction of subsidies	Subsidies generally benefit industrial and wealthy customers at the expense of the poor; reducing subsidies will send proper price signals and improve resource allocation	Detrimental to low-income users, who (in less developed countries) have heretofore subsidized the services of those with service connections
Poorly performing water utilities	Public sector: from provider to regulator	Avoidance of 'regulatory capture', whereby the provider regulates itself, leading to better regulation and utility performance	Better regulation is necessary, but only governments can ensure that the social and environmental goals of water provision are met
	Private sector management	Reduction in government interference and the politicization of water management; introduction of competition, leading to greater efficiency, infrastructure investment, and cost reduction	Profit motive will lead to higher prices and the exclusion of the most vulnerable users; sufficient institutions are lacking to regulate the private sector; water is a 'natural monopoly' for which competition is limited

Source: (Bakker, 2007, p.50)

A decade and more after the introduction of neoliberal policies to water management, Hoering and Schneider (2004) stress that the World Bank officials, internal reviews by the Bank's Organizational Evaluation Department (OED) and spokespersons from private global multi-utilities alike admit that neoliberal policy has achieved much less than promised and expected. They are of the view that while coverage with water connections and, to a much lesser extent, with sewerage systems has improved in some cities and concessions, these achievements have been restricted by and large to well-off consumers, bypassing low-income areas and populations whose needs do not turn into demand because they lack the money to pay up for services. They consider that regulatory authorities have remained weak and are unable to enforce contracts or shield poor consumers from frequent price increases.

The World Bank encouraged, supported and financed the rural and the peri-urban areas, where most of the undersupplied poorer population live due to their limited capacity to pay for private capital. In place of outright privatization, the World Bank is advocating the so-called demand-responsive approach (DRA) or community-driven development (CDD), moving away from the supply-oriented approach, where services are provided by the government, often at sponsored rates (*ibid*). In addition to financial sustainability, it is expected that the poor will be better served through this approach, while government institutions are relieved of the responsibility for sustainable and equitable services.

3.3.1 Ghana

The National Community Water and Sanitation Programme (NCWSP) strategy of Ghana is based on three pillars: (a) demand-responsive approach for community selection, (b) payment of 5 per cent capital cost for construction by the communities

to enhance a sense of ownership and (c) 100 per cent self-finance for operation and maintenance of the water system by the community (Eguavoen, 2007).

Currently in Ghana there are four (4) service delivery models at the highest level of aggregation. These are the utility model (urban water delivery), community management model (rural and small towns), small scale private model and self-supply model. The first two are described as the “formal” and “officially recognised” models. Under the community management model, the community ownership and management (COM) model is the most prominent. The COM model applies the principles of DRA and is the national norm for rural communities in Ghana. COM is applied in a proportion of 34% (27% rural communities and 7% small towns) of water supply under the National Community Water and Sanitation Programme (NCWSP) by CWSA (IRC and Aguaconsult, 2011).

3.3.2 South Africa

Before 1994 the country had been governed in accordance with racist apartheid principles and there existed disparities in the provision of social services such as water supply. South Africa’s national water and sanitation programme is noted as one of the largest in Africa which aims to fulfill the human right to water and to achieve full sanitation and water supply coverage well in advance of the MDGs (Lane, 2004). The water supply and sanitation white paper of the South African Department of Water Affairs and Forestry (DWAF) adheres to the principles of demand-responsive delivery (Kihato and Schmitz, 2002). It indicates that water is an economic good that should be guided by the demand-driven approach and user-pays principle. Towards the end of the 1990s, it became clear that the increasing running costs of many water schemes meant that poorer people could not afford the charges with implications for sustainability and equity. In response, the government introduced a free basic water

policy which encouraged water services authorities to structure their charges for water to provide the first 6,000 litres per household per month free of charge (Muller, 2002).

The key elements of the national water and sanitation program include a clear policy and legislative framework; an implementation program which has provided water infrastructure for over 9 million people in less than 10 years; a policy of free basic water, which aims to ensure that affordability is not a barrier to access to safe water; and the devolution of responsibility from national to local government. The government believes that the program is on course to achieve full coverage of water supply and sanitation by 2010, well in advance of the MDGs, although other observers are less optimistic. The main points of concern, in moving forward, are the capacity of local government to implement the work and the financial sustainability of the free basic water policy.

The Free Basic Water (FBW) policy has been argued (Kihato and Schmitz, 2001) as being a point of departure from demand-responsive approaches which specify that water must be managed as an economic good. The provision of free basic water is seen primarily as a means for fighting poverty according to DWAF. Municipalities are to bear the responsibility for financing free basic water through internal and external revenue sources. Internal sources are generated through charges on businesses or well-off residents which are used to cross-subsidize poor areas and provide free basic water for the poor. Municipalities with inadequate internal sources of revenue finance free basic water from external sources. Each municipal receives an allocation from the national treasury known as the Equitable Share Grant. Provisionally, DWAF has suggested that 30% of the Equitable Share Grant be allocated to water services.

The free basic water policy has revealed a rift between politicians who have welcomed the policy as a good idea and technocrats who use arguments such as ‘sustainability’, ‘cost effectiveness’, ‘logistical feasibility’ and ‘capacity’ to argue against its viability. A municipality such as Durban has been successful in implementing the free water policy due to its large tax base both from middle-class consumers and industry. However, a decision to provide free basic water by DWAF with a demand responsive mandate to rural communities and the poor has brought its own problems. Still (2001) has summarized its problems into two: the first is the availability of funds, and the second is the capacity as a sector to spend those funds.

3.3.3 Mozambique

Both the Mozambican National Water Policy and Implementation Manual are based on the Demand Responsive Approach (Breslin, 2003), similar to what is practised in Ghana. Prior to the development of the National Water Policy and the subsequent Implementation Manuals, Mozambique’s water supply policies were supply-driven which did not lend its activities to sustainable services. This was because government or donors usually identified suitable projects with little or no community involvement, technologies adopted were not sustainable, responsibility for water point citing was most often dependent on local politics rather than issues of access and water committees lacked the ability to respond to technical problems. Guided by these water project failures, lack of sector capacity and a need to transfer more responsibility to the communities, the new policy suggested a dramatic new approach to water supply in Mozambique.

The National Water Policy demands of communities to initiate the project themselves and contribute 2-10% of the total cost of the water service to demonstrate their commitment to the project and their financial and organizational capacity to sustain

the project over time in keeping with DRA principles. Fears were expressed that the DRA may lead to a dramatic decline in the number of communities serviced per year. However, funds for the work, supported by WaterAid have been guaranteed to the districts over a relatively long period of time and this has raised the confidence of the district governments in helping to create demand. Multiple communication channels such as radio, drama and exchange visits are also used for demand creation and community demand expression.

However, a number of factors threaten this process. The lack of investments in government structures such as the districts to undertake regular visits to the communities to monitor the functioning of the water facilities provided. There are also interferences on the part of donors and government in the programme selection process.

3.4 DRA as a developmental tool

It was widely acknowledged in the 1980s among sector professionals that many rural water supply programs in developing countries were performing poorly (Therkildsen 1988; Briscoe and DeFerranti 1988; Churchill et al., 1987). Facilities provided were not repaired and most had fallen into non-use regardless of the type of technology utilised. It was observed that cost recovery was at its lowest, and revenues generated were often insufficient to pay for even operation and maintenance, much less capital costs. Communities did not have a sense of ownership towards their water projects, and households were not satisfied with the projects that donors and national governments installed (Whittington *et al.*, 2008). The necessary components of a DRA (also referred to as the demand-driven approach and demand-oriented approach) process differ somewhat depending on who one asks, but most would agree that project planning should

- involve households in the choice of both technology and institutional and governance arrangements;
- give women a larger role in decision-making than has historically been the norm;
- and require households to pay all of the operation and maintenance costs of providing water services and at least some of the capital costs (*ibid*).

Communities, who simply “receive” a water point by playing only a minor or symbolic role in project implementation, tend to lack a sense of ownership. The result is that millions of dollars have been wasted because communities are not committed to maintaining their water supplies (Breslin, 2003).

Demand responsiveness stands alongside community involvement as one of the pillars of rural water programs over the last decade and it marks a fundamental paradigm shift in development thought and practice especially in the rural water sector. Literature (World Bank Water Demand Research Team, 1993; Black, 1998) has indicated that the performance of low-cost rural water systems depended on healthy consumer demand. Weak consumer demand indicated that beneficiaries would not contribute toward the operation and maintenance of the facility, would not use the facility on a regular basis, and/or would not be satisfied with the facility once it was built (Thorsten II, 2007). According to Serageldin (1994) and Tamayo *et al.* (1999), neglecting demand has often placed new systems in a “low-level equilibrium trap”.

The World Bank, the International Donor Community and others who have supported the shift from the supply approach to the demand approach have argued that communities are more likely to sustain water systems if they:

- Initiate the project themselves. This shows that the community is interested in addressing their water problems;
- Make decisions on technologies, management systems, and hygiene programmes;
- Contribute cash up-front – communities must contribute between 2-10% of the total cost of the water service, to demonstrate their commitment and to highlight their financial and organizational capacity to sustain the project over time;
- Manage facilities themselves – communities must accept full responsibility for their water service, by deciding on a tariff structure and paying all operation and maintenance as well as repair costs.

Sara and Katz (1998) categorized and explained five rules to test for demand responsiveness at both the household and community level. These rules are the eligibility criteria, informed choice, technical options and service levels, cost sharing arrangements and the responsibility for investment support, as illustrated in Table 3.

Table 3: Demand Responsiveness at both the Household and Community Level

Criteria	Detail
<i>Eligibility criteria</i>	Rules for participation should be broad enough so that eligibility does not, by itself guarantee that every eligible community will receive service. Service commitments should follow, not precede, community initiative in seeking the improvement.
<i>Informed request from community</i>	The project should set up procedures to allow an adequate flow of information to the communities. Communities should be able to make informed choices about whether to participate in the project. They must know in advance the terms of their participation and responsibility for sustaining the project.
<i>Technical options and service levels</i>	Communities should be actively involved in selecting service levels. A range of technical options and service levels should be offered to communities, with the related cost and operational implications made clear.
<i>Cost-sharing arrangements</i>	The basic principles of cost sharing should be specified and made clear to all stakeholders at the outset. Cost-sharing arrangements should be designed so that the community chooses the levels of service for which it is willing to pay. Ideally, communities that demand a higher (i.e. more costly) level of service should pay more than those preferring a basic level of service.
<i>Responsibilities for investment support</i>	Rules regarding asset ownership, O&M, and on-going recovery of system costs should be established and agreed upon with all stakeholders.

Source: Sara & Katz (1998)

Demand responsiveness is an established principle in the operation of economic markets. It is considered to be better than supply driven systems because the allocation process is demand driven by consumers themselves. The economists' view is that for producers to survive and prosper in the market, they must produce commodities at a competitive cost and quality, which reduces opportunities for political influence. The benefits of demand-responsive approaches have long been realized in international development practice, primarily through water supply interventions (World Bank, 1996). According to Black (1998), the international development experience is that service providers struggle to be effective when they ignore, or try to create demand, but they have a greater rate of success if services are tailored to local consumer realities, particularly in terms of cost and service level.

DRA was developed as *the* new project approach for water and sanitation delivery during the 1990s in an attempt to improve the efficiency of service delivery and also

to make *users take key decisions about the service they want and are willing and able to pay for* (Wedgwood, 2005, p. 2). It is a model approach, developed and advocated by a number of organizations including the Water and Sanitation Programme and endorsed at the 1992 International Conference on Water and the Environment in Dublin. The approach is based on the Dublin Principles that water is an economic and social good to be managed at the lowest appropriate level. The approach emphasizes the economic value of water and sanitation, and the need to elicit and respond to effective demand, measured in terms of people's willingness to pay for a particular service. The overriding implication of these principles is that water and sanitation must be driven by demand from the users of these services (World Bank, 1997). The beneficiaries of the facility become the focus of projects and programmes, functioning as initiators, planners, implementers, managers and owners of services. In essence, a DRA means that the service should focus on what users want, are able to pay for (in terms of a proportion of the capital costs) and are able to sustain through user contributions – in-kind or cash – that cover operation and maintenance (Welle, 2008).

The key characteristics of DRA as identified by Sara (1999) are that community members make informed choices about:

- Whether to participate in a project;
- Technology and service level options based on willingness to pay.
- When and how their services are delivered;
- How funds are managed and accounted for;
- How their services are operated and maintained.

Government plays a key facilitative role, sets clear national policies and strategies, encourages broad stakeholder consultation, and facilitates capacity building and

learning. An enabling environment is created for the participation of a wide range of providers of goods, services and technical assistance to communities, including the private sector and NGOs. An adequate flow of information is provided to the community, and procedures are adopted for facilitating collective action decisions within the community.

The important point is that households and communities must be aware of the implications of any choice they make, in terms of costs and expected participation in planning and implementation. Trace (1999) proposes the need for alternative approaches other than the DRA since experiences suggests that it may be difficult to achieve total beneficiary usage of the water facility in larger and more diverse communities. This is due to the fact that marginalized groups risk being excluded because they may be unable or unwilling to participate in decision-making, or because they are unable to articulate their demand in the economic terms required (Ghosh, 1999).

To some, the payment factor of between 2.5 to 5% of total cost of the level of technology chosen by the users will only succeed in alienating some members of the community from enjoying the service. However, according to DRA, community capital cost contributions are indicators of communities' financial and organizational capacity to sustain their water points, revealing interest and ownership. A community that contributes to the up-front cost of a water system is considered to be demonstrating demand and commitment to the project. It also serves as an indicator of the community's organizational capacity to resolve any future technical and social problems. Capital cost contributions suggest that the community can gather substantial funds in future when spare parts are needed. Even though WaterAid partners explored the commonly used in-kind contribution, that is labour, building

materials such as stone, sand and water, and agricultural products, it unfortunately proved to be of no real value in terms of demonstrating sustainability.

In theory, water users are expected to form water committees to manage the upkeep of their water facilities and collect money to pay for maintenance. However, the experience of many users is that when a new water point is built, it functions over a period of time; then malfunctions for another year or two, and finally breaks down. Even if users manage to undertake minor repairs, they struggle with major ones (RWSN, 2010). What is becoming clearer is that where a committee is established, it usually needs backup support from external agents such as a local authority or local NGO in order to remain motivated and to be able to retrain or train new committee members and caretakers. It is also very important to note that even good community management structures cannot guarantee effectual handling of the infrastructure if they have not been properly trained and or are hampered by lack of access to spare parts or skilled technical services (*ibid*).

According to Sara and Katz (1998), the most compelling argument in support of the demand-responsive approach is that an expression of demand is an expression of value. This is because when a person is willing to give up valued resources in exchange for a service, it indicates that the person values that service. If this value at the community level is greater than or equal to the cost of providing and maintaining the service, one can assume the community will be willing and able to maintain the service and where the value placed on the service is less, it is likely that the community will not be willing to maintain the system over the long term (*ibid*).

The experiences with the DRA have at best been mixed (Hoering and Schneider, 2004). This is due to the introduction of user fees that can hardly cover for operations and maintenance (O&M) and therefore resulting in unsustainable management of

facilities hence break down. Problems and conflict have been expected when the approach is scaled-up to cover larger areas. Although some progress has been made compared to earlier supply driven centralized approaches to rural water supply due to elements such as decentralization, participation and orientation towards appropriate, affordable technologies there are serious doubts whether this will work under the conditions of rural social, economic and political inequalities and power relations (*ibid*).

3.5 Decentralization

According to Bohman (2006), institutional change within the Ghanaian water supply sector during the post-independence era mirrors international policy trends where power is moving out from the state in different directions and responsibilities are gradually hived off from the central organization to local authorities or other agencies working on specific issues. Decentralization of social services, including education, health, agricultural advisory services, and rural infrastructure (rural roads, water, electricity, and so on) is rooted in the larger decentralization processes that are occurring in the sub-Saharan Africa (SSA) region (Bashaasha *et al.*, 2011), though the motives of decentralization differ across countries (Naidoo, 2002).

Subsequent to the implementation of Ghana's Decentralization Act in 1988 as part of a national reform, Ghana's structure and strategy of its rural water supply sector and its responsibilities has been transferred to the District Assembly and communities (Engel *et al.*, 2005). Ghana is noted as one of the first countries to introduce a community-based approach to rural water supply on a large scale (*ibid*).

Basic services such as health, education, water and sanitation, all of which were the full responsibility of the state have been failing systematically over the decade – and

failing, especially, poor people - and Governments of especially developing countries such as Ghana are falling short of their responsibility to ensure adequate health, education, water and sanitation to their people (World Bank, 2003). Decentralization of government has been a major policy direction of the World Bank and IMF as an adjunct to the Structural Adjustment Programme (Kyei, 2000). Decentralization was recommended on the basis that it would enhance decision making processes and increase participation by the beneficiary communities at the local level. This will result in decisions better suited to the needs of the people and eliminate or reduce issues of corruption and clientelism which came along with centralized government. Proponents of decentralization argue that the ills of centralized government include corruption, clientelism and political alienation and that these can be cured by decentralization of power from central government to sub-national governments (Faguet, 2000).

Article 240 of the 1992 constitution specifies that Ghana shall have a system of local government and administration which shall as far as practicable be decentralized. Additionally, *'there shall be established for each local government unit a sound financial base with adequate and reliable sources of revenue'*. The broad functions of the District Assemblies as spelt out in the Local Governance Act, 1993, (Act 462) are as follows:

- Responsible for the overall development of the district and shall ensure the preparation and submission through the Regional Coordinating Council;
- Formulate and execute plans, programmes and strategies for the effective mobilization of the resources necessary for the overall development of the district;

- Promote and support productive activity and social development in the district and remove any obstacles to initiative and development;

In addition, Section 10 (4) of Act 462 requires the District Assembly to undertake necessary measures to execute approved development plans of the district. Legally, administratively and policy wise, the District Assembly is therefore a key partner in all development activity including water and sanitation (Owusu *et al.*, 2009).

Rondinelli (1981) defines decentralization as the transfer of authority in public planning, management and decision making from the national level to sub national levels. According to Ayee (1994) decentralization is a vital tool in governance and because of this the Government of Ghana in 1988 introduced a decentralization programme based on governmental values such as empowerment, equity, stability, accountability and checking of rural-urban drift. Since the decentralization of government in Ghana, efforts have been made to ensure that local governments, specifically at district, municipal, and sub-country levels drive the agenda for public service provision. De Wit (1997) is of the view that decentralization empowers vulnerable groups to get involved in the development process. According to Rondinelli (1981), “by creating alternative means of decision-making, decentralization can offset the influence or control over development activities by entrenched local elites who are often unsympathetic to national policies and insensitive to the needs of the poor groups in rural communities” (p. 136). Notwithstanding its varied problems, Manor (1997) argues that when decentralization works well it has much to recommend and it “points to its particular value in promoting development and assisting remote, underdeveloped and under-represented groups” (p. 2). The essence of decentralization as advocated by the World Bank and

the IMF rest largely on allocative and efficiency considerations which have been summarized by Tanzi (1995) below:

- Decentralization induces competition among jurisdictions. This is likely to produce the same kind of allocative benefits as a competitive market brings to the private sector.
- Decentralization allows experimentation in the provision of output. The outcome is also likely to be a quality improvement in the provision of services. It may generate a smaller public sector and a more efficient economy and expand the possibilities for increased participation.
- Decentralization promotes accountability through clearer and closer linkages between the benefits of local public services and the cost of these benefits.

Writing on the decentralization process in Uganda, Muriisa (2008) identifies five measures one can use to identify levels of achievement: efficiency, economy, effectiveness, performance, and accountability. Efficiency measures the extent to which output is maximized using minimum resource inputs. Two types of efficiency may be considered: allocative efficiency, which considers a match between public service and local needs, and productive efficiency, which considers a match between provision of the public service and its costs, improve accountability and reduces levels of red tape. Economy refers to production using the cheapest means. In competitive tendering, it is assumed that resource inputs are obtained from the cheapest source while services are provided by the lowest bidder. Effectiveness measures the extent to which the original objectives and policy goals are achieved.

Accountability concerns the one to whom the officials account. There are two forms of accountability: political accountability in which the elected representatives account

to their electorates, and administrative accountability – the extent to which managers and leaders achieve set targets. Usually, the focus is on the extent to which targets are achieved within the limits of the budget. Understanding the accountability relations between clients, service providers and politicians is essential to understanding how governance reforms can improve service provision (World Bank, 2003). As set in the 2004 *World Development Report: “Making Service Work for Poor People”*, it is possible to assess and approach service delivery through an accountability model for service delivery that includes three groups of stakeholders: (i) citizens, as clients, influence policymakers; (ii) policymakers influence service providers, which in turn (iii) deliver services to the citizens who are also clients of the services (Commins, 2007). The World Bank Accountability Framework (WBAF) as illustrated in Figure 2 has been popularly applied especially to health and education and in decentralized settings.

Figure 2: World Bank Accountability Framework (WBAF)



Source: *World Bank (2003)*

Decentralization adds an additional layer of complexity to the framework (Akramov and Asante, 2009). There are two ways of clients (beneficiaries) holding service providers accountable for performance. The first option is to interact directly with the management of organizations providing the service through their community-based organizations. This option is referred to as the short route of accountability. The

second, referred to as the long route of accountability, is the case where clients or community-based organizations hold accountable their political representatives, who then hold the service provider accountable. When there is a breakdown of any of these relationships, service delivery failure results. For instance, service failures may occur when citizens are unable to influence public action through the long route of accountability. Service failures also occur when there is non-payment of salaries to service providers or when there are difficulties in implementing services, such as poorly trained artisans.

The DAs are responsible for the selection of beneficiary communities and the contracting of private companies to provide the goods and services needed for the implementation of the water services. In order to ensure transparency, beneficiary applications are vetted and prioritised for implementation as and when funds become available. Evidences from both developed and developing countries show that organizing rural users with representative local committees and joining these representatives into water user associations can provide important elements for mutual support and the sustainability of quality services.

The responsibility to plan, implement and coordinate the delivery of water and sanitation services lies with the district assemblies as required by the decentralization policy. However, these responsibilities are not accompanied by the necessary support, guidance and resources for the district assemblies to work properly. The limited human capacity management at the DA level and the low technical knowledge of water and sanitation issues present great challenges to decentralization (WaterAid, 2006). The resources needed to promote decision making to the door step of the rural communities and thereby enhance their capacity to plan, implement and manage developmental projects that affect their livelihoods are lacking, inadequate or

delayed. Most districts are unable to implement their programmes and projects set out in the district development plan with consequences of unappreciable and unimpressive growth and development of the district (WaterAid, 2006).

Although decentralization has advantages, there are serious challenges to its effective application. Some of these challenges according to Bashaasha *et al.* (2011) are financing, human resource capacity, and elite capture. Low financial resource base is of most importance because all activities performed by local governments require adequate financial resources. The shortage of qualified and knowledgeable staff to deliver public services and the lack of training opportunities to develop professional and technical expertise has a toll on the human resource capacity situation of the district assemblies. This is constrained further by low staff retention and a relatively low salary leading to low staff morale, as it is also exacerbated by shortage of equipment and logistics. A sufficiently professional and well-trained staff is essential for Local Governments (LGs) to realize their potential for serving their communities. Lastly, the transfer of more political and administrative power could likely create an avenue for abuse which results in corruption. It could also lead to the poor, the women, the disable, the less politically favoured and other minorities being marginalised except measures are explicitly put in place to deter such a situation.

They (*ibid*) recommend that, to enhance sustainability and to anchor firmly the benefits of decentralization, the education, sensitization, and increased involvement of service receipts (beneficiaries) in planning and executing service delivery programmes must go hand in hand with capacity building for effective service delivery.

3.6 Community Participation

Beneficiary participation is more significant than any other factor in achieving functioning water systems and in building local capacity (Narayan, 1995) and therefore should just not be paid lip service. In cases where the best principles of community participation are taken seriously and implemented effectively, a solid foundation is created for subsequent sustainability (Carter and Rwamwanja, 2006). The cornerstone of community-based development initiatives is the active involvement of members of a defined community and although participation can occur at many levels, a key objective is the incorporation of local knowledge into the project's decision-making processes. When potential beneficiaries also make key project decisions, it leads to better designed projects, better targeted benefits, more cost-effective measures and timely delivery of project inputs, and more equitably distributed project benefits with less corruption and other rent-seeking activities (Mansuri and Rao, 2004). The involvement of the intended beneficiaries in the key decisions of any project is important in ensuring that outcomes reflect the needs and wishes of the people for the service to be provided (Ezati, 2001).

Kumar (2002) identifies participation as a tool to empower users of a facility to determine their own destiny. He developed a typology of participation with reference to definitions dating back from the 1970s to the 2000s as shown in Table 4.

Table 4: Typology of Participation

Citation	Definition of Participation
<i>ECLA 1973</i>	Voluntary contribution by people in public programmes designed to contribute to national development but people are not expected to take part in shaping the programme or in criticizing its contents.
<i>Cohen and Uphoff 1977</i>	Includes people's involvement in decision-making processes programme implementation benefit sharing and involvement in the evaluation of programs and interventions.
<i>Conyers 1981,</i>	Participation is means for obtaining information about local conditions needs and attitudes and eliciting beneficiary commitment to the process.
<i>Paul 1982</i>	Participation is an active process by which beneficiary or client groups influence the direction and execution of a development project with a view to enhance their well-being in terms of income, personal growth, self-reliance or other values they cherish.
<i>Schneider and Libercier, 1995</i>	A 'people-centered process' demand-driven by being ultimately based on dynamics perception priorities capabilities and resources of the people
<i>Narayan 1995</i>	A voluntary process, by which people including the disadvantaged (in income, education, gender, ethnicity, influence or control over the decisions that affect them) exercise voice and choice.
<i>World Bank 1996</i>	A process through which the public influences and shares control over development initiatives, decisions, and resources which affect them.
<i>Guijt and Shah 1998</i>	The broad aim of participatory development is to increase the involvement of socially and economically marginalized peoples in decision-making over their own lives.
<i>Blackburn et al. 2000</i>	Participation means enabling people to realize their rights to participate in and access information for the decision-making process.

Source: Kumar (2002)

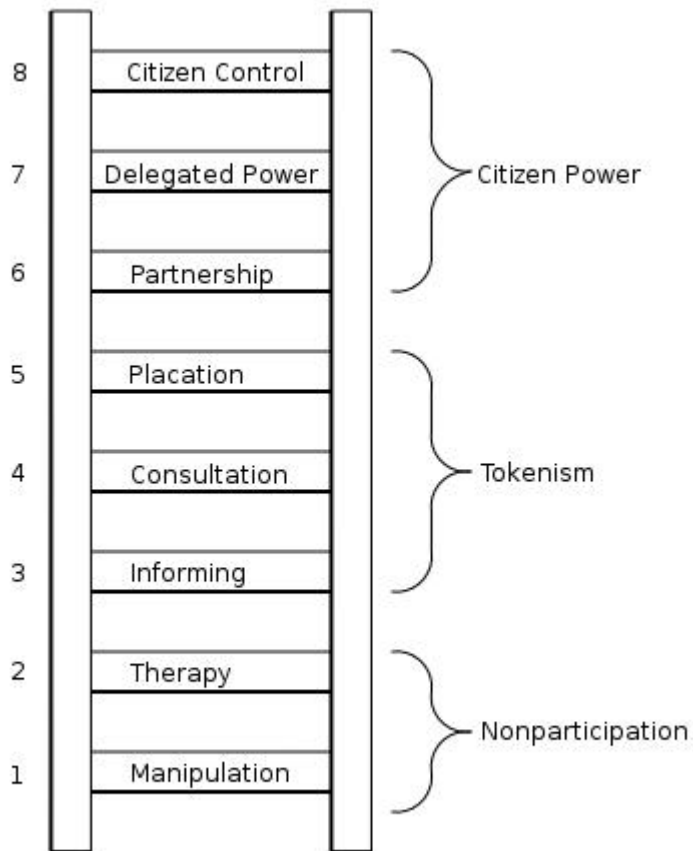
Gine and Perez-Foguet (2008) are of the opinion that community participation has gained widespread acceptance as a prerequisite for sustainability. It is also hailed as central to the provision of essential services like clean water facilities to underserved communities in developing countries (Gbedemah, 2010). Participation is defined as “a process through which stakeholders” influence and share control over development initiatives, and the decisions and resources which affect them” (World Bank, 2004). It is also viewed as “*the basis for project success*” (Thwala, 2010, p. 971).

The objectives of community participation according to Thwala (2001) are empowerment, building beneficiary capacity, increasing project effectiveness, improving project efficiency and project cost sharing. He also identifies four levels of intensity of participation, namely: information sharing, consultation, decision making, and initiating action. Community participation generally is more successful when the community takes over much of the responsibility than when higher level public agencies attempt to assess consumer preferences through surveys or meetings (Thwala, 2001).

Community participation focuses on the view that involving beneficiaries of services in decision making about their communities has important social, economic and political benefits. In the 1980s and beyond for a variety of reasons, public sector donors, policymakers, as well as NGOs emphasised the value and potential benefits of participatory approaches. Their interest in community participation emerged mainly from the failures in state-led development. The risk with an approach to economic development or service delivery that focuses too much on 'community participation' is that it may idealise the internal coherence and solidarity in communities, and miss the essential tasks of supporting effective, accountable and transparent public institutions (Commins, 2007). Also, community participation involves much more than the direct delivery of services and key is how different types of participation may contribute to enhancing both short and long term routes of sustainability and accountability. Community participation processes comprise an identification of stakeholders, establishing systems that allow for engagement with stakeholders by public officials, and development of a wide range of participatory mechanisms (*ibid*).

Arnstein (1969) contends that participation is power, but that there is a critical difference between going through the empty ritual of participation and having the real power needed to affect the outcome of the process. Assessing the types of participation and nonparticipation, Arnstein (1969) suggested a typology of eight levels of participation using a ladder technique to help in the analysis of this issue. The eight types are arranged with each rung corresponding to the degree of citizens' power in determining the end product as illustrated in Figure 3. She is of the view that though the typology uses examples from federal programmes such as urban renewal, anti-poverty, and Model Cities, it could just as easily be illustrated in other issues since "the underlying issues are essentially the same – "nobodies" in several arenas are trying to become "somebodies" with enough power to make the target institutions responsive to their views, aspirations, and needs". There is an acknowledgement that in reality there might be 150 rungs with less sharp and "pure" distinctions among them with some characteristics used to illustrate each of the eight types being applicable to other rungs.

The eight types of participation are as the ladder goes up, manipulation, therapy, informing, consultation, placation, partnership, delegated power and citizen control as illustrated in Figure 3. At the topmost, beneficiaries obtain the majority of decision making or full managerial power. Understandably, the eight-rung ladder is a simplification, but it helps to illustrate that there are significant gradations of citizen participation and knowing these gradations makes it possible to understand the increasing demands for participation.

Figure 3: Arnstein's Model of Participation (1969)

Source: Arnstein (1969)

True participation begins where 'Partnerships' enable negotiation and share decision-making responsibility. Arnstein (1969) considers that partnership engagement is most effective when participants have an organized and resourced base from which to work, and to which they are accountable. To achieve the full benefits of the DRA, the level of participation of beneficiaries should be at the 8th level to be empowered to partake in the planning, implementation and management of the water facilities. DRA in theory should find participation of citizens on the 8th ladder where they are fully empowered to engage in the planning, implementation and management of water facilities.

Skinner (1995) also looked at what individuals and communities were actually involved in within participative partnerships as a tool to categorize participation. Within an effective participative structure, roles and responsibilities will be clear and transparent. He suggests that a community will adopt five roles if it is fully participating within a regeneration programme. Within these five roles, community members will act as:

- beneficiaries of the programme and users of services
- consultees and representatives of local opinion
- the source of general community activity
- the source for the delivery of regeneration programmes
- potential long term partners in regeneration.

Through analysis of the exchange of power, and observation of Skinner's five roles, it is possible to make an assessment of the level of community participation within any given programme. DRA without beneficiaries playing full participatory roles will defeat the purpose for a shift from the supply driven approach.

Successful implementation and sustainability of a DRA project depends on the effective participation and co-operative of all stakeholders at all levels and across sectors by creating co-ordination at the state level, devolving responsibility at the district assembly level, promoting management at the community level, and developing human and institutional capacities. However, the idealized transformatory capacity of participation has been challenged on several grounds (Mansuri and Rao, 2004). First, it may involve real or imputed financial losses due to the time commitments required for adequate participation and also lead to psychological or physical duress for the most socially and economically disadvantaged because

genuine participation may require taking positions that are contrary to the interests of powerful groups. Second, making participation a prerequisite has made it an instrument for promoting pragmatic policy interests, such as cost-effective delivery or low-cost maintenance, rather than a vehicle for radical social transformation. Participation has been described (Bowen, 1986; Ribot, 1995) as a form of forced labour with the poor pressured into contributing far more than the rich. Lastly, the perception that participation will lead to the transformation of the attitudes and implementation styles of bureaucracies may be gullible. It rather leaves the implementers unclear about what they stand to gain from this new accountability.

Mosses (2001) maintains that instead of outsiders (donors and government) listening to and learning from the beneficiaries, it is rather the beneficiaries who learn to say what the outsiders want. He identifies four facets of what has been identified as participation in projects. He finds that even projects with high level of participation have concealed underlying politics. Firstly, he observed that participatory exercises are organized publicly for the beneficiaries who end up making the procedure, often shaped by local relations of power, authority and gender. Secondly, it is the agenda of outsiders that are articulated as local participation. The “needs” of the beneficiaries are often fashioned by the perception of what the outsiders can deliver. Thirdly, there is a local conspiracy in the planning exercise to create space within which they can manipulate to serve their own interest. Fourth, the concept of participation is used to legitimise previously established priorities and the needs of donors which have little real support from the community; thus, demands eventually take over and participatory objectives and goals are sidelined.

The preconditions of community participation in the management of water resources that build the facilitating atmosphere in which community management can occur

are identified by McCommon *et al.* (1990). Some of these preconditions are stated below:

- There must be community demand for improved system. The information required to make informed decisions must be available to the community.
- Technologies and levels of service must commensurate with the community's needs and capacity to finance, manage, and maintain them.
- The community must understand its options and be willing to take responsibility for the system.
- The community must be willing to invest in capital and recurrent costs.
- The community must be empowered to make decisions to control the system.
- Effective external support must be available from governments, donors, and the private sector (training, technical advice, credit, construction, contractors etc.).

According to Richards *et al.* (2004), participation becomes much more difficult and may fail where there is a history of conflict, one stakeholder dominates, the process lacks a clear purpose or goal, and the process has unrealistic goals. Other reasons for failure are when there are unreconciled differences in philosophy and ways of working, there is a lack of communication, there is an imbalance of power and control, stakeholders are missing from the discussion, the process has any hidden agenda, and the perceived costs outweigh the perceived benefits. They recommend that there should be a reflection on the reasons for the failure and learn from past experiences and also ensure all stakeholders have an equal access and capacity to participate instead of merely participating. Richards *et al.* (2004) also advise the

demonstration of commitment from the top by using internal champions to develop appropriate and realistic targets.

3.7 Sustainable management of water facilities

According to Breslin (2003), sustainability is the touchstone by which DRA must be judged. The most popular definition of sustainability is drawn from the 1987 report of the U.N. World Commission on Environment and Development (also known as the Brundtland Commission) which defined it as “*meeting the needs of the present without compromising the ability of future generations to meet their own needs*”. International Reference Centre (IRC, 2003) also defines sustainability as the satisfactory functioning and effective use of services, and equity as everyone (men and women, rich and poor) ... having equal access to benefits from projects. The definition states further that a system that reliably and sustainably meets the needs of 80% of the population while leaving the poorest 20% un-served cannot be counted as successful. The incorporation of a measure of social equity in the definition reflects access to basic services such as water and sanitation as a fundamental human right. Sustained beneficial outcomes from water and sanitation interventions can be defined as outcomes which benefit the people, giving them a better quality of life in a way that is continued over time, and establishing within the community an expectation for a quality of service that will be expressed as an actionable demand if the service is interrupted or removed. Sara and Katz (1998) define sustainability as “the maintenance of an acceptable level of services throughout the design life of the water supply system”.

Montgomery *et al.* (2009), propose that (1) effective community demand, (2) local financing and cost recovery, and (3) dynamic operations and maintenance are the three universal and necessary components of sustainability. Demand must be derived

from the community members themselves and the community must be willing to sustain the facility by paying for the use of the facility for effective and continuous operation. If demand for the service is fragile, the prospects for sustainability can be totally undermined. Such circumstance occurs when community members have alternative water sources which are easier and less costly to manage (WaterAid, 2011). Communities must therefore need the improved water service in preference to what they already have. There must also be in place a management system that will adequately maintain the facility.

Effective community demand is the basis for understanding and prioritizing community and household water and sanitation needs. It is fostered by a demand-responsive approach and related participatory planning methods that result in systems based on what individuals want, what they are willing to pay, and what they are able to sustain (Chambers, 1994; Ramaswami *et al.*, 2007).

Local financing and cost recovery refers to local access to capital and savings. Dynamic operation and management includes establishing supply chains, conducting monitoring and evaluation, and collaborating with internal and external organizations for on-going technical training and support, as well as hygiene and sanitation advocacy (Harvey and Reed, 2004; McConville and Mihelcic, 2007).

The concept of maintaining a service or benefit over time is not new, and sustaining the results of any investment has been the focus of attention in a wide variety of disciplines over many years (Gebrehiwot, 2006). Carter *et al.* (1999), on the impact and sustainability of water and sanitation systems, believe that the reason a significant number of projects in the sector were failing was because of a poor understanding of issues that could lead to sustainable outcomes. A sound analysis of impact must therefore include:

- “a clear understanding of the present water and sanitation problems faced by communities;
- an identification of the potential benefits which can be delivered by improved infrastructure;
- observation of the actual benefits experienced by users and consumers;
- and a quantification of the magnitude of beneficial impact achievable in practice.”

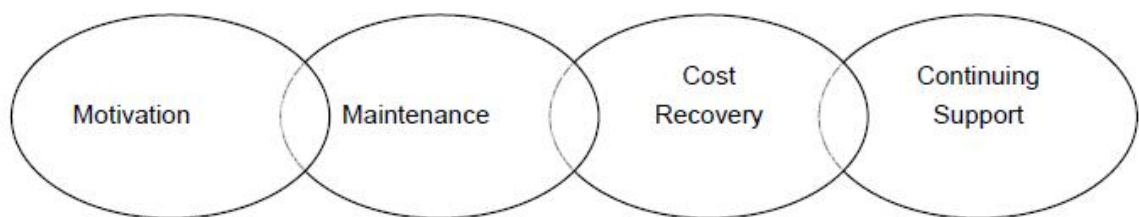
A sustainability analysis must also include a pragmatic definition which involves an understanding of the component elements of strategies for sustainability and an understanding of what impacts can be achieved for the planning and management of development projects.

Sustainability is safeguarding that beneficial change in access to water services translates to a corresponding long-term outcomes and impacts in the lives of people who use the facility. These long-term outcomes and impacts when realized must be maintained and enhanced. If communities slip back into a situation where they have to rely on unimproved and unhealthy water services then investments have effectively been wasted (WaterAid, 2011). There are three particularly important inter-related reasons why the realization of sustainability poses a challenge to the water, sanitation and hygiene (WASH) sector (WaterAid, 2011). These are limited capacity, inadequacy of financial revenue, and the historical approach to service delivery of different actors in the WASH sector. Communities, local government institutions and other service providers in WASH lack the needed training and expertise to efficiently manage the facilities after they have been implemented. Inadequate funds are a

challenge to covering the full cost of operation, maintenance, and capital maintenance which is essential for the continuous use of the facilities. Little or no coordination among the different players in WASH sector continues to frustrate progress made in the sectors due to competing agenda and a general disregard or lack of understanding of government policies.

Carter *et al.* (1999) suggest that the issues important to the sustainability of community water supply could be illustrated by the analogy in Figure 4 of a chain with four essential links; the failure of any one of these links result in the failure of the whole chain.

Figure 4: The sustainability chain



Source: Carter *et al.* (1999)

Beneficiaries will manage projects to ensure sustainable outcome when motivated to do so. They must be made to believe that the new facility provided is preferable to the traditional style of getting water or managing waste. For instance, health education and involvement of the community to the extent of vesting ownership in them is necessary to bring about motivation. Maintenance is an important item in ensuring sustainability because it avoids unnecessary delays in repairs to forestall beneficiaries of broken down water and sanitation facilities reverting to the former lifestyle of patronising poor water and insanitary waste disposal attitudes. Therefore, a clearly structured and trained maintenance organization (caretakers or committee) from

within the community is necessary. Cost recovery is important in generating necessary funds for the smooth operation and maintenance of the project. For continuing support, it is essential that the supporting government or NGO should maintain responsibility for follow-ups. This is necessary and should continue until there is such a time that beneficiaries obtain a “*critical mass*” of good practice and may find it difficult to revert to old poor practices. Simply put, “*short term projects fail*”.

Bagamuhunda and Kimanzi (1998) observe that community enthusiasm for keeping water committees functioning for adopting hygiene practices and continuous collection for recurrent expenses can wane within two or three years of construction. It is advisable that supporting governments or NGOs maintain responsibility for follow up.

There are three particularly inter-related reasons why achieving sustainability has posed as a challenge to WASH (WaterAid, 2010). The first is the limited capacity (in the sense of knowledge, skills and material resources) of communities, local government institutions and other service providers to manage the water facilities. The second is the insufficiency of financial revenues to cover the full operation, maintenance, and capital maintenance costs of infrastructure. The third relates to the historical approach to service delivery of different actors with competing agenda in WASH. There has been a general disregard or lack of understanding of government frameworks.

3.8 Empirical Studies

Ezati (2001) undertook a study which looked at the equity differences in water provision in the Uganda towns of Luwero, Wobulenzi and Busia. The study aimed at establishing how the approach of demand responsiveness was used to guide the

implementation of decisions and to also find the differences in access to safe water resulting from response to demand. The study was limited to the town settings where the demand driven approach had been applied under the Small Towns Water and Sanitation Project (STWSP) and also towns with low safe water coverage. The study used both quantitative and qualitative research methods. He concluded that the application of the Demand Driven Approach (DDA) was found to have negative equity implications for the poor who could not afford to pay for the service. Although this approach is feasible in terms of the current water demand and prospects for sustainability, it requires some shielding with local organisations like town councils to provide loan facilities for timely implementation. He recommends that agencies involved in water provision take into account the limits of a demand-based approach and the differential impacts it engenders.

Using empirical data on local leaders, Yan *et al.* (2010) in a study of the opportunities and challenges of community-based rural drinking water supplies show that leadership matters for the provision of safe drinking water. Their paper was based on the analysis of two survey datasets of WATSANs and households in rural Ghana. Other findings were that communities that have a higher level of existing community groups are more likely to have functioning WATSANs, while ethnically diverse communities are less likely to have these organizations. The paper also indicates that WATSANs have a positive and effective effect on the mobilization of payment for water services particularly with female leaders.

A study of rural water system sustainability of community-managed water systems in Saramaka communities by Smith (2011) showed that technical adequacy is the first and most critical factor for long-term sustainability of a water system. It also showed that technical adequacy is dependent on the appropriateness of the engineering design

for the social, cultural, and natural setting in which it takes place. The study investigated the water use of the communities, the current status of the water supply systems, histories and sustainability of the water supply projects, technical reviews, and community perceptions. The investigation used a combination of qualitative and quantitative methods, coupled with ethnographic information, to construct a comprehensive overview of three rural water supply systems constructed in Saramaka villages in the interior of Suriname. From this overview, factors important to the sustainability of these water systems were identified. The study concluded that the complex relationships between technical adequacy, community support, and the involvement of women play important roles in the success of water supply projects and also addressing these factors during the project process and taking advantage of alternative water resources may increase the supply of improved drinking water to rural communities.

Individuals may have different perceptions of how development interventions meet their well-being. Using the Volta Rural Water Supply project in Ghana as a case study, Arku (2010) found that women and men were able to save considerable amount of time by having easy access to clean water through the project, and also use of time saved corresponded to their well-being indicators. Women, more than men, were found to spend their saved time on activities that provide common benefits to the entire household. Further, as women increasingly spend longer hours trading at the market due to time savings, their financial position within the household and the general standard of living of the household improve. Arku (2010) recommended that a balance of economic opportunities for both men and women, fee breaks and in-kind purchase of water, be encouraged in order for water projects to effectively advance rural people's well-being.

Keshavarzi *et al.* (2006) undertook a study to determine the relationship between water consumption and rural household activities by comparing a snapshot of water consumption with rural household behaviour of low, medium and high water consumers in rural Iran. Factors affecting water consumption in rural households are also determined using daily consumption data for a 5-year period (1999-2004). Results of the study revealed that the daily average water consumption for the area was 121.7 l per person per capita per day (Lpcd) (SD^{1/4} 59.2). Water consumption was also found to be significantly correlated with explanatory variables such as ‘‘household size’’ and ‘‘age of household’s head’’. Finally, they conclude that the relationship between household’s head education and water consumption was found to be negative.

Although there has been a wide acceptance of the idea that ‘‘sense of ownership’’ among users is critical to water infrastructure sustainability in developing countries, little is known about what sense of ownership is, or its drivers. Marks and Davis (2012) presented a novel measure of sense of ownership for piped water systems using empirical data collected from 1140 households in 50 rural Kenyan villages. Their study established an empirical referent for households’ sense of ownership and found that some, but not all, types of participation enhance community members’ sense of ownership for rural water projects. Not surprising however that was, households that obtain water from their community’s piped system on a regular basis have significantly stronger ownership feelings than households using other water sources. A strong and significant association was also observed between sense of ownership and having an individual water connection.

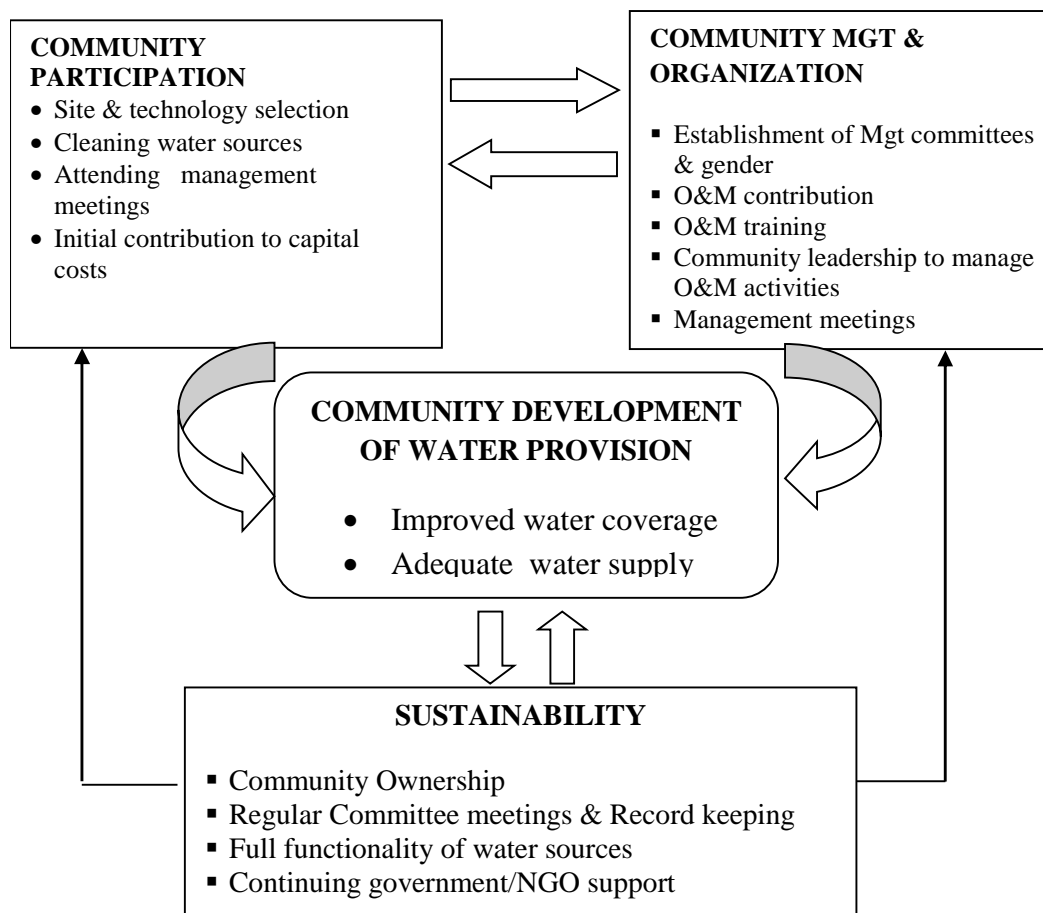
3.9 Conceptual Framework

The conceptual framework as illustrated in Figure 5 shows a review of rural water supply and sustainability. This model, set out here in terms of rural water services, can provide an understanding of the necessary components for sustainable water and sanitation services, and for sustained hygiene practices, with relevant modifications for this sub-sector (Koryang, 2011). The framework in totality represents a number of important factors, which are shown in the literature reviewed. Literature reviewed has indicated that community participation enables communities to contribute towards acceptable and affordable technologies which make communities develop an interest in the operation and maintenance of their water facilities to make them sustainable. Without participation, communities lack a sense of ownership to the facility and therefore will not take care of it properly. Community management, according to Evans and Appleton (1993), builds on long experience of community participation, but goes much further by putting people in charge of their own water systems in a flexible partnership with supporting agencies.

Community management gives users the legitimate authority and effective control over management of facilities through the formation of active water and sanitation committee and other O&M aspects as highlighted in Figure 5. The critical relationship or ideal CM practice in various actors' inputs through participatory process and organization will lead to positive outcomes and eventually sustainability. Therefore in adherence to effective O&M requirements there will be increased access and sustainable rural water supply in communities. Even though McCommon *et al.* (1990) have indicated that community participation does not necessarily guarantee sustainability, the WHO (2003) indicates that experience in the water and sanitation sector has shown that there is a relationship between the level of community

organization, empowerment and autonomy (participation and management) and the level of sustainability of water and sanitation interventions. Finally, sustainability is achieved when there is a strong and continuing government and donor support. These supports are needed for the relevant policy, legislative and financial resources to favour community management of water facilities.

Figure 5: Conceptual Framework showing linkage between Community Participation, Community Management, and Sustainable Management of Water Facilities



Source: Koryang (2011)

3.10 Conclusion

DRA is a rural policy for water service delivery in Ghana which is embedded in neoliberal principles and implemented by the CWSA through the process of decentralisation. Its introduction was necessitated by the failure of centralised supply driven approaches to ensure sustainable water delivery. It was introduced against the backdrop that the involvement of the intended beneficiaries in the key decisions of any project is important in ensuring that outcomes reflect the needs and wishes of the people for the service to be provided.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This chapter comprises the study area, research design, data collection and sampling procedure. The chapter also provides insights into the methods of data analysis.

4.2 The Study Area

The study was conducted in the Shai-Osudoku District (SOD) with its capital in Dodowa. The district is located on latitudes 5°54' and 6°05' North and longitudes 0°05' and 0°20' West. Its vegetation is the sub-sahelian type with short grass savannah interspersed with shrubs and short trees. There are light forests with tall trees along the foothills of the Akwapem Range with tall swampy grass and tall grass savannah in the Volta flood plain (Shai-Osudoku District Development Plan, 2013).

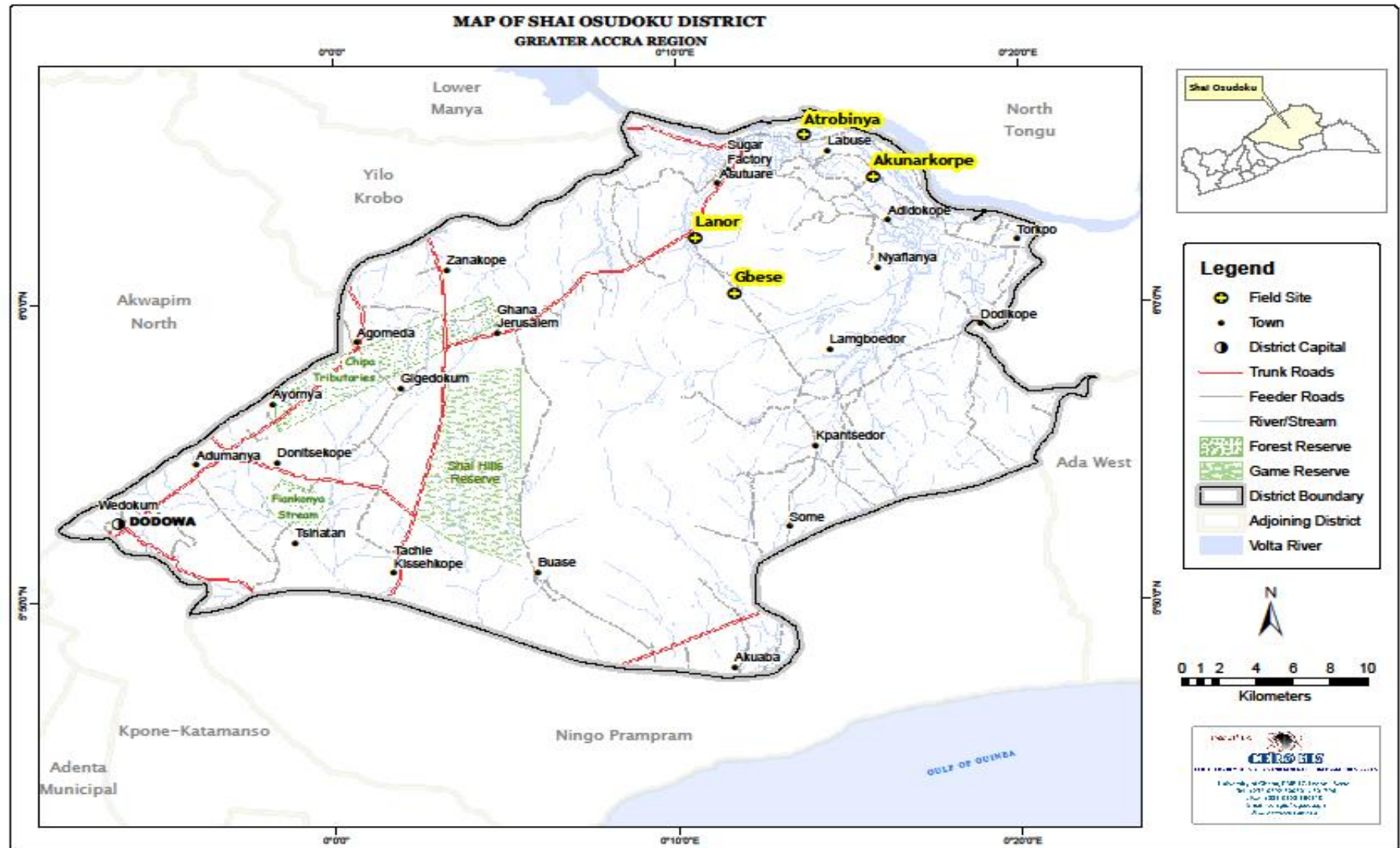
The district is bordered at the north-east, north-west, west, south-west, south and east by North Tongu, Yilo and Manya Krobo, North Akwapem, Kpone-Katamanso, Ningo-Prampram and Ada West Districts respectively as shown in Figure 6. The district comprises 4 town/area councils namely Dodowa, Ayikuma, Osuwem and Asutsuare area councils. Of these 4, only Dodowa is a town council with a population of over 5000 people. The rest are classified as area councils because of their rural status. The district is the largest in the Greater Accra region of Ghana and occupies 21% of the region's landmass. It was re-demarcated in June 2012 from the then Dangme West District. The projected 2012 population stands at 75,525 with men constituting about 48.2% and women representing 51.8%. There are a total of about 145 communities located within the district. The district is mostly rural (76.4%) with urban areas representing only 23.6%. About 74.7% of the population is Christian with Muslims and other religions constituting 4% and 21.3% respectively. It is

predominantly a Dangme speaking area with other tribes such as Ewe, Akan and Northern descent in the minority (SOD, Development Plan, 2013).

About 65% of the labour force is engaged in crop farming, fishing, livestock and forestry activities with cassava, rice, maize, pepper and mango being the major crops cultivated. Other non-agricultural activities engaged in are charcoal production, mining/quarrying and bee-keeping. Most streams take their source from the Akwapem range and are mostly seasonal. Water coverage at the district stands at 72% (pipe-borne and borehole) with 28% being other sources such as rivers, dams, canals and streams. The major developmental challenges of the district are high poverty levels, subsistence agriculture, lack of employment avenues outside agriculture and inadequate sanitation facilities, among other challenges (SOD, Development Plan, 2013).

In terms of education the district has 48 public pre-schools, 49 public primary schools, 35 public junior high schools, 5 senior high schools (3 private, 2 public) 2 integrated community centres for employable skills (Dodowa and Agomeda), one vocational school (Kordiabe) and a secretarial/accountancy school (Ayikuma). Health-wise, the district has one district hospital (Dodowa), 5 CHPS zones (Agomeda, Ayikuma, Agortor, Osuwem, and Tokpo), one health centre (Osudoku), one private maternity home (Dodowa) and one quasi-government health centre (Kordiabe). The district can also boast of one first class road (Tema-Akosombo road), six second class roads with one in a good condition (Adenta-Dodowa road) while the remaining 5 are in fairly good conditions. The district as well has one post office (Dodowa) and 2 postal agencies (Agomeda and Kordiabe) ((SOD, Development Plan, 2013).

Figure 6: Provisional Map of Shai-Osudoku



4.3 District Water Supply

The Ghana Water Company Ltd. and the Community Water and Sanitation Agency supply potable water to the district. It is estimated that 34% of the inhabitants in the 231 settlements have no access to potable water. A total of 18 towns have access to pipe borne water while the inhabitants in the remaining towns depend on wells, boreholes and other resources for water. The main treatment plant is at Kpong. Water from this source supplies the district as well as Accra, the capital city. The main 21-inch distribution line leads to Ashiaman en-route to the capital. On this line, settlements within the district including Prampram, Afiencya, Dawenya as well as Old and New Ningo are serviced. Other communities including Dodowa, Ayikuma and Agomeda in the east are also serviced from the Kpong works; however, their service is via a booster station located at Akole, which also supplies water to the Akwapem Ridge through a 16-inch feeder. The capacity of the Akole reservoir is 100,000 gallons per day (retrieved from www.ghanadistricts.com on 8th April, 2014).

The Osudoku Water Scheme has been completed to supply water to communities in the Osudoku Traditional Area whilst about 29 communities are to be connected to the 3-Districts (Dangme West, Dangme East, North Tongu) Water Scheme currently underway with support from DANIDA/ Community Water and Sanitation Agency. The number of standpipes within communities that currently enjoy pipe borne water indicates that 19 out of the 41 public standpipes are currently functioning while 22 are not functioning. There are communities that are currently not serviced but have standpipes. There are 38 boreholes and one (1) well with a pump. The type of borehole that is constructed is the GH. Mod. Indian MK II. Currently all the boreholes are functioning with the exception of only three. The boreholes are located in 26 communities. There is only one hand dug well at Djorkpo, fitted with a pump in

the district. It is significant to note that all the boreholes in the district are found in the Osudoku Traditional Area. The proximity to the Volta Lake creates a high water table (aquifer) that guarantees sufficient yields. In the absence of boreholes, pipe water, and wells, the population depends on dug out wells and rivers (retrieved from www.ghanadistricts.com on 8th April, 2014).

4.4 The Research Design

This study uses both quantitative and qualitative approaches in data collection. The quantitative data was obtained through the use of structured questionnaires which were conducted through household surveys while the qualitative data were obtained through the use of focus group discussions, in-depth interviews with key informants, field visits and observations. The use of questionnaires mainly focused on quantifiable data in terms of numbers and measures that could be analysed statistically, while the qualitative emphasized on the qualities of entities and on processes and meanings that were not experimentally examined or measured in terms of quantity, amount, intensity or frequency (Kujinga, 2004). In conducting in-depth interviews and constructing questionnaires, due attention was given to the collection of data on the socio-economic and demographic characteristics of households as these variables had influence on outcomes.

4.4.1 Data Collection

Data was collected at three levels, namely household level, community level and agency level. At the household level, data on household characteristics and water usage including household participation in DRA, functionality of water facilities delivery was gathered using structured survey instrument (quantitative data). At the community level, a functionality mapping of water points was conducted which fed into an inventory for water in the district. The mapping was done using transient walk

and key informant interviews. Furthermore, at the community level, another set of data was generated using focus group discussion (FGD) and key informant interviews (KII). FGD is a common method of data acquisition due to these key characteristics especially the insight and interaction generated between the participants. All households observed automatically qualified to participate in the FGD, however, two (2) focus group discussions were held in one borehole community and one pipe community. The purpose for holding the FGD was to gather attitudes, feelings and experience of the groups which could not be derived from the other methods of the mixed methodology employed. It was also a useful method to speak to diverse community members on their opinions of DRA in water delivery and management. It was also meant to inform the group of my observations for clarification. This method of data acquisition becomes very timely in knowing consensus or disagreements within the household. Members of the focus groups comprised community members who were in the community when the water facility was provided. Each group was made up 10 member with and equal gender representation.

In all, a total of 10 key informant interviews were conducted with leaders of the water user groups, extension services specialist staff of CWSA, District Planner, District Community Development Officer and Caretakers/Vendors of the water facilities. Individual interviews were administered, using a structured questionnaire, to 200 household members in the four (4) selected communities.

The FGD was used to solicit information from community members (by gender) on key issues of DRA indicators for water and sanitation; also, issues of community participation and acceptance, facility usage and sustainability were discussed. Key informants, namely traditional leaders, Assembly members, District Assembly staff and Water and Sanitation Committee (WATSAN) members were interviewed using

in-depth interview approach. At the Agency level, officials of CWSA were involved in providing technical information on the DRA concept and practice; issues of acceptability and sustainability were also investigated.

4.4.2 Sampling Procedure and Sample Size

Purposive sampling was used in selecting the communities for study. Maxwell (1997) defines purposive sampling as a type of sampling in which, “particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be gotten as well from other choices” (p. 235). This study purposely selected communities from the Shai-Osudoku District that had acquired their water facility through the DRA and were managing the facilities through the Water and Sanitation (WATSAN) Committees. The researcher also inquired from the DWST and CWSA on areas that were suitable for collecting data that will meet the study objectives. From the list of communities provided four (4) communities were chosen (as highlighted in Figure 6). The communities were Lanor, Gbese, Akunarhkope and Atrobinya. The first two communities had a pipe system in place and the last two communities had boreholes.

These four (4) communities were also chosen because their water facilities were functioning. For the purpose of the study, care was taken to also select communities which are rural to analyse the significance of DRA for rural communities. The nature of the housing in the four (4) communities gives indications of its rural character. The main materials used by households for the construction of houses in the borehole communities are mud, as shown in Figure 7. The pipe communities had a mixture of both mud and cement/sandcrete blocks as main materials for their building as shown in Figures 8 and 9. The main roofing material is corrugated metal sheets for all four (4) communities.

Figure 7: Common Houses in the borehole Communities



Source: Field Survey (2013)

Figure 8: An example of a mud house in Gbese (a pipe community)



Source: Field Survey (2013)

Figure 9: An example of a cement house in Lanor (a pipe community)



Source: Field Survey (2013)

From these four communities, 50 households were randomly sampled in each to make a total of 200 households. At the household level, the household head were used as the respondents but where the household head was not available, a representative (an adult member) was used as respondent on behalf of the household head. Purposive sampling was used to identify key informants, such as caretakers/vendors, WATSAN chairmen, the DWST and CWSA staff. The choice of these four communities helped determine whether the socio economic dimensions of a community play an important role in the sustainable management of DRA based water facilities. It also helped establish the suitability of DRA for different areas with different socio-economic activities and its effect on water usage patterns since the introduction of the approach.

4.5 Method of Data Analysis

4.5.1 Conditions under which DRA leads to improved functionality in a sustainable manner

Sara and Katz's (1998) approach was used in analysing demand-responsiveness and sustainability of rural water supply. They defined sustainability as maintenance of an acceptable level of services throughout the design life of the water supply system. Indicators of demand-responsiveness as used by Sara and Katz (1998) were (1) Project Initiation, (2) Informed Choice and (3) Contributions towards the implementation of the water facility. The measurement of sustainability was (1) Physical condition of the system, (2) Consumer Satisfaction, (3) Operation and Maintenance Practices, (4) Financial management and (5). Willingness to sustain (as shown in Table 5). These indicators were used to ascertain demand-responsiveness and sustainability of the communities' water system.

Table 5: Indicators of sustainability of DRA

Sub-indicator	Source of data
Physical conditional	Household survey/personal observation/KII/PO
O&M	WATSAN/household survey/KII
Financial management	WATSAN/household survey/FGD
Consumer satisfaction	Household survey
Willingness to sustain	Household survey/WATSAN

Source: *Sara & Katz (1998)*

4.5.1.1 Indicators of demand-responsiveness

Demand responsiveness is considered from the perspective of household members and water committees. The remaining of this sub-section provides a detailed discussion on these indicators.

Project initiation: This looks at whether community members felt responsible for initiating the project, as opposed to being selected by the project or government. It is assumed that communities are most likely to sustain facilities for which demand has been expressed. Generally all the communities disclosed they were informed by the District Assembly (DA), through their respective Assembly Members of a Danish International Development Agency (DANIDA) water project. Interested communities were asked to apply for the project. They therefore applied since water was a pressing need. There were also health concerns such as Bilharzia from drinking unclean water from the irrigation canal and stream which they patronized with their animals. Figure 10 shows a picture of the irrigation canal. Staff of CWSA followed up to investigate whether water was a felt need of the community through a series of not less than three meetings. Once demand was established, community members were asked to avail themselves to District Assembly staff to form a water and sanitation committee (WATSAN).

Figure 10: An Irrigation Canal which also serves as an alternative water source



Source: Field Survey (2013)

Informed choice: It is how individuals felt involved in decision making processes surrounding the system, and how well they were informed about the implications of their decisions in terms of cost and responsibility for O&M. Because DRA is largely a rural phenomenon for water supply in Ghana, trained staff must adequately give community members information to make informed choice about which technical options are feasible as well as the relative cost of each option.

The conclusions drawn from the analysis were supplemented with qualitative assessments including focus group discussion (FGD), key informant interviews (KII) and personal observations. Figure 11 is a display of a focus group discussion held at Lanor. The analysis of the data on the subject was in the form of percentages and

frequencies. Descriptive statistics in the form of tables and charts were used to present the results obtained in this analysis.

Figure 11: Focus Group Discussion at Lanor (a pipe community)



Source: Field Survey (2013)

4.5.2 Suitability of DRA for rural communities in providing equitable and affordable water service

The essence of this section is to examine the suitability of the DRA to provide affordable and equitable services for the communities.

4.5.2.1 Affordability

On the issue of affordability, the communities looked at the ability of the community members to pay for the water services provided for both the pipe and borehole services. The results of the ability to pay by community members were explained

through the use of descriptive statistics which came in the form of tables. In addition, the issue of affordability looked at whether household/individuals were in favour of the system of payment. In order to make the issue of affordability more interesting, the study assessed the action taken by the management of the water system if one does not pay for the facility after fetching water.

Since socioeconomic characteristics play an important role in the economic decisions, the study investigated how these factors influence the ability of the community members to pay for both the borehole and pipe. Similar to the study of Yan *et al.* (2010) where the “pay for water” was based on the payment system, this study also used the payment system in respect of the borehole and pipe systems. The dependent variable for this study was therefore the ability to pay for both the pipe and the borehole systems. This was because the ability to pay in this study as compared to Yan *et al.* (2010) was “payment for water”. In achieving this objective, a probit regression was used. The dependent variable for the probit regression was ability to pay (1 was assigned to the ability to pay and 0 was assigned to the inability to pay). The independent variables of the regression were age, gender, household size, number of durable asset, occupation and water usage. Table 6 gives the descriptions of the independent variables.

Table 6: Descriptions of the Independent Variables Affecting Ability to Pay

No	Name of Input	Rep.(x_i)	Unit of Measurement	Definition	Parameter Estimates
1	Age	Age	Years	Absolute ages of respondents	β_0
2	Gender	Gen	Dummy	Male = 1 and Female = 0	β_1
3	Household size	HS	Persons	Children were included	β_2
4	Number of durable asset	Ass	Count	Electrical and other durable physical gadgets	β_3
5	Occupation	Occ	Dummy	Farming =1 Non – farming =0	β_4
6	Water usage	Wat	Litres	Weekly water used	β_5

The probit regression is expressed in the form:

$$P(y = 1 | x) = G(\beta_0 + \beta_1 \text{Age} + \beta_2 \text{Gender} + \beta_3 \text{HS} + \beta_4 \text{Ass} + \beta_5 \text{Occ} + \beta_5 \text{Wat} + \mu)$$

Where G is a function taking on values strictly between zero and one: $0 < G(z) < 1$, for all real numbers z. β_i is the parameter estimate of the independent variables and μ is the error of regression.

4.5.2.2 Equity

With respect to equity, the IRC (2003) criterion was used. IRC (2003) is of the view that equity refers to the situation where everyone (men and women, rich and poor) have equal access to benefits from the projects. Based on these, the following issues were considered: issue of nondiscriminatory pricing for Households, admission of sanctions for defaulting in required payment for water facility use, punishment for

defaulting payment and the effectiveness for the sanctioning for not paying for the service.

4.5.3 Changes in the pattern of water usage with the introduction of the DRA

Data on the pattern of water usage was used to understand the influence with the introduction of the DRA. This was first analyzed based on the difference between the required water used by the household in a week and the actual water used by the household per week. This type of analysis was first done by determining the amount of water usage in litres which exceeded the amount of water required. Thereafter the percentage by which the water usage had exceeded water required was examined. This was done through percentage changes. In order to make more findings with respect to the study's objectives, household usage of the water facility was observed. The observation of was done through the number of people who visit the facility as compared to the other sources of water before the introduction of the DRA. This was based on the number of times members in the community visited the facility as observed at the facility's location. The second part of this analysis was examined to know the factors that affect the amount of water used. In doing this, a simple linear regression was used to determine the factors that affect water usage with respect to the DRA. The regression was of the form:

$$y = \beta_0 + \beta_1 TF + \beta_2 HS + \beta_3 G + \beta_4 D + \beta_5 AV + \mu$$

Where y is the dependent variable and μ is the error of regression. Table 7 gives an explanation of the regression estimates.

Table 7: Description of factors affecting the usage of water

No	Name of Input	Rep	Unit of Measurement	Definition	Parameter
1	Water Used	γ	Litres	Weekly water used	-
2	Type of Facility	TF	Dummy	Pipe = 1 and Borehole = 0	β_1
3	Household size	HS	Count	Children were included	β_2
4	Gender	G	Dummy	Male = 1 and Female = 0	β_3
5	Distance	D	Kilometre	Distance to the Facility	β_4
6	Availability of water	AV	Dummy	All day =1 Not all day = 0	β_5

CHAPTER FIVE

CONDITIONS UNDER WHICH DRA LEADS TO IMPROVED FUNCTIONALITY

5.1 Socioeconomic Characteristics of Respondents

In all, 200 household heads were interviewed, 63% were men against 37% women. Forty three percent (43%) of the respondents had no formal education though a greater proportion can read and write. Another 33.5 % of the respondents had primary and middle/JSS education with the remaining 23.5% constituting those with secondary and post-secondary education. Majority of the respondents were engaged in the informal sector as farmers, artisans and agricultural labour representing 48%, 17% and 12%, respectively. The remaining 23% comprises civil servants (3%), non-agricultural labour (10%), unemployed (6%) and those not in the labour force (4%). Household size of 4-6 elicited 50% of the responses while 1-3 and 6 and above recorded 24% and 26%, respectively.

The number of respondents who lived in compound houses recorded 46.5% with those who dwell in huts forming 23.5%. The remaining 30% lived in semi-detached houses. In terms of ownership of the houses, a majority 58.5% of the respondents owned the houses they dwell in with the remaining 41.5% comprising those living in rented houses and houses owned by relatives who are not household members. A significant 59.5% of the total respondents spent above GHS 600.00 monthly with 37% having their monthly expenditure ranged from 201 to 600. The remaining 3.5% had their monthly expenditure below GHS200. As many as 98% of the respondents reported that they use the community managed water facility the breakdown of which represent 48% borehole users and 50% using the pipe facility. Only 2% of the

respondents indicated they use the canal. The socio-economic characteristics are summarised in Table 8.

Table 8: Summary of socio-economic characteristics

Household characteristics	Valid cases (N)	Classification	
		Category	Percent (%)
Gender (Household head)	200	Male	63
		Female	37
Highest level of Education	200	None	43
		Primary	14.5
		Middle/JSS	19
		O and A level	18
		training college	5.5
Main Occupation	200	Farming	48
		Artisan	17
		Agric labour	12
		Others	23
Household Size	200	1 - 3 people	24
		4 - 6 people	50
		above 6 people	26
Type of Dwelling	200	compound house	46.5
		Huts building	23.5
		Semi-detached	30
Tenure/ownership of dwelling	200	Owned by resp.	59
		Relative not HH member	22
		Others	18
Estimated Monthly Expenditure	200	Below GHC200	3.5
		GHC201-GHC600	37
		Above GHC600	59.5
Alternate Water source	200	Borehole	48
		Pipe Borne water	50
		Others	2

Source: *Field Survey, 2013*

The acquisition of a water facility begins when the donor announces an intention to enter a particular region to provide a number and types of water facilities. Before the beneficiaries are selected the processes and procedure are explained with special reference to the demand-responsive-approach (CWSA, 2004). The community's eagerness to form a water and sanitation (WATSAN) committee and contribute to the implementation of water facility is an indication of their ability to operate and maintain the facility after it is handed over to them.

The communities then meet and discuss their interest in the facility and show evidence of responsiveness by applying to the DA and making a deposit of the counterpart contribution (5% of total cost of implementation) into an account at the bank. The DA does an evaluation and assessment of applications by preparing a community profile to ensure ability to contribute, maintain, operate and manage the water facility to be provided and then does a shortlist. This shortlisting is based on the amount in a bank, population size, existing facilities, current community economic activities, existing community initiated development projects, absence of conflicts such as land, chieftaincy and ethnic disputes, etc. The DA then conducts feasibility studies in the short-listed communities to establish sources of water, cost of the various services be it a pipe system, a borehole, a well source etc. The DAs will then make the final selection of communities after a general meeting in the communities during which all community members are present. The community is sensitized on all possible ways of generating income to support and maintain the facility. Finally the office holders (WATSAN, care-takers, vendors and mechanics) are trained to operate and manage the water facility (CWSA, 2004).

Looking basically at the demographic characteristics of Shai-Osudoku District, it is clear it was an area worth using the DRA approach with respect to the rural water supply. With an NGO like the Danish Development Agency (DANIDA) providing 90% of these water facilities, pipe and borehole, its sustainability was worth considering. DANIDA, like WaterAid, World Vision International and Plan International is a key organization in the water and sanitation sector in Ghana. DANIDA water projects are district based, as such, the funds (based on the approved sub-projects) are transferred by portions from the head office directly to the districts (World Bank, 2008).

As illustrated in Table 8, the facilities provided in all the four (4) communities were functioning though the iron removal plant attached to the borehole of the Atrobinya community had broken down for about three (3) months prior to the collection of data for this study. The community is still able to pump water and manually pour into the iron removal plant for domestic use. The communities and their respective population, and number of facilities are shown in Table 9.

Table 9: Functionality & Service coverage in the 4 selected communities

Community	No. of Facilities	No. Non-functional facilities	Population served
Akunarhkope	1 borehole	0	500
Atrobinya	1 borehole	0	389
Gbese	2 pipes	0	4884
Lanor	1 pipe	0	5004

Source: *Field Survey, 2013 and Census Report (2010)*

5.2 Demand Responsive Approach and sustainable rural water supply

5.2.1 Indicators of demand-responsiveness

Demand responsiveness was considered from both the perspective of household members and water committees. Indicators to ascertain demand responsiveness were project initiation, informed choice and community contribution.

5.2.1.1 Project initiation and Informed choice

As part of the Demand Responsive Approach to enhance community ownership and management of installed water services, Whittington *et al.* (2008) identified the need to involve households in the choice of technology thus ensuring engineering designs were responsive to local needs. Sara *et al.* (1997) in a global study found that sustainability was higher in communities where informed choices about technology type and level of service were made. In addition, Narayan (1995) after analyzing 121 rural water projects funded by different development agencies in 49 countries noted that community participation was crucial for the sustainability of such projects. An informed choice gives beneficiaries a clear understanding of the implications of their choice. The implications may be in terms of investment or recurrent costs, expected participation in planning and implementation, and responsibility for O&M of their water facilities. Yan *et al.* (2010) in summary of literature on success of community based water project concluded that community participation and involvement was indispensable to any successful water project.

The rationale for involving households in the choice of technology was to ensure that engineering designs were responsive to local needs and realities (Whittington *et al.*, 2008) even though some government and donor representatives also argue that communities should not be given a wide range of technical choices because they are unable to make an informed choice (Breslin, 2003). 23.5% of the respondents of the

household survey said they did not participate in deciding on the choice of technology while 56% said they did participate in the choice of the system. 20.5% of the respondents said they do not remember they participated or not. Table 10 depicts the results in the participation in the type of technology for the water facility (whether pipe or borehole).

Table 10: Type of technology

Response	Frequency	Percent
Did not participate	47	23.5
Participated	112	56
Don't remember	41	20.5
Total	200	100.0

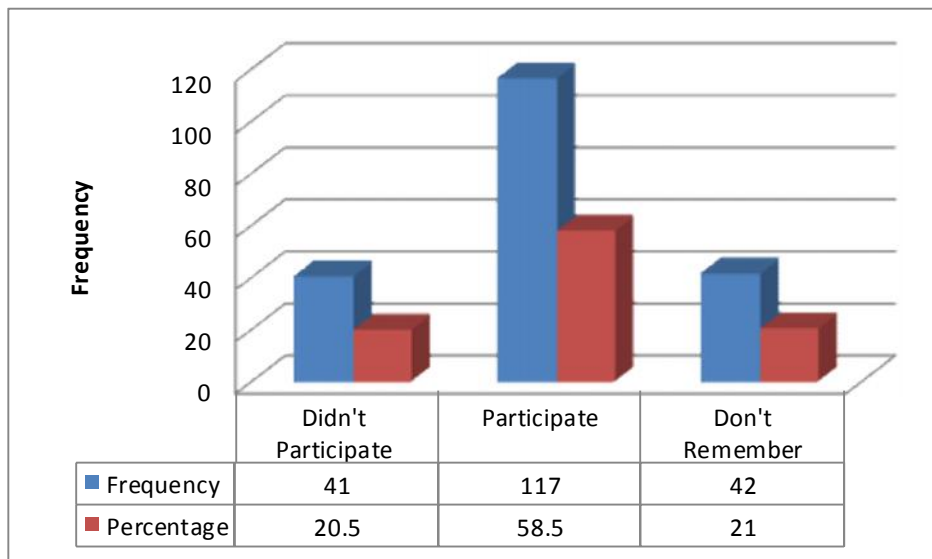
Source: *Field Survey, 2013*

Interestingly, from the focus group discussions (FGD), the borehole communities stated they wanted either a mechanized borehole or a pipe system but were given non-mechanized boreholes rather. They complained that the use of one's energy in pumping water did not allow them to fetch as much water as they will need. KII with the district planner (a member and head of the DWST) revealed that, as part of the funding package, DANIDA had specific technologies for communities based on their population size and income level. Also, each technology had its own cost implication of which pipe was the highest. A KII at the regional office of CWSA indicated it was a direct response to today's interest in getting hooked to a pipe system since some neighbouring communities had the boreholes replaced with pipe facilities. But then she added that numbers also matter. As much as community demand must be met, communities with lower populations cannot be given pipe facilities because of the

cost involved. She concludes by saying *“Either they truly had a change of choice when they saw it (pipes) somewhere else or at the time their choice truly was pipe but technically it was not possible because you do not have a high yielding spring or the population was not enough to enjoy that technology”*.

Also, at the time of installation the borehole communities did not have electricity which is essential to mechanise the facility. Perhaps also, this could be an instance of what Mosse (2001) describes as beneficiaries taking a low-risk strategy to ask for something they are likely to get. Meaning that communities are able to identify what the donor want to offer and so they ask for that in order not to miss the opportunity of being served. Cooke and Kothari (2001) point out that admittedly these facilities are provided with best intentions; however, the so-called ‘participatory’ approaches do not always empower but may unwittingly serve to legitimise and support the status quo. However, the WATSAN committees of Gbese and Lanor (pipe communities) indicated that they were given the options of community management, private management and a partnership, and they preferred community management.

In identifying the site for the construction of the facility as indicated in Figure 12, 20.5% stated they did not participate, while 58.5% said they did participate. The remaining 21% of the respondents did not remember whether they participated or not. Further discussions (FGD) showed that the choice of site was largely the decision of the constructors who had to do some geological and technical feasibility studies to choose the most appropriate sites though community members made some recommendations.

Figure 12: Identifying the site

Source: *Field Survey, 2013*

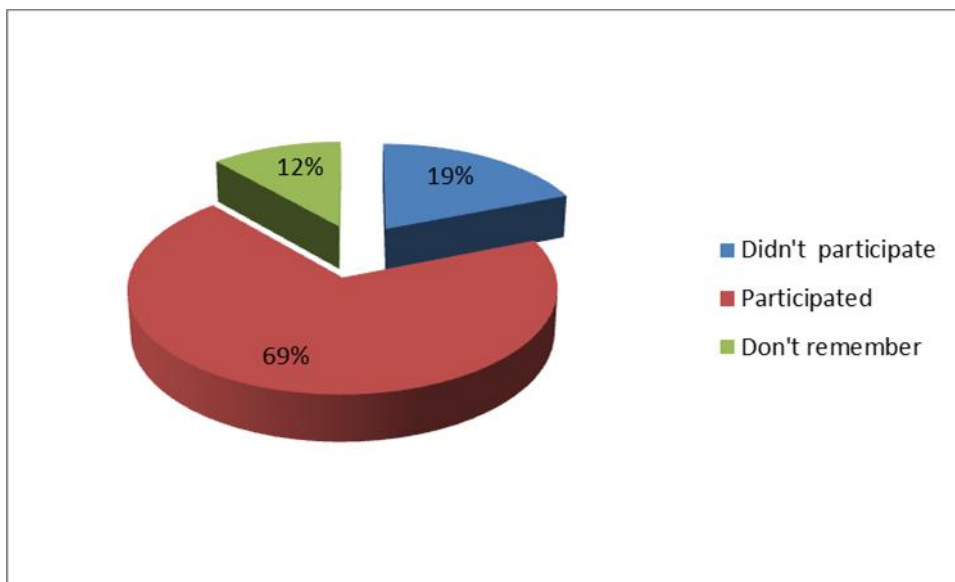
5.2.1.2 Contribution

This factor best differentiates a demand-responsive project from a project in which people simply participate as a requirement for community contribution. This includes cash, labour, and in-kind contributions. The policy at the time of providing the water facilities was that communities contribute 5% of the total cost of implementation.

As seen in Figure 13, nineteen percent (19%) of respondents reported that in deciding on the 5% household contribution, they did not take part while 69.5% participated in the decision and 11.5% did not remember taking part. In the pipe communities, every individual above 18 years was levied GHS 2 to arrive at their 5%. The chairmen of the pipe communities indicated in their interview that their 5% amounted to GHS 16,000 which they could not raise. They were able to raise less than GHS 3000 and therefore solicited for financial support from benevolent individuals, and also corporate bodies like the Volta River Authority (VRA) supported them with the remaining balance. It is worth noting that DANIDA (external donor) was not

comfortable with this arrangement as they claim it could affect the ownership aspect of the facility. On the other hand, FGD with the borehole communities revealed community members organised communal labour by working on farms to mobilise funds to contribute their 5% quota. Some families also donated land freely for the project. There was, however, no record of what percentage of households that contributed in all the four communities.

Figure 13: Household contributions (Cash or Kind)



Source: *Field Survey, 2013*

The 5% quota is a constrain to most rural communities in Ghana. This assertion is made by Eguavoen (2008), and Fielmua (2011), instead of restricting the difficulty in raising the amount to only northern Ghana. Water Aid (2005), also, has indicated that the 5% community quota compromise the principle of equity since households who cannot afford will not be allowed to use the facility. The WaterAid study specified that while this requirement stems from the need to adopt a demand-responsive

approach, its effect would worsen the plight of the poor and leave them dependent on unsafe water sources with all the health implications (Fielmua, 2011). Karikari (1996) maintained that most settlements have very small populations, and many of these, particularly in the savannah zones, cannot afford the 5% capital contribution towards safe water supply. The views expressed above could have served as the reasons why the Government of Ghana has suspended the 5% community contribution since 2011.

5.3 Sustainability Indicators

The World Health Organization (WHO) defines sustainability in water supply as continuous availability of sufficient quantity and quality of water, within adequate institutional frameworks; applying sound management practices, appropriate technologies, and full-cost accounting, and effectively maintaining facilities and equipment. The African Development Bank (AfDB) Rural Water and Supply Initiative (AfDB, 2005) defines sustainability as the degree to which programme benefits are durable and continue beyond implementation period into operations.

The small-town pipe scheme being used in the communities consists of a high-yielding borehole that is then mechanized with an electric pump to transport the water to a large overhead tank. From the tank, gravity is used to distribute the stored water to various accessible points (community standpipes), from which community members can fetch their water. These pipes according to the Ghana WASH project (2013) have a lifespan of 30 years or longer, depending on maintenance while that of boreholes have been estimated to be between 30 to 40 years. However, according to the Rural Water Supply Network report (2010), boreholes are drilled to function for a lifespan of 20 to 50 years.

Sustainability is one of the main criteria by which development is defined and evaluated and therefore requires a precise and unambiguous definition (Lynam and Herdt, 1992). Sara and Katz (1998) defined sustainability as the maintenance of an acceptable level of services throughout the design life of water supply system. They identified sustainability as comprising three categories: technical, social and institutional. These categories were divided into five sub-indicators of sustainability: physical condition, operation and maintenance (O&M), consumer satisfaction, financial management, and willingness-to-sustain the system. Abrams (1998) is also of the view that the entire element needed for sustainability must be in place for a proper functioning of the water facility. There must have been money for recurring expenses and for the occasional repair, there must have been acceptance from the consumers of the service, the source supplying the service must have been adequate, the design must have been properly done, and there must have been sound construction.

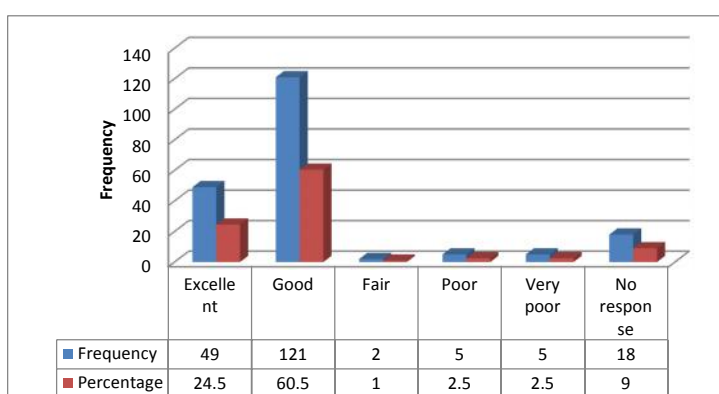
5.3.1 Physical Condition

Serious failings in the quality of implementation may act as killer factors from which recovery is impossible without significant additional investment. Poor quality construction can undermine all efforts to keep systems working, while high quality construction may lead to a very considerable service life, despite weaknesses in other aspects of the Operation and Maintenance (O&M) system (WaterAid, 2011). Howe & Dixon (1993) and Singh *et al.* (1993) have also indicated that shoddy construction of drinking water facilities is a major cause of failed system maintenance. This research therefore probed into the physical condition of the facilities.

This measures the overall physical condition of the water system. It is based on factors such as construction quality which is determined by leaks or defects in the system and effectiveness of masonry or pipe works. Under this criterion, themes considered included the overall rating of the construction quality, the functionality of the facility now and in the next five years.

Figure 14 shows the rating of the construction quality of the facility. It was observed that 24.5% rated it as excellent while 60.5% of the respondents rated the construction quality as good. About 2.5% of respondents each rated it as very poor and poor while 1% rated it as fair. This implies generally the construction quality is good on the whole. However, an interview with WATSAN members in the pipe communities revealed that they were not happy with the quality of construction. According to them, old pipe lines left behind by the defunct Asutuare Sugar Factory, were used instead of new ones and therefore can affect the life-span of the pipe system negatively.

Figure 14: Rating of the Construction Quality



Source: *Field Survey, 2013*

Of equal importance to this study is the functionality of the facilities. Accordingly, a look was taken at the functionality of the facilities in the previous 12 months. Functionality according to Carter *et al.* (2010) is not the same as sustainability. It is a simple snapshot of views of whether or not water supply systems are working at the time of inspection even though it cannot on its own tell us anything about the reasons for the particular state that the water point is in, or why it may be providing an adequate service, intermittent service or no service at all. They add that functionality data are often the best indication we have of inadequacies in sustainable service provision.

From Table 11, it could be seen that 3.5% of the respondents admitted the facility has broken down within 3 months while 12% admitted otherwise. Also, 5% admitted the facility has broken down within 4 – 6 months, 3% admitted otherwise. Another 0.5% admitted that the facilities have broken down within 6 to 12 months while 2.5% admitted otherwise. Majority of the respondents (72%) noted the facilities had not broken down for a year and beyond while 1.5% noted otherwise. This implies the facilities hardly broke down within a year. Discussions held revealed that in the event that a breakdown occurred, it took less than two weeks for it to be repaired. Also, as part of the implementation plan, the donors (DANIDA) trained an area mechanic responsible for the repairs of all faulty boreholes in the Asutuare-Osuwen catchment area. He is always readily available. The area mechanic lives within the district and is responsible for routine maintenance or repair work on the water facilities at the request of the communities. The area mechanic is frequently called upon to obtain the spare parts needed by the community for installation. He (area mechanic) is paid by the communities from revenue collected from households or money obtained through special contributions for the spare parts and their services.

Table 11: Functionality of Facility in the past 12 months

Period of Break down(months)	Yes (Freq)	Yes (%)	No (Freq)	No (%)
0 – 3 months	7	3.5	24	12
4 – 6 months	10	5	6	3
6 – 12 months	1	0.5	5	2.5
Beyond 12 months	144	72	3	1.5
Total	162	81	38	19

Source: *Field Survey, 2013*

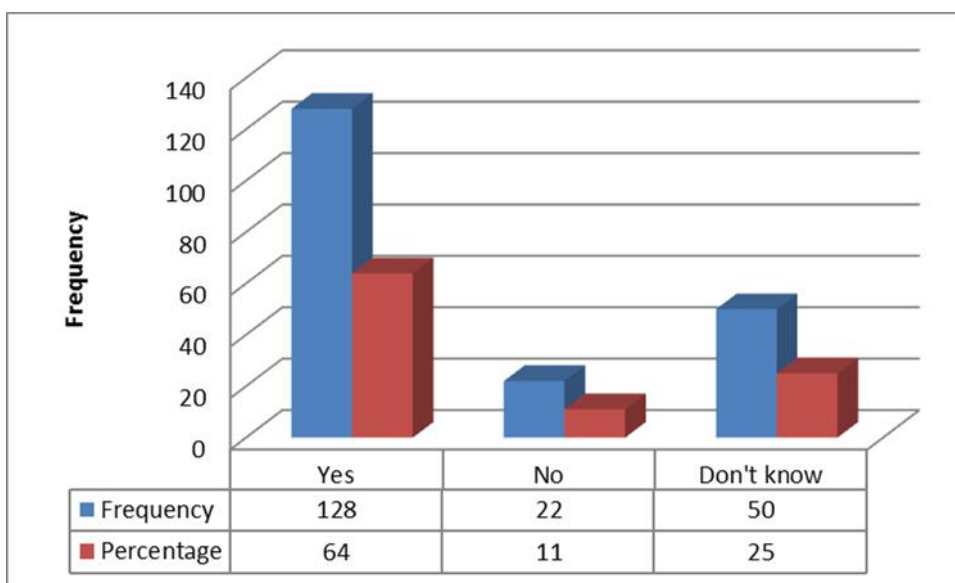
A chi-square analysis was undertaken to find out whether the general functionality and sustainability with respect to the two facilities (borehole and pipe system) were different as indicated in Table 12. It was concluded that the two facilities were not different at a significance level of 1%. In addition, it was concluded that both systems were also functional. Interestingly, all the water facilities in the four (4) communities were functioning. Even though the facilities do break down sometimes the WATSAN managed to mobilize the resources needed to make minor repairs within a short period.

Table 12: General functionality and sustainability of the facility

Type	Borehole (%)	Pipe (%)	Total (%)
Excellent	27	12	39
Very good	34	47	81
Good	28	37	65
Fair	4	4	8
Bad	7	0	7
Total	100	100	200
Chi-squared Stat			16.1018
Df			4
P-value			0.0029
Chi-squared Critical			9.4877

Source: *Field Survey, 2013*

Figure 15 indicates that 64% of the respondents admitted that the facilities will function for the next 5 years, 11% admitted otherwise. The remaining 25% admitted that they do not know whether the facilities will function in the next 5 years. It was gathered that communities will only be able to solve minor faults but in the event that a major one occurs, they will not be able to solve it. Hence community members will not be able to sustain their water facilities. Though DRA expects that beneficiaries will cater for their own maintenance needs, the District Assembly (DA) has in most instances had to come in aid of the communities. For instance, the DA had to pay GHS 10,000 in 2012 to offset electricity bills of the pipe communities to ensure the continuous flow of water.

Figure 15: Facility will function in the next five years

Source: *Field Survey, 2013*

5.3.2 Consumer Satisfaction

Consumer satisfaction with respect to the water system is based on factors such as the ability of the facility to adequately meet the water needs of community members, the frequency of the water flows, availability of water, the general impression of the facility, changes in water usage and whether users are confident to drink water without treating it.

Table 13 shows that 83% of the total respondents agreed that community managed DRA facilities are able to meet the water needs of the communities all year round and 14% of the total respondents believed otherwise.

Table 13: Ability of water facilities to adequately meet water needs (Pipe and Borehole)

Response	Frequency	Percent (%)
Yes	166	83
No	28	14
Don't know	6	3
Total	200	100

Source: Field Survey, 2013

Finding out whether water continues to flow in a month without disruption, 65.5% of the total respondents responded no while 29.5% said yes. The remaining 5% could not tell and this is captured in Table 14. Other discussions revealed that water flows throughout the year except when there was a major breakdown.

Table 14: Months when water does not flow from facilities (Pipe and Borehole)

Response	Frequency	Percent
Yes	59	29.5
No	131	65.5
Don't know	10	5
Total	200	100

Source: Field Survey, 2013

Table 15 shows periods when water is available daily at the two water facilities sites. It could be seen that 43.5% of respondents accessed borehole water every time in the day, 3% of the respondents accessed borehole water in the morning and evening. From the pipe facility it could be observed that 46% of the respondent accessed pipe borne water any time while 3% of them agreed to access water every time.

Observation showed that due to the payment system in place (pay-as-you-fetch), pipe communities have attendants who should be available anytime the pipe is opened. Hence pipes are opened in the morning from 5am to 9am and in the evening from 4pm to 7pm to allow the attendants to attend to other demands of their own. Borehole communities have caretakers who supervise its daily functioning and so do not have to be necessarily present at all times. The boreholes are therefore open to use at all times except when there was a problem with it.

Table 15: Availability of water in a day

Response	Borehole		Pipe facility	
	Frequency	Percent	Frequency	Percent
Morning and Evening	6	3	92	46
Afternoon and Evening	0	0	2	1
Any time	87	43.5	6	3
Don't know	7	3.5	0	0
Total	100	50	100	50

Source: *Field Survey, 2013*

The question was asked about the general impression of the functioning of the facilities. It was discovered that, 40.5% of the respondents rated the facilities as very good, 32.5% of the respondents said it is good, and 19% of the total respondents agreed the facilities are functioning excellently (Table 16). In all the general impressions on the facilities are positive; 4% of the respondent rated it fair and 2.5% had a bad impression about the facilities. It was observed also that 1.5% of the respondents did not have an opinion of its functioning.

Table 16: General impression of the functioning of the facility

Response	Frequency	Percent
Excellent	38	19
Very good	81	40.5
Good	65	32.5
Fair	8	4
Bad	5	2.5
Don't know	3	1.5
Total	200	100

Source: *Field Survey, 2012*

From Table 17, it could be seen that there had been a dramatic change in the volume of water used after the facilities were installed, as indicated by 79% of the total respondents. This may be due to several reasons such as change in the size of households, extra activities, and closeness to the facilities, etc. The actual reasons are yet to be ascertained in the third objective. About 11% of the respondents used the same volume of water as previous and 8.5% of the respondents use less water than previously. It may also imply that the facilities are expensive and they could not afford more or the facilities provide distilled water which needs only a little volume to keep domestic activities intact. Two percent (2%) of the total respondents did not know whether they used more, less or same quantity of water.

Table 17: Change in water usage after facilities were installed

Response	Frequency	Percent
More	158	79
Less	17	8.5
Same	21	10.5
Don't know	4	2
Total	200	100

Source: *Field Survey, 2013*

About 47% of the respondents from the borehole facility drink from the facility confidently without boiling or adding chlorine, while 3.5% do not. This means that they either use other sources such as sachet water, rainwater storage or they add chlorine or boil the water from the facility before drinking. Up to 25.6% of the total respondents from the pipe communities confidently drink from the facilities without boiling or adding chlorine, the remaining 24.5% do not. These categories of respondents either add chlorine or boil the water before drinking. It could also be that they drink from other sources perceived to be cleaner or less expensive if the facilities are considered expensive (Table 18).

Table 18: Confidence to drink from the facility without treatment

Response	Borehole		Pipe water	
	Frequency	Percent	Frequency	Percent
Yes	93	46.5	51	25.5
No	7	3.5	49	24.5
Total	100	50	100	50

Source: *Field Survey, 2013*

5.3.3 Operation and Maintenance (O&M)

Water supply facilities should be considered as assets and managed in such a way that they last their projected service life (Buamann, 2006). The basic principle behind DRA is that communities that benefit from an improved water facility should have overall responsibility for its O&M and this is fulfilled through the formation of a community water committee that is responsible for operating the facility, setting and collecting water tariffs, and managing maintenance and repair activities (Harvey and Reed, 2006). Kleemeier (2000) indicates that there is no such thing as a maintenance-free technology and even technologies such as gravity water supply schemes which are expected to provide sustainable service have failed to live up to that. According to Schouten (2006), the most important element identified of a community managed water facility is a water committee (WATSAN) to manage the water point, as well as contribute funds to pay for its maintenance and repair. However, Carter (2009) identifies that communities are not always motivated to manage water points effectively.

This sub-section examines factors such as the availability of a designated system operator in the community, access to tools and spare parts, and information about follow-up support. Discussions at the DA and CWSA revealed that O&M is paramount to sustainability. When a community adheres to regular O&M, issues of saving into the accounts for breakdown and quick response to breakdowns are assured for smooth running of the facilities.

Once the water facilities are built, district assemblies hold the water systems in trust for the communities, and communities are encouraged to establish WATSAN committees to manage the systems (Komives *et al.*, 2008). The committees are mandated to operate and manage the facility, set and collect tariffs, carry out repairs

and account regularly to the community. With the exception of the Gbese WATSAN committee, the other WATSAN committees of the three other communities have been in office since the facilities were provided. It would have been essential to train the new committee and organize refresher programme for those still in office. Yet, funds for such training is supposed to come from the community water funds which is already inadequate to effectively run O&M, not to mention other auxiliary activities like training.

Another resource for the WATSAN is the “area mechanic” who lives in the district and is originally trained during the implementation stage to do routine maintenance upon the request of the communities. The area mechanic is frequently called upon to obtain the spare parts needed by the community and then to install these parts for which communities must pay.

For effective water facility O&M for sustainability, it is important to identify the role played by caretakers in the case of boreholes, and vendors for pipe communities. Caretakers/vendors are assigned to regularly inspect the water supply and identify areas that need repairs. They also handle the stock of spare parts needed for the smooth running of the facility. In addition, they keep records of all repairs, keep the tool box and supervise activities in the catchment area on behalf of the WATSAN. But similar to sentiments raised by Nyarko (2007), as was also observed in the four communities understudy, “record keeping on operations and maintenance is poor” even though CWSA has developed forms for communities to use. However, the DA which is supposed to monitor their activities also complains of logistical constraints. The caretakers are also supposed to maintain a clean environment around the water facility. It is worth noting that only the borehole communities have maintained their caretakers since the implementation of the water facilities; on the contrary, the pipe

communities have changed their vendors/caretakers who have not received any training for the job.

The study investigated the sense of ownership of the facilities provided. This was necessary because literature reviewed assert that when communities own the facility, they manage it better. About 50% of respondents agreed that the pipe facilities are operated by the communities of location. Fifty percent (50%) out of 200 respondents agreed that the borehole facilities were managed by the communities themselves while 0.5% where not sure who maintained the facility (see Table 19).

Table 19: Facilities operated by the communities themselves

Facility	Frequency	Percent
Pipe water	98	49.5
Borehole	100	50
Don't know	2	0.5
Total	200	100

Source: Field Survey, 2012

Table 20 shows the body which manages the facilities. It shows that 97% the total respondent admits the facilities are managed by the WASTAN. Two percent of the respondents said the Water Sanitation and Management Team (WSMT). This proportion is from the pipe communities. It also appeared that two of the respondents said they did not know.

Table 20: Management of facility

Manage water point	Frequency	Percent
WASTAN	194	97
WSMT	4	2
Don't know	2	1
Total	200	100

Source: Field Survey, 2012

In order to ascertain the effectiveness of the facilities' operation and maintenance, the study probed into frequency of breakdown of the facility within the last 12 months. It was observed that 69% of the respondents agreed that the facilities had broken down within the last 12 months. The frequency of these breakdowns is yet to be ascertained subsequently. Twenty-one percent of the respondents said there had been no breakdowns in the last 12 months, and 10.5% of the respondents could not recollect any such events. This implies that one of the four communities' facilities has not seen any breakdown within these 12 months, or respondents have not taken notice of such events (Table 21).

Table 21: Facility broken down in the last 12 months

Response	Frequency	Percent
Yes	138	69
No	41	20.5
Don't know	21	10.5
Total	200	100

Source: Field Survey, 2012

Table 21 shows how long the last breakdown lasted; 21.5% of the respondents said it lasted for less than 3 days, 22% of the total respondent also said it lasted for more than 31 days. These 22% of respondents were from Atrobinya where, though the borehole implemented by DANIDA is still functioning, an iron removal plant installed by Water Aid (and NGO) has broken down. This gives credence to the assertion that DRA gives a sense of ownership. This is because the iron removal plants were installed at no cost to the beneficiaries and so less care is taken of it like the borehole itself which they contributed towards its implementation. An examination of the fault revealed that very little in terms of cost is needed to repair it. About 19% and 8.5% of the total respondents said the breakdown lasted for 7days and 8-14 days (2 weeks) respectively (This is shown on Table 22).

Table 22: Longevity of Breakdown

Response	Frequency	Percent
Less than 3 days	43	21.5
7 days	38	19
8 – 14 days	17	8.5
More than 31 days	44	22
Don't know	58	29
Total	200	100

Source: *Field Survey, 2013*

Table 23 shows that 23% of the total respondents agreed that breakdown of facilities are caused by lack of spare parts; this can be interpreted as money available but spares are out of the reach of the communities. 21.5% said it is caused by other reasons such as break down from main source and breakdown of iron removal plant.

Interestingly, 26.5% did not know the cause of breakdowns, but are aware the facility broke down. This may imply that community members have little knowledge about the facilities. It could also be seen that 15.5% of the breakdowns is caused by poor maintenance culture; this also means that either the attendants/caretakers are inadequately equipped or are not reliable. 7% also noted that breakdowns were caused by poor construction nature of the facility. Factors such as conflict and vandalism as well as no responses recorded 3% each of the total respondents.

Table 23: Cause of Breakdown

Response	Frequency	Percent
Poor construction	14	7
Lack of spare parts	46	23
Poor maintenance culture	31	15.5
Conflict/ vandalism	6	3
Theft	1	0.5
Others	43	21.5
Don't know	53	26.5
No response	6	3
Total	200	100

Source: *Field Survey, 2013*

Newman *et al.* (2002), after reviewing 18 rural water projects in two regions in Bolivia, observed that training in operations and maintenance was critical to the success of these water systems. From Table 24, respondents were asked if caretakers/attendants are well trained to perform their duties. To measure their performance, 75.5% of the respondents admitted that they are adequately trained

while only 6.5% said otherwise. Also 18% of the respondents did not know whether attendants/caretakers were trained.

Table 24: Adequate training of attendance/caretakers to perform their duties

Response	Frequency	Percent
Yes	151	75.5
No	13	6.5
Don't know	36	18
Total	200	100

Source: *Field Survey, 2013*

Out of 200 respondents, 26.5% of the total respondents admitted that the attendants were trained in management of the facility. Other forms of training, such as proper book keeping, minor fault repairs, etc., recorded 37% of the total respondents. It was also observed that 22.5% of the respondents agreed that they are punctual and ensure water flow as frequent as possible. Seven percent (7%) of the respondents agreed that the attendants/caretakers work effectively. However, few respondents had negative responses as indicated in Table 25. These negative comments came from the pipe communities. Paramount of them was that the attendants would not allow anyone without money to fetch the water, and also they may be under reporting sales. The caretakers themselves revealed that they had not received any training for the job. Even though DANIDA trained some attendants/caretakers, they were no longer at post.

The fact that caretakers at post were not trained is also a setback for the sustainability of the facilities. KII with the district planner indicated that training was supposed to be given by CWSA. However, at the CWSA, the extension services specified that communities are supposed to raise funds from the revenue collected to invite them

(CWSA) to come and train the personnel. As she puts it “last month I went and did training for Oyibi and the cost was fully incurred by the WSDT”. This is rather unfortunate, given the fact that these communities are not able to effectively raise funds for O&M and have the added responsibility to incur the cost of training of the human resource for the continuous running of the facilities. The chairperson of the WATSAN committees interviewed had no idea that subsequent training after that given by DANIDA would be financed by the community. There is also no document which supports the assertion that communities should pay for subsequent training after the initial one organised by the donors as was confirmed at TREND (water consulting agency). It is also not spelt out in any manual of the CWSA whose responsibility it is. Placing the responsibility at the door step of the rural communities is unfortunate. It is evident that the architects of the NCSWP had not factored into the programme this very important component.

Table 25: Reasons for opinion

Response	Frequency	Percent
Training in management of facility	53	26.5
Some problems are caused by them	10	5
Punctuality and ensure we gets water always	45	22.5
Work effectively	14	7
Others	74	37
No response	4	2
Total	200	100

Source: *Field Survey, 2013*

5.3.4 Financial Management

Gine and Perez-Foguet (2008) stress the need for a realistic and transparent financing mechanism where contributions are well managed and invested in maintenance and repair. In analyzing the performance of the water systems in six countries, Sara and Katz (1997) noted that control of funds with respect to the management of the water systems played a key role in its success. This sub indicator was based on a review of each community's financial records and key informant interviews (KII) with the water committees and treasurers.

Generally, basic financial management and accountability of water systems including tariff collection and savings was low in all four communities. In Akunarhkope, each household paid GHS 0.50 monthly even though the caretaker admitted payments were not forthcoming. The Atrobinya community only paid when there was a problem to be fixed, otherwise they enjoyed the services of the facility for free. This financial situation confirms the findings of Whittington *et al.* (2008). In their study conducted in Peru, Ghana and Bolivia, they identified that a substantial minority of rural communities were not collecting sufficient revenues to pay operation and maintenance costs and a significant minority were not collecting revenues at all. This does not augur well for proper O&M. However, beneficiaries according to Kleemeier (2000) are usually reluctant to pay when everything appears to be working and that happens to be the case. At the CWSA, it showed that convincing borehole communities to use a sustainable form of payment (pay-as-you-fetch) has been a challenge. This is because other forms of payment do not work. Laryea (1994) also explains that the long history of rural communities of always being at the receiving end of their own development makes responsibility of the facility difficult. In essence, they are used to being spectators of their own development. However, the

sustainability of water supply is dependent on appropriate prices, and the necessary resources which should come from the project consumers must be in place (Whittington, 1998; World Bank Water Demand Research Team, 1993).

The pipe system communities paid GHS 0.25 per a size of “34 bucket” as they fetched. There was a general view that monies collected will not be sufficient to pay for a major problem except external support was brought in. Also, community members had no idea how much they had in their account. None of the WATSAN in the pipe communities (Gbese and Lanor) had rendered accounts of any form to the communities in the past 4 years. The community members are oblivious of how their monies are handled by the committees. This could also serve as a reason for reluctance to pay. If the WATSAN are not rendering accounts as they should, then doubts are raised as to how funds are used and so users will not want to pay. As Prokopy (2002) puts it, more transparent committee operations are correlated with increased household satisfaction and an increased likelihood to pay a tariff. Hence when the operations of the WATSANs are transparent, households are more likely to pay for the services of the water facilities.

According to the WATSANs, they had stopped calling for meetings with the community members because they never attended when they were called upon. This excuse could mean that the community members have lost confidence in them and so could not be bothered since they (WATSANs) are not transparent. None of the WATSANs had any financial records of their activities to show. None of the WATSANs knew the exact amount they had in their bank accounts even though the boreholes committees said they had over a GHS100 each. According to the attendants of the pipe facilities, they make average monthly revenue of not less than GHS450 of

which they (attendants) are paid a 20% commission. They could sometimes make GHS650 when there is a major funeral in the community. These amounts when collected are paid into a central account called the board account. Lopez-Gunn & Cortina (2006) are of the view that water-user committees play a vital role in the sustainability of rural water schemes and that the enhancement of facilitation skills, the clarification of responsibilities, the improvement of transparency in decision making, and the augmentation of credibility are essential for making a committee trustworthy.

Even though this study focused on only community managed by DRA a look at privately managed community water facilities within the same district revealed that the latter fared better than the former. WATSANs of privately managed water facilities made yearly revenue of between GHS 24,000 and GHS 43,000. Profits realized were used to undertake developmental projects like schools and even WATSAN members could afford to pay themselves some allowances while community managed facilities could barely sustain themselves. Due to this, calls to the DA to permit an increase in water fee by the WATSAN have been refused. The reason for refusal is captured better by quoting the district planner, *“they are not managing the facilities well. In this present age who sells water and makes a loss”*. The views expressed by the district planner is confirmed by the chairman for Gbese WATSAN who said *“ the DA say there are loopholes we should close before we can call for a tariff review. So when we are able to solve these things we will make our demand again.”* Training of caretakers/vendors is also a problem: the CWSA expect people to render their labour for the management of the water facilities for free but does not want to incur the cost of training them.

Given the difficulties innate in managing revenues as expressed earlier at the community level, it is predictable that many communities will soon give up collecting regular user fees and address breakdowns in a more ad hoc manner as problems arise with the water facilities. Perhaps, the fact that services rendered by the WATSANs do not attract any remuneration could explain why things do not go so well with their financial management for effective O&M. As the secretary of the Lanor WATSAN puts it during a group discussion, *“this is total voluntary work; they do not pay for even our transport. I use a motorbike and they do not pay for my fuel”*.

5.3.5 Willingness to Sustain Water Facility

This sector measures community support for sustaining the water system. It assesses whether the community members feel responsible for the maintenance of their water facility and their willingness to sustain them.

The difference between the functioning of the two facilities after external support is phased out was tested. It was discovered that there was a significant difference with respect to the borehole and pipe facility at a 1% significant level when external support phases out. From Table 26, it was realized that 63% of the respondents using the borehole facility maintained it could be sustained while 32% of the respondents using the pipe borne facility argued it could not be sustained after external support is phased out. Majority of the respondents using the borehole believe the facility can be maintained after external support is phased out while majority of the respondents using the pipe borne facility think otherwise. This could be true because the cost of repairing even major faults is relatively cheaper for boreholes than pipes. KII at the District Assembly revealed that the DA has had to pay an accumulated electricity bill of about GHS 10,000 for the pipe communities to prevent a threat of disconnection by

the Electricity Company of Ghana (ECG) since water is pumped to their respective communities using electricity. The communities clearly cannot foot some of the expenses by themselves.

This supports the RWSN (2009) view that many communities experience a gradual decline of the service prior to a major breakdown, which is resolved only through an external rehabilitation programme. Gine and Perez-Foguet (2008) noted communities should choose technologies and set tariffs that are affordable and commensurate with their economic status. Therefore, lower cost alternatives should be introduced because as Wood (1994) puts it, in some rural communities, even hand-pumps may represent an unaffordable technology. Some have argued that it is unrealistic to expect that rural communities can be left to their own devices after a water project is completed, and that for rural water supply systems to be successful, communities need some post-construction technical assistance (Lockwood, 2003).

Table 26: Facility functioning after external support phases out

Type	Borehole (%)	Pipe (%)	Total (%)
Can be maintained	63	32	47.5
Would collapse	31	56	43.5
Don't know	6	12	9
TOTAL	100	100	100
Chi-squared Stat			19.2997
Df			2
P – value			0.0001
Chi – squared Critical			5.9915

Source: *Field Survey, 2013*

5.4 Conclusion

Though not all the indicators of demand responsiveness were adhered to, demand was established by the communities before the facility was provided for them. Sustainable rural water supply requires the recovery of efficient operating costs, capital maintenance costs and any capital costs through charges and levies. With regards to sustainability, financial management which is crucial for O&M and the continuous functioning of the facilities was a major setback. Though communities are obliged to raise funds to operate and maintain their water supply facilities, communities in reality do not follow the regulation judiciously. Community members, especially the pipe communities, would not be able to manage the facilities in the event that a major breakdown occurred. More training of the individuals who manage the facilities and also the household members of the essence of O&M is required.

Communities are supposed to be fully involved in the implementation and management of their water facilities, but this should not strip the DA, CWSA and NGOs of their responsibility for an on-going support of the programme. As Carter *et al.* (1999) put it, “*as communities change, and the needs of their water and sanitation systems change, the appropriate type of support - education, training, financial subsidy, technical assistance, maintenance, even rehabilitation - should evolve*” (p. 12). This will positively reflect on the communities’ willingness to sustain the water facility to ensure sustainability. Also, the prominence of generating satisfactory revenue needs to be recognized by all those accountable for promoting sustainable water supply services.

Finally, even though DRA has gained widespread recognition and has been widely promoted and adopted by the international donor and financial community,

governments, and NGOs as the panacea to sustainable water service delivery, community-based management alone without external support is not a guarantee to achieving sustainability. As Buamann (2006) puts it, “*the theory that communities can do everything by themselves needs to be reconsidered: O&M is a shared responsibility between communities, local authorities and central government*” (p. 11).

CHAPTER SIX

SUITABILITY OF DRA IN PROVIDING EQUITABLE AND AFFORDABLE WATER SERVICE

6.1 Introduction

The nature of the water problem differs depending on the context – rural or urban (Carter *et al.*, 1999). The adoption of DRA for rural water delivery in Ghana marked an important step towards basing the provision of water services on demand, rather than the conventional supply-driven model; it has also complemented efforts to create ownership of services on the part of beneficiary communities. Its birth stems from the fact that water facilities that were centrally provided proved unsustainable (World Bank, 1994). DRA has added to the mere implementation of water facilities to include operation and maintenance and, most importantly, cost-sharing of water supply systems by beneficiaries. DRA also fitted into the broader trend of decentralization of government services and transfer of responsibilities to lower levels of government and ultimately to communities themselves (Nicol, 2000). However, Lockwood (2004) highlights the different actors with different agenda who signed up to the concept.

To governments, DRA is a way of reducing demand on already over-stretched resources and Carter *et al.* (1999) describe it as a way of reducing demand on overstretched resources and making up for lack of capacity. Donors saw an opportunity to stretch development budgets and expand implementation of water supply and sanitation facilities, and to bypass the problems posed by inefficient and often corrupt governments. Non-governmental organizations became the voice of the community and happily seized an opportunity to increase their role, becoming in many countries a parallel provider of services and, in that respect, a kind of parallel

government. The World Bank and allied institutions saw the concept as an ideal vehicle for their messages about reduced government involvement, and increased private sector and civil society roles. And so what does the rural community stand to gain? What the beneficiaries stand to gain has not been critically considered. The thrust of the importance of the adoption of the approach is on equity and affordability. This chapter analyses the suitability of the DRA approach in terms of its equitability and affordability from the perspective of the rural people (Shai-Osudoku district).

6.2 Issue of Affordability

In measuring affordability, the issues considered were the ability of the communities to pay, community members acceptance of payment system, verification for action taken for not paying for the water facility and the socioeconomic characteristics that affect the ability to pay for the water facility.

On the issue of ability to pay for the water facility, Table 26 indicates that 19% of members of the pipe community said they could afford for the facility while 70% said they could not afford it. Eleven percent (11%) of the community members said they could not afford to pay for the use of the facility always. To quote the response of the CWSA extension services specialist during the KII, *“ask them what they used to pay for tanker services before they were provided with the facilities. And meanwhile they pay the lowest rate in the region.”* These sentiments were also shared by the members of the DWST at the DA. A strict adherence to the tenets of DRA means that households or individuals that fail to express effective demand by way of payment are left un-served.

Table 27 indicated that only 9% of the community members interviewed could afford the water facility while 69% said they could not afford. Out of the 100 respondents,

22% said they were not able to pay for the use of the facility always. This confirms the admission by the WATSAN that households were not forthcoming with payment.

In summing up, only 14% of the 200 respondents interviewed from both the borehole and pipe community said they could afford to pay for the use of the water facility while 69.5% said they could not afford the use of water facilities. In all 33% percent noted they could not afford for the water facilities always. According to Carter *et al.* (1999), the financial costs which communities are expected to raise as contribution to capital or recurrent expenses may be impossible for households which only receive income at harvest, and majority (48%) of respondents for the study are farmers. Also, household and communities in particular situations of vulnerability or poverty, and where income-generating opportunities are very limited, simply cannot pay the tariffs required for hand pump O&M (Carter *et al.*, 2010).

Table 27: Ability to pay for the use of the facility in the Pipe Communities

Response	Pipe		Borehole		General	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	19	19	9	9	28	14.0
No	70	70	69	69	139	69.5
Sometimes	11	11	22	22	33	16.5
Total	100	100	100	100	200	100.0

Source: *Field Data, 2013*

Of the 100 people in the pipe communities interviewed, Table 28 indicates that 9% admitted that when they are not able to pay for the facility they were asked to pay in

the subsequent month, 29% admitted they buy on credit and pay when they get money while 33% gave other forms of dealing with the situation when they are not able to afford it. Interestingly, 29% did not give any response to the question. It is worth noting that the Lanor community, during a FGD, said they were allowed to fetch on credit if they did not have money readily available to pay. The Gbese water vendor does not allow community members to fetch on credit. She, however, justifies this action with the explanation that it was difficult to collect monies once the water has been fetched. Some of residents she says feign unawareness of having fetched water on credit and she is obliged to render accounts to the WATSAN who will not take any excuses.

Table 28: Actions taken for not paying for the use of the facility in Pipe Communities

Response	Frequency	Percent
Pay in the subsequent month	9	9
Buy on credit	29	29
Others	33	33
No response	29	29
Total	100	100

Source: *Field Data, 2013*

The response from the borehole communities on the issue of payment was different because as indicated in Table 29, thirty one percent (31%) of those interviewed did not respond to the question. Those who pay in the subsequent month were 56% while those who fetched from other sources were 13%. A group discussion with the WATSAN revealed that though households promised to pay in subsequent months they did not pay as promised.

Table 29: Actions taken for not paying for the use of the facility in borehole communities

Response	Frequency	Percent
Pay in the subsequent month	56	56
Fetch from other sources	13	13
No response	31	31
Total	100	100

Source: *Field Data, 2013*

In all, 24% out of the 200 households interviewed said they pay in subsequent month when they are not able to afford in a particular month, while 23% admitted they buy on credit though but pays as and when they get the money. Twenty three percent admitted they used other means to pay when they are not able to afford on the spot or within the required payment period while 30% did not give any response to the question as indicated in Table 30.

Table 30: Actions taken for not paying for the use of the facility in both Communities

Actions	Frequency	Percent
Pay in the subsequent month	48	24.0
Buy on credit	46	23.0
Others	46	23.0
No response	60	30.0
Total	200	100.0

Source: *Field Data, 2013*

With respect to acceptability of payment in the pipe communities 99% agreed that they were in favour of it but 1% did not respond. Interestingly, none was of the view that the payment system was not good. This is because they have been informed by their WATSAN that what they pay currently is not enough to pay fully for O&M and have been calling for an increase in the water fee. They are of the impression that what they pay is satisfactory and should not be increased. This is indicated in Table 31.

Table 31: Acceptability of Payment in Pipe Communities

Responds	Frequency	Percent
Yes	99	99.0
No	0	0
No response	1	1.0
Total	100	100.0

Source: *Field Data, 2013*

Similar to the pipe communities on the issue of acceptability of payment, the borehole communities had 99% agreeing that they were in favour of it but 1% did not respond. Interestingly, none was of the view that the payment system was not good. This is indicated in Table 32.

Table 32: Acceptability of Payment in Borehole Communities

Responds	Frequency	Percent
Yes	99	99.0
No	0	0
No response	1	1.0
Total	100	100.0

Source: *Field Data, 2013*

Table 33 clearly indicates that 99% of the total households surveyed are in favour of the systems of payment of the water though 1% did not response to the question. As already indicated in Tables 31 and 32, none was of the view that the payment system was not good. A probit analysis was made to access the socio-economic factors that influence ability to pay.

Table 33: Acceptability of Payment in All Communities in General

Responds	Frequency	Percent
Yes	198	99.0
No	0	0
No response	2	1.0
Total	200	100.0

Source: *Field Data, 2013*

Out of the seven socioeconomic factors which were considered in the probit analysis, only occupation of respondents, amount of water usage and water usage squared significantly affected one's ability to pay for the water facility. Occupation was significant at a level of 1% and negatively related to ability to pay, which could be inferred that those who do non-agricultural work as their first occupation are more

likely to pay for the water facility than agricultural workers. A marginal effect of -0.204 for occupation indicates that when a household head changes his occupation to a non-agricultural one, the probability that he will be able to pay for the water will be 0.204 than when he is in his agricultural occupation. This could also mean that farming is not a lucrative business in the district. With respect to amount of water usage which was significant at a 10% significant level and also positively related to ability to pay, it could mean those who can pay are those who fetch more. This is true for the pipe system because of the policy of pay as you fetch; therefore, the more you fetch the more it indicates you are able to pay. Interestingly, at higher level of water usage (water usage square) one is no more able to pay and this is significant at a 10% level of significance. A marginal effect of 0.0011 for water usage indicates that a litre increase in water usage will increase the ability of that household to pay by 0.0011. With respect to water usage square, at higher levels of water usage, there is a 0.000000994 probability a household will not be able to pay if it increases water usage by a litre. These are indicated in Table 34.

Table 34: Factors affecting ability to pay for water facility in Pipe Communities

Dependent Variable: Ability to pay

Method: ML - Binary Probit (Quadratic hill climbing)

Included observations: 99

Convergence achieved after 9 iterations

QML (Huber/White) standard errors & covariance

Variable	Marginal Effect	Coefficient	z-Statistic	Prob.
Age	-0.0011979	-0.005825	-0.579428	0.5623
Gender	-0.0302261	-0.144389	-0.455004	0.6491
House hold size	0.0168606	0.081986	1.470254	0.1415
Number of durable assets	-0.0374442	-0.182076	-1.403566	0.1604
Occupation	-0.2043012	-0.987187***	-2.785646	0.0053
Water usage	0.0010591	0.005150*	1.754651	0.0793
Water usage square	-9.94E-07	-4.83E-06*	-1.769281	0.0768
C	-0.2765108	-1.344561	-1.324312	0.1854
Mean dependent var	0.181818	S.D. dependent var		0.387657
S.E. of regression	0.356818	Akaike info criterion		0.918093
Sum squared resid	11.58607	Schwarz criterion		1.127800
Log likelihood	-37.44561	Hannan-Quinn criter.		1.002941
Restr. log likelihood	-46.93979	Avg. log likelihood		-0.378239
LR statistic (7 df)	18.98836	McFadden R-squared		0.202263
Probability(LR stat)	0.008224			
Obs with Dep=0	81	Total obs		99
Obs with Dep=1	18			

Source: *Field Data, 2013*

For the borehole communities, as indicated in Table 35, gender, household size and durable assets came out as the significant factors affecting the ability to pay for the facility. Interestingly, females are more likely to afford for the usage of the water

facility at a significant level of 10% than the males. The fact that females use more water domestically than males makes them see water as more important than males and are likely to commit funds to that effect. With respect to the marginal effect on gender, the probability a female is able to pay than a male head is 0.0989. With household size, since the borehole system takes payment on monthly basis, households with larger numbers are able to gather enough funds to pay for the water provided. The marginal effect of 0.0304 for household size indicates that a unit increase in the household size will increase their probability of paying by 0.0304. Number of durable assets was significant at 1% and this could be due to the fact that the more gadgets one has the more likely the person is to commit more money to the payment of electricity bill making it difficult to pay for the water which is also paid monthly. With respect to the marginal effects for durable assets, an increase in a durable asset by a household will reduce their ability to pay for water at probability 0.0360. Water usage and water usage square were not significant because since a fixed deposit is paid irrespective of the amount of water one uses in the borehole system, the quantity one fetches does not affect his or her ability to pay.

Table 35: Factors affecting ability to pay for water facility in Borehole Communities

Dependent Variable: Ability to Pay				
Method: ML - Binary Probit (Quadratic hill climbing)				
Included observations: 97 after adjustments				
Convergence achieved after 9 iterations				
QML (Huber/White) standard errors & covariance				
Variable	Marginal Effect	Coefficient	z-Statistic	Prob.
Age	0.0025525	0.013619	1.540318	0.1235
Gender	-0.0989238	-0.543256*	-1.608448	0.1077
House hold size	0.0304443	0.167641***	3.545535	0.0004
Number of durable assets	-0.0360794	-0.199576***	-2.520884	0.0117
Occupation	-0.0352237	-0.180257	-0.599259	0.5490
Water usage	0.0000373	-0.000615	-0.279769	0.7797
Water usage square	1.27E-07	6.92E-07	0.436938	0.6622
C	-0.0210345	-1.150728	-1.172417	0.2410
Mean dependent var	0.164948	S.D. dependent var	0.373062	
S.E. of regression	0.329851	Akaike info criterion	0.853248	
Sum squared resid	9.683339	Schwarz criterion	1.065595	
Log likelihood	-33.38253	Hannan-Quinn criter.	0.939111	
Restr. log likelihood	-43.43516	Avg. log likelihood	-0.344150	
LR statistic (7 df)	20.10527	McFadden R-squared	0.231440	
Probability(LR stat)	0.005347			
Obs with Dep=0	81	Total obs	97	
Obs with Dep=1	16			

Source: *Field Data, 2013*

6.3 Issue of Equity

Carter *et al.* (1996) proposed that aims and objectives of water and supply programmes in developing countries among others should be specifically related to impacts to achieve equity in all aspects of service provision. Equity concerns can be

classified as geographic, social and economic (UNECE & WHO, 2012). Geographically, some communities do not enjoy improved water services because the facilities are non-existent in their community. Socially, some groups are exempted from improved water facilities due to the fact that services provided are not adapted to the particular needs of certain groups (e.g., disabled people). Economically, which is of relevance and interest to this study, is the situation where a person may have access but may not be able to afford to pay to use the water facility. According to Addai (2012) there is a culture in rural communities in Ghana that no person can be denied access to water due to that fact that water is viewed as a basic human need. This section investigated issues such as nondiscriminatory payment, reasons for exemptions and sanctions for defaulting.

From Table 36, eighty one percent (81%) of the respondents indicated that there was no discrimination in terms of payment of the facility and that everyone paid the same amount for water fetched. On the other hand, 3% attested to the fact that there was some form of discrimination in the payment of the water facility. Eleven percent (11%) was not sure whether there was discrimination while 5% did not respond to the question. KII at the CWSA and DA indicated that the decision of who should be exempted lies with the community. They themselves come up with arrangements for those who can genuinely not afford to pay.

Table 36: Issue of Non Discriminatory Pricing for Households for Pipe Communities

Response	Frequency	Percent
Yes	81	81
No	3	3
Not Sure	11	11
No response	5	5
Total	100	100

Source: *Field Data, 2013*

From Table 37, forty six percent (64%) of the respondents indicated that there was no discrimination in terms of payment to the facility and that everyone paid the same amount for water fetched. On the other hand, 13% attested to the fact that there was some form of discrimination in the payment of the water facility. Out of the 100 respondents, 16% were not sure whether there was discrimination while 7% did not respond to the question.

Table 37: Issue of Non Discriminatory Pricing for Households in Borehole Communities

Response	Frequency	Percent
Yes	64	64
No	13	13
Not Sure	16	16
No response	7	7
Total	100	100

Source: *Field Data, 2013*

Table 38 indicates that in general terms, 72.5% of the 200 respondents thought there was no discrimination with respect to payment of water fetched while 8% indicated discrimination in the pricing of the facility. In all, 13.5% indicated they were not sure while 6% did not respond. A question was raised during the FGD as to how the vulnerable groups such as the aged and disabled can access the use of the facility since they cannot pay. There was the general view that such people belong to households which should cater for their water needs.

Table 38: Issue of Non Discriminatory Pricing for Households in General

Response	Frequency	Percent
Yes	145	72.5
No	16	8.0
Not Sure	27	13.5
No response	12	6.0
Total	200	100

Source: *Field Data, 2013*

6.3.1 Reasons for exemption

The DRA had been hoped to be pro-poor and gender sensitive; however, the shift from the supply-driven to a strictly implemented demand-driven approach can lead to reduced water accessibility for particular groups in situations of rampant community poverty and hence an inequitable distribution of water access (Naiga *et al.*, 2012).

In the borehole communities sampled for the study, vulnerable groups, such as old and disabled, are usually exempted from paying levies to use the facilities. The chief's family is also exempted. The pipe communities, however, did not have any

form of exemptions. Every community member pays a fixed rate. From the FGDs, respondents assumed the water vendors' household did not pay for their water use even though the vendors disagreed. The payment system, especially for the pipe communities did not ensure that every community member had access to improved water. The non-discriminatory payment system has a tendency to encourage those who cannot afford at a given time to resort to the use of unhygienic options, such as rivers and dams, with animals. The District Planner and Community Development Officer hinted in an interview that the motivating factor for pushing for the installation of the water facilities in the area was due to its water borne (Bilharzia) endemic status. The issue, therefore, is that if people cannot access the use of the improved water source, then it defeats the purpose of providing the facility.

On the issue of being punished for not paying, Table 38 indicates that 24% admitted that people are sanctioned for not paying for the facility, while 11% said people are not sanctioned with respect to the pipe communities. Forty six percent (46%) indicated they were not sure whether there was any punishment while 19% percent did not respond.

Forty-two percent (42%) admitted that people are sanctioned for not paying for fetching the water in the borehole communities while 32% think people are not sanctioned for not paying for the facility. Those who were not sure of any punishment were 9% and those who did not respond were 12% as indicated in Table 38. The WATSAN members in a group discussion admitted that though households who did not pay should not be allowed to fetch from the facility, it was difficult and sometimes impossible to enforce it. This was largely due to the close-knitted social structure as the borehole communities are more rural than the pipe communities. As

the chairman for Akunarhkope puts it, “*How do you continually demand for just 50p from your aunty, uncle or in-law? You might as well pay for them*”.

In general, Table 39 indicates that 33% were of the view people are sanctioned for not paying for the facility while 24% thought people are not sanctioned for not paying for the facility. Out of the 200 respondents, 27.5% were not sure but 15.5% did not respond.

Table 39: Admitting Punishment for defaulting in required Payment

Response	Pipe		Borehole		General	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	24	24	42	42	66	33.0
No	11	11	37	37	48	24.0
Not Sure	46	46	9	9	55	27.5
No response	19	19	12	12	31	15.5
Total	100	100	100	100.0	200	100.0

Source: *Field Data, 2013*

From Table 39, 19% of respondents in the pipe community admitted that they had been stopped from fetching from the water facility because they could not pay while 8% gave other forms of sanction for not paying for the water. Seventy three percent (73%) did not respond to the question.

From Table 39, fifty eight percent (58%) of respondents in the borehole community admitted that they had been stopped from fetching from the water facility because they could not pay while 1% each said they were asked to weed around the facility

and other punishment as a form of payment for not paying for the water fetched. One percent (1%) gave other forms of sanction for not paying for the water. Forty percent (40%) did not respond to the question.

In all, Table 40 indicates that 35.5% of the 200 respondents said they were not allowed access to the water facility as a form of punishment for not being able to pay, 0.5% said they weeded the compound as punishment, 4.5% gave different forms of punishment for not accessing the facility but 56.5% did not respond to the question.

Table 40: Punishment for Defaulting payment

Response	Pipe		Borehole		General	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	19	19	58	58	77	38.5
No	0	0	1	1	1	0.5
Not Sure	8	8	1	1	9	4.5
No response	73	73	40	40	113	56.5
Total	100	100	100	100.0	200	100.0

Source: *Field Data, 2013*

6.4 Conclusion

Even though households agreed to the payment system, majority were not able to afford the use of water facility. The situation could be as a result of the occupational situation where incomes were realised on seasonal basis. It was also realised that females are likely to spend on water more than males and this could be due to the fact

that females see water as more important than males and are likely to commit funds to that effect. There was a tremendous acceptance for the payment system though the majority was unable to afford it. People who were not primarily farmers were able to pay. People who use more water were able to pay but when they use high volume of water (beyond a certain limit), payment becomes difficult. For borehole communities, those with higher number of electronic gadgets found it difficult to pay at the end of the month. It is widely accepted that there is no discrimination in payment for both systems.

CHAPTER SEVEN

PATTERN OF WATER USAGE WITH THE INTRODUCTION OF DRA

7.1 Introduction

The effect of providing improved water supply on poverty reduction, health and enhancement of rural livelihoods makes it logical for increased concern. Its economic, social and environmental impacts on rural areas according to the African Development Bank (2005) include the following:

- Saving time from fetching water at long distances because time spent on this activity can be used on more productive activities which can contribute to poverty reduction;
- Ensuring an improvement in sanitation promotes good health and also reduces cost on health which leads to improvement in overall national savings for investment in general and other developmental activities;
- Empowering women who are the main players in implementing and managing improved water supply services to contribute more significantly towards family life and other ventures;
- Ensuring children have the opportunity to attend school instead of fetching water thereby increasing school enrolment, and also saving children from frequent sickness related to fetching water.
- Providing the management opportunity to grassroots community members in managing their water supply and protecting their local environment.

An efficient DRA water delivery system will no doubt have a positive impact on rural livelihood in general. This chapter analyses this position in three forms. The first part ascertains whether DRA has affected the usage of water in the communities. The

second part determines the percentage difference with respect to required water usage and actual water usage while the third aspect looks at factors that affect water usage.

7.2 Water Usage with the introduction of DRA

On the issue of the change in the usage of water with the introduction of DRA, Table 41 presents the results in terms the percentage usage of water.

Out of the 68% of the 100 respondents whose use of water exceeded what they required with respect to the pipe facility, 51% said that water used exceeded water required from 1% to 10 %, nine percent (9%) noted water used exceeded water required from 11% to 20 %, two percent (2%) admitted water used exceeded water supplied from 21% to 30%, one percent (1%) each from 41% to 50% and 51 to 60%, while none experienced a difference with respect 31% to 50%.

Table 41: Percentage Water Used exceeds Water Required

Percentage in Litres	Borehole		Water	
	Frequency	Percentage in terms of 100 (%)	Frequency	Percentage in terms of 100 (%)
Negative Percent. difference	11	11	6	6
0	34	34	26	26
1 – 10	36	36	51	51
11 – 20	11	11	9	9
21 – 30	2	2	2	2
31 – 40	0	0	0	0
41 – 50	0	0	1	1
50 – 60	2	2	1	1
Not sure	4	4	4	4
Total	100	100	100	100

Source: *Field Data, 2012*

7.3 Factors influencing water usage

Clearly, results presented in Table 40 indicate that the introduction of DRA has proven to contribute significantly to the water needs of the people of Shai-Osudoku District. From the FGD, it showed that before the installation of the improved water facilities, community members had to resort to the use of water tanker services whose services were very exorbitant. During the use of the tanker services they paid 0.50 pesewas per 34 litres sized bucket but with the introduction of the DRA-based water facilities they now pay 0.25 pesewas per bucket. Based on this, the study probed further to find out the factors that affected the usage of water in the district. In the simple linear regression where the amount of water used per week was the dependent variable and the type of facility used, household size, gender, distance from house to water facility and availability of water served as the independent variables, eight (8) out of the 200 households surveyed were not sure of the water they used per week. Therefore a sample of 192 respondents was used.

From Table 42, there is an indication that the type of facility and distance has influence on water usage. With respect to the type of water facility, it is clear that communities with boreholes were likely to use more water than communities with pipes (significance level of 1%). Due to the fact that borehole communities pay monthly, they are able to fetch water from the facility while gathering funds to pay at the end of the month. The pay-as-you-fetch payment system in the pipe communities restricts use of the water facility when the user does not have money. With distance, those who stayed closer to the facility used more water than those who stayed away from the facility and this is true for both the pipe and borehole facilities. This implies the farther one stayed away from the facility, the less one fetched water (significant at a level of 10%).

Household size, gender and availability of water were not significant. With household size, it could be due to the fact that humans need water to survive and for several purposes; therefore, it could mean that a small household might need a relatively larger volume of water than a large household.

Table 42: Factors affecting water usage

Dependent Variable: Water Usage				
Included observations: 192 after adjustments				
White Heteroskedasticity- Consistent Standard Errors & Covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Type of Facility	-111.2920***	43.34261	-2.567728	0.0110
Household size	7.267634	7.441799	0.976596	0.3300
Gender	15.48855	45.91659	0.337319	0.7363
Distance	-1000.509*	589.5645	-1.697030	0.0914
Availability of water	36.67410	80.90911	0.453275	0.6509
C	507.7283***	93.61642	5.423496	0.0000
R-squared	0.056789	Mean dependent var		494.3490
Adjusted R-squared	0.031434	S.D. dependent var		302.2116
S.E. of regression	297.4238	Akaike info criterion		14.25894
Sum squared resid	16453735	Schwarz criterion		14.36074
Log likelihood	-1362.859	F-statistic		2.239751
		Prob(F-statistic)		0.052147

Source: *Field Data, 2012*

Keshavarzi *et al.* (2006) observed that large size households have no significant impact on water consumption pattern. They also found that households with larger families had their average water consumption per person reduced. They concluded

that some water uses are relatively independent of the size of the family (e.g., outdoor uses, uses for cooking, cleaning, etc.), so that while total water use per household rises, per capita water use falls as family size grows.

With respect to gender, it could be that it is what the water is needed for in the household that matters but not who heads the household. On the variable of the availability of water, it could be due to the fact that both facilities were reliable and had water flowing most of the time; therefore, it lacked significance in terms of usage. In other words, water was mostly available and therefore fetching water does not necessarily depend on its availability.

7.4 Conclusion

Generally, the water needs of the communities were met and in some cases even exceeded requirement. Borehole communities use more water from the improved water source than pipe communities because of the payment system in place. Water usage farther away from the facility reduced in quantity. That is those who stayed far from the facility fetched less as compared to those nearer the facility.

CHAPTER EIGHT

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

8.1 Summary

The study argues that demand responsive community managed facilities cannot be sustained without external support and where user fee alone cannot achieve financial sustainability, clear mechanisms to fill the gap should be put in place instead of leaving the responsibility fully to the users. Even though the DRA has improved access to potable water in terms of usage, the non-discriminatory pricing especially for the pipe communities discriminates against those who cannot afford the facility in the community. In addition, rural communities are served water by one entity, the CWSA, which applies the same principle of DRA in providing portable water. If rural communities do not access facilities provided them due to its non-affordability, they will resort to the use of unhygienic water sources which will negatively impact on their health and in the long run add to the economic burden of the country and also rob the country of its productive human resource.

Four (4) communities were selected in the Shai-Osudoku District for the study. Two (2) were from the pipe communities and two (2) from the borehole communities. The study used a purposive sampling method with structured questionnaires in collecting data from 200 household heads. In addition to the use of the structured questionnaires, the study also conducted focus group discussions (FGD) with the Water and Sanitation Committee (WATSAN) and community members, and also held key informant interviews (KII) with traditional leaders, District Assembly members, District Assembly and Community Water and Sanitation (CWSA) staff and WATSAN committee members.

In analysing the conditions under which DRA leads to improved functionality in a sustainable manner, the criteria of Sara and Katz (1998) in analysing demand responsiveness and sustainability were used. For the demand responsiveness conditions, the study examined project initiation, informed choice and contributions towards the implementation of the water facility, and the measurement of sustainability. As part of the measurement of sustainability, physical condition of the system; consumer satisfaction; operation and maintenance practices; financial management and willingness to sustain were assessed. Out of the 200 respondents, it was realised that 56% participated in the technology to be used, 58.5% participated in identifying the sites for the facilities, and 69% contributed in (cash or kind). Also, over 80% admitted the construction was very good with no significant difference in the construction quality of both the borehole and water, 64% admitted the facility will function in the next five years and 83% admitted the facility was able to meet their water needs. Even though 74% admitted the water was safe for drinking, the majority (65.5%) admitted they could not pay in maintaining the facility when external support fades out; notwithstanding the fact that the communities are in charge of maintaining the facilities.

In examining the suitability of DRA for rural communities in providing equitable and affordable water services, the first factor considered was the issue of affordability. In all, 69.5% respondents said they could not pay for water from the facilities; 57% admitted some form of considerations in using the facility, though not free. Although the majority could not pay, 99% of the total sample size admitted the system of payment was good. In addition to the analysis of this objective, a probit regression was used to determine how socioeconomic characteristics determined the ability to pay for water. For the pipe communities, while higher amount of water usage made people pay more, extremely higher amount of water usage and farm occupation reduced the likelihood of residents' ability to pay. In the borehole communities, while

gender (being female) and the amount of durable assets one uses made it less likely to be able to pay, larger household sizes made residents more likely to pay. In the final analysis of this objective, the IRC (2003) criterion which looks at the issue of equity in payment was used. In all the communities combined, 33% admitted there were punishments in place for not paying for the use of the water facilities while about 73% admitted that pricing is non-discriminatory.

Finally, the study examined the change in the pattern of water usage with introduction of the DRA. In the first part of the analysis, normal and percentage changes were used to determine how the introduction of DRA has affected the weekly usage of water in these communities. In the borehole communities, 11% admitted there have been shortages in water provision by the DRA facility, 34% admitted it has exactly met their needs but the remaining 55% admitted it has exceeded their water needs. In the pipe communities, only 6% admitted they experience shortages with respect to water supply, 26% admitted it exactly met their needs and 68% admitted water supplied exceeded their water needs. In the second aspect of the objective, a simple linear regression was used to determine the factors which affected the use of water provided to DRA communities. It was realised that the borehole communities used more water than the pipe communities in addition to the fact that closer distance to the facility led to residents using more water.

8.2 Conclusions

Both the state and the market have failed in providing safe drinking water in rural areas (Yan *et al.*, 2010). This is due to the fact that the private sector does not usually have sufficient incentives to invest in rural water supply due to the high costs of infrastructure development in areas with low population density and the high transaction costs of collecting fees for drinking water in such areas, especially if the

awareness of the value of safe drinking water is limited and if people can easily resort to other (although unsafe) water sources. The government on the other hand lacks sufficient funds and incentives to manage rural water facilities in a sustainable way hence, the introduction of the community-based management using the DRA. Nonetheless, this thesis agrees with Yan *et al.* (2010) that “*it is well known that communities may also fail to provide services effectively due to problems such as elite capture and limited capacity*”(p. 1). In the case of this study, limited capacity on the part of WATSAN members serves as an inhibiting factor to the sustainable management of water facility.

8.2.1 Indicators of demand responsiveness and sustainability

The majority of the community members in the study area participated in the selection of the technology used in the identification of the sites for the installation of the water facilities and contributed to their implementation. In addition, the majority attested to the fact that the facilities provided were of higher quality in terms of flow, durability and taste. Though their participation was pronounced with respect to demand responsiveness, maintaining the facility would be difficult to sustain without external support due to ineffective financial management. There was also a lack of coordination between community members and WATSANs as well as with the DAs and CWSA in terms of training and monitoring. The activities of the WATSANs were not supervised to ensure that they carried out their responsibilities towards the sustainability of the water facilities.

8.2.2 Suitability of DRA in providing equitable and affordable water service

There is a strict adherence in the pipe communities in terms of payment, making equitability more elusive, as compared to borehole communities though the latter do not ensure equitability to the core in spite of the fact that the payment system was

favourable. In addition, non-farmers are more likely to afford for the use of the facility than farmers while people who used more water are more likely to afford for the facility in the pipe communities. With the borehole communities, females are more likely to afford for the use of the facility which is the same for large households. The pay-as-you-fetch payment system in the pipe communities prevents those who do not have money at the time of needing to use water to patronise the water facilities. They therefore resort to the use of unimproved water sources. This situation has implications for health and productivity.

8.2.3 Change in water usage with the introduction of DRA

DRA has contributed significantly to the water needs of the people of the Shai-Osudoku district in general. The borehole communities use more water than the pipe communities. In addition, households which are closer to the facilities (for both schemes) patronise the use of the facilities.

8.3 Policy Recommendation

Literature reviewed throughout this study adduce to the fact that it was the unsustainable nature of projects provided under the supply-driven concept that informed the decision to introduce the demand-responsive concept in 1998 when the NCWSP was introduced. However, if some modifications are made the sustainability objective will be achieved. This study has identified some of these concerns and they are discussed accordingly.

8.3.1 Institutional Coordination and Collaboration

The lack of attention on the part of the DA has also been identified as a contributory factor to the ineffectiveness in managing the facilities. There is the need, therefore, to make the O&M of these facilities a shared task between government and the communities. The District Assemblies should be resourced to play not just monitoring

roles as they do now, but also actively contribute financially toward the sustainability of the water facilities. There should be active coordination among local water-user committees, DA and also the CWSA, for purposes of supervision and the provision of supporting mechanisms for effective sustainable management of the facilities. Lack of such coordination is a major factor in the unsustainability of rural water facilities (Sharma, 1998; Bhandari *et al.*, 2005).

The CWSA and DAs whose main responsibility is it to facilitate and manage WSDB and WATSAN committees should be resourced to provide long-term support to them. The fact that these institutions lack the requisite resources makes it difficult for them to assist the WSDB and WATSANs. There is the need to create a water department as is the case for health and education in DAs to facilitate linkages with the other sub-sectors and key ministries and agencies that have roles to play in the country's water sector.

The siting of water facilities should be given a location advantage relative to other water sources in order to attract community members to patronised its use.

8.3.2 Education and Training

There should be a clear policy for policy makers (CWSA, Government, Donors) to put in place measures that will address the intermittent and continuous training programmes for office holders (WATSAN committee, vendors, attendants, mechanics and caretakers) and the community on up-to-date methods of sustainable water management and also to revive interest in O&M of the facilities. Community members should also be educated on the efficient use of the facilities. This is due to the fact that interest could wane as time goes by. After ten (10) years of benefiting from the use of the facility there is the likelihood of the office holders and the community at large to loose the enthusiasm with which to cater for the facility when

it was first provided. The cost of training should not be borne by the communities since they (communities) can barely raise enough funds for O&M. It is asserted that DRA for community management of water facilities was introduced due to the inability of governments to build and effectively maintain water supply infrastructure. However, this study shows that this responsibility seems to be an arduous task for only rural communities to bear. This is due to the fact that rural communities have a very limited revenue base and also few benefits from economies of scale as is the case in urban centres and even small towns.

8.3.3 Equity Considerations

The issue of who the marginalised are and who should be exempted from paying for the water facility should not be left for the communities to decide but should be spelt out by CWSA to embrace equity concerns. Ghana's rural water sector delivery can take a cue from the South African model. According to Deverill *et al.* (2002), the increasing adoption of DRA as an approach to planning and executing rural water supply (RWS) has consequences. As an approach based explicitly on demand, DRA will, by its very definition, exclude those who cannot easily articulate this demand or who are unable to contribute towards an improved service, or who simply do not want the service. The exclusion of these groups under DRA has significant implications for achieving the maximum coverage targets; especially, because in most instances it is the poorer and less able communities that will be excluded.

This is necessary because the communities (especially the pipe communities) strictly abide by the pay-as-you-fetch rule and will not allow any one who does not make a financial commitment to access the facility. Those refused to fetch would resort to the use of unhygienic sources.

8.3.4 External Support

The results from the study indicate that the implication of DRA for sustainable management in rural communities would be better enhanced if a clear external support structure is put in place to address the inefficiencies of community management of water facilities. The fact that communities make a demand for a facility and therefore own it, does not necessarily translate into sustainable management. As Gbedema (2010) puts it, the provision of water facilities for rural communities based on DRA runs the risk of serving as a one-off investment. The policy of 100% responsibility for O&M should be relooked at. Communities should be made to finance only minor repairs while major ones should be borne by external sources. In the midst of dwindling financial resources of the DA which restrains them from fully performing their duties, government and donors should assist them financially and logistically.

8.4 Suggestion for Further Research

It will be worth investigating thoroughly the mechanisms that will guarantee financial sustainability for effective O&M. If communities, based on the tenets of DRA, are supposed to incur 100% cost of O&M, then it will be prudent to research into means of ensuring financial sustainability which from the study is very poor and will affect overall sustainability negatively in the long term.

Even though gender issues were not the subject of this study, the study noted that women were more likely to pay for water than men. Research into the dynamics of DRA and its implication for gender is recommended. This will make a stronger case for the involvement of women in decision making and management of water facilities in rural communities and for the purpose of sustainability. It will also help shed light on how the DRA is impacting positively or otherwise on women in particular.

This research was conducted in communities which at the time of receiving the water facilities had to contribute 5% of the total cost of implementing the water facility. As has been indicated in this study, currently payment of the 5% has been stripped by the government. The impact of the removal of the 5% quota paid by communities towards the implementation cost of water facilities has not been researched into. It is important to ascertain whether or not without the expression of that financial demand, sustainability can be achieved. This is against the backdrop that it has been argued that by communities paying for the 5% they develop a sense of ownership towards the facility and will ensure its sustainability.

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APPENDIX**Questionnaire**

**INSTITUTE OF STATISTICAL, SOCIAL AND ECONOMIC RESEARCH
(ISSER), UNIVERSITY OF GHANA**

**PH.D RESEARCH TITLE: DEMAND RESPONSIVE APPROACH AND ITS
SIGNIFICANCE TO SUSTAINABLE MANAGEMENT OF WATER
FACILITIES IN THE DANGME WEST DISTRICT**

**DANIELLA DELALI SEDEGAH
HOUSEHOLD SURVEY QUESTIONNAIRE**

*The information gathered is for a Doctor of Philosophy in Development Studies
Thesis and therefore will be held **confidential**.*

Code_____

Name of Interviewer_____

Date_____ 1

Town/Community_____ **District**

_____ **Telephone of Respondent**

SECTION A: DEMOGRAPHIC INFORMATION

HOUSEHOLD INFORMATION

ID CODE	NAME	AGE (IN COMPLETED YEARS)	SEX post code: male=1 Female =2	RELATIONSHIP TO HEAD 1=Head (Wife/husband) 2=Spouse (son/daughter) 3=Child (son/daughter) 4=Grandchild 5=Parent/parent-in-law 6=Son/daughter-in-law 7=Other relative 8=Adopted/foster/stepchild 9=House help 10=Non-relative	HIGHEST LEVEL OF EDUCATION 1=None 2=Primary 3=Middle/JSS 4=Voc/Comm. 5='O' level/SSS 6='A' level 7=Training college 8=Tech/prof 9=Tertiary 10=Koranic 11=Don't know	CAN (NAME) read or write? (In any language) 1=Yes 2=No	MARITAL STATUS 1=married 2=consensual union 3=separated 4=divorced 5=widowed 6=Never married	DOES SPOUSE LIVE IN HOUSEHOLD ? 1=Yes 2=No If spouse is in HH, spouses 1D (if more than one spouse, the first one)	ETHNICITY Codes to be provided below	MAIN OCCUPATION Record answer and then write code using occupation code below. Record multiple options for household head (at most 3 options). For all other members record single primary occupation.	Does this hh member migrate during the year? If yes, how many months YES=1, NO=2	If a hh member has farming in addition to another occupation, ask what % of this time is spent on farming
01												
02												
03												
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11												
12												

ID CODE	NAME	AGE (IN COMPLETED YEARS)	SEX post code: male=1 Female =2	RELATIONSHIP TO HEAD 1=Head 2=Spouse (Wife/husband) 3=Child (son/daughter) 4=Grandchild 5=Parent/parent-in-law 6=Son/daughter-in-law 7=Other relative 8=Adopted/foster/stepchild 9=House help 10=Non-relative	EDUCATION 1=None 2=Primary 3=Middle/JSS 4=Voc/Comm 5='O'level/SSS 6='A' level 7=Training college 8=Tech/prof 9=Tertiary 10=Koranic 11=Don't know	CAN (NAME) read or write? (In any language) 1=Yes 2=No	MARITAL STATUS 1=married 2=consensual union 3=separated 4=divorced 5=widowed 6=Never married	DOES SPOUSE LIVE IN HOUSEHOLD ? 1=Yes 2=No If spouse is in HH, spouses 1D (if more than one spouse, the first one)	ETHNICITY Codes to be provided below	OCCUPATION Record answer and then write code using occupation code below. Record multiple options for household head (at most 3 options). For all other members record single primary occupation.	Does this hh member migrate during the year? If yes, how many months	If a household member has farming in addition to another occupation, ask what % of this time is spent on farming
13												
14												
15												

OCCUPATION CODES		ETHNICITY CODES	
1. Farming	7. Health worker	1. Asante	12. Mamprusi
2. Teaching	8. Non-agric labour	2. Akwapim	13. Gonja
3. Artisan	9. Trading	3. Fanti	14. Grusi/Frafra
4. Office worker	10. Student/pupil	4. Ga	15. Dagarti
5. Civil Servant	11. Unemployed	5. Dangme	16. Kusasi
6. Agric labour	12. Not in labour force	6. Krobo	17. Kassena-Nankani
		7. Ewe	18. Kankoma
		8. Guan	19. Nanumba
		9. Nzema	20. Builsa
		10. Hausa	21. Other (Specify)
		11. Dagomba	

B. 1. SUSTAINABILITY - Housing condition and asset**1. In what type of dwelling does your household live?**

_____ Separate house (Bungalow) (1), _____ Semi-detached house(2), _____ Flat/Apartment (3), _____ Compound House (4), _____ Huts/Buildings [same Compound] (5), _____ Huts/Buildings [different Compound] (6), _____ Tents (7), _____ Improvised home (kiosk, container) (8), _____ Living quarters attached to office/shop (9), _____ Uncompleted building (10), _____ Other (specify) (11)

2. Who owns this dwelling?

_____ Owned by household member (1), _____ Been purchased (e.g. Mortgage) (2), _____ Relative not household member (3), _____ Other private individual (4), _____ Private employer (5), _____ Other private agency (6), _____ Public/Government ownership (7), _____ Other (specify) (8)

3. How many rooms does this household occupy?

1. Living rooms _____, 2. Dining rooms _____, 3. Bedrooms _____

4. What major material did you use for the walls of your house?

_____ Mud / mud bricks (1), _____ Stone (2), _____ Burnt Bricks (3), _____ Cement/Sandcrete (4), _____ Wood/Bamboo (5), _____ Iron Sheets (6), _____ Cardboard (7), _____ Other (specify) (8) _____

5. What major material did you use for the roofing of your house?

_____ Mud (1), _____ Thatch (2), _____ Wood (3), _____ Metal Sheet (4), _____ Cement/Concrete (5), _____ Roofing tiles (6), _____ Asbestos (6), _____ Other (specify) (8) _____

6. What major material did you use for the floor of your house?

_____ Earth (1), _____ Cement/ Concrete (2), _____ Stone (3), _____ Burnt Brick (4), _____ Tiles (5), Other (specify) (6) _____

7. What kind of toilet facility does your household use?

_____ Open defecation (0), _____ Private toilet (pour flush) with septic tank (1), _____ Private household pit latrine: improved (2)
 _____ Private household pit latrine: unimproved (3), _____ Shared toilet or latrine (a few households sharing) (4)
 _____ Public toilet or latrine (4), _____ Other (9) (specify) _____

8. What is your main source of fuel for cooking and lightening?

Energy type/Fuel	Cooking	Lighting
a. Electricity		
b. Kerosene		
c. Charcoal		
d. Fuel wood		
e. Battery		
f. Candles		
g. Gas		
h. Generator		
i. Solar Energy		
j. Other (Specify)		

9. Which of the following gadgets does your household or household member own and currently in a working condition? (yes=1 no=2)

_____ 1. Radio
 _____ 2. Cassette Player
 _____ 9. Refrigerator
 _____ 10. Freezer

- | | |
|-----------------------------|--------------------------|
| _____ 3. Colour Television | _____ 11. Electric Iron |
| _____ 4. VCR/VCD/DVD player | _____ 12. Sewing machine |
| _____ 5. Mobile phone | _____ 13. Computer |
| _____ 6. Fan | _____ 14. Gas stove |
| _____ 7. Electric Stove | _____ 15. Bicycle |
| _____ 8. Motorcycle | _____ 16. Automobile |

10. Which of the following livestock does the household own? (yes=1 no=2)

- | | |
|------------------|----------------------|
| _____ 1. Cattle | _____ 6. Guinea fowl |
| _____ 2. Goat | _____ 7. Donkey |
| _____ 3. Sheep | _____ 8. Horse |
| _____ 4. Pig | _____ 9. Others |
| _____ 5. Chicken | |

11. What size of agricultural land does the family own?

- _____ 1. Hectares
 _____ 2. Acres
 _____ 3. Poles
 _____ 4. Other (specify)

B. 2. SUSTAINABILITY - Household expenditure and water use

1. Monthly estimate of expenditure

Item	Daily	Monthly	Yearly
1. Food			
2. Alcoholic beverage and tobacco			
3. Clothing and Footwear			
4. Clothing and Footwear			
5. Housing			
6. Electricity			
7. Gas			
8. Transport			
9. Communication (mobile phone)			
10. Recreation & culture			
11. Education			
12. Health			
13. Miscellaneous goods and services			
14. Total of average monthly expenditure			

2. Your total monthly expenses _____ . Does that sound right? (Revise total if needed)

Revised total _____

3. How much water does your household use in a day?

No	Type	Units	No. of times	Actual Unit Cost	WTP Unit Cost
1	Kufuor Gallon				
2	Prempeh				
3	Bucket (34)				
4	Other (specify)				

4. How much water does your household require in a day?

No	Type	Units
1	Kufuor Gallon	
2	Prempeh	
3	Bucket (34)	
4	Others (specify)	

5. Which of these is your main source of water?

_____ Pipe system (1), _____ Borehole (2), _____ Hand-dug Well (3), _____ Rainwater /Reservoir (4) _____ Dam/River/Lake/Pond (5), _____ Other (specify) (6) _____

6. Rank question 5 in the frequency of usage

_____ Pipe system
 _____ Borehole
 _____ Hand-dug Well
 _____ Rainwater /Reservoir
 _____ Dam/River/Lake/Pond
 _____ Other (*specify*) _____

7. Which of these is community managed and operated? (*tick*)

_____ Pipe system (1), _____ Borehole (2), _____ Hand-dug Well (3),

8. Who manages the water point? _____ WATSAN (1), _____ WSDB (2), _____ Don't know (3)

9. Which organisation provided/ facilitated the provision of the water facility?

_____ Community (1), _____ CWSA (2), _____ GWCL (3), _____ NGO (4), _____ Other (*specify*)(5), _____ Not Applicable (6)

10. How many days in a week do you have access to water? _____

11. Who fetches water for this household? _____ father (1), _____ mother (2), _____ children (3), _____ other (*specify*) (4)

B. 4. SUSTAINABILITY- Conditions of the introduction of DRA**1. Was your household aware that a water facility would be placed in your community before construction began?**

(0) No _____ (1) Yes _____ (2) Don't remember _____

2. How was awareness created?

3. In some projects like this, there are community meetings about the project to discuss the project and sometimes to make decisions about it before it is built. How many meetings about the water facility did you or someone from your household attend before construction?

_____ Number (1), _____ can't remember how many (2), _____ don't remember if we attended (3)

4. Who attended these meetings from your household?

_____ Household head (1), _____ spouse (2), _____ adult child (3), _____ both household head and spouse (4), _____ other (*specify*) (4)

I am going to read you a list of decisions that might have been made about the water facility. Please tell me whether you or someone in your household personally participated in making those decisions.

Before the project did you participate in	Did not participate or give input (1) Participated or gave input (2) Don't remember (3) Agree (4), Did not agree (5)				
	1	2	3	4	5
1. Choosing the type of technology?					
2. Identifying possible sites for facility?					

3. Deciding on or electing who manages the facility?					
4. Determining the hours and days the facility will operate?					
5. Deciding how much each household would have to contribute for construction of the facility: such as labour or cash?					
6. Setting the tariff for water provided by the facility?					
7. Identifying persons responsible for collecting money?					
9. What were the decisions?					

5. Were there any other kinds of decisions in which you participated?

6. If you disagreed with any of the decisions above, can you explain why?

7. To what extent do you agree with the planning process of the water project?

_____ agree (1), _____ somehow agree (2), _____ do not agreed (3), _____

8. To what extent do you agree with the implementation process of the water project?

_____ agree (1), _____ somehow agree (2), _____ do not agreed (3), _____

9. Who do you think had the most influence over the decisions made before the project was undertaken?

_____ The community (1), _____ WATSAN (2), _____ DWST (3), _____ Other external gov't agents (e.g. District Assembly, CWSA, etc) (4),
 _____ Private drilling contractor (5), _____ Donor (7), _____ Village leaders (8), _____ Unit committee (9),
 _____ Assembly member (10), _____ Other (11) (specify _____) _____ Don't know/ don't remember (12)

10. Did you or any member of your household attend any training or educational sessions about the water facility/use before, during and after its/their construction?

_____ No (1), _____ Yes (2), _____ Don't remember/ don't know (3)

11. What kinds of training? Check all that apply

Before the project did you participate in	Yes=1, No=2, Don't know=3		
	1	2	3
Hygiene trainings and education			
Maintenance training and education			
Conflict resolution			
Training but don't remember the topic			
Other (specify)			

12. Did your household contribute anything towards the construction of the facility?

_____ No (1), _____ Yes (2), _____ Don't remember/ don't know (3)

13. What did you contribute?

1. Labour (*number of days per household*) _____ or not sure
2. Materials (*approximate value of materials in Cedis*) _____ or not sure
3. Funds (*amount in Cedis*) _____ or not sure
4. Land (*approximate value*) _____ or not sure
5. Other (specify) _____ or not sure

14. Overall, how will you rate the construction quality of the water facility?

_____ Very Poor (1), _____ Poor (2), _____ Fair (3), _____ Good (4), _____ Excellent (5), _____ Not Sure (6)

C. SUSTAINABILITY - Functionality

1. What year was the water facility constructed or renovated? _____

2. Who was the major funding agent of the facility?

- _____ Donor (specify) _____ (1)
- _____ District Assembly (2)
- _____ Community (3)
- _____ MP (4)
- _____ Don't know (5)

3. How many public taps or public wells were there before this community managed water facility was installed?

_____ Hand dug wells (1), _____ Boreholes (2), _____ Pipe (3), _____ None (4)

4. How many are functional? _____ Hand dug wells (1), _____ Boreholes (2), _____ Pipe (3)

5. Is the community managed water facility able to meet your water needs all year round?

_____ Yes (1) _____ No (2)

6. Which periods of the day is water available? (*Check all that apply*)

_____ Morning (1), _____ mid day (2), _____ evening (3), _____ night (4), _____ all day (5)

7. Specify which months water doesn't flow

____ January (1), ____ February (2), _____ March (3), _____ April (4), _____ May (5), _____ June (6), _____ July (7), _____ August (8), _____ September (9), _____ October (10), _____ November (11), _____ December (12)

9. Has the facility broken down in the last 12 months? _____ Yes (1) _____ No (2)

10. How many times has the facility broken down in the last 12 months? _____

11. How long was the last breakdown (*in days*)? _____

12. What was the cause of the breakdown?

- _____ Poor construction (1), _____ lack of spare parts (2), _____ poor maintenance culture (3), _____ conflict/ vandalism (4),
 _____ Theft (5), _____ other (*specify*) (6) -----

13. How many days/ weeks/ months does it take to repair? _____ days/ weeks/ months

14. Are there regular water quality testing? _____ Yes (1) _____ None (2) _____ Only after installation (3) _____ don't know (4)

15. What is the distance from your house to the water facility? _____ (in metres)

16. How long do you stand in line to get water? _____ (in minutes)

17. What is your general impression of the functioning of the facility?

_____ excellent (1), _____ very good (2), _____ good (3), _____ fair (4), _____ bad (0)

18. Explain your answer above?

19. In your opinion, will the facility function in the next five years? _____ Yes (1) _____ No (2) _____ don't know (3)

20. Explain your answer above?

21. Since the water facility was installed, have people from the donor agency, the local government or other organizations been back to your community to offer support?

_____ Yes (1) _____ No (2) _____ don't know (3)

22. What support did they provide?

23. If there were a major breakdown of the system, would the community be able to finance all repairs with funds available within the community?

_____ Yes (1) _____ No (2) _____ don't know (3)

24. Explain your answer in Q23?

25. What do you think is the future of your water facility after the external support is phased out?

C. EQUITY - Suitability of DRA for Rural Communities for providing equitable and affordable water service

1. Do you use the community managed water facility?

_____ Yes (1) _____ No (2) (*skip to Q4*)

2. If yes, how long have you been using it?

_____ months ago (1), _____ years ago (2), _____ since it started operation (3), _____ can't recall (4)

3. What was your motivation for switching to using the facility from other sources that you once used?

_____ convenience (1), _____ better quality (safety, taste, smell, colour) (2), _____ more reliable (3), _____ lower cost (4),
 _____ other sources no longer functional/ dried up (5), _____ health reasons (6), _____ other (specify) (7) _____

4. If no, when did you stop using the water facility?

_____ Months ago (1), _____ Years ago (2), _____ Don't know (3)

5. Why did you stop using the water facility? (*check all that apply*)

_____ Too expensive relative to other sources (1), _____ Don't like payment system (2), _____ Poor quality/ taste relative to other sources (3), _____ Not working now (4), _____ too far away relative to other sources (5), _____ Other (*specify*) (6)

6. Does every household pay the same rate for the facility? _____ Yes (1) _____ No (2) _____ Don't know (3)

7. If no, how do they pay and how is the rate determined?

_____ Per month (1), _____ Per year (2), _____ Pay as you fetch at the pump site (3), _____ Others (*specify*) (4), _____ Don't know (5)

8. Is the current water payment system acceptable to you? _____ Yes (1) _____ No (2) _____ Don't know (3)

9. Are some community members exempted from paying for using the water facility?

_____ Yes (1) _____ No (2) _____ Don't know (3)

10. Why are they exempted?

11. What is the punishment for defaulting in payment?

12. How is one punished for defaulting?

13. Are you in a position that you cannot pay for the water facility?

_____ Yes (1), _____ No (2), _____ Sometimes (2)

14. If yes, give reason(s) why.

15. What do you do if you cannot afford at some time to pay for the water?

D. CHANGES IN WATER USE**1. What was the major source of domestic water to this community before the water facility was constructed?**_____ Pipe system (1), _____ Borehole (2), _____ Hand-dug Well (3) _____ Rainwater /Reservoir (4), _____ Dam/River/Lake/Pond (5), _____ Other (6) (*specify*)**2. What was the distance? _____ (in metres)****3. Now that you have the water facility, do you use more or less water in your house?**

_____ More (1) , _____ Less (2), _____ Same (3)

4. What is the number one problem with respect to your water supply?

_____ Distance (1), _____ Inadequate water points (2), _____ Taste of water (3), _____ Frequent break downs (4), _____ Water cost (user fees) (5), _____ Too many people at the water point (6), _____ Others (specify) (7) _____, _____ Don't know (8)

5. What other sources of water do you continue to use for domestic purposes?_____ Pipe borne water (1), _____ Borehole (2), _____ Hand - dug Well (3), _____ Rainwater /Reservoir (4), _____ Dam/River/Lake/Pond (5), Other (*specify*) (6) _____**6. Which source(s) of water do you use most of the time?**

N o	Water Source	A. Cooking	B. Drinking	C. Washing	D. Bathing
1	Pipe borne water				
2	Borehole				
3	Hand - dug Well				
4	Rainwater /Reservoir				
5	Dam/River/Lake/Pond				
6	Other specify.....				

7. Do you feel confident to drink your drinking source without boiling it or using chlorine?

_____ Yes (1), _____ No (2), _____ Don't know (3)

8. What recommendation will you make for better management of the facility?

GUIDING QUESTIONS FOR FOCUS GROUP DISCUSSION

1. When was the water facility installed?
2. Whose idea was it to build the facility?
3. What were the major sources of water before the water facility was installed?
4. Whose idea was it to choose the site for the facility to be installed?
5. Whose idea was it to choose the technology to be installed?
6. Was the lack of water the major problem at the time?
7. Who does the water facility belong to?
8. Who manages the water facility?
9. Did you select the WATSAN members yourselves?
10. What is the role of the WATSAN?
11. Is the facility working?
12. Before the water facility was installed did you contribute anything (cash or kind) towards its installment?
13. How much do you contribute towards operation and maintenance of the water facility?
14. How was the amount arrived at?
15. Did every one pay the same amount?
16. Who collects and manages the money?
17. How much is currently available for maintenance and repairs?
18. Has the facility ever broken down?
19. When the facility breaks down, do you know who to contact with the relevant technical training to carry out repairs?
20. How long did it take before it was repaired?
21. Since the facility was installed how often do the external agencies and DA visit?
22. What happened at the time? What support did they provide?
23. Does the water facility provide water throughout the year?
24. What is the community's ability to sustain the facility without external support?

GUIDING QUESTIONS FOR CARETAKER/VENDER

1. How long have you served as the caretaker of the borehole/pipe in this community?
2. Do you live in this community?
3. How were you chosen to be the caretaker/vendor?
4. What are your main job responsibilities?
5. Are you the only caretaker/ vendor or there are others who serve this role?
6. Is the water facility working? If not what is the problem?
7. Did you have skills related to water operation before you were chosen for this position?
8. Have you ever received training for the function you carry out?
9. What types of training have you received?
10. Would you like to receive additional training related to your work?
11. Are you paid for the work you do?
12. How much are you paid?
13. Where do the funds come from to pay you?
14. Do you think you are fairly compensated for the work you do?
15. Averagely how long does a user typically have to wait for his/her turn to use this facility?
16. How much money do you typically collect on a normal day?
17. To whom do you give the money that you collect?
18. Do you record the money you collect every day in a book or ledger?
19. Do all households pay the same rate?
20. Are there some who are exempted from paying?
21. What recommendations will you make for better management of the facility.