

**PRIVATE SECTOR WATER SERVICES DELIVERY**  
**INDAR ES SALAAMTANZANIA**

**PRIVATE SECTOR WATER SERVICES DELIVERY  
IN DAR ES SALAAM TANZANIA**

**By**

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**A Dissertation Submitted to Mzumbe University, Dar es Salaam Campus College  
in Partial Fulfillment of the Requirements for the Award of the Degree of Master  
of Science in Procurement and Supply Chain Management(MSc-PSCM) of  
Mzumbe University.**

2014

**CERTIFICATION**

I, the undersigned certify that have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled: **Private Sector Water Services Delivery in Dar es Salaam Tanzania** in Partial Fulfilment of the Requirements for award of the Degree of Masters of Science in Procurement and Supply Chain Management of Mzumbe University.

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## **DECLARATION**

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## **DEDICATION**

This work is dedicated to my Mother Safiness Z. Chediell for her care and material support. It is also dedicated to my lovely daughter Nema Zawadi and my son Agness Zawadi who missed me a lot during my study absence.

## **ABSTRACT**

This study intended to assess the private sector water services delivery in Dar es Salaam Tanzania. The study focus on exploring the factors influence the delivery of water services to Dar es Salaam resident by private sector in Tanzania. The study specific objectives includes; identification of factors affect water quality delivery to DSM consumers by private sectors in Tanzania, examine the effect of price by Private sectors in delivering water to consumers in Dar es Salaam Tanzania, to investigate the effect of infrastructure in water supply to Dar es Salaam water consumer in Tanzania and to investigate the effect of urban planning to the delivery of water service by private sector to Dar es Salaam residents in Tanzania.

A study used a case study as the research design to describe the private sector water services delivery in Dar es Salaam Tanzania. Data were collected through uses of questionnaires, interviews and documentary reviews. Questionnaires were both closed open-ended questions. Interviews were conducted on the basis of predetermined interview guide. Thus both qualitative and quantitative methods were collectively employed in the process of collecting data and information required in this study.

The study concluded that, quality of water is still a challenge to both DAWASCO and private sector, this is due to the fact that the chain from service provide to the final consumer is long. Also the the water facilities and infrastructure are poor. This affecting the quality of water. The price charged by water vendor is high and normally determine by water demand, vendor are not compete on price lather than collaborate. Also the poor urban planning in the city create a challenge in supply and improvement of water infrastructure.

Based on the study findings the study recommending that, the involvement of private sector in water service delivery at large will solve the current problem of water service in Dar es Salaam. The study futher suggest the use of of PPPs forms in dealing with water problem.

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## LIST OF ABBREVIATIONS

AICD.....	Africa Infrastructure Country Diagnostic
AWWARF.....	American Water Works Association Research Foundation
BLOT.....	Build-Lease-Operate-Transfer
BOOT.....	Build-Own-Operate-Transfer
BOT.....	Built-Operate-Transfer
DAWASCO.....	Dar es Salaam Water Sewerage Corporation
DBFO.....	Design Build- Finance Operate
DEA.....	Data Envelopment Analysis
EWURA.....	Energy and Water Utilities Regulatory Authority
HBS.....	Household Budget Survey
ICSID.....	International Centre for the Settlement of Investment Disputes
IWA.....	International Water Association
MKUKUTA.....	MkakatiwaKukuzaUchuminaKupunguzaUmaskinitanzania
NGOs.....	Non-Government Organization
NSGRP .....	National Strategy for Growth and Reduction of Poverty
PLC.....	Public Limited Company
PPP.....	Public Private Partnership
UK.....	United Kingdom
UN.....	United National
UNCITRAL.....	United Nations Commission on International Trade Law
UNICEF.....	United Nations International Children's Emergency Fund
UWSAs.....	Urban Water and Sewer Authorities
WHO.....	World Health Organization

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Research Problem

The recent political and economic crises in the public sectors at post Structural Adjustment Programmes period have led to the realization that neither the state nor the private sectors alone can spur economic growth and development (2013). A common dilemma facing governments around the world is how to meet the sizeable fiscal costs of providing and maintaining infrastructure networks. Over the past decade, developed and developing countries have looked to fiscal rules, budgetary reforms, tax policy and administration measures public and private partnerships and other innovative financial instruments to raise additional finance for infrastructure investment (Minassian, 2008).

Today private sector resources increasing important in enabling developing countries to meet the growing demand for municipal services, particularly now that central government funds and municipal revenues are becoming scarcer. The private sector typically has provided transportation and solid waste removal services, and only recently has been encouraged to take a share in water supply and sanitation services. Gabrie, (1987) argue that the provision of piped water is the one with which the private sector is least involved it may not be a coincidence that water is also the sector that in many counties seems to have the greatest problems.

Like other segments of the infrastructure water management in most developing countries are experiencing management, operationaland financial problem. They must contend with 11 neglected and leaking water pipes, are unable to fund service improvements or system expansion to satisfy unmet demand and must face the prospect of increased costs imposed by more stringent environmental standards (Walkert 1993). African has the lowest water supply and sanitation coverage of any region inthe world. More than 30% of Africans residing in urban areas currently lack access to adequate water services and facilities. In the year 2000, World Health Organisation (WHO) estimated that Africa contains 28% of the world“s population

without access to improved water supplies, and 13% of the world's population without access to improved sanitation. Only 62% of the people in African countries have access to improved water supplies and only 60% have access to improved sanitation (WHO, 2000; p6).

According to World Health Organization, in order to meet the recently established Millennium Development Goals (MDGs) of halving the unserved population by 2015, urban Africa requires about 6000 to 8000 new water connections to water source every day. This will call for strong political commitment backed by resources and action if governments are willing to reduce the widening gap between served and unserved households. Water utility customers want adequate and a reasonable quality of water service delivery with environmental protection and public health protection at the lowest reasonable cost (AWWARF, 1998).

The quality of water delivered and used for households is an important aspect of domestic water supplies, which influences hygiene and therefore public health (WHO, 2003). Large numbers of households in cities around the developing world do not have access to one of the basics of human needs—a safe and reliable supply of drinking water, (McKenzie et al, 2009). At the beginning of 2000, at least 1.1 billion people in the world lack access to safe drinking water (UNICEF and WHO, 2000).

Tanzania like other developing country abandoned socialism in 1986 with the signing of a structural adjustment programme with the International Monetary Fund. In 1991 the government took a radical step in water provision. It abandoned the idea of free water and adopted a new National Water Policy(2002). It removed central government subsidies for its water utilities and prescribed that they should be self-sustaining (Water Aid, 2001). The latest national Water policy has a target of providing universal access to safe water and sanitation by 2025 with the involvement of communities and the private sector (URT, 2002).It moved a step further six years later by creating Urban Water and Sewer Authorities (UWSAs), autonomous public bodies responsible to its own Board and not to a city or national government body. UWSA's were independent

of government, are self-financing and would control whatever revenue they collected (URT, 2002).

In Dar es Salaam, DAWASA was created as the public entity that can solve the water crises in the city. Most of residents in Dar es Salaam were relieved and hopeful that the company would be able to solve the city's water dilemma (Theodory, 2009). However, in early December 2004 headlines of varied newspapers portrayed a negative image of City Waters. A headline in the Guardian of 6th December 2004, a reputable newspaper read "City Water but no water" attests media's pessimistic view on City Waters' operations. The article claimed that the company initially boasted it would bring water back to the city through efficient bill management, efficient collection of water charges, efficient operation and routine maintenance, but the scenario of water supply services in Dar es Salaam remained bad if not worse.

Six months after the article (May, 2005), government of Tanzania terminated the contract with City Water on grounds that the company made less than half of the required investment and failed to improve water supply services in Dar es Salaam. As a result, a new entity, DAWASCO was incorporated under the Public Corporation Act of 1992 through government notice No. 139 of 20th May, 2005 to replace City Water. DAWASCO was appointed to assume management of the technical and commercial operations for DAWASA within its service area under a 10 year term lease effective from 1st July, 2005. The partnership between DAWASCO and the government is unique as DAWASCO is supposed to run a government owned utility in an investment environment designed for a private operator (Kjellen, op. cit.).

Despite these institutional changes, overall performance of the utility remains below target. In 2008/09, DAWASCO failed to meet more than half of the targets set out in the Lease agreement with DAWASA (EWURA, 2010). Non-revenue water for example, was estimated to be around 55 percent. This poor performance is attributed to a mix of causes, including low metering efficiency, a high level of leakages and substantial illegal consumption (DAWASCO, 2010) Internal organization challenges facing the company include an unreliable customer database, low institutional and

human capacities, resulting in inaccurate meter reading and billing, and low staff morale and motivation. externally, these problems have translated into a strained relationship between DAWASCO customers and staff, characterized by a mixture of distrust and collusion (DAWASCO, 2010).

However the current situation of water service delivery in Dar es Salaam is a poor, inadequate water to meet the current demand, poor water infrastructure, low quality of supplied water and low pressure of water are common problems in various parts of the city. According to Water Aid report in Tanzania of 2001, the city's demand for water is between 350 to 400 Mld, % of which 60% is domestic demand, 10% is commercial, 10% is and 20% is institutional demand only 50% of the population of the city is supplied through its DAWASCO piped water system.

## **1.2 Statement of the Problem**

Different studies in relation to private sector participation in public service delivery shown that there is a number of advantages arise from private sector participation in delivery of public service. For example (Itika et al, 2011) on his study successes and constraints for improving public private partnership in health services delivery in Tanzania" suggest the uses of PPP as the right policy option for improving health service delivery. It further explain that, it is important for the local authorities to work closely with the responsible ministries. Other studies includes, Nkya (2000, 2004) studied PPPs on solid waste management in Dar es Salaam, Kironde (1999) studied urban waste management in Dar es Salaam and Ngowi (2006) on his study public-private partnership (PPP) in service delivery in Tanzanian local government authorities (LGAs). All studies suggest the uses of PPP as a mode of procurement by local government due to its benefits like reduce the government burden of investing in social service, increasing performance and quality of service deliver also at large stimulate economic growth of the country.

In Dar es Salaam water service delivery, different studies suggest the involvement of private sector in provision of public water service. For example Theodory and

Malipula, (2013) argue that, for purpose of solving water crises in Dar es Salaam stronger public-private partnership is required. This is chiefly because water infrastructure requires heavy investment that the private sector which is for quick profit cannot be attracted to provide. Also the study of Theodory and Malipula (2012) suggest the specific attention has to be put on finding alternative sources of water for the fast growing Dar es Salaam population and re-establishment of the water facilities in informal settlements through a public-private partnership venture.

Despite of the benefit arise from private sector participation in delivery of water service like relieving budgetary burden, network expansion, improved efficiency in water service delivery, reduction in cost, long-term sustainability, and technology transfer. However, the private sector involvement in water service delivery at large affected by cost of the water service, quality and infrastructure as well as urban planning. This is an important area to put into consideration since it tend to affect the consumers of water service.

To the best of my knowledge, not a single empirical paper has systematically assess the private sector water services delivery in Dar es Salaam Tanzania. specifically focus on factors influence the delivery of water services to Dar es Salaam resident by private sector in Tanzania. This is an important gap. Hence the study is needed for bridging the gap.

### **1.3 Research questions**

#### **1.3.1 Main research question**

What factors influence the delivery of water services to Dar es Salaam resident by private sector in Tanzania?

#### **1.3.2 Specific questions**

- i. What factors affect water quality delivery to DSM consumers by private sectors in Tanzania?

- ii. How does price affected by Private sectors in delivering water to consumers in Dar es Salaam Tanzania?
- iii. How does infrastructure affect water supply to Dar es Salaam Water Consumer in Tanzania?
- iv. What is the effect of poor urban planning to the delivery of water service by private sector to Dar es Salaam residents in Tanzania?

#### **1.4 Research Objectives**

The overall objective of this study was exploring the factors influence delivery of water services to Dar es Salaam resident by private sector in Tanzania.

##### **1.4.1 Specific objectives**

- i. To identify factors affect water quality delivery to DSM consumers by private sectors in Tanzania.
- ii. To examine the effect of price by Private sectors in delivering water to consumers in Dar es Salaam Tanzania.
- iii. To investigate the effect of infrastructure in water supply to Dar es Salaam Water Consumer in Tanzania.
- iv. To examine effect of urban planning to the delivery of water service by private sector to Dar es Salaam residents in Tanzania.

#### **1.5 Scope of Study**

Although the water service delivey is the commn challenge in most of urban areas in Tanzania, the study limit itself in Dar es salaam specifically focuson theprivate sector which are involving with delivery of water servicein the city.It consider the water service as the public service in which (DAWASCO) as the public entity responsible for provisional of service. The private sector and are main share holders in provisional of service to consumers.

## **1.6 Significant of the Study**

The finding of the study is of greater benefit to public and private sectors, policy makers as well as in academic field. In public and private sectors the study is of paramount importance because it increases knowledge and provides up-to-date information on urban water supply systems and its adverse impacts on the urban poor. It also serves as a working document for policy makers in the water sector and Non-Governmental Organizations. In the public sector, the study also explains how the public sector can utilize the resources in terms of capital and skills of the private sector to improve the living standards of their citizens by ensuring quality, affordable and well-established water infrastructure that meets the water demand of Dar es Salaam populations.

Academically, the study appreciates the work done by other scholars in relation to private participation in improving public service delivery in Tanzania. For example, Kironde (1999), Nkya (2004), Ngowi (2006), (Itika, 2011). However, most of the previous studies in relation to private sector participation in public service delivery explain the benefits of PPPs in improving public service in terms of quality and reliability (Itika et al, 2011, Nkya, 2004). The issue of PSPs in solving Dar es Salaam water crises was given little attention due to that reason; the study is of paramount importance since it aimed at dealing with the problem.

## **1.7 Limitation of the study**

The primary delimitation of this study emanates from the use of case study as a research design for data collection. Although the case-study design presumes that the cases under study reflect similar entities, the results cannot be easily generalised to other contexts. Other study constraints include time and financial resources that were not sufficient enough to conduct a survey in the entire part of Dar es Salaam; this made it difficult for the researcher to collect primary data; hence, secondary data was also used. However, the researcher managed to collect the data effectively from the selected samples to complete this dissertation.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter consists of theoretical review, empirical reviews and Conceptual Framework. In this chapter the researcher visited different books articles web site and the work that has been done by other researchers. This helped the researcher to understand the well the topic under study and also to establish relationship between variable.

#### **2.2 Theoretical Literature Review**

In this section we briefly discuss theoretical framework and relate it to public and private sector in delivery of water service in Dar es salaam, Tanzania. The theory which relateto the study is agencetheory.

The agence theory concentrate with the conflicting between the principal and the agence in obtaining their respective objectives and it focus on the mechanisim related to obtaining information. The theory applied to project management, specifically in the management of government projects (Moe, 1984). In government projects, the same principal-agent model exists. The principal, in this case the project manager, is faced with the problem of ensuring the agents, in this context the members of the project team, will choose to pursue the principal's best interests. Critical success factors have a direct relationship on an organization's processes and resulting outcomes, such as projects and contracts. Thus, their importance is crucial to an organization's process improvement effort.

In context of this study the agence theory is used. As it argued by Theodor and Malipula, (2009), that the theory can be used to explain the privatisation of water supply in Dar es Salaam. they explain explain that the contracting model expounds the relationship between two legal personalities a principal (the property owner) and an agent who makes decisions on behalf of the principal. The agent's decisions or actions

affect the principle's assets, defined broadly, among others, as wealth, health and reputation (Douma, et al., 1991 cited in Nkya, 2007: 47-48). This theoretical underpinning suggests that success of any privatisation is a product of a systemic partnership among the principal and the agent. Therefore, any analysis of privatisation grounded on this theory requires a systemic functionalist review of the roles played by the principal and agent and the environment within which they operate. With regard to the water supply in Dar es Salaam, there are two actors-the Principal who is the government of Tanzania and the agent DAWASCO.

The Principal (government) retains control of the water facilities and responsible for its infrastructural development. It only tenders contracts to private companies for the management thereof. Since the Principal retains ownership, the contracting process must contain a number of safeguards in order to be protective of the principal, including a well designed process of competitive bidding, incentive based on the compensation along with measurable performance targets and procedure which complying with central government regulations (Beecher, 1995).

### **2.2.1 Definition of key terms**

Privatisation is the incidence or process of transferring ownership of a business enterprise, agency or public service from the public sector (the state or government) to the private sector that operate for profit or to private non-profit organisations (Malipula, 2009 cited in Nkya, 2007)

Tanzania National Policy the Public Private Partnerships (PPP, 2010) define PPP as an arrangement between the public and private sector entities whereby the private entity renovates, constructs, operates, maintains, and manages a facility in whole or in part in accordance with specified output specifications. The private entity assumes the associated risks for a significant period of time and in return receives benefits and financial remuneration according to agreed terms. PPPs constitute a cooperative venture built on the synergy of expertise of each partner that best meets clearly defined public needs through the most appropriate allocation of resources, risks and rewards.

Public private partnerships (PPPs) refer to arrangements for the procurement of goods and services utilizing franchising and similar arrangement with the private sector; the private sector is contracted to provide public goods and services on behalf of government (Regan, 2005). In essence the private entity becomes the long-term provider of services.

The Private Sector; according to Faulkener,(1997) it describes as institutions, firms and individuals who may be active in many different aspects of infrastructure management but whose main objective and organization is to generate a profit on their investments. The private sector has strengths in transparency, its ability to innovate and replicate and its customer focus (Caplan, 2001). It is able to respond quickly to the need to improve and deliver services and has limited exposure to political interference.

Public–private-civil society partnerships involve the collaboration between public, civil society and private organizations to produce and deliver public services. This approach not only helps to mobilize resources from different sectors, but also management experiences that may enhance the efficiency and effectiveness of servicedelivery (Birner, 2007; Fenta, 2007).

### **2.2.2 Overview of private sector participation in water service delivery**

The benefits of private sector participation in water supply and waste water management pertain to both funding and operations. When a government reaches a ceiling on debt, private infrastructure projects are a way to expand and improve services while available government resources are concentrated in areas that do not offer the private sector any profit margins. Private sector participation can increase both the availability and reliability of services and pass on to consumers part of the gains in efficiency in the form of reduced tariffs or user fees. Any government contemplating the use of private resources should be clear about the two main advantage which includes efficiency gains and capital formation (WASH Technical Report, 1993).

There are three main players in private sector participation in the supply and delivery of water and sanitation services. These include the private sector, the public sector, and the consumer. In developing countries the public sector often expects the private sector to become heavily involved in service delivery and investment. In Tanzania the public entities deal with water include DAWASCO, EWURA, ministry of water and other public entity which are direct or indirect interact with the water management. The private sector includes, non governmental organisation (NGOs), foreign investor, financial institution like UN, IMF, World bank and other donor agents and local private firm like water vendors, community water project and other local investor. However the willingness of private sector participation will depend on the environment created by government (WASH Technical Report, 1993).

The public managers must create an environment that lowers risks and offers a high probability of a reasonable return on investment. Private sector capital is fungible across a range of investments by types and by countries and will be attracted by the prospect of the highest returns. The opportunity cost of investment in a particular water supply project will be viewed against other opportunities (WASH Technical Report, 1993). Some of the factors that affect the private investor's perceptions of risk and adequate return are discussed below.

**Financial risk;** Infrastructure investments in developed and developing countries have different risk and reward expectations. In developed countries, water supply and wastewater facilities are often thought of as low-risk and low-to-medium return investments, with tax policy playing an important role. The low risk is the result of a lack of competition in the water supply "market" and is balanced by limited growth potential and lack of diversification. Utilities attract institutional investors looking for safe long-term returns rather than investors who are drawn to growth industries, which are more risky but offer higher returns (WASH Technical Report, 1993).

In some developing countries, infrastructure investments are achieving healthy returns of over 30 percent on equity in a number of BOT type projects, reflecting the higher risks in utility investments. The equity or credits of suppliers make up a big part of

equity in certain infrastructure investments like telecommunication and power, both of which have large requirements for imported equipment that are often written into bilateral agreements to favor the export programs of donor countries.

**Guarantees;** The willingness of foreign investors to take part will depend on the profitability of a specific investment in relation to the overall country investment risk. Government guarantees and investment incentives may mitigate this risk and attract suitable partners. Contracting and leasing options are another factor in attracting international as well as domestic interest. Country risk, government guarantees, and the length of the contracting period are important considerations affecting investment.

**The Changing Government Role;** Traditionally, water and wastewater services have been operated by government agencies at the national, regional, or municipal level. With the introduction of the private sector, the public sector role changes from that of providing a service to that of managing and oversee service delivery. It is important that consumers and the general public recognize this changed role and are aware of their right to bring suggestions and complaints before the public regulatory and oversight authority (WASH Technical Report, 1993) .

**Regulatory and Legal Framework;** It is competition that provides the incentive to maintain quality and minimize costs. Since water supply and sanitation are natural monopolies and competition in day-to-day operations is not practical, public regulation or oversight must step in to protect consumers from exploitation. Regulation is especially Important to prevent monopolies from charging excessive rates. Prices must reflect the level of service delivered. This ensures that private sector profits do not come at the expense of government efforts to achieve social equity.

The regulatory process must recognize the collective weakness of consumers and must provide incentives for suppliers to treat consumers fairly and appropriately. This particularly true of wider environmental concerns. Independent watch dog organisations such as public utility commissions, offices of fair trading, and monopoly

commissions must be established outside the control of the ministry or agency responsible for providing water supply service. Since water supply and sanitation in developing countries are overwhelmingly public sector operations, public authorities may need to examine current legislation and institutional arrangements for the introduction of private sector participation. Private sector enterprises need to know how to interact with public sector agencies (WASH Technical Report, 1993).

**Cost Recovery;** Any strategy for private sector participation must take its direction from market forces, recognizing that private sector investment is most appropriate in undertakings where consumers can bear full cost recovery, such as industrial development, tourism, and high-income housing. But the strategy also must take into account the implications of current sector policies on cross subsidies. Often water and sanitation agencies rely on high volume and high income users to subsidize the cost of service to other consumers (WASH Technical Report, 1993).

### **2.2.3 Form of private sector participation in water service delivery**

There are many types of private sector participation in the water supply and sanitation sector and outlines the circumstances in which each type is appropriate. WASH Technical Report (1993) explain five principal types of private sector participation in the water supply these include service contracts; management contracts; lease contracts; concession arrangements (longer-term leases) that include BOT and BOO; and divestiture. These are explained as follows;

**Service Contracts;** Under a service contract, a private firm agrees to provide a specific service such as meter reading or bill collection for a fixed fee, on a cost-plus basis, or for compensation based on the volume of service provided. Service contracts, normally written for a year and often for three to five years, are reviewed periodically as an inducement to the contractor to maintain the quality of service (WASH Technical Report, 1993).

Service contracts are the most common form of private sector participation in developing countries. They ensure satisfactory service at a reasonable cost provided there are a sufficient number of qualified contractors to constitute a competitive market. A contractor's performance is easily assessed against the cost of the service clearly stipulated in the contract; this is unlike the general cost allocations that fund many municipal services and may conceal cross subsidies (UNECE (2008, pp.2-3)

**Management contract;** The private entity is responsible for all aspects of operations and maintenance of the facility under contract. Example: Government can contract a private firm to manage a public health organisation (PPP Act, 2010). It more extensive than service contracts, giving the contractor complete responsibility for the operation and maintenance of the water system and the authority to make all operating decisions. To encourage the contractor to maintain the facility in good condition, compensation is usually linked to a physical output, such as the volume of water delivered. The contractor is not responsible for capital improvements nor for a decline in revenue. Some examples of this type of operation feature profit-sharing arrangements.

Management contracts are a suitable option where there are enough experienced firms to compete. Once a contractor is in place, however, and has acquired the advantage of an incumbent, it may be inconvenient to make changes or terminate a contract. Thus, effective regulatory oversight is essential to ensure that the contractor does not do anything inconsistent with the interests or policy objectives of the water and sewerage authority. For example, because the contractor does not own the facility or have any responsibility for capital assets, the maintenance of these assets could be neglected. (WASH Technical Report, 1993).

**Lease Contract ;** base contracts are more comprehensive than management contracts and normally require the lessee to finance working capital and the replacement of equipment with a fairly short productive life, such as vehicles and pumps, In essence, a private firm rents capital assets-the existing facilities-and assumes total responsibility for operation, maintenance, and service delivery under the terms of the

lease. The lessee does not own or assume liability for the major fixed assets. Under a lease arrangement, the private contractor collects the tariffs from users, retains an agreed propoMon (the lease-contractor rate), and pays the remainder to the authority as a rental fee. If the agreed rate is based on collection efficiency, the lessee has an incentive to increase coverage, increase collections as a percentage of billable water and sewerage services, reduce costs, and generally improve efficiency to increase profits. Lease contracts normally run between 6 and 15 year (UNECE (2008)).

**BOTs and BOOs; Build, operate, and transfer (BOT)**and build, operate, and own (BOO) arrangements are fairly recent innovations in financing public sector infrastructure. Private interests build and operate projects under both arrangements, but with BOTs assets are transferred to the public authority after a specified contract period, whereas under BOOs assets remain with the private company (Cointreau, 1990).

**Build, lease, and transfer (BLT)**schemes are useful where, for instance, a country's constitution prohibits private (and especially foreign) firms from operating plants considered critical for national sovereignty. Build, lease, and transfer (BLT) schemes are useful where, for instance, a country's constitution prohibits private (and especially foreign) firms from operating plants considered critical for national sovereignty. Under a BLT scheme, private sponsors build a plant, lease it to the government to operate, and transfer it to the government when the lease expires. According to (UNECE, 2008) the private sector participation in delivery of public service explain inform of PPP. It argue that the term includes;

**Buy-Build-Operate (BBO):** Transfer of a public asset to a private or quasi-public entity usually under contract that the assets are to be upgraded and operated for a specified period of time. Public control is exercised through the contract at the time of transfer (UNECE, 2008).

**Build-Own-Operate-Transfer (BOOT):**A private entity receives a franchise to finance, design, build and operate a facility (and to charge user fees) for a specified period, after which ownership is transferred back to the public sector (UNECE, 2008).

**Operation and Maintenance Contract (O and M):**A private operator, under contract, operates a publicly owned asset for a specified term. Ownership of the asset remains with the public entity. (Many do not consider O and M's to be within the spectrum of PPPs and consider such contracts as service contracts (UNECE, 2008).

#### **2.2.4 Indicator of infrastructure coverage, quality and access in Tanzania**

There is little argument that for sub-Saharan Africa as a whole and Tanzania in particular, lack of adequate infrastructure is a major constraint on individual and social welfare. According to the work of the 2008 Africa Infrastructure Country Diagnostic (AICD), less than one-third of households in sub-Saharan Africa have access to electricity and less than one-fifth to improved sanitation, while only around 15 percent have access to a telephone. While Tanzania has made considerable progress in expanding access to both these services in recent years. only one-third of households have access to an improved water source while the over whelming majority lacks access to improved sanitation. Coverage of electricity and road networks in Tanzania are low even by the standards of the region, with only 11 percent of households having access to electricity and only 28 percent of the rural population living within 2 km of an all-weather road (World Bank, 2007a).

According to (Eifert et al, 2005) study of the global competitiveness of the African manufacturing sector found that losses from power failure amounted to 10 percent of sales for the median Tanzanian firm compared to only 1 percent for the median Chinese firm. It was these and other infrastructure and logistics-related losses, rather than differences in the cost or productivity of labor and other direct inputs, that accounted for much of the variance in measured productivity between manufacturers in China and those in Tanzania and other African countries. Likewise, water supply service coverage in Dar es Salaam remained at 68 percent since 2005. Mainly due to slow

increase in water production compared to 8 percent population growth rate. In terms of use of facilities (estimated from survey data), prior to the WSDP, the Household Budget Survey (HBS07) showed a decline in water supply services from 90 percent in 2000/01 to 79 percent in 2007 for urban water supply and from 46 percent to 40 percent over the same timeframe for rural water supply.

These empirical findings are collaborated by evidence from business surveys such as the Global Competitiveness Report (2007-08) which identified an inadequate supply of infrastructure as the most problematic factor for foreign investors doing business in Tanzania. The Tanzania's 2005 Poverty Reduction Strategy Paper (MKUKUTA in Swahili) therefore rightly identifies improvements in the provision of physical infrastructure as one of the keys to the success of country's development strategy

#### **2.2.4.1 Dar es Salaam's Water Infrastructure**

Dar es Salaam's main source of water is the Ruvu River. The development of the river commenced in the 1950s with a plant at Upper Ruvu, some 65 kilometers west of Dar es Salaam. The Lower Ruvu scheme, some 55 kilometres west (or north-west) of the city, was commissioned in 1976. There is also a smaller surface water plant at Mtoni just south of the city Centre, which along with boreholes, complement the water supply, mainly in the Southern parts of Dar es Salaam. The capacity of the sources supplying Dar es Salaam were in 1995 estimated to 273 megalitres per day (Howard Humphreys, 1995), but only a portion of that quantity reaches the city, due to consumption and leakage along the transmission lines from Ruvu.

Investment in distribution mains has been limited in recent decades. Hence, few households and establishments have distribution mains nearby. When opting to connect to the piped water network, the cost of service pipes, due to the distance, will be higher. While the public investments in distribution mains (pipes serving local areas, to which service lines can readily be connected) have been lagging behind, the privately financed service lines are taking over. Spaghetti-like bundles of parallel PVC pipes can be seen at numerous junctures in the city. These pipes are much more sensitive to damage, and are of course less efficient for conveying the same volumes

of than what one major pipe would be. Most of the service pipes are badly laid and riddled with bursts, leaks and sub-standard fittings (Howard Humphreys, 1995). The (excessively) long service pipes (due to the scarcity of mains) are often laid by DAWASA employees, but the full cost is borne (in accordance with regulations) by the customer. There are hence no subsidies for connections.

#### **2.2.4.2 Public Water Distribution**

Connection costs to the piped distribution network is high for individual households. This is because of the high cost of piping (given the shortage of distribution mains to local areas) as well as connection fees. Hence, as estimated by the Water Demand Study in 1995 (Mwandosya and Meena, 1998), only about a third of the households in Dar es Salaam were connected to the network, and most households needed to make use of several alternative sources. In an estimate for 1990 presented by (JICA, 1991) about 30% of the households had house connections, 24% yard connections, and 45% had no connections. The registered house and yard connections accounted for 30% of the net volumes supplied, whereas only 6% of the water were delivered through standpipes/kiosks.

The remainder of the water supplied went to illegal connections (29%) and leakage (30%) in JICA's estimate. How the available water quantities are distributed is actually not known. However, dividing the projected revenues from different customer categories with the applicable tariff (Dar es Salaam Water and Sewerage Authority, 1999; DAWASA Divestiture Technical Team, 1998), the proportions can be deduced. The resulting proportions are as follows; 64% to domestic users, 18% to industrial/agricultural users, 11% institutional, and 7% went to commercial customers. On top of this, between 20% and 50% of the water is estimated to leak out of the system (DAWASA Divestiture Technical Team, 1998).

The tariff which is the basis for what DAWASA charges its customers – generally flat rates, based on the water pressure or regularity of distribution to different areas – defines different price levels for different categories of customers. The volumetric rate for households in use during early 2000 was 1,225.00 shillings per 1000 gallons,

equivalent to about US\$0.34 per cubic metre (Dar es Salaam Water and Sewerage Authority, 1999). DAWASA are authorized to increase the tariff by 15% twice per year, but the rate of increase has been more moderate, given that price escalations are sensitive when services are poor.

It is estimated that 80% of the water produced is billed. But as only about 50% of the payments are collected, the combined billing and collection efficiency reaches only 40% (DAWASA Divestiture Technical Team, 1998). During 2000 DAWASA undertook an ambitious ‘disconnection exercise’ where defaulters were visited and given the option of paying their debts up front or facing disconnection, and the prospect of a reconnection fee when resuming payments and services. The exercise caused heated debates in the newspapers. Many people complained about not getting any water – so why should they pay? And if they use vendors, they have already paid for the water they use! Nonetheless, when facing disconnection, most people pay anyway (DAWASA, pers. comm.)

#### **2.2.4.3 Measuring the Performance of Water Services**

According to Gupta (2006), performance measurement can be defined as an approach to determine how effectively and efficiently a local body delivers the required service. According to him, there are two methods of measuring the performance of a system, one is the average analysis or simple ratio measures and the other one which takes into account all the inputs used and outputs produced by the utilities called total factor productivity measures. The total factor productivity measures are based on either regression analysis (RA) or Data Envelopment Analysis (DEA) technique.

WSP (2006) developed some performance indicators using ratio methods to measure the efficiency of water supply systems. The indicators chosen were infrastructure quality, costs and urban planning Staffing, metering, unaccounted for water (UFW), production/consumption, coverage etc. (Kumar, and Sarangi, 2006). UFW is basically the difference between the quantity of water produced and put into the system and quantity consumed or paid by consumers. It comprises of water losses due to leakage, illegal connection and unbilled authorized consumption like water used for cleaning

reservoirs and flushing the network system, fire-fighting and water provided free to certain consumer groups and sensitive institutions (e.g. hospitals, schools, etc (Bernard and Eugene, 2006)

### **Revenue Collection Efficiency**

According to (Acutt et.al, 2001), sound financing is crucial to long-term operation, maintenance, replacement and expansion. According to AmengaEtego (2006) the overall income from the water sales should be able to cover operational costs and generate sufficient cash-flow to ensure sustainable long-term operations. Collection efficiency is one of the most important indicators in water supply service delivery that promotes sustainability of the systems but also one of the major shortfalls of many water managers (Sakyi 2003).

### **Customer Satisfaction**

For any performance measurement system for services in water delivery to be successful, the views of the users of the service is crucial. This is because their level of satisfaction with the services indicates the performance of the system. According to MIME consult report (2003), high access to the service indicates increased customer satisfaction and consequently their willingness to pay for the water; improved health benefits; and improved revenue collection (cited in CWSA) document). The time taken to fetch water at the standpipes is a good measure of accessibility (Bathsheba, 2011).

According to International Water Association (IWA 2004), “access to good, safe and reliable drinking water is one of the most basic needs of human society and as such requires integrated approach, close cooperation and partnership between all stake holders”. IWA (2004), research has shown that access to good, reliable and sufficient water supply increases the health status of people. However it is unfortunate that many people in the world today lack the needed quantity and quality of water.

### **2.2.5 General overview of water privatization in Dar es Salaam, Tanzania**

Water privatization in Dar es Salaam began with the award of a 10-year lease contract signed in 2003 for Dar es Salaam, the largest city and former capital of Tanzania. It was signed between the government of Tanzania and City Water, a consortium

consisting of the former British firm Biwater, Gauff Engineers from Germany and a Tanzanian company called Super doll. The government terminated the lease contract in May 2005 amid mutual allegations of breach of contract, and deported the three top executives of City Water (the Guardian, 2008).

According to a report of Action Aid, before privatization "the water system in Dar es Salaam was hardly a model of public sector efficiency." Until 1991, water was provided for free, except for some high income areas. The system was characterized by "disrepair, a lack of investment, high levels of wastage, and very poor levels of service coverage". In 1997 the semi-autonomous utility DAWASA was created and water tariffs were introduced for all users. According to the report, "DAWASA proved to be no better than its predecessor, and the wastage and disrepair reached crisis levels." By 2003 "only 98,000 households in a city of 2.5 million people had house connections. Only 26% of water was being billed, 60% was lost through leaks, and a further 13% through un authorized use, illegal taps and non-payers. Even those with connections only received water irregularly, and the water quality was poor. In low-income areas, the vast majority of households had no water connection at all, relying instead on buying water from kiosks, water vendors or their neighbors, at more than three times the price (Greenhill and Wekiya, 2004).

External donor investment produced the lease contract through soft loans worth US\$145.5 million for a Dar es Salaam Water Supply and Sanitation Project approved by the World Bank in 2003. The African Development Bank contributed US\$48m, the European Investment Bank US\$34m and the World Bank US\$61.5m. The private company was supposed to contribute US\$8.5m from its own funds and the Tanzanian government was supposed to contribute US\$12.6m (World Bank, 2010).

The World Bank and the International Monetary Fund set conditions for further loans to Tanzania contingent on the privatization of state-run organizations. According to research by Action Aid, in 2000 the "signing of a concession agreement assigning the assets of DAWASA (the public utility for Dar es Salaam) to private management companies" was included as a condition for debt relief under the HIPC initiative.

When lack of investor interest meant that Tanzania was unable to comply with this condition, donors agreed to waive it. They then asked for a lease contract instead of a concession, implying a shorter contract duration and less responsibilities transferred to the private company (Greenhill and Wekiya, 2004).

According to Action Aid "there has been very little meaningful public participation or consultation, limited public debate, and no transparency around the privatization process. Even the country's elected MPs have been kept largely in the dark. The Department for International Development paid Adam Smith International, sister organization of the neo-liberal UK think-tank Adam Smith Institute, more than £500,000 to provide advice to the Tanzanian government. More than £250,000 of that sum was spent by Adam Smith International on a video which included the words: "Our old industries are dry like crops and privatization brings the rain (The guardian, 2005) the contract was awarded through international bidding, but City Water was the only company that submitted a bid.

Action Aid UK claimed that water users in Dar es Salaam faced soaring bills and mass disconnections since 2003. It also said that City Water disconnected whole areas in an attempt to get people with illegal connections to pay up. They found that poor families turned to unsafe water supplies rather than pay the increased bills. "Donors have been pushing through a project in which 98% of the investment will go to the areas where the richest 20% of the population live," said Billy Abimbilla, director of Action Aid Tanzania. Unprofitable areas" where the poor reside were given to non-governmental organization and were not part of the area of the private responsibility. Water Aid, CARE and Plan International were to be subcontracted under World Bank funding to carry out water projects in low income areas which were unlikely to be served by the piped network for some time. This component of the World Bank project only accounted for \$3-\$4m, roughly 2%, of the total project costs(Greenhill and Wekiya, 2004)

Tanzania's water minister, Edward Lowassa, said that no new pipes have been installed, the company has not spent the money it had promised, water quality has

declined, and that revenue has decreased (The Guardian, 25 may 2005).According to MussaBillegeya of the Tanzania Association of NGOs (TANGO) Biwater was doing almost none of what they were supposed to do. They didn't pay the lease fee to the government. They owed around US\$3.5 million to the government in 2005. They did not contribute to a collection fund that was meant for the poorest people. Biwater was supposed to inject US\$8.5 million of capital but they fell far short of that.

According to Cliff Stone, the British chief executive of City Water, the government breached the lease contract. He said that water quality and quantity had improved. He also claimed the Tanzanian government had given the company wrong data about water supplies and the delays were not of City Water's making. He also said the Tanzanian government owed the company US\$3m. He acknowledged, however, that the project was well behind schedule and that no pipes had been installed Biwater said it invested £7m in City Water (The Guardian, 25 may 2005).

A London tribunal threw out a case brought by CWS under the rules of the United Nations Commission on International Trade Law (UNCITRAL). The tribunal, citing World Bank evidence, found that water and sewerage services had deteriorated under CWS's management. It awarded £3m in damages to DAWASA, the Tanzanian water utility, and half a million pounds in legal costs. It pointed to a World Bank study in 2005 which concluded: "The primary assumption on the part of almost all involved, certainly from the donor side, was that it would be hard if not impossible for the private sector operator to perform worse than DAWASA, but that is what happened.Since City Water is defunct and has no assets, the damages and legal costs have not been paid (The Guardian july, 2008).In a separate legal case the International Centre for the Settlement of Investment Disputes (ICSID) ruled that Tanzania's government had violated its bilateral investment treaty with the UK by expelling City Water on four separate counts: unlawful expropriation of assets, a failure to provide fair and equitable treatment, unreasonable and discriminatory conduct and a failure to provide full protection and security.

However, it also threw out a £10m damages claim made by Biwater, saying that there were no damages to award as the company's value was "nil" at expropriation time. ICSID's ruling showed that while Biwater publicly denied culpability for City Water's poor performance at the time, its executives were aware of the company shortcomings. "Our City Water staffing was totally with non-Biwater staff with a weak leader, no clear experience or qualified business plan," wrote Adrian White, a former BBC governor, who holds the majority stake in Biwater, early in 2005. Biwater reacted to the decision by saying that "the Tribunal's decision not to award damages or costs (to Biwater) has sent an extremely negative message to the international investment community."

#### **2.2.6 Overview of PPPs in Tanzania**

Public private partnerships (PPPs) refer to arrangements for the procurement of goods and services utilizing franchising and similar arrangement with the private sector; the private sector is contracted to provide public goods and services on behalf of the government (Regan, 2005). Public Private Partnership is an important instrument for the government to attract private investment and to improve public services. The Public Private Partnership Policy was issued in 2009, the Public Private Partnership Act (PPP Act 2010) passed in 2010 and the PPP Regulations passed in 2011.

In essence the private entity becomes the long-term provider of services while government becomes the purchaser of the services (Ahadzi, 2004, Grout, 2003). PPP schemes are built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards (CCPPP 2004). PPPs span a spectrum of paradigms that progressively engage the expertise or resources of the private sector. At one end, there is straight contracting out as an alternative to traditionally delivered public services. At the other end, there are arrangements that are publicly administered but within a framework that allows for private finance, design, building, operation and possibly temporary ownership of an asset

### **2.2.7 Benefit of using PPP in Tanzania**

Tanzania needs to utilize all available options to attract increased private's actor investments including PPPs. This is very essential in order to achieve the Millennium Development Goals, National Development Vision 2025 and the National Strategy for Growth and Reduction of Poverty (NSGRP) goals. Tanzania, like most other developing countries, is faced with huge budgetary constraints which need to be addressed through greater participation of the private sector. The PPP arrangement is beneficial to a country and justifiable in view of the potential benefits that accrue to all parties.

The potential benefits includes facilitating creative and innovative approaches in stimulating private sector to engage in specific PPPs; with the government allowing bidders to compete on the basis of their ability to develop unique and creative approaches to the delivery of a required output. Also it enhances government's capacity to develop integrated solutions that effectively addresses public needs. It reduced costs of implementation and realization of quality products and services attributable to economies of scale and operating efficiency and accessing technical and managerial expertise, financial resources and technology from the private sector.

## **2.3 Empirical Literature Review**

In this section researcher reviewed the work done by other researcher which relate to the topic under investigation. It basically aims at relating theoretical literature review with finding of other researchers.

### **2.3.1 Empirical study from Tanzania**

According to Theodory and Malipula (2012) on their study titled "Supplying Domestic Water Services to Informal Settlements in Manzese, Dar es Salaam". Argue that there should be deliberate efforts by the government and development partners (local and international) to vastly improve water infrastructures in informal settlements areas. Specific attention has to be put on finding alternative sources of water for the fast growing Dar es Salaam population and re-establishment of the water infrastructure in informal settlements through a public-private partnership venture. Since this

recommendation requires a lot of resources in the meantime Manzese inhabitants need to be empowered to take advantage of rational water shortage coping mechanisms in place particularly utilization of the underground water sources. We further recommend for deliberate initiatives towards improving water supply services governance in terms of enhancing local community involvement in water supply projects so as to heighten their sense of ownership, improving transparency and accountability in the management of water supply services projects.

According to Kjellén (2003) on the study titled "water provisioning in Dar es Salaam, Tanzania argue that privatization is often a way of implementing changes that many feel should be done anyway. Organizational adjustments to promote higher efficiency within the existing institutional structure in Dar es Salaam would probably be a daunting task. Privatization can then become an opportunity to get a 'fresh start.' But, as Lobina and Hall (2000) show with a number of case studies, efficiency is not necessarily higher in privately owned water corporations. Nonetheless, in the case of Dar es Salaam, privatization is also a way of securing the major capital investment programme financed through the World Bank and other donor institutions. (The credit is conditional on that privatization takes place).

Other study in relation to private sector participation in public service delivery suggest the uses of PPP for example Itika et al, (2011) on their study titled "successes and constraints for improving public private partnership in health services delivery in Tanzania". Argue that, Public-private partnerships are the best policy option for improving health service delivery in the country. Despite of the strong dissatisfactions with the performance of PPPs in the health service, given the long history of the private sector as well as the increasing number of PPPs in the service delivery, poor capacity and mistrust between the government and the private sector need to be worked upon.

According to (Ngowi, 2006) on the study Public-Private Partnership (PPPs) in the Management of Municipalities in Tanzania argue that, the PPPs concept is being used in Tanzania's bid to bring about sustainable development. However, a number of potential and actual challenges are likely to face parties in a PPP arrangement. This is

mainly due to the fact that it is not easy to attain the minimum critical mass of the requirements for a smooth operation of the PPPs concept in Tanzania. In light of these challenges therefore, it is further concluded that there is a need for interventions if the PPPs concept is to be meaningfully used as one of the strategies for sustainable development in Tanzania and beyond. There is, therefore, a need for capacity building initiatives.

### **2.2.2 Comparative study from other counties**

According to WASH Technical Report (1993) titled “Preparing for private sector participation in the provision of water supply and sanitation services” argue that the participation of private sector in delivery of water service can help to meet water challenges by strengthening their institutional and management performance. This, in turn, may produce efficiency gains and better use of existing resources. However private sector can contribute in these areas, but it is important for decision makers to understand the opportunities and constraints that govern the private sector's willingness to participate. To enable the private sector to make a profit, the main and legitimate motivation for its interest in the sector, public managers must create an environment that lowers risks and offers a high probability of a reasonable return on investment.

According to (Charles, 2006) on the study titled “public private partnerships as modes of procuring public infrastructure and service delivery in developing countries: lessons from Uganda local government authorities” argue that, The major constraint being the lack of PPP prerequisites, comprising of policy guidelines, regulatory frameworks, awareness, training and strong public and/or private sector institutions. Lack of a national and sectoral policy and regulatory framework on PPP in Uganda is a major deterrent to extending the PPP concept to local governments. The framework is necessary to protect public interest, check abuses, enhance capacity and promote PPPs.

According to (Muneera, 2012) on the study titled ‘Public-Private Partnership (PPP) in Solid Waste Management. A literature review of experiences from developing countries with special attention to Sri Lanka. Argue that, generally developing nations

face several problems to manage the waste in the cities. Due to the increase in the environmental and health issues create by waste; developing nations looking for an alternative solution to manage the problem. In recent years PPPs engaged inset increased rapidly as PPP found good strategies to ensure environmental protection or to provide urban environment services.

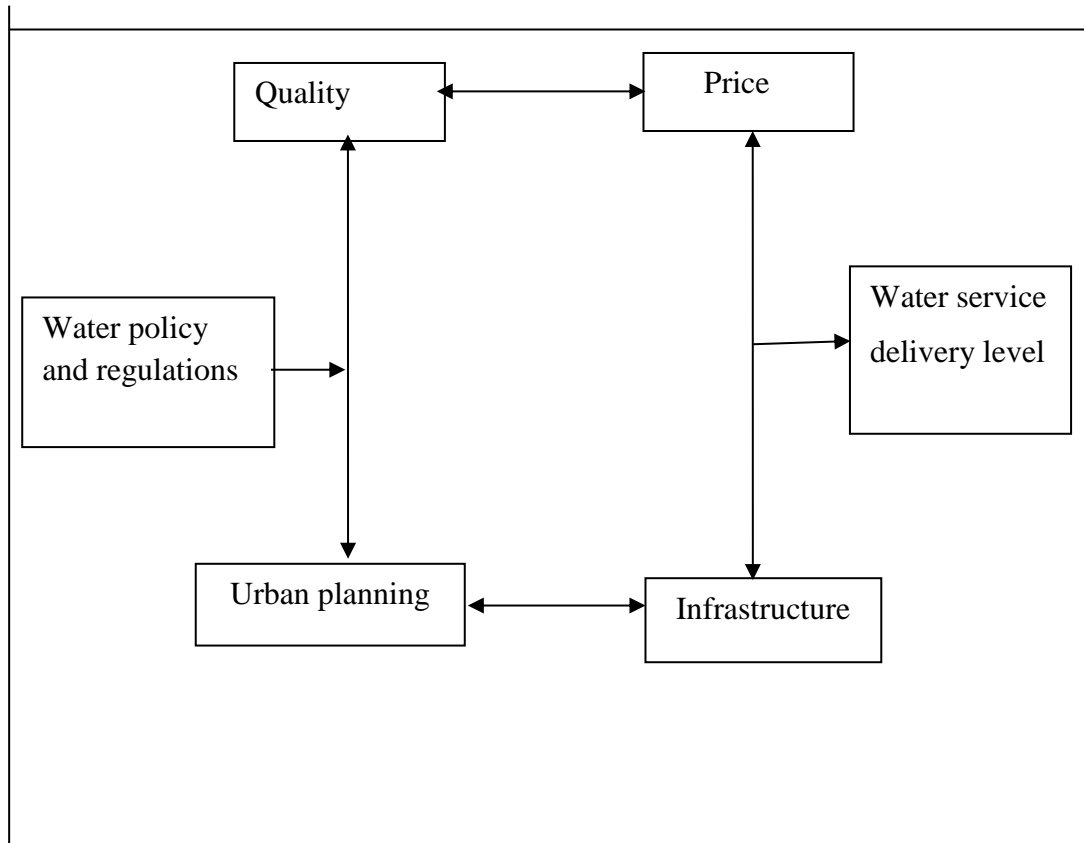
#### **2.4 Research Gap**

Form empirical literatuereview, the study appreciate some work which was done by other researchers in relation to private sector participation in delivery of public service. Form the empirical reviews it evidence that the private sector have contribution in delivery of public service. The empirical reviews suggest diferent forms in which private sector can delivery public service like through PPPs on the side of solving water crises in Dar es Salaam the study suggest involvement of private sector. However none of the studies above has systematic examine the private sector water services delivery in dar es salaam Tazania.Focus on the identify factors affect water quality delivery to DSM consumers by private sectors, examine the effect of price by Private sectors in delivering water to consumers and the effect of infrastructure and urban planning in water supply to Dar es Salaam Water Consumer in Tanzania. Therefore the study is needed for bridging the gap.

#### **2.5 Conceptual Framework**

The conceptual frameworks guide this research drawn in relation to the problem identification and based on factors affecting private sector participation in delivery of water service in Dar es salaam, Tanzania.The main problem is water service delivery (dependent variable) in which the effective delivery of the water service.It depends on the qulity of the service, quantity of the water supplied, infrastructure used to supply water and the price charge for water service. However all these depend on the water policy and reguration of the country.

**Figure 2.1 shown;** The conceptual framework of the factors affecting water service delivery by private sector in Dar es Salaam, Tanzania



**Source;** researcher (2014).

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

Research methodology is the systematic way to solve the research problem. It may be understood as a science of studying how research is done scientifically. This chapter presents the methodology and procedures used in the study, which include research design, study area, study population, sample size and sampling techniques, data sources and type, validity and reliability and data management and analysis.

### **3.2 The Research Design**

The study used a case study as the research design to investigate private sector water services delivery in Dar es Salaam Tanzania. The selection of case study design based on its ability to provide in-depth of the case to be studied, also enables the researcher to use multiple sources of data and a variety of research methods to explore the research questions which, in turn, foster the validation of data through triangulation (Denscombe, 1998). Thus, any findings or conclusions are likely to be more compelling and accurate (Yin, 2003).

A case study design is defined as the research strategy which is used in many situations to contribute to the knowledge of an individual, group, organizational, social, political, and related phenomena (Yin 2003:1-7). The strategy offers the opportunity to “explain why certain outcomes may happen more than just find out what those outcomes are” (Denscombe, 1998:31).

The case study strategy is best for gaining a deeper understanding of the research being investigated (Morris and Wood, 1991). However, the case study approach has not been widely accepted as a reliable, objective and legitimate research strategy. One of the most critical criticisms directed to this approach related to the difficulty in generalizing the findings to a larger population (Yin, 1994; Thomas, 2003).

### **3.3 Study Area**

The study was conducted in Dar es Salaam where by different part of the city was used for collection of information in relation to the study specifically those areas which much affected by water shortage problem. Although the water crises is the common problem in most of urban area in Tanzania, the city of Dar es Salaam was selected as the single case due on the basis of time constraint and it much affected by increasing in population it accounts for around 25 percent of the country's urban population hence demand of water is dramatically increasing.

### 3.4 Study Population

A population can be considered to be the focal group from whom the researcher wants to learn something. It is the totality of all the objects and subjects that meet the requirements of a specific situation. An accessible population can be described as all the cases that meet the criteria and are accessible for the study (Polit and Hungler 1995:33; 229-230). For the case of this study, population includes Public water authority specifically Ministry of water, EWURA, DAWASCO, and other public entity deal with water service. Also private sectors deal with provisional of water service and consumer of water in Dar es Salaam.

### 3.5 Sample Size and Sampling Techniques

#### 3.5.1 Sample Size

Sampling of the study population allows the researcher to have a manageable area that can be possible to maintain the objectivity of the study with in a specified period of time (Kothari, 1990). The total target population of 130 respondents was used. In determination of the sample size the famous formulae of taro Yamani's was used. The formular states that, the desired sample size is a function of the target population and the maximum acceptable margin of error (known as the sampling error) and it is express mathematically thus;

$$n = \frac{N}{1 + Ne^2}$$

Where:

$n$  =sample size

$N$  = target population

$e$  =maximum acceptable margin of error (5%)

Thus in this study, the desired sample size given that there is 80 respondent it

Consider;

$N= 130$  respondents

$$E = 5\%$$

Then to compute for the sample size consider the formular above;

$$n = \frac{N}{1+Ne^2} \text{ Then it follows that;}$$

$$n = \frac{130}{1 + 130 \times 0.05^2}$$

$$n = 98 \text{ respondents}$$

### 3.5.2 Sampling Technique

The study adopted a non probability sampling strategy using purposive and snow ball techniques which enabled researcher to select and study cases that would serve the purpose of the study and answer the research questions. A non-probability sampling involves the researcher in choosing subjects for a particular reason.(Polit and Hungler 1993:174). According to Corbetta (2003), a non-probability approach reflects that, the chances of each person to be chosen in the sample is unknown but the features of the population are used as the main measure for selection. A purposive approach is well-suited to small-scale and in-depth studies (Ritchie et al 2003).

The study used main stakeholders which are public authority which deal with water supply activites in Dar es salaam (EWURA, DAWASCO, Ministry of water and Kinondoini municipality), private sectors deal with water supply activites and consumers of water service. Table 3.1 identifies the Number of respondents and the sampling technique for each stakeholder.

**Figure 3.1 shown the sample size and sampling techingues used**

<b>Key stakeholders</b>	<b>Number of respondents</b>	<b>Sampling techniques</b>
Public sectors	15	Snowball sampling
Private sectors	20	Puprosive sampling
Consumer	63	Purposive sampling
<b>Total</b>	<b>98</b>	

**Source;** researcher (2014).

Study was collected data from 15 respondents from public sectors by non probability sampling in which snowballing techniques was used. The snowballing technique is well-suited for purposive sampling (Denscombe, 1998). With the snowballing technique the sample is formed as a referral in which each participant is asked to suggest other people who could potentially take-part in the study. Also, this type of sampling is often used with very small-sized samples such as case study or if there is a need to choose participants that are well-informed (Neuman, 2000). The researcher can approach the new person using the name of the nominator as a source of reference to increase his/her credibility (Denscombe, 1998).

In collection of data researcher was introduced by Temeke Municipality Engineer colleagues who worked in ministry of water, EWURA, DAWASCO and other colleagues who worked at local government authorities and (from kinondini, Temeke, and Ilala). Researcher conducted an interview with engineer Primus friend and then asked the interviewee to suggest some other potential respondents who might be interested in the research topic and could help it further.

On the side of private sectors the study was used purposive sampling approach to identify a sample. A purposive sampling is a type of non-probability sampling in which the researcher chooses subjects with specified characteristics. Convenience sampling involves choosing subjects that are easily available to the researcher (Kothari 2001:72-73). A researcher used a total of 20 respondents which includes water vendors and other people which involve with selling of water to householder. With the purposive sampling the researcher has to use personal judgement to select cases that will best meet the research questions and objectives (Saunders et al 2003). Rubin and Rubin (1995) named three main guidelines for selecting a purposive sample. The researcher should select the informants who are knowledgeable about the issues being investigated, willing to talk and representative of the range of points of view.

Likewise, researcher used purposive sampling techniques to select respondents from consumers of water service. A total of 68 respondents were used for data collection. The researcher used students of MSC/PSCM class of 2014 of Mzumbe university Dar es Salaam campus to present consumers of water service in Dar es salaam. The uses of MSC/PSCM class was based on the fact that the respondent were knowledgeable about the current situation of water service delivery in Dar es Salaam because they come from different parts of the city hence they present the whole Municipality in Dar es Salaam. Also researcher collect data from other water consumers from different water collection central in the city for more information.

### **3.6 Data Sources and Type**

According to Yin (2003:83) “evidence from case studies can come from six sources: documents, archival records, questionnaire, interviews, direct observation, participant-observation, and physical artifacts”. For the case of this study the primary data was gathered directly from respondents which includes public organizations, private firms, and consumers of water service in Dar es salaam. The secondary data was obtained from indirect sources, such as textbooks, articles, websites and internet.

#### **3.6.1 Primary data collection method**

The study was used both questionnaire, interviews and direct observation as the techniques for collect primary data. According to (Collis et al, 2009) primary data includes the information obtained directly from a source, such as interviews or observations and questionnaire. In addition, Burns (2000: 485) argued that, primary data are first hand information obtained for a research. This could be in the form of an interview, questionnaire, records written and kept by people involved in, or who bear witness to an event.

##### **3.6.1.1 Questionnaire**

The study was used questionnaires which containing structured and unstructured questions in collection of primary data. Researcher prepare questionnaires thematically on the basis of the research questions and divided into two sections where by the first

section; Section A, captures personal information of the respondents, while Section B captures information in addressing research questions (i) to (iii) (seen appendix I). The questionnaire was distributed to the selected sample of respondents in the public organizations and consumers of water service.

### **3.6.1.2 Interview**

Researcher used unstructured interview to collect primary data from the consumers of water service, respondent from some public sectors and form some private sector which deal with water supply in Dar es salaam (water vendor). An interview is literally an inter view, an inter-change of views between two persons conversing about a theme of mutual interest” (Kvale, 1996:14). According to Kothari (2004) the researcher shall use both structured and unstructured interview that involve face to face contact with the respondents. The uses of interview was based on the fact that; the researcher want to get information from households uses of water service in which mostly of them do not preffer questionnaire.

Interview was the suitable way for solving language problem since it was done by using both English and Swahili language for those who do not understand English. The transcribed material was translated by an experienced Swahili translator, and reviewed by the assistant and the researcher. Juntunen (2000:45–49) notes that “language barrier and the role of the research assistant are in focus when evaluating the relevance of the data collection”. Choosing informants who were all fluent in English would have severely restricted the choice of informants, so swahili language was used for purpose of getting response form the consumers of water service and from the local water vendors who are mostly of them used Swahili language.

The researcher is fairly fluent in Swahili, and was helped by an assistant on a few occasions when a word or two in the answer was not fully understood, and seemed to be critical in understanding the response, or where a ‘new’ sub-topic opened up for which the researcher needed an additional phrase to probe the issue. All interview was

done in line with the research questions. A researcher develop a pattern of questions in advance to guide the conversation with the respondents.

At the beginning of each interview, researcher introduced himself to the interviewee stating my name, position, institution and then explained the aim of the research to formalise the interviewee with the research topic. This brief introduction was followed by asking the interviewee about his/her personal information (education, marital status, residential area and for how long have been there).

All these was aimed on creating a good atmosphere to conduct the interview and facilitate the interaction with the interviewee. The interviews was conducted in various area were by people used to collect water ( water collection centras) and it lasted between 45 – 120 minutes. At the end of the interview, all respondents were asked to give me permission to conduct direct observation and take some photographs, for more clarification.

### **3.6.1.3 Direct observation**

The researcher also using direct observation in collection of primary data which enable the researcher to detect some issues investigated in a natural and unplanned situation. According to Krishnaswami (2002), observation is the systematic phenomenon in its proper setting for the purpose of gathering data for particular study. This type of observation implies that the observer watches and listens to events directly. The observation can be guided through a set of questions that an investigator attempts to answer (Thomas, 2003). In fact, visiting the field to collect the data through other evidence, i.e. interviews, creates an opportunity to make direct observation (Yin, 2003).

The researcher used non participatory method during the study that is researcher did not actively participate but observed the situation under study. The reason of using observation is because the research method gives an opportunity to gather firstly live

data from the situation (Cohen et al, 200). Throughout the observation researcher took field notes to the issues observed and supported the notes with pictures.

### **3.6.2 Secondary Data Collection Method**

The researcher collect secondary data through documentary reviews. A document is any substance that gives information about the investigated phenomenon and exists independently of the researcher's actions. It is normally produced for specific purposes other than those of the research but it can be used by the researcher for cognitive purposes, e.g. letters, newspapers, diaries and websites. (Corbetta, 2003). Saunders et al (2003:201-202) argue that, the uses of this source of data saves particular time and money for the researchers, it allow the researcher to analyse far and larger data sets and give the researcher opportunity to think about the theoretical aspirations and substantiate issues, as there is more time to analyse and interpretation of data.

In the present study, a number of documents were critically analysed, including various documents form ministry of water, DAWASCO, EWURA, and Dar es salaam miunicipality which are inline with the study most of this document are inform of electronic (soft copies) which are found in various websites.

## **3.7 Validity and Reliability**

### **3.7.1 Validity**

The study validity was achieved by undertaking multiple methods to investigate the problem from different angles and strengthen the validity of the findings. According to (Mugenda and Mugenda, 2003) validity is the accuracy and meaningfulness of inferences, which is based on the research results. Ritchie and Lewis (2003) indicated that the validity of research is conceived as the precision or correctness of the research finding. Researcher used triangulation and generalization strategies to make study more valid. According to (Arksey and Knight, 1999), Triangulation is a strategy that can be used to strengthen the confidence of the research findings. The uses of different source of data and different techniques in collection of data like questionnaire, interviews, direct observation and document analysis increasing study validity.

Generalisation can be defined as “the assertions of enduring value that are context free” (Lincoln and Guba, 1985:110). For qualitative researchers, generalizability can be perceived as the “fit” between the cases studied and the other situations to the extent that make it possible to generalise the findings of the research (Schofield, 1994).

Kalof et al. (2008) added two ways to achieve the generalizability of the research findings, this includes clear description of the sample selection criteria and rich description of the research site. Both tactics had been used in the current study where a thick description of sampling procedures and selection criteria had been provided. It also provided detailed information about the research site in terms of the procedures undertaken to achieve the aim and objectives of the research.

### **3.7.2 Reliability**

A number of measures were undertaken to enhance the reliability of the current research. Lysons (2002) define Reliability as a measure of the ability of a product to function successfully when required for the period required under specified conditions. Reliability is known as to what extent the research findings can be replicated, if another study is undertaken using the same research methods (Ritchie and Lewis, 2003).

Reliability in the current study was achieved through recording of all interviews to present more reliable evidence and avoid any bias which might happen if the researcher attempted to remember the conversation. Gray (2004:345) asserted that “in terms of reliability, it is fairly obvious that taped conversations will tend to present more reliable evidence than hastily written field notes”. Also, all the questions were worded clearly and asked in a natural tone of voice. If there was any misunderstanding the question would be repeated in order to enable the interviewee to understand what she/he was asked for. Moreover, all interviewees were given the opportunity to explain their own beliefs and thoughts freely without any intervention either with comments or gestures, which would create bias in the interviewee’s response to the question being asked.

### **3.8 Data Management and Analysis**

Data Management and analysis is an important step in research the researcher stated how the data was inspected, collected, analyzed and program used in the analysis. This ensured correctness and reliability of the findings.

#### **3.8.1 Data Management**

Data management is an administrative process by which the required data is acquired, validated, stored, protected and processed and by which its accessibility, reliability and timeliness is ensured to satisfy the needs of the data users. Data used by the current study includes qualitative and quantitative data. After collection of data, later the collection was edited and summarizaed to reduce errors that occurred in collection process.

The exercise was involved careful scrutiny or checks of the completequestionnaire not only to ensure that they all filled but also to detect errors and omission so as to ensure consistency with other facts gathered. Immediately after the interview session, proper notes about the responses obtained were compiled to avoid the possibility of forgetting. Data collected was entered into the computer to accelerate the analysis stage.

#### **3.8.2 Data Analysis**

The study findings were presented using statistical procedure or models such as tables and percentages, which were used to summarize the results in order to draw conclusions. The study applied both qualitative and quantitative analysis techniques. The researcher used Microsoft Excel in analyzing primary data. With the use of Microsoft Excel the researcher was able to analyze the information from the findings quickly. The analysis was guided by research objectives and research questions.

## CHAPTER FOUR

### DATA ANALYSIS AND PRESENTATION OF FINDINGS

#### 4.1 Introduction

In this chapter the analysis and discussion of the findings are presented. The analysis and discussion in this chapter is based on the responses from research questionnaires, interview questions, observation and secondary data information. The research intended to assess the private sector water services delivery in Dar es Salaam Tanzania. Specifically focus on identification of factors affect water quality delivery to DSM consumers by private sectors in Tanzania, examine the effect of price by Private sectors in delivering water to consumers in Dar es Salaam Tanzania, to investigate the effect of infrastructure in water supply to Dar es Salaam Water Consumer in Tanzania and to investigate the effect of urban planning to the delivery of water service by private sector to Dar es Salaam residents in Tanzania.

#### 4.1 Response rate

The study was conducted by using both interview and questionnaire to collect primary data. Out of 98 respondents only 94 were respond to both questionnaire and allowed for interviews. Researcher distribute 65 questionnaire in which only 61 questionnaire was filled and return while 4 was not return. Similarly interview was also used for collection of primary data in which the researcher conduct an interviews with some public sector officers, private firms which deal with water supply like water vendors and some consumers of water service specifically those who were collect water at water collections centrals in various areas in the city which make a total of 33 interviewed respondents. For more explanation the study response rate presented in the form of table as it shown below;

**Table 4.1** shown the response rate of respondents

<b>Response Rate</b>	<b>Number of Response</b>	<b>Response in Percentages</b>
Expected response	<b>98</b>	<b>100%</b>
Actual response	94	95.92%
Not response	4	4.08%

**Source;** Analyzed data, (2014).

From the study finding, it evidence that the respondents were willing to participate in the study this is due to high response rate of 95.92% . Also high response is the sign of high quality study. This is supported by (Aday, 1996) which argue that higher response rates assure more accurate survey results.

## **4.2 Demographic Information of the Respondents**

The following respondents characteristics were found to be important variables as basis for the situational analysis, geographical location, length of stay in a particular area, education, gender, occupation and current water service provider.

### **4.2.1 Geographical location of respondents**

The study sough to find the distributin of respondents in term of geographical ares in Dar es salaam. The researcher found that, out of 94 respondents 44 respondents which is 44.68% come from Kinondoni, 33 respondents which is 35.11% come from Temeke and the rest 19 respondents which is 20.21% come from Ilala. The study findings presented in the table below;

**Table 4.2** shown the geographical distribution of respondent in DSM

<b>Location area</b>	<b>Number of respondents</b>	<b>Percentage of respondent</b>
Kinondoni municipality	42	44.68%
Temeke municipality	33	35.11%
Ilala municipality	19	20.21%
<b>Total</b>	<b>94</b>	<b>100%</b>

**Source,** field survey (2014).

From the study finding it clear that majority of respondents come from Kinondoni municipality, followed by Temeke and Ilala municipality. This is the sign that Kinondoni municipal occupied by the large population than other municipality. The study finding is corresponding with the Census Report of (2002) which shown that, Kinondoini Municipal had the highest population with a total of 1,083,913 inhabitants, followed by Temeke with 768,451 and Ilala with 634,924 inhabitants.

#### **4.2.2 Gender of respondents**

The study sought to find out the distribution of the respondents by gender. This is for general information and is not a direct objective of the study. The findings are presented in the Table below;

**Table 4.3** shown the gender of respondents

<b>Gender</b>	<b>Number of respondent</b>	<b>% of respondent</b>
Male	46	48.94%
Female	48	51.06%
<b>Total</b>	<b>94</b>	<b>100%</b>

**Source,** field survey (2014).

From the table 4.3 above the study found that, the male respondents were 48.94% while the female were 51.06%. From the finding it evidenced that the majority of respondents were female. Although the female were many than male but their difference is minimal, that means the study was gender unbiased. Also it is the sign that the water problem is affect the entire society regardless of gender.

#### 4.2.3 Education level of respondents

The study sought to find out the distribution of the respondents by education. The study study finding represented in the table below as follows;

**Table 4.4** shown educaton level of the respondents

<b>Education level</b>	<b>Number of respondent</b>	<b>% of respondents</b>
Postgraduate/ masters	5	5.32%
A/Diploma/Bachelor degree	50	53.19%
Diploma	6	6.38%
Certificate	8	8.51%
Secondary	15	15.96%
Primary	10	10.64%

**Source,** field survey (2014).

Form the table above the study found that, 5.32% of respondents have post graduate/ masters degree, 53.19% of respondents have advance diploma/ bachelor degree, 6.38% respondents acquire dipoma, 8.51% of respondent acquired certificate 0.64% of respondents acquire secondary certificate and the rest of respondent that is 10.64% acquired primary education.

From the study findings the majority of respondents have attain university education which are more than 50% . This imply that the respondents could give responses that are factual. Also it indicate that there is a possible relationship between attainment of formal education and an individual's chances of access to water. In the sense that

education is an avenue to attaining an income hence the consumer's likeliness to have an income and ability to pay for water connection to regular water supply.

#### 4.2.2 Length of Stay in the area

The respondents were asked to state for how long they had been staying in the area. The response showed that 67 respondent out of 94 had stayed in their respective areas of residence for over 4 years with the majority being between 4-10 years. Whereby 27 of the respondents indicated that they did not know how long they had respectively stayed in the areas. The study finding was presented in the table below as it shown;

**Table 4.5** shown Length of Stay in the area

<b>Length of Stay in the area</b>	<b>Number of response</b>	<b>% of response</b>
More than 4 years	67	71.27%
They dont know how long	27	28.73%
<b>Total</b>	<b>94</b>	<b>100%</b>

**Source,** field survey (2014).

From the table 4.3, the finding shown that 71.27% of respondents stay in their area for more than 4 years while the rest of 28.73% they dont know for how long. This means that majority of respondents had stayed long enough in the areas to have experience of water service provision and they are well experience water problem in their area.

#### 4.2.3 The current situation of water service delivery in Dar es salaam

The respondents explain that, the current situation of water service delivery is poor which characterized by inadequate water supply, poor infrastructure as well as low quality of water service delivery. The source of water supply are inadequate to meet the demand of water. The main source of water is from DAWASCO, water vendors, Community water supply and other source of water like form rain harvesting and well and boreholes which are not sufficient to solve water shortage in Dar es salaam. The study finding is presented in the table below;

**Table 4.6**respondents source of water supply

<b>Water service providers</b>	<b>Number of responds</b>	<b>% of respondents</b>
Dawasco	53	56.4%
Water vendors	20	21.3%
community water supply	15	16.0 %
Other source of water supply	6	06.3%
<b>Total</b>	<b>94</b>	<b>100%</b>

**Source,** Researcher finding, (2014).

From the table 4.5, the finding shown that 56.4% of respondents using water from Dawasco. 21.3% of respondents buy water from water vendors, and 16% of respondents using water from community water supply while the rest of respondents that is 06% obtain water form other source like from river, rain water havesting and form wells and borehole. From the study finding, it shown that majority of the study respondents about 56.4% use water form DAWASCO. However the rest of respondents that is 43.6% they obtain water form other source. For example purchasing from water vendors, well and borehole, river water and other through rain havesting. The finding explain as follows;

#### **Uses water from DAWASCO**

Majority of the respondents that is 56.4% using water from DAWASCO in which they have private water connections and some time purchasing water from DAWASCO Kiosk. Respondents also claimed that even if they have pipe line at home, water problem is not yet solved. DAWASCO water are not reliable and some time the quality of water is poor. Areas surved like Ubungo Msewe, Msewe golani, Makongo juu and Changanyikeni most of household they have DAWASCO pipe connection but at the same time they have alternative source of water. It futher argue by respondents that DAWASCO has fail to solve the current water demand.

The finding of the study is inline with Theodory and Ndunguru (2013) study which show that there is a large gap between demand and supply of water in the city of Dar es Salaam. It is estimated that the city's demand for water is between 350 to 400 MLd of which 60% is for domestic use, 10% is for commercial purpose, 10% is for industrial activities and 20% is institutional use. However, DAWASCO produces 300 million litres of water per day for the city against a demand of 400 million litres.

### **Purchasing water from Vendors**

The current situation of water supply in the city is poor DAWASCO fail to meet water demand in Dar es salaam. Un reliability and absence of water for a long time is the common problem in various part of Dar es salaam. Respondents form Ubungo Msewe, Kimara Baruti, Sinza, Tabata claimed that they normally purchasing water form street water vendors even if they have DAWASCO pipe line at their home. According to Humphrey (1995) water vendors supply water to about 50% of house holds in the City of Dar es Salaam (observe figure 4.1 and 4.2).

The study finding is corresponding with UNDP report of 2011 which explain that in Kimara there is DAWASCO infrastructure but the supply and access of water remain limited, in part because of the hilly terrain. the majority of households therefore rely on DAWASCO's public kiosks or mobile vendors for water distribution. In which water tankers and trucks distribute water across the area. tanker trucks are often refurbished fuel delivery lorries that have been cleaned and repainted. Operating under the scheme known as 'water-by-tank', operators may load their tanks at one of the 23 official water-by-tank water points operated by DAWASCO.

Messer (2001) noted that when the water authorities do not provide water which meets the demands of the population, the locals look for alternative means of getting water. Individuals or collective organizations seek for alternative ways of obtaining water. Residents opt to buy water from water vendors who keep water in 5000 to 10000 litres reservoir on their plots. However, other residents obtain water from water vendors that use handcarts who are common providers of water in many parts of the city.

### **Community water supply**

The establishment of community water service provide is the measure taken by community in solving the water shortage problems. 16.0 % of respondents claimed that they normally used public water tap as well as in house connection managed by water committee. The researcher observe the situation in area like Golani and Tungi.

This finding concur with UNDP report of 2011 which explain that, in Tungi, Ferry the common source of water for house hold is form community based service provider. one had expanded considerably to supply 12 public taps as well as 125 in-house connections. it is managed by a Water committee comprised of eight members, who are elected by the community for a three-year term. the other community- provided service was supplied by a borehole owned by the community. the pump operating the borehole is managed by an individual, who pays a monthly fee of tshs 5,500 (uS\$3.80) to the local council.

### **Other source of water supply**

The study observe that the absence of water from DAWASCO resulting into other alternative source of water. 06.3% respondents are mostly depends on rain water havesting, borehole and also from rivers water. The havesting water or water drawn from the wells and bore holes are common used for other purpose lather than cooking.

This finding concurs with that of Mwakalila (2007) who documented that many parts of Kinondoni and Ilala municipality have no piped water supply especially those areas (wards and streets) located far from the city centre. Residents in those areas rely much on boreholes, shallow wells that are mainly used during water deprivation days and during DAWASCO taps break down. According to Chinyele (2008) argue that most residents at Kimara Ward particularly Mavurunza, Kilungule and Kingogo localities to depend on rain water for a variety of uses during rainfall season. Rain water harvesting plays great role in water supply provisioning in the study area despite the fact that there are fewer initiatives to bring in modern technologies in rain water harvesting.

### 4.3 Factors affect water quality delivery to DSM consumers by private sectors in Tanzania

The study sought to find the respondents' views on the factors affecting water quality delivery to DSM consumers by private sectors. A separate physical water quality parameters (i.e., Taste, Smell, Colour) was used as the measurement of the quality of water. The researcher used four (4) points that is ("Excellent", "Good", "Fair", and "Poor") in question regarding to physical quality of water. Here, respondents were expected to indicate which best described their impression about the water quality.

**Table 4.7** shown factors affect water quality delivery to DSM consumers by private sectors in Tanzania.

<b>Factors</b>	<b>Excellent</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
Taste	16 (17.%)	50 (53.2.%)	18 (19.2%)	10 (10.6%)
Smell	14 (14.9%)	53 (56.4%)	17 (18.1)	10 (10.6%)
Colour	5.3%	15 ( 16.0 %)	40 (42.6%)	34 (36.2%)

**Source,** field survey (2014).

From the table above the study found that consumers were generally satisfied with the taste of water (53.2.%) rating it as good and (17.%) rating as Excellent. However some of respondents claimed that some time due to the shortage of water the vendors supplied water from borehole which contain salt. On the side of the smell of water, the study revealed that consumers were generally satisfied with the smell. This is shown in table 4.6 where (14.9%) said it was excellent, (56.4%) graded it as good.

The greatest dissatisfaction of the consumers on the quality of water were found in the colour of water. The respondents claimed that the colour of water looked brownish with instances with tiny particles this make most of the consumers to store the water and allowing it to settle before usage. This was commonly in the area like Makongo

juu, Ubungo msewe, Golani, and changanyiken in which most of the consumer purchasing water form water vendors.

The study finding shown that however respondents argue that the water taste and smell is good, the colour of water was the problem many respondents claimed that the water supplied by vendor have brownish colour and some time have salt. This imply that the quality of water supplied in Dar es salaam is poor.

The study finding is inline with (UNDP, 2011) which argue that the water supplied by the vendors is not safe this is due to the fact that itdeficult to monitor quality between tha source and the end users. It futher argue that most of the households purchase water from vendor which is too salt to drink.Sometimes when DAWASCO water is in short supply tankers and trucks have to drive around the area looking for alternative water sources.

If they travel further than usual to obtain water, the vendor may increase the price he charges. Tankers and trucks will sometimes carry river water if they are requested to supply water for construction purposes. There is no guarantee that the tanks are properly cleaned before refilling them with water for drinking purposes. This makes water quality unreliable for end users.

The study finding is also in agreement with (Theodory and Malipula, 2013) which found that the that low-income households were paying a premium to access utility water delivered via various third party providers. Kiosks were often not functioning and borehole water was considered to be of poor quality. The quality of water was still poor as the results indicate that many residents were affected by water related diseases. It futher inline with that of (Mosi, 1996) which revealed that many residents in Dar es Salaam are being affected by water related diseases. Availability of water to the urban poor is still a challenge to DAWASCO.

#### **4.4 The effect of price charge by Private sectors in delivering water to consumers in Dar es Salaam Tanzania**

The study sought to find the respondents' views on the effect of price charged by private sector in delivering water to consumers in Dar es Salaam Tanzania. The study asked respondents about their impression on the cost of water with a four-point grading system (e.g., Low, Moderate, High and Very High). The study used responses from customers to examine the fairness of water tariff since water pricing is an important criterion for ensuring financial sustainability of the service. The findings presented in the table below;

**Table 4.8** shown the effect of price by private sector in delivery of water to consumers in Dar es Salaam.

<b>Effect of Price</b>	<b>Number of Response</b>	<b>Percentage of Respondents</b>
Very high	16	17%
High	51	54.3%
Moderate	20	21.3%
Low	7	7.4%
<b>Total</b>	<b>94</b>	<b>100</b>

**Source, field survey (2014).**

From the table above the study found that, majority of respondents 54.3% said high, 21.3% said moderate, 17% said very high while another 7.4% said very low. Those who said it was very high and high happen to live in the area where the DAWASCO water is unreliable most of the area like Changanyikeni, Makongo juu, Tabata, they purchase water at high price from water vendors. Normally the price of water supplied by vendor is high compared to the charge of DAWASCO simply because they add with transportation cost.

The finding of the study is inline with (Foster and Bricenogarmendia, 2010) which argue that the price of water supplied by the private vendors is high compare to that of DAWASCO Kiosk some low-income households located far from the utility infrastructure are buying water at the end of the private supply chain at a price equivalent to over uS\$17/m<sup>3</sup> this is almost 30 times the price paid by those who have a household connection to the city utility’s piped network (uS\$0.59), and 17 times the average price paid per cubic meter in organization for economic co-operation and development (OECD) countries. The poorer households pay such high prices not because they can afford to, but because there is no alternative.

#### **4.4The effect of infrastructure in water supply to Dar es Salaam Water Consumer in Tanzania.**

The study sougth to find the respondents views on the effect of infrastructure in delivery of water service to Dar es salaam residents. The respondents were required to agree or dis agree with the statement that, the water crises in Dar es salaam is caused by poor water infrastructure. The finding of the study presented in the table below;

**Table 4.9** shown the effect of infrastructure in water supply to dar es salaam water consumers.

<b>Response</b>	<b>Number of respondnets</b>	<b>Percentage of respondents</b>
Agree	89	94.7%
Dis agree	5	5.3%
<b>Total</b>	<b>94</b>	<b>100</b>

**Source,** field survey (2014).

From the table above the study found that, 94.7% of the respondents argee that, poor infrastructure is the cause of water shortage to Dar es salaam water consumers while the rest of respondents that is 5.3% dis agree with the statement. Form the study finding it clear that poor water infrastructure at large affect the water service delivery to Dar

es salaam residents. The respondents claimed that poor water infrastructure affect the quality, quantity and some time revenue to both public and private vendors.

Despite the URT government took some measure to improve water service since 2002 like increasing of budget in water sectors in 2006 and consider water crises as among of the key issue to be solved by National Strategy for Growth and Reduction of Poverty (MKUKUTA). The current level of water supply is still a challenge, according to the study response about 94.7% of respondents claimed that water infrastructure is the main cause of water crises in Dar es salaam. During interview, researcher observe the water leakage form the pipe in some areas also some interviewee claimed about the pressure of water. This is the common problem in areas in Kimara, Sinza, Vingunguti and Ubungo Msewe and other area in the city. (see figure 4.5).

This finding corresponds to that of Kjellén (2006) who argue that, infrastructure for water supply in Dar es Salaam was largely installed in the 1950s and 1960s now not only suffers from under-maintenance and old age, but also the challenge of supplying water to population vastly larger than it was originally set up to serve. Also (Kjellen, op, cit) argued that the proportion of water that is supplied in the city of Dar es Salaamis lost through leakages due to advanced age of water infrastructures. This contributed much to water shortage in the city. In Manzese informal settlements most of water supply infrastructures areuncovered and damaged leading to water loss.

The finding of (Bathsheba, 2011) also corresponding with finding of the study as it agrue that, revenue is a function of price and quantity; hence loss of water through pipe bursts reduces the quantity of water that reaches the customer and invariably revenue. The GWCL main distribution pipes are old metal pipes that have received little or no replacement since the construction of the Abesim water delivery system in 1950. Most of these pipes have seen severe corrosion which bursts frequently and affects the distribution as the system has to be shut down for repairs.

#### **4.6 The effect of urban planning to the delivery of water service by private sector to Dar es Salaam residents in Tanzania**

Urban planning is of paramount important for achieving government objectives of delivering water and other infrastructure service to its people. The study sought to find the respondents views on the effect of urban planning in delivery of water service by private sector to Dar es Salaam residents in Tanzania. The study asked respondents about their impression on the extent in which urban planning affect water service delivery by private sector with a four point grading system (e.g., Low, Moderate, High and Very High). The finding presented in the table below;

**Table 4.1.1** show the respondents on the effect of urban planning to the delivery of water service by private sector to Dar es Salaam residents in Tanzania.

<b>Effect of urban planning</b>	<b>Number of Response</b>	<b>Percentage of Respondents</b>
Very high	20	21.3%
High	50	53.2%
Moderate	13	13.8%
Low	11	11.7%
<b>Total</b>	<b>94</b>	<b>100</b>

**Source, field survey (2014).**

Form the table above the study found that, majority of respondents 53.2% said high, 21.3% said very high, 13.8% moderate, 11.7% said low. This imply that the urban planning affect the water service delivery. Poor urban planning in most of the area in the city create poor or no water service. Researcher observe area like Manzese, Tandale, buguruni, and vingunguti characterized by poor urban settlements in which water infrastructure and availability of clean water also is the challenge. The private water vendor facing the challenge in selling water due to absence of road which allow penetration to the interial households (seen figure 4.3)

The study finding corresponding with the (Theodory and Malipula, 2013) which agree that Poor urban planning normally poses great challenges on urban water supply services. In Dar es Salaam the challenge is inextricably linked with the increase of informal settlements due to massive influx of people from the countryside to seek a better future. Most of these inhabitants (7 out of 10) are urban poor living in unplanned settlements which cause challenges to water infrastructure (Kyessi, 2001). Among the challenges are the difficulty to lay down water pipes in congested houses, control pipe cutting and effective revenue collection enforcement.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

## **5.1 Introduction**

This chapter summarised the findings resulting from the data collected and analysed in chapter four. It also gives the opinion of the researcher as a result of reasoning from the summary of findings and finally recommendations for improvement in order to solve water problem in Dar es Salaam.

## **5.2 Summary of the key findings**

This study intended to assess the private sector water services delivery in Dar es Salaam Tanzania. Focus on factors influence the delivery of water services to Dar es Salaam resident by private sector in Tanzania. The study collect primary data by using questionnaire, interview and direct observation while secondary data was collected by using secondary source like review various documents.

Four important areas of the study concern includes identification of the factors affect water quality delivery to DSM consumers by private sectors in Tanzania. Examining the effect of price by Private sectors in delivering water to consumers in Dar es Salaam Tanzania. Also to investigate the effect of infrastructure in water supply to Dar es Salaam Water Consumer in Tanzania and the effect of urban planning to the delivery of water service by private sector to Dar es Salaam residents in Tanzania.

The first specific objective was aimed on identify factors affect water quality delivery to DSM consumers by private sectors in Tanzania. According to the study finding the water quality is affected by smell, taste and color. Respondents claimed that the smell and taste are not the common problems in water sourced by DAWASCO but for water sourced form boreholes the taste contain salt, on side of color it look brownish this at large affect water quality.

The second objective focus on examine the effect of price by Private sectors in delivering water to consumers in Dar es Salaam Tanzania. The study found that the price of water supply by private vendors is high compare to the price of DAWASCO in the area like Changanyikeni, Golani, water vendor tend to sell water at high price due to absence of water infrastructure and inadequate water supply.

The third study objective focus on investigating the effect of effect of infrastructure in water supply to Dar es Salaam Water Consumer in Tanzania. The study found that poor water infrastructure in Dar es Salaam at large affecting the lever of water service delivery. In some area the water linkage was observed also it was found that the infrastructure are old that cannot copy with the current population increasing in the city.

The last objective focus on investigating the effect of urban planning to the delivery of water service by private sector to Dar es Salaam residents in Tanzania. The study found that poor urban planning in Dar es Salaam at large affecting water service delivery. The area like Manzese lead difficult for both public and private water service provide to delivery water service. Poor urban planning in Dar es Salaam at large affect the development of new water infrastructure and maintained of the old one.

## **5.2 Conclusion and Recommendation**

In this section, the author make his conclusion and give a recommendation based on the research findings.

### **5.2.1 Conclusion**

The objective of this study was to examine the factors influence the delivery of water services to Dar es Salaam resident by private sector in Tanzania. Based on the summary of findings, the following conclusions were made;

The quality of water is still a challenge to both DAWASCO and private sector, this is due to the fact that the chain from service provide to the final consumer is long. Also the the water facilities and infrastructure are poor also affecting the quality of water. On the side of price, the private sector set price based on the demand of water, normally the vendor are not compete on price lather than cooperate in price. This at large affect the final consumer. Even DAWASCO kiosk charge low price but most of the kiosk are not function. This create an opportunities for vendor to higher the price.

Study also found that poor water infrastructure at large increase the water problem in Dar es salaam, most of water infrastructure does not meet water demand of increasing population also infrastructure are old which cause water leakage. The private water vendor are much affected by poor water infrastructure because decreasing the quantity of water as well as the quality.

The study also conclude that urban planning is the main factor which determine the quality of water service delivery by private sector. In dar es salaam the problem of water shortage is relate to poor urban planning. The study found that most of unplanned settlement like Manzese, Kigogo, Tanndale, Vingunguti are common area affected by water crises simply because of dffucult to develop water infrastructure. The common source of water includes vendors and borehole and Dawasco kiosk which doesnot meet the population dwater demand.

### **5.2.2 Recommendation**

The study has made the following recommendations based on the study findings; Management of quality of water service is of paramount important to both public and private water service delivery. The reality is that there is not a one size fits all solution. In some cases local or national governments will be able to increase access to affordable water for their people in a timely manner, as well as manage the service sustainably.

In other cases, there will be private sector companies (local and/or international), or public-private partnerships, that can achieve these goals more efficiently. We want to help the public sector understand how best it can leverage the knowledge of the private sector, in areas such as efficiency in management and operations, for public purposes. Also private sector should consider the heath of their customers in the all process of delivery water to consumer. The public water utility (DAWASCO) should appreciate

the role of private sector in delivery of water and making strategic alliance with water vendors.

On the issue of price, the water vendor charge high price due to various factors like high price of petroleum product, lincensing, as well as poor transiportation system in some area all these are considered by vendor when they set price. For purpose of lowering price the government and other stakeholder should improve water infrastructure and other facilities which affecting its availability like electricity and good transportation sytem.

Since Poor urban planning is the challenge to both public and private sector participation in delivery of water service delivery the government should discourage the informal settlement in areas which is not well planned for settlements. Also the government should improve living condition of its people in both rural and urban area to discourage rural to urban migration.

Generally the study recommend that, In the long term, there is a need for a coherent, inclusive and socially responsive public utility that provides safe drinking water to all residents of the city. For the short term, this report considers policy measures targeting small-scale water vendors, which could contribute to lowering prices and improving physical access to safe water for low-income communities.

### **5.2.3 Recommendations for further research**

Despite of the various barriers which hinder full utilization of private sector resource in improvement of water service in Dar es salaam. The study suggest the involent of private sector in solving the water crises. The study futher suggest the use of of PPPs forms in dealing with water problem. However, it was not possible within the scope of this study to establish which aspects and type of PPPs are more crucial and should be prioritised in provision of water. A further research should be conducted to

determine the appropriate mode of PPPs which is suitable for water and electricity service delivery in Dar es Salaam since these are te major problem in the city.

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## QUESTIONNAIRES

**Dear respondents,**

I am Zawadi. G.Chediely a Master student of Mzumbe University. The following is a list of questions associated with PPPs implementation in service delivery in the Water sector. I am requesting you to answer them as honestly as possible. I will use the answers for research purposes only for my Masters Degree of Science in Procurement and Supply Chain Management of Mzumbe University (MSC-PSCM. The responses will be handled confidentially, and names of the respondents not disclosed at all.

**SECTION A: General information**

1. Name (Optional) ----- 2. Residential area -  
-----
3. Gender..... a. Male    b. Female..... (        )
4. Educationa. University b. Phd holder c. Masters degree d. Bachelor degree  
e. Secondary f. Primary g. other specify..... (        )

**Section B. Questionnaire for manages, public and private entities**

1. Which sector do you have experience with?  
a. Public sector b. Private sector c. Both [        ]
2. Which of the following best identifies you? General Experiencewith PPP  
a. Consultant b. Engineer c. Contractor d. Subcontractor e. Supplier  
f. InspectorOther (please specify) [        ]
3. How many years of experience do you have in water supply projects?  
a. 5 years and below b. 6 - 10 years c. 11 – 15 years  
d. Over 15years [        ]

**C. Questionnaire for Consumers**

1. Name of current water service provider.....  
a. Dawasco b. other private sector [        ]
2. Do you have piped water inside your house?

- a. Yes b. No. .... [       ]
3. If No, how far (in metres) are you from the water access/connectivity point?  
a. 0-200 b. 201-399 c. 400-599 d. 600-799 e. 800-999 [       ]
4. Did you pay connectivity fee?  
a. Yes b. No [       ]
5. Have you ever had colored water from your current household consumption connection?  
[       ]  
a. Yes b. No
6. How many days in the week do you get water? a.1-2days [       ]  
b. 3-4days c.5-6days d. Weekly .
7. How many hours in a day do you receive water? a Less than 8 hrs  
b Between 8-16hrs c Between 16-24hrs [       ]
8. On the average how many buckets (34 cm size/ 4 gallons) of water do you need for your household per day? a 4 b. 8 c. 12 d. more than 12 [       ]
9. What is your impression about the physical water quality - taste?  
a. Excellent b. Good c. Fair d. Poor [       ]
10. What is your impression about the physical water quality - smell?  
a. Excellent b. Good c. Fair d. Poor [       ]
11. What is your impression about the physical water quality - colour?  
a. Excellent b. Good c. Fair d. Poor [       ]
12. Have you ever noticed any solid particles in your current water supply?  
a. Yes b. No [       ]
13. Do you currently experience interruption in your current water supply?

a. Yes b. No. [ ]

14. If Yes, how often in a month does it occur?

a. Once b. Twice c. Thrice d. Four times [ ]

Have you ever purchased water from water vendors? [ ]

a. Yes b. No

15. If Yes, Please Explain?.....and how much  
.....

16. How much is your household monthly water bill now in Tshs?

17. What possible solution could you suggest for the improvement of water provision Service in Dar es Salaam?

18. What is the main challenge in the current water supply system?

19. How do you get water when there is no supply from DAWASCO?

## Appendix II A

**Figure 4.1 shown;** A lorry supply water to DAWASCO kiosk



Source; field survey (2014).

Figure 4.2 shown the mobile water vendor selling water in Kimara, Dar es salaam



Source; field survey (2014).

Figure 4.3 shown un planned settlement in Vingunguti area, Dar es salaam.



**Source;**field survey (2014).

Figure 4.4 show the water likage in ubungo msewe which caused by poor water infrastructure



**Source;** field survey (2014).